The London School of Economics and Political Science

Policy Networks in Japan:

Case of the Automobile Air Pollution Policies

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Declaration

I, *Takashi Sagara*, confirm that the work presented in this thesis is my own.
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Abstract

The thesis seeks to examine whether the concept of the British policy network framework helps to explain policy change in Japan. For public policy studies in Japan, such an examination is significant because the framework has been rarely been used in analysis of Japanese policy. For public policy studies in Britain and elsewhere, such an examination would also bring benefits as it would help to answer the important question of whether it can be usefully applied in the other contexts.

Based on an examination of the policy networks concept, this thesis sets out four distinct hypotheses. In order to examine their validity, the thesis examines policy-making and policy changes on emission standards in automobile air pollution policies in Japan from the 1960s to the 2000s based on the application of the policy networks approach. The thesis concludes that the policy networks approach can help to explain policy changes in Japan to a certain extent but that its explanatory value is limited. In order to make the concept more relevant to Japan, the thesis suggests that the approach should pay more attention to interpersonal relationships, individuals and individual companies and that it should consider how well participants are incorporated into networks and whether different interests can co-exist without conflicts more fully. Further, it proposes that the approach should take into consideration other associated policy networks and relationships between policy networks in order to more effectively understand policy change. Finally, based on the findings, the thesis proposes future research on shifts from the government style to the governance style of politics on automobile air pollution at both the national and local levels in Japan.

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List of Abbreviations

COOP	Consumer Cooperatives
CO	Carbon Monoxide
CO_2	Carbon Dioxide
EA	Environmental Agency
EIA	Environmental Impact Assessment
EIW	Equivalent Inertia Weight
EPA	Environmental Protection Agency
FEO	Federation of Economic Organizations
HC	Hydrocarbon
JAMA	Japan Automobile Manufactures Association
JCSA	Japan Chain Store Association
JTA	Japan Trucking Association
LDP	Liberal Democratic Party
METI	Ministry of Economy, Trade and Industry
MITI	Ministry of International Trade and Industry
MLIT	Ministry of Land, Infrastructure and Transport
MoC	Ministry of Construction
MoE	Ministry of Environment

MoH	Ministry of Health
MoT	Ministry of Transport
NGO	Non-Governmental Organization
NO_2	Nitrogen Dioxide
NOx	Nitrogen Oxides
NPA	National Police Agency
PAJ	Petrol Association of Japan
PM	Particulate Matter
SME	Small and Medium Enterprise
STA	Science and Technology Agency
TMG	Tokyo Metropolitan Government

Chapter 1

Public Policy Approaches and Network Approaches

Introduction

The thesis seeks to examine the evolution of emission standards in Japan. Then, in order to understand the evolution of emission standards in Japan, it is necessary to focus on relationship between the state actors and the auto industry because the relationship between them significantly influences policy-making processes in emission standards. The Marsh and Rhodes model or the so-called British policy networks framework, given that two British political scientists, Rod Rhodes and David Marsh, led its development and it has been widely used in Britain, has been recognized as useful in analysing the relationship between policy actors and its influence on policy outcomes. Its utility has been confirmed in both British and European contexts, but its utility has rarely been examined in non-European contexts. Especially, examination of its utility in the context of Japan has been quite rarely investigated. The purpose of this thesis is to examine its utility in the Japanese context, where relationship between policy actors is important in policy-making processes. Concretely, the thesis seeks to examine two questions: '*how does the British policy networks framework relate to Japan when relationship between policy actors is crucial in policy-making processes?*' and *'does the framework help to explain policy change in Japan when relationship between policy actors matters in policy-making processes?'*

The condition, namely '*when relationship between policy actors is crucial in policy-making processes' or 'when relationship between policy actors matters in policy-making processes'* needs to be added because its strengths are, as discussed later in this chapter, shown when relationship between policy actors more significantly matters in policy-making processes than other factors,

including institutions, socio-economic factors, ideas of policy actors and rational choice of policy actors. Thus, the British policy network framework may not play the same role in any cases.

In addition, within the context of broader arguments on the British policy networks framework, this thesis hypothesizes that in Japan when relationship between policy actors matters in policy-making processes:

a) Policy will be made through interactions between organizations which have resource dependent relationships with each other and which seek to achieve their own goals by utilizing strategies that are subject to various `rules of the game'.
b) Policy networks can be distinguished between `policy communities' and `issue networks' according to four dimensions, including membership, integration, resources and power.
c) The degree of policy change will be constrained and the direction of policy change will be manipulated by the existence of policy networks because they favour the existing balance of interests in networks and groups proposing an undesirably great policy change, or ideas of such a change, will be excluded from networks by the appreciative system of networks;
d) Policy change is more likely to be driven by exogenous than endogenous factors, though both factors can lead to changes in policy networks and then to policy change, but the nature of pre-existing policy networks can mediate both factors and restrict the potential for policy change, particularly where such changes challenge the interests and values of the pre-existing network.

The thesis examines these hypotheses through an empirical study of the evolution of automobile emission standards and air quality legislation in Japan from the 1960s to the 2000s.

This introduction chapter first introduces current issues on Japanese green automobiles and

automobile emission standards. Then, it examines five approaches in order to analyse policy change, including institutional approaches, ideas-based approaches, socio-economic approaches, rational choice approaches and network approaches. After these examinations, it looks at characteristics of policy-making in emission standards and suggests that network approaches may be better in analysing the evolution of emission standards because relationship between policy actors is important in analysing policy-making in emission standards. Finally, the chapter outlines the structure of the thesis.

Green Japanese Automobiles and Strict Emission Standards

At the night on 27 February 2005, the night for the 77th Academy Awards, the world might have seen seemingly strange scenes in the television. Many film stars, such as Leonardo DiCaprio, Charlize Theron and Robin Williams arrived at the Kodak Theatre in Hollywood in California, in high-mileage, low emission, Toyota Prius hybrid, not big and gorgeous limousines. Those celebrities drove Toyota Prius hybrid to show their strong concern for global warming and environmental issues.

The impact of Toyota Prius hybrid can be seen in other nations that have world famous auto manufacturers. For instance, in Britain, Toyota Prius hybrid as well as other Japanese-made automobiles has been widely used across Whitehall, mostly because of environmental reasons. Further, the Gordon Brown Government considered replacement of traditional British automobiles such as Jaguars and Range Rovers with Japanese automobiles, especially Toyota Prius hybrid, as automobiles for ministers and senior civil servants because the Government seeks to demonstrate its strong commitment to and to take a powerful initiative in, the global warming and environmental issues (Financial Times, 19 March 2008).

Even in Germany, Toyota Prius hybrid has been adopted as official automobiles at the levels of local governments such as the Government of Tübingen (Minoguchi, 2007). Moreover, at Brussels, Stavros Dimas, Commissioner for Environment, from Greece, decided to replace his Mercedes with the Green Toyota (BBC News, 1 June 2007).

Although Toyota Prius hybrid may be one of the most famous environmentally friendly automobiles, other Japanese-made automobiles also have demonstrated high environmental performances. Indeed, Honda Civic GX won the green ribbon from the American Council for an Energy-Efficient Economy (ACEEE) as the greenest automobile of 2008. According to the lists of the greenest automobiles of 2008, 9 of 12 were Japanese-made: Toyota Prius hybrid (2^{nd}), Honda Civic hybrid (3^{rd}), Toyota Yaris (5^{th}), Nissan Altima hybrid (6^{th}), Toyota Corolla (7^{th}), Toyota Camry hybrid (10^{th}), Honda Civic (11^{th}) and Honda Fit (12^{th}). It is true that many European latest diesel automobiles have achieved similar efficiency standards to Prius and some of them such as Mercedes E320 bluetec diesel have even outperformed the Prius on longer journey (BBC News, 1 June 2007) and *The Economist* (14 June 2007) ridiculed that the Prius has achieved cult status among image-conscious Hollywood stars and greener-than-thou politicians. However, it cannot be denied that many Japanese-made automobiles are more environmentally-friendly than most of other automobiles and that the Japanese automakers have greatly contributed to the development of clean technology in automobiles.

Undoubtedly, considerable efforts of Japanese automakers to produce environmentally friendly automobiles have significantly contributed to successful production of greener automobiles. However, Japanese automakers, possibly like any other automakers in the world, were less concerned of producing environmentally friendly automobiles until automobile emissions became recognized as serious environmental problems and strict emission standards were established by the state. Indeed, as described later, many Japanese-made automobiles have been one of the greenest

automobiles in the world since the mid-1970s in which the Japanese Government established the world strictest emission standards for automobiles, which have been reinforced several times and consequently still one of the strictest emission standards in the world. In making comparison between the recent Japanese, US and EU emission standards on NOx for petrol passenger automobiles after the late 1990s, for instance, the Japanese emission standards were reinforced from 0.08g/km (the 2000 emission standards) to 0.05g/km (the 2007 emission standards) (MoE, 2007); the American emission standards were strengthened from 0.4g/mi (the Tier1 standards) in 1994 to 0.07g/mi (the Tier2 standards) in 2004 (Dieselnet, date of access: 20 April 2008); the EU emission standards were reinforced from 0.15g/km (Euro3) in 2000 to 0.08g/km (Euro4) in 2005 (Camall, date of access: 20 April 2008).

Although there may be several other factors including the changing management strategies to reflect the increasing environmental concerns of consumers and the recognition that emission standards in the giant markets such as American and European will be undoubtedly more and more reinforced, it might be difficult to deny that highly strict emission standards in Japan significantly contributed and have still contributed to the production of the greenest automobiles by the Japanese automakers (MoE, 2002; Tanikawa, 2003). Especially, it has been often claimed that the 'greenization' of the Japanese-made automobiles began when the Japanese Government successfully carried out the strictest emission standards in the world, the so-called Japanese Muskie law, in the mid-1970s, whose requirements were the same as those of the original Muskie law in the US, where the US Government failed to enforce it (Kawana, 1988)(see the detailed discussion in Chapter6).

Then, the question is 'why and how has the Japanese Government been able to continuously establish highly strict emission standards in the world?' Although this question may be a great concern for environmental policy-makers in the rest of the world, political analysis of the evolution of emission standards in Japan has almost never been done. This must be a shame because political

analysis of this issue may probably provide a valuable insight into automobile air pollution policies, especially emission standards, for policy-makers in foreign nations as well as in Japan. The thesis examines the evolution of emission standards in Japan, which may be one of the most interesting topics in Japanese environmental policies for the rest of the world.

Five Approaches for Analysing Policy Change

The purpose of this thesis is as mentioned to examine the evolution of emission standards in Japan. Then, the thesis requires an analytical tool for that purpose. It may be one way to review all available frameworks that can be used to examine policy change, in order to choose it. However, as there are a number of available frameworks for the examination of policy change, because of limited time and space, such task seems almost impossible. Rather, it may be better to categorise them into several approaches according to their main characteristics, then to choose one approach that is appropriate for the research and finally to select one framework within the category for the research. According to John (1999), most of the existing frameworks that are utilized for analysing policy change can be categorized into main five approaches, including institutional approaches, ideas-based approaches, socio-economic approaches, rational choice approaches and network approaches. His categorization seems valuable because the past researches on policy change normally tend to find that policy change was due to one of or combinations of, these five factors such as socio-economic factors, institutional factors, ideas of policy actors, rational choice of policy actors and relationship between policy actors (John, 1999; Sabatier, 2007). Although there may be other factors such as psychological factors, it may be reasonable to review these main five factors first, based on the discoveries of the predecessors, and then other missed factors where these five factors seem irrelevant for the evolution of emission standards.

The section first examines briefly these five approaches. The first part of this section looks at main characteristics, strengths and weaknesses and a few examples, of each approach. However, it pays a particular attention to main characteristics and strengths of each approach. There are two reasons for this. First, it is, as explained later, considered that each approach has both merits and demerits and that there is no 'always best' or 'universal' approach. Second, it can be consequently suggested that, when researchers choose an approach, they need to choose an approach which can most *strongly* deal with main features of a certain issue despite its weaknesses. Thus, one of the main purposes of the first part is to describe that each approach has characteristics and strengths and weaknesses and no approach is thus always best in analysing policy change.

After examining the five approaches, the next part of this section seeks to examine the main features of policy-making process in emission standards. In this part, it is suggested that policy-making process in emission standards can be characterised as close relationship between the state actors and the auto industry. This sub-section reviews the literature on relationship between the state actors and industry in public policy and indicates that close relationship between them is often considered as one of the main features of policy-making in Japan. Consequently, the sub-section justifies that the thesis deploys network approaches whose strengths can be shown when relationship between policy actors strongly matters.

Institutional approaches

Institutionalists argue that, in order to understand policy-making process and policy outcomes, it is necessary to examine institutions because 'the organisation of political life makes a difference' (March and Olsen, 1984: p.747). They emphasize the importance of institutions because:

Political democracy depends not only on economic and social conditions but also on the design of

political institutions. The bureaucratic agency, the legislative committee, and the appellate court are areas for contending social forces, but they are also collections of standard operating procedures and structures that define and defend interests. They are political actors in their own right (March and Olsen,1984: p.738).

Institutional approaches seek to understand policy-making focusing on both institutions, including not only formal institutions but also 'informal conventions of political life', and the impact of these institutions upon individuals and the interaction between these institutions and individuals (Lowndes, 2002: p.91). According to John (1998: p.38), institutionalists have traditionally argued that paying attention to constitutions, legal systems and government structures is crucial in policy-making analysis because they play a role in division of powers and responsibilities between the state organizations and in determination of rules and norms of behaviour in decision-making so that political life will be manageable (Hall, 1996: p.6; Hill, 2005: p.85). As well as these formal institutions, institutions in the approaches today contain a wide range of 'institutions' such as accepted rules, norms, ideologies, culture, routine, conventions which govern trade union behaviour and bank-firm relations (Hall, 1996; Kato, 1996).

Institutionalists claim that focusing on institutions will discover the aspects of politics which have been under-explored or neglected (Kato, 1996: p.53). Similarly, Hall (1996) contends that institutional approaches may allow us to more understand political world. Institutional approaches are especially useful when researchers seek to compare policy-making between countries because examining similar policy processes in different institutional contexts can lead to exposure of the distinctive features of formal rules of each country and the values which forms a state tradition (John, 1998: p.65; Hill, 2005: p.90).

Although each school agrees that institutions do matter in policy-making process, there have

been various kinds of schools within institutionalisms which are mostly different in other parts including the definition of institutions (North, 1990; Skocpol, 1985). Each school enables researchers to obtain 'a different window or insight into how institutions shape the way in which decision-making takes place' (Parsons, 1995: p.324). Further, Kato (1996) contends that each school may be suitable for a different objective. Peters (1999) specifies seven strains of new institutionalisms (Cited in Lowndes, 2002: p.96):

1. *Normative institutionalists* study how the norms and values embodied in political institutions shape the behaviour of individuals.
2. *Rational choice institutionalists* argue that political institutions are systems of rules and inducements within which individuals attempt to maximize their utilities.
3. *Historical institutionalists* look at how choices made about the institutional design of government systems influence the future decision-making of individuals.
4. *Empirical institutionalists*, who most closely resemble the 'traditional' approach, classify different types and analyse their practical impact upon government performance.
5. *International institutionalists* show that the behaviour of states is steered by the structural constraints (formal and informal) of international political life.
6. *Sociological institutionalists* study the way in which institutions create meaning for individuals, providing important theoretical building-blocks for normative institutionalism within political science.
7. *Network institutionalists* show how regularised, but often informal, patterns of interaction between individuals and groups shape political behaviour. ,

As Hall (1996) indicates, each perspective may not be wrong and is likely to give a partial

explanation of the forces which work in a certain situation. Though it may be true that each school is not substantially untrue, institutionalisms consequently suffer terminological confusion. 'What are institutions?' might be one of the most frequently criticized points of institutionalisms because institutions seem to mean everything (Hill, 2005: p.37; Peters, 2000: p.2). As Frederickson and Smith (2003: p.69) describe, according to institutionalisms, *'today we are all institutionalists'*. Ostrom (1999) then claims that as long as the definition by scholars of institutions means almost anything, the study of institutions would not progress very much.

As well as the definition problems, there is a difficulty in identification and measurement of institutions because they are often invisible, existing, for instance, in the participant minds and in the implicit and unwritten forms (Ostrom, 1990; Peters, 2000). In addition, Hill (2005: p.85) claims that, because institutional approaches highly emphasize particular configuration of institutional situations and actors, they can only take an account of past events with little possibility for generalization. Thus, it is hard to specify conditions for policy change in institutional approaches.

Finally, it seems that institutionalists themselves admit both the limits of 'original' institutional approaches and the importance of other factors such as networks and rational choice of policy actors so that institutional approaches today include a wide range of 'institutions' as described above. Thus, although institutions may matter, even institutionalists would agree that other factors such as the socio-economic factors, rational choice of policy actors, networks and ideas should not be undervalued.

Ideas-based approaches

The ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. Indeed the world is ruled by little else. Practical men, who believe themselves to be quite exempt from any intellectual influences, are

usually the slaves of some defunct economist.

John Maynard Keynes

Ideas-based approaches contend that ideas play a central role in policy-making processes. Those approaches seek to comprehend how ideas influence policy-making (Tannenwald and Wohlforth 2005). According to Majone (1989: p.2), it would be quite difficult to understand policy-making processes only by paying attention to power, influence and bargaining without the consideration of debate and argument. Similarly, King (1973: p.421) argues that if we try to understand public policy, we must know much more about the ideas of policy-makers. He further contends that ideas comprise both a necessary condition and a sufficient one to explain the American policy pattern rather than elites, demands, interest groups and institutions (King, 1973: p.423). Further, Odell (1982: p.344) emphasise the necessity to focus on the circulation of policy ideas through Washington in order to adequately explain or forecast U.S. policy. Ideas necessarily mediate our understanding of real situations while actors in politics in turn seek to create, change and fight over, those ideas (Stone, 1989: p.283).

According to Parsons (1995: p.173) and O'Mahony (2007: p.12), advocacy coalitions, epistemic communities and multiple streams models are models which try to produce more general explanations of the relationships between ideas and policy utilising new metaphors for the policy process such as networks, sub-systems, streams and coalitions.

In the advocacy coalition model, Sabatier (1993) emphasises the importance of ideas in the analysis of the policy process. The advocacy coalition model seeks to understand the policy process in terms of policy subsystems, inhabited by 'advocacy coalitions', which are 'composed of people from various governmental and private organizations that both (1) share a set of normative and causal beliefs and (2) engage in a nontrivial degree of coordinated activity over time' (Sabatier and

Jenkins-Smith, 1999: p.120). In policy subsystems, advocacy coalitions compete with each other in order to achieve their distinctive policy objectives. The competition between them is mediated by 'policy brokers' (e.g. politicians) and policy brokers seek to find reasonable compromise between coalitions (ibid). Policy outputs, the resultant impacts and new information influence coalitions and coalitions may revise their beliefs and/or change their strategies as they learn from them 'to better understand the world in order to further their policy objectives', which is described as a process of policy-oriented learning by Sabatier (ibid: p.123).

Policy-oriented learning tends to occur at the level of secondary aspects of a coalition's belief system. The belief systems of each advocacy coalition has a 'hierarchical tripartite structure': 'the deep core' (e.g. basic ontological and normative beliefs), 'the policy core' (e.g. basic normative commitments and causal perceptions) and 'the secondary aspects' (e.g. policy preferences and the design of institutions) (ibid: pp.121-122). Compared to both the deep core and the policy core, the secondary aspects are less rigid and less resistance to change and they tend to be modified by policy-oriented learning.

In his epistemic community model, Haas (1992) examines how epistemic communities in international organizations seek to get their ideas adopted. Although Haas used his model at the international level, his model can be applicable to national settings too (Parsons, 1995). According to Haas (1992: p.3), epistemic communities are composed of 'professionals with recognised expertise and competence in a particular domain and an authoritative claim to policy-relevant knowledge within that domain or issue-area.' Epistemic communities seek to influence policy-making processes to exercise political influence mainly by 'diffusing ideas and influencing the positions adopted by a range of actors, including domestic and international agencies, government bureaucrats and decision-makers' (Adler and Haas, 1992: p.379), and by acquiring bureaucratic positions within public organizations. Epistemic communities can affect national governments and international

organizations by occupation of niches in advisory and regulatory bodies (Haas, 1992: p.30). According to Haas (ibid: p.30), it indicates that 'the application of consensual knowledge to policymaking depends on the ability of the groups transmitting this knowledge to gain and exercise bureaucratic power.'

Based on the garbage can model developed by Cohen, March and Olsen (1972), Kingdon (1995) proposed multiple streams model to examine why some agenda items become paid much attention to while others can get little attention. According to Kingdon (ibid), in the agenda setting processes, there are three streams, problems, policies and politics, which are separated and independent from each other according to its own dynamics and rules. However, at critical points in time, where 'A problem is recognized, a solution is developed and available to the policy community, a political change makes it the right time for policy change, and potential constraints are not severe' (Kingdon, 1984: p.174), these three streams are coupled by policy entrepreneurs with their solutions, which significantly increases opportunities for issues to be made *agendas* by policymakers.

In his multiple streams model, ideas play a key role in policy streams. There is a wide range of ideas floating around and confronting one another and combine in the 'policy primeval soup.' Specialists in policy communities, whose members share a common concern in a single policy area, generate ideas. In addition, only a few ideas can survive and get serious consideration through the selection processes because most ideas do not satisfy selection criteria such as technical feasibility, compatibility with the dominant values of the policy community and ability to anticipate future constraints (Zaharidis, 1999: p.73).

Concerning general criticisms about the ideas-based approaches, Tannenwald and Wohlforth (2005: p.5) criticise that the notion of ideas is very much ambiguous, embracing 'notions of culture, shared belief systems, and worldviews, as well as specific strategies of actions and policy programs.' Similarly, Philpott (1996) points out that the notion of ideas is rather all-embracing and they mean

different kinds of things in different cases. Consequently, John (1998: p.153) contends that hypotheses and predictions cannot be produced by ideas-based approaches because they are more like partial 'explanatory gadgets' and they cannot become a theory like rational choice. In addition, because they tend to suppose that elite ideas bring about a policy, their explanations are likely to depend on not causation but association (Yee, 1996). It is criticized that ideas-based studies do not prove that ideas really influence policy outcomes (John 1998: p.154; Harris, 1972: p.362; Tannenwald and Wohlforth, 2005: p.5). As Parsons (1995) points out, ideas may play a role but it may be difficult to locate the decisive point at which policy is shaped by ideas.

Finally, it seems that ideas alone cannot explain policy-making process. Indeed, the examples picked up as the ideas-based approaches in this section were the approaches that combined 'ideas' with networks. In addition, political actors cannot always make decision according to their ideas because their decisions may be constrained by social and economic factors and institutions. Moreover, it has been widely recognized that ideas-based approaches can provide a satisfactory explanation for policy-making when combined with rational choice approaches (Busch, 1999; Garret and Weingast, 1992). In explaining why one particular cooperative solution is chosen when there are a wide range of paths to cooperation which cannot readily be differentiated, for instance, policy analyst may be able to do so by using both approaches because 'ideas play a role in coordinating the expectations that are necessary to sustain a cooperation among a set of players with divergent preferences' (Garrett and Weingast, 1992: p.205).

Socio-economic approaches

Socio-economic approaches tend to consider that socio-economic factors drive policy-making processes and policy is affected and determined by those factors. Unlike the 'politics does matter' perspectives, which pay attention to politicians, parties, party competition, political values and so on,

namely the policy processes, the 'socio-economic factors do matter' perspectives argue that policy outcomes are the result of powerful social and economic forces rather than the policy processes. According to John (1998: p.92), the basic idea of the socio-economic approaches is 'the policy process, far from being a rational weighting up of alternatives, is driven by powerful social-economic forces that set the agenda, structure decision-makers' choices, constrain implementation and ensure that the interests of the most powerful (or of the system as a whole) determine the outputs and outcomes of the political system.' Consequently, decisions of policy-makers are either consciously or unconsciously reflecting powerful social and economic forces. In addition, the socio-economic approaches maintain that individuals do not have the capacity to control their own social and political institutions (Hill, 2005: p.50). Thus, the socio-economic approaches regard those *political* factors or policy processes as a basically epiphenomenon (Parsons, 1995).

The most important point that the approaches allow political scientists to realise might be that social and economic realities are not 'out there' as political scientists tend to separate socio-economic factors from the policy processes and overlook the influence of those factors (McAnulla, 2002; see also Giddens, 1984). The approaches may as a result provide a powerful set of explanations of policy emergence and implementation (John, 1998: p.93). Especially, the approaches can contribute to the question of 'status quo' of many policies because they propose that political choices are considered as predetermined by social and economic factors (Hill, 2005: p.42).

Although there are several kinds of 'socio-economic factors do matter' theories, Marxist theory, the 'funnel of causality' model, the regulation theory and globalist theory are briefly introduced here, as these theories are important contributors to the socio-economic approaches (Hill, 2005; John, 1999).

Karl Marx and Friedrich Engels in their famous *'The Communist Manifesto'* (1848) insist that 'the executive of modern state is but a committee for managing the common affairs of the whole

bourgeoisie.' This famous comment of Marx and Engels means that the state is nothing but mere tools of the bourgeoisie class to support the capital accumulation process. Thus, it is supposed that the state plays a role in creating conditions where the production of profit can be promoted by capitalists (Hill, 2005: p.41). According to Marxism, the policy process is structured by 'the power of the capitalist class and/or the political logic created by the capitalist mode of production and policy is detetermined by the interests of the wealthy and the dominant economic system.

The 'funnel of causality' model created by Hofferbert (1974) is another example. He assumes that socio-economic structures determine policy outputs and the problems of that premise. His model compares the policy process to funnel. At the broad input end there are key determining factors including historic and geographical conditions, social and economic composition and mass political behaviour, while at the end of the funnel there are government institutions and elite behaviour, serving to filter and mediate these forces so that policy output is formed (Hofferbert, 1974; Parsons, 1995). The conditions 'are a set of circumstances with multiple relevance that the elite can overcome, suppress, or exploit, but not ignore, under normal circumstances' (Hofferbert, 1974: p.253). Thus, his model suggests that policy decisions are never made in a vacuum and rather definition of problems and formulation of policy by a political system largely depend on the pressure of macro factors and conditions that are outside the policy-makers' capacity to influence to any significant extent (John, 1999: p.107; Parsons, 1995: p.216).

Another example of the socio-economic approaches is the regulation theory. The regulation theory was advanced by Michel Aglietta (1979). He argues that the disintegration of the fabric of society can be led to only by the process of unhindered capital accumulation. Therefore, a regime of accumulation or a mode of regulation is necessary so that society can continuously function as a society: 'A mode of regulation is a set of mediations which ensure that the distortions created by the accumulation of capital are kept within limits which are compatible with social cohesion within each

nation' (Aglieta, 1979: p.44). While the economic, social and political framework, allowing capitalism to extract a surplus and to prevent capitalism from excessive instability and collapse for a while, constitute a regime of accumulation, the important part of the regime in the regulation theory is the form of technology, and the state structure and the state policies reflect and regulate the technological basis to the capitalist economy (John, 1999: pp.100-101). Consequently, in order to explain policy change, the regulationists tend to depend on the shift in production techniques and their effect on accumulation of capital, the profit rate, the nature of the state and the regulatory framework of law and policy (ibid).

The elaboration of the central argument of the regulation theory can be done by a brief observation of the salient features of Fordism (Rahman, 2003). According to John (1999: p.101; see also Lipietz, 1982), a well-developed state bureaucracy to set uniform standards for products and to create the conditions for mass markets was required in advanced capitalism by the spread of *mass-production techniques*. There were long production runs based on stable consumer demand so that the investment in large factories could be reaped. That is why, the state needed to ensure full employment and a stable level of economic growth by Keynesian economic management techniques to manipulate consumer demand, savings and investment. Further, the state needed to provide universal education and public health provision because the workforce needed to be trained and to have a good standard of health. The bureaucratic state was mirrored by large factories and organisations, and they had large hierarchies and sought to produce a uniform product, resulting in Fordism.

Globalist theory maintains that the policy process and policy are determined by global economic forces. Radice (1999: p.6) argues that 'There is little doubt that deeper international economic integration, and especially the globalisation of finance, has reduced significantly the traditional post-1945 capacity of national governments to manage their economies by means of fiscal and

monetary policies, labour and welfare legislation, and a variegated regulatory regime for business which included extensive public ownership'. Similarly, Hill (2005), Gill (2000) and Gill and Law (1988) indicates that national government has lost the policy autonomy because of a wide range of global trends such as the development of global financial market, the emergence and growth of multinational companies and diffusion of information and technology. Consequently, John (1998) suggests that national government is competing for capital and adjusting its policies so that the needs of multinational companies can be satisfied, as if it were a municipal government. Therefore, according to globalist theory, the policy process and policy are determined by global economic institutions.

There have been a number of criticisms against the socio-economic approaches. For instance, it has been suggested that socio-economic factors might affect individuals but individuals may also affect socio-economic factors (Hill, 2005; McAnulla, 2002). Although their propositions differ in various aspects, Hay (1996) and Archer (1996) propose that relationships between socio-economic factors and individuals are not unidirectional but mutual. In addition, John (1998: p.114) points out that the socio-economic approaches tend to overlook the importance of political autonomy and they reduce complex policy choices to wider-ranging forces. Although there are social and economic forces surrounding policy-makers, it has been suggested that they have the ability to shape their destiny. For instance, Weiss (1998: pp.190-192) has found that government has the ability to sustain differences in fiscal and monetary policies despite the global economic trends. Further, McAnulla (2002: p.276) maintains that socio-economic approaches neglect the possibilities that individuals take effective actions out of control of structures. Sharpe and Newton (1984: pp.206-208) contend that economic-social factors are only one of ingredients for cooking 'policy' and whether those factors can play any part in policy is dependent on a series of human volitions.

Moreover, the socio-economic approaches tend to underestimate the importance of other influential factors such as relationships between political actors, institutions and ideas of political actors. The social-economic factors might be important in policy-making process as relationship between political actors, institutions and ideas of political actors could be partly determined by the social-economic factors. However, these various kinds of factors could not be perfectly so and it seems that they can enjoy autonomy from the social-economic factors. For instance, even when facing the economic globalisation process, national political actors might be able to reject it because of their strong 'anti-globalisation' ideas. Therefore, although the socio-economic factors are significant and might be more influential than other various kinds of factors in certain situations, the socio-economic factors cannot always provide a satisfactory explanation for policy-making process.

Rational choice approaches

Rational choice approaches seek to explain policy-making process by utilizing ideas of economics or economic rationality (Hill, 2005; Steinmo and Thelen, 1992). According to John (1998: pp118-119; see also Hall, 1996: p.12), there are distinctive five kinds of assumptions in rational choice approaches; individuals have preferences that are prior to the social and political world; individuals behave to maximise their own utility rather than act for the interests of others; individuals articulate their preferences as clear goals; individuals possess information about the preferences; and in examination of the information available to them, individuals are able to choose the course of action that fulfil their preferences and are able to alter their courses of action when the benefits and costs of choices change.

Steinmo and Thelen (1992: p.12) contend that rational choice approaches are 'a universal tool kit' that researchers can apply to any political setting (1992: p.12). In addition, Becker (1962) points out that rational choice approaches (or economic approaches) are useful because it is possible to

consider all human behaviour contain participants who seek to maximize their utility from a fixed set of preferences and accumulate an optimal amount of information and other inputs in a wide rage of markets. Ward (2002: pp.69-70) specifies seven distinctive strengths of the rational choice method:

1. It forces you to be explicit about assumptions that are often left implicit in verbal arguments.
2. It provides a 'positive heuristic'-a set of categories that help in constructing explanations, a set of exemplary examples of good explanation to emulate, and suggestions about fruitful lines of research.
3. Because models are by definition *simplified representations of reality* constructed with a view to improving our understanding, it forces us to attend to what we want to explain, what is central to explaining the phenomena we are interested in and what can be left out of the model as peripheral or unimportant.
4. If correctly applied it ensures that propositions actually follow logically; so the method can be used to see if a logically coherent basis for widely believed conclusions can be constructed.
5. It goes beyond inductively derived correlations to provide a mechanism linking independent and dependent variables, running through the actions individuals take.
6. It provides a unified framework of explanation across different fields of the social sciences and across sub-disciplines, allowing cross-fertilisation of ideas and a view point from which common patterns can be seen across diverse phenomena.
7. Even in circumstances in which action is irrational, it provides a standard against which action can be judged and indicates variables that might lead to departures from rationality.

Economic theory of bureaucracy is one of the approaches that utilize self-interest maximization in political science. Assuming that public officials act for their own self-interest, advocates of this

theory such as Downs (1967) and Niskanen (1971) suggest that bureaucrats will seek to maximize their budgets and the size of the bureau so that they can maximize their self-interest. Further, because they are *monopolistic providers* of public goods and services, it is supposed that they tend to oversupply them in order to enlarge their *firms*. However, Dunleavy (1986) claims that this perspective taken by Downs and Niskanen is too simple and suggest that public officials seek to shape their organizations rather than grow bigger for their self-interest, which is 'the so-called bureau-shaping model'.

Game theory may be one of well-known rational choice approaches. Game theory, originated in applied mathematics and developed in economics, studies the logic of various situations in which self-interested individuals interact with each other (Hill, 2005: p.57). In these situations, one needs to take into consideration the choices of other individuals in order to choose his/her optimal behaviour, which is a main theme of game theory. As Hill (ibid) points out, game theorists extensively study complicated games in which analysts may find it difficult to specify an indisputable choice for the individual players. Scharpf (1997: p.73; see also Robinson and Goforth, 2005) specifies 'Assurance', 'Battle of the Sexes', 'Prisoners' Dilemma' and 'Chicken' as most notorious games.

Rational choice approaches, as described above, have a number of advantages and ideas of economic rationality and maximization of self-interest, have been widely utilized in policy-making analysis. However, rational choice approaches have been suffering a wide range of criticisms. In terms of psychology, it has been suggested that rational choice approaches are misleading because individuals might not always act rationally and their behaviours might often be influenced by envy, revenge, guild, greed, altruism and so on (Lewin, 1991; Mansbridge, 1990a; Ward, 2002; Kirschner, 1996; Quattrone and Tversky, 1988). Further, Simon (1957: p.79; see also Kato, 2000) contends that the rational assumption of individuals is unrealistic and human rationality is limited, which is called 'bounded rationality', because 'the number of alternatives he must explore is so great, the

information he would need to evaluate them so vast that even an approximation to objective rationality is hard to conceive.'

In addition, it has been claimed that rational choice approaches underrate social structure (e.g. social class, gender and religion), norms, ideas and ideologies, all of which determine and constrain individual behaviours (Ward, 2002; Hill, 2005; Hindess, 1988; Harrop and Miller, 1987; Durkheim, 1915; Edelman, 1964). In other words, rational choice approaches fail to consider the social-economic factors, institutions and ideas of political actors. For example, self-interests of political actors might come from certain ideas of political actors. In addition, their behaviour cannot enjoy freedom from institutional constraints and political actors may, either consciously or unconsciously, act within the institutional constraints. Moreover, policy preferences may be shaped by institutionalised relationship between political actors, namely policy networks, which are structures forming the preferences of actors. This may be another important factor that rational choice approaches tend to fail to pay attention to.

Network approaches

Network approaches focus on both formal and informal relationships between actors, which, it is expected, determine policy outputs and outcomes. Network approaches emphasise the fragmented and complicated nature of the modern policy-making. According to Campbell *et al* (1989: p.86), modern policy-making can be characterized as fragmented and specialized because the scope of governmental responsibility has expanded and complexity of public affairs has increased. Likewise, Richardson and Jordan (1979) identify the segmented nature of policy-making and suggest that policy is made between a number of interconnecting and interpenetrating organizations. Similarly, Parsons (1995: p.185) indicates complexity of modern policy-making and points out that, as both government and policy-making activity has been growing, the range of participants has grown both

wider and more complex.

Because of fragmentation and specialization, a range of group/government relationships may exist in different policy arenas (Smith, 1993: p.56). Network approaches suppose that there are complex interactions between actors in the policy process (Hanf and O'toole, 1992; Kassim, 1993; Smith, 1997) and policy output is 'the result of interactions among a plurality of separate actors with separate interests, goals and strategies' rather the result of 'the choice process of any single unified actor' (Scharpf, 1978: p.347). In addition, they tend to consider that relationships between actors differ both in different policy sectors and in the same policy sector over time (Atkinson and Coleman, 1992; Marsh and Rhodes, 1992a; Rhodes, 1986a). Network approaches are attractive because they enable policy analysts to carry out realistic analysis of policy-making in which policy comes from complex interactions of participants, and it allows the analysts to focus on a more informal picture of real policy-making processes (John, 1998; Parsons, 1995). According to John (1999), within network approaches, there are two kinds of influential frameworks: formal network framework and the Marsh and Rhodes model or the so-called British policy network framework.

Formal network framework contends that network structure is important because the information flows and the power distributions across social organisations are influenced by it (John, 1999). By using the formal network framework, ideas based on the more impressionistic explanations can be examined (John, 1998). The framework seeks to measure relationships within network to understand the density of network, the centre of the network, the structural equivalence of the network and the number of cliques by applying the sociometric mapping technique (John, 1998: p.82). One of the classical studies of the formal network analysis in political science is the work of Laumann and Knoke's *The Organizational State* (1987). Laumann and Knoke chose two policy arenas, health policy and energy policy, which were significant national issues in the 1970s and the 1980s. They carried out a massive political networks project for the data collection and discovered that important

differences existed between these two policy arenas. In addition, there has been an attempt to examine policy networks in the same policy sector between different countries. Knoke *et al.* (1996) tried to examine similarities and differences in policy networks between the US, Germany and Japan. By conducting collaborative research to investigate the social organization and policy-making processes of national labour policy arenas in these three countries during the 1980s, they discovered that variations in network structure between them were significantly influenced by differences in state traditions and in government intervention histories in the economy.

Rod Rhodes pioneered policy network analysis in Britain, which has been developed by Marsh and Rhodes (1992a, 1992b), and utilized and refined by many researchers (e.g. Cunningham, 1992; Peterson, 1992; Saward, 1992; Smith, 1993; Smith, 1997; Stone, 1992; Marsh and Smith, 2000). Rhodes's analysis is based on a theory of power dependence. According to Rhodes (1981), because organizations have to exchange resources in order to achieve their goals in decision-making, though the dominant coalition may retain some discretion, they need to depend on each other. Policy network is formed because of the resultant close resource interdependency relationships within a policy sector.

Policy network analysis of Marsh and Rhodes (1992b) (see also Rhodes and Marsh, 1992: pp.186-87; Rhodes, 1997: p.43) distinguish policy networks according to 'the closeness of the relationships within them' or the level of integration, and place policy communities at one extreme and issue networks at the other. While policy communities contain close relationships and high integration, issue networks have loose relationships and low integration. Further, Marsh and Rhodes (1992b) propose four dimensions to determine a network position: membership, integration, resources and power.

Like other approaches, network approaches also suffer from criticisms. For instance, network approaches have a boundary problem as it is difficult to specify both where network begins and ends

and who is in network (Kassim, 1994). In addition, Dowding (1995: p.137) criticizes that network characteristics cannot explain the nature of the network and the nature of the policy process because characteristics of components within networks are the driving force of their explanation. By re-examining some of Marsh and Rhodes' case studies (Marsh and Rhodes, 1992b), he discovered that the resources and the strategies in bargaining, rather than network characteristics, mattered (Marsh, 1998). In a similar vein, network approaches have been criticized because they tend to neglect institutions and the state by focusing on relationships (John, 1998). Moreover, it seems that network approaches fail to address 'who rules? why do they rule? how do they rule? in whose interest do they rule?' (Daugbjerg and Marsh, 1998: p.55). Namely, network approaches tend to pay little attention to the social and economic contexts within which networks operate. In addition, institutional settings of public decision-making may determine members of policy networks with excluding other actors from policy networks, affecting formation of policy networks (Konig and Brauninger, 1998).

Choosing an Approach

The previous section discussed five kinds of approaches to analyse policy change. The question is then 'which approach does this research deploy to analyse the evolution of emission standards in Japan?' As described above, all the approaches have both strengths and weaknesses and none of them may be the *'anytime, anywhere best'* approach (John, 1998: p.18). Clearly, policy-making can be more or less affected by all of those five factors. However, the degree of influence among them may differ from one policy issue to another. For instance, policies for art and music may be more influenced by ideas than economic interests of actors. Thus, within a nation, characteristics of policy-making in one policy issue may be different from another, and all policy-making in one

nation cannot be then best explained only by one approach. Therefore, it may be appropriate to choose one approach which can capture prominent characteristics of a certain policy issue of interest (see John, 1998). Thus, in order to choose an approach to examine the evolution of emission standards in Japan, it may be necessary to understand the main characteristics of policy-making in emission standards.

Characteristics of policy-making in emission standards

Although emission standards for automobiles in Japan have been one of the strictest in the world and passenger automobiles in Japan have been one of the most environmentally friendly in the word, there has been interestingly little literature on political analysis of the evolution of emission standards in Japan. In addition, even political analysis of policy-making in emission standards has been done only by one article in the Journal of Japanese Public Policy, according to the researcher's literature review. The article was written by the author (Sagara, 2002), which examined a new innovative automobile air pollution policy by the Tokyo Metropolitan Government (TMG) and its impacts on the national emission standards (see Chapter 7: p.235). Sagara discovered that policy-making in emission standards at the national level mainly involved the Ministry of Transport (MoT), the Environmental Agency (EA) and the auto industry and they formed very close relationship, although the Ministry of International Trade and Industry (MITI) and the Liberal Democratic Party (LDP) are closely involved in the policy-making processes of emission standards. He found that all of them frequently interacted with each other and they were dependent on each other for resources because all of them had distinctive resources that were necessary for other actors; for instance, MoT had resources such as giving protection for the auto industry, the authority for road administration and expertise and knowledge; resources of the auto industry included economic resources, ability to influence results in implementation, interpersonal relationships with MITI and

technical information; EA had resources such as authority for environmental administration, granting access to policy-making processes, strong public support, strong LDP support, support from local governments and expertise and knowledge. Further, he found that the cooperative relationship among them and especially the strong cooperative relationship between MoT and the auto industry determined decision-making and policy outputs in emission standards.

Although it seems that there has been no other literature on the political analysis of policy-making in emission standards, a few memoirs and documentary books mentioned the importance of close relationships between the state actors and the auto industry in emission standards in the 1970s. For instance, Hajime Nishimura (1976), a former Professor of Tokyo University, specified close relationships between the state actors and the auto industry in policy-making processes of emission standards. As a member of the research team of seven major cities including Tokyo, Kyoto, Osaka, Yokohama city and Kawasaki city of Kanagawa, Nagoya city of Aichi and Kobe city of Hyogo, which examined the feasibility of the 1976 emission standards (see Chapter6: p.174), Nishimura narrated what he experienced in the postponement of the 1976 emission standards. According to Nishimura, the auto industry was strongly incorporated into the policy-making processes of emission standards because the auto industry had influential economic resources and technical information. In addition, he pointed out that MoT, EA and the auto industry formed the network, which strongly influenced policy-making processes of emission standards and policy outputs.

Hideyuki Kawana (1988), who was a journalist of Mainichi Shinbun (newspaper), similarly indicated the deterministic network between the state actors and the auto industry in policy-making processes of emission standards, in the second volume of his serial documentary books on pollution. In this volume, he described what happened in the establishment of the 1975/1976 emission standards, the enforcement of the 1975 emission standards and the postponement of the 1976 emission standards. Kawana found the close relationships between MoT, MITI, EA, LDP and the

auto industry in the policy-making processes of emission standards, which primarily influenced the policy-making processes and the policy outputs. In addition, he indicated the informal policy-making processes in emission standards, in which MoT, EA and the auto industry discussed emission standards so that the interests of the auto industry were strongly reflected into the policy outputs. According to Kawana, the auto industry was a very powerful actor because it had influential economic resources and technical information.

Although there are a limited number of evidences, all of them pointed out that the relationships between the state actors and the auto industry might be the deterministic factor in policy-making of emission standards. Indeed, it has been often claimed that relationships both between public actors and private actors must be the key to understand Japanese politics (Tsujinaka, 1988: p.6).

According to Tsujinaka, this is especially true where the state actors and a certain industry has the 'Amakudari' relationship, in which private and public corporations, which are linked to or under the jurisdiction of their ministries or agencies, accept the retired senior bureaucrats in high-profile positions (Colignon and Usui, 2003). In terms of the Amakudari relationship between the state actors and private actors, such a relationship is normally formed between ministries and the large companies or the strong industry association, which has influential resources, often economic resources, and whose cooperation is significant for ministries in both the establishment and implementation of policy. Some of the prominent examples of the Amakudari relationships are the connections between banks and Ministry of Finance (MoF) (Suzuki, 2002), the connections between MITI and MoT and the auto industry (Boyd, 1998; Response, 22 February 2002; Response, 24 July 2006), the connections between the pharmaceutical industry and Ministry of Health (MoH) (DPJ News, 14 July 1998; Mainichi Shinbun, 01 September 2006).

Although the linkages between bureaucracy and private actors themselves are not remarkable and many similar linkages can be observed in other industrial nations, what is distinctive is:

'the extensive use made of them. This is a consequence of the insulation of the industrial policy-making and implementation process from public debate. The government and industry relation is private, and considerable benefits accrue to the principal parties to the relationship because of that privacy which it is in their interests to protect. Effectively, they are constrained to use the channels that exist to come to agreement, lest the open expression of disagreement publicize the process and invite the involvement of otherwise excluded parties with conflicting interests to prevent (namely, the labour unions, environmental groups, opposition parties, women, small and medium enterprise associations)' (Boyd, 1989: p.65).

Thanks to the strong linkages, industrial policy-making processes can be depoliticised because economic growth is beyond question and means for economic growth are considered as a set of technical choices best left to the elite bureaucratic cadre, which may be beneficial for both bureaucracy and industry (ibid). In addition, the Amakudari relationship is useful for the private actors because former bureaucrats with their connections to the government are a 'valuable asset' for them because they may avoid regulatory inspections, exchange information with ministries and secure preferential treatment from ministries (Dominici, 2003: p.18).

The Amakudari relationship is beneficial for bureaucrats too because retired bureaucrats can normally be employed as a higher-rank manager, *unbelievably very well paid* (Gendai, 10 June 2006). Further, as mentioned above, the strong connections with industry constitute the key to the success of bureaucracy to carry out and implement policy. According to Wakayama (1998: p.220), the day-to-day efforts over many years to maintain close and extensive relationships with industry can induce company to accept policy even where company considers that it appears costly and unfair. Thus, the relationship between them in Japan is 'one of dependency' (Boyd, 1989: p.68).

Based on the discussion above, although the Amakudari relationship has been almost daily criticized in the public debate, it might be called 'the necessary evil' and indeed the belief that the strong connections between bureaucracy and industry have saved Japan from a crippling economic and political dependence upon the Industrial Western countries and created the conditions for a phenomenal economic success, contributes to the legitimisation of the strong government-industry connections in the management of the economy (Boyd, 1989: p.85). Political scientists such as Wolferen (1989) have specified the Amakudari relationship as central features of political and economic structure of Japan, which strongly connect private and public sector together and prevent political and economic change. In addition, where the state actors and the private actors have very close relationship, especially the strong Amakudari relationship, political scientists have often found that the relationship determines policy-making processes and policy outputs (Boyd, 1987).

As described above, although there are a few evidences, they all specified the strong connection between state actors and the auto industry, especially strong connection between MoT and the auto industry, in the policy-making processes of emission standards. The strong connection between MoT and the auto industry is one of the famous examples of the Amakudari relationship. MoT or the technology and safety department of the automobile transport bureau of MoT has played a central role in emission standards. Although EA determines emission standards, which is discussed later in chapter4 (p.132), MoT or its technology and safety department implements them and decides a variety of things for the implementation such as grace periods. Moreover, because the success of emission standards depends much on MoT, EA needs to discuss emission standards with MoT when they are determined. Therefore, MoT, especially its technology and safety department, is highly influential in making emission standards. The Japanese Automobile Manufacturers Association (JAMA), which is the main association of all major automakers, has recruited ex-officials of the

technology and safety department of MoT; since 2006, Kanji Nakayama, who was a head of the technology and safety department, for instance, has been one of the managing directors of JAMA. Thus, MoT and the auto industry clearly have the Amakudari relationship.

Further, Sagara and Kawana found that the connection between the state actors and the auto industry in making emission standards included the connection between MITI and the auto industry, which is also one of the well-known examples of the Amakudari relationship. Ex-officials who are recruited by automakers often once belonged to the automotive section or were a chief of the section. The automotive section deals with a wide range of automotive issues including the production of automobiles, the promotion of research and development of low emission automobiles, fuel efficiency standards and recycling of automobiles. Regarding the recent Amakudari situation, several automakers recruited ex-officials of MITI, including Michio Onishi (Executive Officer, Mitsubishi Motors) and Katsuhiro Nakagawa (Vice-President, Toyota). Thus, the Amakudari relationship between MITI and the auto industry can be easily observed.

Unlike MoT and MITI, it seems that EA does not have the Amakudari relationship with the auto industry. However, as mentioned above, Sagara (2002) discovered the close resource-dependency relationship between EA and the auto industry in the policy-making processes of emission standards. The best option for EA is surely making emission standards 'zero'. It is indeed possible for EA to choose that option but EA would not do so because no automaker would achieve the standards concerning the current level of technology of the automakers and no automobile could run on road in Japan. Even, it is almost impossible for EA to establish so strict emission standards that entail excessive costs for the automakers because it would lead to a great increase in price of automobiles and the consequent confusion of the Japanese economy and the Japanese life. Thus, it can be said that emission standards need to be established based on Best Available Technique not at Excessive Cost (BATNEC). Namely, emission standards need to be as strict as technically and economically

possible. In order to establish emission standards which satisfy such condition, technical information and cooperation of the auto industry are necessary. Consequently, EA needs to highly depend on the auto industry for its resources, especially technical information and cooperation, in order to carry out emission standards effectively. On the other hand, in order to make emission standards reasonable and acceptable for the auto industry, the industry needs to depend on EA for its resources, especially its authority both to grant access to policy-making processes of emission standards and to determine emission standards. Thus, they need to depend on each other for resources in policy-making processes of emission standards and the close relationship exists between them. In addition, because of the same reasons, MoT needs to depend on the auto industry for resources such as technical information and cooperation in implementation. If MoT fails to obtain technical information and cooperation in implementation, it would be highly difficult to implement effectively emission standards. In turn, the auto industry needs to be dependent on MoT for its resources such as the ability to determine grace periods.

Moreover, although the Petrol Association of Japan (PAJ) recently became involved in the policy-making processes of emission standards because reducing sulphur components in gas oil was necessary to reduce emissions from diesel automobiles (see chapter7: p.235), as Sagara (2002) argues, no private actor but the auto industry was almost exclusively involved in the policy-making processes of emission standards because the technological level of the automakers was the one of the most important aspects for judgement to determine emission standards. As a result of exclusion of other industries or private actors, the connection both between MoT and the auto industry and between EA and the auto industry could be more strengthened, which could, it is supposed, make the connection between them more influential in the policy-making processes of emission standards.

In summary, the policy-making processes of emission standards involve two kinds of strong connection or the Amakudari relationship both between MoT and the auto industry and between

MITI and the auto industry. Further, the main nature of policy-making processes of emission standards is the close resource dependency both between EA and the auto industry and between MoT and the auto industry. Further, because only the auto industry is almost exclusively involved in the policy-making processes of emission standards, the connection both between EA and the auto industry and between MoT and the auto industry can be more powerful and then influential in the policy-making processes. Because of the Amakudari relationship, close resource dependent relationship and the exclusive position of the auto industry in the policy-making processes of emission standards, it might be reasonable to conclude that understanding the policy-making processes of emission standards and the evolution of emission standards would require examination of the relationship between the state actors and the auto industry.

Therefore, it can be justified that the research utilizes network approaches whose strengths are shown when relationship between policy actors more significantly matter in policy-making processes. Surely, other factors, including institutions, socio-economic factors, ideas of policy actors and rational choice of policy actors, may be relevant to the policy-making processes of emission standards, and they may provide another insight into the policy-making processes of emission standards when they are utilized in analysing the evolution of emission standards in Japan. However, because of the limited time and resources for the research, the research decides to utilize network approaches as an analytical tool for understanding the evolution of emission standards. This decision can be justified partly because of the fact that political analysis of the evolution of emission standards has been, as mentioned above, almost never examined, and thus this research can be a starting point for studies of the topic with expectation that other following researches will examine it in term of other four perspectives based on the results of this research.

The Structure of the Thesis

This chapter argued that network approach can be useful to analyse the evolution of emission standards because understanding the policy-making processes of emission standards and the evolution of emission standards would require examination of the relationship between the state actors and the auto industry. Chapter 2 examines different interpretations of network approaches and carries out a fuller conceptual discussion on the value of policy networks. Although the chapter concluded that network approaches would be better to analyse the evolution of emission standards, there are different interpretations of networks approaches. Then, chapter 2 examines different interpretations of network approaches and justifies that the British policy networks framework would be better for this research. After the conceptual discussion on policy networks is made, the thesis confronts two big questions. That is, '*how does the British policy networks framework relate to Japan when relationship between policy actors is crucial in policy-making processes?*' and *'does the framework help to explain policy change in Japan when relationship between policy actors matters in policy-making processes?'* Those two questions are the central parts of the thesis. It may be very simple and straightforward to set the purpose of the thesis as examination of those two questions. However, examination of those two questions may greatly contribute to public policy studies in Japan because there is little research on the applicability of the British policy networks framework to Japan. In turn, the contribution of this examination to British public policy studies may be not small because it would help to answer one important question of whether the framework can be used in the non-European or universal context. Based on the discussion made in chapter 1 and chapter 2, chapter 2 finally identifies a number of research questions and the research hypotheses that will be tested within the empirical investigation that follows.

Chapter 3 introduces an empirical study in which the validity of the hypotheses is examined and the research questions are answered. The chapter first introduces the empirical case more concretely

for the thesis, namely automobile air pollution policies in Japan. The chapter then discusses and examines methodological aspects associated with the empirical investigation. The rest of the chapter supplies a research process for the thesis.

Chapter 4 provides background knowledge for the empirical study. The first section of chapter 4 briefly explains the history of environmental problems and policies in Japan. Then, the second section discusses procedures for making environmental laws and emission standards at the national level and those for making local environmental ordinances in the Tokyo metropolitan government (TMG). After presenting conceptual discussion and providing preliminary information for the empirical study, including methodological aspects of the empirical study and various aspects of environmental policies in Japan, the thesis reaches to its main body of the empirical study. Chapters 5, 6, and 7 present the results of the empirical data collection and they are based on both primary and secondary sources.

Chapter 5 discusses automobile air pollution policies mainly in the 1960s. Chapter 5 first discusses how and why automobile air pollution happened and greatly deteriorated in the mid-1960s. Then, the discussion turns to the examination of relationships between the state and the ministry of international trade and industry (MITI) and the auto industry. Next, the chapter discusses automobile air pollution in metropolitan areas, focusing on concentration of population and business in those areas. The chapter then examines national and local automobile air pollution policies before the first emission standards were established in the 1960s. Next, the chapter discusses the establishment of the first emission standards, and it discloses how the policy change happened.

Chapter 6 deals with automobile air pollution policies in the 1970s. For automobile air pollution policies, the 1970s was the most turbulent era in Japan and this chapter is consequently the largest part of this thesis. In the early 1970s, it was planned that automobile air pollution policies or emission standards would be greatly advanced. However, the plan was obstructed and hampered by

the oil crisis, stagnation of economic development and postponement to enforce the US emission standards in the mid-1970s. However, the plan was in the long run enforced in the mid-1970s to the late 1970s, which was the greatest advance of both the emission standards and automobile air pollution policies in the history of the Japanese automobile air pollution policies. While the emission standards had been most greatly reinforced in the mid-1970s to the late 1970s, the national ambient air quality standard for nitrogen oxides (NOx) was relaxed in the late 1970s, which was often called the greatest retreat in the history of automobile air pollution policies and even environmental policies in Japan.

Chapter 7 presents both the stagnation of automobile air pollution policies in the 1980s and their advance in the 1990s and the 2000s. Although automobile air pollution policies and emission standards did not greatly develop in the 1980s, automobile air pollution policies started to advance again in the 1990s. However, emission standards were not greatly reinforced, but the automobile NOx law was instead established in the early 1990s. Then, from the mid-1990s, mainly because both the state, industries and the public recognized the importance to do something for the environment, and the automakers strongly recognized positive effects of proactive business activities for the environment due to the global environmental movements, emission standards for particulate matter (PM) were established and it was decided that those for NOx including the 2007 emission standards were to be greatly reinforced. Finally, in 1999 and 2000, mainly because of the operations of TMG on diesel trucks which sought to reduce emissions of both NOx and PM from diesel trucks, it was determined that the 2007 emission standards were to be enforced in 2005.

After presenting the results of the empirical study and examining the results of the empirical investigation based on the policy networks concept in chapter 5, 6 and 7, chapter 8 seeks to answer the research questions. Finally, discussion turns to the examination of the validity of the research hypotheses.

The last chapter seeks to examine the two big questions that have led to this research and the research hypotheses. After those two big questions are examined, the chapter examines the identified problems of the British policy networks framework within the recent development of the framework. Then, the next section discusses the limitation of the qualitative methods utilized in this research. Next, the chapter seeks to make suggestions for policy makers and for future research, based on the results of this research. Finally, based on this research, the thesis ends with great expectation that this research stimulates public policy researchers in Japan to adopt the British policy networks framework and contributes to making it more suitable for complicated policy-making in Japan because the British policy networks framework seems to be greatly relevant to Japan and very useful to analyse policy-making and policy changes in Japan.

Conclusions

As a starter of this thesis, the chapter first discussed current issues on Japanese green automobiles and automobile emission standards. Then, the chapter examined five approaches to analyse policy change. After examination of those approaches, the chapter examined the main characteristics of policy-making processes in emission standards and suggested that network approaches might be more appropriate in analysing the evolution of emission standards because relationship between the state actors and the auto industry is the key to understanding policy-making processes in emission standards. The remaining part of this chapter presented the structure of this thesis. As explained in that section, the next chapter presents different interpretations of network approaches and a conceptual discussion, and seeks to propose both research hypotheses and research questions based on the conceptual discussion

Chapter 2

Different Policy Network Frameworks and the Concept of Policy Networks

Introduction

The previous chapter has discussed five approaches for analysing policy change and suggested that network approaches might be better in analysing the evolution of emission standards because relationship between the state actors and the auto industry is the key to understanding policy-making in emission standards. Although the previous chapter decided to adopt network approaches, there are different interpretations of network approaches. Then, this chapter first examines different policy networks frameworks and justifies that the Marsh and Rhodes model or the so-called British policy networks framework is utilized for the research.

Next, this chapter seeks to carry out a fuller conceptual examination of policy networks. The conceptual discussion on policy networks first goes to the mechanics of policy networks, namely resource and power dependency. In its discussion, more specifically, appreciative systems, rules of the game, resources of participants and strategies are examined in more detail. Then, the conceptual discussion turns to the typology of policy networks. It examines four dimensions of policy networks such as membership, integration, resource and power that distinguish policy networks between policy communities and issue networks. The next issue to be examined is policy changes and changes within policy networks. Here, issues include relationships both between the existence of policy networks and policy changes and between changes within policy networks and policy changes, and exogenous and endogenous factors leading to changes within policy networks.

After the conceptual discussion, the chapter proposes hypotheses to be tested within the empirical

investigation. Finally, given the concept of policy networks and the hypotheses, the chapter seeks to identify research questions.

Different Policy Networks Frameworks

As justified in the previous chapter, the thesis utilizes network approaches in order to examine the evolution of emission standards. However, as the previous chapter showed two frameworks in the network approaches, there are different forms of policy networks frameworks and they interpret policy networks differently though policy network researchers share a common understanding that policy networks exist and operate as links between actors within a particular policy domain. Policy networks frameworks have been often categorized by a geographical perspective, namely American, British and German-Dutch. It seems that there has been a sort of agreement among the policy network researchers that the policy networks frameworks can be distinguished by these three kinds of geographical locations (Adam and Kriesi, 2007; Knoke, 2007; Marsh, 1998a; Peterson, 2003; Turmanidze, 2007; Rhodes, 1997).

This does not mean that researchers outside these three areas have not contributed to the development of policy networks frameworks and their substantial contribution cannot be ignored (e.g. Atkinson and Coleman, 1992; Daugbjerg, 1998; McLeay, 1998; Adam and Kriesi, 2007). Rather it means that researchers outside those three geographical areas have contributed to the development of one, two or all of the American, British and German-Dutch schools. In addition, of course, those three schools are not perfectly distinguished from each other and they, more or less, influence each other. For instance, the development of the British policy networks framework has been clearly influenced by both the American and German-Dutch works (e.g. Heclo, 1978; Hanf and O'toole, 1992; Scharpf, 1978; Van Waarden, 1992), but the British works have undoubtedly

contributed to the German-Dutch policy networks frameworks. Further, some researchers utilize the policy networks frameworks that are geographically different from where they belong; the work of Richardson and Jordan (1979), both of who are British, depends on the American policy networks framework; The Dutch researcher, Mol (1995), utilizes the British policy networks framework.

However, it may be still valuable to categorize the network approaches into American, British and German-Dutch policy networks frameworks because each of these three different frameworks provides distinctive perspectives in interpretation of policy network approaches. Then, such perspectives may contribute to the selection of a policy networks framework from other frameworks. The existing literature has not concluded which one framework is the right because their distinctive perspectives may be more relevant in one situation but less relevant in other situations. Therefore, it may be a better idea to seek for a policy networks framework whose perspectives are more relevant in the theme of this research, namely the study of relationships between state actors and the auto industry in the evolution of emission standards and the evolution of emission standards.

Policy networks as a form of interest group intermediation versus policy networks as a new form of governance

Policy networks as a form of interest group intermediation

Researchers distinguish policy networks between the American and British policy networks frameworks and the German-Dutch policy networks frameworks because the former generally views policy networks as a typology of interest intermediation while the latter considers them as a new form of governance (Adam and Kriesi, 2007; Borzel, 1998; Knoke, 2007; Marsh, 1998a; Peterson, 2003; Turmanidze, 2007). Policy networks are recognized as a typology of interest intermediation by the American and British schools because both schools generally consider policy networks as a generic term for different forms of relationships between the state and interest groups, applying to all

kinds of relations between public and private actors (Borzel, 1997, 1998; Dagurre, 2000). Marsh (1998a), Rhodes and Marsh (1992b) and Greer (2002) also argues that policy networks, primarily in the British and American tradition, are defined as a generic label encapsulating a wide range of forms of interest intermediation such as policy communities and issue networks

The American/British literature of policy networks as a form of interest intermediation tends to utilize policy networks as an analytical tool in order to examine institutionalised relations between the public and private actors, 'allowing a more fine grain analysis by taking into account sectoral and sub-sectoral differences, the role played by private and public actors, and formal as well as informal relationships between them' (Borzel, 1998: p.258). In addition, the American and British schools seem to share a common understanding that the existence of policy networks affects policy outcomes. Moreover, some authors such as Marsh and Rhodes (1992) have attempted to add some explanatory value to the different network types because they assume that the structure of a network significantly affects the logic of interaction between the network members, which affects both policy process and polity outcomes.

Policy networks as a new form of governance

The German-Dutch school shares significant similarities with the American/British schools, especially the British school (Marsh, 1998). First, they see modern society as characterised by functional differentiation, with private organizations, which control key resources and play an increasingly crucial role in formulating and implementing policy. Second, most researchers in both schools view policy networks as greatly influencing policy outcomes, although they do not explicitly tell the causal mechanisms involved (Marsh, 1998a; Klijn, 1998). Finally, researchers such as Kickert (1997) focus on the importance of institutional structures in the same way as do Marsh and Rhodes. Hence, the American/British schools and the German-Dutch school are not mutually

exclusive and the literature does not always clearly distinguish between these two schools. However, there is one fundamental difference between them. Namely, while the American/British schools generally regard policy networks as a form of interest group intermediation or as a form of interest group representation, the German-Dutch school tends to view policy networks as a new form of governance in modern political systems as a mechanism to mobilize political resources in situations in which these resources are widely dispersed between the public actors and private actors (Borzel, 1997; Kenis and Schneider, 1991; Kickert et al., 1997; Marsh, 1998). It is considered that 'policy networks only characterise a *specific* form of public-private interaction in public policy (governance), namely the one based on non-hierarchical co-ordination, opposed to hierarchy and market as two inherently distinct modes of governance' (Borzel, 1997: p.3).

According to Hanf and O'Toole (1992: p.166), modern governance is characterized by 'decision systems in which territorial and functional differentiation disaggregate effective problem-solving capacity into a collection of sub-systems of actors with specialised tasks and limited competences and resources'. Because of a functional interdependence of public and private actors in policy-making processes, policy networks emerge as a new form of governance which enables governments to marshal political resources in situation where these resources are widely dispersed between public and private actors so that collective action can be orchestrated towards the solution of a common policy (Kenis and Schneider, 1991; Marin and Mayntz, 1991). Consequently, Kenis and Schneider (1991: p.36) regard policy networks as 'webs of relatively stable and ongoing relationships which mobilize and pool dispersed resources so that collective (or parallel) action can be orchestrated towards the solution of a common policy'. Similarly, Scharpf (1993) views policy networks as involving a plurality of both public and private actors who have distinctive but interdependent interests, who are mutually dependent on their resources and who informally interact with each other in policy-making processes and that they provide a framework to efficiently carry

out the horizontal coordination of interests and actions of those actors.

Although the German literature and the Dutch literature share much in common, there is a difference in the interpretation of policy network approaches. In order to explain the development of policy networks as a new form of governance, the German literature tends to utilize 'the so-called actor-centred institutionalism' combining rational choice and institutional assumptions (Adam and Kriesi, 2007; Marsh, 1998a; Mayntz and Scharpf, 1992, 1995). In this perspective, policy networks are conceptualised as informal institutions, providing opportunities and constraints for rational actors who seek to maximize their preferences (Mayntz and Scharpf, 1995; Marsh, 1998a; Scharpf, 1993).

On the other hand, the Dutch literature puts a less emphasis on the rational choice approach and a more emphasis on strategy, which indicates that calculating subjects act in structured settings, because they are often concerned about network management as a form of public management consisting of coordination of strategies of actors with different goals and preferences (Kickert, Klijn and Koppenjan, 1997a: p.10; Marsh, 1998a: p.10).

As it may be clear already, the American/British policy networks frameworks are more appropriate to be utilized in this research as a theory for the examination of the relationship between state actors and private actors and its influence on policy outcomes in the evolution of emission standards in Japan. Indeed, the purpose of this study can be categorized as an interest group intermediation study or an interest group representation study. The American/British perspectives view policy networks as a form of interest intermediation and the notion of policy networks in the American/British schools as an analytical tool to examine interest intermediation. On the contrary, the notion of policy networks in the German-Dutch school is nether focused on interest intermediation nor an analytical tool for studying interest intermediation. As Mayntz (1993a: p.5) points out, in the German-Dutch school, 'the notion of policy networks does not so much represent a

new analytical perspective but rather signals a real change in the structure of the polity'. In addition, Borzel (1998: p.263) argues that the concept of policy networks as a specific form of governance does not constitute a proper theory. Therefore, the research utilizes the American/British perspectives on policy networks as an interest intermediation.

American policy networks framework versus British policy networks framework

American policy networks framework

In the US, networks studies emerged as the sub-government model in the 1950s and 1960s (John, 1999; Jordan, 1990). Pioneers of the networks approach emphasized close relationships between executive agencies, Congressional Committees and interest groups (Griffith, 1939; Freeman, 1955). Close relationships between them were the basis of sub-governments in which many of the decisions were made by those actors (Freeman, 1955). Ripley and Franklin (cited in Jordan 1990b: p.321) define sub-governments as 'clusters of individuals that effectively make most of the routine decisions in a given substantive area of policy...A typical sub-government is composed of members of the House and/or Senate, members of Congressional staffs, a few bureaucrats and representatives of private groups and organizations interested in the policy area'. Thus, the model focuses on interrelationship between individuals within government, bureaucratic agencies and interest groups. Lowi (1964, 1969) developed the sub-government model by emphasising the role of a limited number of privileged groups that have close relationship with governments, namely the triangular nature of the relationships between the central government agency, the congressional committee and the interest groups, leading to the well-known metaphor, *'the iron triangle'*.

Because the sub-government approach was a critique of the pluralist model of interest group intermediation (John, 1999; Rhodes, 1997), Heclo (1978) and McFarland (1987) emphasized the importance of issue networks which are 'a communications network of those interested in policy in

some area, including governmental authorities, legislators, businessmen, lobbyists, and even academics and journalists...(and) constantly communicates criticisms of policy and generates ideas for new policy initiatives' (McFarland, 1987: p.146). According to Heclo and McFarland, closed sub-governments were opened because more participatory forms of politics emerged, interest groups went off and power in congress became fragmented (John, 1999). The hit-back of pluralists took place in the 1970s and the 1980s, and the networks approach has been used to describe the complicated nature of policy-making processes in the US even after then (see Browne, 1995; Peterson, 1993).

Researchers using both concepts normally seek to specify stable interaction patterns and simultaneously examine which actors are responsible for decision (Klijn, 1990; Jordan, 1990a). Further, researchers concentrate on studying which relationships can be found and which of them are crucial for the decisions that are being made (Klijn, ibid). Then, American analysts tend to claim that policy networks are descriptive concepts of public policy making (Turmanidze, 2007). Although the sub-government approach and the issue network approach interpret relationships between actors in policy-making differently, both of them consider policy networks as a micro-level analysis. Researchers such as Marsh (1998a), Rhodes (1997) and Turmanidze (2007) argue that this is one of the most crucial differences between the American policy networks framework and the British policy networks framework, focusing on the structural relationship between actors rather than the interpersonal relationship.

It seems that both the sub-government studies in the US and issue network studies are less relevant for the purpose of this research. First, as Peters (1998: p.27) points out, the strength of the iron triangles has been exaggerated and such interpretation of policy-making cannot work well in contemporary Japanese politics because the concept seems too narrow and many more groups are

now not so restricted to access to the policy processes. Second, issue network studies seem also inappropriate for this study because it is supposed that the basic pluralist assumption of issue network studies cannot be applicable to the study of evolution of emission standards because the exclusively close relationship between state actors and the auto industry may be the key in understanding policy-making in emission standards. Third, as described above, both sub-government studies and issue network studies just seek to describe relationships between policy actors and they do not attempt to explain how policy network affects policy outcomes, though this is an important question of this research. In addition, Peters (1998) argues that policy network may not affect policy outcomes in the US because American politics remains more unstructured than that in most European countries and possibly Japan. Finally, it seems that the research needs to be a meso-level analysis because the focus of this research is placed on the structural relationship between state actors and the auto industry rather than the interpersonal relationships between them. It may be more probable that individuals within the state and private organisations (e.g. MoT, MITI and the auto industry) act in the role of organisation representatives as suggested by Van Waarden (1992). Further, it is suggested that 'the behaviour of the individuals within networks is likely to be shaped heavily by the institutional arrangements that drive the perspective of the actors and the composition of the network' (Bressers, O'Toole and Richardson, 1994: p.6). In addition, partly because of limited time and resources, it must be practically highly difficult or perhaps impossible to find interpersonal relationships between policy actors for forty years and examine how they have affected policy outcomes. Thus, the research considers it better to focus on the structural relationship rather than the interpersonal relationship. Because of the reasons mentioned above, it can be determined that both sub-government studies and issue network studies are not appropriate for the purpose of this research.

Formal network analysis

As described above, the existing literature which seeks to categorise policy networks frameworks generally considers the American policy networks framework as sub-government studies/issue network studies (Marsh, 1998a; Rhodes, 1997; Turmanidze, 2007). However, recently, in the US, much of the development in concept and methodology of policy networks has been centred in not political science but sociology and the formal sociometric-based method or the formal network analysis, developed by two American sociologists, Edward Laumann and David Knoke, have been used in several major works (Peterson, 1998: p.27). Knoke (2007: p.7) points out that developers of the American policy network studies are Laumann and Knoke, while the British developers are Marsh and Rhodes. In contrast, Marsh (1998) and Adam and Kriesi (2007) tend to view formal network analysis as a *fourth-way* perspective on policy network studies, namely neither German-Dutch, British nor *conventional* American. Their formal network analysis is worth being discussed because one of a few studies that have examined policy network in Japan utilized the method (Knoke et al., 1995).

Formal network analysis seeks to measure and analyse the complex pattern of the private/public actors' interactions in decision-making processes (Adam and Kriesi, 2007; Knoke et al, 1996). In addition, although the conventional American policy network studies are concerned about the interpersonal relationships, it views the structural relationships between policy actors as being crucial in policy networks (Knoke et al., 1996). According to John and Cole (1998: pp.132-135), in formal network analysis, researchers normally count the occurrence or frequency of interactions between actors and derive measures of the structure of the network. The frequency of contacts can be measured through formal records of links between bodies, divined questionnaires, structured interviews or diaries. Then, the relationships between actors can be coded and a matrix in which actors are both rows and columns can be created; if the relationships are binary, this is called a graph

while it is called a value graph if there are frequencies of interaction. The graph is normally entered into a text editor and it is then imported into computer programmes for network analysis (e.g. UCINET IV, GRADAP or STRUCTURE) so that the measures of network structure can be produced (ibid).

There are two kinds of most commonly used measures in formal network analysis to interpret the results, measurement of density and centrality (ibid). The density measures the ratio of the number of interactions in a network with the total possible ties in order to comprehend the extent to which actors interact, which indicates the closeness of relationships, and their significance to network participants.

The centrality attempts to understand the property of actors concerning their links with others and it normally measures how much communication within a network passes through an actor (Freeman, 1979; John and Cole, 1998). The centrality is considered as crucial because it is supposed that it can identify types of policy network by looking at who dominates the network. Those who have high centrality scores in the network can be regarded as playing crucial roles in decision-making and as being the key in comprehending the circulation of ideas and decisions for acting collectively (John and Cole, 1998: p.135). In addition, normally, the results are shown in the network structure images and summary indices, allowing characterisation of their key aspects including the level of centralisation, density and connectedness. Researchers often interpret the emerging structures in terms of concepts drawn from interest group studies (Adam and Kriesi, 2007; Knoke et al, 1996).

There have been many studies which have utilized the formal network analysis (Heinz and Laumann, 1982; Hunter, 1953; Laumann et al., 1973; Laumann and Knoke, 1987; Marsden and Laumann, 1979; Knoke et al., 1998). Hunter (1953) specified sociogrammes of the elites in his study of community power in Atlanta so that the idea that cities were ruled by close-tied elites could be supported. Laumann and Pappi (1976) studied elite networks in the communities of Altneustadt in

West Germany and Towertown in the US to employ the measures of centrality, density and cliques. Further, Laumann and Knoke (1987) utilized network measures including multidimensional scaling of the distances between actors in order to examine the differences in policy networks in energy and health in the US.

Finally, Knoke, Pappi, Broadbent and Tsujinaka (1996) attempted to study the similarities and differences in labour policy networks between the US, Germany and Japan. The research discovered that state traditions and histories of government intervention in the economy are important sources of variation in network structure. Among a number of studies which utilized the formal network analysis developed by Laumann and Knoke, this study may be the most relevant for this research because it is seemingly one of a few Japanese policy network studies which have been done so far. Thus, it may be useful to discuss what they have found about the labour policy network in Japan.

Knoke *et al.* (ibid) studied policy networks in labour policy domain by utilizing formal network approach. According to them, policy networks can be divided into policy communication networks and political support networks. Policy communication networks correspond to influence relationships which 'involve persuasive communications intended to change others' perceptions and beliefs regarding political actions and their potential consequences' (Knoke *et al.*, 1996: p.102). Political support networks mean domination relationships which 'involve exchanges of sanctions intended to facilitate or restrain others' behaviour in directions desired by the initiator' (ibid). In policy communication networks, various kinds of information such as scientific-technical, legal and political knowledge are transmitted from one actor to another without loss of control by the initiator. In contrast, in political support networks, sanctions such as financial and material rewards and public support and legitimation as well as coercive penalties are transmitted, often leading to the loss of control over those resources by the initiator.

Knoke *et al.* (ibid) observed that the centre of the Japanese policy communication network

contained the government organizations, the business peak federation mandated and responsible for the labour domain (Japan Federation of Employers Associations: FEA) and the more docile of the two peak labour federations (Japan Private Sector Trade Union Confederation: PTU) with exclusion of the political parties, namely the Liberal Democratic Party (LDP) and the Japan Socialist Party (JSP), the leftist oppositional labour peak federation (General Council of Trade Unions of Japan: GCU) and the generalist business peak federation (Japan Federation of Economic Organizations: FEO). Thus, they argue that the Japanese centre represented intermediation of communication by bureaucracies as 'the peak associations mediated communications from the civil society and worked directly with the specialist government agencies to discuss labour policy, without political party interference' (Knoke *et al.*, 1996: p.213). In contrast, as they discovered, there are two centres in the political support network. LDP, the Ministry of Labour's Labour Policy Bureau (LPB), FEA and FEO occupied one centre, while JSP, PTU and GCU occupied the other centre.

In addition, they found that as an organization was more central in either the communication or the support network, the higher was its reputation for being influential in labour politics (Knoke *et al.*, ibid: p.213). Further, as central organizations were also more central, they were more active in trying to affect the outcomes of legislative policy events. Also, they found that the political support network was more important than the communication network because the provision of political support by peak federations was more crucial in initiating action than information.

Although the formal network analysis has been widely adopted in policy network studies, various researchers are sceptical about its utility (e.g. John, 1999; Marsh, 1998b; Rhodes, 1990; Thatcher, 1998). First, formal network analysis tends to be 'preoccupied with description and the measurement of linkages' (Rhodes, 1990: p.295). Consequently, the content of exchanges are not generally analysed though numbers often cannot simply be added up. Thatcher (1989: p.391) claims that 'the number of information linkages takes no account of the different kinds and value of information that

is being exchanged'.

Second, it is unclear what networks measure (John, 1999). As John and Cole (1998) point out, relationships may be symbolic or ceremonial, operation or used in implementing policy, or may be about policy choices. Networks may show not the important relationships in politics but the short-lived political phenomena. Third, it is difficult to determine the boundaries of networks (Laumann *et al.*, 1992). Because networks by definition diffuse and shade into each other despite the requirements of a precise graph in network measures, the precise measures in formal network analysis inflict an arbitrary simplicity onto a complex world (John and Cole, 1998). Fourth, formal network analysis is normally cross-sectional and can merely provide a snapshot of fluid sets of relationships (ibid). Researchers may have difficulties in precise generalisation of what set of relationships the network measures capture where network change rapidly. Finally, it has been considered by many researchers that 'the considerable effort spent collecting and analysing network data yields only the obvious or very little' (John and Cole, 1998: p.137). The findings that formal network analysis produces such as 'there is a core to a network' and 'network centrality is correlated with power' may not be unsurprising and invaluable (ibid).

It may be undeniable that formal network analysis can provide a very clear picture of the networks. Thus, it may contribute to understanding of the relationships between state actors and the auto industry in policy-making of emission standards. However, there are a few problems in using the formal network analysis for this research. First, it is practically almost impossible to count the frequency of contacts between policy actors in thirty or forty years ago. For instance, Knoke *et al.* (1996) investigated events by interviews in labour policy in Japan, which took place between 1982 and 1988, from September 1988 to August 1990. Because they were able to contact those who experienced the events and ask informants about the frequency of contacts, they could carry out that

research. However, it is highly difficult or almost impossible to carry out the same research as that of them in examining events taking place in thirty or forty years ago; those who experienced the events may be retired; some of them may have passed away; even if they are not retired, it may be difficult to expect that they remember events and whom they contacted and how much they contacted with each other.

Second, again practically, it is difficult to perform the same research as their research because of limited time and resources. Investigation of policy networks in labour policy events between 1982 and 1988, as mentioned above, took two years and required interviewing 125 organisations. Although it is not clear how many researchers conducted the research, it is indicated that several researchers conducted the research (Knoke *et al.*, 1996: p.75). As explained later in Chapter3, the research examines the evolution of emission standards from the 1960s to the 2000s. Thus, it can be supposed that it would require more time and resources in order to carry out the same research. Undoubtedly, the research does not have enough time and resources to perform it.

Third, as mentioned above, the formal network analysis is nothing but a descriptive device and unable to explain how the close relationship between policy actors, namely policy networks, affects policy outcomes. The centrality and the density in policy networks may not explain the way in which networks affect policy outcomes and such examination may need to adopt a more traditional methodology such as semi-structured/unstructured interviews rather than quantitative methods (Marsh, 1998b).

Finally, it can be, as discussed above, argued that frequency of contacts may not simply display the precise relationships between policy actors. It may be possible that one Government agency more frequently contacts the auto industry but the information they exchanged is not so important; in contrast, another Government agency exchanges more valuable information with the auto industry though their frequency of contacts is low.

Formal network analysis might be utilized in order to investigate policy-making in the 1990s and the 2000s because it may be probable that those who were involved in policy-making in the 1990s and the 2000s might be contactable and they might remember what happened in policy-making. However, the research rejects using formal network analysis only in these terms because it would lose consistency in analysis. Further, it does not adopt it to supplement the investigation of policy-making only in these terms because of limited time and resources. Because of those reasons, formal network analysis is not adopted in this research.

British policy networks framework

Richardson (2000: p.1006) alleges 'British origins of what is now termed the network approach'. In addition, Rhodes (1990: p.32: cited in Peterson, 2003: p.7) similarly asserts that 'American political science was not the major formative influence' on the early work of network studies in the UK. However, Peterson (2003: p.15) claims that the idea of networks as an analytical concept was developed by an elastic range of work in the UK, US and Europe on interest intermediation, through both pluralist and corporatist structures and concentrated on intergovernmental and government-industry relations. Peters (1989: p.21) also contends that several works in North America such as Heclo (1978) and Atkinson and Coleman (1989) have contributed to the British network idea and that the more restricted concepts of interest group politics such as the iron triangles was the origin of the concept of networks. Indeed, Marsh and Rhodes (1992: pp.5-8, cited in Peters, 1998: p.21) argue that the American literature served as a foundation for this body of research.

In Britain, the networks approach emerged with two influential works of Richardson and Jordan and Heclo and Wildavsky in the 1970s. Richardson and Jordan's *Governing Under Pressure* (1979) discovered that policy-making in Britain took place in sub-system, named 'policy community', in which civil servants and producer groups had close interpersonal relationships. Heclo and

Wildavsky's *The Private Government of Public Money* (1974) observed interpersonal contacts of the executive group of civil servants who shared common values centred in the Treasury and suggested that policy was made in this policy community. Thus, both works indicate that there are a number of relatively closed networks in Britain unlike the US. The concept of policy community was utilized and developed in studies of Britain from the 1970s onwards (Jordan, 1990a, Heclo and Wildavsky, 1974; Richardson and Jordan, 1979; Grant et al., 1988; Rhodes, 1988).

Although their works laid the ground of the policy networks framework in Britain, it was works of Rhodes (1986, 1988) and Marsh and Rhodes (1992a) that contributed to the dominant position of the policy networks framework in British political science (John, 1999). Consequently, there seems agreement between researchers that the British policy networks framework is the framework developed by them (Rhodes, 1997; Marsh, 1998; Knoke, 2007), although some British researchers such as Dowding (1995) and Wilks and Wright (1987) interprets policy networks differently, as is described below in this section. Rhodes took a different approach from those approaches of the pioneers in British political science. Following not the American policy networks literature but the European literature on interorganisational relations such as the work of Benson (1982), Rhodes (1997: p.36) emphasises 'the structural relationship between political institutions as the crucial element in a policy network rather than the interpersonal relations between individuals within those institutions' in his work on local government and central government (1986, 1988). Rhodes (1988, 1997) claims that networks are created by both private and public actors in order to exchange resources on which they mutually depend to realize common policies. Rhodes (1988: p.77) then defines policy network as 'a cluster or complex of organisations connected to each other by resource dependencies and distinguished from other clusters or complexes by breaks in the structure of resources dependencies.' He also emphasizes the importance of the sectoral level analysis rather than the sub-sectoral level analysis.

Marsh and Rhodes (1992) developed the Rhodes model. The Marsh and Rhodes model emphasizes the structural relations between policy actors at the meso-level, which constrain and facilitate actors within the network and it is a model of interest group intermediation or the model of relations between interest groups and government (Marsh and Rhodes, 1992; Daugbjerg and Marsh, 1998; Smith, 1993). In addition, most of the case studies in their edited collection considered the structural relationships as the crucial element in their identified policy networks (Marsh and Rhodes, 1992). They stress that policy networks exist at both the sectoral and sub-sectoral levels. In addition, Marsh and Rhodes (1992b) (see also Rhodes and Marsh, 1992: pp.186-87; Rhodes, 1997: p.43) developed an influential typology, placing policy communities at one extreme and issue networks at the other according to 'the closeness of the relationships within them' or the level of integration. Moreover, they propose that the structure of policy networks affects policy outcome and that policy outcomes may be predicted through analysing the structure of policy networks (Marsh, 1998a, 1998b; Marsh and Rhodes, 1992): while the existence of policy community results in policy continuity, the existence of a loose network results in a policy change (Turmanidze, 2007). As Daugbjerg (1998b: p.276) points out, 'the British network tradition is most concerned with the relationship between networks and outcomes'.

One of the distinctive points on the British policy networks framework is its emphasis on interorganisational relationships rather than interpersonal relationships. According to Rhodes (1990), focusing on interorganisational networks is better in policy analysis because 'If we focus on individual behaviour, then necessarily the general concept will become less useful. To pursue micro-level analysis, to explore personal networks, will provide a wealth of detail but make it increasingly difficult to generalize about policy networks' (1990: p.311).

Also, the British policy networks framework is distinctive in that it explains as well as describes the patterns of organizational relationships and that it is not prescriptive. Though the American

network literature used the idea of policy networks as a metaphor or as a descriptive device, in Britain the policy networks framework has gone beyond metaphors and a descriptive device, and presented typologies of policy networks and attributed causal power to networks. In addition, whether it is a practical or a theoretical level, the literature on the British policy networks framework has neither sought to prescribe nor had a great intention of the co-ordination of public services (Rhodes, 1990).

Another distinctive point in the policy networks framework in Britain is its strong emphasis on resources and bargaining (John, 1999). According to Rhodes (1986, 1988), organizations are dependent upon other organizations for resources and they have to exchange resources and engage in bargaining in order to achieve their goals. The policy network is created by the resulting interdependence (John, 1999). Thus, in the British policy networks framework, it is assumed that policy networks are characterized by resources and bargaining.

Next, compared to the US literature, the British literature tends to focus more on analysing value systems and perceptions of actors within policy networks as can be seen in using the appreciative systems (Klijin, 1999). In addition, closeness of relationships in policy networks is a more crucial issue in the discussions in the British literature (ibid). Finally, the literature in the British policy networks framework has an explicit concept of networks (Rhodes, 1990). The American policy networks concept may be confusing, as it has used various metaphors such as sub-government and iron triangle. However, in terms of terminology, the British policy networks framework is clear because it has rejected other metaphors to avoid terminological confusion.

The Marsh and Rhodes framework, the often called the British policy networks framework, has been suffering a wide range of critics. There must be no disagreement that Keith Dowding has most actively criticized the British network framework. According to Richardson (1999: p.199), 'Dowding's central thesis is that policy network began as a metaphor and may only become a theory

by developing along the lines of sociological network analysis, something he considers is of limited potential'. Refereeing to the study of water privatisation by Richardson et al. (1992), he claims that:

All we learn from the study in network terms is that if a policy community breaks down an issue network evolves and other groups are able to enter the policy process more forceably. But it does not explain community breakdown, nor issue network transcendence, nor the dynamics of change (Dowding, 1995: p.139).

In order to explain network changes and policy changes, Dowding emphasises the importance of the roles of agents in policy networks. Dowding (1994: p.69) argues that network approaches fail:

because the driving force of the explanation, the independent variables, are not the network characteristics per se but rather characteristics of components within the networks. These components explain both the nature of the network and the nature of the policy process.

Thus, for Dowding, policy networks reflect patterns of interaction and resource exchange between agents and bargaining between the actors within policy networks affects policy outcomes (Marsh, 1998a). He maintains that policy networks fail to establish any direct link between the bargaining taking place within the policy network and policy outcomes.

Other researchers similarly doubt that the network characteristics can explain policy outcomes. For instance, Marin (1990) contends that it is unclear that sufficient information for outcome prediction can be provided by interactions between policy actors. Further, Jordan (1990a: p.301) claims that 'political outcomes are the result of processes and not simply the consequence of structures'. John (1999) also contends that focusing on relationships offers an incomplete

explanation of policy change.

Further, Thatcher (1998) claims that the British policy network studies involve static bias because they exclusively focus on networks omitting other factors such as the characteristics of agents, ideas and institutions. The static bias due to their exclusive emphasis on networks is similarly pointed out by Adam and Kriesi (2007), Klijn (1996) and Hunan (2000). In addition, König, (1998: p.387) and Kenis and Schneider (1991) suggests that the policy network concept is just a metaphor that describes the complexity of social and political life. Studies using the network concept have not explained the reason of mutual dependency and the way in which mutual dependency affects public decision-making (ibid).

Wilks and Wright (1987) propose three major modifications of the Rhodes model. Although they sought to modify the Rhodes model, their propositions can be mostly critiques to the Marsh and Rhodes model too. First, while Rhodes focuses on the structural relationships between institutions, they emphasise interpersonal relations. Second, although the Rhodes model focuses on the sectoral level, they emphasise the importance of the sub-sectoral analysis in order to examine the government-industry relations because the key to understand government-industry relations is to disaggregate to sub-sectoral policy networks. Third, their terminology is different from the terminology of Rhodes. They distinguish between policy universe, policy community, and policy network. They define policy universe as the large population of actors and potential actors who share a common interest in industrial policy, and may contribute to the policy process on a regular basis. Policy community is defined as a more disaggregated system in which those actors and potential actors, who share a common interest in a particular industry and who interact with one another, exchange resources so as to balance and optimise their mutual relationships take part (1987: p.296). Finally, they consider policy network as 'a linking process, the outcome of those processes, within a policy community or between a number of policy communities' (ibid: p.297).

Wilks and Wright argue that their approach is superior to the Rhodes' model distinguishing between networks and communities according to the closeness of the relationships involved. Particularly, they argue that their model enables them to recognize both that not all the same policy issues in the same policy sub-sector are dealt with in the same network; and that policy network members may be drawn from different policy communities within the same policy area, or even from different policy areas (Rhodes, 1997: p.42). Related to the propositions made by Wilks and Wright, Jordan et al. (1994) claims that networks only exist at the sub-sectoral level. In addition, McPherson and Raab (1998) consider that networks are based on personal relationships between known and trusted individuals sharing beliefs and a common culture.

It is considered that the British policy networks framework is more appropriate for the purpose of this research than other network concepts even though these criticisms are taken into consideration. First, as discussed above, the research considers the structural relationships as crucial in policy networks rather than interpersonal relationships as suggested in the British policy networks framework. Although it may be possible that individuals sometimes play an important role without being influenced by the institutional arrangements, it may be more probable that their behaviour is shaped by institutional arrangements. In addition, partly because of limited time and resources, finding interpersonal relationships between policy actors for forty years and examining how they have affected policy outcomes may be practically highly difficult or perhaps almost impossible.

Second, the British policy networks framework is more relevant for this research because of its traditional focus on closed relationships between policy actors. As mentioned above, the concept of policy community, a closed policy network, was utilized and developed in British studies, while so were issue networks studies in the US. This difference may be caused by the pluralistic and unstructured nature of politics in the US (Peters, 1998), while closeness of relationships in policy networks is a more important issue in the UK (Klijin, 1999). It is supposed that policy-making in

emission standards can be less pluralistic and structured. Thus, it may be more likely that policy-making in emission standards can be characterised as occurring in policy community rather than issue network.

Third, its strong emphasis on resources and bargaining may be beneficial for this research. As shown in the previous chapter, in the study of a new innovative automobile air pollution policy by TMG and its impacts on the national emission standards, Sagara (2002) found that the state actors and the auto industry were dependent on each other for resources because all of them had distinctive resources that were necessary for other actors. Thus, the strong emphasis on resources and bargaining in the British policy networks framework must contribute to this research.

Fourth, the British policy networks framework is highly interested in explaining policy outcomes in terms of relationships between policy actors, namely policy networks. On the contrary, the sub-government/issue network concepts and the formal network concept tend to merely describe relationships. Because it can be supposed that relationships between state actors and the auto industry have affected policy outcomes and the research seeks to examine it, the British policy networks framework may be suitable for this research.

Finally, needless to say, the British network framework may be useful for this research because it is focused on interest group intermediation. Because the research is interested in the relationship between state actors and the auto industry and its impacts on policy outcomes, the British policy networks framework as a form of interest group intermediation may be useful for this research.

Because of the main five reasons, it can be considered that the British policy networks framework is suitable for this research despite several critiques as described above. In addition, even these critiques have been *criticized* by many researchers. For instance, concerning the Dowding's critiques against the British policy networks framework, his argument is not shared by all researchers (Adam and Kriesi, 2007). Stone (1992: p.224) counter-argues that it is network structures that make a

difference. Even Dowding (1994a: p.13) himself previously admitted the importance of institutions shaping preferences: 'when explaining a particular political process and its resultant outcomes by means of individual behaviour one does not need to do so without taking into account the institutional structures which help to shape that behaviour. Even in individualist analysis, the institutions which help to shape behaviour are, in many ways, what carry the explanatory force'.

Regarding three kinds of main propositions made by Wilks and Wright, first of all, although they emphasise the interpersonal relationships in policy networks, Rhodes (1990), as mentioned above, claims that focusing on interpersonal networks will provide a wealth of detail but make it increasingly difficult to generalize about policy networks. In addition, in terms of this research, focusing on the structural relationships rather than interpersonal relationships may be better, as explained several times above. Second, although Wilks and Wright consider that policy network studies should be carried out at the sub-sectoral level, Marsh and Rhodes (1992) suggest that policy networks exist at both the sectoral and sub-sectoral levels and that it is an empirical question whether there are networks at both levels. Finally, as far as their terminology is concerned, Jordan (1990a: p.335) criticizes it in that: 'the main argument against the Wilks/Wright terminological usage is that they have been pre-empted. The term they use already have an accepted currency and it is simply too confusing to use terms differently unless the alternative terminology has clear advantages.'

Although *counter-critiques* against original critiques have been introduced, it may be still possible that original critiques are nevertheless right. Further, other critiques such as the static bias of the framework may be true too. However, it seems that there are no clear answers or conclusions on whether these critiques are true. Even if all of them were the deficiencies of the British policy networks framework, it may be still justifiable to utilize the framework for this research because the British policy networks framework is more relevant for the research as discussed above even after these deficiencies are taken into account. The British policy networks framework may not be a

perfect analytical tool but must be a more appropriate one based on the discussions which have been made so far.

The Concept of Policy Networks

Resource and power dependency

A distinctive characteristic of policy networks is resource dependency. The policy networks approach assumes that organizations are dependent on each other for resources and thus they need to enter exchange relationships to achieve their objectives (Rhodes, 1981). Interest groups might need to be allowed by government to enter policy-making processes in order to achieve their objectives (Smith, 1993). Similarly, government might not be able to realize its pursued policies without help from other groups. Government can introduce a new policy by forcing other groups to follow it or by just ignoring them. However, in order for government to make effective and efficient policies, government needs to own sufficient information. As government normally has the insufficient and inadequate amount of information, government needs to depend on interest groups that possess information necessary for government (Berry, 1984). Further, because of limited resources such as personnel and specialist skills, government may fail to implement policies because interest groups would not cooperate without being consulted or negotiated in a policy-making process (Scharpf, 1978). Thus, even for government, co-operation with other groups is necessary for effective government action.

Indeed, it is often government that has a strong interest in fostering the networks (Hill, 1997). According to Smith (1993: cited in Hill, 1997: p.73), government seeks to establish networks because they advance a consultative style of government, they minimise policy conflict and facilitate to depoliticize issues, they enable policy-making to be predictable and they are related well to the

departmental organisation of government.

Relationships between the government and other groups are thus 'one of dependency' and they need to exchange resources to achieve their objectives (Smith, 1993: p.58; Rhodes, 1981: pp.98-99). This power dependence model contains five propositions (Rhodes, 1981: pp.98-9):

1. Any organisation is dependent on other organisations for resources
2. In order to achieve their goals, the organisations have to exchange resources
3. Although decision-making within the organisation is constrained by other organisations, the dominant coalition retains some discretion. The appreciative system of the dominant coalition influences which relationships are seen as a problem and which resources will be sought
4. The dominant coalition employs strategies within known rules of the game to regulate the process of exchange
5. Variations in the degree of discretion are a product of the goals and the relative power potential of the interacting organisations. This relative power potential is a product of the resources of each organisation, of the rules of the game and of the process of exchange between organisations.

Within the power dependency model, actors bargain with each other for resources. According to Rhodes (1986: p.47; 1990: p.303; 1991: p.541), there are five resources identified as central to the bargaining:

1. Authority (or legal resources): the mandatory and discretionary rights to carry out functions or services commonly vested in and between public sector organisations by statute or other constitutional convention.

2. Money (or financial resources): the funds raised by a public sector organization from taxes, from service charges and from borrowing.
3. Political Legitimacy (or political resources): access to public decision-making structures and the right to build public support conferred on representatives by the legitimacy deriving from election.
4. Informational resources: the procession of data and control over either its collection or its dissemination or both.
5. Organisational resources: the possession of people, skills, land, buildings, materials and equipment and hence the ability to act directly rather than through intermediaries.

Similarly, Mol (1995: p.71) identifies legal resources (authority), economic and financial resources and informational resources to be exchanged between the policy actors. Further, products and services, funds, personnel and information are identified as central to interaction between the policy actors by Aldrich (1972: p.15). By manipulating these resources, the policy actors seek for a more influential position to achieve their objectives by bargaining with the other actors, by trying to maximise their influences over outcomes and by trying to avoid becoming dependent on the other actors to find alternative resources (Rhodes, 1986: p.18; Scharpf, 1978: p.359).

However, policy outputs are not purely the result of bargaining between policy actors, and they can be constrained by the appreciative system of the dominant coalition. The resources are usually not distributed equally between the policy actors and some policy actors have a number of resource attributes and consequently they form the dominant coalition or policy network, especially a policy community (Smith, 1997: p.36). What the dominant coalition perceives will affect 'the choices of goals, the definition of problem and the identification of needed resources' and consequently will establish dominant 'appreciative systems' (Rhodes, 1986: p.18). Appreciative systems are

'combination of factual and value judgements which describe the state of the world or reality' (Rhodes, 1981: p.104). Because of appreciative systems, the interests of the policy network can be promoted and groups proposing solutions which are conflicting with appreciative systems are excluded from the policy network (Smith, 1993: p.62).

Further, whether policy actors are able to 'maximise scope for decisional manoeuvre (discretion)' depends not simply on the amount of resources they have, but on the way the resources are deployed (Rhodes, 1986: pp18-19; see also Rhodes, 1997: p.37; Smith, 1993: p.59; Hardy *et al*, 1990; Wright, 1988: p.598). Strategies are 'the means for imposing upon other organizations an organization's preferences concerning the time of, the conditions for and the extent of the exchange of resources' (Rhodes, 1986b: p.19). Rhodes (1988: p.92) identifies 11 kinds of strategies including bureaucratic, incorporation, consultation, bargaining, confrontation, penetration, avoidance, incentives, persuasion, professionalization and factorising. For example, national government might give local governments financial incentives to implement a policy. Policy actors however might not be able to deploy strategies without any constraints. Indeed, their deployment of strategies and behaviours are constrained by the 'unwritten constitution', or informal rules of the game (Wright, 1988: p.609). Rules of the game are the less formal or conventional rules by which the institutions of society are largely defined and the approximate limits within which 'discretionary behaviour' may take place are set (Truman, 1951: pp.343-4). Thus, rules of the game guide their behaviours toward one another and affect the way they deploy resources (Mol, 1995: p.71; Wright, 1988: p.609). According to Rhodes (1986b: pp.391-2), rules of the game include:

1. Pragmatism: doctrinal, especially party, disputes should not prevent the work being done.
2. Consensus: agreed settlements are preferable to imposed solutions.
3. Fairness: the parties affected by proposed policies, even known opponents, should have the

opportunity to state their case.

4. Accommodation: where agreement is not possible, the 'loser' is not antagonized...
5. Territoriality: actors do not extend their demands beyond their known remit. Thus, there is a 'lead' department for issues, and other central departments should not intervene...
6. Secrecy: discussions should be private and limited to the affected parties and not open to wider public scrutiny.
7. Depoliticization: issues should be subject to technical rather than political criteria as in the case of grant distribution.
8. Summit diplomacy: decisions should be taken by elites, meeting in secret, and be a product of direct, face-to-face discussion...
9. Local democracy: local authorities as elected units of government have a legitimate sphere of competence which is 'out of bounds' to central departments.
10. The right to govern: certain matters are in the national interest, and the centre has both the right to intervene to preserve that interest and a monopoly of legitimate coercion to impose its definition of the national interest.
11. Trust: access to discussions, secret and otherwise, and effectiveness in these discussions hinges on assessments of reliability. If and only if a group is deemed reliable, as in the case of the associations, will it command an entrée and attention.

In addition, Wright (1988: p.609) identifies six rules of the game: mutuality (mutual advantage); willingness to consult informally and expectation of consultation; informality; articulation of policy issues in an acceptable mode and language. Some radical groups such as environmental groups might take overt action to be given attention. However, by so doing they break the rules of the game and they might be then excluded from the policy network (Saunders, 1975: p.38). Following Van

Waarden (1992), Smith (1997: p.36) points out, since rules of the game reflect and affect perceptions, attitudes, interests, social and knowledge/professional background, rules of the games and appreciative systems are closely related. In addition, it should be noted that the bargaining does not take place between equals, that is, their dependence is 'mutual but asymmetric' (Smith, 1997: p.40). As Smith (1993: p.59) maintains, the central government is often the dominant coalition with greater resources than those of other groups and thus able to create the policy network, determine rules of the game and control access to the network (see also Rhodes, 1988).

Types of policy networks

Marsh and Rhodes (1992b) (see also Rhodes and Marsh, 1992: pp.186-87; Rhodes, 1997: p.43) distinguish policy networks according to 'the closeness of the relationships within them' or the level of integration, and place policy communities at one extreme and issue networks at the other. While policy communities contain close relationships and high integration, issue networks have loose relationships and low integration. Further, Marsh and Rhodes (1992b) propose four dimensions to determine a network position: membership (number of participants and type of interest), integration (frequency of interaction, continuity and consensus), resources (distribution of resources within network and distribution of resources within participating organizations) and power.

Regarding membership, policy communities have a limited number of participants, often with professional or economic interests. As Laffin (1986: pp.6-7) argues, policy communities have a highly 'stringent entry criteria' which involve:

1. Profession of expert knowledge.
2. Occupancy of a senior position in a relevant organisation.
3. What civil servants call 'soundness', meaning that the person can be trusted to observe the

norms of the community.

4. A reputation for getting things done.

Rules of the game, mentioned above, work to prevent other groups from entering communities and determine the behaviours of the participants in order for them to gain access to networks. Moreover, policy communities have another way of exclusion by institutions. As Smith (1993: p.61) points out, 'within most policy communities there are particular institutions which are central to the policy process and the membership of these institutions ensures access to the policy community'. The most common example might be an advisory committee established within the government or a department to deal with a particular issue. Policy communities are normally dominated by economic or professional interests.

Encompassing a wide range of affected interests, issue networks conversely have a large number of participants involving a number of interest groups and government agencies, with limited resources (Heclo, 1978). Issue networks are fairly open and consequently, members are continuously changing with actors entering and leaving the network (Smith, 1993). Members of issue networks can be those excluded from policy communities. According to Saward (1992), Smith (1992:1993) and Marsh (1992), policy communities have a core and a periphery, or insiders and outsiders. As Rhodes and Marsh (1992) maintain, 'the types (of networks) are not mutually exclusive'. Namely, a policy community and an issue network can co-exist within the same policy area. Members of issue networks have limited number of resources and thus have a limited or no access to policy-making of a particular issue, though they have an interest on the issue. Outsiders are often not even members of policy networks, and Pross (1986: p.99) call them 'attentive publics' of the networks.

The second dimension is integration. The level of integration of policy network can be examined by frequency of interaction, continuity and consensus. Concerning a frequency of interactions, members

in policy communities are constantly involved in a policy-making process on all the matters related to a particular issue and they interact with each other daily and with a high quality (Rhodes, 1992: p.186; Smith, 1993: p.62). In contrast, interaction in issue networks is irregular and has a low intensity (Rhodes and Marsh, 1992; Rhodes, 1997). Regarding continuity, there is strong stability over the membership, values and policy outcomes in policy communities over a long period of time (Rhodes and Marsh, 1992). On the contrary, the memberships, values and policy outcomes in issue networks could be unstable and frequently changeable.

As far as consensus is concerned, in order for policy communities to exist, there should be a high degree of consensus on both the policy aims and the rules of the game. In addition, as Mol (1995: p.68) argues, policy communities have more than a consensus, that is ideology which determines the world-view of the policy communities (see also Benson, 1975). Ideology is a way of understanding the world by defining and ordering it (Therborn, 1980: p.15). Consequently, ideology defines problems as well as the solutions available. Moreover, ideology will limit 'the range of arguments that are permissible, legitimate and likely to be accepted as valid forms of controversy' (Laumann and Knoke, 1987: p.315). Furthermore, Smith argues that:

> *Issues within a policy community are often depoliticised. They are seen as technical issues to be resolved by insiders because no conflict is perceived over the potential policy options. Therefore, there is no need to include other groups in the discussion of an issue. If the ideology is fully effective groups outside the community will not even claim the need to be involved in the policy community. (Smith, 1993: p.63)*

Conversely, issue networks are practically unable to achieve consensus. Because of the number of

groups with a variety of interests, it is unlikely that issue network members reach consensus and policy-making can be depoliticised. Also there is conflict among issue network members over definitions of a problem and solutions available to it. Moreover, there might be conflict even between different government agencies and departments over 'who is responsible for a policy or an issue, who should be involved and what action should be taken' (Smith, 1993: p.63). Moreover each agency or department might often try to justify or legitimise their proposed views of a problem and solution to it, by incorporating other pressure groups into their side. This might make an issue more politicised and then consensus more unachievable.

Another dimension is the distribution of resources within policy networks and within participating organisations. All policy community members have resources that can be exchangeable with other members (Rhodes and Marsh, 1992: p.186; Rhodes and Marsh, 1993: p.63). Interest groups can exchange resources that are crucial for government to implement a policy, with a position in a policy-making process and obtain some control over policy (Smith, 1993). Consequently, the nature of interaction in policy communities is bargaining and negotiation over the direction of policy (Mol, 1995; Smith, 1993; Jordan, 1990). In addition, the distribution of resources within participating policy actors is hierarchical and thus once agreement is reached, 'the leaders can guarantee the compliance of their members' (Rhodes and Marsh, 1992: p.186).

On the contrary, issue networks members are likely to have limited resources to be exchanged and consequently it is more likely that government consults pressure groups 'without feeling the necessity to negotiate' (Mol, 1995: p.68). This consultation might contain a simple exchange of information and there is a little possibility that the consultation would significantly influence policy outcome (Jordan and Richardson, 1987). Thus, pressure groups often choose overt activities such as lobbying and demonstrations to be in an influential position. Regarding distribution of resources within the issue network, distribution is both varied and variable and so is the ability to control their

members (Rhodes and Marsh, 1992).

The final dimension is the nature of power. There is a balance of power in policy communities. Although there might be a dominant group, and thus the group might benefit more than others, a positive-sum must be achieved in order for policy communities to persist (Rhodes and Marsh, 1992: p.186; Mol, 1995: p.69). Namely, there must be a mutual expansion of power and, without any member sacrificing its power, each member must increase its influence over policy (Smith, 1993). In issue networks, there is no balance of power because of unequal resources and access. Because 'advantages for one group of members lead to disadvantages for others' - or namely there are winners and losers - participants are usually in a zero-sum game in issue networks (Mol, 1995: p.69).

Four dimensions of policy networks, which divide policy networks into those two types of policy networks, policy communities and issue networks, have been discussed. While policy communities can be identified in a number of policy areas, issue networks are rather exceptional and at the periphery (Rhodes and Marsh, 1992: p.190; Marsh and Rhodes, 1992a: p.254). Issue networks often develop around policy issues 'of lesser importance to government, of high political controversy, or in new issue areas in which interests have not had the time to establish institutionalised relationships' (Smith, 1993: p.10). Furthermore, although fragmented, there is still an order in issue networks (Rhodes and Marsh, 1992: p.190).

In addition, it should be noted that this typology will not try to determine whether a policy area conforms perfectly to either list of characteristics. Rather it will play a diagnostic role in identification of the key characteristics of policy networks by providing a set of diagnostic criteria and setting the outer limits of the analysis (Rhodes and Marsh, 1992: p.188). The policy networks framework recognises both a variety of characteristics of the policy process and the existence of intermediate cases (Rhodes and Marsh, 1992). Thus, it is necessary to keep the term, 'policy networks' as a generic description for its diagnostic role. Moreover, they emphasise the need to

'focus on trends in a given policy area; to explore the extent to which it is becoming more or less integrated or an interest is more or less dominant' (1992: p.187).

Policy change and network change

The constrained policy change and the incremental degree of policy changes might be a feature of policy networks. As Rhodes and Marsh (1992: p.193) argue, policy networks (especially policy communities) constrain the degree of policy changes and thus 'policy networks foster incremental outcomes, thereby favouring the status-quo or the existing balance of interests in the network.' In addition, Richardson *et al* (1982a) point out that policy changes are rather incremental because there is a resource interdependency between the actors and thus negotiation might be essential in policy communities. They also argue that both the government and other groups share an interest to avoid sudden policy changes. Further, as mentioned earlier, ideas of undesirably great policy changes for policy network and groups with such ideas will be excluded from the network by appreciative systems of network, which again leads to the constrained and incremental degree of policy changes.

As the existence of a policy network constrains both policy agendas and policy outcomes, great policy changes might not occur easily, where there is policy network (Rhodes and Marsh, 1992: p.197). Then, because policy inertia is closely related to the existence of policy network, changes within policy network may enable great policy changes to take place. Continuity and stability are main features of policy networks, especially policy communities (Rhodes and Marsh, 1992: pp.196-97; Marsh and Rhodes, 1992: p.260; Smith, 1993: p.97), but various researchers, including Saward (1992), Smith (1992) and Stones (1992), observed changes within policy networks. There are two different sources for changes within policy networks, endogenous sources within policy networks and exogenous sources (Rhodes, 1988; Smith, 1997).

Endogenous sources of changes within policy networks can emerge when policy actors within

policy networks succeed in changing the pattern and intensity of resource interdependency by manipulating their own resources (Smith, 1997). Moreover because consensus within policy networks can be made by 'a continuing process of re-negotiation', it might be possible that disagreements within a network will emerge and then policy networks will change (Rhodes and Marsh, 1992).

A distinctive example of endogenous sources of changes might be despotic power exercised by state actors within policy networks. Mann (1984) distinguishes between the despotic power and infrastructural power of the state. According to him, despotic power means that the state can act directly to achieve objectives 'without routine, institutionalised negotiations with groups in civil society' (Mann, 1984: p.188). In contrast, infrastructural power is 'the capacity of the state to actually penetrate civil society, and to implement logistically political decisions throughout the realm' (Mann, 1984: p.189). State actors are able to exercise the infrastructural power 'through its administrative machinery and its relationship with groups in society' (Smith, 1993: p.52). While the state actors are usually dependent upon the infrastructural power, they can deploy the despotic power in order to break up policy communities by, for example, allowing new groups to enter networks since they usually determine rules of the game (Smith, 1993: p.95).

However, the cost to use the despotic power in policy communities can be significant because it will lead to a great loss in the infrastructural power from losing the cooperation of other groups. In contrast, the costs could be much lower when state actors within an issue network deploy the despotic power. Further, the cost could be reduced when state actors outside a policy community exercise the despotic power. As Smith (1993: p.96) points out, the prime minister or the President possesses the authority to break up a policy community and if he/she is prepared to bear the costs, they can effectively change policy communities because 'they can force new issues onto the agenda, they can take decisions themselves, they can give access to different groups, or they can change the

institutions which is responsible for making a decision'. However, as Smith (1993: p.96) argues, there is 'a physical and political limit' for this and the leaders are rarely going to wish to challenge policy communities.

Although it might be possible that changes in policy networks occur because of endogenous sources, the possibility might be not high, especially in policy communities where there is strong consensus among its members, stability of and continuity of its members and values. Changes in policy networks more often occur because of exogenous sources of changes. Smith (1993: pp.93-7) and Rhodes and Marsh (1992: pp.193-4) identify similar exogenous sources of changes: economic, social, ideological, and information/knowledge.

First of all, *economic or market change* is a significant source of instability in policy networks. Economic changes such as deepening economic recession and the increasing unemployment rate might lead to major changes in policy networks. *Social change* might also lead to changes in policy networks. As Inglehart (1990) argues, once a society is richer, it leads to development of post-material values. This may bring the creation of new groups concerned about new issues or problems such as the environment and peace. These groups, though they are often outside the policy communities, are confronting existing networks. Also, such social movements can often enter the established policy networks because the existing networks have no solutions to them (Smith, 1993). These new problems and new groups will bring a politicisation of a certain policy area and will bring the breakdown of the consensus.

Second, *ideology* also has an influence on policy networks. The ideology of policy actors, such as the President and the governing party, affects policy networks. For example, in the UK, the decision to establish Her Majesty's Inspectorate of Pollution (HMIP) could be made because of the Cabinet Office Efficiency Scrutiny's conclusion that a unified Inspectorate could deliver both deregulatory benefits, which meet the government ideology, and integrated environmental benefits (O'Riordan

and Weale, 1989; Smith, 1997).

Third, *change in information and knowledge* on a certain issue can greatly affect policy networks. The most well-known example for this is the case of smoking policies. The dissemination of information and knowledge about the linkage between smoking and a number of diseases such as lung cancer, has been giving strong pressure to the smoking policy networks, leading to radical policy changes in smoking, in almost all advanced nations or even a number of developing nations.

Although changes within policy networks brought by those exogenous factors may lead to policy changes in the shape of policy output, it is necessary to recognize that those exogenous changes are not independent from policy networks, and policy networks are 'part of the process of change' (Rhodes and Marsh, 1992: p.195; Marsh and Rhodes, 1992a: p.259). Policy networks are not passive against the process of changes and often indeed fight to protect themselves from changes. Thus, policy networks are rather a 'dynamic conservatism' and seek to 'contain, constrain, re-direct and ride-out' changes and then materially affect their 'speed and direction' (Rhodes and Marsh, 1992: pp.195-96; Marsh and Rhodes, 1992: p.260). Also, as Smith (1997) argues, exogenous changes can be often internalised either by building new resources or by involving new interdependent members with those resources. Because the existing literature on the policy networks framework normally considered factors of policy changes as exogenous, it has not been discussed much how policy networks respond to endogenous factors. However, considering the 'dynamic conservatism' feature of policy networks, it can be expected that policy networks affect 'speed and direction' of endogenous factors.

Finally, in order to understand policy network change and policy change, identifying the factor/factors causing those changes would be required. However, such identification can offer only a partial explanation of those changes. Full understanding of those changes will depend on a fuller investigation of whether and how the boundary between the core and periphery of policy networks

shifts, and how the political ideas of policy network members change because of endogenous or exogenous influences (Atkinson and Coleman, 1992).

Research Hypotheses and Research Questions

Research hypotheses

The previous section of this chapter has discussed the policy networks framework, and this section seeks to propose hypotheses which the thesis will examine within the empirical investigation that is to be shown. There are two big questions that have driven the author to write this thesis. Those two questions are '*how does the British policy networks framework relate to Japan when relationship between policy actors is crucial in policy-making processes?'* and *'does the framework help to explain policy change in Japan when relationship between policy actors matters in policy-making processes?'* Based on the policy networks concept discussed above, it could be hypothesized that in Japan when relationship between policy actors is crucial in policy-making processes;

1. Policy will be made through interactions between organizations which have resource dependent relationships with each other and which seek to achieve their own goals by utilizing strategies that are subject to various `rules of the game';
2. Policy networks can be distinguished between `policy communities' and `issue networks' according to four dimensions, including membership, integration, resources and power;
3. The degree of policy change will be constrained and the direction of policy change will be manipulated by the existence of policy networks because they favour the existing balance of interests in networks and groups proposing an undesirably great policy change, or ideas of such a change, will be excluded from networks by the appreciative system of networks;

4. And related to the third hypothesis, policy change is more likely to be driven by exogenous than endogenous factors, though both factors can lead to changes in policy networks and then to policy change, but the nature of pre-existing policy networks can mediate both factors and restrict the potential for policy change, particularly where such changes challenge the interests and values of the pre-existing network.

Research questions

Based on the concept of policy networks given above, and the associated hypotheses to be tested within the empirical investigation, the thesis now can provide a number of more specific research questions to be examined in the case of auto-related air pollution in Japan. Those research questions are:

① Who were included in and who were excluded from the key policy networks?

② What were the appreciative systems and did they help to affect the choice of goals and definition of problems and exclude other actors?

③ What were the resources in the core of the policy network?

④ What were the strategies employed in the core of the policy network?

⑤ What were the rules of the game in the core of the policy network?

⑥ What kind of interests did the participants have, and whose interests were dominant in the core of the policy network?

⑦ How often did the participants interact; did membership, values and outcomes continue over time, and did all the participants have consensus over basic values and the legitimacy of the outcome?

⑧ How were the resources distributed within the core of the policy network and within

participating organizations?

⑨ How was power distributed?

⑩ What were the key drivers for policy changes?

Conclusions

In this chapter, different policy networks frameworks were examined. Then, it was justified that the Marsh and Rhodes Model or the so-called British policy networks framework would be used for this research. Then, the policy networks concepts were deeply examined in terms of resource and power dependency, typology of policy networks and network change and policy change. Next, based on the conceptual discussion on policy network, several hypotheses were proposed. Also, associated with those hypotheses, a number of research questions were identified to be examined in the empirical study. In the next chapter, methodological aspects of the empirical study were shown. Concretely speaking, chapter 3 mainly seeks to set out what kind of approach has been adopted, what sort of data has been used and how it has been collected and analysed and how the research process has developed.

Chapter 3

Methodological Approaches

Introduction

Given the conceptual basis for the thesis and the associated hypotheses and the research questions to be tested in the empirical investigation, the thesis requires an empirical focus in order to examine the validity of the hypotheses and find answers to the research questions. This chapter first introduces an empirical study which was carried out for those purposes. Although it was already mentioned in chapter 1 that the empirical study was the evolution of emission standards in Japan, this chapter more concretely introduces the empirical study.

Then, the discussion goes to the methodological aspects on the empirical study. In this section, the adoption of qualitative approaches to policy analysis is first justified by examining the basis for qualitative research. Then, this section shows two kinds of data sources: primary data and secondary data, used in this research. It also explains how they were collected, and examines in detail the semi-structured interview approach which was used for the primary data collection in terms of its key features and confidentiality. At last, the section examines content analysis as an analytical method for the data collected. Finally, the discussion turns to the research process for the empirical investigation.

The Empirical Study

As described in chapter1, the empirical study of this research is the evolution of emission standards in Japan. In addition, the research deals with emission standards only on air pollutants which are harmful to human such as NOx and PM. The research does not focus on carbon dioxide (CO_2). CO_2 emissions from automobiles may have been one of the most significant environmental issues because of its effects on global warming. However, there are great differences between issues on NOx and PM and those of CO_2 in various respects. First of all, while NOx and PM bring about serious health damages, CO_2 may not result in adverse health effects directly. In addition, as NOx and PM come mainly from automobiles, CO_2 comes from a wide range of sources. Further, while CO_2 is normally recognized as a global issue, NOx and PM are often considered as local problems because of their local effects. Consequently, stakeholders are different between issues of NOx and PM and those of CO_2. Because of practical constraints such as limited time and resources, it is considered that the research better focuses on NOx and PM.

Moreover, issues of CO_2 are relatively new as it became prominent in the mid-1980s, while issues of NOx and PM, especially NOx, have been notable since the mid-1960s. Thus, issues of NOx and PM seem appropriate for this research in that opportunities for policy changes on emission standards for NOx and PM may be higher. Because of the reasons above, although all of them are from automobiles, it may be better to distinguish between issues of NOx and PM and those of CO_2, and issues of NOx and PM may suit this research.

Finally, as for levels of analysis, this research has looked at both national and local policy processes. Because this research has examined evolutions of emission standards which are established by the central government, the research has consequently focused on national policy processes for emission standards. However, in order to understand evolutions of emission standards, it is necessary to look at local policy processes too because it is often said that environmental policies in Japan have been often led and influenced by local governments and environmental

policies established by local governments (Kawana, 1987; Kaku, 1997; Kitamura, 1997). In terms of automobile air pollution, metropolitan areas of Japan including Tokyo, Kanagawa, Saitama, Chiba, Osaka and Hyogo have suffered from serious automobile air pollution. As a result, local governments of these metropolitan areas have recently sought to reduce automobile air pollution by various means, including idling restrictions and promotion of low-emission automobiles.

Especially, TMG has been one of the most ambitious local governments in reduction of automobile air pollution. In addition, TMG has recently become much more motivated to reduce automobile air pollution and established various remarkable automobile air pollution policies mainly because automobile air pollution in Tokyo is one of the worst in Japan and it cannot be neglected any longer (TMG, 2000). As the previous research of the researcher (Sagara, 2002) indicates, the very ambitious attitudes of TMG towards automobile air pollution and its remarkable policy for automobile air pollution have influenced the national policies for automobile air pollution. Therefore, the research has focused on policy processes of TMG too.

Methodological Approaches

Qualitative approaches

In order to carry out policy analysis, qualitative research is adopted for the empirical investigation. For Cresswell (1994), qualitative research is a process of inquiring in order to understand problems of the society or people. In addition, qualitative research is comprised by three components, including comprehension of a picture which is complex and holistic, built with words, and a description of the detailed perspectives of the subject under study and practice in a natural setting. According to Bauer *et al* (2000: p.7), qualitative research is suitable for 'interpreting' social realities while quantitative research is concerned with numbers and the utilization of statistical devices for

data explanation. Further, as Bryman (1984) and Ratcliff (2005) point out, qualitative research is concerned with producing not a breadth of data but 'a great deal of depth' of data.

Qualitative research has particular value for this thesis because it may be suitable for this empirical investigation. As mentioned several times, the thesis is interested in complicated interactions and interdependencies between participants. According to Bryman (1984), qualitative research can be a helpful tool when the purpose of research is a detailed examination of complexities and interrelationships in the society.

Further, Flick (2002) argues that qualitative research is useful when social researchers seek to study the increasingly complex social relations brought by rapid social change and the consequent diversification of modern society. In addition, a fuller comprehension of the complicated social relationships will depend on flexibility and openness of research methods. As research methods can be designed flexibly and openly in qualitative research, it can appropriately deal with the complexity of social relations (Flick, 2002).

Qualitative research is useful too for this research because this research seeks to understand the context in which policy actors interact with each other in policy-making process from their own point of view. Qualitative research focuses on the subjective views of participants under study in order to understand the context of a situation in which events or processes take place (Ratcliff, 2005). As Court (2004) points out, it is necessary for researchers to understand what they see and hear in the field 'within the frame of reference of participants', without removing participants from their settings. If researchers pay too little attention to meanings of participants within the frame of reference of participants, it could lead to misunderstanding of meanings and then producing wrong results. When researchers get closely involved in the subject under study and they view the social world from the eyes of the subject, researchers can understand events in the context of a 'meaning systems' employed by the participants (Bryman, 1984: p.78; Olson, 1995).

Although qualitative research seems quite suitable for this research, there seems one problem concerning the relations between qualitative research and existing theories. Unlike quantitative research which normally starts from theoretical knowledge formed by the existing literature and findings, qualitative research, especially qualitative research with a grounded approach, gives a priority to the data and the field under study (Flick, 2002). Qualitative researchers may adopt a qualitative approach because of this openness in qualitative research as it may enable those researchers to generate new theories and find phenomena that are ignored by previous literature and researchers (Ratcliff, 2005).

As Hoffmann-Riem (1980; in Flick, 2002) points out, in order to utilize its openness, qualitative researchers need to postpone the structuring of the investigating issue until they become able to structure the investigating issue by interacting with the participants being studied. Thus, it is suggested that 'the researcher should at least suspend the *a priori* theoretical knowledge that he or she brings into the field' (Flick, 2002: p.41).

However, existing theories may not exist independently from the data or the field under study, namely the real world. Rather, theories are 'versions of the world' (Goodman, 1978). As Goodman suggests (1978), theories are continuously revised, evaluated, constructed and reconstructed so that the real world can be appropriately seen. Thus, theories are preliminary and relative to the real world.

As this research starts from a policy networks theory, it may constrain the openness and narrow the focus of this qualitative research. However, as the theory may be a version of reality, it cannot be denied that the theory may help to carry out a more focused and detailed empirical investigation. Surely, it may be important to choose appropriate methods in qualitative research so that qualitative research still keeps its openness with utilising an existing theory. This issue is discussed in the next section.

What sort of data was used and how was it collected and analysed?

This research depends on two kinds of data sources: primary data collected by the researcher and secondary data.

Secondary data

Secondary data include:

- ✓ Existing literature on automobile air pollution policy, economic policy, transport policy and other related issues such as NGOs and business ethics in Japan.
- ✓ Memoirs (e.g. Michio Hashimoto: Ex-chief of the air protection bureau in the environmental agency).
- ✓ Documentary books (e.g. Hideyuki Kawana: an ex-journalist of Mainichi Shinbun)
- ✓ Newspapers (e.g. Asahi shinbun, Mainichi shinbun and Yomiuri shinbun)
- ✓ Memorial Books (e.g. Japan automobile manufactures association).
- ✓ Governmental white papers (e.g. environmental white papers, transport white paper and international trade white paper) and white papers of local governments
- ✓ Diet papers at both the House of Representatives and the House of Councillors.

First, existing literature on automobile air pollution policy, general environmental policy, economic policy and other associated issues including activities of NGOs, behaviours and ethics of the Japanese business was collected by various ways. Most books published in the 1980s, the 1990s and the 2000s could be obtained in various kinds of libraries such as the national library, a library of

Hachioji City in Tokyo and the library of Aoyama Gakuin University in Tokyo. However, most books published in the 1960s and the 1970s were out of print and unavailable in most libraries. As investigation for issues in the 1960s and the 1970s was perfectly dependent on the secondary sources, it seemed vital to collect them. Thus, the researcher spent a large amount of time in finding those books in online second-hand bookshops and second-hand bookshops in the real world.

Second, memoirs of key actors in automobile air pollution policy, automobile policy and the related issue had a lot of the required data. The Memoirs included those of Shigemichi Sahashi (the former administrative vice-minister of the ministry of international trade and industry, MITI) (1994) and Michio Hashimoto (the former Chief of the air protection bureau in the environmental agency, EA) (1988). Third, documentary books were also useful to collect the required data. Especially, a series of documentary books on histories of pollution in Japan written by Hideyuki Kawana, an ex-journalist of Mainichi Shinbun, contained a number of data essential for the empirical analysis. Fourth, the investigation of secondary sources included several kinds of newspapers such as Asahi Shinbun and Mainichi Shinbun. Both online archives and archives of newspapers at libraries were extensively and intensively utilized.

Fifth, in order to collect the date on the industry side, the data from several memorial books published by the Japan Automobile Manufactures Association (JAMA), Automobile Guidebooks from 1968 to 2002 published by Japan Motor Industrial Federation annually and two memorial books published by the Japan Trucking Association were collected. The data from those materials contained significant data, especially on relationships between the state and the auto industry and the interests of JAMA. For collection of the data on the government side, a wide range of governmental white papers had been reviewed. Those governmental white papers included environmental white papers (Kankyo hakusho) and pollution white papers (Kogai hakusho), transport white papers (Unyu hakusho), and international trade white papers (Tsusho hakusho). Moreover, white papers published

by local governments such as Tokyo, Kanagawa, Chiba, Saitama, Osaka and Hyogo were also greatly examined.

Sixth, it seemed that one of the most important sources of data was the Diet papers at both the House of the Representatives and the House of Councillors. In the Diet papers, data necessary for the empirical analysis which was not available in other sources of data could be obtained. Those data came from statements of the speakers who were both the members of the parliaments and sworn and unsworn witnesses to collect the data. An intensive investigation of the Diet papers was carried out. The Diet papers were available at:

http://kokkai.ndl.go.jp

At the website, the Diet papers of both Houses from the first Diet to the latest Diet could be read. The site search engine at the website was utilized to find data. First, the minutes that contained any of several keywords, including automobile air pollution (jidosha kogai), nitrogen oxides (chisso sankabutu) and names of automobile air pollution policies (e.g. the 1976 emission standards or showa gojyuichinendo kisei), that could be considered to reach the necessary data, and that belonged to related committees including special committees for pollution, special committees for industrial pollution, committees for the environment, committees for transport and committees for commerce and industry, with setting the term of reference as from 1960 to 2002, were searched for. However, as it was found that issues related to automobile air pollution policy were discussed in other committees, those keywords were searched for in other committees too. The number of pages that were obtained became more than 6,000 pages. Except issues on automobile air pollution policies from the 1990s onwards, the empirical investigation for the thesis was dependent on those various types of secondary data. The Diet papers referred to in this research are listed in the Appendix A.

As far as the data requirements in the 1960s, 1970s and 1980s were concerned, the data could be obtained only from those secondary sources. However, as a number of materials had been already available, the data requirements for them could be achieved. Contrarily, concerning those in the late 1990s and the 2000s, the investigation of those secondary data could not satisfy the data requirements, as the materials such as memoirs and documentary books have not been available. Then, semi-structured interviews had been conducted in order to collect the primary data.

Primary data and semi-structured interview

Primary data was collected by conducting semi-structured interviews. The semi-structured interview is neither an open, non-directed conservation nor is it a highly structured questionnaire (Kvale, 1996). The semi-structured interview retains openness but it is controlled by a list of questions and topics to be covered because the semi-structured interview focuses on certain themes. The semi-structured interview enables researchers to learn about problems, opinions and views of subjects and get inside information (CEMCA, 2005). As Kvale (1996) points out, it seeks to observe the world of the subjects and their relation to it and comprehends the central theme they experience. As Flick (2002: p.74) argues, the semi-structured interview has been widely used because of 'the expectation that the interviewed subjects' view-points are more likely to be expressed in a relatively openly designed interview situation than in a standardized interview or a questionnaire.' The semi-structured interview may be thus the most adequate tool to understand subjects' view-points (Honey, 1987). Flexibility in the semi-structured interview may be another advantage. In order to understand fully the complicated nature of policy-making and relationships between participants, some flexibility may be required. Further, flexibility may be necessary when the researchers seek to clarify responses, and explore more detailed responses and areas of questions arising during the

interview process. Because of the reasons mentioned above, it seems that the semi-structured interview is an appropriate way for data collection in this research.

In the research, 52 semi-structured interviews were conducted with 48 interviewees. Although the whole list of interviewees is put in the Appendix B, interviewees included:

- ✓ Central government officers of related ministries such as the ministry of economy, trade and industry (METI), the ministry of environment (MoE) and the ministry of land, infrastructure and transport (MLIT)
- ✓ Officers of local governments such as TMG, the prefectural government of Osaka and the prefectural government of Kanagawa.
- ✓ Staff of the automakers.
- ✓ Staff of the related industries such as the premier chain stores, transport companies and oil refining companies.
- ✓ Staff of environmental NGOs

Based on the secondary data, it was possible to predict key subjects. However, in order to more carefully identify key subjects, the research took a snowballing approach. That is, the first subject was asked to recommend another/other subject(s) that the researcher needed to talk with as the first subject considered him/her or them played a role in or had information on policy-making processes of automobile air pollution. As explained above, the semi-structured interviews were conducted in order to collect information on automobile air pollution issues of the 1990s and the 2000s. Issues in those terms were greatly related to local governments, especially TMG. Consequently, the first key informant was an officer in TMG. Then, he recommended other subjects to whom, he thought, the

researcher needed to talk. This process continued until a subject no longer recommended a new subject. Subjects sometimes recommended specific persons but they normally recommended institutions or a section of the institutions that the researcher needed to talk to.

In addition, the predicted subjects based on the secondary data were almost the same as those identified in the snowballing process. However, there was an exception. Although the secondary data, especially some books, indicated that environmental NGOs played a role, no informant identified environmental NGOs as key actors. The researcher nevertheless interviewed with some environmental NGOs identified in the secondary data because it was necessary and interesting to understand why they were on one hand considered as important actors, while they were not considered so on the other hand.

Because of high difficulties to access to central government bureaucrats and staff of the industries, only one interview could be allowed in most cases. As Kvale (1996) points out, there are problems of access to the interviewees in interviews with elites and it is necessary for interviewers to understand sufficiently interview topics in advance. Thus, interviews with those subjects were conducted mostly at the last stage of the interview research and interviews to other subjects were conducted first. Especially, as issues in the 1990s and 2000s were, as mentioned just above, closely related to local governments, interviews with officials of local governments had been mainly conducted at a first stage. In addition, pilot interviews had been conducted in order to test and refine both the interview schedule and the interview techniques at the very beginning stage of the interview research, which may contribute to reliability of the data collected. Moreover, in order to maintain validity of the data collected, opportunities for respondent validation were made both in the interview schedule and in follow-up interviews.

One of the most serious issues in the interview research was confidentiality. Although most officials of local governments agreed that their real names would be listed in the thesis, the other interviewees

did not allow their real names to be listed and wished to remain anonymous. There are obviously conflicts between the ethical research and reproducibility of the findings by other researchers. If anyone were unable to know who participated in a study and where and when it was done, it would be impossible for other researchers to check research results.

Admitting the importance of the reproducibility, confidentiality may still need to be respected and maintained. While keeping confidentiality, the interviewees could openly talk about their views on policy-making and complicated relationships between actors. Further, as the interviewees came to think that they would not be harmed as a result of the interview, they were relatively relaxed and allowed tape recordings of the interviews, which was necessary for the data analysis. As Kvale (1996) mentions, it is a duty of the interviewer to create an atmosphere in which the interviewees feel so safe that they speak freely about his/her experiences and feelings. In order to keep confidentiality, or keep the private data or information which could potentially identify the subjects to others hidden, the reporting of the interview in the Appendix B gave interviewees just numbers with their roles and organizations they belonged to because those kinds of information may be at least necessary for reproductively and reliability. In addition, the degree of confidentiality is different from one interviewee to another because some interviewees required strong confidentiality though others did not so, and the reporting of the interview seeks to open information of interviewees as much as possible.

Content analysis

The secondary data and the results of all the interviews which were transcribed, were examined by content analysis. Holsti (1969: p.14) defined content analysis as any technique to make inferences by objective and systematic identification of identified characteristics of messages. For Krippendorff (1980: p.21), content analysis is a research technique used in order to make replicable and valid

inferences from data to their contexts. Further, according to Weber (1985: p.9), content analysis is a research methodology that uses a set of procedures so that valid inference from text can be made.

To use content analysis, Krippendorff (2004) argues, new insights may be provided and understanding of certain phenomena may be increased. Content analysis has a value when reductive analysis of a large amount of texts is carried out (Flick, 2002). Unlike other analytical methods such as ethnomethodology and historiographical methods, content analysis has the potential to process large volume of texts (Krippendorf, 2004). As the research needs to examine a great amount of texts, content analysis seems to suit this research. Further, content analysis can deal with unstructured matter as data (Kippendorf, 2004). As the research adopted the semi-structured interviews, as mentioned above, the responses are not easily tabulated or coded like surveys and structured interviews. However, those structured methods do not allow researchers to get a 'rich' data and hear their perception in detail. Content analysis is useful in unstructured data because it is 'context sensitive and therefore allows the researcher to process data texts that are significant, meaningful, informative' (Kippendorf, 2004). Content analysis may be thus suitable for this research.

As justified above, the empirical investigation deploys qualitative research and the content analysis deployed in this research is consequently qualitative content analysis. Quantitative content analysis is based on quantification or it, in other words, seeks to express data in numbers (Neuendorf, 2002; Sommer and Sommer, 1997). As this research seeks to find answers to the research questions out of the collected data, it does not seek for quantification or expressing data in numbers. According to Mayring (2000: p.2), qualitative content analysis can be defined as 'an approach of empirical, methodological controlled analysis of texts within their context of communication, following content analysis rules and step by step models, without rash quantification'. However, as Graneheim and Lundman (2003) points out, there are different opinions on its definitions, approaches and procedures (e.g. Bauer, 2000; Judd *et al*, 1991).

Among various approaches for qualitative content analysis, the research adopts the directed approach of qualitative content analysis. The directed approach of qualitative content analysis is distinctive in that it seeks for conceptual validation or extension of a theoretical framework or theory on which research questions are based. As this research similarly seeks to validate and extend a theoretical framework of policy networks, the directed approach of qualitative content analysis is an appropriate approach for this research. Because the approach focuses on a theoretical framework or theory, the procedures of analysis in this approach are structured as shown below (Hickey and Kipping, 1996).

According to Hsieh and Shannon (2005), Mayring (2000) and Potter and Levine-Donnerstein (1999), its procedures begin by identifying key concepts or variables as initial coding categories based on an existing theoretical framework or theory. Then, by using an existing theoretical framework or theory, operational definitions for each category are determined. Next, all transcripts are reviewed and all text that appear to relate to each category is highlighted. All highlighted text is then coded by using the categories wherever possible, and text that cannot be coded into one of these categories is given a new code. Finally, researchers examine the extent to which the data supports a theoretical framework or theory.

Because the procedures of analysis in the directed approach of qualitative content analysis are guided consistently by a theoretical framework or theory, they are structured. Further, this characteristic of the approach may reduce a problem of subjectivity in analysis as researchers read materials through lenses of a theoretical framework or theory. However, because of the dependence of theory, it may be possible that researchers approach the data 'with an informed but, nonetheless, strong bias' (Hsieh and Shannon, 2005). Consequently, as Hsieh and Shannon (2005) point out, researchers tend to find evidences that support a theory. Thus, when the directed approach of qualitative content analysis is conducted, researchers always need to be reminded that they should

focus on finding both supportive evidences and non-supportive evidences.

The Research Process

The research process for the thesis can be divided into several stages. The first stage of the research process was the quest for a conceptual device to deal with the main characteristic of policy-making in emission standards, namely the close relationship between policy actors. At first, for this purpose, the search for a conceptual device to capture such a feature of policy-making in emission standards began with reviewing a number of existing concepts. Then, it found that the British policy networks framework seemed useful in analysing both the close relationship between policy actors and its impacts on policy outcomes.

At the second stage, the research process began with an examination of the concept of policy networks. After the examination, the research process found two big questions which comprised the central part of the thesis. Those two questions were, as stated earlier, '*how does the British policy networks framework relate to Japan when relationship between policy actors is crucial in policy-making processes?'* and *'does the framework help to explain policy change in Japan when relationship between policy actors matters in policy-making processes?'* Then, the thesis could set up research hypotheses and the associated research questions to be tested within the empirical investigation. Then, because of the reasons mentioned above, automobile air pollution policies or emission standards for NOx and PM were chosen for the empirical analysis, and its data requirements were established.

At the third stage, the fieldwork started in order to collect data for the empirical analysis. First, secondary data was collected from a wide range of sources. Then, for the primary data collection, the research carried out semi-structured interviews. Most semi-structured interviews were held in an

office of the interviewees. The time taken for each interview approximately ranged from 50 minutes to 60 minutes as the researcher requested a 60-minute interview to each interviewee when the appointment for interview was made. '60 minutes' was determined because it was expected that 60 minutes would be sufficient to collect data necessary for the empirical investigation, and the past experience of the researcher told that interviewees would be unhappy to give more than 60 minutes for interview.

At the final stage, qualitative content analysis of both the secondary data and the transcribed texts was carried out. First, based on the 10 research questions, 10 categories in accordance with the research questions were established. For instance, the category of 'Resources' was created for the research question of 'what had been the resources in a policy network?'. Second, based on the literature on the policy networks approach, subcategories of possible words and phrases for each category were created based on the literature on policy networks. For example, subcategories of possible resources in the category of resources included a number of resources identified by the policy networks literature such as authority, money, political legitimacy, informational resources and organizational resources as described in the previous chapter. Third, all transcripts were reviewed and all words, phrases, sentences and even paragraphs that seemed to relate to each category were highlighted. Then, all highlighted words, phrases, sentences and paragraphs were coded by using the categories and subcategories. Words, phrases, sentences and paragraphs that could not be coded into one of these categories and subcategories were given new codes. Finally, content analysis of the texts was carried out again so that results of the analysis could be right and reliable.

Conclusions

This chapter discussed the rationale for the empirical study and methodological aspects of the

empirical study. The first section of this chapter introduced an empirical study of the thesis. It justified that empirical study of this thesis was emission standards for NOx and PM in automobile air pollution policies, and its levels of analysis included local policy processes as well as national policy processes, with special attention to policy processes of TMG.

In the second section, methodological aspects on the empirical study were discussed. First, the section examined the basis of qualitative research and concluded that qualitative approach was appropriate for this research. Second, the section introduced two kinds of data sources: primary data and secondary data used in this research. It also explained how they were collected, and examined in detail the semi-structured interview approach which was used for the primary data collection in terms of its key features and confidentiality. Third, the section examined content analysis as an analytical method for the data collected. It examined main components of content analysis and justified that content analysis was adopted in this research. Then, it proposed the adoption of the directed approach of qualitative content analysis for analysis in this research because the approach focused on a theoretical framework or theory, as did this research. Finally, the last section discussed the research process for the empirical investigation. Based on this, the following chapters present the results of the empirical study. However, it may be useful to provide supplementary information on environmental policy, automobile air pollution, policy processes and policy actors in Japan before presentation of the empirical study. It may contribute to full understanding of the empirical study for readers who are not familiar with those issues in Japan.

Chapter 4

Introduction to the Empirical Study

Introduction

The empirical focus for this thesis is emission standards in automobile air pollution policies in Japan. Before presenting the empirical study, it is necessary to provide some background knowledge of a history of environmental problems and environmental policies, environmental policy processes, and the auto industry in Japan. The provision of such background knowledge may help those who have limited knowledge on Japan and automobile air pollution to understand the empirical study more easily and deeply.

This chapter first provides a brief history of environmental problems and policies in Japan. Though the thesis focuses on automobile air pollution problems and policies, it may be useful to get a grasp of the history of other environmental problems and policies. As the public concerns on automobile air pollution may not be independent from those on other environmental problems, in order to understand the public concerns on automobile air pollution in a certain period, it may be necessary to know the public concerns on other environmental problems in the same period. Similarly, the concerns of both the state and the business on automobile air pollution may be also greatly influenced by those on other environmental problems and the public concerns on them. In addition, the history of other environmental policies may contribute to understanding of both the development of government attitudes towards environmental problems and the ups and downs of public attitudes towards environmental problems. Also, in examining the history, the characteristics

of the central and local governments, the business and the public may become apparent.

After these issues are examined, discussion then turns to procedures for making environmental policies in Japan. As procedures for making environmental laws are different from those for making emission standards, the section discusses both procedures and differences between them. Also, in this section, procedures for making environmental ordinances in TMG are discussed. Further, it clarifies why innovative environmental policies often come from Tokyo. Then, the chapter introduces the automakers and roles of the auto industry in the Japanese economy.

Brief History of Environmental Problems and Environmental Policies

This section introduces a brief history of environmental problems and environmental policies in Japan. The brief history deals with those problems and policies after the Second World War, namely 1945, and before 2000. Although environmental problems had existed before 1945, it may be unnecessary to examine them, as there was almost no automobile air pollution before 1945. The year 2000 was set because of practical reasons. The research began in 2000 and the fieldwork carried from 2000 to 2001. In addition, as it was mentioned later, a significant policy change on automobile air pollution policies happened in 2000. As it is necessary to draw a time line for the research, the year 2000 was chosen as a time line.

The GDP level of Japan in 1945 was only 20 percent of the GDP level before the Second World War, because of the huge economic damage from the war. Consequently, the central government carried out a wide range of economic policies to recover from such economic damages. Consequently Japan could develop rapidly, and it took only 11 years (1956) to reach the same GDP level as had been in place before the Second World War. Although environmental problems occurred

in some industrial regions because of the high economic activities, they were not so prominent and they did not lead to the increasing environmental concerns until the mid-1950s (Kaku and Maruyama, 1997).

Environmental policies from 1945 to the mid-1950s were dependent on local governments. As various kinds of pollution became recognizable in the highly industrial areas such as Tokyo, Osaka and Kanagawa, though not so serious, local governments of those areas sought to deal with pollution. For instance, TMG established the ordinance on pollution prevention in 1949. However, the central government just sought for economic developments and did not pay much attention to environmental issues (Kawana, 1987).

From the mid-1950s, environmental problems became notably serious because of high economic development led by the chemical sector and heavy industry (Miyamoto, 1996). Because of serious air pollution and water pollution, fisheries and farmers started to ask both the central and local governments to solve them (Kaneko, 1999). Moreover, as it became apparent that pollution brought about adverse health effects, the public became concerned about pollution and many of those who suffered serious health damage united with each other to stop pollution and demand compensation for the damages. Then, it became necessary for the central government to establish national environmental policies (Kaku, 1997). However, the central government still sought to pursue further economic development and hesitated to do something for environmental problems (Awaji, 1995). In addition, the industries that the central government intensified were the steel, mining, chemical and petrochemical industries, all of which were sources of serious pollution. Because of such attitudes of the central government, environmental problems became more serious and trans-regional. Consequently, the central government was required to establish national environmental policies (Hizume, 1997). Finally, in 1958, the central government established two environmental laws: the

law on drain from plants and the law on conservation of water quality.

However, these environmental laws were not effective for environmental protection because they emphasized the harmony between economic development and environmental protection rather than the necessity for pollution prevention and reduction (Awaji, 1995). Because the central government could not stop the escalation of environmental problems, from the mid-1950s to the mid-1960s, Japan had a great number of very serious environmental problems, including four of the most serious environmental disasters in the history of Japan: Minamata disease, Itai-itai disease, Yotsukaichi asthma and Niigata Minamata disease. Minamata disease occurred in the Minamata area in Kumamoto and this disease was caused by methyl mercury produced in the process of manufacturing acetaldehyde by Nihon Chisso (a fertilizer industry) (Nishimura and Okamoto, 2001; Miyazawa, 1997). Itai-itai disease occurred in Toyama and the cause of this disease was cadmium that Kamioka Kouzan (a mining industry) produced in its manufacturing process (Ogino, 1968). Yotsukaichi asthma took place in Mie. Yotsukaichi was the industrial area where a lot of complex processes existed, and they polluted the air, which caused asthma (Ono, 1971). Niigata Minamata disease occurred in Niigata. Like Minamata disease, the disease was caused by mercury that was produced in the process of manufacturing acetaldehyde by Shouwa Denkou (a fertiliser industry) (Takizawa, 1970).

Because of these environmental disasters, more than one thousand people died and a huge number of people had health problems. Both the central government and local governments could not prevent those environmental problems from becoming so deadly serious because of their they obsession with economic development and negligence of pollution (Kawana, 1987). In addition, both the local and national governments often sought to deal with incidents of pollution in secret in cooperation with industries in order to prevent those incidents from becoming big issues (Miyamoto, 1996). Especially, the Ministry of International Trade and Industry (MITI) so actively sought to

protect the polluting companies (Miyamoto, ibid). Such negative attitudes of both the central and local governments clearly made the pollution more serious and deadly.

Even after the mid-1960s, rapid economic development continued. In addition, the Olympic Games were held in Tokyo in 1964, which greatly stimulated investment and economic activities. Also, the central government established a great number of projects to stimulate economic development such as construction of highways and the creation of new industrialized zones. Although the central government still gave a priority to economic development, the public were greatly concerned about environmental issues, and a great number of the Japanese people, including people living in the project area, teachers, researchers, lawyers and doctors, united in an attempt to stop these projects, and they could often succeed in it (Kaku, 1997). The anti-pollution campaigns at that time were at its peak, especially in urban areas where citizens were more concerned about the environment (Miyamoto, 1996).

These new environmental movements were different from the previous environmental movements (Kawana, 1987). The feature of the previous environmental movements was that the anti-pollution campaigns began after serious environmental problems happened. However, in the new environmental movements, the anti-pollution campaigns began before serious environmental problems took place. As the anti-pollution campaigns were so active, they often succeeded in leading to the cancellation of the construction of petrochemical complexes, power plants and factories. According to Shimizu and Matsubara (1979), this was the beginning of citizens' movements in Japan. It seems that, after experiencing a number of serious environmental problems, some of the Japanese people came to consider environmental protection (pollution prevention) more important than economic development. Surely, this change may be partly due to the fact that the Japanese people could afford to pay attention to environmental protection (MoH, 1999).

As well as the public, the central government also changed its stance towards environmental

protection from the mid-1960s. Indeed, from the mid-1960s to the 1970s, environmental policies in Japan dramatically developed because of intensified environmental movements stimulated by a great number of environmental problems. The central government established the first systematic environmental law in 1967, *the basic law for environmental pollution control.* In article 2, this law defined pollution problems as air pollution, water pollution, soil pollution, noise, vibration, land subsidence and odour. In articles 3 and 6, the law clarified the responsibilities of the central and local governments, the business and the Japanese people for environmental protection. This law also set out some environmental standards on pollution (article 9) and ordered local governments to follow national environmental policies (article 18). Although the environmental law was innovative, this law sought to integrate environmental protection into economic development (articles 1 and 9) (Matsushita, 2000). Consequently, the law and the government were seriously criticized by the public. Considering this nature of the law, it seems that the central government still considered the economic development more important than environmental protection (Kaku, 1997).

. Because the law was greatly criticized by the public, pollution became more serious, and it became apparent that environmental problems prevented economic activities, the central government came to recognize the necessity to enforce effective environmental policies for pollution prevention and protection (Kawana, 1987). Then, the 'Pollution Diet' was held in 1970. The Diet first decided to exclude the criticized 'harmony' statement of the basic law for environmental pollution control and the new statement of the law was that the law gave priority to the environment and health of people rather than economic development (Awaji, 1995). The Diet also established new environmental laws and revised existing laws. After the Diet, development of environmental policies still continued with strong public support, and the central government could establish a lot of strict environmental regulations (Miyamoto, 1996).

Moreover, in 1971, EA was established for integrated environmental administration.

Environmental problems at that time were very diverse and the range of environmental problems went beyond the boundaries of existing ministries. Hence, EA was expected to play a role to deal with a wide range of trans-boundary problems. The main object of EA was to systematically plan and administer environmental policies. As expected, EA formulated many strict environmental laws and environmental standards with strong public support. For instance, the central government set up the law concerning measures for relief of pollution-related patients in 1973, and this law enabled victims of pollution to have compensation from industries without lawsuits (Kaneko, 1999). As well as the public and the central government, industries also seemingly changed their attitudes towards the environmental protection since they were afraid of suffering from negative public images by being blamed as polluting firms (JILPT, 2005). They also recognised that they would be charged to pay a huge amount of money for compensation for victims if their pollution damaged the health of people and that prevention was cheaper than cure (Kaku, 1997). Consequently, industries started to invest in pollution prevention. Although the environmental concerns of the central and local governments, the public and industries had been high from the mid-1960s to the early 1970s, those concerns diminished after 1973. One of the reasons for this was that rapid economic development stopped because of the oil crisis and economic recession started (Matsumoto, 2000). As a result, the number of big projects such as construction of highways and complexes decreased. Moreover, deadly pollution dramatically decreased, mainly because of effective environmental policies and a large amount of investments into environmental protection by industries, such as installing anti-pollution equipments (Kawana, 1987). In addition, though environmental problems or pollution had been attributable mainly to activities of industries, both people and households became responsible for environmental problems and pollution such as water pollution from shampoo, soap and washing powder and air pollution by using privately owned automobiles (Hara, 1995). In terms of environmental problems, the Japanese people became both polluters and victims. As a result, the

environmental movements and the anti-pollution campaigns became inactive and the Japanese people became less concerned about environmental problems (Miyamoto, 1996).

The decreasing concerns of the public on environmental problems and the economic recession led to diminishing motivation for environmental improvements amongst both industries and the state (Awaji, 1995). Further, industries and some ministries which had close relationships with industries, especially MITI, started to make existing strict environmental regulations loose (Kaku, 1997). Industries with MITI, the Ministry of Transport (MoT) and the Ministry of Construction (MoC), for instance, required EA to relax the national ambient air quality standard for NOx and to discontinue the law concerning measures for relief of pollution-related patients (Awaji, 1995). Because of the pressures, the national ambient air quality standard for NOx was eased in 1978 and the law concerning measures for relief of pollution-related patients was abolished in 1987. Moreover, EA became unable to establish strict environmental policies any longer. The stagnation of environmental policies continued until the late 1980s.

Environmental policies again advanced from the late 1980s. At this time, some global environmental problems such as depletion of the ozone layer and global warming became prominent, and the state, industries and the public came to pay much attention to those global environmental problems (MECSST, 1999). Then, the government concluded many international agreements on global environmental problems, including, for example, emission of Chlorofluorocarbon (CFC) gases. In 1992, the United Nations Conference on Environment and Development was held in Rio de Janeiro, which required each nation to cooperate to solve global environmental problems. Its influence on Japan was great, and indeed it led to the reinforcement and the establishment of various environmental policies (Kawana, 1995b). In addition, the high public demands to improve the environment because of the global environmental movements contributed to them. From the

mid-1990s, the state started to pay attention to nature conservation though environmental policies in Japan normally focused on pollution. For instance, the government changed the basic law for environmental pollution control to the *environment basic law* in 1993. The new law sought to recover the good environmental quality and to conserve it for future generations. The law also sought to conserve nature and wildlife such as endangered animals and forests. Because of high technology levels on pollution protection, Japan succeeded in pollution reduction and prevention. However, as technologies could contribute less to protection of nature and wildlife, environmental policies in terms of nature conservation were less successful in those areas (OECD, 1977).

Although the state became more actively sought to deal with environmental problems, it seems that the state was still less concerned about environmental problems than local governments. For instance, in order to effectively conserve nature and wildlife, the state tried to establish the environmental impact assessment law (EIA). However, the EIA law was not established because of great pressures from MITI, MoT, the ruling party (liberal democratic party: LDP), and industries (Kaku, 1997). Industries were greatly opposed to the EIA law because conducting the EIA might be time-consuming and it would cost much money (Kaku, 1997). Though the EIA law was not established at the national level, various local governments established ordinances on EIA because local governments strongly recognized that EIA was necessary to effectively protect the environment. Thus, even in the present time, it seems that local governments have more actively sought to solve environmental problems (Kitamura, 1997). Further, the state has been less proactive in environmental policies and it may have been subject to both domestic pressures from industries and the public and international pressures (Awaji, 1995).

Although industries sought to prevent the establishment of the EIA law, they generally came to more strongly recognize the importance of environmental protection for their business activities (Nakamura and Chin, 2000). Because of the global environmental movements and high public

demands for the environmental protection, companies in a wide range of industries became required to voluntarily act environmentally friendly (Krut and Gleckman, 1998; Yano, 1998). Also, as manufacturers normally recognized the positive effects of developing lower emission technologies, because they would contribute to improving corporate images and putting manufactures in an advantageous position in both the international and domestic markets, they actively sought to develop such technologies (Koyo Sangyo Saisei Iinkai Kankyo Sangyobsenmon Bukai, 2005). Consequently, as far as companies and their products are concerned, according to the results of a project initiated by Corporate Knights Inc to choose the 100 global most sustainable corporations (2006), 10 of them were Japanese. In addition, according to data from the U.S. environmental protection agency, Toyota's *Prius* and Honda's *Civic Hybrid* were the most environmentally friendly automobiles (Forbes, 07/05/2006).

Finally, regarding the public, similarly, partly due to the global environmental movements, the environmental concerns of the public have been high and they tend to act environmentally friendly according to various surveys (Nakamoto and Chin, 2000). Consequently, the number of environmental groups, including non-profit organizations (NPOs), non-governmental organizations (NGOs) and Foundations has greatly increased and, for instance, there were 11,075 environmental groups in Tokyo in 2003 (ERCA, 2004).

As this is a brief history of environmental problems and policies in Japan, it may be difficult to conclude something out of it. However, one thing seems clear. That is, environmental policies have been greatly influenced by, and the success of EA in environmental policies has been dependent on, ups and downs of environmental concerns of the public and public support for environmental policies (Miyamoto, 1996). Thus, the environmental concerns of the public and their support may be both key drivers for environmental policy changes and significant resources for EA.

Procedures for Making Environmental Policy

This section introduces how environmental laws, emission standards and environmental ordinances are made in Japan. The literature on policy-making process normally deals with procedures for making laws. However, procedures for making emission standards are different from those for laws and the differences between those two procedures have made issues of emission standards unique. Thus, it may be necessary to understand procedures for not only emission standards but also laws. Finally, as the empirical study includes environmental policies established by TMG, procedures for making local ordinances in TMG are also discussed.

Before examining procedures for three kinds of environmental regulations, let me explain the differences among them by using examples of regulations of air pollution. Simply speaking, their differences are: laws are examined and established by the national Diet; emission standards are examined and established by EA; and local ordinances are examined and set out by local governments.

In Japan, the basic environment law controls other environmental laws including the air pollution prevention law. The basic environment law sets out basic principles of environmental policies. In Chapter 2 of basic principles concerning environmental conservation, the law orders the establishment of environmental standards for various kinds of pollution such as air pollution. Environmental standards such as the national ambient air quality standard for NOx are established by EA. Environmental standards are environmental targets that are considered that it is desirable to be achieved in order to protect human health and preserve the living environment. Environmental standards are neither threshold limits for the environment nor minimum conditions for human health, but they are administrative targets that the state and local authorities refer to when they seek to establish environmental policies.

Then, in terms of air pollution, EA seeks to achieve environmental standards based on the air pollution prevention law. The air pollution prevention law sets out various issues for air pollution prevention including monitoring of air pollution and emission standards. However, concrete figures of emission standards are not set out in the air pollution prevention law, though the law orders that the director-general of EA should establish emission standards. Then, emission standards are examined and established by EA and the director-general of EA. Finally, local authorities establish local ordinances in order to achieve environmental standards based on the air pollution prevention law.

Procedures for making environmental laws

Environmental laws are examined in committees of the national Diet, and then they need to be approved in the plenary of the national Diet. In addition, most drafts for environmental laws are submitted by the cabinet or LDP as it has been the ruling party (1955-1993; 1994-present). LDP has its own committees (*bukai*), which discuss and make drafts. Each committee corresponds to one of the ministries. However, it is normally not the members of LDP but bureaucrats of EA who make drafts. This is mainly because bureaucrats have much expertise and knowledge for it (Nakayama, 2002). Although bureaucrats have expertise and knowledge, they need to depend on LDP to ensure that their drafts are passed in the committee and the Diet (Nakano, 1992). LDP also needs to depend on bureaucrats of EA in order to make environmental laws acceptable for industries that LDP has dizzy relationships with (Fukuoka, 1995; Ito *et al,* 2000). LDP needs to depend on industries for money (donation) and support in election, while industries need to depend on LDP in order to achieve their goals. Thus, in procedures for making environmental laws, it seems that there are interdependent relationships between the LDP, bureaucrats and industries. In addition, studies of policy processes in Japan at the national level often deal with procedures for making laws focusing

on the relationships between LDP, bureaucrats and industries (Abe *et al*, 1990).

Procedures for making emission standards

Normally, a certain issue for emission standards is discussed in the specialist committee in the central pollution council, which is an advisory body for EA, based on proposals made by EA (Abe *et al*, 1990). After investigation and examination of issues, specialist committees suggest concrete figures of emission standards to a chairman of the central pollution council. Then, a chairman normally brings the suggestion to the director-general of EA. Then, following the suggestion, EA establishes new emission standards and, based on established emission standards, MoT establishes permissible limits which automobiles must satisfy. As well as emission standards, procedures for making environmental standards (e.g. the national ambient air quality standard for NOx) normally follow this process.

Members of the central pollution council come from a wide range of areas, and members of specialist committees can be specialists in a certain field. However, as Abe (1995) and Abe *et al* (1990) severely criticizes, many of them are normally not active for environmental protection and those who are greatly active for environmental protection are not selected. Further, they also criticise that many of them come from industries which are not active for environmental protection.

As shown above, procedures for making emission standards are different from those for making emission standards. In procedures for making emission standards, bureaucrats of EA in theory do not need to depend on LDP and other actors including industries. As pointed out, studies of policy processes at the national level in Japan normally focus on procedures for making laws and they pay little attention to procedures for making emission standards. Consequently, it is unknown what kinds of relationships there are in procedures for making emission standards. This research deals with procedures for emission standards, and it examines what kinds of relationships there are in

procedures for making emission standards. These two kinds of focuses are notable contributions that this research makes.

Procedures for making local environmental ordinances

Ordinances are local laws. Thus, their drafts are normally prepared by officers of local governments and they are then submitted to local assemblies. Then, they are examined and approved in local assemblies. However, there is one big difference between procedures for making environmental laws and those for making local environmental ordinances. That is, as explained above, though most drafts for environmental laws are proposed by the cabinet or LDP in procedures for making environmental laws, most drafts for local environmental ordinances are proposed by governors. For instance, from 1995 to 2001, the governors of Tokyo proposed 884 of drafts for ordinances though councillors of the TMG assembly proposed 31 of those (Sasaki, 2003).

This is due to the difference between the national political system and the local political system. While the national political system is a parliamentary system, the local political system is presidential. A governor of Tokyo is chosen directly by the public in Tokyo and officers of TMG work for a governor. A governor has a wide range of authorities such as establishment of ordinances and personnel matters. Although officers of TMG make drafts for ordinances as in procedures for making environmental laws, drafts can be greatly influenced by the interests of a governor because a governor can decide what kinds of ordinances will be made (Yamazaki, 2002). A governor can order TMG to prepare drafts for the ordinances that reflect his/her interests.

In addition, as a governor is chosen directly by the public, it is likely that a Governor's decision can be influenced by the public concerns (Sasaki, 2003). As mentioned in the previous section, local governments have often established innovative environmental policies that the national government has then followed as governors have often been more responsive to the public environmental

concerns than prime ministers (Kitamura, 1997). It seems that a governor depends more on public support than a prime minister because of the differences between the national and local political systems.

Automakers and Roles of the Auto Industry in the Japanese Economy

This section introduces Japanese automakers and examines the roles of the auto industry in the Japanese economy. There are 11 automakers (excluding motorcycles) in Japan: Toyota, Nissan, Mitsubishi Motors, Mazda (Toyo Kogyo), Fuji Jyuko, Isuzu, Suzuki, Daihatsu, Mitsubishi Fuso, Hino and Nissan Diesel. While Toyota, Nissan, Mitsubishi Motors, Mazda and Fuji Jyuko mainly produce passenger automobiles, the rest are producers of trucks and buses. Toyota and Nissan have been two of the largest automakers and are very influential in the auto industry (Nishimura, 1976; Miyoshi, 1999). Indeed, 10 of 11 chairmen of the Japan Automobile Manufactures Association (JAMA) came from Toyota (5 chairmen) and Nissan (5 chairmen); only one chairman came from neither Toyota nor Nissan, but Honda. In addition, Daihatsu and Hino are subsidiary companies of Toyota, while Nissan Diesel is a subsidiary company of Nissan.

The auto industry is one of the most powerful and influential industries in Japan (Miyoshi, 1999). Indeed, two of ten presidents of federation of economic organizations (FEO) were from Toyota: Shoichiro Toyota (1994-1998) and Hiroshi Okuda (2002-). The President of FEO is the leader of all the major companies in Japan, and it is often called the prime minister of the business world. The auto industry is both powerful and influential because the auto industry has greatly contributed to the Japanese economy. According to JAMA (2005), it was estimated that almost 4.9 millions of people worked for the auto-related industries in 2005. In other words, 8.2 percent of the total workforce in Japan was engaged in the auto-related industries. Thus, the auto industry has played a greatly

important role in employment creation in Japan.

In addition, one automobile consists of 20 thousands to 30 thousands of parts including cylinders, flames, cables, chassis, plating, emission purification parts and batteries. A great number of small and medium enterprises (SME) are providing those parts to the automakers and their business is greatly dependent on the automakers. Thus, economic influence of the automakers over SMEs has been enormous (JAMA, 2005). Also, automotive shipment, including motorcycles, was 43,163 billion yen in 2002. The figure was 16.0 percent of the total value of manufacturing shipments in Japan. Further, export of Japan is greatly dependent on the auto industry. In 2004, the total value of automobile export was 12,500 billion yen (F.O.B basis), which was 20.4 percent of the total value of export. In terms of international trade, Japan is greatly dependent on the auto industry. As described above, economic resources of the auto industry such as money and job creation, may be greatest among those of the other industries. Because of the greatest economic resources, it seems that the auto industry has been one of the most powerful industries in Japan.

Conclusions

This chapter provided background knowledge to understand fully the results of the empirical investigation. This chapter first looked at a brief history of environmental problems and environmental policies in Japan, and it pointed out that those high environmental concerns of the public and high public support for environmental polices were key drivers for environmental policy changes and significant resources for EA when it sought to make strict environmental policies. Second, the chapter discussed procedures for making environmental laws, emission standards and local ordinances. This part pointed out that studies of policy processes at the national level in Japan paid little attention to procedures for making emission standards, though procedures for making

environmental laws and those for making emission standards were different, and that it is, as a result, unknown what kinds of relationships there are in procedures for making emission standards. Because this study focused on both procedures for making emission standards and relationships between actors in their procedures, these may be notable contributions that this study makes.

Finally, this chapter introduced automakers in Japan and roles of the auto industry in the Japanese economy. In this chapter, it was made clear that the auto industry had a great amount of economic resources, which had made the industry one of the most powerful in Japan. With the provided background knowledge, the thesis now goes to the main empirical study.

Chapter 5

The Case of Automobile Air Pollution Policies in Japan

1960s

Introduction

This chapter examines the development of automobile air pollution policies in the 1960s because, until this time, automobile air pollution had not been a prominent environmental issue. The chapter first discusses how and why automobile air pollution came to happen and greatly worsened in the mid-1960s. The occurrence and increase of automobile air pollution were closely related to the economic development of Japan and increase in the number of automobiles, the volume of road transport and the number of roads. Then, discussion turns to issues on the auto industry and the state. This section examines how the auto industry was protected and led by MITI. In contrast to this, the section also discusses how the auto industry was independent from the state and MITI.

The next section deals with automobile air pollution in metropolitan areas. This section examines the reasons why automobile air pollution became prominent mostly in metropolitan areas and the situation of both air pollution and automobile air pollution in metropolitan areas. The fourth section examines automobile air pollution policies before the first emission standards were established. The section introduces both main policy tools for automobile air pollution and main actors in the policy-making processes on automobile air pollution. Further, the section discusses the influences of the US government in automobile air pollution policies in Japan.

Then, the fifth section introduces the fist emission standards. After discussing these issues in the

1960s, the next section seeks to examine the policy network of automobile air pollution policies and analyse the first policy change, namely the establishment of the first emission standards on CO, based on the policy network framework.

The structure of this chapter is different from the structure of the other presentation chapters. In the following chapters, development of emission standards is presented in a sequential manner like a history teller. In contrast to it, each section in this chapter deals with themes mainly in the 1960s relating to automobile air pollution independently from the time sequence between sections, though this chapter looks at those in the 1950s too.

Finally, it is important to emphasize that the original results presented in most of this chapter are the researcher's own results based on the secondary data collected and original analysis. Although they have not been analysed by the policy networks approach, the relationships between MITI and the auto industry in economic policies in the second section have been greatly discussed. Consequently, the original results in the second section are based on literature reviews and an analysis of the data collected by the researcher. Further, the policy network analysis of the relationships between MITI and the auto industry is original and has never been done before.

Economic Development and Automobiles

This section examines some main factors leading to the occurrence and increase of automobile air pollution. Though a wide range of factors might be related to its occurrence and increase, there were dominant factors including economic development and increasing number of automobiles, road transport and roads.

Regarding economic development in the 1950s and the 1960s, the state and the Japanese people shared the same goal of economic development and they consequently united to achieve the goal

(Yamazaki, 1999). As mentioned in the last chapter, the government carried out a wide range of economic policies in order to achieve economic development. Then, Japan achieved accelerating levels of economic development from the early 1950s, and the average GNP growth rate from 1956 to 1965 in real terms was about 10.8 percent, while the average growth rate of GNP per capita in real terms was 9.3 percent. Consequently, the lifestyles of Japanese people changed due to the great economic development for those years (EA, 1972). Also, as automobiles could be produced cheaply, an increasing number of Japanese came to use automobiles (Jidosha Kotsukyoku of the MLIT, 2002). Consequently, the number of road passenger transport increased. In addition, such high levels of economic development stimulated transport demands, and especially the increase rates of the volume of road freight transport were higher than any other transport means in the 1960s. As a result, the number of both automobiles and road passenger/freight transport increased greatly, and road networks had been constructed to meet its increasing transport demands. The rest of this section briefly examines how the number of automobiles, the volume of road passenger/freight transport and the number of roads had changed in the 1950s and the 1960s.

First, concerning the number of automobiles (MoT, 1964; Jidosha kotsukyoku of the MLIT, 2002), the number of automobiles was only 1,501,740 in 1955 (see Appendix C). Then, in 1960, it had increased to 3,403,768. Thus, the number of automobiles doubled for only five years. Further, the number of automobiles almost doubled again for the next five years (1960 to 1965) as it increased to 8,123,096 in 1965. Finally, its number doubled again and again as it increased to 16,528,521 in 1970. One of the most prominent features of the number of automobiles from 1950 to 1970 was that the number of passenger automobiles most greatly increased. Indeed, while the number of automobiles increased by 1,034 percent from 1955 to 1970 - and similarly the number of trucks increased by 1,124 percent - the number of passenger automobiles increased by 4,607 percent.

Second, as far as the volume of road passenger/freight transport is concerned, according to MoT

(1964) and Jidosha kotsukyoku of MLIT (2002), rapid economic development stimulated transport demands (see Appendix D). In 1955, the amount of road freight transport was 10 billion ton kilometres (btk), but it had increased from 20 btk in 1960 to 48 btk in 1965. Further, after the economic recession in the mid-1960s, it increased dramatically and became 135 btk in 1970. Consequently, in 1966, as far as the shares of freight transport in terms of tons and kilometres transported, road freight transport exceeded the rail transport and obtained the second largest share (31.1 percent) after coastal shipping in Japan.

The volume of road passenger transport also increased greatly (MoT, 1966, 1967, 1968) (see also Appendix D). Indeed, according to MoT (1964, 1966) and Jidosha kotsukyoku of MLIT (2002), the total number of passengers transported by road transport increased from 4,262 million persons in 1955 to 7,900 million persons in 1960. Then, it became 14,863 million persons in 1965 and 24,033 million persons in 1970. In addition, the increasing rates of road passenger transport for private use had increased more dramatically than those by taxis and buses (MoT, 1968). For example, while those rates of buses and taxis in 1965 were 3 percent in terms of the number of passengers transported by them, those rates by automobiles for private use were 29 percent (MoT, 1966).

Finally, regarding the number of roads, the number of roads was insufficient, resulting in traffic jams, traffic noise and automobile air pollution, especially in metropolitan areas such as Osaka and Tokyo (MoT, 1966). Consequently, it was considered that constructing roads was one of the main effective automobile air pollution policies (C12). Then, the state sought to invest a large amount of money in the road construction.

In addition, the Metropolitan expressway for the Tokyo Olympic Games was opened in Tokyo in August of 1964, and the Hanshin expressway was opened in Osaka in June of 1964. Further, although only the Meishin highway existed in 1963, the highway networks greatly extended in ten years (see figure 5.1). In addition, as the Tomei highway was opened, Tokyo and Hyogo were

connected by these two highways, and giant metropolitan areas were formed along these two lines, so called Tokaido megalopolis, with a population of almost a half of the people in Japan (MoT, ibid). In addition, the megalopolis contained three major industrial areas: the Keihin industrial area (mainly Tokyo, Kawasaki city and Yokohama city of Kanagawa), the Chukyo industrial area (from the eastern part of Aichi to the north-eastern part of Mie), and the Hanshin industrial area (mainly Kobe city in Hyogo and Osaka city in Osaka), as well as the Tokai industrial area (Shizuoka).

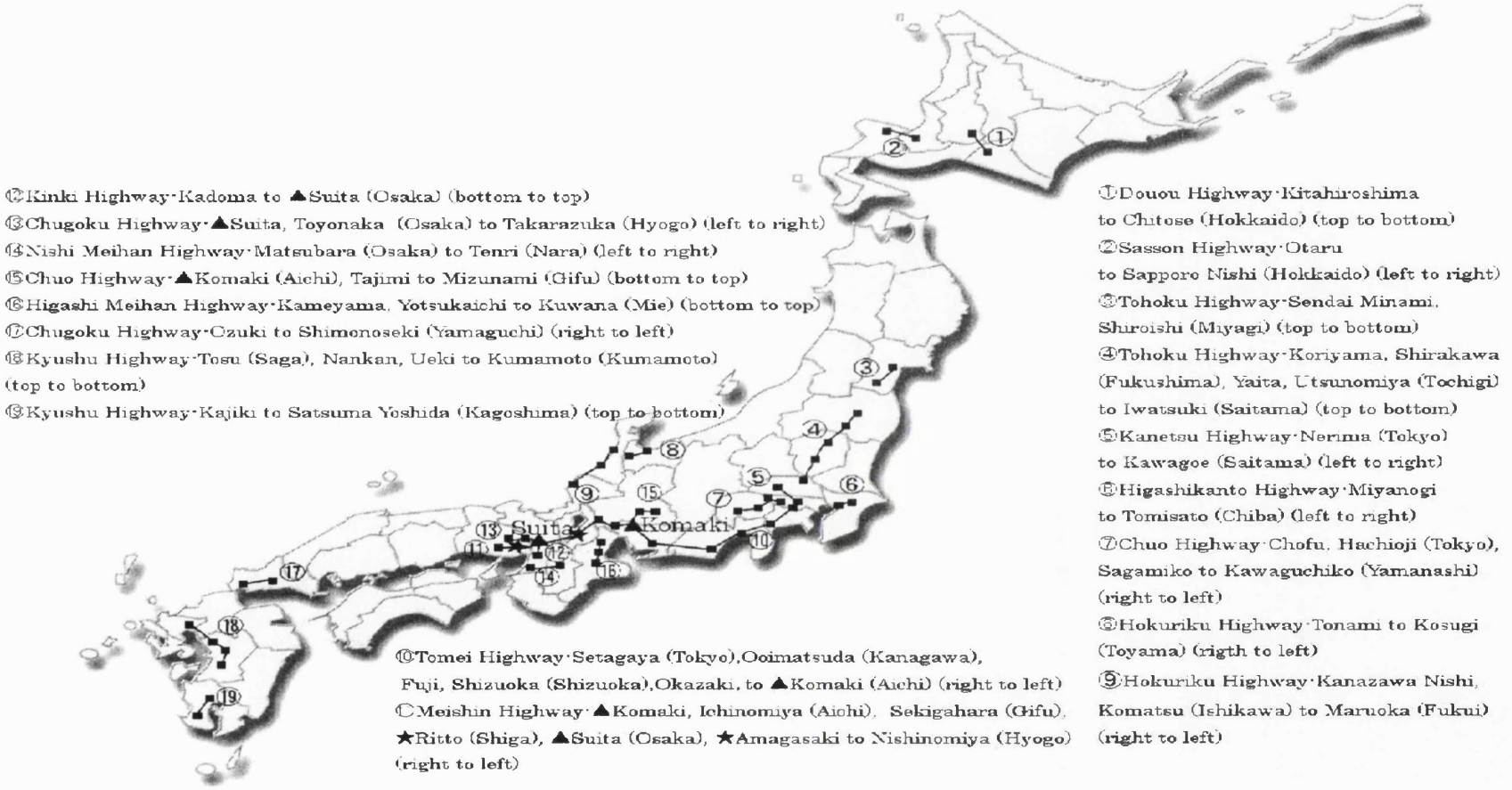
Nevertheless, as the number of automobiles and the volume of road transport greatly increased, traffic jams had been still serious in many trunk roads in metropolitan areas, especially in the Tokaido megalopolis. For instance, the national roads 1st, 2nd, 14th, 15th, 16th, 22nd, 26th and 246th were the most congested roads (MoC, 1968) (see figure 5.2). Consequently, automobile air pollution around those trunk roads in the metropolitan areas became notable (MoT, 1965). In order to improve this situation, the state invested a huge amount of money for road construction, but the number of automobiles increased at so high a rate that new roads could not meet the demand, and then the state built new roads for the problem, which continued over and over again (MoC, 1971).

This section has discussed the major factors leading to the occurrence and increase of automobile air pollution. In terms of the policy networks framework, a few things can be emphasized. First, the state, industries and even the public shared the same idea that economic development had to be given a priority. As described below, this was closely related both to one of the appreciative systems that automobile air pollution policies needed to be little harmful for economic activities of the auto industry. Second, as it was considered that automobile air pollution happened because of the insufficient supply of roads, automobile air pollution polices sought to improve not automobiles but roads. This was also one of the appreciative systems in the core of the policy network of automobile air pollution policies.

The Auto Industry and the State

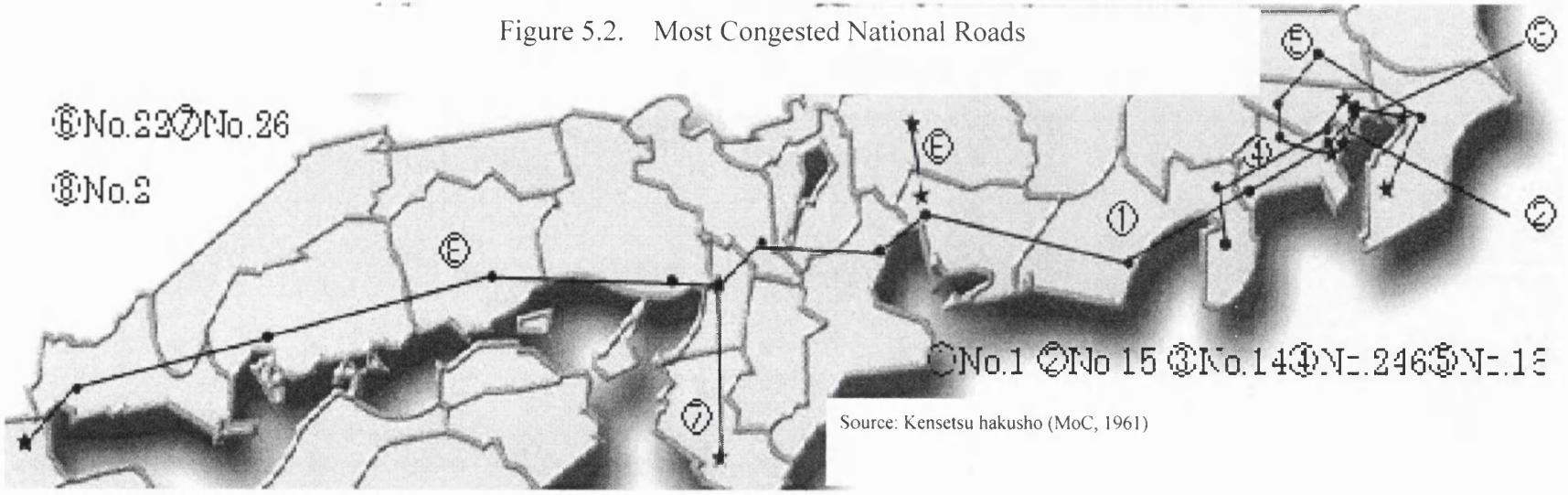
In the 1960s, domestic automakers became able to produce all types of passenger automobiles massively and cheaply. While in 1963, 1,283,531 of automobiles were produced in Japan, the number had increased from 1,875,614 in 1965 to 5,289,157 in 1970 (see Appendix E). Especially, the level of production of small passenger automobiles had increased greatly from 327,031 in 1963, 599,030 in 1965 to 2,377,639 in 1970 (Jidoshakogyo shinkokai, 1972). In addition, the year of 1966 was called 'the starting year of my car' and the level of automobile production had increased greatly, especially since that year (JAMA, 2002). This success of automakers was realized mainly because of the strong protection and guidance of the state (C33, Sato, 1994). In the 1950s and 1960s, MITI sought to lead the industrial structure and the auto industry was the target industry. MITI attempted to protect and grow the auto industry through its policies (C32, Muto, 1984). According to a MITI's leaflet titled 'for understanding the domestic passenger automobiles (kokusan jyoyosha no rikaino tameni, 1952)', MITI suggested small passenger automobiles had to be produced, as roads in Japan were narrow and small passenger automobiles used less petroleum than other larger types of passenger automobiles because Japan was largely dependent on the Middle East for oil; a wide range of manufacturers depended on the auto industry and it was necessary to grow the industry for the economic development; by producing automobiles domestically, loss of foreign currency could be prevented; and these had to be continued until the auto industry had highly developed (JAMA, 1988). Because the auto industry was protected by MITI, the US often called the ministry, 'the notorious MITI' (Takagi, 2000). As mentioned above, the state, the auto industry and the public shared the same goal of economic development. In addition, it can be now apparent that the Japanese people and the state recognized that the auto industry played a significant role in Japanese economy and that the auto industry had to be protected from economic damages. From this point, it can be stipulated

Figure 5.1. Highway Networks 1963-1973



Source: Kensetsu hakusho (MoC, 1961-1974)

Figure 5.2. Most Congested National Roads



Source: Kensetsu hakusho (MoC, 1961)

that it was recognized that automobile air pollution policies needed to be little harmful to the economic activities of the auto industry. On the contrary, Tsuruta (1984) argues that the auto industry was not entirely protected, and the state could not perfectly lead the auto industry. Indeed, in denying the model of Japan as a company, he proposed that it would be necessary to notice that the role of the state in the private economy was greatly limited (Tsuruta, 1984: p.51). Thus, although the state sought to protect the industry from severe competition, the automakers greatly competed with each other, and it was 'the important source of energy of the Japanese economy' (Komiya, 1984: p.14). Indeed, for instance, 'the starting year of my car' was initiated by the competition between Toyota and Nissan in 1966 (Sato, 1994). Another example may be the failure of the state in re-arranging the automakers. In 1961, there were 17 automakers in Japan: Toyota, Nissan, Isuzu, Hino Jidosha, Fuji Jyuko, Prince, Mitsubishi Nihon, Shin Mitsubishi, Kurogane, Toyo Kogyo (Mazda), Daihatsu, Aichi Kikai, Suzuki, Nissan Diesel, Nikken, Hope and Fuji Jidosha (Iwakoshi, 1963). MITI thought that these domestic automakers would lose in the international competition because they did not have high levels of international competitiveness (Takagai, 2000). In order to make the automakers strengthen competitiveness, MITI sought to reduce the number of automakers so that economies of scale would work (Sahashi, 1994).

Thus, by establishing the temporary law concerning development of specific industries, MITI announced that it would prohibit a new entry into the auto industry and reorganize these automakers into three groups: one group for mass-produced passenger automobiles, another group for special passenger automobile, and another group for mini passenger automobiles in 1961. By doing so, MITI sought to make the Japanese automakers able to compete with the big 3: GM, Ford and Chrysler (Shoji, 2001).

However, Honda, which was a producer of bicycles, greatly criticized the law and started producing automobiles against the will of MITI *(NHK, 5th February 1995, cited in Honda,1999)*. In

addition, other automakers were also against the law because it would obstruct the principle of free competition and hamper development of the auto industry (JAMA, 1988). Consequently, the law could not be passed at the ordinary Diet session in 1963. Thus, it can be said that free economic activities of the auto industry were respected by the state. This may be a rule of the game in the core of the policy network of automobile air pollution policies.

Although the state could not perfectly guide the auto industry, the industry might still be strongly influenced by the state, especially before the 1960s. For example, its protection and development policies had been based on the agreement concluded between MITI and the auto industry that the state would protect the industry from the domestic investment of foreign automakers and from their imports; that the state would introduce foreign advanced technologies on advantageous conditions for the domestic automakers; and that the state would financially help the industry (see Muto, 1984).

Based on this agreement, for example, MITI set the highest tariff rates for imported small passenger automobiles because the domestic automakers produced small passenger automobiles most greatly (Onishi, 2005). The financial help for the industry was greatly made too and the society of automotive engineers, for example, obtained a total of 369 million yen from 1951 to 1959 (Muto, ibid).

Although the auto industry became relatively independent from the influences of the state as the industry developed, MITI was often still influential on the industry even in the 1960s. The prime example of this might be the merger of Nissan and Prince. Japan became unable to restrict both imports (article 11 of GATT) in 1963 and exchanges for reasons of the international balance of payments (article 8 of IMF) in 1964, and finally Japan liberalised imports of finished automobiles (Economic planning agency, 1964). Consequently, MITI again sought to reduce the number of automakers and organized them into two groups: the Toyota group and the Nissan group (Sahashi, 1994). The reason that Toyota and Nissan were chosen as 'the fathers' was that these two automakers

occupied almost 80 percent of domestic production of all passenger automobiles in the 1960s (Itakura, 1997). Then, Nissan amalgamated Prince with the intermediation of the minister of international trade and industry in 1965.

However, again the influence of MITI was not strong enough to organize all automakers into the two groups. Although MITI could make Nissan and Prince combine, other relatively small automakers chose to cooperate with the foreign automakers. Although Hino and Daihatsu chose to make a business tie-up with Toyota, Mitsubishi Motors concluded a capital tie-up with Chrysler in 1969, and Isuzu made a business tie-up with GM in 1970. Consequently, the number of automakers did not change as MITI desired.

From these episodes, it might be clear that the auto industry and MITI had, over time, formed the core of the policy network (i.e a small cooperation network) in economic policies related to automobiles in the early 1950s. Although their engagements were not always cooperative, as mentioned earlier, the core of the policy network shared both the economic interests and an appreciative system that the auto industry needed to be protected for its development.

Automobile Air Pollution in Metropolitan Areas

Automobiles and road passenger/freight transport were concentrated into metropolitan areas, leading to the occurrence of automobile air pollution and deterioration of urban air quality. This section first examines why concentration of automobiles and road passenger/freight transport into metropolitan areas happened. Then, it presents the situation of automobile air pollution in metropolitan areas.

The number of automobiles and the volume of passenger/freight transport increased significantly because automobiles came to be produced massively and cheaply and the income of the Japanese

people increased; a number of roads were constructed and the demand for road freight transport increased. Due to such a great increase, automobile air pollution became notable in the 1960s and especially in the late 1960s (EA, 1970). In addition, it seems that automobile air pollution became especially problematic in metropolitan areas such as in Tokyo and Osaka. Further, industrial air pollution was also very serious in these metropolitan areas. Consequently, the mixed air pollution had been notable specifically in these metropolitan areas (EA, 1969).

One of the main reasons for this might be that these metropolitan areas had the highest concentrations of population, automobiles and passenger/freight transport. Regarding population, for instance, Tokyo had 11.1 percent of all the population (10.87 million people) and the Tokyo area had 21.4 percent (21.02 million people) in 1965 (MoT, 1968). Also, Osaka had 6.7 percent, and the Osaka area had 16.4 percent (MoT, ibid). Thus, 37.8 percent of people lived in these two areas and almost 50 percent of them lived in three metropolitan areas (MoT, ibid).

This increase may have been brought about mainly because economic activities in those three areas were the most brisk (Economic planning agency, 1969). In addition, the industrial structure of Japan had changed from the primary industry to the secondary industry in the 1960s and a number of factories were constructed in those areas, which enabled workers in the primary industry to move into the metropolitan areas (MoT, 1968).

As well as the factories, the number of companies increased significantly in those metropolitan areas. In addition, the great concentration of factories and companies in those three metropolitan areas stimulated brisker economic activities, which in turn brought about a concentration of population in those areas. Further, due to the stimulated economic activities, the middle classes developed and those metropolitan areas formed mass consumption markets, which then attracted new factories and new companies to come into those areas.

Because of the highest concentrations of population and very active economic activities, as well as

the beginning of motorization in the mid-1960s, the number of automobiles and the volume of road passenger/freight transport greatly increased in those areas in the 1960s. For instance, in 1967, 32 percent of all automobiles existed in Tokyo, Osaka, Aichi and Kanagawa (Jidosha kogyo shinkokai, 1971). Especially, Tokyo, Osaka and Aichi had 28 percent. In addition, a large proportion of the volume of road passenger/freight transport was carried out in those metropolitan areas. In 1967, for instance, in terms of weights of goods transported, Tokyo had 12.3 percent of all the volume of the road freight transport and 23.2 percent of all the road passenger transport (MoT, 1968; see Appendix F). In addition, Osaka had 8.5 percent of all the volume of the road freight transport and 8.0 percent of all the road passenger transport (MoT, ibid).

Although the state invested a huge amount of money for the construction of roads, automobile air pollution, especially CO and lead toxicity, had not been improved in those metropolitan areas because the number of automobiles and the volume of the road passenger/freight transport increased more greatly (EA, 1967, 1969; MoT, 1967). Further, a number of factories were concentrated in these areas and they emitted a huge amount of both sulphur oxides (SOx) - due to the increasing combustion of heavy oil - and dust, from combustion of coal. Consequently, air pollution was concentrated especially in those metropolitan areas.

This section has shown that automobile air pollution was notable in metropolitan areas because of higher concentrations of population, automobiles, and road passenger/freight transport. This was one of the appreciative systems in the core of the policy network of automobile air pollution policies. This section has sought to emphasize this appreciative system because the appreciative system was very important in the 1980s, the 1990s and the 2000s.

Automobile Air Pollution Policies

In the early 1960s, as automobile air pollution was becoming recognized, traffic controls were performed from 1960 in Osaka and from 1962 in Tokyo, although they were applied only to the large size trucks. Then, because automobile air pollution became notable in the mid-1960s, TMG established the Institution of pollution for research regarding automobile air pollution, and took an initiative in installing an afterburner on automobiles of the Metropolitan police in 1967. Further, TMG decided that it would carry out their own automobile air pollution policies and it asked the state to give them authority to enforce their own policies (C30). However, the state did not allow local government authorities to enforce their own policies (C30).

As mentioned above, it was considered that automobile air pollution was brought by the insufficient number of roads and inappropriate maintenance of automobiles (MoT, 1964) and that automobile air pollution was notable only in a few metropolitan areas. Consequently MoT sought to solve this problem by encouraging owners of automobiles to regularly inspect and maintain their automobiles as well as constructing and improving roads (MoT, ibid). As this policy of MoT was not effective, automobile air pollution became worse (MoT, 1965). In addition, although Japan did not have environmental laws or environmental standards for automobile air pollution until 1968, it was forbidden for automobiles to emit much exhaust gases by the road transport vehicle law and the road traffic law, and it had been stipulated by article 31 of security standards based on article 41 of the road transport vehicle law, that bad smell gases and toxic gases must not be emitted greatly from automobiles.

Although MoT was responsible for these two laws, a wide range of ministries and agencies were related to automobile air pollution policies (C3, C13, C31). For instance, MoT, MITI, MoH, MoC and the National Police Agency (NPA) joined the liaison committee on pollution policies, which existed in the Prime Minister's office and this liaison committee discussed automobile air pollution policies in the future (C1, C4, C6). Further, engineers in MoT, MITI and MoH and Science and

Technology Agency (STA) or those in their research institutes, took part in the liaison committee on air pollution prevention, and research was established in STA, and the liaison committee discussed technology policies to promote technologies for automobile air pollution (C1).

MoT was responsible for road transport administration. Because the goal of or, in other words, the main interest of MoT was to promote appropriate road transport and solve problems related to road transport, and because automobile air pollution was a problem in road transport, MoT sought to solve the problem. The main roles of MoT were to make regulations on safety about road transport and to supervise both maintenance and inspection of automobiles (C7c). In addition, MoT studied problems of automobiles on the actual running condition and carried out research to improve automobiles in its ship research institute (C7c, C15b).

Though MoT was one of the main authorities on automobile air pollution, MITI and MoH were normally responsible for pollution problems, and they had both sections of pollution problems and committees on pollution problems, in which specialists discussed certain pollution issues (C12). Although those ministries had relatively good relationships (C25a), the public normally considered that MITI was on the industry side, while the MoH was on the public side (C25a). It might be natural because MITI sometimes criticized the anti-pollution campaigns and sought to protect economic activities (C37). MITI sought to prevent automobile air pollution from happening and reduce it as much as possible, because MITI was responsible for industrial pollution, and it supervised production and distribution of automobiles and supervised research institutes of the automakers (C7b, C15b, C31). MITI had the research centre on safety and pollution of automobiles, in which MITI, the auto industry and researchers collaborated to develop technologies on automobiles in order to reduce exhaust gases (C16, C23). In addition, MITI sought to improve automobiles so that Japanese automobiles could be more sold in foreign nations (C16, C23). As well as the technical assistance, MITI financially assisted the auto industry in order for the industry to develop technologies on

exhaust gas reduction.

Although MITI and MoT carried out similar research on automobiles and supported technically the auto industry, MoT carried out the research in order to establish regulations on automobile air pollution, while MITI did so in order to advance exhaust gas reduction technologies because it was necessary for the auto industry to develop (C17, C18, C34). Because of this difference, the research institute of MITI had more financial and human resources and carried out more advanced research than that of MoT (C18).

Further, although both MITI and MoT were the main authorities on automobile air pollution, they had their own territories. Indeed, there was a statement of official agreement on automobile air pollution policies between MITI and MoT that MITI supervised the auto industry in terms of automobile production while MoT supervised the industry in terms of the establishment of regulations (C22a). MITI decided how much exhaust gases could be reduced considering the current level of technologies that the auto industry cooperatively told MITI, and ordered the auto industry to develop technologies by the amount that MITI determined. Then, MoT inspected and maintained automobiles that automakers produced which met the requirements of MITI on the actual driving conditions (C22b). In addition, MITI and MoT very frequently contacted each other on automobile air pollution issues (C7c, C9, C15a).

MoH was responsible for pollution in order to protect the public health, and MoH played a central role in pollution administration in general before EA was established. Concerning automobile air pollution, MoH monitored automobile air pollution and investigated the adverse health effects of automobile air pollution (C6a, C17, C31). MoC was responsible for road construction and, as improving roads, especially constructing multi-level crossings, was considered as the most appropriate policy tool for automobile air pollution, MoC was related to automobile air pollution policies (C12, C17). NPA monitored automobile air pollution and its adverse health effects and

clamped down on diesel automobiles emitting black smoke on roads and ordered their owners to maintain their diesel automobiles (C6c). Finally, the main role of STA was to study technologies to reduce exhaust gases (C7a)

Concerning relationships between the auto industry and the state actors, close relationships can be identified both between MoT and the auto industry and between MITI and the auto industry (C7c). MITI and MoT participated in the committee on technologies of JAMA in which representatives of each automaker took part. Further, MoT consulted the auto industry on all issues about automobile air pollution. For example, MoT decided how to examine automobiles in terms of exhaust gas emission after the ministry listened to opinions of the auto industry (C7b). Moreover, MoT often told the auto industry about the drafts of automobile air pollution policies (C8a). Thus, the auto industry could be aware of these drafts of automobile air pollution policies before drafts were made in public. Thus, it can be said that the auto industry was incorporated into the policy-making processes of MoT. In addition, as MITI and the auto industry had quite close relationships, MITI also frequently contacted and consulted the auto industry on automobile air pollution policies (C8b). Thus, it can also be said that MITI incorporated the auto industry into its policy-making processes. However, it seems that the incorporation of the auto industry into the policy-making processes could not be strong as automobile air pollution policies such as promoting the maintenance of automobiles and constructing multi-level crossings did not require much cooperation or technical information of the auto industry. In addition, because MITI, MoT and the auto industry discussed automobile air pollution policies before they were established, it can be stipulated that they sought to have consensus on automobile air pollution polices. Moreover, as members in the core of the policy network discussed and examined drafts of automobile air pollution policies in secret before they were made in public, secrecy might be one of the features of the policy-making processes on automobile air pollution. Consequently, it was often criticized that both MITI and MoT represented

the interests of the auto industry (C28a, C28b). From the discussion above, it is now apparent that MITI, MoT and the auto industry formed the core of the policy network surrounded by the periphery of the policy network to which other relevant state actors belonged.

In addition, automobile air pollution policies in Japan were influenced by the US government. There were a few reasons for this. First, in the mid-1960s, only the US carried out regulatory policies on exhaust gases (C10). Second, the US automakers had more advanced technologies on exhaust gas reduction than both European and Japanese automakers (C11a). Third, the Japanese export of passenger automobiles was greatly dependent on the US auto market. In addition, the Japanese government and the US government exchanged technologies, information and knowledge on automobile air pollution in the specialist section of air pollution in the Japan-US meeting on development and utilization of natural resources (C2). Automobile air pollution policies in Japan were established based on discussions with the US government as well as discussions among the relevant state actors (C3).

The Establishment of the First Emission Standards

As described above, automobile air pollution policies were influenced by the US government. The establishment of the first emission standards for CO were also affected by the establishment of emission standards in the US. In 1966, the US proposed that it was going to enforce emission standards for Hydrocarbon (HC) and CO from all passenger automobiles from 1968 (C11b). Influenced by this proposal as well as the deterioration of air quality and the increased public concerns on automobile air pollution, the Government decided to enforce the first emission standards for CO, although the auto industry maintained that the establishment of emission standards for CO was too early (C8c). The automakers discussed the values of the emission standards for CO at the

meeting of JAMA before they discussed the values with MoT (C10, C14a, C15a). The automakers competed with each other very fiercely to increase their domestic share (C24a). However, in terms of exhaust gas issues, they greatly cooperated with each other and positively disclosed data on exhaust gas technologies of each automaker at the committee on technologies of JAMA (C24b).

The automakers recognized that they needed to develop technologies for exhaust gas reduction because the US government considered the establishment of emission standards (C5). Although only Nissan and Toyota exported passenger automobiles to the US in 1966, MITI and the auto industry recognized that producing low emission passenger automobiles would be great advertisements for Japanese passenger automobiles. Consequently, as other automakers were greatly interested in exporting their automobiles to the US, all the automakers sought to seriously develop technologies for reducing exhaust gases.

Then, MoT discussed the values with JAMA and decided that MoT was going to enforce the emission standards for CO and so the values were set as 3 percent by weight (C14b, C15a, C19). As is the same in all the following emission standards, the emission standards for CO were set for new automobiles, though all automobiles eventually need to achieve the standards when they have a regular inspection after a certain period of grace period. Although the values were less stringent than the US counterparts, MITI justified achieving the values required almost the same levels of technologies, because of different road conditions (C25). When automobiles run smoothly, they did not emit much CO. However, when automobiles could not run smoothly like in traffic jams, they emitted more CO. As roads in metropolitan areas of Japan had more traffic jams than the US, automobiles in Japan emitted more CO (C25). Thus, the core members of the policy network considered that the automobile air pollution was due to the insufficient number of roads and that it was a local problem. Indeed, for instance, the head of the petroleum department of MITI told the press that exhaust gases might not contribute to air pollution (C6b). Moreover, Koji Matsuda, the

president of Toyo Kogyo, argued that if the public criticized exhaust gases too much, the state had to just build chimneys around roads (C34). Further, Hanji Umehara, the senior vice-president of Toyota, maintained that only a few areas of Tokyo had serious automobile air pollution in Japan (C10). In addition, it seems that the core members considered that emission standards needed to be the same as those of the US but that they did not need to be stricter than them. This was a new important appreciative system in the core of the policy network.

As mentioned above, a wide range of ministries and agencies had been related to automobile air pollution policies. However, after it was decided that the first emission standards for CO were to be enforced in 1968, MoT proposed that MoT wanted to be exclusively responsible for emission standards (C25a). Although MoH maintained that both MoT and MoH had to be responsible for emission standards, MoH compromised because MoT promised that it would establish emission standards after MoH agreed to the emission standards proposed by MoT (C25b, C35). The compromise also came from the fact that MoT had substantially supervised the auto industry and that it had more influences over the industry than MoH (C26b) - indeed, because MoH was a less powerful ministry than MITI and MoT which were closely related to the industry (C27).

MoT strongly sought to be exclusively in charge of emission standards because MoT considered that emission standards were closely related to safety issues in both automobiles and road transport (C26a). Because securing safety in both automobiles and road transport was the most important for MoT, emission standards were critical issues as it was possible that automobiles would become less safe because of the improvement and development of engines to reduce emissions (C28b). Because MoT sought to keep good relationships with the auto industry in order to effectively enforce emission standards, MoT negotiated and bargained with the auto industry, and consequently it could not enforce as strict emission standards as MoH wanted (C35, C40).

As for MITI, because developing exhaust gas technologies became necessary, as mentioned above,

MITI sought to arrange the automakers into a few groups because dispersed information and data could be concentrated (C29). MITI considered that the auto industry was the most important export industry and that the industry had to have the most advanced exhaust gas technologies to strengthen the international competitiveness (C38a, C38b). Although MITI sought to merge domestic automakers with other domestic automakers and told the US that the Japanese government would not allow the US automakers to tie up with the Japanese automakers at the Japan-US automotive negotiations in August 1967, Mitsubishi motors voluntarily decided to tie up with Chrysler (C38b). This was very shocking for MITI because the auto industry disobeyed an order of MITI (C38b). In the late 1960s, it was often said that the auto industry became less loyal to MITI because it got the very powerful industry (C21, C39). Indeed, in the late 1960s, the auto industry became one of the most powerful industries and the industry most greatly exported their products than other industries.

However, the state actors still influenced the auto industry. For instance, in order to reduce CO, there were mainly two ways for its reduction; one was to invent a new engine design and the other was to install afterburners. The US had adopted the latter, but it became clear later that it was not practicable in terms of durability. Then, the US chose to invent a new engine design. Then, MoT forced the automakers to reduce exhaust gases including CO by designing a new engine. Moreover, cheap measuring equipment for automobile exhaust gases was unavailable and thus MoT asked the automakers to establish research facilities for its invention, while MoT also strengthened its own research centre (C3). Thus, the auto industry was still dependent on MoT for the technical assistance. Further, MITI supplied greatly both the technical and financial assistance to the auto industry (C36). From these facts, the auto industry was still dependent on MITI and MoT.

Although the first emission standards were enforced, it was still considered that the main measures for automobile air pollution were constructing multi-crossings and maintaining automobiles (C20, C41). Regarding the maintenance of automobiles, the new guideline for inspection and maintenance

for automobile exhaust gases was established. In Japan, automobile users had to take regular checks and maintenances of their automobiles because of the Ordinance No. 70 of MoT, which required the cleaning of exhaust gases (MoT, 1968). Before its introduction, the requirements of checks and maintenances had focused on the securing of safety, and thus the new guideline was established so that the checks and maintenances that emphasized the clearing of the exhaust gases would be strongly promoted.

Examination of Policy Changes in the 1960s based on the Policy Networks Framework

After discussing a wide range of issues on automobile air pollution policies in the 1960s, this section attempts to analyse both the policy network of automobile air pollution polices and the establishment of the first emission standards on CO, based on the policy networks framework. The identified policy networks are displayed in the end of this chapter.

The policy network of automobile air pollution policies (Figure 5-3)

In terms of automobile air pollution policies, before the policy network of emission standards was established, automobile air pollution policies were dealt with in the policy network of automobile air pollution policies. MITI, MoT and the auto industry formed the core of the policy network characterized by resource interdependency relationships but weak exclusiveness. Though MITI and the auto industry had strong relationships in economic issues, MoT and the auto industry formed a dominant alliance in the core of the policy network of automobile air pollution policies because MoT mainly dealt with issues related to road transport. In addition, there was the periphery of the policy network in which MoH, MoC, NPA and STA took part. The boundary between the core and the periphery was not strict and the peripheral members, especially MoH could join and influence the policy-making processes.

The core of the policy network members frequently contacted each other to discuss important issues on automobile air pollution policies. Because MoT did not need technical information and cooperation very much, it is likely that they frequently interacted with the auto industry. In addition, frequency of interactions on automobile air pollution policies between MITI and the auto industry was less than that between MoT and the auto industry.

While MITI and MoT had ministerial interests, respectively economic interests and interests of promoting appropriate road transport, the auto industry had strong economic interests. Though their interests were different, those interests did not conflict with each other and they had consensus over automobile air pollution policies, the appreciative systems and the rules of the game.

In addition, all the core policy network members had resources. MoT had the authority for road transport administration, and could permit access to the policy-making processes and give protection to the auto industry; MITI had the authority for industrial pollution and economic issues, and could give protection to the auto industry and grant access to the policy-making processes; the auto industry had economic resources and technical information, and could influence results of automobile air pollution policies. Although the resources were almost equally distributed to all in number, they were not equally distributed in terms of their influences. Because it was considered that economic development had to be given a priority, it seems that the resources of MITI were more influential than those of MoT. In addition, the resources of the auto industry were less influential because technical information of the auto industry was not significant, as MITI and MoT had technical information as much as or perhaps more than the auto industry. In addition, because the auto industry greatly depended on MITI and MoT for protection and financial and technical assistance, it seems that the auto industry could not refuse to cooperate in automobile air pollution policies or to greatly influence the results of automobile air pollution policies. Similarly, power was distributed to all, but it seems that the state actors, especially MITI, were more powerful than the

auto industry because of the same reasons mentioned above. As far as the distribution of resources within the auto industry is concerned, Nissan and Toyota had more economic resources and technical information, but the automakers competed fiercely with each other so that Nissan and Toyota might not distribute their resources to the smaller automakers very much. As in the distribution of resources, the power was distributed to all, but it seems that the state actors, especially MITI, were more powerful than the auto industry.

Finally, in terms of strategies, all of the core policy network members had distinctive strategies. Regarding strategies of the auto industry, one of the strategies was manipulation of technical information as MITI and MoT needed the technical information in making automobile air pollution policies. Further, cooperation was also another strategy of the auto industry because MITI and MoT required the cooperation of the auto industry in order to establish and enforce automobile air pollution policies. However, as mentioned earlier, because automobile air pollution policies at that time did not 'greatly' require technical information and the cooperation of the auto industry, these strategies were not so effective.

The first policy change (Figure 5-4)

The first policy change was the establishment of the first emission standards for CO. It seems that this policy change was significant because the policy network of emission standards was created. The policy change was brought by several factors including the establishment of emission standards in the US, the deterioration of the air quality and the increased public concerns of automobile air pollution. Especially, the establishment of the emission standards in the US was the most influential because automobile air pollution policies in Japan were influenced by the American automobile air pollution policies, and the automakers needed to achieve the American emission standards to export their products to the US. Consequently, the core of the policy network members recognized that the

emission standards needed to be established, although they needed to be almost the same as, and not to be stricter than, those of the US.

The policy network of automobile air pollution policies dealt with a wide range of issues related to automobile air pollution policies, and various state actors could join the policy-making processes. However, because the enforcement of emission standards required improvements of engines, which could in turn affect the safety of automobiles, MoT sought to be exclusively in charge of emission standards as the promotion of appropriate road transport, including safety, was the main interests of MoT. Consequently, the new core of the policy network of emission standards, characterised by high integration and exclusiveness, was created by MoT in order to protect its interests by excluding other actors which had conflicting interests for MoT.

As the policy network of emission standards was created out of the policy network of automobile air pollution policies, the characteristics of the policy network of emission standards were almost the same as those of the policy network of automobile air pollution policies. However, there were some differences in the characteristics between these two different networks.

First, although the core members did not change, MoT became the main actor in making emission standards because the enforcement of emission standards required improvements of engines, as described above, which could in turn affect the safety of automobiles. As the promotion of appropriate road transport was the main interests of MoT and its interests could be in danger, MoT became the most active among the core policy network members, and its interests became the most dominant. Further, as MoT could substantially become the policy-making ministry of emission standards, two of its resources (granting access to the policy-making processes and the authority for road transport administration) became more powerful. In addition, although the boundary between the core and the periphery was not strict in the policy network of automobile air pollution policies, the boundary was strict because MoT did not want other conflicting interests to influence the

policy-making processes, and other actors were strongly excluded from policy-making processes of emission standards. Further, though a wide range of state actors were related to previous automobile air pollution policies, a limited number of them were related to emission standards. In addition, MoT, as described above, sought to be exclusively responsible for emission standards and to exclude other state actors with different or conflicting interests, the number of related state actors decreased in the policy network of emission standards.

However, as the establishment of emission standards required technical information and cooperation of the auto industry, both of which were resources of the auto industry, MoT became more dependent on the auto industry. Further, as the auto industry became one of the greatest contributors to the Japanese economy, its economic resources became more significant. Thus, the auto industry also became more powerful. Consequently, it seems that MoT and the auto industry became the main actors. In addition, from the discussion above, it can be clear that resource interdependency relationships between MoT and the auto industry became stronger, and they needed to frequently contact each other to examine issues on emission standards, although all the core policy network members had resource interdependency relationships and contacted on issues of emission standards. As a result, the alliance between MoT and the auto industry became the dominant alliance in the core of the policy network.

Second, the appreciative systems also changed. As mentioned above, because the Japanese government sought to follow the US in automobile air pollution policies and the automakers needed to achieve the US emission standards, the core of the policy network came to consider that emission standards needed to be established, though the emission standards in Japan had to be almost as the same as, and had not to be stricter than, those of the US. Because all the core policy network members shared this idea, it can be said that this was a new appreciative system. In addition, regarding the appreciative system that automobile air pollution policies were technical matters,

technical matters came to involve engines and exhaust gas reduction technologies as well as maintenance. Moreover, two of the appreciative systems that automobile air pollution was a local problem, and that automobile air pollution was due to the insufficient supply of roads became weak because it was becoming recognized that reduction of automobile air pollution required improvements of automobiles rather than improvements in problems particular to certain metropolitan areas. Third, strategies changed too. As MoT became more dependent on the auto industry for its resources, it became necessary for MoT to negotiate and bargain with, rather than consult, the auto industry, and it became effective for MoT to incorporate the auto industry into policy-making processes of emission standards, namely making them members of the automobile committee of the transport technology council which was an advisory body of MoT and in which emission standards were discussed by a wide range of specialists. As for the auto industry, because MoT became more dependent on the technical information of the auto industry, the manipulation of technical information became an effective strategy. Third, the distribution of the resources and the power changed too. Concerning the distribution of the resources, although it did not change in number, as mentioned above, the resources of both MoT and the auto industry became more influential. As for the power distribution, MoT and the auto industry similarly became more powerful.

Conclusions

The chapter discussed automobile air pollution policies in the 1960s. The first section of this chapter identified a high level of economic development in the 1950s and 1960s, which increased the income of Japanese people and changed their lifestyle. Because of the effects of economic development, the number of automobiles and levels of transport by automobiles greatly increased.

Consequently, traffic jams and resulting automobile air pollution became notable in the metropolitan areas. Then, the state sought to solve this problem by constructing roads but constructing roads in fact further stimulated those trends.

Second, this chapter examined the relationships between MITI and the auto industry. The section showed that the values of automobile production, especially production of small passenger automobile production, had tremendously increased after 1966, the so-called 'starting year of my car'. Then, the section identified that the auto industry had been led and protected by MITI. However, the section also specified that its economic activity was not perfectly controlled by MITI and its free economic activity was respected by MITI. Third, the chapter examined automobile air pollution in metropolitan areas and identified that automobile air pollution happened mainly in metropolitan areas because of concentration of population and businesses into those areas. Fourth, the chapter discussed automobile air pollution policies before the first emission standards were established. Fifth, the chapter examined how the first emission standards were established. Finally, the last section analysed both the policy network of automobile air pollution policies and the establishment of the first emission standards on CO, based on the policy networks framework.

The next chapter examines automobile air pollution policies in the 1970s. The 1970s was the most turbulent era for automobile air pollution policies and the next chapter is consequently the largest among the three presentation chapters.

Figure 5-3 The Policy Network of Automobile Air Pollution Policies

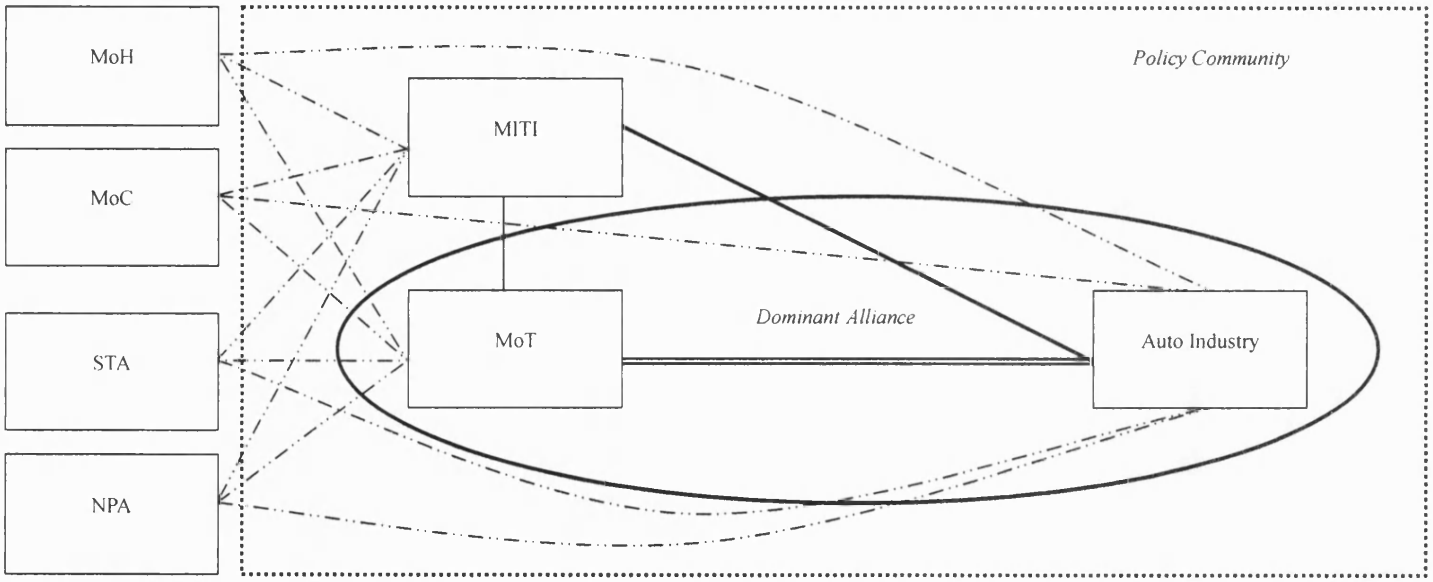
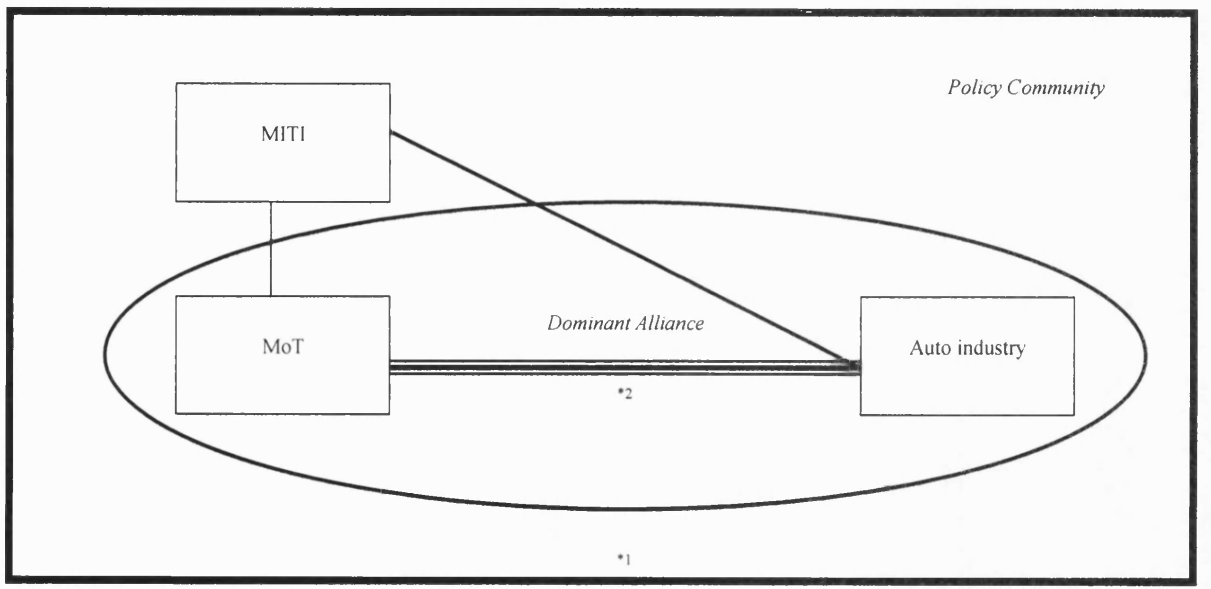


Figure 5-4 The Policy Network in the First Policy Change



*The key changes in the diagram are: the decrease in the number of related actors, the boundary between the core and the periphery becoming stricter (*1) and the relation between MoT and the auto industry becoming more crucial (*2).

Chapter 6

The Case of Automobile Air Pollution Policies in Japan

1970s

Introduction

This chapter deals with automobile air pollution policies in the 1970s, the most turbulent era in the history of automobile air pollution policies in Japan. As shown in the previous chapter, automobile air pollution became prominent because of various factors. In the 1970s, as automobile air pollution became critically and deadly serious, automobile air pollution policies greatly advanced.

The degrees of advance in automobile air pollution policies in the 1970s were the greatest compared to those in other eras. However, such a great advance in automobile air pollution policies in the 1970s was not easily achieved. Automobile air pollution policies were developed because of the serious situation of automobile air pollution, high public demand for improvement of automobile air pollution and the establishment of strict emission standards in the US. However, the great advance was hampered by occurrence of the oil crisis, stagnation of economic development and the decision of the US government to postpone the enforcement of the strict emission standards of the US Muskie law in the mid-1970s, although the great advance was achieved in the long run in the mid-1970s to the late 1970s.

In addition, although emission standards were greatly advanced in the 1970s, the national ambient air quality standard for NOx was greatly eased. Consequently, in terms of the national ambient air quality standard for NOx, automobile air pollution became greatly improved, and automobile air

pollution became the environmental problem notable only in the metropolitan areas. This chapter discusses those ups and downs of automobile air pollution policies in the 1970s.

The results presented in most of this chapter are the researcher's own results based on the secondary data collected, and original analysis. The establishment of the Japanese Muskie law was possibly the most important event in the history of automobile air pollution policies, and the relaxation of the national ambient air quality standard was often referred to as a symbolic event of retreat in environmental policies in the late 1970s, both of which dominates most parts of this chapter. There were several books that depicted them (Nishimura, 1976; Kawana, 1988, 1993b; Katagata, 1974; Hashimoto, 1988). Although the research referred to those books, they did not provide sufficient data that the research needed to analyse automobile air pollution policies in the 1970s in terms of the policy networks framework. Then, the source of data that the research depended on most in this chapter was the Diet paper because the Diet paper provided more useful data in this analysis than other sources. The Diet paper identified characteristics of both the policy network and members of the policy network and changes within the policy network in policy changes, all of which has seemingly never been disclosed. Therefore, the results are original and it is likely that no similar research has been done before.

Automobile Air Pollution and its Policies before the Japanese Muskie law

Lead air pollution and photochemical smog

In 1970, some serious environmental incidents on automobile air pollution happened. First, the lead pollution incident occurred at the crossing of Ushigome Yanagi Cho in Shinjyuku Ward of Tokyo in May (EA, 1971; Katagata, 1974). The media reported this issue every day and the Japanese people were very shocked (C43). Second, the photochemical smog incident occurred (Fujita, 1991).

On the 18th of July, almost 6,000 people suddenly suffered pain of the eyes and throat in Suginami Ward of Tokyo (EA, 1971). This incident was considered as the results of photochemical smog, which was, it was thought, due to nitrogen dioxide (NO_2) emitted from automobiles (C45). Again, the media picked up on this issue greatly and people got frustrated about automobile air pollution. These incidents, especially the photochemical smog incidents, made both the people and the government recognize automobile air pollution as the most serious social problem.

Automobile air pollution policies before the Muskie law

Before these incidents happened, MoT recognized that automobile air pollution would reach an extreme situation in the near future because of the recent sharp increase in the number of automobiles (C41; see Appendix C, D&E). Then, MoT made an inquiry on a long-term basic plan on automobile air pollution policies to the automobile committee of the transport technology council, which was an advisory body of MoT to examine inquiries made by MoT and make propositions on transport technology issues for MoT.

On the 20th of July, the committee issued its interim report (EA, 1972; C52a). First, the report suggested that there was a need to pick up CO, NOx, HC and lead compounds as air pollutants and to scientifically monitor situations of automobile air pollution. Second, it proposed that two-step targets in 1973 and 1975 needed to be set in order to reduce emissions, by which the amount of emissions in 1975 would become equivalent to that of 1963, and its amount in 1980 would become equivalent to that of 1961. Third, in order to achieve those targets, it suggested that regulations for emissions from newly produced automobiles needed to be gradually strengthened. Fourth, it proposed that the exhaust gas problems had to be considered in terms of urban planning and arrangements of transport systems. Finally, in order to promote those strategies, the report maintained that both support of the state and international cooperation would be necessary.

Based on this report, it was decided that MoT would enforce the first emission standards for NOx in 1973 (0.9g/km) and reinforce them in 1975 (0.6g/km). It seems that this decision was influenced by several factors. First of all, automobile air pollution became critically serious and MoT recognized the need to establish and reinforce emission standards. Second, the Japanese people became greatly concerned about automobile air pollution and they strongly demanded strict automobile air pollution policies. Third, the US was going to enforce the emission standards for NOx in 1973 and its values were 0.6g/km. Because the automakers had to achieve the emission standards, MoT sought to enforce the same emission standards as those of the US. In addition, as it was decided that emission standards of most notable pollutants such as NOx, HC and CO were to be enforced, it can be said that the state considered that the emission standards were the main policy tool, though the previously main tools such as promoting maintenance of automobiles and constructing roads were still recognized as effective policy tools. Consequently, the policy network of emission standards became the most dominant policy network in the policy networks of automobile air pollution policies. In addition, it became less considered that automobile air pollution was due to inappropriate maintenance of automobiles and insufficient supply of roads and local problems because it became recognized that emissions of passenger automobiles mainly contributed to automobile air pollution.

Though MoT decided to enforce the emission standards based on the report of the automotive committee, it was criticized that its interim report was significantly influenced by two of its members who came from the auto industry. The members of the committee involved representatives of the automakers from Toyota and Hino (C65b, C65a). It was told that, although some of the members of the committee sought to establish very strict emission standards, such suggestions were rejected because of their strong oppositions. Consequently the values (0.09g/km in 1973) were determined in terms of the US emission standards (Mainichi Shinbun, 11 July 1970). Further, although the values

were the same as those of the US emission standards, the time limit was two years after those of the US emission standards. MoT sought to establish emission standards that enabled automobiles both to be used safely and to reduce emissions to the level of minor health damages because safety issues were the most important interests of MoT (C65a, C75b). Then, MoT accepted the request of the automakers to implement the US 1973 emission standards in 1975 so that it would become more probable that their new automobiles could be lower emissions and safer. In addition, it may be possible that MoT responded to the demands of the auto industry to keep cooperative relationships with the industry.

This issue highlighted the influences of international policies or US automobile air pollution policies on Japanese emission standards. As the values of exporting automobiles to the US increased, achieving the US emission standards was a must for the automakers, and it can be said that the US emission standards were as important as those of Japan. This also highlighted the strong influences of the automakers in the policy-making processes of MoT. As they were granted access to the policy-making processes, they were able to influence the policy outcomes. While it was criticized that the *representatives* of the automakers could be the members of the committee to discuss the technological issues on the automobile emission controls, Tomizaburo Hashimoto, the minister for transport, maintained that the automakers had to be its members because it was necessary to listen to their opinions on developments of new technologies and automobile air pollution policies would be ineffective without their information (C65c). The discussion above indicates that MoT was dependent on the automakers for their technical information while the automakers were dependent on MoT for permission of access to the policy-making processes. This was a key feature of the core of the policy network in this period. In addition, it seems that their relationship was not equal and that MoT was more powerful than the auto industry. In fact, MoT did not leave development of technologies to reduce emissions to the auto industry but the ministry sought to make the state

supervise it (C47).

In this period, the interests of reducing emissions as promotion of appropriate road transport were powerful because MoT made itself exclusively responsible for emission standards. In addition, MoT considered that economic development could not be achieved with pollution and that it could be achieved by strongly implementing anti-pollution programmes (C47). Because of this positive attitude towards reinforcement of automobile air pollution policies, the auto industry often complained of MoT (C50).

All the automakers generally did not want to have strict emission standards. Nevertheless the automakers recognized that they had to reduce emissions to achieve the US emission standards to export their passenger automobiles into the US. Thus, it seems clear that most automakers had purely economic interests. However, some automakers had different interests. Automakers such as Honda positively considered that pollution prevention was an opportunity to increase shares. Indeed, Soichiro Honda, the President of Honda, argued that the 1970s would be an era of pollution prevention and an automaker would destroy itself if it failed to appropriately deal with automobile air pollution (C46). Thus, it can be said that their interests were not purely economic but 'environmental' economic. Although there were two kinds of different interests, all of them recognized the need to reduce emissions. In fact, the auto industry greatly increased its spending on the research of emission reduction technologies (C41, C48a). Therefore, their interests did not conflict. In addition, as MITI also recognized that it was necessary to achieve the US emission standards, all of the interests in the core of the policy network did not conflict either. Although all of the automakers sought to develop technologies to reduce emissions, they normally sought to competitively develop technologies because they thought that technological competition among the automakers would most effectively lead to great technological developments (C89b, C93b). The differences in the interests of the automakers, and the technological competition stimulated by the

establishment of the strict US emission standards, contributed to the establishment of the 1975 emission standards of the Japanese Muskie law.

The US and Japanese Muskie Laws

Establishment of the Muskie law in the US

In 1970, a very influential incident on automobile air pollution policies happened in the US. Senator Edmund S. Muskie created a very ambitious bill that required 90 percent reduction from the 1970 standards in HC and CO emissions from all new automobiles and light trucks for 1975 and the same level of NOx reduction for 1976 (Katagata, 1974; Kawana, 1988). The clean air act amendments of 1970, or the so-called Muskie law, significantly advanced the policies to improve air quality in the US (Cochran *et al*, 1999). The bill was passed and President Nixon signed the clean air act amendments (Davies and Davies, 1975). The figure, 90 percent, came from the amount of reduction necessary for protecting human health. This act sought to promote the technological developments to reduce the hazardous air pollutants and it was thus called 'the technology-forcing policy' (Melnick, 1983; Gerald and Lave, 2003).

If Japanese automakers could not meet the standards, their automobiles could not be sold in the US. They were provided approximately only a three and a half year time horizon to develop a way to reduce emissions by 90 percent. In Japan, it was said that the US was going to enforce the Muskie law to establish a non-tariff trade barrier to exclude Japan from the US auto market (Kido *et al*, 1970). It was thought that the big 3 had much more advanced technologies than the automakers of Japan. Thus, when the Muskie law was established, it was supposed that only the big 3 would achieve its requirements, while the Japanese automakers would not. Further, it was expected that the big 3 would obtain the patents on exhaust gas reduction technologies in Japan when they invented

them (Kawada, 1970). The Japanese automakers and even the Japanese government feared that, with those patents, the big 3 would require both the establishment of the joint enterprises and the liberalization of the capitals in Japan (Kido *et al*, 1970). Although all the automakers surely did not want to have such strict emission standards, they considered that they had nothing but to achieve the Muskie law in order to export their automobiles.

MoT assumed that the enforcement of the Muskie law would be technically quite difficult and doubted that those automobiles achieving such strict requirements of the law could be used without any problem (C55). However, as Japanese automobile air pollution policies followed those of the US, and MoT sought to reduce emissions because it was responsible for emission standards, the ministry proposed that the technology developments for emission reduction had to be more promoted in order for the automakers to achieve the Muskie law (C61a, C64, C70a). In addition, at the committee on transport in the House of Councillors on the 16th of February 1971, Tomizaburo Hashimoto mentioned that the automakers would be able to achieve its requirements by making a great effort for it, though great subsides from MITI would be necessary.

MITI considered that, although it was not clear if the Muskie law was feasible, greatly severe competitions on emission reduction technologies among advanced nations would take place in the near future. Thus, MITI recognized that it would be necessary for the automakers to achieve the Muskie law (C52b). Moreover, Kiichi Miyazawa, the minister for international trade and industry, stated that the automakers would be able to satisfy its requirements because there was a lot of time remaining. This indicates that all the members of the core of the policy network basically agreed to establish the Japanese Muskie law, and their interests did not conflict although they had distinctive interests such as economic interests of MITI and some automakers, environmental economic interests of other automakers and interests of promoting appropriate road transport of MoT.

In addition, the pressures of the US to make Japan have the same levels of emission standards as

those of the US, contributed to the decision of the establishment of the Japanese Muskie law. In the early 1970s, the values of imports of the Japanese automobiles into the US greatly increased and the US actually imported almost a half of all the automobiles the Japanese automakers exported. On the other hand, regarding the US automakers, the total values of automobile production became 8.28 million in 1970, though that of 1965 was 11.06 million. As drops in sales of the US automobiles negatively influenced the US economy and contributed to a serious trade loss, the Nixon administration abolished a value-added tax for automobiles (7 percent) and imposed a surcharge on imports (10 percent). Later, the Nixon administration carried out a devaluation of the dollar instead of abolishing the surcharge on imports. Further, the Nixon administration began to control automobile prices to keep them low to compete with foreign counterparts.

Then, on the 21st of August 1971, Japan and the US had a meeting on pollution at Honolulu, Hawaii, and they pointed out that differences in both ambient air quality standards and the ways to charge the costs for pollution prevention would restrict trade. Further, they agreed that they would cooperatively enforce strict emission standards and to reduce emissions by exchanging both information and results of the research (C69). Thus, they decided that they would have the same standards and the same measures. Because of the rapid increase in imports of Japanese automobiles into the US, the US criticized Japan as the Japanese automakers dumped a huge number of cheap automobiles because the Japanese automakers did nothing for pollution prevention. Consequently, the state started to reconsider and modify the 1973/1975 emission standards in order to establish the Japanese Muskie law (C70c).

Preparation for the Japanese Muskie law

On the 1st of July 1971, the environmental agency (EA) was established and Sadanori Yamanaka took office as the first director-general of EA. EA was established because different ministries had

dealt with environmental problems in their own jurisdictions, which had made the environmental administration very complicated. Consequently although MoT had exclusively dealt with automobile air pollution problems, EA became a main authority over automobile air pollution and responsible for emission standards. Concretely EA established emission standards and MoT then made security standards based on emission standards which prescribed automobile structures and equipments to secure emission standards and decided how long grace periods of emission standards were (EA, 1971; C65). Because all the members in the core of the policy network basically agreed to have the Japanese Muskie law, their interests and the environmental interests of EA did not conflict.

Then, due to the cabinet reshuffle of the administration of Eisaku Sato, Buichi Ohishi (LDP, the ruling party) became the director-general of EA on the 5th of July 1971. Although Sadanori Yamanaka had been in office only for four days, he laid the foundation of the Japanese Muskie law (Kawana, 1988). In addition, he was the first member of the cabinets who criticized automobiles as mobile sources of pollution (C49).

EA actively sought to establish the Japanese Muskie law with strong public support and support of both the LDP and the director-general of EA. Support of them was important resources of EA, and public support might be the most significant resource for EA. As mentioned in Chapter 4, from the mid-1960s to the early 1970s, the Japanese people were highly concerned about pollution problems and consequently supported EA and its advanced environmental policies.

In addition, the Japanese people supported the reinforcement of emission standards and automobile air pollution policies partly because of TMG. Serious photochemical smog often happened in Tokyo and citizens in Tokyo greatly demanded improvements of air quality. In addition, Ryokichi Minobe, the governor of Tokyo, was highly concerned about pollution problems (Yamazaki, 2002). Consequently TMG more actively sought to improve air quality than other local governments. Then TMG decided to reduce automobile air pollution to use various ways such as the reinforcement

of emission standards for CO and the recommendation of implementing afterburners onto automobiles (Mainichi, 24 May 1972; C51a). However, because of legal and technical problems, its policies failed (C51a, C60, C83a, C83b, C83c). Then TMG made a number of proposals to the state such as establishment of strict emission standards (Asahi Shinbun, 30 May 1970). Kawana (1992) maintained that these activities of TMG triggered active discussion among the Japanese people on the situation of automobile air pollution, and the Japanese people consequently recognized the severity of air pollutants such as NOx and HC. Although TMG was not a member of the core of the policy network, it played an important role in automobile air pollution policies as a generator of the public support and a representative of the Japanese people and local governments, especially those in urban areas. In addition, EA and TMG contacted with each other on automobile air pollution and its policies (Kawana, ibid). Thus, it is likely that TMG was an important member of the periphery of the policy network.

On the 18th of September 1971, Buichi Oishi ordered EA to prepare for the Japanese Muskie law and he consulted the central pollution council, which was an advisory body of EA, about whether the Muskie law could be enforced in Japan in terms of technical points of view and what the concrete long-term plans for reduction on the automobile air pollutants such as NOx, CO and HC had to be (C60, C61b). Then a specialist committee on automobile pollution in the air quality section of the central pollution council was established for its deliberation (see Appendix G on the members of the specialist committee). As in the policy-making processes of MoT on emission standards, the auto industry was still able to join the policy-making processes of EA. EA needed to do so because EA was almost perfectly dependent on the auto industry for technical information to establish emission standards.

Making decision to carry out the Japanese Muskie law

Although EA started the preparation for the Japanese Muskie law, EA encountered a few negative factors for the establishment of the Japanese Muskie law. First, it became questionable whether photochemical smog in 1970 really happened because some evidences showed that these incidents were caused by sulphuric acid mist (C62a). Second, in the US, the US automakers as well as foreign automakers, actively sought to make the enforcement of the Muskie law postponed, and it became questionable whether the Muskie law could be enforced as planned (C62c, C61a).

Despite these negative factors, on the 3rd of October 1972, the air quality section submitted its report to EA (EA, 1973). The report was almost a translation of the Muskie law. Following the report, EA issued its notification to lay down the lines of establishments of the 1975 emission standards and the 1976 emission standards, and this was called 'the Japanese Muskie law' (C78b). In terms of passenger automobiles, the values of the 1975 emission standards on average were 2.1g/km for CO, 0.25g/km for HC and 1.2g/km for NOx. In other words, thanks to the 1975 emission standards, the values of CO would decrease by 89 percent, those of HC by 91 percent and those of NOx by 45 percent (EA, 1973). Further, the values of the 1976 emission standards on average were 0.25g/km for NOx. In addition, the 1975/76 emission standards were applied to standard passenger automobiles, small passenger automobiles and mini passenger automobiles that were driven by petrol and liquefied petroleum gas (LPG). After the decision of the establishment of the Japanese Muskie law, the main policy tool perfectly became emission standards (C71, C73, C74). It cannot be too much to say that automobile air pollution policies came to mean emission standards after the establishment of the Japanese Muskie law.

Success of Honda and Toyo Kogyo and its Positive Effects

Success of Honda and Toyo Kogyo

In order to achieve the requirements of the Muskie law, the automakers spent a huge amount of both human and financial resources. Thanks to those efforts, two Japanese automakers, Toyo Kogyo and Honda, achieved the strictest emission standards in the world (EA, 1974). Toyo Kogyo stated that it was going to achieve the requirements of the Muskie law when the Environmental Protection Agency (EPA) held hearings concerning the one-year postponement of it in April 1972 (Katagata, 1974). Further, in the hearings held by EPA in March 1973, Toyo Kogyo said that it would bring automobiles with rotary engines that achieved the Muskie law into the US market when the law came into force.

Honda stated in the same hearings of April 1974 that Honda would be able to produce automobiles achieving the 1975 requirements and that they would even be able to sell them exactly from 1975 because of its invention of the so called CVCC engines in 1972 (Asahi Shinbun, 21 September 1972; see Appendix H). Honda was the only one automaker that did not make an application for the one-year postponement to EPA.

Definitely, successes of these two automakers were the most significant drivers which led to the establishment of the 1975 emission standards. In addition, competition in technological developments among the automakers and environmental economic interests of Honda and Toyo Kogyo contributed to their successes.

Although EA did not know their great achievements (C66a), MoT and MITI had already received that information before their announcements and they were, as a result, becoming active to enforce the 1975 emission standards; because it was a great achievement to lead foreign automakers for MITI (C66c); and because there seemed little safety problems concerning their achievements for MoT (C66b). For instance, before Honda made an announcement on the invention of the CVCC engines, MoT had sent a director of the institute of transport safety and pollution and its chief of

department for pollution to see it test-driving (C66b).

The Oil Crisis and the Postponement of the Muskie Law, and their Adverse Effects

The Oil crisis and the postponement of the Muskie law

On the 6th of October 1973, the 4th Middle East war took place and the Organization of the Petroleum Exporting Countries (OPEC) announced that they would raise oil prices, leading to the first oil crisis. Japan imported 99.7 percent of oil from foreign nations, and 82 percent of imports came from the Middle East (Kawana, 1988; C44). In response to the demands for fuel-efficient automobiles, the automakers sought to reduce oil consumption in their automobiles by lightening their weights and increasing the efficiency of their engines (Kawana, 1988). As it was supposed that reducing emissions would lead to fuel inefficiency, some automakers, especially Toyota and Nissan, strongly criticized EA for strengthening emission standards (EA, 1974; Kawana, ibid).

In addition, in the US, the US automakers as well as Volvo and International Harvester, submitted an application to EPA for the postponement of the Muskie law in 1972 (C67). Although EPA refused their application, the National Academy of Sciences (NAS) demanded a one-year postponement and GM, Ford and Chrysler called for a re-examination concerning EPA's rejection of their application for the postponement (Katagata, 1974; Jidoshakogyo shinkokai, 1972). In April 1973, EPA announced that it would postpone the Muskie law in terms of CO and HC for one year (EA, 1974; C72a). Further, William D. Ruckelshaus, the director-general of EPA insisted that the Diet had to reconsider its postponement because its values in NOx were too strict (Katagata, 1974). Then, EPA made a decision to defer the Muskie law for one year in July (EA, 1974). Moreover, on the 23rd of January 1974, the US decided to delay enforcing the NOx reduction by 90 percent for two years.

Muddling through of the Japanese Muskie Law

Nevertheless EA still maintained that Japan was going to enforce the 1975 emission standards as planned (C68, C72a, C72b). Further, it was decided that income tax for automobiles which achieved the 1975 emission standards would be reduced by 60 percent from October in 1974 to June in 1974 in order to enable automobile owners to choose these low emission passenger automobiles (C70, C77b). In order to know the state of their technological developments for the 1975 emission standards, from the 14th of May, EA held hearings for Toyota, Nissan, Mitsubishi Motors, Toyo Kogyo, Honda, Fuji Jyuko, Daihatsu, Suzuki and Isuzu. In the hearings, Toyota and Nissan strongly insisted that EA had to phase the 1975/76 emission standards (C69). However, Honda and Toyo Kogyo said that they would be able to mass-produce automobiles achieving the 1975 emission standards, and none of them said it was technically impossible to achieve the 1975 emission standards (Kawana, 1988). This shows that the automakers had both different attitudes towards and interests in the 1975 emission standards (C66c, C89b, C93b).

Despite a number of suggestions made by the automakers including a one-year postponement like the US and the introduction of provisional standards, EA accepted almost nothing because Honda and Toyo Kogyo had achieved the 1975 emission standards (Katagata, 1974). Although none of the requests were accepted, it was clear that some automakers, especially Nissan and Toyota, started to seek for the relaxation of the Japanese Muskie law (C76b, C82a). For instance, according to Toyota Shinbun (1 January 1975), Toyota started to ask those state actors related to decision-making processes on the 1976 emission standards to determine values of the 1976 emission standards carefully in order to make the 1976 emission standards postponed (C126d). Thus, it seems that the interests of some automakers with economic interests, those of other automakers with environmental economic interests and those of EA began conflicting.

As well as the auto industry, the actors in the core of the policy network had different interests

within themselves. For instance, Takeo Miki (LDP), the director-general of EA, repeatedly told that he was not thinking of the postponement of the Muskie law, though Soroku Yamagata, the head of the air quality bureau of EA, mentioned that EA would carry out a basic reconsideration of the 1976 emission standards. As for MoT, some media reported that MoT changed its positive attitudes towards the enforcement of the Japanese Muskie law and started consideration of the postponement of the 1976 emission standards (C68, C72a, C72b). However, Torazaburo Shintani (LDP), the minister for transport, supported the enforcement of the 1975/76 emission standards (C75a). Torazaburo Shintani and Takeo Miki then asked Yasuhiro Nakasone, the minister for international trade and industry, to cooperate with them for the 1975/76 emission standards (C75a). On the 14th of December, Yasuhiro Nakasone then stated that he had no intention to modify or defer the 1975/76 emission standards, although MITI started to make the 1976 emission standards postponed. Thus, although all the ministries and ministers in the core of the policy network agreed to the establishment of the 1975 emission standards, they had different intentions on the 1976 emission standards. These differences between ministries and ministers or LDP members seemingly made difficult the decision of whether the 1976 emission standards would be established or not.

The Enforcement of the 1975 Emission Standards

The 1975 emission standards

Using the oil crisis as an excuse, in late 1970, some automakers strongly demanded relaxation of the 1975/76 emission standards (C75a, C75b). They usually put pressure on EA behind the scenes through LDP and MITI (Nihon Keizai Shinbun, 19 February 1974; C78a). However, with strong public support, Takeo Miki strongly sought to enforce those emission standards (C76A, C81b). Thus, it seems that public support and the successes of Honda and Toyo Kogyo were influential factors that

led to the establishment of the 1975 emission standards.

On the 29th of November 1973, after EA and MoT considered values of the 1975 emission standards based on collected data and a proposal submitted by JAMA, MoT showed JAMA their proposal for the 1975 emission standards (C126d). As the proposal was stricter than the one that JAMA suggested, it insisted on its relaxation of HC and its postponement. Concerning HC, its values of the 1975 emission standards on average were 0.25g/km and its values on the permissible maximum limits were 0.38g/km. Then, it requested the relaxation of the permissible maximum limits for HC from 0.38g/km to 0.4g/km (C105a). Then, its values in the proposal changed from 0.38g/km to 0.39g/km for HC after the deliberation between MoT and JAMA. Finally, on the 19th of January 1974, EA and MoT formally determined the values of CO, HC and NOx in the 1975 emission standards. EA finally issued its notification for the 1975 emission standards on the 21st of January 1974. Thus, emission standards were mainly made by MoT, EA and the auto industry. In addition, all of them seemingly sought for the consensus.

The 1976 Emission Standards

Counterattack of the auto industry

After the postponement of the Muskie law and the oil crisis, the automakers, especially Nissan and Toyota, very actively resisted the enforcement of the 1976 emission standards (C105a). In addition, even Honda and Toyo Kogyo, which, it was considered, would achieve the 1976 emission standards because they had the most advanced technologies, came to maintain that they could not technically satisfy the standards (C77a, C79, C88a, C99c, C109d, C111i).

It was often told that Honda and Toyo Kogyo could in fact achieve the standards, but they maintained that they could not do so because Nissan and Toyota asked them to seek for the

postponement of the standards cooperatively with other automakers (C110f). Indeed, Eiji Toyota, the President of Toyota, admitted that he told other automakers not to carelessly mention possibilities to achieve the 1976 emission standards (C88b). There was a big technological difference between large automakers such as Nissan and Toyota and other small and medium automakers such as Honda and Toyo Kogyo. Nissan and Toyota consequently intended to make the 1976 emission standards abandoned and it was believed that they made other automakers cooperate to do so (Nishimura, 1976). However, according to Nishimura (1976), although all of the automakers basically cooperated to make the 1976 emission standards postponed, some automakers such as Mitsubishi and Fuji Jyuko chose to perfectly cooperate to achieve the target, while Honda and Toyo Kogyo did not perfectly cooperate and they often implied that the 1976 emission standards were feasible. Though the cooperation of the automakers led to the postponement of the 1976 emission standards, this imperfectness contributed to making new 1976 emission standards less strict than the automakers demanded and then to the establishment of 1978 emission standards eventually.

In June, JAMA issued a report named 'problems on NOx reduction'. In the report, JAMA pointed out two things (C109d, C110f). First, the 1976 emission standards were too strict and all of the automakers would not achieve the 1976 emission standards. Second, it did not make sense to have the strict national ambient air quality standard for NOx (0.02ppm) because the level of NOx in nature was 0.01ppm or 0.02ppm. From this report, it may be again clear that all of the automakers agreed to seek for the postponement of the 1976 emission standards (C110f).

In addition, economic problems on the 1976 emission standards were often proposed. For instance, Toshio Sanuki of the Japan Development Bank (Nihon Keizai Shinbun, 2 June 1974) argued that by enforcing the 1976 emission standards, the costs of automobiles would increase approximately by 120 thousand yen, which would make demand for passenger automobiles decrease by about 30 percent, making 3.17 million workers in all automobile-related industries lose jobs. Moreover, he

suggested that Japan accordingly would become unable to export its automobiles, resulting in loss of foreign currency to buy petroleum and then collapse of Japanese economy. At this time, emission standards were recognized as one of the most significant economic problems. Thus, the most dominant appreciative systems in the core of the policy network were 'emission standards were technical problems' and 'emission standards were one of the most significant economic problems'. Being important economic problems had been seemingly a very effective and powerful appreciative system in any areas of policies in Japan because economic development was a primary objective of all the Japanese people. Thus, it can be easily expected that MITI and the auto industry considered that they could exclude any disputing opinions from the core of the policy network by making the 1976 emission standards economic problems.

In this situation, in June, Takeo Miki firstly admitted the possibility that the 1976 emission standards would not be enforced (C104a, C83b). In addition, from early 1974, all the actors in the core of the policy network including EA, often pointed out that there were technical problems on the 1976 emission standards (C81a, C83a, C86b, C87c, C100c). Because of this situation, Itaru Yonehara, a member of the House of the Representatives (Japan communist party), complained against EA that if EA argued that there were technical problems on the 1976 emission standards, then the Japanese people had to think that the 1976 emission standards were infeasible (C78b). This may indicate that 'emission standards were technical problems' as an appreciative system was a very effective way to exclude other actors and opposing opinions.

In order to know the state of technological developments for the 1976 emission standards, EA decided to hold hearings for the automakers from 6th to 18th of June (EA, 1975; C84, C87b). Because decision-making had been in secret, some MPs such as Takeko Kutsunugi of the Japan communist party, asked EA to make the hearings in public (C85a). However, EA refused to do so because each automaker had business secrets (C85b). Further, though they insisted on participating in the

specialist committee, other groups such as civil groups were excluded because EA maintained that the specialist committee discussed technical issues and civil groups could not do so (C122, C100a).

In the hearings, all the automakers argued that the 1976 emission standards would be technically impossible and demanded the postponement (EA, 1975; C86a, C87b, C109d). In addition, Nissan and Toyota even refused both to answer how much they could reduce NOx emissions and to show EA the data on their technologies (C82b, C87b, C87c, C89c, C93c, C109d). However, EA accepted their 'technical difficulties' arguments. All EA did was just to request the automakers to reduce emissions and EA did not investigate or study the engines (C111e). Consequently, EA was unable to have technical information to counter-argue something against the automakers and EA did nothing but to admit their statements and data. In addition, even the specialist committee of the central pollution council was unable to obtain sufficient technical information which proved technical difficulties of the automakers, and the committee, as a result, did not sufficiently examine technical possibilities (C90b, C90c, C91b, C99a). Therefore, technical information of the auto industry was a very powerful resource and manipulation of technical information was an effective strategy.

After the hearings, JAMA accelerated its attacks and criticized both the standards and EA in various media (C111i). For example, in a magazine, *Jidosha Journal July,* Toshio Nakamura was interviewed and he severely criticized the emission standards to point out negative economic impacts of the 1976 emission standards. Toshio Nakamura was a senior executive director of JAMA in 1972. Before he joined JAMA, he had been a vice chief of the international trade bureau of the MTIT. MITI strongly asked JAMA to give MITI the post in order to effectively lead the auto industry (C102d). It was told that he served as a pipeline between MITI and the auto industry (C106). This interpersonal relationship was an important resource both for MITI and for the auto industry. In addition, it indicates that it was MITI that sought to have strong relationships with JAMA to achieve its objectives.

Further, Kakuei Tanaka, the prime minister, during the election campaign for the House of Councillors in July, addressed that the 1976 emission standards would be technically impossible and the postponement thus would be unavoidable (C108c). Takeko Miki made a protest against his statement and asked him to leave this issue to EA (C87a). LDP sought to win in the election by obtaining support from corporations. Further, LDP was expected to be dependent on them for the nationwide local elections in next April and the coming general election. Thus, it was told that Kakuei Tanaka made this statement to gain support from the automakers. Indeed, in the election for the House of the Councillors, JAMA donated 480 million yen to LDP: 130 million yen from Toyota and 120 million yen from Nissan (C109d, C88c).

This indicates that the auto industry could influence LDP because of its increasing economic power. Because Kakuei Tanaka emphasized the relationships with industries to win in elections, LDP depended more on the auto industry for their money, though the auto industry was more dependent on LDP because the auto industry needed to rely on LDP for the postponement of the 1976 emission standards. Although LDP had not been closely involved in decision-making processes of emission standards, LDP became, as a result, closely involved. As shown below, LDP often pointed out problems on the 1976 emission standards and sought to justify postponement of the standards in the Diet. Further, LDP put pressures on EA on automobile air pollution policies for the auto industry. For instance, when some automakers such as Suzuki requested LDP to postpone the enforcement of the 1975 emission standards, LDP asked EA to reconsider problems on its enforcement (C90b). Then, it can be clear that LDP became a powerful member of the core of the policy network. Surely, LDP, as a ruling party, was more powerful than other actors. In principle, LDP could make policy proposals passed in the Diet and formally establish emission standards, had legitimate power over ministries, and could reflect interests of stakeholders into policies. However, LDP was dependent on ministries for their knowledge and expertise and on industries for their economic resources. Further, LDP

sometimes had conflicting interests within it and failed to collectively seek for goals. For instance, even in this time, some LDP members such as Kakuei Tanaka and Yoshiro Hayashi had economic interests, though other members such as Takeo Miki had environmental interests. Despite the different interests within LDP, the economic interests dominated LDP, and LDP was consequently almost collectively able to seek for the postponement of the 1976 emission standards.

Due to these circumstances, it seems apparent that the original 1976 emission standards would be postponed and that EA sought to enforce the original emission standards in 1978 because the US postponed the 1976 requirements of the Muskie law and sought to enforce them in 1978 (C86b, C87b, C109d, C79). As emission standards became significant economic problems, MITI actively sought for the postponement of the 1976 emission standards in cooperation with the auto industry. In addition, as MITI was able to take part in the meetings of the specialist committee of the central pollution council as an observer, MITI was given the opportunity to state its opinions. Though MITI had been a less influential member of the core of the policy network, MITI became one of the most influential members of the core of the policy network. As mentioned in the previous chapter, in economic policies related to automobiles, MITI had been a central member of the core of the policy network. As automobile air pollution policies became an economic problem, it might be natural that MITI became the central member of the core of the policy network.

In order to achieve the postponement, at the meeting of JAMA in August, Toshio Nakamura, the senior director of JAMA, announced that Hachiro Moriguchi, the head of the bureau of machinery and information industry of MITI, requested to make necessary prearrangements to the members of both the air quality section and the specialist committee of the central pollution council (C99b, C102d).

Local governments and the 1976 emission standards

The Japanese people, most local governments and civil groups had no choice but to accept the postponement because it was argued that the enforcement of the standards was technically impossible. However, some local governments in metropolitan areas such as TMG did not choose the 'nothing but to' option and they started to investigate the technical difficulties. On the 14th of July, TMG then held hearings for the automakers concerning the 1976 emission standards. In the hearings, all of them stated that the postponement was necessary. Further, Nissan insisted that it was still unknown whether exhaust gases were the cause of photochemical smog and that the grounds for the national ambient air quality standard for NOx in Japan seemed inappropriate from the scientific point of view (Nishimura, 1976; C87c). Thus, it seems that some automakers such as Nissan started to seek for not only the postponement of the 1976 emission standards but also the relaxation of the national ambient air quality standard. Because it was expected that emission standards for NOx were reinforced until the ambient air quality standard was achieved, some automakers started to make it relaxed.

Because technical difficulties were not clear in the hearings, TMG doubted the arguments of the automakers. Then, on the 22nd of August, a round-table conference of 7 major cities consisting of Tokyo, Kyoto, Osaka, Yokohama city and Kawasaki city of Kanagawa, Nagoya city of Aichi and Kobe city of Hyogo, announced that they collaborated to establish a research team for evaluation of the automobile technologies so that assessment of the technologies of the automakers could be carried out and current status of their technological developments could be monitored.

After making hearings for the automakers and in-depth investigations, on the 21st of October 1974, the research team concluded that all the automakers were able to achieve the 1976 emission standards and issued its report on this conclusion (C113). One of the main reasons for this conclusion was that Toyo Kogyo and Honda admitted that their rotary engine and the CVCC engines

were able to satisfy the requirements of the 1976 emission standards with a little effort (Nishimura, 1976). However, as the research team admitted, its conclusion could not be perfectly true because it was unable to obtain technical information from the automakers (Nishimura, 1976; C91a).

Concerning this conclusion, Yoshio Hayashi (LDP), clearly criticized it in the Diet and maintained that the report was unscientific and unreliable (C89a, C91a). In addition, Hitoshi Kasuga, the head of the air quality bureau of EA, criticized that the report was filled with only assumptions and guesses and that its consideration on various aspects of the 1976 emission standards could not lead to its conclusion (C89b). Because of the dispute between them on the technical possibilities on the enforcement of the 1976 emission standards, the Japanese people became more greatly concerned about automobile air pollution and they came to doubt the 'technical difficulties' arguments. Thus, TMG with other local governments again greatly influenced the policy-making processes as a peripheral network member.

In August 1974, the new director-general of EA, Matsuhei Mouri, inquired the central pollution council concerning the 1976 emission standards and the specialist committee of the central pollution council started to examine this issue. As far as the central pollution council was concerned, the socialist party suggested that the council was unable to propose strict emission standards as some of its members came from the automakers such as Katsuji Kawamata from Nissan (the air quality section) and Kiyoshi Iemoto from Hino (the specialist committee) (C87a). Though the socialist party asked EA to exclude them from the council, EA again argued that it would not exclude them because they were necessary in the consideration of technical issues of the automakers including pollution control technologies and production technologies (C88d, C88e, C99a). This shows that the decision-making processes were greatly dependent on the auto industry for its technical information. Though EA argued that they were not the representatives of the auto industry, they were indeed

representatives of the automakers (C96). For instance, when Kiyoshi Iemoto began to speak, he always used the phrase 'we, the automakers' not 'I' (Nishimura, 1976). In addition, he talked much more and was more influential than the other members of the committee because he 'represented' the automakers and he had much more technical information. Consequently, the special committee was often called 'the Iemoto committee' (Sukio Iwatare, socialist party, at the special committee for pollution and environmental conservation in the House of the Representatives, 14 February 1975). Thanks to Kiyoshi Iemoto, JAMA could obtain all the information given in the meetings of the specialist committee (C98, C99d). Thus, the auto industry could not only join the decision-making processes but greatly influence the processes.

The Postponement of the 1976 Emission Standards

Compromise of EA under strong pressures

In late 1974, although it was recognized that the problem of automobile air pollution was the problem of emissions from passenger automobiles as an appreciative system since 1970, EA, MITI and LDP often mentioned that automobile air pollution was a local problem in order to justify the postponement of the 1976 emission standards. For instance, on the 20th of September 1974, at the special committee for pollution and environmental conservation in the House of Councillors, Hitoshi Kasuga maintained that the enforcement of the 1976 emission standards was not the only solution to reduce NOx emissions (C111j). He argued that it was necessary to consider real differences because automobile air pollution was only notable in metropolitan areas. LDP pointed out that automobile air pollution was a problem prominent only in metropolitan areas and automobile air pollution had to be dealt with by using various policy tools such as total traffic control (C90a, C93d). Moreover, MITI maintained that automobile air pollution was a problem of metropolitan areas and it was necessary to

rely not only on emission standards but also on synthetic measures to deal with automobile air pollution. Thus, it seems that the actors in the core of the policy network recognized as an appreciative system that automobile air pollution was a local problem.

In addition MITI, LDP and the auto industry more actively sought to make emission standards economic problems. For instance, Yoshiro Hayashi (LDP), in the House of Representatives, often emphasized unemployment problems (C90a). Yoshiro Hayashi suggested that MITI had to seriously consider the unemployment problems concerning the 1976 emission standards. Shingo Moriyama, a vice-chief of the machinery and information industry bureau of MITI, expressed agreement with him and demanded that the central pollution council would greatly consider its economic effects. As mentioned above, because MITI and LDP had strong relationships with the auto industry, MITI, LDP and the auto industry formed triangular relationships.

However, the Japanese people did not accept both of the appreciative systems. For instance, according to the opinion poll carried out by TMG on the 1976 emission standards (C90b), 16 percent of its respondents answered that the enforcement of the 1976 emission standards needed to be postponed because the automakers maintained that it was technically infeasible, while 62 percent answered that the standards had to be enforced because the automakers undoubtedly had technologies that could achieve the standards. In addition, concerning a question of emission standards in terms of economy and pollution, 78 percent answered that the standards had to be enforced because human health had to be given a priority, while only 5 percent answered that the emission standards needed to be postponed because its enforcement harmed economic activities of the auto industry. Thus, two of the most significant appreciative systems were not effective. Although the 1976 emission standards were postponed as described later, this ineffectiveness of the appreciative systems contributed to the enforcement of the 1976 emission standards in 1978.

However, MITI, LDP and the auto industry actively sought to make new 1976 emission standards

less strict and gave strong pressures to EA and the specialist committee. As for MITI, Hachiro Moriguchi requested EA to consider not only environmental aspects but also economic aspects of the new 1976 emission standards and proposed the values of the new 1976 emission standards for NOx on average as 0.6g/km for passenger automobiles with less than 875kg in gross vehicle weight (GVW) and as 1.0g/km for those with more than 875kg (GVW) and mini passenger automobiles, and MITI asked for the three year postponement. As for the auto industry, JAMA sought to make the values of the new 1976 emission standards for NOx 0.9g/km and asked Kiyoshi Iemoto to propose the values in the specialist committee (Asahi Shinbun, 4 December 1974). Concerning LDP, LDP gave very strong pressure to EA. Consequently, though EA sought to set the values for NOx as 0.8g/km, EA gave it up because of the pressure (Hara, 1975).

Finally, on the 5th of December, the specialist committee issued its interim report suggesting both the new 1976 emission standards (0.6g/km for passenger automobiles with the weight of less than 1 ton and 0.85g/km for those with the weight of more than 1 ton) and the postponement of the original 1976 emission standards for NOx.

Although the specialist committee issued the interim report, its conclusion was doubted because it subsequently became disclosed that Nissan gave false information to the specialist committee and Toyo Kogyo told at the hearings held by TMG that the level of emissions of its passenger automobiles was less than the requirements of the new emission standards, though Kohei Matsuda, the President of Toyo Kogyo, was criticized by JAMA because of this statement (C91c). Because of the information, the 'technical difficulties' arguments of the auto industry became highly suspicious for the Japanese people. From this episode, it is likely that some automakers were unhappy about the postponement and they implicitly sought to make the 1976 emission standards enforced. Thus, the interests of JAMA (economic interests) were different from those of some automakers (environmental economic interests) and JAMA seemingly represented those of Nissan and Toyota.

This difference in interests led to the failure of the 'operation of JAMA' in the long run.

The Miki Administration and Japan Communist Party

Influences of Takeo Miki on the central pollution council

Kakuei Tanaka had to resign his post as the prime minister because the public severely criticized the cosy relationships both between LDP and industries and between him and industries (C76A). Consequently, on the 10th of December, Takeo Miki was elected as the prime minister because he had been recognized as one of the cleanest members of LDP (C104). He had been the general-director of EA and he enforced the 1975 emission standards. Thus, he might be one of the greenest members of LDP. As it was thought that the 1976 emission standards had been postponed because of the cosy relationship between LDP and the auto industry, he sought to carry out the 1976 emission standards (C103b). He then directed Tatsuo Ozawa, a new director-general of EA, to make the central pollution council more carefully deliberate the interim report (C92). After the careful deliberation as required by Takeo Miki, Kiyoshi Wadatsu, the commissioner of the central pollution council, produced a final report as follows (C93a, C95b, C97a, C99e). First, the values for NOx in the new 1976 emission standards were determined as 0.6g/km for passenger automobiles with weight of less than 1 ton and 0.85g/km for those with weight of more than 1 ton. In addition, the report stated that the automakers sought to achieve the original 1976 emission standards as 0.25g/km for NOx in 1978 without fail; the interim report said that the automakers would promote technological developments by the target year of 1978 and would seek to achieve it by successively evaluating its states. Thus, the values of the original 1976 emission standards became those of the 1978 emission standards. In addition, the final report pointed out that it was regrettable that the Japanese people became suspicious of the process of making the decision concerning its

postponement due to insufficient efforts of the automakers for technological developments to reduce emissions and its inadequate investigation of the current situation of technological developments. Then, concerning a preferential tax system for low emission automobiles, the report set 0.6g/km as a criterion.

Thus, although the original emission standards became formally eased, it was decided that the original 1976 emission standards were going to be established and the automakers were officially criticized thanks to Takeo Miki. This shows strong influences of the prime minister in decision-making processes. Because of the intention of Takeo Miki, the decision-making processes on the postponement of the original 1976 emission standards were much more careful and its decision greatly reflected his intention.

After the postponement of the original 1976 emission standards and the decision to enforce the new 1976 emission standards, some automakers such as Toyo Kogyo and Honda sought to achieve the new 1976 emission standards. However, other automakers, mainly Toyota and Nissan, sought to justify the postponement and demanded the relaxation of the new 1976 emission standards by making this issue an economic problem (C93b, C93f, C94). However, because the Japanese people generally supported him, Takeo Miki was able to refuse their suggestion because he argued it was not the economic efficiency but the environmental problems that had to be given a priority (C93b, C93f, C94).

Japan communist party

On the 31st of January 1975, Tetsuzo Fuwa (the Japan Communist Party) in the House of the Representatives, brought summaries of the proceedings in the specialist committee for automobile pollution of the central pollution council, which were given to each automaker while the specialist committee had been still examining the postponement of the 1976 emission standards (C97b).

Though the contents of the discussion in the specialist committee were closed to outsiders, the automakers knew them because Kiyoshi Iemoto gave them to other automakers (C99a).

According to the document (Nishimura, 1976; C97b), in the final meeting of the specialist committee, some of them such as Kiyoshi Iemoto required the three-year deferment, though the others demanded the two-year delay. Naoomi Yamaki suggested the two-year delay, arguing that the Japanese automakers would need to achieve the original 1976 emission standards by 1978 because the postponed 1976 requirements of the US Muskie law planned to be enforced in 1978. Keizo Hatta agreed with him saying that this was not only the technical issue but also the political issue because their decision had to be made by consideration of the US automobile air pollution policies.

Regarding the values of NOx for the 1976 emission standards, as all of the members except Kiyoshi Iemoto, Keizo Hatta and Ikuo Kobayashi, the chief of the automobile pollution section in EA, maintained that different values had to be established depending on the size of passenger automobiles, it was decided to do so. It was relatively easily determined that the value for small passenger automobiles was 0.6g/km because all the automakers except Nissan and Toyota told that they could achieve 0.6g/km. For large-size passenger automobiles, 8 out of 9 members suggested 0.9g/km, because Nissan told that 0.9g/km was possible for all of its passenger automobiles, though Toyota insisted that the feasible values were 1.0g/km to 1.1g/km, although they did not submit data indicating that these were their best values (C100b). However, Ikuo Kobayashi criticized the auto industry and claimed that, according to the material that the director-general of EA had received from a member of the Diet, though Toyota had been insisting that the feasible values for NOx were 1.0g/km to 1.1g/km, the material pointed out that the values could be 0.9g/km for all of its automobiles (C103c). Then, Keizo Hatta unexpectedly proposed 0.85g/km for large-size automobiles. In the long run, this 'unscientific' proposal of him was accepted for large-size automobiles in the 'scientific' meeting.

In addition, Tetsuzo Fuwa severely criticized the specialist committee because it did not scientifically deal with the problem, though it insisted that the problem had been tackled with scientifically (C97b). For instance, in the meeting held on the 8th of August 1974, Keizo Hatta argued that the enforcement of the 1976 emission standards would deteriorate fuel efficiency, automobile exports and drivability and would negatively influence sales of automobiles. Further, in the meeting on the 2nd of September, Keizo Hatta proposed to ask specialists in engines about the 1976 emission standards. However, Hiroshi Katayama and Ikuo Kobayashi denied this proposition because it was unthinkable that specialists in engines would know more and be better informed than the automakers (C103b). The committee was unable to examine scientifically the feasibility of the 1976 emission standards and the committee rather economically examined it.

In addition, the proceedings disclosed that EA maintained that the specialist committee had to say that the values were determined from a point of health protection because it might not be persuasive to say that they were determined because of fuel efficiency and drivability (C103b). In addition, although it was not written in the documents, another related fact was also disclosed by the party that, though it was prescribed that only the designated members were allowed to participate in a meeting of the council, Hitoshi Kasuga, the head of the air quality bureau of EA, allowed Tadahiro Iwakoshi, the President of Nissan, to participate in one meeting of the council as a representative of Katsuji Kawamata, a member of the council (C99d, C103c).

The party moreover disclosed inappropriate relationships between MITI and the auto industry. The party pointed out that many of its executives of the auto industry were ex-officials of MITI: Shigenobu Yamamoto (Toyota), Ryuzo Yamazaki (Nissan) and Toshio Nakamura (JAMA) (C98). This indicates that MITI and the auto industry had interpersonal relationships. Further, the party disclosed the close relationships between MoT and JAMA (C99d). In the pollution-related technology committee of JAMA held on the 20th of August 1974, Michikazu Aoki, the chief of the

engineering department of JAMA, reported that MITI was going to maintain that MITI did not support the enforcement of the 1976 emission standards. Then, Toyota suggested that the automakers ask MoT to make statements to support the postponement of the 1976 emission standards (C99c). Though MITI and the auto industry very frequently contacted each other, MoT also frequently met with the auto industry at that time (C105b). However, MoT did not actively seek for the postponement of the 1976 emission standards because emission standards became an economic problem and MoT was no longer a central member of the core of the policy network. Though the Japanese people more greatly demanded the enforcement of the original 1976 emission standards due to these disclosures, on the 22nd of February 1975, EA formally established the new 1976 emission standards based on the report made by the central pollution council (C117b).

The Enforcement of the 1976/1978 Emission Standards

Great efforts of the automakers for the 1976 emission standards

After the postponement of the 1976 emission standards, some automakers such as Nissan and Toyota, MITI and some members of LDP such as Fumio Hayashi and Yasushi Morishita, sought to justify the relaxation of the emission standards and even required further relaxation of the new 1976 emission standards (C121a, C102a, C103a, C111). On the contrary, other automakers, especially Honda and Toyo Kogyo, actively sought to achieve the new 1976 emission standards in order to meet the public demand. Consequently, according to Asahi Shinbun (13 February 1975), in February 1975, while all passenger automobiles of Honda and Mitsubishi Motors and 90 percent of those of Toyo Kogyo and Fuji Jyuko were expected to achieve the new 1976 emission standards by 1976, 56 percent of those of Nissan, and none of Toyota, were expected to achieve the standards by the year (C99b). Thus, despite severe criticism against the automakers, the automakers still had

different interests and they sought for different goals.

As for EA, with strong support of the public and Takeo Miki, EA actively sought to establish the 1978 emission standards. EA established a private examination board for the NOx reduction technologies concerning the automobiles in which only specialists in engines took part to investigate technological developments of the automakers and enforce the new 1976/78 emission standards (C109, C110, C115b). The private examination board could make its collected data open because the automakers agreed to let their data open, as the public strongly demanded it (Fujita, 1991). When the specialist committee examined emission standards, it did not open its data collected by itself or submitted by the automakers. However, as the data needed to be opened, most automakers sought to submit remarkable data because opening data that was inferior to that of other automakers was not favourable for corporate images. Thus, this contributed to the severe technological competition among the automakers (C123).

In addition, the central pollution council did not deal with this issue. It can be easily seen that EA was unable to utilize the central pollution council because it was disclosed that decision-making processes were inappropriate and influenced by the auto industry. Further, it was criticized that the state and industries had close relationships in appointment of members of the central pollution council and that representatives of industries were able to dominate important posts of the council (C119).

As for the new 1976 emission standards, because the values of the standards were determined as all of the automakers could nearly achieve the values, all of them were going to satisfy the requirements (C107a, C140). Although it was expected that all the automakers would achieve the 1976 emission standards relatively easily, some of them had achieved them earlier than it was expected. One of the main reasons for this may be severe technological competition among the automakers (EA, 1977). Because more automakers had environmental economic interests, it may be

natural that technological competition among the automakers, especially those with environmental economic interests, became severer. Another reason may be tax reduction. EA in cooperation with the ministry of finance (MoF) carried out tax reduction which was applied to passenger automobiles that achieved the 1976 emission standards (C101, C107a, C107b, C108, C116a, C116b). In addition, the tax reduction rate in 1975 was twice as high as that in 1976. Thus, some automakers such as Honda, Toyo Kogyo and Mitsubishi Motors sought to achieve the 1976 emission standards in 1975. Contrarily, because the grace period for the 1975 emission standards continued until November 1975, Toyota sought to produce a huge amount of passenger automobiles that did not achieve the standards in 1975 (C99f, C102b, C102c). This indicates that Toyota had strong economic interests.

In December 1975, all the newly produced passenger automobiles became subject to the 1975 emission standards. However, the grace period continued for another four months because some automakers which mainly produced small passenger automobiles and regional economic groups requested MITI and MoT to defer its enforcement for small passenger automobiles, and MoT accepted their requests (C113a, C113b, C113c). Thus, although MoT was unable to establish emission standards by itself, it seems that MoT was still able to influence policy outcomes.

Differences between the automakers on the 1978 emission standards

From the 16th of August to the 6th of September 1975, the private examination board held hearings on automobile technologies by inviting the automakers (EA, 1976; Kawana, 1988). In the hearings, Toyo Kogyo and Honda stated that it might not be impossible to achieve 0.25g/km by 1978. Nissan, Mitsubishi Motors, Isuzu and Fuji Jyuko announced that they had already developed passenger automobiles achieving 0.25g/km, although it would be difficult to mass-produce them in 1978 (C115a, C115b). However, Toyota and Daihatsu, which belonged to the Toyota group as mentioned in chapter 4, claimed that it was almost impossible to achieve 0.25g/km by 1978 and called for the

two-year postponement (C115a).

As well as Toyota and Daihatsu, some members of LDP such as Saburo Saegusa maintained the relaxation of the 1978 emission standards because of the negative economic impacts of the 1978 emission standards (C117a). MITI also requested EA to relax the 1978 emission standards because of the consequent negative economic effects. Thus, although the prime minister and LDP as a whole sought to enforce the 1978 emission standards, some LDP members acted differently from them, though none of LDP members came to disagree to the 1978 emission standards in the long run. In addition, MITI took the same attitudes as Toyota and Daihatsu. This seems to indicate that Toyota was very powerful, and LDP and MITI greatly considered the interests of Toyota. Therefore, it may not be wrong to consider that the interests of the auto industry or JAMA that LDP and MITI sought to protect were often those of Toyota and, in other words, that they had the same interests in the core of the policy network. In addition, this indicates that Toyota and possibly Daihatsu had economic interests though other automakers had environmental economic interests.

Although Toyota, LDP and MITI sought for the relaxation of the 1978 emission standards, they had to give it up and Toyota had to achieve the 1978 emission standards because most automakers announced in early 1976 that they were able to mass-produce passenger automobiles which achieved the standards (C115a). Moreover, Honda, Toyo Kogyo and Mitsubishi Motors told that they were ready to sell passenger automobiles achieving the 1978 emission standards even within 1977 if those passenger automobiles could have tax reduction (Nishimura, 1976). Then, EA in cooperation with MoF decided that tax reduction would be applied to passenger automobiles which achieved the standards both in 1977 and 1978 (from the 1st of April to the 31st of August) (C120, C121a, C121b).

Tax reduction was effective in the promotion of low emission automobiles. According to MoF, in the case of the 1976 emission standards, during the grace period of the 1976 emission standards where tax reduction was applied, 70 to 80 percent of passenger automobiles sold were those satisfied

by the 1976 emission standards though they were more expensive and lower fuel efficient (C121c). In addition, considering the fact that the Japanese people tended to buy passenger automobiles which were more expensive and less fuel-efficient though tax reduction was applied to them, it can be expected that the Japanese people were environmentally friendly buyers of passenger automobiles. Thus, the automakers considered that the Japanese people would prefer to buy passenger automobiles that satisfied the 1978 emission standards if tax reduction was given.

Finally, in July, because most automakers became able to mass-produce passenger automobiles that achieved the standards, Toyota finally made it clear that Toyota was going to be able to achieve 0.25g/km by 1978. Then, in August, when a private examination board held the last hearings for the automakers, all of them stated that they were able to mass-produce passenger automobiles that achieved 0.25g/km by 1978 (EA, 1978). Based on the hearings, the board produced its final report (C123). Finally, based on the report, EA and MoT established and enforced the 1978 emission standards.

Relaxation of the NOx Ambient Air Quality Standard

The story of the 1970s did not end happily because it ended with the relaxation of the national ambient air quality standard for NOx. After the oil crisis, because economic development in Japan slowed down, industries clearly became less concerned about air pollution (EA, 1975, 1976; C126a). In addition, air quality had been improved because the consumption of fossil fuels had decreased due to the low economic development, which stopped the increase in NOx (EA, 1976; C112a, C118). Consequently, some industries as well as MITI and LDP sought to make the ambient air quality standard for NOx (0.02ppm for a daily mean) less strict (Fujita, 1980). For the auto industry, the relaxation of the ambient air quality standard was a must issue because emission standards were to

be reinforced until the national ambient air quality standard was achieved. Some industries, MITI and LDP often claimed that the standard was neither realistic nor based on scientific evidences (C122, C126b). Even EA admitted that scientific data was not sufficiently available when the standard was established in 1973. Then, EA asked the central pollution council about acceptable levels of NOx in the air from medical and public health points of view on the 28th of March 1977(C125). Then, the air quality section of the central pollution council proposed 0.04ppm to 0.06ppm as acceptable levels of NOx in the air on the 20th of March 1977 (EA, 1979; C125).

MITI, LDP and the related industries, especially the auto industry and the steel and iron industry, formed strong triangular relationships and collectively sought to make the new national ambient air quality standard 0.10ppm as equivalent to its American ambient air quality standard (C125, C126c, C127a, C127b, C128). However, as EA strongly insisted that the new standard had to be within 0.04ppm to 0.06ppm, in July 1978, MITT compromised to propose 0.06ppm. Then, EA decided that the national ambient air quality standard for NOx was relaxed to 0.04ppm to 0.06ppm (Hashimoto, 1988).

Consequently, while 89.6 percent of all air pollutant-monitoring stations (799) did not achieve the standard, only 4.6 percent (41) failed to meet it according to the data of 1977 (Kawana, 1993b). In addition, those unachieved stations were set in metropolitan areas of Tokyo, Kanagawa, Aichi, Osaka, Hyogo and Fukuoka (EA, 1980). Then, EA decided that air pollution policies for the achieved areas had to be different from those for these metropolitan areas (EA, ibid). In addition, EA argued that the new national ambient air quality standard would be achieved within 7 years (1985) because effects of automobile air pollution policies for stationary sources and automobiles would appear by then, and total NOx emission control which EA planned to carry out in metropolitan areas would be enforced in the mid-80s (EA, 1979). This relaxation of the national ambient air quality standard for NOx reinforced one of the appreciative systems that automobile air pollution was a local problem.

Further, as most areas of Japan had achieved the standard thanks to the relaxation, automobile air pollution policies were not greatly advanced and emission standards were not greatly reinforced after this relaxation.

Examination of Policy Changes in the 1970s based on the Policy Network Framework

In this chapter, five kinds of major policy changes have been identified: the establishment of the first emission standards on NOx and the 1975 emission standards (the second policy change); the decision to enforce the Japanese Muskie Law (the third policy change); the establishment of the 1975 emission standards (the fourth policy change); the postponement of the 1976 emission standards (the fifth policy change); and the establishment of the 1978 emission standards (the sixth policy change). This section seeks to analyse these policy changes based on the policy networks framework. The diagrams of the policy network in each policy change are demonstrated in the end of this chapter.

The second policy change (Figure 6-1)

The second policy change was the establishment of both the first emission standards for NOx (the 1973 emission standards) and the 1975 emission standards for NOx. This policy change happened because of both the occurrences of lead air pollution and photochemical smog due to air pollutants from automobiles, the consequent increased public concerns on automobile air pollution and the necessity for the automakers to achieve the US emission standards to export their products. In 1970, photochemical smog and lead air pollution happened, and the media greatly picked up on issues of automobile air pollution. Then, the Japanese people became highly concerned about automobile air pollution and strongly demanded the state to immediately improve the air quality, which made MoT

recognize the needs to do something to decrease automobile air pollution because it was mostly responsible for automobile air pollution. In addition, the US government decided to enforce emission standards for NOx. Because the automakers had to achieve the US emission standards for NOx in order to export their products, and MoT needed to improve the air quality because of the strong public demands, MoT decided to have the same emission standards as those of the US.

Three kinds of changes in the policy network happened in this policy change. First, in terms of interests, some automakers such as Honda found that producing low emission automobiles would lead to economic profits for them, that is, they had environmental economic interests. However, other automakers such as Toyota did not think so and still sought for economic interests. Though the core policy network members had different interests, their interests still did not conflict with each other because all of them considered that achieving the American emission standards was necessary.

Second, regarding resources, because the 1975 emission standards required high levels of technological developments, MoT became more dependent on the auto industry for technical information to effectively enforce the 1975 emission standards. Consequently, technical information of the auto industry as resources became more powerful. However, it became more important for the auto industry to access to policy-making processes of emission standards because emission standards became a main policy tool for automobile air pollution and it was apparent that they would become stricter and stricter. As a result, they had strong resource interdependency relationships, and this was a key feature of the core of the policy network.

Third, because it was recognized that emission standards were the most important policy tool, the core of the policy network was no longer able to share two of its appreciative systems that automobile air pollution was due to the insufficient supply of roads, and that automobile air pollution was a local problem.

In addition, as well as NOx and CO, it was decided to establish emission standards for HC and

emission standards consequently covered most major air pollutants emitted from automobiles. Then, emission standards became the most important policy tool and the policy network of emission standards became the dominant policy network in automobile air pollution policies.

The third policy change (Figure 6-2)

The third policy change was the decision to enforce the Japanese Muskie law. This policy change seems one of the most significant policy changes in the history of emission standards and even automobile air pollution policies in Japan. Definitely, the main driver for this policy change was the establishment of the Muskie law in the US. In order to export their products, the Japanese automakers needed to satisfy the requirements of the Muskie law. In addition, as it had been prescribed in the core policy network that the Japanese emission standards needed to be the same as those of the US, as one of the appreciative systems, all of the core of the policy network members basically agreed to the establishment of the Japanese Muskie law. In addition, the agreement between the Japanese government and the US government on the enforcement of the same emission standards contributed to this policy change. Because the number of automobiles exported into the US significantly increased, it became a serious economic problem in the US. Further, the Japanese automakers exported automobiles that emitted less air pollutants than those sold in Japan. The US government, as a result, strongly demanded the Japanese government to have the same emission standards so that the Japanese automakers were unable to do such inappropriate business activities. Then, the Japanese government needed to establish the Japanese Muskie law. Moreover, the ruling party, LDP and its ministers in the Cabinet, including ministers of international trade and industry and transport and director-generals of EA, recognized the need to achieve the US Muskie law both for pollution reduction and development of the auto industry. This positive attitude of LDP towards the establishment of the Japanese Muskie law contributed to this policy change too.

Moreover, the government needed to respond to the strong demand to decrease automobile air pollution. Partly because TMG pointed out the serious situation of automobile air pollution and carried out automobile air pollution policies, and because some serious automobile air pollution incidents such as photochemical smog happened, the Japanese people became highly concerned about automobile air pollution. In addition, in the mid-1960s to the early 1970s, anti-pollution campaigns were at its peak in response to a number of environmental problems that took place all over Japan. The Japanese people, especially those living in metropolitan areas, formed anti-automobile air pollution campaigns and demanded the state to improve automobile air pollution, which led the state to the decision to establish the Japanese Muskie law. In addition, as described in chapter 4, in order to respond to strong public demands caused by a wide range of pollution problems, the state actively sought to reduce pollution, carried out a number of environmental policies and established EA to advance environmental policies. This positive attitude of the state also contributed to the decision.

As far as changes in the policy network are concerned, LDP and EA joined the core of the policy network. LDP joined the core of the policy network because emission standards became important political issues as LDP needed to deal with both the increased automobile air pollution and the establishment of the US Muskie law. In this policy change, the main interests of LDP were environmental interests or the establishment of the Japanese Muskie law. Although the auto industry was dependent on LDP for its resources such as the ability to reflect interests of stakeholders into policies to achieve its targets, LDP was also dependent on the auto industry for economic resources (donation) to win in elections. Further, LDP was dependent on MITI, MoT and EA for their expertise and knowledge to carry out policies, though those ministries depended on LDP to get their proposals passed in the Diet. Although LDP and other core policy network members had close resource interdependency relationships and LDP was a member of the core of the policy network, LDP did

not normally join the circle of policy-making processes of emission standards in which MITI, MoT, EA and the auto industry discussed emission standards. LDP rather was a director or watchman to see that policy-making processes did not go against the interests of LDP, and LDP sought to make policy-making processes desirable for it by, for instance, direction and persuasion. In addition, where policy-making processes went for the interests of LDP, LDP supported ministries to make policies.

Associated with the changes in the members of the core of the policy network, a few changes happened in the core of the policy network. First, after EA was established, it became responsible for automobile air pollution and the establishment of emission standards, and it thus became one of the core policy network members who were exclusively entitled to enter policy-making processes of emission standards. Though EA was a core policy network member, it did not have as strong a relationship with the auto industry as MITI and MoT. Because MITI guided automobile production, and MoT did automobile usage on roads and was still responsible for implementation of emission standards, competent ministries for the auto industry were still MITI and MoT. As a result, it seems that the dominant alliances were the alliance between MITI and the auto industry and that between MoT and the auto industry, though the latter alliance seems more dominant because the former alliance acted not for environmental issues but economic issues. Similarly, because EA and the auto industry did not form a strong alliance, their interactions were less frequent with low quality.

Second, concerning resources, the enforcement of the Japanese Muskie law required technical information and cooperation of the auto industry more than before because unknown technologies were necessary and EA could not enforce it without development of technologies and mass-production of low emission automobiles. In addition, the auto industry became one of the largest economic powers in Japan, and its economic resources became, as a result, bigger. By using the bigger economic resources, namely donation to LDP, the auto industry came to have influences over national policy-making processes. Therefore, it seems that resources of the auto industry

became greater. As for MoT, it lost one of its resources and granting access to policy-making processes of emission standards because EA took over the resource.

Third, though MoT had a strategy of strong incorporation of the auto industry in policy-making processes of emission standards, EA took over the strategy and the auto industry was still able to join policy-making processes, namely the specialist committee of the central pollution council which was an advisory body of EA and in which a wide range of experts scientifically discussed emission standards. As for strategies of the auto industry, its manipulation of technical information and cooperation became more effective because EA was more dependent on the auto industry for technical information and cooperation. Consequently, EA could not exclude the auto industry from policy-making processes. In addition, as resources of the auto industry became greater, it is likely that the auto industry was more powerful than EA.

Fourth, as for distributions of resources, resources were almost equally distributed to all in number but unequally distributed to them in terms of their influences. Again, because resources of the auto industry became more powerful in policy-making processes of emission standards, the auto industry had the most powerful resources. Though influences of MITI did not change, and those of MoT decreased because it lost granting access to policy-making processes, EA had the strong public support. Because anti-pollution campaigns were very active, and their anti-pollution interests often influenced the state mainly through elections, the public support was very influential. In addition, as the LDP support enabled EA to establish the Japanese Muskie law, it might be another important resource for EA. Then, it is likely that resources of EA were more influential than those of MITI and MoT.

Fifth, as for distributions of power, because resources of the auto industry became more powerful and so were its strategies, it is likely that the auto industry became most powerful. In addition, because of the same reason mentioned just above, EA was seemingly more powerful than MITI and

MoT.

Finally, it should be pointed that this policy change happened although the core policy network members had distinctive and seemingly conflicting interests. There were economic interests of MITI, MoT's interests of appropriate road transport, environmental economic interests of some automakers, economic interests of other automakers and environmental interests of EA and LDP in the core of the policy network. However, their interests did not conflict with each other. Surely, environmental economic interests and environmental interests welcomed the establishment of the Japanese Muskie law. In addition, in order to promote appropriate road transport, MoT recognized that reducing automobile air pollution was necessary. Further, the automakers with economic interests found it necessary to achieve the US Muskie law in order to continue exporting their products into the US to satisfy economic interests. Moreover, MITI considered that it was necessary for the automakers to achieve the US Muskie law because it was needed to continue exporting Japanese automobiles into the US, and achieving the US Muskie law would enable the Japanese automakers to lead other foreign counterparts so that economic interests of MITI would, in the long run, be enhanced. Thus, although they had different interests, there was a coincidence of interests and hence some consensus on the establishment of the Japanese Muskie law.

The fourth policy change (Figure 6-3)

The fourth policy change was the establishment of the 1975 emission standards (the 1975 requirements of the Japanese Muskie law). This policy change was also one of the most significant policy changes. The most powerful driver of this policy change was the successful technological developments of Honda and Toyo Kogyo on reduction of exhaust gases. In addition, severe competition among the automakers to increase shares contributed to the successes of them because Honda and Toyo Kogyo recognized that producing low emission automobiles would make

themselves lead other rival automakers in the long run. Further, as described above, the state still needed to respond to high public demand to decrease automobile air pollution because of serious automobile air pollution and high public demands were thus a powerful driver again.

Although Honda and Toyo Kogyo succeeded in achieving the 1975 emission standards of the US Muskie law, the US decided to postpone it in 1974 and the oil crisis happened in 1973. Consequently, several negative factors happened too. First of all, some automakers such as Toyota and Nissan had 'pure' economic interests to postpone the 1975 emission standards, though other automakers including Honda and Toyo Kogyo had environmental economic interests to achieve the standards and win in the international market with their highest anti-pollution technologies. Because of the postponement of the US Muskie law, and the oil crisis and the consequent economic recession, emission standards became a significant economic problem. As interests of MITI and some automakers were about to be damaged, they started to actively influence policy-making processes of emission standards. Although it was decided that the 1975 emission standards were enforced because two automakers had already achieved the standards and LDP with environmental interests supported the establishment, economic interests of MITI and some automakers became powerful, they began to very frequently contact each other, and the alliance between MITI and the auto industry became dominant in the core of the policy network because the two largest automakers, Nissan and Toyota, had economic interests and the auto industry as a whole (or JAMA) reflected their interests. In addition, although all the core policy network members found it inevitable to establish the 1975 emission standards though their interests came to conflict with each other, they did not consider so on the 1976 emission standards because of their different and conflicting interests.

Second, regarding resources, because of the economic recession, economic resources of the auto industry and the legitimacy of the policies of MITI to pursue economic interests became powerful. However, as Honda and Toyo Kogyo had already achieved the 1975 emission standards, the

director-general of EA, Takeo Miki, strongly supported the enforcement, which was apparently a great resource for EA. Again, as the resources of the auto industry and MITI became relatively greater than those of EA, MITI and the auto industry were becoming more powerful than EA. Consequently, though the 1975 emission standards were established, they were modified through the negotiation and bargaining process with the auto industry. Because some automakers, LDP and EA sought to establish stricter emission standards than those of the US, though MITI and the auto industry sought not to do so because it was recognized as an appreciative system that emission standards needed to be the same as those of the US, it seems that there were disagreements to the basic values. However, all of the core policy network members accepted the legitimacy of the outcome on the reinforcement of emission standards.

The fifth policy change (Figure 6-4)

The fifth policy change was the postponement of the 1976 emission standards, and this policy change was a significantly negative change in emission standards. Although key drivers for policy changes were discussed at first in the previous parts, changes in the policy network are discussed before discussion of key drivers because changes in the policy network are much related to the policy change in this part.

As for resources of the core policy network members, first, the economic resources of the auto industry such as job creation and acquisition of foreign currency became relatively more important because of the oil crisis and the resulting economic recession. Moreover, as the auto industry became one of the largest industries in Japan, it became able to influence LDP through donation to the party by utilizing its economic resources. As strategies of Kakuei Tanaka, the prime minister, for elections, were greatly dependent on donation by industries, its economic resources were especially effective in making LDP on their side, which was a great resource for the auto industry. In addition, the strong

support from Yoshiro Hayashi, an ex-official of MITI and a powerful LDP member, seemed a great resource too. Further, interpersonal relationships with MITI were significant resources for the auto industry. The automakers and JAMA had accepted ex-officials of MITI into themselves and, through the interpersonal relationships between those ex-officials of JAMA and the officials in MITI, sufficient information and ideas of effective strategies were exchanged.

Second, the resources of MITI also increased and became more significant. Again, as economic problems became the main issues, its authority for economic issues became the most legitimate authority in the core of the policy network because EA had the authority for environmental issues and MoT had it for road transport issues. Also, MITI started to greatly utilise interpersonal relationships with the auto industry to achieve its objectives. Moreover, LDP including Kakuei Tanaka and Yoshiro Hayashi started to support MITI, and this was also an important resource.

Third, EA received the strong public support especially from metropolitan areas. In addition, some local governments of metropolitan areas, especially TMG, supported and helped EA to justify and enforce the 1976 emission standards. However, those resources became less important than economic resources. Further, it seems that EA still had support from some members of LDP such as Matsuhei Mouri, a director-general of EA, but LDP as a whole dominantly supported the auto industry and MITI. Finally, as far as resources of LDP are concerned, the most important resource of LDP was legitimate power over ministries. LDP had an ability to influence ministries by, for instance, direction and persuasion because LDP had legitimate power over ministries. In this time, LDP gave pressure and direction to EA to give up the enforcement of the 1976 emission standards. Thus, though LDP was much dependent on the auto industry for its economic resources, so was the auto industry on LDP for those resources to make EA give up the postponement of the 1976 emission standards.

Regarding interests of the core of the policy network, because of the postponement of the Muskie

law, the automakers did not need to achieve the 1976 emission standards and the enforcement of the 1976 emission standards was expected to result in huge economic damages although Japan was already in an economic recession due to the oil crisis. Because two appreciative systems, 'automobile air pollution policies needed not to damage economic activities of the auto industry' and 'emission standards needed to be the same as those of the US' were invaded and emission standards became a critical economic problem, the core policy network members with economic interests such as MITI and some automakers including Toyota which had strong interests to protect these two economic-related appreciative systems, actively sought to control policy-making processes of emission standards to achieve their appropriate economic goals.

In addition, as described above, LDP and the auto industry had close resource interdependency relationships and LDP as a whole greatly reflected the interests of the auto industry. Thus, interests of LDP in this time were economic interests. As for interests of EA, EA had weak environmental interests. EA in general sought to reinforce emission standards to a degree that the auto industry could agree. Hence, EA chose to protect the cooperative relationships with the auto industry to protect the interests of the auto industry rather than greatly reinforce emission standards against the interests of the auto industry. Concerning MoT, because emission standards became economic issues which were territories of MITI though MoT respected economic interests, MoT less actively joined policy-making processes. Thus, interests of the core policy network members as organizations did not greatly conflict with each other.

In addition, because of the reasons mentioned above, MITI, the auto industry and LDP became powerful actors and the alliances both between MITI and the auto industry and between the auto industry and LDP became dominant in the core of the policy network. Also, it seems that MITI and the auto industry very frequently contacted each other. Further, frequency of interaction between LDP and the auto industry seemingly increased too. In addition, because all of the core policy

network members as a whole respected economic interests and agreed to the postponement of the 1976 emission standards, it seems that they basically shared values and accepted the legitimacy of the outcome on the postponement of the 1976 emission standards. Moreover, as described above, resources were distributed very unequally to the members in terms of influences of resources, which enlarged significantly differences of power distribution.

Although economic interests were dominant and all the core policy network members seemingly respected economic interests, there were conflicting interests within the members. First, as indicated above, although LDP was dominated by economic interests, some powerful members of LDP such as Takeo Miki and Matsuhei Mouri (director-generals of EA) had environmental interests and they sought to enforce the 1976 emission standards. Second, EA, in general, such as Hitoshi Kasuga, the head of the air quality bureau of EA, had weak environmental interests but Ikuo Kobayashi, who was the chief of the automobile section of EA and joined policy-making processes of emission standards, had strong environmental interests and sought to make the new 1976 emission standards as strict as possible. Finally, some automakers such as Honda and Toyo Kogyo had environmental economic interests though JAMA sought to achieve strong economic interests. The enforcement of the 1976 emission standards was desirable for them because they had more advanced technologies for exhaust gas reduction and thus they could increase sales if the standards were enforced. However, because they could not explicitly tell that they could achieve the standards as there was an agreement among the automakers to make the standards postponed, they sometimes implied that they had technologies to achieve the 1976 emission standards. These differences within the core policy network members, as described later, contributed both to making the degree of negativity in the policy change smaller than the core policy network members with economic interests sought to achieve, and then to the enforcement of the 1978 emission standards (the next policy change).

As far as the appreciative systems are concerned, that automobile air pollution policy was one of

the most important economic issues seemed to be added to the appreciative systems. Those kinds of 'the most important economic problems' had been 'sacred' areas, and no other actors except MITI and the related industries had been able to invade those areas. By making this automobile air pollution problem one of them, MITI and the auto industry thus sought to exclude other interests. In addition, though it was recognized as an appreciative system that emission standards were technical matters, it became considered by the core policy network members that emission standards were technical matters and there were technical difficulties to reducing emissions. Concerning strategies, although LDP sought to achieve its targets by supporting EA by authorization, it changed its strategies from that to giving pressures to EA by direction and persuasion to achieve its new targets.

Then, regarding key drivers for the policy change, the main factors that brought about such a negative policy change were the postponement of the US Muskie law and the oil crisis. As described above, various aspects of the core of the policy network changed because of these two drivers, which led to this negative policy change. In addition, though the core policy network members with seemingly different conflicting interests shared basic values and accepted the legitimacy of outcomes on emission standards as long as the appreciative systems were protected, two of its appreciative systems were invaded. Though 'emission standards need to be the same as those of the US' had been an important appreciative system, it was invaded as a result of the postponement of the US Muskie law. Further, as it was expected that the enforcement of the 1976 emission standards would result in huge economic damages for the auto industry, it was also against one of the appreciative systems. Because two of the appreciative systems were interfered, some core policy network members, especially the auto industry and MITI, were no longer able to have consensus on emission standards.

Thus, it was clear that the postponement of the US Muskie law and the oil crisis were the main drivers for this policy change. However, these two incidents had already happened in the previous policy change, but the previous policy change was a policy change that advanced emission standards

unlike this negative policy change. It seems that the negative policy change happened because interests of some core policy network members such as the auto industry, EA and LDP changed, which influenced and changed various aspects of the core of the policy network including relationships, resources and power distribution. Hence, although the postponement of the Muskie law and the oil crisis were definitely important drivers for this negative policy change, it was those changes in the dimensions of the core of the policy network that substantially brought about the negative policy change. This may indicate that the core of the policy network was not independent from a policy change but a part of it, and the core of the policy network was able to change the directions of a policy change.

Finally, although the very negative policy change happened, the degree of 'negativity' was not as great as MITI and the auto industry sought for. One main reason for this might be that the appreciative systems were not strong enough so that other actors sought to challenge the appreciative systems. For instance, one of the appreciative systems was that emission standards were technical matters and there were technical difficulties to reduce emissions from automobiles. While the auto industry sought to utilise this appreciative system to justify the postponement of the 1976 emission standards, the core of the policy network was unable to do so because this appreciative system was challenged by some EA members and some local governments in metropolitan areas who believed, from information implicitly told by some automakers, that there were almost little technical difficulties. Though the industry argued that the enforcement of the 1976 requirements of the Japanese Muskie law was technically infeasible, local governments organized a research team to examine if the enforcement of the 1976 emission standards would be really technically impossible due to the information of some automakers, and the research team concluded that the enforcement would be possible. Thus, it can be said that local governments were influential peripheral members in the policy network. In addition, though the auto industry acted collectively to make its demands

come true, as described above, the industry had different interests, economic interests and environmental economic interests, within it, though automakers with environmental economic interests did not explicitly express their interests. Because of this difference among them, which was based on the severe competition among the automakers, the issue could not be kept to technical matters and it was not recognized that there were technical difficulties to reduce emissions.

Further, a new appreciative system that automobile air pollution policies were one of the most important economic issues was ineffective. While MITI and the auto industry emphasised expected economic problems caused by the enforcement of the 1976 emission standards of the Japanese Muskie law, some members of EA, the local governments of metropolitan areas and the public, mainly in the metropolitan areas, considered automobile air pollution a more important problem than economic development, and they sought to challenge the appreciative system. MITI and the auto industry tended to consider that the public had still given a priority to economic issues as in the middle of the high economic development. However, the public mainly in metropolitan areas had already started to consider environmental issues more important than, or as significant as, the economic issues. Because of the ineffectiveness of the appreciative systems and disagreements to the basic values, the dominant members of the core of the policy network were unable to exclude conflicting ideas of reinforcement of emission standards or perfectly control the policy outcomes.

The sixth policy change (Figure 6-5)

The sixth policy change was the establishment of the 1978 emission standards. It seems there were three main drivers for this policy change. One of the main drivers was the 'clean' administration of Takeo Miki. The former prime minister (Kakuei Tanaka) had to resign his post because the public severely criticized the disclosed cosy relationships both between LDP and industries and between him and industries. In addition, it was believed that the 1976 emission standards had been postponed

because of these cosy relationships. Consequently, Takeo Miki became the new prime minister partly because he had been recognized as one of the cleanest and greenest members of LDP. Then, Takeo Miki started to reconsider the postponement of the 1976 emission standards, which was the symbol of the cosy relationships, and he sought to enforce the original 1976 emission standard as soon as possible. Another driver was high public demands for the enforcement of the 1978 emission standards because of the disclosure of inappropriate decision-making processes on the postponement of the 1976 emission standards and the inappropriate relationships between both MITI and the auto industry and between LDP and the auto industry.

The next driver was the severe competition among the automakers and the consequent successes of them in technological development for the 1978 emission standards. As the public severely criticized the auto industry because of these disclosures, most automakers that previously had economic interests such as Mitsubishi Motors and Nissan sought to produce low emission automobiles to avoid suffering negative corporate images. In addition, because they in fact hoped the enforcement of the 1978 emission standards, though they were not able to do so because they were required to cooperatively seek for the postponement of the standards, some automakers with environmental economic interests very actively sought to produce low emission automobiles. Further, because of the directions from Takeo Miki and strong public demands to make open policy-making processes and data used in the processes and to enforce the original 1976 emission standards, EA established a private examination board for the NOx reduction technologies concerning automobiles that examined the state of technologies on the NOx reduction. Because the examination board opened the data on the NOx reduction technologies to the public, automakers sought to submit remarkable data to improve corporate images, which stimulated technological competition too.

In addition, after the enforcement of the 1975 emission standards, the automakers learned that Japanese consumers tended to buy automobiles that emitted less, though they were low fuel

efficiency and more expensive. Consequently, though Toyota sought to postpone the 1978 emission standards, it changed to achieve the 1978 emission standards, and all the automakers finally sought to produce low emission automobiles and succeeded in it in the long run. Thus, the tendency of the public to buy low emission automobiles was influential on the decisions of the automakers to achieve the 1978 emission standards and it was thus a significant driver too.

In this policy change, several changes happened within the core of the policy network. Regarding the interests, automakers had different interests as in the policy change of the establishment of the 1975 emission standards. Toyota, and perhaps Daihatsu, (a member of the Toyota group), had pure economic interests to prevent any economic damages and seek to avoid reinforcement of emission standards, while most automakers including Honda and Toyo Kogyo had environmental economic interests. Although most automakers had environmental economic interests, it seems that there were two kinds of environmental economic interests. As described above, Honda and Toyo Kogyo seemingly sought to proactively produce low emission automobiles because they recognized that such proactive activities would lead to profits in the long run. However, other automakers such as Mitsubishi Motors and Nissan sought to produce low emission automobiles mainly because they sought to avoid suffering negative corporate images as they were severely criticized of inappropriate behaviour in the postponement of the 1976 emission standards. Thus, it can be said that some automakers had proactive environmental economic interests but others had reactive environmental economic interests, though the auto industry as a whole was dominated by environmental economic interests. In addition, though EA had different interests within it in the previous policy change, it seems that EA had united strong environmental interests because of a strong intention of the Miki administration. Further, because it was severely criticized of inappropriate relationships with the auto industry and Takeo Miki became the leader of the party, the dominant interests of LDP became environmental interests, though some powerful members (e.g. Yoshiro Hayashi) seemingly still had

economic interests to reflect the interests of Toyota.

The appreciative systems changed too. Because Japan had already had the strictest emission standards in the world and it was apparent that the Japanese automakers had the highest levels of technologies to reduce emissions, 'emission standards need to be those of the US' was no longer an appreciative system, and any core policy network member no longer insisted on this appreciative system. In addition, JAMA or Toyota, and MITI greatly emphasised another appreciative system that automobile air pollution policies were one of the most important economic issues and they needed to be harmless for the auto industry. However, this appreciative system was not effective enough to exclude conflicting interests, and JAMA and MITI could not keep it because Takeo Miki and the public gave priority to environmental issues rather than economic issues. Further, because it was apparent that the automakers had technologies for the 1978 emission standards, the core of the policy network was unable to keep unchallenged one of the appreciative systems that automobile air pollution policies were technical matters and there were technical difficulties to reduce emissions.

Further, resources in the core of the policy network changed. First, MITI became unable to 'use' very much the interpersonal relationships with the auto industry and obtain the LDP support because they were severely criticized by the public. Also, the authority of MITI for economic issues became less significant because it was not recognized, as described above, that this issue was an economic matter. Similarly, the auto industry was unable to use very much the interpersonal relationships with MITI and did not have the strong LDP support. Further, economic resources of the industry became less controlling. Contrary to MITI and the auto industry, resources of EA increased because EA had greater support from both LDP and the public. In addition, some local governments powerfully supported the enforcement of the 1978 emission standards and their support definitely contributed to the success of EA. Thus, it seems that some local governments were still important peripheral policy network members.

As far as the rules of the game are concerned, although secrecy was protected to a certain extent, decision-making processes were not perfectly kept secret in this policy change because the examination board opened technological data to the public, though the specialist committee of the central pollution council, in which technological data was collected and examined to establish emission standards, did not do so. Moreover, strategies changed. EA used financial incentives for automobile buyers to purchase low emission automobiles, which moved all the automakers to achieve the 1978 emission standards. In addition, as the close involvement of the auto industry became considered problematic, the auto industry was not closely incorporated into the decision-making processes.

Though the previous main strategy of LDP to seek for its goal (the postponement of the 1976 emission standards) was to give pressures to EA, its main strategy in this policy change was to support EA by authorization to establish the 1978 emission standards. As for frequency of interactions, though MITI and the auto industry still frequently interacted with each other, as their relationships were severely criticized and they could not make up cooperative and effective strategies, frequency of interactions and quality of them, it seems, decreased. In addition, to avoid the public criticism, it seems that the level of frequency in interactions between LDP and the auto industry became low and they were unable to cooperatively make decisions on emission standards.

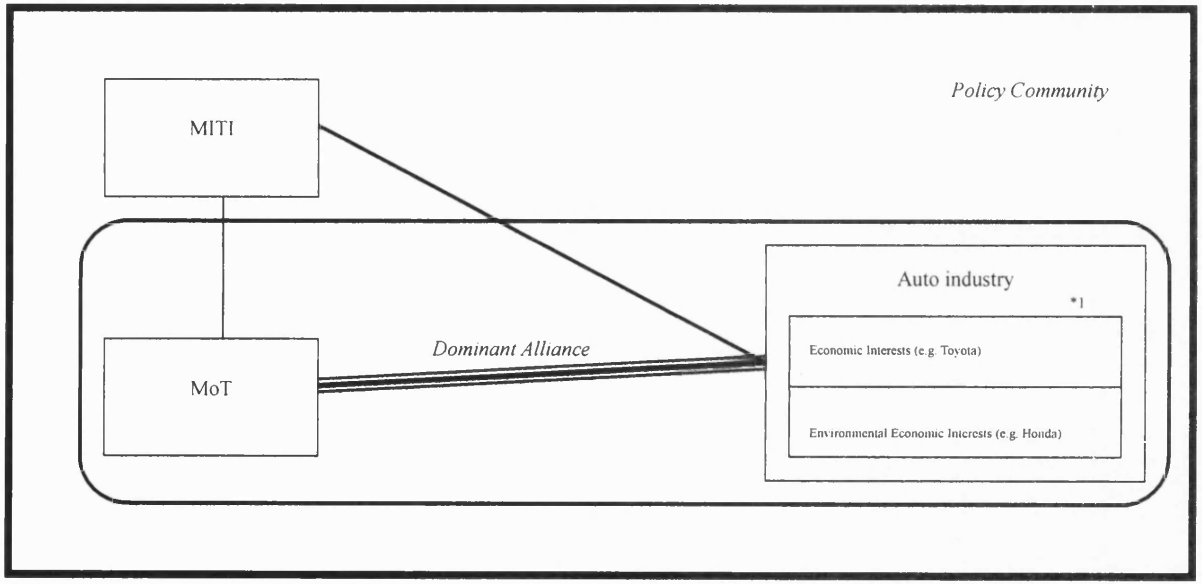
As for consensus over basic values, because the appreciative systems and the rules of the game were challenged, as described above, there was disagreement on the basic values. Concerning the legitimacy of outcomes, all of the core policy network members basically agreed to it and accepted the legitimacy of the outcome. Concerning the distribution of resources and power, resources of EA, as mentioned above, became more powerful than those of MITI and the auto industry, which made EA more powerful than them.

Conclusions

The chapter examined automobile air pollution policies in the 1970s. As shown above, the 1970s had experienced several dramatic policy changes in automobile air pollution policies and it could be called that the 1970s was the most turbulent era in the history of automobile air pollution policies in Japan. The issues discussed in this chapter included the establishment of the emission standards for NOx, making decision to enforce the Japanese Muskie law, the enforcement of the 1975 emission standards, the postponement of the 1976 emission standards, the enforcement of the 1978 emission standards and the relaxation of the national ambient air quality standard for NOx.

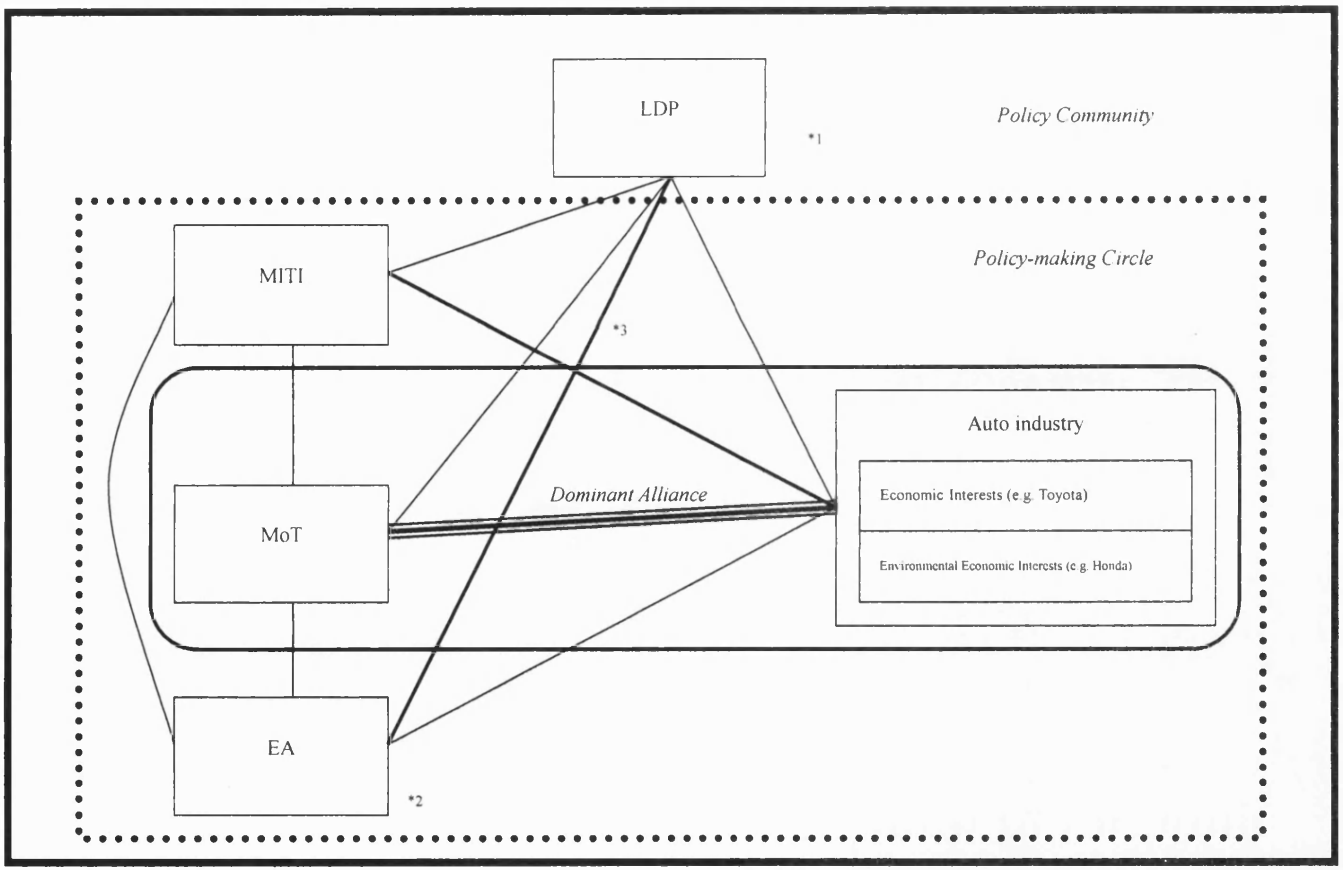
Although it was not easy to enforce the Japanese Muskie law in Japan, Japan could have the strictest emission standards in the world in the long run. However, because of the relaxation of the national ambient air quality standard, automobile air pollution policies did not greatly advance in the 1980s. The next chapter begins with this stagnation of emission standards and automobile air pollution policies.

Figure 6-1 The Policy Network in the Second Policy Change



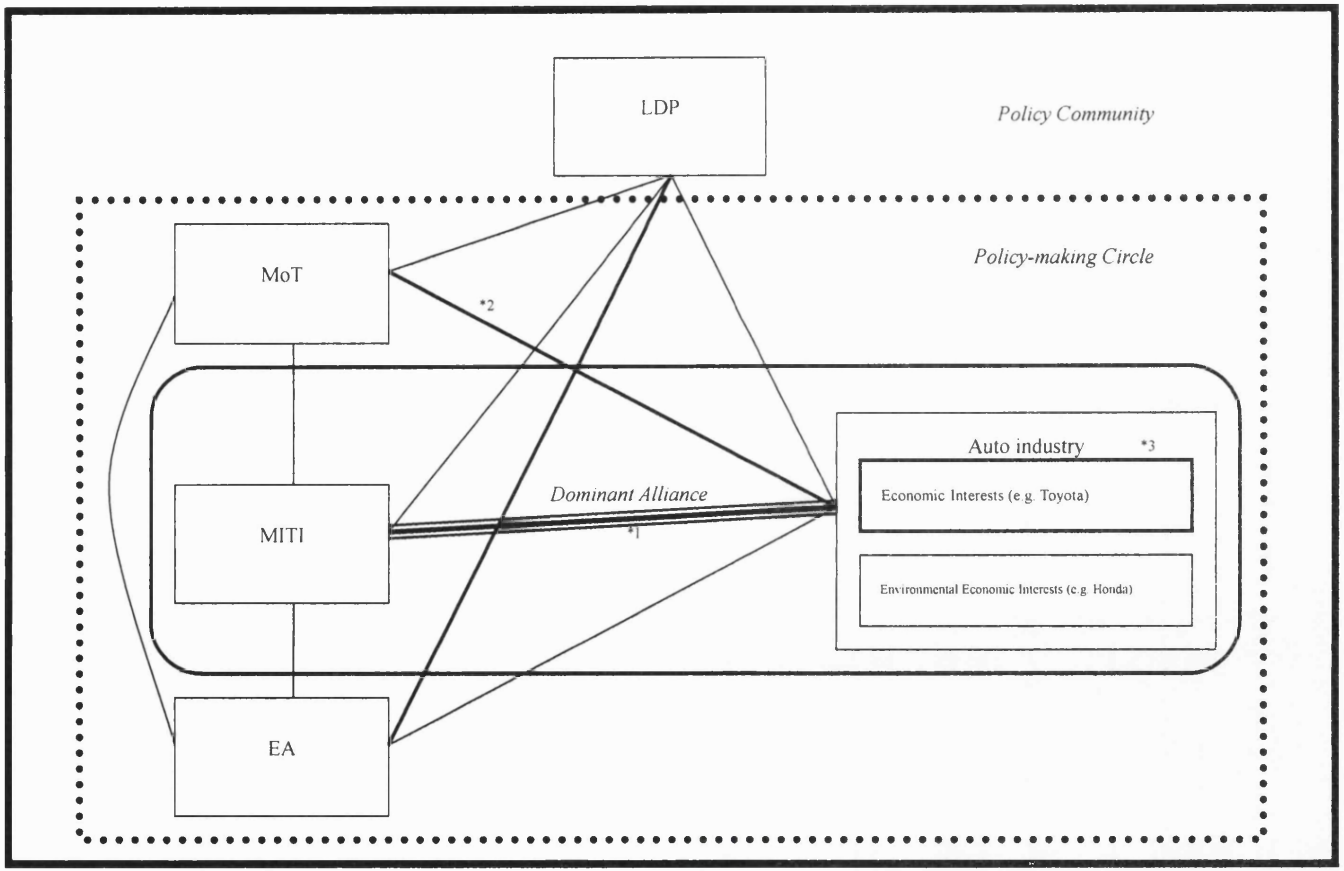
*The key change in the diagram is the co-existence of the automakers with economic interests and the automakers with environmental economic interests (*1).

Figure 6-2 The Policy Network in the Third Policy Change



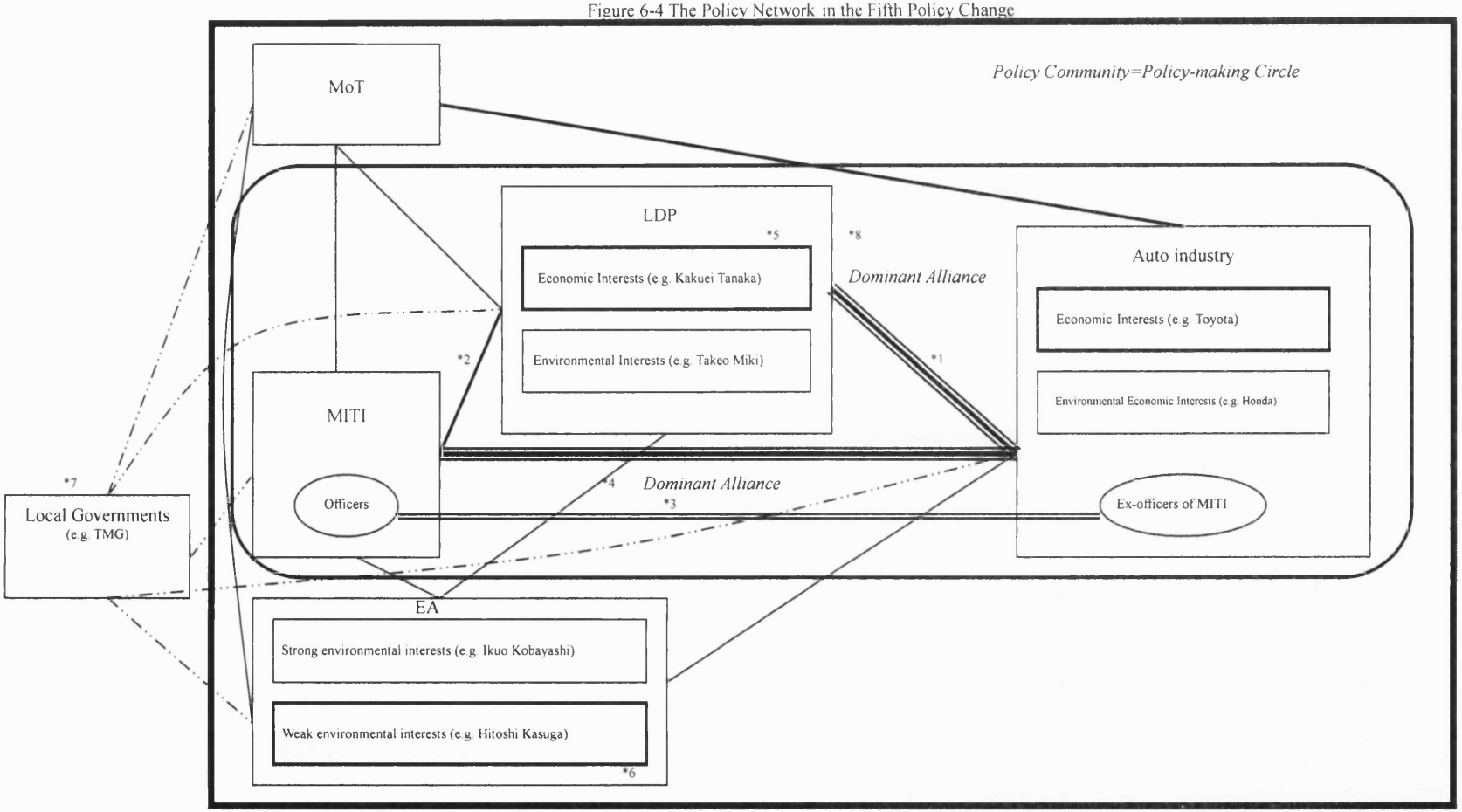
The key changes in the diagram are: the entry of LDP (*1) and EA (*2) into the policy community and the creation of the new crucial relation between LDP and EA (*3).

Figure 6-3 The Policy Network in the Fourth Policy Change



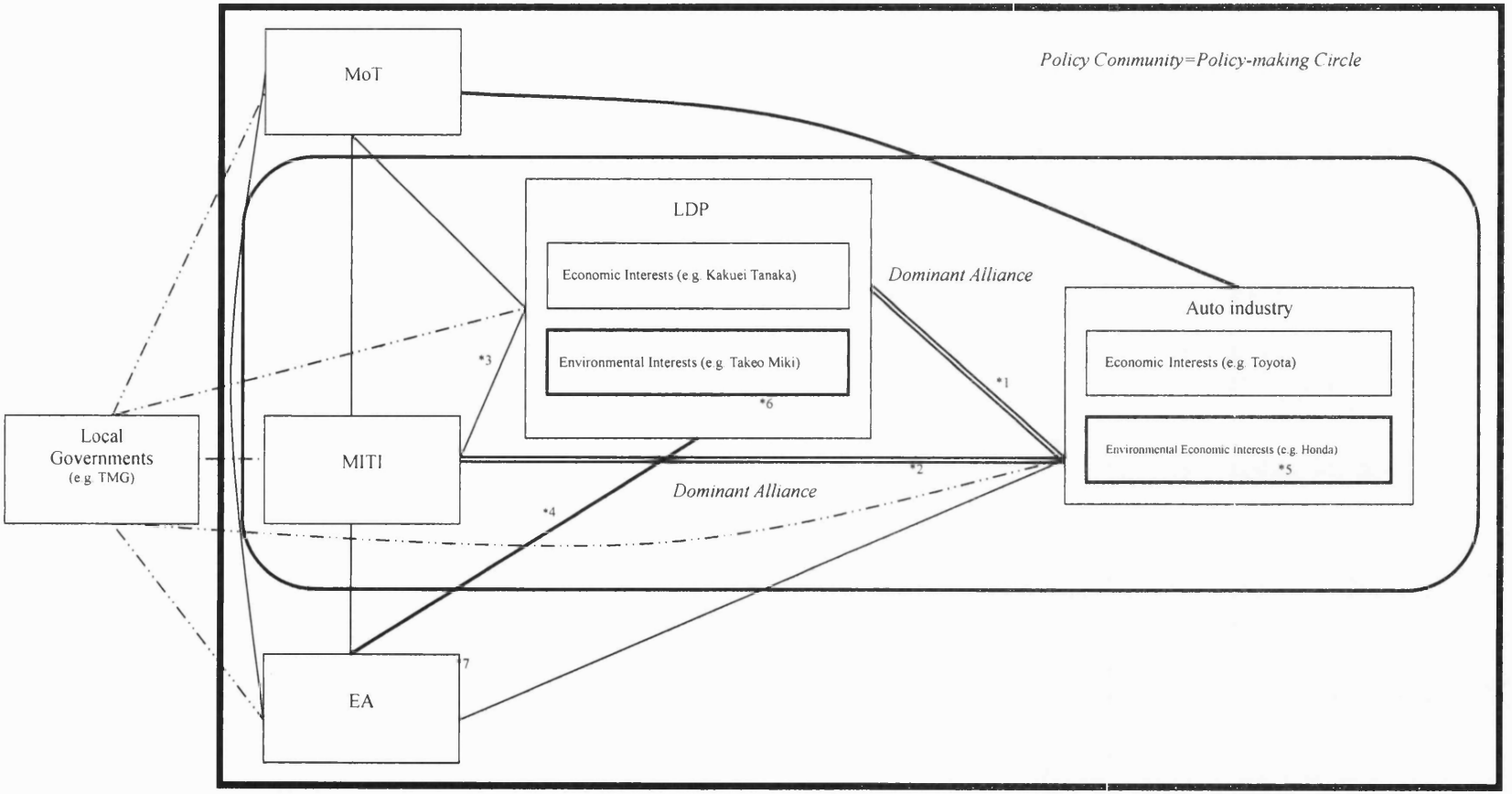
The key changes in the diagram are: the relation between MITI and the auto industry becoming dominant (*1), the relation between MoT and the auto industry becoming less crucial (*2) and the automakers with economic interests becoming more powerful and the consequent collapse of the coexistence of environmental economic interests and economic interests within the auto industry (*3).

Figure 6-4 The Policy Network in the Fifth Policy Change



*The key changes in the diagram are: the relation between LDP and the auto industry becoming more crucial (*1), the relation between MITI and LDP becoming crucial (*2), the personal relation between MITI and the auto industry becoming crucial (*3), the relation between LDP and EA becoming less crucial (*4), both LDP members with economic interests (*5) and EA officials with weak environmental interests (*6) becoming powerful, TMG becoming influential in the periphery (*7) and the entry of LDP into the policy-making circle (*8).

Figure 6-5 The Policy Network in the Sixth Policy Change



The key changes in this diagram are: the relation both between LDP and the auto industry (*1) and between MITI and the auto industry (*2) becoming less crucial, the relation between LDP and MITI becoming less crucial (*3), the relation between LDP and EA becoming crucial (*4), the interpersonal relation between MITI and the auto industry becoming unavailable and both the automakers with environmental economic interests (*5) and the LDP members with environmental interests (*6) becoming powerful and interests of EA members becoming united (*7).

Chapter 7

The Case of Automobile Air Pollution Policies in Japan

1980s, 1990s and 2000s

Introduction

The previous chapter showed both great advances and retreats in automobile air pollution policies in the 1970s. This chapter examines automobile air pollution policies in the 1980s, the 1990s and the 2000s. Automobile air pollution policies in the 1980s developed less than in the 1990s and the 2000s. Indeed, the 1980s can be said to have been the dark age of automobile air pollution policies in Japan.

Automobile air pollution policies advanced in the 1990s and 2000s. First, the automobile NOx law was established in the mid-1990s as a new policy tool for automobile air pollution. Second, emission standards for PM have been established. Finally, TMG established a new local ordinance on automobile air pollution for diesel trucks and carried out 'operations' to eliminate diesel trucks to reduce emissions of NOx and PM from them, which led to the early implementation of planned emission standards.

In addition, it should be made clear that, unlike emission standards on NOx for passenger automobiles, emission standards on NOx for diesel trucks were based on concentration of NOx (i.e. ppm) until 1994. Thus, strictly speaking, emission standards for diesel trucks should be called concentration standards. However, what the regulations in fact did was to determine a permissible level of emissions from diesel trucks and it is normally recognized as emission standard in Japan. Thus, in the research, although the regulations should be technically called the concentration

standards, they are instead called emission standards.

The results presented in most of this chapter are the researcher's own results based on primary and secondary data collected and original analysis. Although the results presented in the previous chapter were largely based on the Diet paper database, the results of this chapter were less dependent on the Diet paper database and rather based on other secondary data including newspaper and existing literature and the primary data because the Diet paper database provided less useful and sufficient information in the 1980s, 1990s and the 2000s.

In addition, the last part of this chapter on the operations of TMG on diesel automobiles and the early implementation of the 2007 emission standards was based on the previous research of the researcher. The results of the research came from semi-structured interviews and a wide range of secondary sources, especially from the website of the environmental protection bureau in TMG (http://www2.kankyo.metro.tokyo.jp/jidousya/diesel/tokyo-sora/index.htm). In addition, they were published in a paper, 'Policy networks and policy change' in the *Journal of Japanese Public Policy* in 2002. This paper was the first research on this topic and the results of this part were thus perfectly original and no similar research has been done before. As for the other parts of this chapter, they were mostly dependent on the secondary sources, but no one else seemingly has analysed secondary sources to provide an original historical analysis of automobile air pollution policies in Japan.

Total NOx Emission Control and Emission Standards

EA sought to carry out automobile air pollution policies focusing on metropolitan areas as well as reinforcement of emission standards for diesel trucks. As for policies focusing on metropolitan areas, EA carried out total NOx emission control in metropolitan areas including the Tokyo area, the Yokohama area (Kanagawa), and the Osaka area in June 1981 (EA, 1981). Local governments

responsible for those three areas needed to produce a total emission control plan for NOx and SOx so that the total amount of them emitted mainly from business activities would be reduced to the defined amount based on the national ambient air quality standard (EA, 1982). Based on the plan, local governments determined emission standards for the areas which factories with beyond a certain scale and other specified business facilities in the area had to obey.

EA also reinforced emission standards for NOx from diesel trucks. As NOx emissions from petrol passenger automobiles were greatly reduced, EA sought to reduce NOx emissions from diesel trucks. In addition, as diesel trucks had greater fuel efficiency, prices of gas oil for diesel trucks were lower than those of petroleum, and as emission standards for diesel trucks were not strict, the number of diesel trucks had greatly increased (C136, C137a; see Appendix C, D&E). However, the state did not actively seek to reduce NOx emissions from diesel trucks because they were used for commercial purposes (C169a). Further, even after it was recognized that emissions of NOx from diesel trucks needed to be reduced, they had been much looser than those for petrol automobiles because of technical difficulties (Kawana, 1993b; C131b).

Their 'technical difficulties' arguments did not work well in the mid-1970s because other stakeholders strongly doubted their arguments. However, in this time, as other actors recognized there were great technical difficulties to reduce NOx emissions from diesel trucks, their 'technical difficulties' arguments seemingly succeeded and they had been rarely challenged (C131a, C148, C154a).

Nevertheless EA expected that it would be difficult to achieve the national ambient air quality standard for NOx in metropolitan areas unless emissions from diesel trucks were reduced. Then, in December 1977, the central pollution council submitted its report to EA concerning measures for setting long-term emission limits in answering the inquiry made by EA in July 1975 (EA, 1981, 1986; C131b, C205b). The report suggested the reinforcement of emission standards at two stages:

one in 1979 and the other in a few years after the first stage. Following the report, on the 30th of January 1978, the 1979 emission standards were established so that emissions of NOx from small sized indirect injection (II) diesel trucks, middle sized direct injection (DI) and II diesel trucks and large sized DI and II diesel trucks were reduced respectively by 8 percent, 12 percent and 8 percent, and 12 percent and 8 percent compared to the previous emission standards (EA, 1985).

Then, in order to establish emission standards for the second stage, EA set up the study group for evaluation of automobile pollution prevention technologies (C129, C130, C131b). In May 1980, the team proposed the 1982 emission standards for II diesel trucks and they were established in September 1980 (EA, 1982; C133). Then, at a hearing held by the study group, the automakers made it clear that they were able to reduce NOx emissions from DI diesel trucks by almost the same amount to be reduced by the 1982 emission standards. Then, on the 26th of August 1981, the 1983 emission standards for DI diesel trucks were established (EA, 1983, 1984; C205). Thanks to both emission standards, emissions of NOx from diesel trucks were reduced by 8 percent or 7 percent.

Although in the mid-1980s it was recognized that diesel trucks were the main source of NOx emissions in metropolitan areas, the levels of reduction were lower than those of the Japanese Muskie law (C137b). Normally, emission standards were established after the automakers told EA that it was possible to achieve defined emission standards proposed by EA (EA, 1986; C137a, C179; I1-4, I14, I22-26, I28). Thus, it can be said that emission standards became a technology-waiting policy.

In addition, as mentioned above, the 'technical difficulties' arguments of the automakers worked well (Asahi Shinbun, 26 December 1989, 25 August 1991; C137b, C137c; I14). It seems that there were indeed technical difficulties to reduce NOx emissions. Regarding petrol passenger automobiles, the reduction of NOx emissions had been carried out by a three-way catalyst (TWC). However diesel engines could not technically use TWC (C242h). In addition, though a main reduction measure for

NOx emissions in diesel trucks was to improve engines, the improvements of engines had been already almost technically impossible. In addition there were no alternative petrol trucks which had the same durability and power output. Consequently, their 'technical difficulties' arguments had normally been unchallenged, contributing to the technology-waiting policies.

Further, the automakers did not very actively seek to reduce NOx emissions partly because they had achieved the strictest emission standards in the world and it was expected that American and European automakers would not catch up with Japanese counterparts for ten years in terms of the NOx reduction technologies, and partly because automobile air pollution became not a problem of automobiles but a local problem (C149, C150). Moreover, as there was no Muskie law for diesel trucks, technological competition among the automakers did not occur, although EA sought to stimulate technological competition by carrying out assessment of technologies of each automaker on emission reduction (C174a, C174e, C178). Further, it is likely that technological competition did not occur because the two 'most environmentally friendly' automakers, Honda and Toyo Kogyo did not produce diesel trucks

Serious Automobile Air Pollution and Policies

Deterioration of NOx and PM air pollution

Though emission standards had been reinforced several times, as it normally took eight to ten years for substitutions of automobiles to be complete, the substitution effects of emission standards established in the late 1970s did not appear even in the mid-1980s (Kawana, 1993b; C206a). Further, due to the increased durability of automobiles, substitutions of automobiles took place later than it was expected (C135, C137a). In addition, as the number of automobiles, especially diesel trucks, had increased by one million to two million every year, most of those effects had been offset by such a

great increase, and the situation of automobile air pollution by NOx had not been improved in metropolitan areas (Asahi Shinbun, 01 March 1985, 16 September 1991; C132, C134, C138a, C212, C141; see Appendix C, D&E).

On the 1st of March 1985, Shigeru Ishimoto, the director-general of EA, consequently, admitted that EA failed to achieve the national ambient air quality standard by 1985 as Tokyo, Kanagawa and Osaka did not achieve the standard. Because high levels of reduction of NOx emissions from both petrol and diesel automobiles were, it was considered, technically difficult, EA then sought to reduce NOx emissions to carry out total NOx emission control from automobiles along with constant reinforcement of emission standards (1988, 1989; C138b, C173b, C173d). Then, EA established a study group for NOx in which experts, local governments in metropolitan areas and EA discussed issues on NOx reduction to achieve the standard (C138b, C211). Although a limited number of actors had been involved in automobile air pollution policies where emission standards were the almost only one policy option, the number of involved actors into automobile air pollution policies had increased because automobile air pollution policies involved those focusing on metropolitan areas as well (C139a, C139b, C139c, C142a, C220b, C165, C166a, C166b). In addition, as automobile air pollution was 'made' a problem notable only in metropolitan areas, EA started to cooperate with local governments in those areas approximately from the early 1980s in decision-making processes of automobile air pollution policies focusing on metropolitan areas, and they became involved in the processes though they were not still 'closely' involved (C220b).

As far as policy changes in emission standards are concerned, because there had been not as significant policy changes as those policy changes which were considered as 'policy changes' in the previous chapters, as demonstrated in Appendix I, it can be even said that policy changes did not happen in the 1980s. Policy changes did not happen in the 1980s because two appreciative systems that emission standards were technical matters and there were technical difficulties to reinforce

emission standards and that automobile air pollution was a local problem worked well.

In addition, in the mid-1980s, the automakers recognized that emission reduction would lead to not a decrease but an increase in sales, both domestically and internationally because their passenger automobiles of lowest emissions were greatly sold and the level of automobile production became the largest in the world (C163). In addition, as MITI recognized its positive economic effects, MITI shared the environmental economic interests and agreed to reinforcement of emission standards unless they entailed excessive costs (I2). MITI became less powerful in the core of the policy network because emission standards were not serious economic issues. Similarly, LDP became a less controlling actor in the core of the policy network because LDP also shared the environmental economic interests and it agreed to reinforcement of emission standards. In addition, the dominant alliance became that of MoT and the auto industry (I14). Although the auto industry, MITI and LDP had environmental economic interests, they had 'weak' environmental economic interests because they were not fully ensured that production of low emission automobiles would always lead to positive economic impacts (I3, I30).

In July 1985, the study group suggested reinforcement of emission standards for diesel trucks. Then, following the report, Shigeru Ishimoto, the director-general of EA, made an inquiry to the central pollution council on the 18th of November 1985 (EA, 1986). Then, based on the report made by the central pollution council, EA established the 1988 emission standards and the 1989 emission standards (C143). Consequently, compared to the previous emission standards, the emission standards on NOx for small sized II diesel trucks, middle sized DI and II diesel trucks and large sized DI and II diesel trucks were reduced respectively by 16 percent, 9 percent and 5 percent, 7 percent and 5 percent. Because these emission standards were influenced to a certain extent by the suggestion of the study group, it can be said that local governments in the study group could

influence the decision-making processes of these standards though they were still unable to join the decision-making processes.

As for the central pollution council, although the council was not criticized and it was not discovered that its decisions were greatly influenced by industries, industries such as the auto industry were still able to join decision-making processes of the council but other groups were not allowed to do so because EA maintained that they did not have technical knowledge though emissions standards were technical matters (C142b, C144a, C145c; I14, I47, I48).

On the 27th of December 1985, EA established a report, named 'the middle-term perspectives concerning NOx in metropolitan areas' (EA, 1986, 1989; C144b). The report identified several reasons that the national ambient air quality standard was not achieved, predicted the situation of automobile air pollution and suggested automobile air pollution policies in three to five years. According to the report, the ambient air quality standard for NOx was not achieved because the number of diesel trucks increased greatly; substitutions of automobiles did not come unlike expectation due to the increase in service time of them; the ratio of diesel trucks to all automobiles increased; and the number of DI diesel trucks increased. Regarding the situation of NOx in three to five years, the report expected that the level of NOx emissions from automobiles would decrease by 18 percent because of the effects of the enforced emission standards and the level of NOx emissions from both stationary and mobile sources would decrease by 12 percent in Tokyo. Further, it expected that the number of the general monitoring stations which failed to achieve the national ambient air quality standard would halve in 1988. However, in the report, EA pointed out that the standard would not be achieved with measures taken or planned to be taken for the NOx reduction, and then proposed further reinforcement of emission standards and establishment of other automobile air pollution policies focusing on metropolitan areas.

Then, to establish automobile air pollution policies focusing on metropolitan areas, in September

1986, EA set up a study group for promotion of the establishment of measures for road traffic in metropolitan areas for the NOx reduction, which was composed by MoT, MoC, MITI, NPA, the local governments of Tokyo, Kanagawa, Osaka and Hyogo and researchers. Based on measures suggested by the study group, EA sought to reduce NOx by 14.7 percent or 19.5 percent in the Tokyo area and 12.3 percent or 16.5 percent in the Osaka area within three years compared to the emissions of NOx in 1985. Measures to reduce NOx included promotion of low emission automobiles, measures for material flow, measures for human flow, and measures for traffic flow. Again, it identifies that there were a wide range of actors which joined decision-making processes of automobile air pollution policies focusing on metropolitan areas. In addition, it needs to be emphasized that local governments who had been strongly excluded from decision-making processes became involved in the processes (I1, I9, I12, I14). Especially, from the late 1980s, EA emphasized that local governments needed to play a central role in automobile air pollution policies and EA needed their support in automobile air pollution policies because automobile air pollution was a local problem and because it considered that automobile air pollution policies that were established and enforced by local governments would be effective (EA, 1989, 1990).

National and local polices for automobile air pollution

In the late 1980s, the density of NOx in the air in those three specified areas became even as bad as in the mid-1970s (EA, 1986, 1988, 1989, 1990, 1991; Asahi Shinbun, 27 August 1988, 14 December 1991; C149, C151a, C151b, C152). In addition, its situation in other areas such as Aichi, Fukuoka, Saitama and Chiba became worse. Consequently LDP came to recognize the need to immediately establish measures to reduce NOx emissions. The sub-committee for consideration of the NOx standard in the environmental section of the political investigation section of LDP encouraged related ministries to cooperate with each other to reduce NOx emissions (Kawana,

1993b). The section played a central role in relaxation of the national ambient air quality standard for NOx in 1978. However, at this time, the same section greatly supported reinforcement of automobile air pollution policies. In addition, LDP supported EA when EA requested establishment of tax reduction for most up-to-date diesel trucks in 1990 to promote substitutions of old diesel trucks (C155, C156, C157a). This change was mainly due to the increased awareness of the public to the environmental problems because international environmental problems such as acid rain and destruction of the ozone layer became notable in the 1980s (EA, 1981, 1990, 1991, 1992; C153, C154a, C154b, C157b, C163, C169a, C170d, C170h). As the public demanded LDP to greatly advance environmental policies, LDP started to actively seek to improve the environmental quality in order to respond to the demand. This change of LDP on automobile air pollution problems contributed partly to the advancement of automobile air pollution policies in the 1990s.

Though the middle-term perspectives concerning NOx in metropolitan areas expected improvements in NOx emissions in 1988, the total amount of NOx emissions in reality did not improve. Then, a study group which was established in 1988 under the head of the air quality bureau in EA, produced a report named, 'The new middle-term perspectives concerning NOx in metropolitan areas' on the 23rd of December 1988. The report suggested various measures to reduce NOx emissions such as reinforcement of emission standards mainly for diesel trucks, total NOx emission control from automobiles and reduction in the prices of gas oil (EA, 1990; C154b).

In addition, on the 22nd of December 1989, the central pollution council submitted a report concerning NOx reduction from automobiles (EA, 1990; Yomiuri Shinbun, 23 December 1989; C157a, C158, C159, C250a). The report suggested great reduction of NOx and basic reconsideration of PM policies. Concerning NOx, the report suggested reduction of NOx emissions from diesel trucks by 30 to 60 percent. It sought to set two-step targets to reduce NOx emissions from DI large sized diesel trucks by 38 percent and from middle sized diesel trucks by 56 percent. In addition, it

sought to reduce NOx emissions from DI diesel trucks to the level of emissions from the II engines.

Regarding PM, it suggested reduction of PM emissions from diesel trucks by more than 60 percent (EA, 1990, 1991; C179, C181). It suggested the establishment of a regulation for PM from diesel trucks. The report further maintained reduction of the sulphur components in gas oil by almost 90 percent. Thus, it seems that EA chose automobile air pollution policies focusing on metropolitan areas rather than the enforcement of the Japanese Muskie law for diesel trucks (C137a). In addition, although automobile air pollution policies focused almost exclusively on NOx emissions from diesel automobiles, PM emissions from diesel automobiles became recognized as another significant air pollutant (C137b).

Further, as automobile air pollution in three metropolitan areas was serious, citizens in those areas strongly demanded improvements in the air quality (Asahi Shinbun, 17 August 1989; C146, C174e). Then, local governments in metropolitan areas sought to reduce NOx emissions by their own ways (C140). Local governments could freely make automobile air pollution policies to some extent but they could not do so when their automobile air pollution policies conflicted with jurisdictions of MITI (business activities) and MoT (road transport) (Asahi Shinbun, 15/10/1991; I9, I12-14, I16). As most of the automobile air pollution policies were related to either business activities or road transport, what they could do was in fact very limited. Thus, although EA emphasized the need that local governments played a role in automobile air pollution policies, they were in reality unable to do so (I6, I7, I10, I11, I14, I16). It seems that even in automobile air pollution policies focusing on metropolitan areas, MITI and MoT were more influential.

Further, local governments had difficulties in carrying out their own automobile air pollution policies because they normally did not have cooperative and interdependent relationships with industries. For instance, TMG with other local authorities carried out the total traffic control on Wednesdays from September 1991 to January 1992 to request automobile owners to control traffic

(C170b, C174a). Then, these local governments jointly carried out research on the total traffic control by giving questionnaires to almost 200 thousands of companies. However, only 5.1 percent of them returned the answered questionnaires and only 8.9 percent of the respondents answered that they cooperated for the policy (C174f). This may indicate that local governments had neither cooperative nor resource-interdependent relationships with industries. Indeed, industries had cooperative and resource-dependent relationships with their competent ministries such as MITI and MoT rather than local governments (I5-9, I11-14, I22, I23, I34-38, I39-42).

Automobile NOx Law

Decision-making for automobile NOx law

As mentioned above, the situation of NOx air pollution became even worse in the late 1980s and in the early 1990s (Kankyocho Taikihozenkyoku, 1994; Fujita, 1991; C159, C161, C169a, C169d, C169g, C171, C172, C173a, C176a). Although EA still basically considered emission standards a first choice of automobile air pollution policies, it practically started to reduce the total amount of NOx emissions from automobiles in defined metropolitan areas because emission standards did not work well in NOx reduction in the areas (C137a, C170c, C173a; I1, I14, I15).

Then, following the new middle-term perspectives concerning NOx in metropolitan areas and suggestions concerning reinforcement of measures for NOx made by the sub-committee of LDP, EA decided to carry out the total NOx emission control from automobiles. Then, EA established a study group for measures for the total NOx emission control from automobiles. The study group then issued its interim report on the 24th of November in 1990 (C158, C162a, C162b). The interim report proposed three main items: allocation of permissible emission limits to companies and factories; inflow regulation for high emission automobiles to put a sticker on those automobiles driven in

specified areas which satisfied defined standards wherever those automobiles were registered in specified areas; and the vehicle category regulation to replace diesel trucks by petrol ones and replace old diesel trucks by newest ones.

After issuing the interim report, the study group held hearings for related industries, related ministries and the public (C162a). At a hearing, JAMA argued that the total NOx emission control from automobiles would negatively influence material flow, economy and society (C169a). Further, JAMA pointed out that diesel trucks emitted the smaller amount of CO_2 and thus they were better in terms of global warming (Asahi Shinbun, 15 October 1991; C174e). The Japan trucking association (JTA) argued that the total NOx emission control from automobiles in some local governments was not desirable because trucks moved from one prefecture to another (C162a, C169c, C169d, C170a, C174e). In addition, at a hearing, the Japan chain store association (JCSA) argued that it would be problematic to evenly reduce the number of diesel trucks from each company and the consumer co-operatives (COOP) stated that substitutions of diesel trucks would cost a huge amount of money (Kawana, 1993b; Asahi Shinbun, 16 September 1991). Further, NPA suggested that the inflow regulation would not be feasible because of limited human resources. As far as local governments were concerned, at a round table conference consisting of governors of Tokyo, Fukuoka, Kyoto, Shiga, Yamanashi and mayors of Osaka city in Osaka, Kobe city in Hyogo and Yokohama city in Kanagawa, and EA, on the 3rd of June 1991, those governors and mayors strongly requested its early enforcement.

Because of severe criticism from industries, EA gave up allocation of permissible emission limits and inflow regulation, and decided to carry out the vehicle category regulation in specified areas as a main policy tool for the total NOx emission control because most industries were not against it (Fujita, 1991; Asahi Shinbun, 15 October 1991, 26 October 1991; C164a, C164b, C168, C170a, C170c). Then, on the 25th of October 1991, the study group submitted a final report to the

director-general of EA, Kazuo Aichi. In the final report, the study group proposed the vehicle category regulation as a main measure. This indicates that, though only the auto industry was influential in emission standards, several industries were influential in the total NOx emission control because it was mainly related to not the automakers but automobile users.

As shown above, there were a wide range of actors involved in automobile air pollution policies focusing on metropolitan areas or the total NOx emission control from automobiles, and they formed a new policy network (C173c). Consequently, it seems that two main different policy networks came to exist in automobile air pollution policies. In the policy network of the total NOx emission control, various actors were able to take part in the decision-making processes (C242). In addition, EA, MITI and MoT were the central actors or the actors in the core of the policy network, and MITI and MoT were controlling in the core of the policy network. In addition, the alliances between MITI and its supervising industries and MoT and its supervising industries were powerful in the policy network, and those alliances sought to avoid the establishment of strict automobile air pollution policies focusing on metropolitan areas. However, relationships between them were less strong and less integrated than those both between MITI and the auto industry and between MoT and the auto industry in the core of the policy network of emission standards as different industries had their own distinctive attitudes and objectives. In addition, no one industry was dominating in the policy network of the total NOx emission control though only the auto industry was controlling in the policy network of emission standards (I34, I36-39, I41). This contributed to the weak integration of the policy network. Moreover, local governments in metropolitan areas were more influential in the policy network of the automobile NOx law because local governments were involved in the establishment and enforcement of the law. Thus, local governments in metropolitan areas were influential members in the periphery of the policy network or it can be even said that they were the quasi-members in the core of the policy network.

After the final report was issued, EA started coordination among related ministries in order to draw up a bill for the law concerning special measures for total emission reduction of nitrogen oxides, so called the automobile NOx law, in November 1992. Then, MoT agreed to cooperate for the vehicle category regulation based on a motor vehicle inspection programme of MoT to secure the measure. In addition, it was determined that companies and factories were guided by those competent ministries, normally MITI and MoT, which had jurisdictions over those companies and factories in the automobile NOx law (C242i). Again, it indicates that MITI and MoT were influential and powerful actors in the policy network of the automobile NOx law (the total NOx emission control). After its bill was drawn up, on the 26th of February 1992, EA made an inquiry to the central pollution council concerning the bill. On the same day, the bill was discussed and admitted by both the air quality section and the road pollution section for one and a half hours (EA, 1992; C170a, C170e, C170f).

The bill mainly consisted of the vehicle category regulation in specified areas and rationalization of usage of automobiles which was included in the bill after negotiations between EA and the related ministries. However, because companies and factories were not forced to rationalise usage of their owned automobiles and they were just guided to do so, its effects were doubtful (Asahi Shinbun, 27 February 1992). Thus, it can be said that the automobile NOx law was the vehicle category regulation in specified area. Further, the bill suggested that MoT was to be responsible for the vehicle category regulation in specified areas and MITI and MoT would guide industries in the automobile NOx law because, as EA considered, these ministries had closer relationships with factories and industries and information of them, though the final report had suggested that local governments played these roles (C169d, C169e, C169g, C170a, C170b, C170g; I6, I10, I12, I14). On the 20th of May, the bill was approved at a plenary session in the House of the Councillors and on the 3rd of June, the automobile NOx law was proclaimed and was enforced in December 1993 (C169c,

C169e).

Automobile NOx Law

Regarding the contents of the law, it clarified responsibilities of the state, local governments, companies and factories and the public (EA, 1993, 1996; C169a, C172, C175). First, the state was responsible both for establishment and enforcement of basic and comprehensive measures. Second, local governments were responsible for enforcement of concrete measures based on a plan for the total NOx emission control considering situations of each area. Third, companies and factories which used automobiles were responsible for using their automobiles in a manner that could reduce NOx emissions. Fourth, the public was responsible to cooperate in administrative measures for the total NOx emission control, use rationally public transportation and pay attention to a driving manner. Among these, it needs to be paid attention that the law described that local governments were responsible for automobile air pollution and automobile air pollution policies.

In addition, the law sought to designate areas which did not achieve the national ambient air quality standard as specified areas and to reduce total NOx emissions in those areas. Then, the government determined a guideline for the total NOx emission control which specified basic items concerning total NOx emission control for those designated areas. Basic items included enforcement of the vehicle category regulation in specified areas and promotion of low emission automobiles, measures for material flow, measures for traffic flow, and human flow (C174a). When a guideline was framed, a prime minister, not a director-general of EA, deliberated basic items in cooperation with related ministers because the main role of EA was to make arrangements in environmental policies among related ministries such as MITI and MoT and EA thus was unable to lead other ministries (C169f, C174b). This indicates that EA was normally less powerful than MITI and MoT in the policy network of the automobile NOx law.

Next, a local government made a plan for the total NOx emission control. When making a plan, a local government needed to establish a liaison for the total NOx emission control composed by representatives of the prefecture government, municipal governments and representatives of branch offices of related ministries, and listen to opinions of the liaison (C169d). Then, a local government needed to submit it to a prime minister for its approval. Thus, there were a number of constraints to implement the law for local governments (Asahi Shinbun, 27 February 1992). However, it is apparent that local governments came to play a role in national automobile air pollution policies, and they were more involved in decision-making processes of automobile air pollution policies (C169d, C170a, C174a, C174b;I1).

The vehicle category regulation was the most innovative and central part of the automobile NOx law and it can be said that the automobile NOx law was the vehicle category regulation (Asahi Shinbun, 27 February 1992) Vehicle categories included normal sized trucks, small sized trucks, large sized buses, microbuses and automobiles for special purposes. The same emission standards for specified automobiles were applied to automobiles with the same GVW. Those standards were secured by the road transport and motor vehicle law of MoT. Thus, new automobiles which did not meet defined emission standards were unable to be registered and an inspection certificate was not issued for those in-use automobiles which did not conform to defined standards.

Though the automobile NOx law was enforced, and Tokyo, Chiba, Saitama, Kanagawa, Osaka and Hyogo were chosen as the special areas, plans for the total NOx emission control for each prefecture could not be made as it was scheduled. EA established its guideline in January 1993. Then, six local governments established their own liaisons. It was scheduled that related ministries would propose concrete measures to realize the guidelines and explain the effects of those measures, and all the members would discuss and consider those measures to make plans which would be submitted to EA by October at the latest and be enforced by the end of the year. However, it had been taking more

time than expected because, at the meetings of the liaisons, ministries such as MITI and MoT did not propose measures and indicate their possible effects. This was because MITI and MoT were unable to propose strict measures against their supervising industries in an economic recession at that time (Asahi Shinbun, 03 July 1993; I12, I14). Although it took more time, because MITI and MoT finally provided them with concrete measures and their possible effects, local governments could submit their plans to the prime minister and they implemented them after their plans were approved.

Though EA expected NOx emissions would be reduced by 20 percent at best due to the vehicle category regulation in specified areas, TMG expected 7.9 percent and the Osaka government expected 7 percent (Mainichi, 21 April 1992; C169d, C169e, C169g, C174e). Thus, local governments expected that the national ambient air quality standard could not be achieved by the law. Then, some local governments sought to carry out their original total NOx emission control from automobiles to reduce as much NOx as possible. Since 1988, the Osaka government had spent 50 million yen to prepare for the total NOx emission control from automobiles and then expected that it became required for each factory and company to make a plan to reduce NOx emissions from automobiles, introduce low emission automobiles and rationalize material flow (C242i). Further, local governments of Tokyo, Kanagawa, Yokohama city and Kawasaki city had considered the establishment of their original total NOx emission control (Asahi Shinbun, 18 October 1992).

However, the automobile NOx law prevented local governments from establishing a local ordinance to reduce NOx emissions from automobiles as it was a stricter regulation of the automobile NOx law (C169d, C170b). Indeed, in July 1993, at the round table conference organized by EA, EA argued that it was not allowed to force factories and companies to reduce total NOx emissions because it was a stricter regulation of the law. Thus, as mentioned above, the law prescribed that local governments became responsible for automobile air pollution and they were expected to play a role in the automobile NOx law, but because of the constraints set by the law,

what they could do in reality became limited (I6, I7, I9-15).

Emission Standards in the 1990s

Reinforcement of emission standards for NOx

As well as the automobile NOx law, EA sought to reduce NOx emissions to reinforce emission standards for NOx and established emission standards for PM based on the report submitted by the central pollution council on the 22nd of December 1989. Consequently, compared to the previous emission standards, NOx emissions were reduced by 12 percent for II diesel trucks with less than 1.7t in GVW in 1993, by 14 percent for DI diesel trucks with from 1.7t to 2.5t in GVW in 1993, by 1 percent for II diesel trucks with more than 2.5t in GVW in 1994 and by 7 percent for DI diesel trucks with more than 2.5t in GVW in 1994 (EA, 1993; C158, C160, C250b).

Further, a study group for evaluation of technology concerning exhaust gas reduction was established under the air quality bureau of EA in October 1990 (EA, 1993). Then, concerning diesel trucks, the study group drew up three reports in August 1993, October 1994 and November 1995. Based on those reports, emission standards for NOx were reinforced in 1997 to 1999 (EA, 1997, 1998; C184). NOx emissions were reduced by 5 percent for II diesel trucks in 1997 with less than 1.7t in GVW, by 22 percent for II diesel trucks with from 1.7t to 2.5t in GVW with manual transmission in 1997 and those with automatic transmission in 1998 and by 12 percent for DI diesel trucks with from 1.7t to 2.5t in GVW with manual transmission in 1997 and those with automatic transmission in 1998, and by 5 percent for II diesel trucks with from 2.5t to 3.5t in GVW in 1997, for those with from 3.5t to 12t in GVW in 1998 and those with more than 12t in GVW in 1999 and by 9 percent for DI diesel trucks with from 2.5t to 3.5t in GVW in 1997, for those with from 3.5t to 12t in GVW in 1998 and those with more than 12t in GVW in 1999.

Establishment of emission standards for PM

Emissions of PM from diesel automobiles, diesel emitted particulate (DEP), came to be strongly recognized as serious problems especially in the 1990s (EA, 1994, 1996, 1997, 1998, 1999; Fujita, 1991, Kawana, 2001; C176a, C147, C249b). In 1980, because various carcinogenic substances emitted from diesel automobiles were discovered, EA started to establish emission standards for PM and it began to investigate the health effects of DEP and collect information on regulations for PM (C170a, C174b). However, in order to avoid the establishment of emission standards for PM, the auto industry itself organized a huge research project to investigate health effects on PM and, it reported that significant health effects could not be found according to the results of its investigation. Then, EA stopped to establish emission standards for PM.

However, from the late 1980s, it was often pointed out that DEP contributed to a wide range of diseases. Further, because of global environmental movements, the state, industries and the public strongly recognized that it was necessary to do something for the environment (I1, I20, I21, I23-30). Moreover, industries strongly recognized the positive effects of proactive environmental business activities. Consequently, MITI, LDP and the auto industry, as mentioned above, had environmental interests. However, because they sought to protect the environment unless environmental protection entailed excessive costs, it can be said that they had environmental economic interests. In addition, it seems that the auto industry had stronger environmental economic interests than MITI and LDP. In the late 1990s, the automakers strongly recognized the importance of producing highly low emission automobiles and considered that requirements for the production of such automobiles were not an obstacle but a business opportunity (C258; I1, I20-30). Further, they recognized that the 21st century would be an era of the environment. Moreover, the EU and the US had established emission standards for PM and it was unreasonable that Japan did not have emission standards for PM (I1,

I14).

In 1993, because of the reasons mentioned above, again, following the report submitted by the central pollution council on the 22nd of December 1989, emissions standards for PM were established in 1993 and reinforced in 1994 (C158, C167, C173d, C173e, C183). Those PM emission standards were 0.25g/km for II diesel trucks with less than 1.7t in GVW in 1993 and 0.7g/km for diesel trucks with more than 2.5t in GVW. In addition, again based on those three reports submitted by the study group, those PM emission standards were also strengthened to 0.08g/km for II diesel trucks in 1997 with less than 1.7t in GVW in 1997, 0.09g/km for diesel trucks with from 1.7t to 2.5t in GVW with manual transmission in 1997 and those with automatic transmission in 1998 and 0.25g/kWh for diesel trucks with from 2.5t to 3.5t in GVW in 1997, for those with from 3.5t to 12t in GVW in 1998 and those with more than 12t in GVW (EA, 1995; C178). As emission standards in the EU and the US in 1998 were respectively 0.10g/km and 0.134g/km, however, those Japanese emission standards were very loose.

Reduction of PM emissions from diesel trucks was more difficult in Japan than other countries such as the US because the oil imported from the Middle East contained higher levels of sulphur components (C173b, C174d, C180; I22, I25, I28, I44-46). Thus, although EA asked the automakers to reduce PM emissions, they maintained that reduction of sulphur components in gas oil was, first of all, necessary (EA, 1992; C169a, C169b, C170a, C170h, C173b, C174c, C174d). Consequently, cooperation of Petroleum Association of Japan (PAJ) was becoming necessary to reinforce emission standards for PM, and it seems that PAJ was becoming a member of the periphery of the policy network of emission standards (EA, 1992; C169a, C170d; I1, I21, I25, I28). Because EA, MoT, MITI and the auto industry still exclusively established emission standards, PAJ was not a member of the policy community (I14, I22, I23, I44-46).

The Operations of TMG on Diesel Trucks and the Early Implementation of the 2007 Emission Standards

Decisions for three major air pollution cases

By 1999, decisions had been made by courts for three major cases concerning automobile air pollution: the national road 43rd air pollution case, in which plaintiffs required the state and the Hanshin expressway public corporation to stop noise and NO_2 emissions from the road and to pay compensation for damages; the Nishiyodowaga air pollution case, in which plaintiffs required ten major polluting companies, the state and the Hanshin expressway public corporation to stop NOx emissions beyond the previous national ambient air quality standard for NOx (0.02ppm for a daily mean) and stop PM emissions beyond the current national ambient air quality standard for PM, and to pay compensation for damages; and the Kawasaki air pollution case, in which plaintiffs required the state, the metropolitan expressway public corporation and 14 companies and groups to pay compensation for damages because mixed air pollution consisting of both exhaust gases such as NO_2 and PM, and emissions of SO_2 from factories had brought about pollution-related diseases such as respiratory disease in Kawasaki city and to stop emissions of NO_2, PM and SO_2 (Kawana, 2001). In all of those three cases, the courts ordered the defendants to pay compensation for damages and admitted that the state was responsible for automobile air pollution though the courts did not order them to stop emissions of air pollutants such as NOx, PM and SOx immediately because they did not consider it necessary at the expense of the public nature of roads, considering the current levels of air pollution. Further, the court in the Kawasaki air pollution case, recognized causal relationships between respiratory disease and NO_2 and PM. Consequently, it became *legally* recognized that there were causal relationships between respiratory disease and NOx and PM from diesel trucks though

the state did not clearly admit them (I14, I17). Decisions for those three cases had made the state recognize that it had to do something to reduce NOx and PM emissions (I1, I3, I4). In addition, on the 31st of May 1996, 120 of pollution-related patients who lived or worked in Tokyo brought a suit against the state, TMG, the metropolitan expressway public corporation and seven automakers (Asahi Shinbun, 09 December 1995, 31 May 1996). The plaintiffs requested them to stop emissions of toxic air pollutants and pay compensation for damages. Because of this law case, TMG strongly felt that it needed to establish local automobile air pollution policies to reduce emissions of NOx and PM (I14).

National automobile air pollution policies

Based on the suggestion made by the central environmental council (the former central pollution council) in 1997, EA decided that emission standards for petrol passenger automobiles were going to be reinforced from 2000 to 2002 to reduce NOx emissions approximately by 70 percent because the automakers became able to reduce NOx emissions by that amount (EA, 2000; C187). Further, in December 1998, the central environmental council issued a report concerning the next measures for exhaust gases (EA, 2000). The report first suggested that it was necessary to reinforce emission standards by two stages. Second, it suggested reduction of NOx by 25 percent to 30 percent and PM by 28 percent to 35 percent from 2000 to 2004 depending on vehicle categories (short-term targets). Third, it proposed to request the automakers and the oil companies to promote technological developments so that reduction of NOx and PM emissions by another 60 percent for all vehicle categories could be possible by 2007 (long-term targets or the 2007 emission standards) (EA, 1999; C187).

Compared to the previous levels of reduction in emission standards, the levels of reduction in newly planned emission standards were very high. Thus, unlike several times of reinforcement of

emission standards in the 1980s and in the mid-1990s, it can be said that reinforcement of emission standards in this time was *'policy changes'*. It seems that in the late 1990s EA became motivated to seek more actively and strongly to reduce those emissions.

The operations of TMG on diesel automobiles

In April 1999, Shintaro Ishihara, who was previously the minister for transport and the director-general of EA, won the election for the Governor of Tokyo. The establishment of environmental policies for diesel trucks was one of his targets in his manifesto. Before 1999, the Bureau of Environmental Protection (BEP) of TMG had already recognised that the situation on PM and NOx in Tokyo had been critically serious and that diesel trucks had been the main contributors to the serious situation. Indeed, for BEP, the problems of NOx and PM were all of the very serious environmental problems in Tokyo (C186, I14). In addition, as mentioned above, TMG was sued by pollution-related patients. Then, BEP strongly felt that it had to do something to decrease automobile air pollution caused by diesel trucks.

Then, after Shintaro Ishihara won the election, BEP found in his manifesto that he had the same interests of reducing serious NOx and PM emissions from diesel trucks, and then BEP was determined to carry out a strict automobile air pollution policy for diesel trucks. This decision owed very much to the charismatic power and leadership of Shintaro Ishihara. It had been unusual for BEP or TMG to establish a strict policy that might be at odds with the interests of the state. It can be said that TMG had been served for the state only as an implementer of national policies and had sought to avoid conflicts against the state (I14, I15). In this respect, roles of TMG had been to work not for the interests of people living in Tokyo but for those of the state. However, after BEP obtained strong support from Shintaro Ishihara with his charismatic power and strong leadership, it seems that they changed themselves to work as a policy maker for people living in Tokyo

Then, BEP began to make a policy for diesel trucks. After considering the legal issues on policies for diesel trucks, as it was not allowed for local governments to establish stricter policies for NOx due to the automobile NOx law, as mentioned above, they decided to establish a policy for PM from diesel trucks because it would simultaneously contribute to the reductions of NOx emissions from diesel trucks. Next, in order to make a PM policy, they had to begin to collect necessary information because they did not have sufficient information for it. The necessary information mainly included alternative diesel trucks and equipments to reduce exhaust gases from diesel trucks. Those kinds of information had been monopolized by MITI, MoT and the auto industry (I6, I7, I9, I10, I13, I14). Moreover, they did not have a close resource-interdependent relationship with the automakers, and thus they did not possess the necessary information to establish a PM policy. Consequently, in order to establish a PM policy, they began to collect information by themselves (I14). They collected such information both from researchers and doctors who were concerned about health effects of diesel exhaust gases, and from the Internet. The Internet was very helpful to collect both domestic and international information related to diesel trucks. Indeed, the Internet could change policy-making of BEP. Before the Internet was available, it was difficult for BEP to obtain information and was very costly, and it took a huge amount of time to do so. However, because of the Internet, the information necessary became available to BEP, and thus they could cheaply and shortly find the needed information. By using these resources, in terms of alternative diesel trucks, they found that petrol and LPG trucks with the maximum carrying capacity of up to 2 tons to 3 tons had been already sold. BEP also found that diesel trucks in the EU were to employ diesel particulate filters (DPF) in order to meet the emission standards of EuroIV, and it thus considered that DPFs could be employed in Japan too. Because of the information they obtained, they realised that a more stringent PM policy for diesel trucks could be established in Tokyo (TMG, 2000).

On the 27th of August 1999, Shintaro Ishihara announced that TMG initiated an operation for

reducing NOx and PM emitted from diesel trucks, named 'The operation for eliminating diesel automobiles'. He presented five kinds of propositions in the operation.

1. In Tokyo, diesel automobiles should not be sold, purchased or used.
2. Diesel automobiles for commercial use should be substituted by other automobiles such as petrol automobiles for commercial use, where there are substitutions available.
3. Diesel automobiles are required to employ DPFs.
4. The recent tax system for gas oil should be corrected.
5. The new diesel automobiles that meet a long-term target (the 2007 emission standards) should be invented and produced soon.

In addition TMG announced that it would perform several kinds of actions, which were divided by two different purposes: provision of places and materials for discussion on automobile air pollution, and leading actions to decrease usage of diesel trucks such as the replacement of diesel trucks owed by TMG with petrol trucks. Regarding the former actions, in September, TMG first carried out an on-line debate for seventy days which was the first attempt in Japan. Second, TMG held an off-line debate in which scholars, journalists and representatives of JAMA, JTA and COOP took part as panellists in October. Also, TMG continuously published green papers as materials for discussion on automobile air pollution. The first green paper was published on the day of the announcement for the operation. The first green paper, named *Obiyakasareru Kenko*, showed the current situation of serious air pollution and possible health effects of NOx and PM, and it argued that diesel trucks contributed greatly to air pollution. Further, the paper insisted that, diesel trucks were widely used because there was a big difference in tax between them. Moreover, TMG published another green paper to propose two things. First, it was generally thought that stricter policies for diesel trucks

were at odds with current international recognition that diesel trucks were better than petrol trucks because diesel trucks emitted less CO_2. However, the paper argued that policies for diesel trucks were being strengthened in the EU and the US. Second, concerning the argument that most up-to-date diesel trucks were good for the environment, emission standards for NOx from diesel trucks were much looser than those for petrol passenger automobiles.

In addition, as it was often told that the operation would bring about an increase both in CO_2 and in cost for truck transport companies, in order to justify the operation, TMG argued that TMG sought to mitigate those adverse effects. In terms of CO_2 emissions, in 1999, CO_2 was clearly the main environmental issue for the state and industries as well as NGOs and the public (I1, I2, I3, I14, I23, I30, I39, I43, I47, I48). However, TMG suggested that substitution of diesel trucks to petrol trucks would be urgently necessary, even at the expense of short-term increases in CO_2 because diesel trucks were responsible for most of the NOx and PM emissions, both of which had been damaging human health. TMG also argued that it was surely not preferable that the CO_2 emissions would increase, but CO_2 emissions could be reduced by other means. Regarding increase in cost for truck transport companies, it was thought that truck transport companies would suffer the increasing costs to reduce NOx emissions from diesel trucks. Then, in order for truck transport companies to replace their diesel trucks with other cleaner automobiles or to employ DPFs, TMG decided that it would prepare a huge budget (more than 1 billion yen) to provide subsidies for them. It seems that TMG succeeded in preventing this issue from becoming a troublesome economic issue. As described in the previous chapter and this chapter, where one environmental issue became a significant economic problem, it was normally very difficult to carry out a policy for the issue because of strong pressure from related industries and MITI.

When BEP started the operation, related ministries and industries criticized the operation because TMG proposed termination of diesel trucks (I1-4, I20-43). JAMA argued that terminating diesel

automobiles seemed problematic. Toyota maintained that diesel automobiles did not have to be terminated, Mitsubishi motors proposed that terminating diesel automobiles might be problematic in terms of the global warming problem and Isuzu argued that diesel automobiles were not the only source of automobile air pollution (I14, I22, I23). An automobile section in the machinery and information bureau of MITI doubted the effects of termination of diesel trucks because it would lead to increase in commodity price and argued that MITI would like to discuss carefully this issue with TMG (I2, I14). EA also argued that EA did not think of termination of diesel automobiles because they were superior in terms of CO_2 emissions (I1, I14). Further, JTA maintained that diesel trucks played a central role in Japanese economy and diesel trucks thus did not have to be terminated.

Thanks to those various kinds of actions, the operation could have received both the great attention of the media and the public, and support from them. Based on the discussion made concerning the five propositions, on the 16th of December 1999, TMG proposed a number of programmes to deal with diesel exhaust gases and initiated 'the second operation for eliminating diesel automobiles' in order to realize the programmes. Concerning the programmes, they were based on six basic ideas of TMG concerning diesel exhaust gases:

1. It is necessary to dramatically modify ways to use automobiles, especially diesel automobiles in Tokyo, in order to protect the health of the public in Tokyo.
2. The number of diesel automobiles should not be increased in Tokyo in excuse of global warming.
3. The future possibility of diesel automobiles is not denied.
4. Strategies for diesel automobiles should not be neglected in excuse of economic efficiency.
5. Comprehensive strategies for automobile air pollution putting more emphasis on diesel automobiles should be advanced.

6. TMG will move the state and industries concerning diesel exhaust gases as a local government entrusted by the citizens in Tokyo.

Again, these basic ideas were at odds with the core of the policy network and its appreciative systems. In addition, the nine kinds of programmes could be divided into programmes which TMG sought to realise by local ordinances and those which TMG requested the state to carry out. Concerning the former programmes, TMG proposed equipment of DPFs onto large sized diesel trucks and buses, restriction of usage of and substitution of diesel automobiles, promotion for the use of lower emission automobiles and requirements to explain and open environmental information concerning automobiles. As far as the latter programmes were concerned, TMG, for instance, suggested correction of favoured treatment in tax for gas oil, the early implementation of emission standards for the long-term targets (the 2007 emission standards) and the reinforcement of sulphur component reduction in gas oil.

Regarding the second operation for eliminating diesel automobiles, TMG again held an on-line debate from December 1999 to July 2000. In addition, TMG proposed the reinforcement of leading actions; for instance, TMG sought to make emissions from diesel trucks owned by TMG lower to equip DPFs onto them or to replace diesel trucks with petrol ones. Moreover, TMG held three forums in Tokyo in March, April and June 2000 in order to stimulate the movement and public opinion to establish a strict policy for diesel trucks.

In addition BEP learned that the continuously regenerating DPFs were used in Europe and the US for diesel automobiles. The continuously regenerating DPFs were supposed to be equipped with almost any type of diesel trucks and relatively cheap. Further, it came to know that the continuously regenerating DPFs were mainly produced by an English manufacturer, Johnson Matthey, and an US manufacturer, Engelhard Corporation (I31-33). Then, it requested those two companies to give

information about them and learned that they could be used for diesel trucks (I14, I31). Consequently, BEP decided that it would carry out a policy for PM from diesel automobiles and the main part of the policy was to require diesel trucks to equip DPFs onto them.

On the 31st of January 2000, concerning the Amagasaki air pollution case in which pollution-related patients and bereaved families of those who died due to air pollution required the state, the Hanshin expressway public corporation and nine companies to pay compensation for damages and stop pollution of PM beyond a certain level, the Kobe district court ordered the state and the Hanshin expressway public corporation to pay almost 200 million yen as compensation for damages and to stop pollution of PM beyond 0.15g/m³ for a daily mean. Further, the court recognized causal relationships between DEP and respiratory diseases, and severely criticized the state and Hanshin expressway public corporation because of joint tortuous acts as air pollutants emitted from roads that they built and managed formed serious automobile air pollution. This decision of the Kobe district court was shocking for the state because the court admitted the petition to stop PM pollution which had been rejected by courts in former air pollution cases (Kawana, 2001). In addition, as there were many roads in other metropolitan areas that did not satisfy the PM level identified by the court, the state had to reduce PM emissions as soon as possible in order that those roads could be kept in use (I1, I3). Surely, this decision was a favourable wind for the operation of TMG, as TMG strongly emphasised the importance on the reduction of DEP emissions (I14).

On the 15th of December 2000, a bill for an ordinance concerning the environment securing the health and safety of citizens in Tokyo, which included the regulation for diesel exhaust gases, was unanimously approved at a plenary session of the Metropolitan Congress, and it was decided that the ordinance was to be enforced in April 2001. Because of the regulation for diesel exhaust gases in the ordinance, first, use of diesel trucks whose PM emissions exceeded defined emission standards for PM (0.08g/km for small sized diesel trucks, 0.09g/km for middle sized diesel trucks and 0.25g/km

for large sized diesel trucks) was banned in October 2003, regardless of their registration places. Second, although there was a seven-year grace period, it was required to make diesel trucks which did not satisfy its requirements equipped with DPFs or replaced with new diesel trucks. Third, a fine of less than 500 thousand yen was given to an offender or a name of an offender was published when a user of diesel trucks broke the regulation.

The new PM policy for diesel trucks was the vehicle category regulation for PM like the vehicle category regulation for NOx in the automobile NOx law. With a few exceptions, both of the vehicle category regulations were almost the same. Thus, TMG just modified the vehicle category regulation in the automobile NOx law (I1, I15). Because of its strong public support, technical information and strong ability to establish automobile air pollution policies, it is likely that TMG became one of the most influential actors in the policy network of the automobile NOx law. In addition, the state actors of the policy network including MoT, MITI and EA needed the information of TMG especially on its vehicle category regulation and they needed the cooperation of TMG in order to effectively carry out automobile air pollution policies and the automobile NOx law (I1, I3). Consequently, it seems that TMG became a member in the core of the policy network of the automobile NOx law. TMG was able to become a member of the core of the policy network perhaps because it was less integrated than that of emission standards and TMG had been a quasi-member in the core of the policy network.

In addition, the other three prefectures, Saitama (July, 2001), Chiba (March, 2002) and Kanagawa (September, 2002), also decided to carry out the same regulation for diesel trucks as these prefectures as well as Tokyo had socially and economically close relationships with each other, and almost 80 percent of automobiles flowing into Tokyo came from those three prefectures (I6, I7, I10, I11, I13-19). Because these local governments had a more stringent version of the automobile NOx law by themselves, state actors such as EA again needed to contact these local governments more

frequently and closely to obtain the information on their automobile air pollution policies and to appropriately carry out automobile air pollution policies including the automobile NOx law (C265b). Thus, it is likely that those local governments also became more influential in the policy network of automobile NOx law and possibly became members of the core of the policy network.

Early implementation of the 2007 emission standards

In November and December 1999, TMG requested PAJ for the early reduction of sulphur components in gas oil because high sulphur components in gas oil in Japan made it difficult to put the exhaust gas purification technologies to practical use. Further, TMG asked JAMA to cooperate to realize the early implementation of emission standards of the long-term targets (the 2007 emission standards). For its early implementation, on the 22nd of February 2000, Kayoko Shimizu, the director-general of EA, also requested the Presidents of both JAMA and PAJ to promote technologies for the early reduction in sulphur components and the early implementation of emission standards (C188a, C188b, C189, C190). MITI also made similar requests to both associations, and MoT asked JAMA to early develop more advanced technologies to reduce exhaust gases for the early implementation (I2, I3, I14). Then, on the 16th of March 2000, JAMA and PAJ individually made announcements concerning diesel exhaust gases. Both of them stated that JAMA and PAJ would closely cooperate with each other to reduce diesel exhaust gases so that both associations could meet the social demand to improve air pollution caused by diesel trucks. PAJ announced that, concerning the early implementation of the 2007 emission standards, the association would actively deal with it to provide low sulphur gas oil for diesel trucks earlier than it was planned; then, MITI decided to financially assist investments in plants and equipments of the oil companies in order to reduce sulphur components in gas oil. In addition, JAMA argued that, as EUROIV was to be enforced in 2005, the 2007 emission standards could be enforced in 2005, two years earlier than

planned, although the 2007 emission standards were different from EUROIV (C188c; I1, I2, I14, I15, I20-30, I31-33, I44-46). It seems that JAMA and PAJ made these decisions because they did not want to get negative images by behaving negatively as the public became seriously concerned about automobile air pollution problems caused mainly by diesel trucks, and they greatly supported the reinforcement of automobile air pollution policies because of the operations of TMG or Shintaro Ishihara (C191, C192; I1-4, I6-10, I14-19, I22, I23, I25, I28, I44-46).

It was undeniable that TMG influenced decision-making of emission standards. However, TMG was still a member of the *periphery* of the policy network because TMG was not closely involved in decision-making processes of emission standards (I1, I14). However it became a powerful member in the policy network of emission standards, possibly because TMG became a member of the core of the policy network of the automobile NOx law and because it had interdependent relationships with other actors in the core of the policy network. It can be deduced that the policy network of emission standards was not independent from the policy network of the automobile NOx law.

On the 30th of March 2000, TMG with other six local authorities requested EA, MITI and MoT for the early implementation of the 2007 emission standards and assistance in the development of exhaust gas purification technologies and promotion for putting DPFs to practical use as early as possible. Then, the air quality section of the central environmental council submitted a report concerning the next measures for exhaust gas controls in November 2000 (EA, 2001; C193). Because the report suggested the early implementation of the 2007 emission standards in 2005, EA formally decided to early implement the 2007 emission standards in 2005, based on the report.

Examination of Policy Changes in the 1980s, 1990s and 2000s based on the Policy Networks Framework

This chapter so far has discussed automobile air pollution policies and specified three policy changes in the 1980s, the 1990s and the 2000s: the establishment of the emission standards for PM from diesel automobiles (the seventh policy change), the great reinforcement of emission standards for NOx and PM (the eighth policy change) and the early implementation of the 2007 emission standards (the ninth policy change). Then, it finally attempts to analyse these three policy changes as well as the stability period between the sixth policy change in the 1970s (the establishment of the 1978 emission standards) and the seventh policy change. The diagrams of each policy network are demonstrated in the end of this chapter.

Stability in emission standards between the sixth policy change and the seventh policy change (Figure 7-1)

From the 1980s to the early 1990s, levels of reinforcement in emission standards had been very low. In addition, it seems that the high stability of the core of the policy network contributed to low levels of reinforcement or the stability of emission standards. It seems that several factors contributed to the stability. First, thanks to the 1978 emission standards, the automakers had the most advanced technologies on exhaust gas reduction in the world. Because it was expected that American and European automakers would not catch up with Japanese automakers in terms of exhaust gas reduction technologies approximately in 10 years, the automakers less actively sought to develop technologies than the 1970s. In addition, not all of the automakers were sure that producing lower emission automobiles would lead to profits for them, which also contributed to low motivation of the automakers to further reduce emissions.

Second, because emission standards for petrol passenger automobiles had been much strengthened and their emissions became the lowest in the world, the state sought to reinforce emission standards for NOx from diesel trucks because the number of them increased and they emitted more NOx than

petrol passenger automobiles. However, it was recognized that reducing emissions of NOx from them had technical difficulties. In addition, possibly because automakers with environmental economic interests including Honda did not produce diesel trucks and there was no Muskie law for diesel trucks, technological competition did not occur among the automakers to develop technologies on exhaust gas reduction.

Finally, the relaxation of the national ambient air quality standard for NOx also contributed to the stability of emission standards. It was widely thought that emission standards needed to be reinforced because the national ambient air quality standard had not been achieved in a number of areas in Japan. However, as the national ambient air quality standard was relaxed because of strong demand from industries such as the auto industry, MITI and LDP, only metropolitan areas failed to satisfy the national ambient air quality standard. Consequently, automobile air pollution became a local problem and EA sought to carry out automobile air pollution policies focusing on metropolitan areas rather than enforcing strict emission standards for NOx from diesel trucks.

Characteristics in the core of the policy network changed in the 1980s. First, as for interests, all the automakers learned that producing low emission automobiles could lead to profits but they were not fully sure that it would always bring about profits for them because effects of producing low emission automobiles on sales in both the domestic and international markets were not available. Also, as described above, the Japanese automakers had the most advanced technologies to reduce emissions of NOx that European and American counterparts could not catch up with, which seemingly made the Japanese automakers less actively seek to reduce emissions. It can be said that the Japanese automakers had weak environmental economic interests because they sought to reduce emissions gradually but not greatly because of the reasons discussed above. MITI had economic interests but it agreed to the minor reinforcement of emission standards because it recognized that reducing emissions was necessary and minor reinforcement would not bring about economic

damages to the auto industry. Concerning LDP, mainly because the Japanese Muskie law was enforced and emission standards became less paid attention to by the public, and automobile air pollution policies became not a national but a local problem, LDP did not seek to greatly reinforce emission standards and became out of the policy-making circle. However, as LDP recognized that it was necessary to reduce emissions, it agreed to the gradual reinforcement of emission standards and supported EA though its support became less strong.

Second, in terms of members, though the core policy network members did not change, it seems that the dominant alliances changed. In the previous policy change, because emission standards became an economic problem, the alliances both between MITI and the auto industry and between LDP and the auto industry were dominant. However, as emission standards were not an economic problem in this period, those alliances were not dominant. Instead, because the core of the policy network came back as normal, the alliance between MoT and the auto industry became dominant. In addition, as the public became less interested in automobile air pollution, local governments became less motivated to influence emission standards. Consequently, local governments were no longer influential peripheral policy network members. Third, regarding the rules of the game, secrecy became one of the rules of the game again. Though, in the previous policy change, the core of the policy network was unable to utilize the central pollution council in which policy-making processes and the data used in them were not opened to outsiders, the core of the policy network was again able to utilize it and policy-making processes and the data were not opened to them. Fourth, because the core of the policy network came back as normal and the alliance between MoT and the auto industry became dominant again, it can be deduced that MoT and the auto industry were very frequently in contact with each other on important issues on emission standards. Finally, in terms of distribution of resources and power, it seems that the number of resources was not much different among the core policy network members and so was the power of them.

In addition, the stability of emission standards was closely related to the stability of the appreciative systems. There were two kinds of appreciative systems; automobile air pollution was a local problem; and emission standards were technical matters and there were technical difficulties to reduce emissions. As described above, because of the relaxation of the national ambient air quality standard for NOx, automobile air pollution became a local problem. In addition, also as discussed above, because emission standards for NOx from petrol passenger automobiles became the strictest in the world and it was recognized that there were technical difficulties to reduce emissions of NOx, it was considered that reducing emissions of NOx was technically difficult. Consequently, these two kinds of appreciative systems had been normally unchallenged, which contributed to the stability of the core of the policy network and emission standards. In addition, because it was widely recognized that there were technical difficulties to reduce emissions, emission standards were reinforced when the auto industry told EA that technologies to reduce a certain level of emissions were available. Thus, it can be said that emission standards became from technology-forcing policies to technology-waiting policies. Finally, because the core policy network members agreed to policy aims, the appreciative systems and the rules of the game, it can be said that there was consensus over basic values.

The seventh policy change and the eighth policy change (Figure 7-2)

The seventh policy change was the establishment of the emission standards for PM from diesel automobiles in 1994. It seems that there were mainly three drivers. One driver was the global environmental movements and the consequent recognition of the state, industries and the public to do something to improve the environment. Due to a number of global environmental problems such as the destruction of the ozone layer and acid rain, all of them considered it necessary to protect the environment. Consequently, the public tended to act environmentally friendly such as buying

environmentally friendly products. In response to the global environmental movements and the resulting high public environmental concerns, industries acted environmentally friendly and sought to produce environmentally friendly goods. Finally, the state actively sought to carry out a wide range of environmental policies in order to respond to high public environmental demand. Another driver was the establishment of the emission standards for PM in the EU and the US. Because the EU and the US decided to establish them, it was inexcusable not to establish emission standards for PM. Finally, it became recognized that reducing PM was immediately necessary because it was almost scientifically proved that DEP was related to a wide range of diseases such as lung cancer. Consequently, the state considered it necessary to reduce emissions of PM.

Within the core of the policy network, a few changes happened in this policy change. First, concerning interests, as described above, the state and the auto industry recognized that environmental protection was very important and that environmentally friendly business activities would lead to profits. However, they sought to protect the environment as long as it did not entail excessive costs. Thus, it can be said that MITI, LDP and the auto industry had environmental economic interests. In addition, as positive effects of producing low emission automobiles on sales were recognized, it seems that the automakers had relatively strong environmental economic interests and they actively sought to reduce emissions, which contributed to technological competition among the automakers. Second, regarding resources, EA had strong support from both LDP and the public. Third, consequently, the resources of EA were more powerful and so was EA in terms of power. Finally, because EA became supported by LDP and it became powerful, it seems that the auto industry needed to frequently contact EA on issues of emission standards. However, because the competent ministries for the auto industry were MITI and MoT, MITI and MoT could more frequently discuss important issues on emission standards.

The eighth policy change was the decision to greatly reinforce emission standards for NOx and PM

in 1997 and 1998. Although emission standards for NOx had been reinforced only gradually for more than a decade, as shown in Appendix I, it was decided that they were going to be reinforced greatly. The main driver of this policy change was similarly the positive attitudes of the state, industries and the public towards environmental protection due to the global environmental movements. In addition, judgments of courts on three air pollution cases, including the national road 43rd air pollution case, the Nishiyodogawa air pollution case and the Kawasaki air pollution case, legally recognized the responsibility of the state and causal relationships between respiratory diseases and NOx and PM emitted from automobiles. They clearly made the state strongly recognize that it needed to reduce emissions of NOx. Concerning changes within the core of the policy of the network, it seems that almost no change happened within it.

The ninth policy change (Figure 7-3)

The ninth policy change was the early implementation of the 2007 emission standards for NOx and PM. It could be said that this policy change was relatively significant because emission standards had never been early implemented. The main key drivers for this policy change were deterioration of the air quality because of increasing NOx and PM, increased public demand stimulated by the operations on diesel trucks carried out by TMG, the availability of the Internet and the consequent easy accessibility to information on automobile air pollution and emission standards, judgements on the Amagasaki air pollution case, the establishment of strict emission standards on PM in the EU and instability of the appreciative systems because of the operation carried out by TMG.

In the late 1990s, the air quality had not been improved and even deteriorated. Especially, the air quality in Tokyo had been serious and TMG had been sued by pollution-related patients. It was easy to predict that TMG would lose the lawsuit in consideration of the previous three air pollution cases

as mentioned above. In addition, because of the automobile NOx law, TMG became legally responsible for automobile air pollution in Tokyo. Then, with the charismatic leader of Shintaro Ishihara, TMG started to seek to enforce its own automobile air pollution policies specifically for diesel trucks because most NOx and PM emissions had been due to them in Tokyo. As well as its enforcement, TMG sought to make the state strengthen automobile air pollution policies including the early implementation of the 2007 emission standards. For those purposes, TMG tried to make the public greatly concerned about automobile air pollution caused mainly by diesel trucks by various means. In addition, in order to justify its proposals made in the operations for diesel trucks, TMG tried to collect information on situations of foreign advanced emission standards, effects of NOx and PM on health, and anti-pollution technologies on PM and NOx in foreign nations, mainly the US and the EU, by using the Internet, though those kinds of information had been monopolized by the state and the auto industry and they were costly and time-consuming to be found by TMG. TMG then succeeded both in acquisitions of the public support for the reinforcement of automobile air pollution policies and increasing the public demands for stricter automobile air pollution policies, and in accessing to those kinds of information.

The judgement on the Amagasaki air pollution case was very influential too. The court, in the case of the Amagasaki air pollution, recognized the causal relationship between PM emitted from diesel trucks and respiratory diseases and ordered the state to stop PM emissions beyond a certain level. As many places in metropolitan areas exceeded the level identified by the court, it became necessary for EA and MoT to make those areas satisfy the level so that automobiles could not be used there. Another key driver was the emission standards on PM of the EU. The EU sought to make their emission standards on PM stricter than its Japanese counterparts. Especially, the emission standards on PM which were to be enforced in 2005 were much stricter than those of Japan, and TMG strongly proposed that Japan had to have similar emission standards like those of the EU. Because of the

strong proposition of TMG and the resulting public demands to make the Japanese emission standards on PM as similarly strict as those of the EU, the auto industry and EA then came to need to reinforce PM emission standards.

As well as those factors, it seems that the instability of the appreciative systems partly led to this policy change. As mentioned, the core of the policy network had two kinds of appreciative systems; automobile air pollution was a local problem; and emission standards were technical matters and there were technical difficulties to reduce emissions. Concerning the former appreciative system, TMG maintained in public that automobile air pollution was caused not by factors particular to metropolitan areas but primarily by heavy emissions of NOx and PM from diesel trucks. As far as the latter appreciative system is concerned, it was recognized that there were mainly three kinds of technical difficulties. First, there were technical difficulties in diesel engines to reduce emissions of both NOx and PM. Second, although DPFs could reduce them without improving diesel engines, there were no DPFs available that worked properly. Third, despite these technical difficulties, it was considered that replacing diesel trucks with petrol trucks was technically difficult because there were no alternative petrol trucks that had similar power-output and durability and because petrol trucks emitted more CO_2. However, TMG maintained that DPFs that could work properly were already available in the EU and the US and that there were alternative petrol trucks. Further, TMG argued that emissions of NOx and PM had to be reduced even at the expense of short-term increase in CO_2. Because the public greatly supported TMG and believed in those arguments of TMG, it was difficult to keep the appreciative systems stable and unchallenged.

In addition, it is likely that this policy change could happen because TMG was a member of the core of the policy network in the policy network of the automobile NOx law. Because it was recognized that automobile air pollution was a local problem and the national ambient air quality standard was not achieved only in metropolitan areas, EA sought to carry out automobile air

pollution policies focusing on metropolitan areas. Then, in the mid-1990s, the automobile NOx law was established to reduce emissions of NOx in metropolitan areas. Though emission standards ordered the automakers to reduce emissions from their automobiles, the automobile NOx law ordered a wide range of commercial automobile users in metropolitan areas to reduce emissions from their owned automobiles. In addition, a wide range of public actors including MITI, MoT, EA and local governments in metropolitan areas such as Tokyo and Osaka joined its policy-making processes. Though MITI, MoT and EA were the main core policy network members and they made decisions, the integration of the core of the policy network was not high and, unlike the policy network of emission standards, a variety of stakeholders could influence policy-making processes in the policy network of automobile NOx law. Further, because local governments in metropolitan areas were closely involved in policy-making processes of the automobile NOx law, though they could not influence processes as much as MITI and MoT, it seems that they were quasi-core policy network members.

Further, TMG carried out a local PM policy which was almost the same as the automobile NOx law or the vehicle category regulation, which was a main part of the ordinance. Because the main core policy network members needed information and cooperation of TMG to effectively carry out automobile air pollution policies and the automobile NOx law, TMG came to have close interdependency relationships with other core policy network members and it seemingly became a powerful member of the core of the policy network. Then, TMG influenced policy-making processes of emission standards because it was a powerful member of the periphery of the policy network of emission standards, as it became a powerful core policy network member in another policy network. It seems that the policy network of emission standards was not independent from the policy network of the automobile NOx law. Thus, it can be said that this policy change happened partly because the automobile NOx law was established and so was the policy network of the automobile NOx law, in

which TMG was closer to the core of the policy network and whose core of the policy network was less integrated, because automobile air pollution became a local problem due to the relaxation of the national ambient air quality standard.

In this policy change, it is likely that two changes happed in the policy network. First, PAJ and TMG became influential peripheral policy network members because reducing PM emissions required decrease in sulphur components in gas oil by PAJ and because information and cooperation of TMG was necessary to effectively carry out automobile air pollution policies and the automobile NOx law. Second, as described above, because of the operations of TMG, the appreciative systems were challenged and then unstable. Except these two minor changes, no other changes happened in the policy network. It is possible that the core of the policy network chose to respond to the demand of the public and TMG rather than subduing them because their demand did not seriously conflict with their interests and because the core of the policy network could be protected from the outsiders to satisfy their demand.

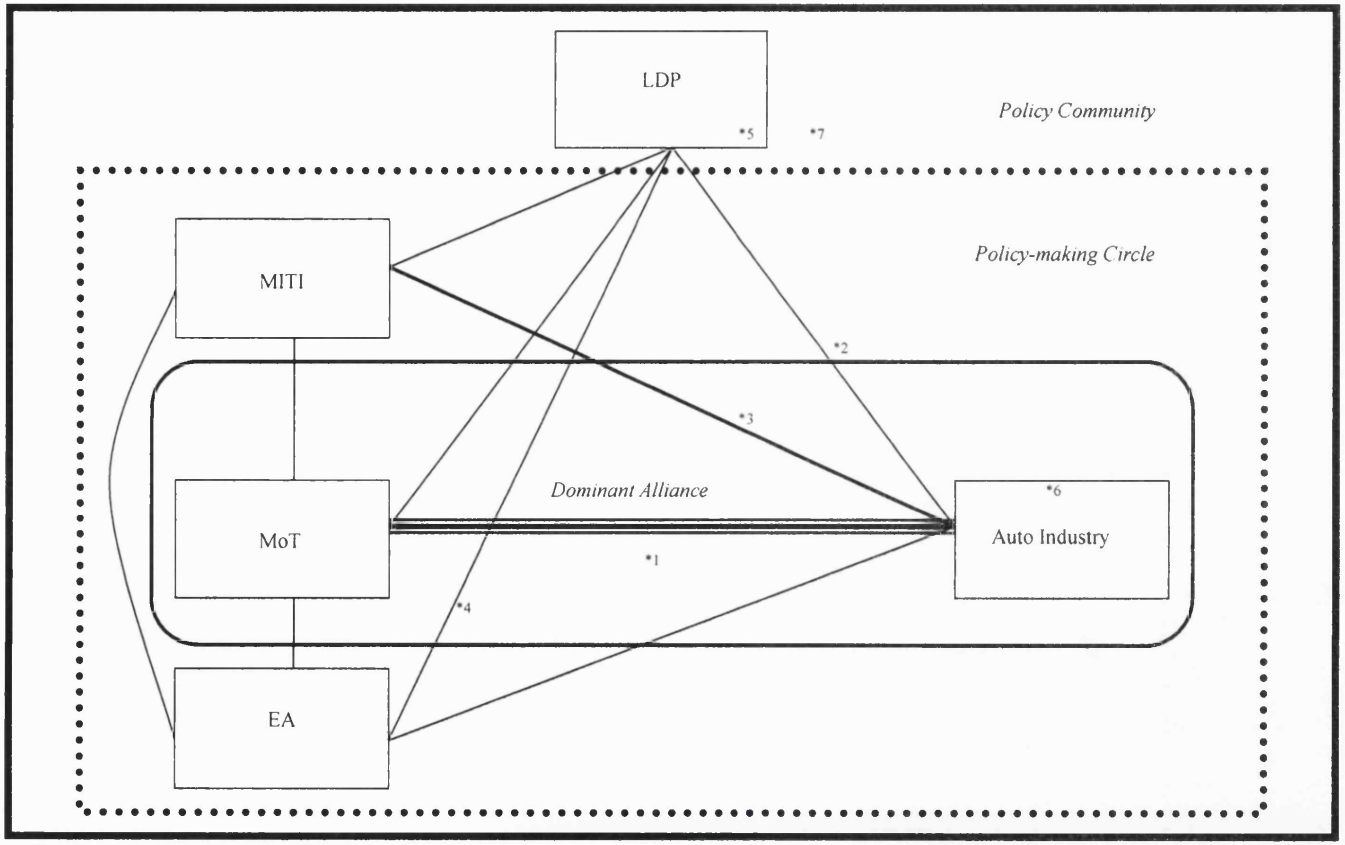
Conclusions

This chapter discussed automobile air pollution policies in the 1980s, the 1990s and the 2000s. The chapter found that automobile air pollution policies did not advance in the 1980s, but they developed in the 1990s and the 2000s. As far as automobile air pollution policies in the 1980s were concerned, as automobile air pollution was made a local problem due to the relaxation of the national ambient air quality standard for NOx in the late 1970s, and as automobile air pollution policies were made technical matters, automobile air pollution policies did not greatly develop in the 1980s. Then, because automobile air pollution worsened, automobile air pollution policies started to develop again in the early 1990s. However, because of these two kinds of appreciative systems, emission standards

were not greatly reduced and instead the automobile NOx law was established. Then, from the mid-1990s, mainly because both the state, industries and the public recognized the importance to do something for the environment, and the automakers strongly recognized the positive effects of proactive business activities for the environment due to the global environmental movements, emission standards for PM were established, and it was decided that those for NOx, including the 2007 emission standards, were going to be greatly reinforced. Finally, in 1999, mainly because of the operations of TMG on diesel trucks, it was determined that the 2007 emission standards were to be enforced in 2005.

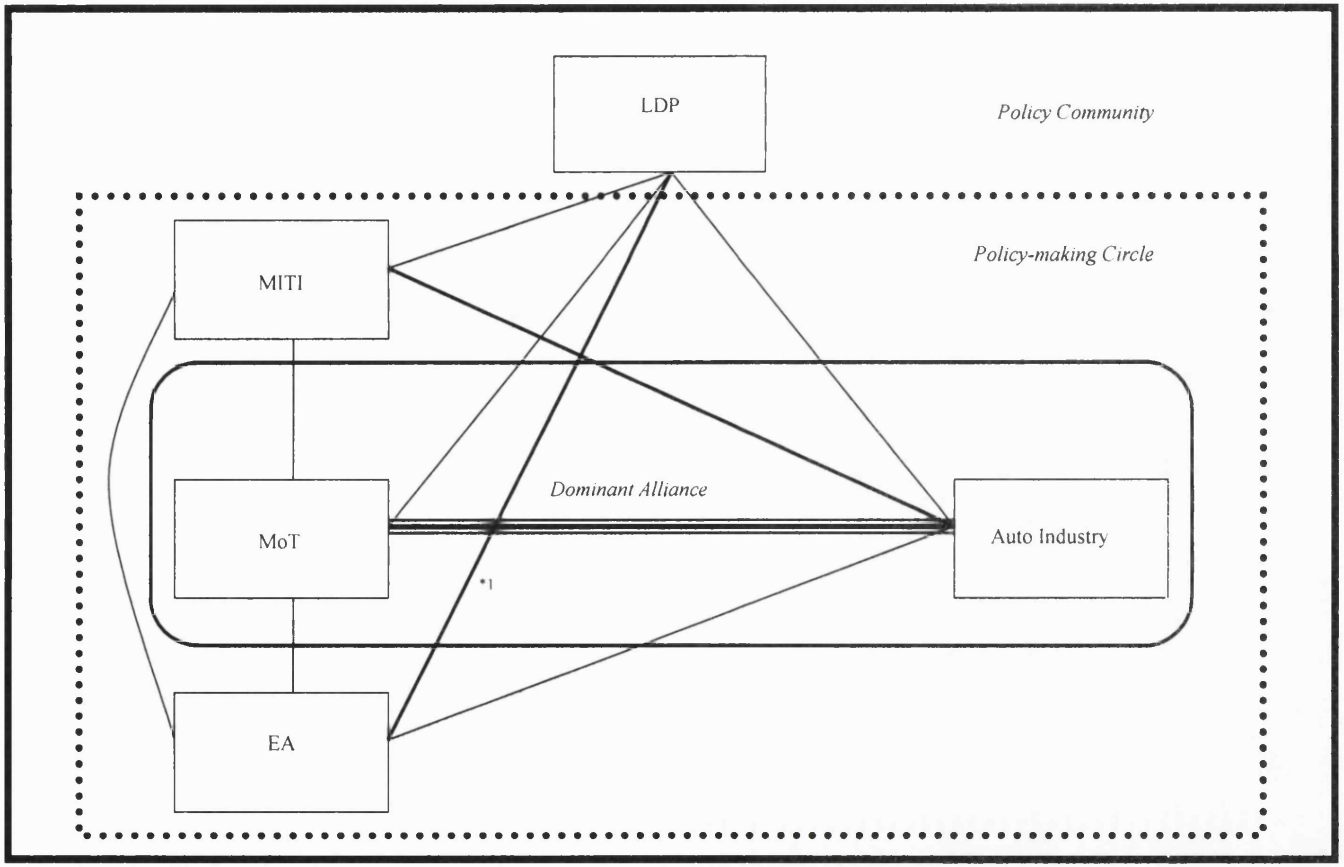
Chapter 5, 6 and 7 examined automobile air pollution policies and emission standards in Japan. In addition, nine major policy changes which were identified in each period as well as the policy network of automobile air pollution policies and the stability period between the sixth policy change and the seventh policy change, were analysed based on the policy networks framework. Then, the next chapter seeks to examine the validity of the research hypotheses based on the policy networks concept as well as answering the research questions associated with the hypotheses.

Figure 7-1 The Policy Network between the sixth policy change and the seventh policy change



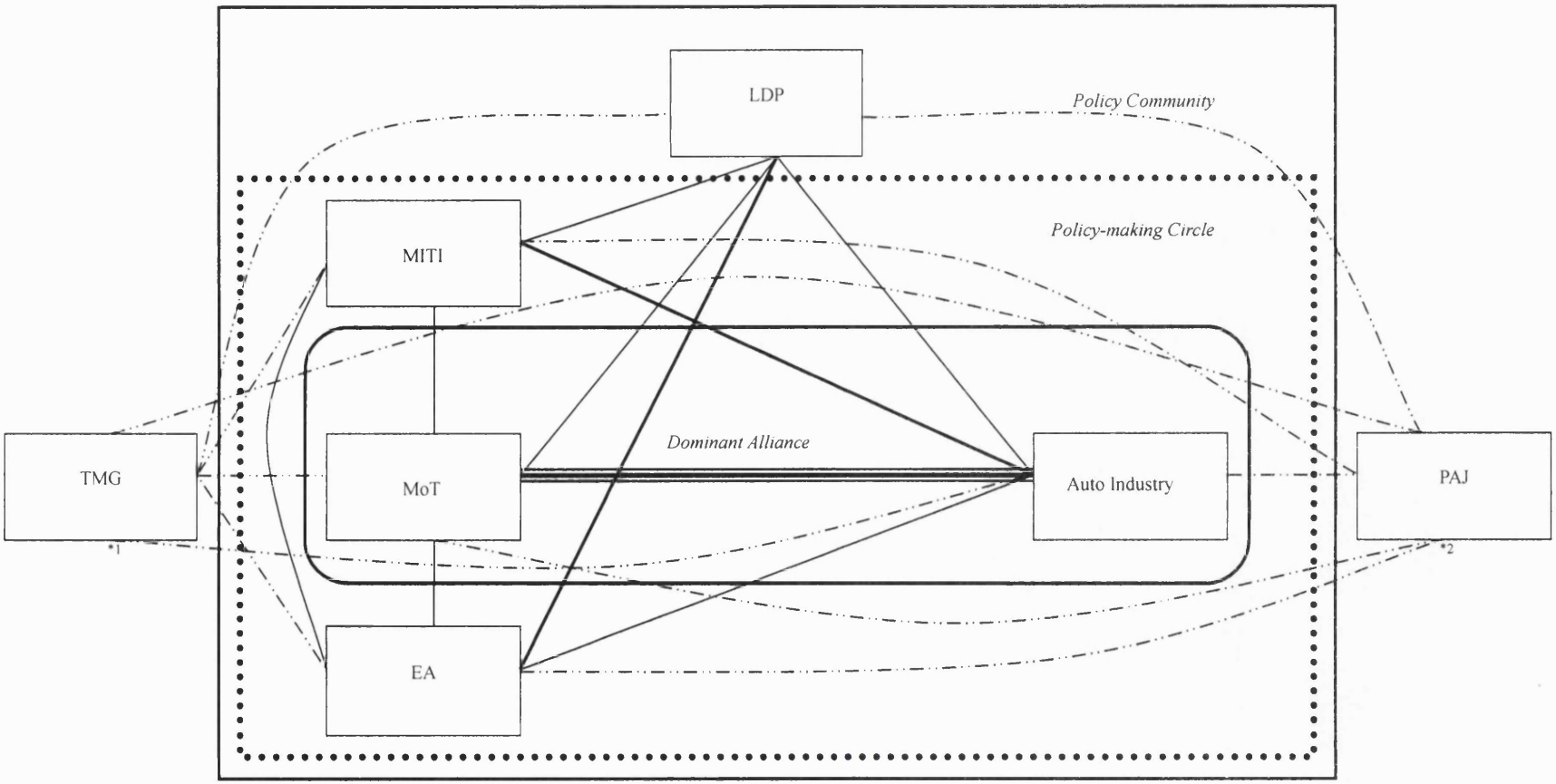
The key changes in the diagram are: the relation between MoT and the auto industry becoming more crucial (*1), the relation between LDP and the auto industry becoming much less crucial (*2), the relation between MITI and the auto industry becoming less crucial (*3), the relation between EA and LDP becoming relatively less crucial (*4), interests of LDP becoming united (*5), interests of the auto industry becoming united (*6), TMG becoming less influential in the periphery and LDP becoming out of the policy-making circle (*7).

Figure 7-2 The Policy Network in the seventh and the eighth policy change



*The key change in the diagram is: the relation between LDP and EA becoming crucial.

Figure 7-3 The Policy Network in the ninth policy change



The key changes in the diagram are: TMG becoming influential in the periphery (*1) and PAJ becoming influential in the periphery (*2).

Chapter 8

Analysis

Introduction

The previous chapters have provided results of the empirical investigation. Following the results of the empirical investigation, this chapter seeks to examine the validity of the research hypotheses based on the policy networks concept as well as answering the research questions associated with the hypotheses. The first section of this chapter seeks to identify answers to the research questions. Then, the next section seeks to examine the validity of the research hypotheses following both the outcomes of the analysis on the results of the empirical investigation and identified answers to the research questions.

Answers to Research Questions

After examining the results of the empirical investigation based on the policy networks concept, this section seeks for answers to the research questions which has been identified in the second chapter (refer to the tables of answers for the 10 research questions for each policy change in Appendix J).

1. Who were included in and who were excluded from the key policy networks?

The original members of the core of the policy network were MoT, MITI and the auto industry, and EA and LDP joined the core of the policy network in the early 1970s. After this change, the members of the core of the policy network had not changed. Before emission standards became an economic problem, the alliance between MoT and the auto industry had been most dominant. When they became so, however, the most dominant alliance became that between MITI and the auto industry. However, after automobile air pollution policies were not an economic problem and the core of the policy network came back as normal, the alliance between MoT and the auto industry became dominant again. Regarding the peripheral policy network members who existed around the core of the policy network, TMG had been its member since the early 1970s, though it was influential only in the mid-1970s and in the 2000s, and PAJ joined it in the late 1990s and became very influential especially in the 2000s. MoH and other related state actors had been influential peripheral policy network members too before the first emission standards were established. Other actors such as NGOs had been excluded from both the core of the policy network and the periphery of the policy network.

2. What were the appreciative systems and did they help to affect the choice of goals and definition of problems and exclude other actors?

There were a wide range of the appreciative systems including; automobile air pollution policies were technical matters and there were technical difficulties to reduce emissions; automobile air pollution was a local problem; automobile air pollution policies needed to be little harmful to economic activities for the auto industry; automobile air pollution was due to the insufficient supply of roads; emission standards needed to be those of the US; and automobile air pollution policies were the most important economic problems. Among them, the first and the second appreciative

systems had been available and effective for the longest time. Regarding the other appreciative systems, they had been only temporarily available and effective. Though the first appreciative system modified itself from 'automobile air pollution policies were technical matters' to 'automobile air pollution policies were technical matters and there were technical difficulties to reduce emissions' and it was challenged in the sixth policy change, it had been very stable and effective after the sixth policy change until the ninth policy change. Regarding the second appreciative system, because only metropolitan areas such as Tokyo and Osaka failed to achieve the national ambient air quality standard for NOx, this appreciative system had been effective and unchallenged similarly after the sixth policy change until the ninth policy change.

After the core of the policy network had those two stable appreciative systems, the choice of goals came to focus on metropolitan areas and problems specific in those areas. Also, it became considered that automobile air pollution was not due to automobiles themselves but to ways and circumstances in which automobiles were used. Further, as emission standards were, it was widely believed, technical matters and there were technical difficulties to reduce emissions, other actors could not or even did not seek to join policy-making processes in the central pollution council in which only actors with technical knowledge were allowed to take part in, or challenge the core of the policy network. However, in the last policy change, as TMG publicly maintained that these appreciative systems were wrong and the public believed in the arguments of TMG, these appreciative systems were challenged and then unstable.

3. What were the resources in the core of the policy network?

The resources of MITI included the authority for economic issues, giving protection for the auto industry, granting access to decision-making processes, expertise and technical knowledge,

interpersonal relationships with MITI and support from LDP. MITI had the strong support from LDP and could greatly utilize the interpersonal relationships with the auto industry only temporarily in the sixth policy change because the inappropriate relationships between MITI and the auto industry were severely criticized by the public, and voters became highly concerned about the environment rather than economic development.

MoT had resources including giving protection for the auto industry, granting access to policy-making processes, expertise and knowledge, and the authority for road administration. However, as EA became responsible for policy-making on emission standards, it lost one of the resources to permit access to its policy-making processes on emission standards. Although MoT lost it, it was still powerful because MoT had the authority for road administration and it consequently could decide grace periods for emission standards and implement them.

The auto industry had several resources such as economic resources, technical information, ability to influence results of policies in implementation, LDP support, and interpersonal relationships with MITI. Again, as the relationships both between MITI and the auto industry and between LDP and the auto industry were severely criticized, the auto industry could not always greatly utilize them as resources to influence policy-making processes on emission standards. However, it seems that the auto industry had more controlling resources such as technical information and economic resources than those of the others. The technical information of the auto industry was always necessary in policy-making processes of emission standards and was as a result a very influential resource. Economic resources were most dominant when the Japanese people considered economic development the most important issue and they tended to give a priority to economic issues in the economic crisis and when LDP was greatly dependent on the auto industry for economic resources mainly to win in elections (donation). However, economic resources had not always been controlling and they were sometimes considered as less significant than automobile air pollution. In addition,

LDP did not always depend on the auto industry for donation to win in elections and it often sought to do so to reflect interests of the public.

Although MITI, MoT and the auto industry had relatively the same resources and the influence of their resources had not significantly changed over time, EA had changing resources and the influence of its resources had changed greatly. The resources of EA included the authority for environmental administration, granting access to policy-making processes, public support, LDP support, local governments' support and expertise and knowledge. As it had been already a strict rule that the auto industry needed to be consulted in policy-making processes on emission standards and EA needed to incorporate the auto industry into the processes because it needed both technical information and cooperation of the auto industry, its resource to grant access to policy-making processes was in reality almost useless. Also, although EA had the authority for environmental administration, in terms of automobile air pollution policies, MoT had the authority for road administration and automobiles when they were driven on roads, and MITI had the authority for the auto industry and its technology. Consequently, the authority for environmental administration to the auto industry had been often constrained. In addition, although the support from the public, LDP and the local governments had been the most important and often the most controlling, EA did not have those resources necessarily when they were needed and EA was surely unable to manipulate them. Further, the support from them had not always been influential. However, when EA had great support from them, EA was often able to increase the power of its authority for environmental administration.

As for interests of LDP, it had the authority to make policy proposals passed in the Diet and formally establish emission standards, legitimate power over ministries and ability to reflect interests of stakeholders into policies. Because other members of the core of the policy network were dependent on resources of LDP to a certain extent, those resources were powerful. In addition,

because LDP could influence emission standards to utilize those resources, 'whose interests did LDP seek to reflect' was very important in evolutions of emission standards.

4. What were the strategies employed in the core policy network?

The strategies employed by the core policy network members included consultation, negotiation and bargaining, financial incentives, technical and financial assistance and incorporation. Before the establishment and the implementation of emission standards needed technical information and cooperation of the auto industry very much, it seems that MoT consulted the auto industry in policy-making processes. However, after it needed them and the auto industry got economically powerful, MoT and then EA bargained and negotiated with the auto industry. MoT and EA had incorporated the auto industry into policy-making processes so that the auto industry would provide technical information and it would cooperate in both the establishment and the implementation of emission standards. Although the auto industry was so greatly incorporated in policy-making processes, the auto industry became less greatly incorporated in policy-making processes in the establishment of the 1978 emission standards. In addition, both MITI and MoT had often given financial and technical assistance to the auto industry, and it seems that the auto industry was greatly dependent on those resources especially in its development phase.

EA had two kinds of strategies including incorporation and financial incentives. As stated above, EA had incorporated the auto industry into policy-making processes though this strategy was not so effective. In addition, after the enforcement of the 1978 emission standards, EA had often used financial incentives in order to encourage automobile users to choose low emission automobiles, which motivated the automakers to produce low emission automobiles.

The auto industry's strategy was manipulation of technical information and cooperation. Because

technical information was, as mentioned above, necessary for policy-making, the auto industry had utilised technical information so that the auto industry could be incorporated into policy-making processes and it often could achieve its preferable policy outputs. In addition, cooperation of the auto industry was important in the establishment and the implementation of emission standards because it might take much time to establish emission standards and it would be difficult to smoothly implement them without it.

As for strategies of LDP, it sought to influence policy-making processes by supporting policy makers or giving pressure to them. Because core policy network members often succeeded in achieving their targets when they were supported by LDP and they often failed to do so when they were given pressure from LDP, its strategies seem effective.

5. What were the rules of the game in the core of the policy network?

The rules of the game included; all the actors needed to be consulted; consensus needed to be achieved; policy-making processes needed to be in secret; and territories of each ministry needed to be protected. It seems that all of them had been normally stable. Although secrecy was not perfectly protected in the enforcement of the 1978 emission standards, policy-making processes had been kept secret except that time.

6. What kind of interests did the participants have and whose interests were dominant in the core of the policy network?

As for interests of the core policy network members, MoT (promoting appropriate road transport) and EA (environmental) consistently kept their interests. In addition, MITI almost consistently kept

its interests though it changed its interests from economic interests to environmental economic interests. Regarding interests within these organizations, though EA had different interests in the fifth policy change, those ministries had the same interests within themselves. Compared to them, the auto industry and LDP often changed their interests and had different interests within themselves. Interests of the auto industry included economic interests, weak environmental economic interests, environmental economic interests, strong environmental economic interests, reactive environmental economic interests and proactive environmental economic interests. Those of LDP contained environmental interests, economic interests, weak environmental economic interests and environmental economic interests. Though ministries consistently sought to achieve their original interests such as economic, environmental and promoting appropriate road transport, the auto industry and LDP did not have such interests that were foundations of them and they rather changed their interests to achieve their ultimate goals, that is triumph in elections for LDP and increase in sales for the auto industry. In addition, without doubt, there were different and conflicting interests within both the auto industry and LDP because members of the auto industry competed with each other to increase their own sales and those of LDP did so to obtain higher places in LDP, ultimately the prime minister. Further, there were different ways to achieve their goals; some automakers may find it necessary to make themselves environmentally friendly to have a better corporate image in order to increase sales, though others may seek to increase sales to produce high emission but cheap automobiles; some LDP members may seek to obtain the public support to appeal that they were greatly concerned about the environment, though others may seek to do so to insist that economic development needs to be achieved even at the expense of environmental destruction. Thus, it seems natural that the auto industry and LDP had changing interests and they had different interests within them.

Before EA was established, interests of MoT had been dominant in the core of the policy network.

Then, after EA and LDP joined the core of the policy network, environmental interests of them were dominant when the state decided to enforce the Japanese Muskie law and their environmental interests and environmental economic interests of some automakers were dominant when the 1975 emission standards were established. Then, though economic interests of MITI, the auto industry and LDP were so in the postponement of the 1976 emission standards, environmental interests of EA and LDP and environmental economic interests of most automakers became controlling when the 1978 emission standards were established. Next, after the establishment of the 1978 emissions standards, weak environmental economic interests of the auto industry and LDP were dominant until the mid-1990s when strong environmental economic interests of the auto industry and environmental economic interests of MITI and LDP became most powerful.

7. How often did the participants interact, did membership, values and outcomes continue over time and did all the participants have consensus over basic values and the legitimacy of the outcome?

As for frequency of interactions, before emission standards became an economic problem and achieving emission standards much required improvements in engines, it seems that MoT and the auto industry more frequently contacted with each other on emission standards. Then, after emission standards became a significant economic problem and achieving them required high improvements in engines in the establishment of the 1975 emission standards, the postponement of the 1976 emission standards and the establishment of the 1978 emission standards, it is likely that MITI and the auto industry most frequently interacted with the auto industry. After the establishment of the 1978 emission standards, MITI and the auto industry and MoT and the industry more frequently contacted with each other because they supervised the industry, though frequency of interaction

between MITI and the auto industry seemingly decreased because their relationships were criticized and this issue was no longer a significant economic issue for MITI.

As for consensus over basic values and the legitimacy of the outcome, though the core policy network members consistently accepted the legitimacy of the outcomes, they sometimes did not have consensus over the basic values. For instance, some automakers disagreed to one of the basic values that emission standards needed to be those of the US and sought to make stricter emission standards in the establishment of the 1975 emission standards. In the postponement of the 1976 emission standards, though some automakers, LDP members and an EA member in a senior position explicitly or implicitly disagreed to the basic values, the core policy network members as organizations agreed to the basic values. In the enforcement of the 1978 emission standards, EA, LDP as a whole and the auto industry as an industry did not agree to the basic values because they did not think that emission standards needed not to bring economic damages to the auto industry or that there were technical difficulties to reduce emissions, though MITI, some automakers such as Toyota and some LDP members sought to protect the basic values. Though there were disagreements over the basic values among the core policy network members until the establishment of the 1978 emission standards, they had consensus over the basic values after then.

As far as the consistency over memberships and basic values, memberships had been almost the same over time since EA and LDP joined the core of the policy network and basic values had mostly unchanged after the enforcement of the 1978 emission standards. As for the consistency over outcomes, policy outcomes had greatly changed when the appreciative systems were not stable or effective enough to constrain the degree of policy changes. However, when the appreciative systems were so, especially in the 1980s, outcomes did not significantly change.

8. How were the resources distributed within the core of the policy network and within

participating organizations?

All the core policy network members had resources and it seems that the number of resources that each member had was not much different among the members in all the policy changes. However, the influence or the power of resources of each member often differed greatly among them in several policy changes. For instance, though the core policy network members had almost the same number of resources, resources of the auto industry were most controlling in the postponement of the 1976 emission standards. In addition, the power of resources differed from one policy change to another. For example, economic resources of the auto industry were most powerful in the postponement of the 1976 emission standards, but they were not so, in the establishment of the 1978 emission standards. However, it seems that resources, in terms of both number and power, had been distributed relatively equally in the late 1960s, the 1980s and the 1990s. In those terms, the core of the policy network had been more stable than in the other terms. As for the resource distribution within participating organisations, it could not be deduced that the leaders of the auto industry had distributed the resources to the other small automakers. Although Toyota and Nissan were the leaders of the auto industry because they had the largest shares of auto sales in Japan, they severely competed with other small automakers such as Honda and Toyo Kogyo. Consequently, the leaders did not distribute resources to them and it seems that resources were normally not distributed vertically. Indeed, Honda distributed technical information on CVCC engines to Toyota and there were thus even adverse vertical distributions of resources.

9. How was power distributed?

The distribution of power had been almost the same as the distribution of resources. Namely, the

power had been distributed to all but unequally, and the distribution of power differed from one policy change to another. Normally, when the power of resources of one actor became bigger than other actors, it was likely that the power of the actor became stronger too. In the late 1960s, the 1980s and the 1990s, the power had been distributed relatively more equally than in the other terms as in the resource distribution.

10. What were the key drivers for policy changes?

There had been various kinds of key drivers for policy changes. In addition, most key drivers had been exogenous to the core of the policy network such as deterioration of the air quality, oil crisis and the establishment and postponement of the US Muskie law. Especially, both the establishment and the postponement of the US Muskie law might be the greatest driver in all the policy changes. Policy changes had been brought by endogenous drivers too, including technological development of Honda and Toyo Kogyo, the clean administration of Takeo Miki, the severe competition among the automakers and the consequent successes of them in developing technologies for the 1978 emission standards, the recognition of the state actors and the auto industry to do something to improve the environment and instability of the appreciative systems. Although those drivers were endogenous factors, most of them were greatly influenced by exogenous factors such as the Muskie law for the technological development, strong public criticism against the dirty administration of Kakuei Tanaka because of his inappropriate relationships with industries for the clean administration of Takeo Miki, strong public demands and the tendency of the public to buy lower emission automobiles for the severe competition of the automakers and the consequent successes of them to develop technologies for the 1978 emission standards and the global environmental movements and the consequent high public demands for the better environment for the recognition of the state and the auto industry to

improve the environment. Instability of the appreciative systems in the early implementation of the 2007 emission standards was brought by TMG, who is a peripheral policy network member of the policy network of emission standards. Thus, although it was an endogenous factor for the policy network as a whole, it was an exogenous factor for the core of the policy network.

Validity of Research Hypotheses

Based on the policy network analysis of the empirical investigation and answers to the research questions, the section seeks to examine the validity of the research hypotheses.

Hypothesis 1

Policy will be made through interactions between organizations which have resource dependent relationships with each other and which seek to achieve their own goals by utilizing strategies that are subject to various 'rules of the game', in Japan when relationship between policy actors is crucial in policy-making processes.

Emission standards had been established through interactions first among MITI, MoT and the auto industry and then among MITI, MoT, EA, LDP and the auto industry, although emission standards were more deeply examined within the circle of MITI, MoT, EA and the auto industry and LDP watched over policy-making processes of emission standards from outside the circle. All the actors in the core of the policy network had resources for making and implementing emission standards such as the authority of MITI for automobile technology, the authority of MoT for automobiles when they were driven and implementing emission standards, the authority of EA for making emission standards, the authority of LDP to formally establish emission standards and the technical

information of the auto industry. Thus, it could be said that all the actors had been dependent on each other for resources.

All the actors in the core of the policy network had their own interests and goals; for instance, normally, MITI had economic interests/goals, EA had environmental interests/goals, MoT had interests/goals to promote appropriate road transport, LDP had party interests/goals such as economic interests and environmental interests and the auto industry had economic and environmental economic interests/goals. In order to achieve their interests/goals, the core policy network members had used various kinds of strategies. However, their strategies had been subject to the rules of the game. For instance, EA with LDP could establish emission standards without negotiation with the other members and without their agreement. In reality, EA, however, negotiated and bargained with the other members because consensus needed to be reached among all the members to establish emission standards and to effectively enforce them.

Although it seems that this first hypothesis had the validity, this hypothesis could not be perfectly validated. As it was prominent especially in the postponement of the 1976 emission standards, emission standards were made partly through interpersonal interactions. Moreover, it could not be denied that individuals sometimes played a significant role in policy-making processes: for instance, influence of Kakuei Tanaka on the postponement of the 1976 emission standards and influence of Takeo Miki on the establishment of the 1978 emission standards. Further individuals in EA including Ikuo Kobayashi and individual companies of the auto industry had played a significant role in policy-making processes. Without any consideration of the interpersonal interactions and influence of individuals and individual companies, it would be difficult to perfectly explain policy-making processes. Regarding the validity of this first hypothesis, it could be therefore said that the hypothesis could be mostly validated though it missed the importance of interpersonal interactions and influence of individuals and individual company in policy-making processes.

Hypothesis 2

Policy networks can be distinguished between 'policy communities' and 'issue networks' according to four dimensions, including membership, integration, resources and power, in Japan when relationship between policy actors is crucial in policy-making processes.

According to Marsh and Rhodes (1992b: p.187), a policy community has characteristics including a limited number of participants with some groups consciously excluded; a dominant economic or professional interest; frequent interaction between all members of the community on all matters related to the policy issues with high quality; consistency in values, membership and policy outcomes over time; all the participants sharing basic values and accepting the legitimacy of the outcome; exchange relationships with all members of the policy community having some resources; bargaining between members with resources; and the hierarchical distribution of resources within the participating organizations so that leaders can guarantee the compliance of their members; a balance of power between members. On the other hand, an issue network is characterized by a large number of participants and a range of interests; fluctuating contacts in frequency and intensity; significant fluctuating access; the absence of consensus and the presence of conflict; consultative relationships and limited resources and varied and variable distribution of resources; unequal power.

In the membership category, as for the membership, the number of participants in the core of the policy network had been very limited. Although EA and LDP joined the core of the policy network of MoT, MIIT and the auto industry, no other actors joined the core of the policy network. Though economic interests were dominant especially in the postponement of the 1976 emission standards, the environmental interests and the interests to promote appropriate road transport had been often controlling too. It seems that whether economic interests were dominant was not a necessary

condition. Rather, it might be more important to keep the interests of the members in the core of the policy network not conflicting. In the postponement of the 1976 emission standards, the economic interests were very dominant. However, as several interests were both explicitly and implicitly critically conflicting with each other, the core of the policy network was unstable. In the 1960s, the 1980s and the 1990s, the core of the policy network had been stable as various interests were getting along with each other.

In the integration category, as for frequency of interaction, it could not be found that all groups interacted frequently and with high quality on all matters related to policy issue. For instance, when Honda and Toyo Kogyo had succeeded in developing technology to achieve the 1975 emission standards, MITI and MoT had received the information before they announced it in public but EA and LDP did not know it. Basically, MITI and MoT were the parents of the auto industry and EA might be a schoolteacher of the industry and LDP was a mayor of the town in which they lived. Thus, it seems that MITI, MoT and the auto industry normally interacted more frequently and with higher quality on almost all matters related to policy issue, though EA and the auto industry might interact only when EA sought to make a policy and needed to know technological information and opinions of the auto industry. In addition, LDP did not normally frequently contact the auto industry on emission standards when emission standards were not big political issues. Indeed, frequency of interaction of all groups on all matters related to policy issue might not be a main characteristic of the core of the policy network in this case. Although EA had still had less frequent interaction with the auto industry in the 1980s, in the 1990s and in the 2000s, the core of the policy network seems stable in those terms. Further, although it could be deduced as in this research with some evidences, it might be technically difficult to perfectly find interaction of participants and determine whether their interaction is frequent (twice, three times, a hundred times or more?). Rather, incorporation of participants into policy-making processes on all matters related to policy issue would be a more

appropriate category in this case.

As far as continuity is concerned, the membership first experienced a small change in membership as the original participants were MoT, MITI and the auto industry and only LDP and EA joined the core of the policy network. As for basic values including the appreciative systems and rules of the game, basic values had been mostly persistent over time, especially in the 1960s, the 1980s and the 1990s. Basic values had been changing especially in the postponement of the 1976 emission standards and the establishment of the 1978 emission standards. Concerning consensus, in the postponement of the 1976 emission standards and the establishment of the 1978 emission standards, the core policy network members did not share the basic values but, even in those terms, they accepted the legitimacy of outcomes. In the other terms, especially in the 1960s, the 1980s and the 1990s, they had strongly shared the basic values and accepted the legitimacy of outcomes.

In the resource category, regarding resource distribution within the core of the policy network and within participating organisations, all participants had resources and the number of resources that they had was similar in number, although the resources were distributed normally unequally in terms of their influences. Again in the 1960s, the 1980s and the 1990s, the resources were, however, distributed relatively equally in terms of influences. In addition, the leaders of the auto industry did not normally distribute resources to the subsidiary automakers and they had been thus unable to perfectly guarantee the compliance of the other automakers. Finally, in the power category, as for the power distribution, power had been usually unequally distributed to all participants but relatively equally to all of them in the 1960s, the 1980s and the 1990s.

Although the core of the policy network of emission standards did not perfectly conform to one of the two network types, it could be said that the core of the policy network of emission standards had been a policy community type of policy network. Therefore, the second hypothesis could be validated to a certain degree because the core of the policy network of emission standards could be

mostly categorized as a policy community according to the four dimensions including membership, integration, resource and power, but it could not be perfectly validated because it could not perfectly satisfy the four dimensions as described above.

Hypothesis 3

The degree of policy change will be constrained and the direction of policy change will be manipulated by the existence of policy networks because they favour the existing balance of interests in networks and groups proposing an undesirably great policy change, or ideas of such a change, will be excluded from networks by the appreciative system of networks, in Japan when relationship between policy actors is crucial in policy-making processes.

The degree of policy change had been often constrained by the existence of the policy community (the core of the policy network) of emission standards. It was more apparent when the policy community had been stable in the 1960s, the 1980s and the 1990s. However, when the policy community was unstable as in the establishment of the 1978 emission standards, the policy community could not constrain the degree of the policy change. Further, the policy community constrained the degree of the negative policy change in the postponement of the 1976 emission standards when the policy community was unstable.

The policy community manipulated the direction of policy changes too and its manipulation was more successful when the policy community was stable and the appreciative systems were effective. For instance, when EA failed to achieve the national ambient air quality standard for NOx, EA did not seek to establish the Japanese Muskie law for diesel trucks and it chose to establish the automobile NOx law as well as several times of minor reinforcement of emission standards because the policy community had kept this issue a local problem.

In addition, when the policy community was stable, it seems that participants normally favoured the existing balance of interests but they usually did not appreciate the existing balance when the policy community was unstable. For instance, in the establishment of the 1978 emission standards, environmental interests and environmental economic interests might be stronger than economic interests and some automakers such as Toyota sought to increase economic interests in the core of the policy network.

Further, groups such as TMG which proposed radical policy changes had been excluded from the policy community by the appreciative systems such as 'automobile air pollution policies were technical matters' and 'emission standards needed to be the same as those of the US.' Because of the appreciative systems, it had been considered that other participants were unnecessary to be joined in policy-making processes.

Therefore, although this hypothesis could be validated when the policy community had been stable, it could not be validated in the mere existence of policy network and even policy community.

Hypothesis 4

Policy change is more likely to be driven by exogenous than endogenous factors, though both factors can lead to changes in policy networks and then to policy change, but the nature of pre-existing policy networks can mediate both factors and restrict the potential for policy change, particularly where such changes challenge the interests and values of the pre-existing network, in Japan when relationship between policy actors is crucial in policy-making processes.

Concerning the argument that policy change is more likely to be driven by exogenous than endogenous factors, most factors that led to policy changes in this research were exogenous factors and there were five endogenous factors including technological development of Honda and Toyo

Kogyo, the clean administration of Takeo Miki, the severe competition among the automakers and the consequent successes of them in developing technologies for the 1978 emission standards, recognition of the state actors and the auto industry to do something to improve the environment and instability of the appreciative systems. However, all of those factors, except the last factor, were, as stated earlier, brought by exogenous factors, and those factors could be thus endogenous factors driven by exogenous factors, and they can be even categorized into quasi-exogenous factors. Further, instability of the appreciative systems can be an exogenous factor for the policy community though it can be an endogenous factor for the policy network as a whole. Therefore, it can be said that policy changes can be brought more by the exogenous than endogenous factors.

In addition, it is likely that the identified key endogenous and exogenous factors in this research normally changed one or more characteristics of the policy community such as resources, resource distribution and the rules of the game, and then changes in the policy community led to policy changes. However, in the eighth policy change, identified factors did not change characteristics of the policy community. As for the eighth policy change, because the characteristics of the policy community changed in the previous policy change and all of the core policy network members shared the basic values to reduce automobile air pollution, identified factors did not need to change characteristics of the policy community to change policies and those factors rather just further pushed the members to do so. Thus, when factors for policy changes and policy changes that they may lead to are not conflicting with the basic values and interests of the core of the policy network, although it may be natural, policy changes can happen without changes in the policy network.

Concerning the argument on whether the potential for policy change can be restricted by the nature of pre-existing policy networks, particularly where such changes challenge the interests and values of the pre-existing network, the policy community could mediate the endogenous factors and constrain the potential for policy changes when policy changes can be at odds with basic values and

interests of the pre-existing policy network, though endogenous factors were changes inside the policy community. In the establishment of the 1975 emission standards, though Honda and Toyo Kogyo succeeded to achieve the standards, the policy community mediated the endogenous factor and constrained the degree of the policy change. However, in the establishment of the 1978 emission standards, the policy community could not mediate the endogenous factor, the severe competition among the automakers and the consequent successes of them in developing technologies for the 1978 emission standards, because most automakers joined the competition and they succeeded in technological development unlike in the establishment of the 1975 emission standards.

As for the exogenous factors, when the policy community had been stable and the appreciative systems were effective, the policy community mediated the exogenous factors and manipulated the degree and the direction of policy changes when policy changes that they may lead to can be conflicting basic values and interests of the policy network. For example, in the 1960s, when the air quality deteriorated, the policy community could make this issue a problem of inappropriate maintenance of automobiles and a solution became improvement of maintenance of automobiles. Also, in the 1990s, similarly when the air quality became bad, the policy community could make this issue not a problem of automobiles but a local problem and EA then established the automobile NOx law.

Hence, this research suggested that key factors that brought about policy changes were exogenous factors or quasi-exogenous factors but that both factors could bring changes in one or more characteristics of the policy network, leading to policy change. Also, it identified that the nature of pre-existing policy network mediated the factors and constrained the degree of policy change when policy changes that they may lead to could be conflicting basic values and interests of the pre-existing policy network. However, as described above, the factors did not need to change the characteristic(s) of the pre-existing policy network when the core policy network members

considered that the factors for policy changes and policy changes that the factors may lead to are not conflicting with their basic values and interests. In addition, the policy network could not always mediate the factors. This research indicates that it is more likely that the factors can be mediated by the policy network when the policy network was stable. However, because this hypothesis could be applied to most policy changes in this research, it can be concluded that the hypothesis can be validated not strongly but to a certain degree.

Conclusions

This chapter, based on the examination of the nine policy changes, which took place in the previous chapters, the chapter sought to answer the research questions. Next, the chapter finally arrived at the examination of the validity of the four research hypotheses. Although all the hypotheses have been validated to a certain extent, they have not been perfectly validated. Following the results of the examination of the research hypotheses, the next concluding chapter seeks to examine two big questions that led to this research:'*how does the British policy networks framework relate to Japan when relationship between policy actors is crucial in policy-making processes?'* and *'does the framework help to explain policy change in Japan when relationship between policy actors matters in policy-making processes?'*

Chapter 9

Conclusion: Reflections on the research and Suggestions

Introduction

In the previous chapter, the research questions associated with the hypotheses have been answered and then the validity of the hypotheses based on the policy networks framework have been examined. Then, all the hypotheses have been validated to a certain degree but the validation of them could not be perfectly made. This chapter first seeks to examine the two big questions which have led to both the research and the research hypotheses, namely '*how does the British policy networks framework relate to Japan when relationship between policy actors is crucial in policy-making processes?*' and '*does the framework help to explain policy change in Japan when relationship between policy actors matters in policy-making processes?*' In examination of those two questions, some problems on the British policy networks framework are identified and some modifications can be proposed for the framework so that the framework can be applied more appropriately to Japan. After examination of those two questions, the problems identified in the previous section are highlighted and examined within the recent development of the framework. The next section seeks to examine and reflect on the limitations of the qualitative methods utilized in this research including problems on the secondary sources, problems on the semi-structured interviews and problems on the qualitative content analysis. After making some suggestions for policy makers in the next section, the final section seeks to make two kinds of suggestions for future research on the 'governance' style of the modern policy-making of automobile air pollution in Japan.

Answers to Two Big Questions

All the research hypotheses in this research are based on the two big questions of how the British policy networks framework relates to Japan when relationship between policy actors is crucial in policy-making processes and whether the framework helps to explain policy change in Japan when relationship between policy actors matters in policy-making processes. The previous chapter has examined the validity of the research hypotheses and it has been found that all the hypotheses have been validated to a certain degree but not perfectly. As all the hypotheses have not been perfectly validated, it could be expected that the British policy networks framework does not 'perfectly' relate to Japan and the framework does not 'perfectly' help to explain policy change in Japan, even when relationship between policy actors is crucial in policy-making processes. However, it is not clear how much the framework is relevant to Japan and useful for the explanation of policy change in Japan, when relationship between policy actors matters. This section seeks to examine to what extent the framework related to Japan and helped to explain policy changes on emission standards in Japan, when the relationship is important. This section also suggests modifications of the framework in order to make it more appropriately relate to Japan and help more effectively to explain policy change.

How does the British policy networks framework relate to Japan when relationship between policy actors is crucial in policy-making processes?

This question is closely related to the first and second hypotheses. Regarding the first hypothesis, it has been concluded that emission standards have been made through interactions between organisations which have had resource interdependency relationships and sought for their own goals

by using strategies that have been subject to the rules of the game. To this extent, it could be said that the British policy networks framework perfectly related to Japan when relationship between policy actors was crucial in policy-making processes. However, it has been further concluded on the first hypothesis that policies have sometimes been made partly through interpersonal relationships and policy-making has sometimes been influenced by individuals and individual companies. The British policy networks framework had paid little attention to the interpersonal links. Indeed, it has often been criticised as analysing only 'the surface appearance of relationships within and between organizations' (Stones, 1992: p.200). Rhodes admits the importance of interpersonal links because of its provision of 'a wealth of detail' (1990: p.311). Though it will, as Rhodes (ibid) argues, make generalization of policy networks difficult, interorganizational networks are strengthened by interpersonal links, and interpersonal links play a role as 'constraints and resources which can have an effect upon any exchange within the network' (Marsh and Rhodes, 1992a: p.197).

In addition, the importance of the role of individuals and individual companies has been neglected. In this analysis, the influence of individuals with power such as the prime minister and the director-general of EA has been dealt as resources. However, they can be also treated as policy actors. In either case, paying attention to individuals with power would contribute to a rich understanding of policy-making. Individuals with less power played a role in policy-making too. For instance, when the postponement of the 1976 emission standards was decided, EA in general sought to keep a cooperative relationship with the auto industry, but Ikuo Kobayashi, the chief of the automobile pollution section in EA, might not greatly respect the relationship and tried to establish as strict an emission standards as possible. It could not be denied that he constrained the degree of the relaxation. Further, individual companies had greatly influenced policy-making in the establishment of the 1975 emission standards and the 1978 emission standards. Therefore, focusing only on interorganizational networks and organisations would result in an imperfect understanding of policy-making in the

Japanese context.

Regarding the second hypothesis, the core of the policy network of emission standards could be distinguished as the policy community type of policy network according to the four dimensions including membership, integration, resource and power to a certain extent because it satisfied imperfectly all the characteristics of policy community. One of the characteristics that the policy community of emission standards unsatisfied was about dominant interests in the membership category. According to the Marsh and Rhodes model, the dominant interests need to be either economic or professional. However, this research has indicated that a condition of policy community is whether all interests can co-exist without conflict. In this research, it could be also said that a key issue is whether economic interests can co-exist with other interests.

Another characteristic is about frequency of interaction in the integration category. As argued in the previous chapter, even when the policy community had been very much integrated and stable, EA had still had less frequent interaction with the auto industry. In addition, technically speaking, it could be difficult to measure the frequency of interaction and its quality. Rather, it would be more important to examine how well participants are incorporated into networks and decision-making on all matters related to policy issue.

As for the question of how the British policy networks framework relates to Japan, it could be said that the policy networks framework greatly relates to Japan when the relationship between policy actors plays a crucial role in policy-making processes. However, the framework may need to pay attention to interpersonal relationships, individuals and individual companies. Further, it is necessary to examine if different interests co-exist without conflicts and how well participants are incorporated networks.

Does the framework help to explain policy change in Japan when relationship between policy actors

matters in policy-making processes?

This question is directly related to the third and fourth hypotheses, though it is also related to the first and the second hypotheses. As for the third hypothesis, it has been concluded that the degree of policy changes had been constrained and the direction of policy changes had been manipulated by the existence of the policy community because the stable policy community had favoured the existing balance of interests in the policy community, and groups proposing an undesirable great policy change or ideas of such an undesirable change had been excluded from the policy community by the appreciative systems of the policy community. Although the mere existence of the policy community had not greatly constrained the degree of policy changes and manipulated their directions, the stable policy community had been apparently relevant to policy changes in degree and direction. Thus, the British policy networks framework might be helpful to explain the degree and the direction of policy changes in the Japanese context.

As far as the fourth hypothesis is concerned, it has been concluded that changes in policy network had been more brought by the exogenous factors than by endogenous factors, but exogenous factors had been mediated by the policy community. Endogenous factors had been directly the endogenous changes in the policy community. However, even those endogenous changes within the policy community had been mediated by the policy community. Thus, in endogenous factors, the policy community had been related to policy changes in two ways.

In exogenous factors, the exogenous factors had been mediated by the policy community. In addition, policy changes had been brought by changes in the characteristics of the policy community such as resources, resource distribution and the appreciative systems. Thus, in exogenous factors, the policy community had been relevant to policy changes in two ways too.

Therefore, in this research, it could be said that the British policy networks framework could help

to explain policy changes in the Japanese context. However, one suggestion could be made to more effectively explain policy changes in Japan in the policy networks framework. The British policy networks framework normally fails to consider associated policy networks and relationships between policy networks, which has seemingly made it difficult for the framework to greatly examine factors for policy changes and more effectively analyse policy changes. Although literature on policy networks tends to focus on a certain policy network that is to be examined, policy networks often have relationships with other policy networks and it is possible that other policy networks and changes in other policy networks influence the policy network, which may affect its characteristics such as integrity and stability and lead to policy changes. In other words, policy networks may not be perfectly independent from other policy networks and it may be thus necessary to take into consideration other policy networks and relationships between policy networks to explain policy changes in terms of the British policy networks framework.

This research found that three different policy networks were related to the policy network of emission standards, though there may be more than three policy networks related to the policy network of emission standards. The first policy network is the policy network of economic policies on automobiles. The policy network of economic policies on automobiles, in which MITI and the auto industry had seemingly been most dominant, influenced policy-making of emission standards when emission standards became significantly related to economic policies on automobiles and the alliance sought to protect its economic interests, through the connection between both policy networks.

The second one is the policy network of the national ambient air quality standard for NOx, in which it is likely that MITI, LDP and some powerful industries, especially the auto industry, were more controlling at the time of the relaxation of its standard. In order to avoid further reinforcement of emission standards and to make automobile air pollution a local problem, MITI, LDP (especially

some members with strong economic interests and relationships with MITI and the auto industry) and the auto industry (especially Toyota) sought to make the national ambient air quality standard for NOx less strict and they succeeded to do so. Because of the relaxation of the standard, the policy network of emission standards had a very strong and stable appreciative system that automobile air pollution was a local problem, which contributed to the high stability of the policy network and the policy outcomes.

The policy network of the automobile NOx law is the last policy network related to the policy network of emission standards. Although emission standards had solely dealt with automobile air pollution, there have been mainly two measures for automobile air pollution because of the establishment of the law. Because both of them dealt with automobile air pollution and the same state actors were mainly related to both of them, these two policy networks have close relationships. Indeed, TMG, as a policy community member of the policy network of the automobile NOx law, could influence policy-making in the policy network of emission standards through the connection between both policy networks.

As described above, the policy network of emission standards had relationships with other policy networks and it was not independent from them. The British policy networks framework often neglects associated policy networks and relationships between policy networks. Consequently, the framework usually treats some factors for policy changes due to another/other associated policy networks such as the relaxation of the emission standards and changes in the automobile NOx law in this research as independent factors for the observed policy network, and the framework then often fails to explain policy changes though it may be in fact possible to do so within the policy networks framework. Taking into account both other associated policy networks and relationships between policy networks, the British policy networks framework may be able to explain policy changes which are due to events in another/other associated policy networks, though the framework still

cannot deal with factors leading to policy changes which are independent from the policy network such as the oil crisis. Thus, this research can maintain that the policy networks framework needs to more seriously examine other associated policy networks and relationships between policy networks to account for both factors contributing to policy changes.

In addition, it is also suggested that researchers need to look at key associated policy networks in a sector, area and even all areas related to a certain theme. For instance, the policy network of emission standards was related to the policy network of the automobile NOx law (a sector of automobile air pollution), the network of the national ambient air quality standard for NOx (an area of air pollution) and the network of economic policies on automobiles (all areas related to automobiles). Therefore, researchers need not pay too much attention to associated policy networks in a defined area or sector and rather they may need to look widely at other associated policy networks in all areas. It is apparently worth shedding light on other associated policy networks and relationships between policy networks. Indeed, it seems ironic that the policy 'networks' framework has often neglected *networks* between policy networks because it tends to focus exclusively on *networks* between actors.

Highlighting Problems in the Recent Development of Policy Networks Framework

The previous section specified some problems related to the British policy networks framework or the Marsh and Rhodes framework. This section seeks to highlight them and examine them within the recent development of the British policy networks studies. The identified problems include: the 'micro-level' problem, the problem on the frequency of contacts, the 'endogenous factors versus exogenous factors' problem, the problem on interrelationship between policy networks and the problem on dominant interests. In addition, the section examines the dialectical approach proposed

mainly by David Marsh and his associates. Marsh and his associates seek to develop the dialectical model to respond to a number of criticisms against the Marsh and Rhodes model, and the dialectical model covers most of the problems identified by this research.

The 'micro-level' problem

The research discovered that policy-making in emission standards has sometimes been influenced by individuals and individual companies. The 'micro-level' problem has been widely recognized and criticized by a wide range of researchers, especially Keith Dowding. In addition, as mentioned several times, Rhodes (1990) himself recognises the importance of the micro-level focus in policy-making. Further, Marsh (1998a: p.12) admits that the Marsh and Rhodes model downplays agents although 'the behaviour of the actors affects both the structure of the network and the broader context within which the network operates'. Indeed, the 'micro-level' problem seems to be the most criticized aspect of the British policy networks framework.

Several attempts have been made in order to overcome the 'micro-level' problem. It seems that networks analysts are especially interested in combining rational choice concepts with network concepts (Blom-Hansen, 1997; Borzel, 1998; Dowding, 1995; Krahmann, 2003).

Krahmann (2003: p.14) suggests that the British policy networks framework can be fruitfully combined with rational choice theory so that hypothesis about the decision making process as an intermediate variable between structures and outcomes can be established (see also Dowding, 1994; Daugbjerg and Marsh, 1998). Krahmann (2003: pp.14-15) maintains:

the utility of rational choice theory for network analysis derives from its utility to explain how rational actors may use their relations in a network to exert pressure on each other and thus understand the interactions among the members of a network. In particular, this author argues that

the concept of bounded rationality conforms with the British network approach in that the members of a network by definition interact regularly with each other. It can therefore be presumed that actors have clear expectations regarding the cost and utility of exerting pressure on other actors in order to change their policy preferences within their network. In short, the structure of a network sets the boundaries in which actors rationally seek to influence the decision making process.

Similarly, Marsh (with Daugbjerg, 1998) accepts the Dowding's proposition of utilizing rational choice concepts in network analysis to analyse the effect of networks on policy outcomes though he suggests that making realistic assumptions about individual behaviour needs to be taken into account when the rational choice theory is used. In order to utilize rational choice approach based on realistic assumption, Daugbjerg and Marsh (1998) propose that the concepts of bounded rationality and subjective expected utilities should be used. According to Daugbjerg and Marsh (1998: p.68), these concepts need to be adopted because of the unrealistic assumptions of rational choice theory about 'the knowledge available to, and the attention paid by, actors and its failure to acknowledge that the calculations of actors involve subjective judgements of costs and benefits'.

It has been suggested that bounded rationality is a realistic assumption as it assumes that individuals utilize standard operating devices as a shorthand guide to rational action when faced with limited information and time and given limited interest (Simon, 1982). Daugbjerg and Marsh (ibid) claim that a rational approach to networks need to utilize a bounded rationality model and focus on the methods utilized by the individual and the group for making strategic decisions, their shorthand guide and their perceptions of both the decision-making scheme with which they are encountered and the costs and benefits attached to various choices. Further, Daugbjerg and Marsh (ibid) suggest on using the so-called subjective expected utility theory (SEU), in which individuals make strategic judgements concerning their subjective perceptions of the costs and benefits involved; for each type

of behaviour the SEU is defined as the sum of the utilities for each behavioural consequence multiplied by the subjective probability of each consequence (Opp, 1986: p.89 cited in Daugbjerg and Marsh, 1998: p.68).

The integration of rational choice concepts into the British policy networks framework may be beneficial because of the strength of rational choice assumptions that they can enable researchers to generate hypotheses about how actors utilise their relations to affect each other and the decision-making process (Krahmann, 2003: p.15). Consequently, rational choice assumptions can be used to illustrate some common features in the actions of a variety of actors as well as generalizing interactions across causes and issues (ibid).

Although Marsh now recognizes the importance of the roles of agents in policy-making and suggests the adoption of rational choice concepts in network analysis, he still considers that policy network as a structure should not be undervalued. Daugbjerg and Marsh (1998) claim that actors behave in a structured context, a policy network. Toke and Marsh (2003: p.6) maintains:

'when a decision is made within a particular network, it is not simply the result of a rational assessment of available options, as rational choice theorists like Dowding would suggest, but rather reflect past conflicts and the culture and values of decision makers. As such networks do affect policy outcomes but not in a simple way. They are the structuration of past conflicts and present organizational power. By examining networks we are looking at the institutionalisation of power relations within the network and within the broader socio-economic and political context.'

Thus, Marsh admits the limitation of network concepts but he also points out the limitation of rational choice concepts. In other words, both network and rational choice concepts have their own utility and limitations and policy outcomes need to be explained in reference to both the structures of

the network or the behaviour of the agents. Although Dowding strongly emphasizes the importance of the roles of agents, he even admits that preferences of agents are shaped by institutional structures (Dowding, 1994). Policy networks are structures that shape preferences of the actors within them (Daugbjerg and Marsh, 1998). Thus, it is necessary to comprehend the way in which actors interpret the context and it is as mediated through that interpretation that the structural context affects the strategic calculation of the actors (Toke and Marsh, 2003: p.7). Consequently, Daugbjerg and Marsh (1998: p.67) suggest that 'any explanation of behaviour in networks must acknowledge the dialectical relationship between the structure of the networks and the actions of the members of the network'.

The solution of integration of rational choice concepts into network analysis for the 'micro-level' problem seems very simple and straightforward. However, it is supposed that such attempts may not be easy and without problems. It has not been clear if such integration can be really possible without difficulties. Basically, the methodological foundations differ between rational choice concepts and network concepts. While network concepts seek to explain policy-making in terms of relationships between policy actors, rational choice concepts attempt to explain it in terms of the strategies of individual actors or variables/categories regarding the attributes of individual actors (Thatcher, 1998: p.408). Hence, it may be possible that the combination of both concepts in policy-making analysis can lead to unclear, confusing and sometimes contradicting conclusions.

As argued in the first chapter, policy-making may be influenced more or less by different factors, including socio-economic factors, institutional factors, ideas of policy actors and rational choice of policy actors as well as relationship between policy actors. This research utilized network approaches because it was assumed that relationship between state actors and the auto industry might be the key to understanding policy-making in emission standards. As supposed, network approaches

(the British policy networks framework) could effectively explain policy-making in emission standards in general because relationship between them significantly affected policy-making and policy outcomes, though the roles of individuals played a significant role in some cases. It may be undeniable that focusing on both rational choice concepts and network concepts may lead to blurring in the roles of relationship between policy actors. Thus, although it is clearly one of its deficiencies that the network concepts fail to deal with the roles of individuals, it can be suggested that the integration should be considered where relationship between policy actors and the roles of individuals are both considered as being playing an important role in policy-making. For instance, the research found that individuals played a crucial role in the postponement of the 1976 emission standards and in the establishment of the 1978 emission standards and it can be suggested that these two cases should be analysed by integrating rational choice concepts into network concepts. It may be necessary to be emphasized that network researchers should focus on relationship between policy actors where they consider that they play an important role in policy-making. Then, where they cannot explain a certain policy-making case in terms of network concepts because individuals unexpectedly play a crucial role in policy-making, they should admit that network concepts cannot explain it and leave it to other interpretations. Although the roles of individuals should be taken into account in the research, it cannot be suggested to use the combination of both concepts where relationship between policy actors is evidently crucial in policy-making. It is considered that the utility of network concepts should not be constrained or damaged by integrating other perspectives into it.

The problem on the frequency of contacts

The research identified that frequency of interaction in the integration category of the Marsh and Rhodes typology was less useful in determining types of networks. In the existing literature,

researchers tend to examine the frequency of contacts less strictly or even omit the frequency of contacts in determining whether a certain network can be characterised as a policy community or an issue network. For instance, Marsh (1998b) argues that the policing policy network identified by McLeay (1998) can be almost perfectly characterized as a policy community while the European environmental policy network specified by Bomberg (1998) can be characterised as an issue network. However, McLeay just mentioned 'frequent high-quality interaction', in attempting to characterise the policing policy network in Britain and New Zealand. This is only a quotation from the work of Marsh and Rhodes (1992: p.251) and very much ambiguous. In the McLeay's work, except this part, the frequency of contacts between policy community members were seemingly not mentioned. Bomberg characterised the European environmental policy network as an issue network, but did not mention the frequency of contacts. Similarly, Daugbjerg (1998a: p.85) characterized the agricultural network in Denmark as a policy community without mentioning the frequency of contacts. On the contrary, Smith (1993: p.103) characterised the agricultural policy network in Britain as a policy community and specified that members in the inner circle of the agricultural policy community were 'intimately involved in policy-making on a day-to-day basis'.

Thus, it seems that there is no agreement among researchers on the definition and utility of 'the frequency of interaction' in the integration category of the Marsh and Rhodes typology. It may be natural for the researchers who used the British policy networks framework to omit using the frequency of interaction in determining types of policy networks because they generally consider that the content of exchanges is more crucial as discussed in the section of formal network analysis in the second chapter. Their contacts may be symbolic or ceremonial, or they may contact with each other for implementing policy or for determining policy choices (John and Cole, 1999). Further, practically, it is highly difficult to investigate the frequency and quality of contacts that were taking place in thirty or forty years ago.

Therefore, instead of the frequency of interaction, the research can again suggest that it would be more important to examine how well participants are incorporated into networks and decision-making on all matters related to policy issue. Indeed, studies using the British policy networks framework often have mentioned that participants are highly incorporated into networks and decision-making on all matters related to policy issue. For instance, McLeay (1998) identified that the core participants in the policing policy community in both Britain and New Zealand were involved in policy-making on all matters related to policy issue though the peripheral actors were only partly integrated into the regular sectoral decision-making processes. Further, Smith (1993) discovered that a distinctive set of insiders in the agricultural policy community were highly integrated into the administrative as well as the policy processes. Finally, Bomberg (1998) identified that members in the European environmental issue network were involved in policy-making depending on issues and they were not so on all matters related to policy issue. Thus, 'how well participants are incorporated into networks and decision-making on all matters related to policy issue' seems to be recognized as an crucial criteria to determine the types of policy networks and it can be proposed that this criteria may be better than the frequency of interaction. In addition, investigation of the former may be more feasible than the latter.

The problem on interrelation between policy networks

The research discovered that there were interrelationships between the policy network of emission standards and other policy networks and the relationships between them affected policy-making in emission standards. Then, it can be suggested that policy network analysts should take into account relationships between the focused policy network and other related policy networks as well as the related policy networks themselves. Marsh and Rhodes (1992) mentioned that different types of network might co-exist in a given policy area, with overlapping networks which were produced by

actors or organizations who belonged to more than one network. However, it seems that they neither treated it seriously nor included it into their four types of exogenous factors for policy change, including economic, ideological, political and knowledge-based. Indeed, Marsh and Smith (2000: p.8) point out that Marsh and Rhodes fail to examine other networks as important exogenous constraints though the relationship between networks is apparently significant.

Marsh points out that: 'Individual policy networks don't exist in isolation, although tight networks may succeed in isolating the interactions in their network from the attention of other networks. As such, other policy networks provide an important feature of the context within which particular networks operate.....the context within which networks operate is composed, in part, of other networks and this aspect of the context has a clear impact on the operation of the network, upon change in the network and upon policy outcomes' (Marsh, 1998: p.190). Pemberton (2000: p.778) similarly argues that the policy network (or policy community) does not operate in a vacuum and the actors and organizations who are the members of the policy network are themselves involved in other network.

Some case studies specified interaction between policy networks and its influence on policy outcomes. For instance, in the study of GM crop issues, Toke and Marsh (2003) identified the interaction between policy networks, which affected policy outcomes. According to Toke and Marsh, the Royal Society for the Protection of Birds (RSPB) had regular contacts with radical opponents such as the Soil Association who constituted their own network, although RSPB was a member of the GM environmental protection policy network. Consequently, the policy network and the outcome of the GM crop issues were affected by the relation of RSPB with another network constituted by the radical opponents.

In addition, this research also found that the dominant policy network of economic policies on automobiles affected the policy network of emission standards and its policy outcomes though they

existed in different policy areas. Daugbjerg (1998) and Smith (1991) point out that the dominant policy network has a significant influence on other policy networks and their policy outcomes whether the dominant policy network exists in the same policy area or a different policy area. Although the work of Smith may not be 'the recent development', it seems that the work most explicitly specified and examined the influence of the dominant policy network and thus it is worth being mentioned here. According to the Smith's work on the 'Salmonella in eggs' issues (1991), from the 1950s to the 1980s, the food policy network was highly influenced and mostly dominated by concern for the interests of the agricultural policy community because of the demand of the post-war food situation and fading consumer interests. The food policy network was consequently less autonomous and food policy was significantly affected by the agricultural policy community. Daugbjerg (1998a, 1998b) also specified the dominant position of the agricultural policy network over the environmental policy network in Denmark. Daubgjerg points out that the agricultural policy community was highly dominant and powerful so that the Danish farmers could successfully transfer the state responsibility rule from agricultural policy making to environmental policy making.

Further, the policy network of emission standards was affected by the pre-existing policy networks from its formation. Before the policy network of emission standards was established, there were already dominant and influential policy networks related to automobiles. Clearly, the policy network of economic policies on automobiles existed before the formation of the policy network of emission standards and the relation between its core members (i.e. MITI and the auto industry) and its rules and ideology affected the policy network of emission standards. Although the research did not investigate it, the policy network of transport policies on automobiles apparently existed between MoT and the auto industry before the creation of the policy network of emission standards. Indeed, the policy network of emission standards was originated from the policy network of automobile air pollution policies, whose core members were MoT and the auto industry because automobile air

pollution was closely related to safety issues in both automobiles and road transport.

Further, since environmental policy is a relatively new issue compared with other policies such as economic policies, it may be unavoidable that environmental policy networks especially need to deal with other dominant policy networks from their creation. Daugbjerg and Pedersen (2004) identify the similar points. They argue that, before environmental policy problems became an important issue on the political agenda, producer groups and state actors established policy network in many policy sectors. In their study on green tax issues in Scandinavian nations, they discovered that advocates of green taxation had to operate within a set of already established state-producer policy networks and the structures of these established state-producer networks were barriers to green taxation to a varying extent. Producer groups, representing polluters, could utilize the already-established state-producer policy networks as a source of structural power in environmental policy-making.

As discussed above, relationships between policy networks can influence the focused policy network and its policy outcomes and it should be worth being examined extensively. Although the previously cited works such as Smith (1991), Daugbjerg (1998a) and Daugbjerg and Pedersen (2004) pointed the importance of relationships between policy networks and the roles of dominant policy networks over other policy networks, all of them did not examine sufficiently important issues such as: what kind of relationships did networks have?; how did relationship between them affect policy outcomes?; and how could it influence policy outcomes? They rather tended to still focus on a single policy network and a single-issue area. Peters (1998) criticizes this tendency of policy network studies, claiming that policy network studies as seen in the topical chapters in Marsh and Rhodes (1992d) tend to pay attention only to a single-issue area. However, the necessity to look at different policy networks whether they are in the same policy area or in different policy areas has been often emphasized and there would be no reason to neglect different policy networks related to the focused policy network in order to explain policy-making and policy outcomes.

The 'endogenous factors versus exogenous factors' problem

Another perspective that should be highlighted is the 'endogenous factor versus exogenous factor' issue. Marsh and Rhodes suggest that most network change originates from exogenous factors, economic, ideological, political and knowledge-based (Marsh and Smith, 2000: p.7). This research similarly found that changes in policy network had been more brought by the exogenous factors than by endogenous factors. However, it was discovered that exogenous factors were often unable to affect the policy community directly and exogenous factors had been rather mediated by the policy community. It seems that Marsh and Smith (2000) most extensively examined this issue, although it has been less discussed in the recent development of the policy network studies, compared with the previous two issues.

Marsh and Smith (2000: pp.7-8) argue that the distinction between exogenous and endogenous factors is misleading. They emphasize the necessity to recognize that there is a dialectical relationship between the network and the broader context within which it is located. Then, they point out two issues regarding this perspective. First, they propose that, because policy networks reflect exogenous structures such as class and gender structures, the structure of networks tend to reflect the broader pattern of structured inequality within society. In addition, agents are at the same time located in a wide range of structural positions like class and gender structure. Consequently, exogenous structural positions may be more significant and reflected in network membership, while structural privilege may be given to them by membership of a policy network. Second, they maintain that, though network structure, network change and the policy outcome may be partially explained by exogenous factors, these contextual factors are dialectically related to network structure and network interaction. They claim that 'the extent and speed of change is clearly influenced by the network's capacity to mediate, and often minimize, the effect of such change' (Marsh and Smith,

2000: p.8).

Thus, as suggested by Marsh and Smith, it may be necessary to examine relationship between exogenous factors and the policy network in order to explain network change and policy change. Although many empirical studies of networks tend to explain change in term of exogenous factors to the network (Marsh and Smith, 2000), it cannot be appropriately explained without reference to 'what happened within the policy network' because of exogenous factors.

The problem on dominant interests

The problem on dominant interests has been much less investigated than the other problems discussed above. This research observed that a condition for the stable policy community was whether all interests could co-exist without conflict. This conclusion is different from the perspectives of the Marsh and Rhodes model. According to the Marsh and Rhodes typology, the dominant interests must be either economic or professional (Marsh and Rhodes, 1992a). Following their typology, where other interests are dominant in the policy network, the policy network cannot be as integrated as the policy community. However, this research discovered that the policy network could be as integrated and stable as the policy community though there were different interests existing in the policy network because they did not conflict with each other; however, this research found that it was always necessary for the policy network to be integrated and stable that economic interests could co-exist with other interests. This research extensively examined the interests of each policy network members and discussed how the different interests conflicted with each other and how they could co-exist without conflict.

On the contrary, most existing case studies tend to pay a little attention to interests of all policy network members and how their interests can co-exist and how they conflict. For instance, all case studies which used the British policy networks framework in the edited collection of Marsh (1998)

did not mention interests of each policy network members or how certain interests rather than other interests could become the dominant interests when they identified the focused policy network as a policy community or mostly as a policy community; for example, McLeay (1998: p.128) just mentioned 'they have a common interest in maintaining a stable policy environment'; Cavanagh (1998: p.98) only mentioned 'the interests of the oil industry... dominate the policy network'; and Daugbjerg (1998: p.84) just stated 'Agricultural interests have been closely tied to the national interest'. Although it may be possible the reading of the researcher missed other parts which mentioned 'interests', they clearly did not mention interests of each policy network member and the conflict/co-existence of interests.

As shown just above, discussions of network studies often start with the arguments that the policy network actors share interests or certain interests dominate the policy network. It seems that network studies are preoccupied with *'the seemingly common knowledge'*. It may be commonly understood that health policy is dominated by the interests of doctors; agricultural policy is dominated by the interests of farmers; automobile economic policy is dominated by the interests of the auto industry and so on. It may be true that those policy networks may be dominated by these interests. However, researcher should not start his/her research based on *'the seemingly common knowledge'* and should examine interests of all policy network members and the way in which different interests co-exist without conflict. As Smith (1993) points out, government is not unified but fragmented, and each department, or even a section of departments, has distinctive interests and pursues them. Thus, it may be hard to assume that the state actors and the private actors in the policy network have the same interests. Therefore, in order to understand the characteristics of the policy network and policy change, examination of these issues must be necessary.

The dialectical approach

Finally, this section briefly examines the dialectical approach developed by Marsh (1998b), Marsh and Smith (2000, 2001) and Toke and Marsh (2003). Although five kinds of problems that identified in the research were discussed, the dialectical approach similarly specified three of them as deficiencies of the Marsh and Rhodes model including the 'micro-level' problem, the problem on interrelation between policy networks and the 'endogenous factors versus exogenous factors' problem though it identified other problems too.

In order to respond to criticisms that policy networks cannot explain policy change, Marsh and his associates developed the dialectical model. They consider that the British policy networks framework tend to fail to explain policy change because studies using the framework are likely to neglect the 'dialectical relationships', leading to the static bias of the framework. They seek to add the 'dialectical relationships' to the framework so that the framework can become 'a more dynamic approach to the analysis of policy networks and their influence on policy outcomes' (Marsh, 1997: p.10, cited in Hunan, 1999).

The dialectical model does not simply deploy network metaphors and suggests that policy networks as explanatory variable need to recognize the importance of three dialectical relationships between structure and agents, network and context and network and outcomes in order to understand network change and policy outcomes (Marsh and Smith, 2000; Toke and Marsh, 2003). Namely, two variables in each set have interactive relationships and each affects the other.

First, though the model recognizes the network structure constrains and facilitates agents as suggested in the Marsh and Rhodes model, it admits at the same time that agents interpret those constraints and opportunities and thus shape the network structures (Toke and Smith, 2003). Thus, Toke and Marsh (2003: p.231) maintain that 'any explanation of the effect of networks on policy outcomes...must emphasize the role of agents'. Second, they suggest that, in order to understand how networks affect outcomes, it is necessary to recognize that there is a dialectical relationship

between the network and the broader context within which it is located (Marsh and Smith, 2000: p.7). Marsh (1998b: p.195) argues that policy networks as structures cannot be treated as given and they reflect exogenous structures such as class and gender structures. In addition, Marsh (ibid) maintains that although network structure, network change and the policy outcome may be partially explained by reference to exogenous factors to the network, these contextual factors are dialectically related to network structure and network interaction. In other words, although exogenous changes may influence the resources and interests of actors within a network, the extent and speed of the resultant change is apparently affected by the capacity of the network to mediate the effects of the changes. In addition, the model views other policy networks as important exogenous constraints and suggests that there is a dialectical relationship between policy networks. Finally, while policy outcomes may be influenced by policy network, network may be in turn shaped or reshaped by policy outcomes through change in the membership of the network or to the balance of resources within it, change in the broader social structure and agents' learning by experience.

The dialectical model seems valuable in that the network framework *formally* admits its failure to deal with several important factors such as the role of individuals and the importance of relationship between policy networks. However, it seems that the model is less useful than Marsh and his associates expect because they fail to explain how the network framework integrate these dialectical relationships into the framework. For instance, although Toke and Marsh (2003) adopted the dialectical model in the study of GM crop issues, all they did was only showing that the three kinds of dialectical relationships existed. In addition, researchers have already started to integrate these three dialectical relationships or factors contained in these three dialectical relationships into the networks framework. Concerning the dialectical relationship between structure and agents, as shown in the 'micro-level' problem, Krahmann (2003) apparently recognizes the dialectical relationship between policy networks and agents and attempts to integrate the dialectical relationship into the

networks framework by combining rational choice concepts with the networks framework. Indeed, all factors that Marsh and his associates highlight seem to be nothing new and they have been more or less discussed in the previous works. Raab (2001) claims that the dialectical approach takes us no further than existing network theory. In addition, though the model emphasizes the *dialectical* nature of relationships, as Dowding (2001) points out, it seems natural that relationship is *dialectical.*

Further, by focusing on these three kinds of dialectical relationships, researchers may tend to pay less attention to relationship between policy actors, namely policy networks. Looking at these three kinds of dialectical relationships may be useful. However, the study of Toke and Marsh (2003) is likely to put too much focus on the dialectical relationships, resulting in the insufficient analysis of policy networks. Toke and Smith (ibid: p.249) in the conclusion said that the gain obtained from the dialectical approach 'may be at the expense of some of the parsimony of traditional approaches, but it is a price worth paying if it helps us, for example, to explain how policy change on GM crops have occurred'. However, it can be strongly suggested that the policy networks framework should focus primarily on relationships between policy actors or policy networks and should not pay 'the expense of some of the parsimony of traditional approaches'. The research claims that the dialectic approach, where it is used as in the study of Toke and Marsh, rather deteriorates the quality of the policy networks framework though its perspectives must be 'value-added' to the policy networks framework.

Limitations of the Qualitative Methods

This section seeks to examine the limitations of the qualitative methods used by this research. As explained in Chapter 3, the research used both the primary and the secondary data. The primary data was collected by conducting semi-structured interviews. The secondary data collection was carried

out by reviewing a wide range of written sources such as newspapers, memoirs, documentary books, governmental white papers and so on. In addition, the extensive usage of the Diet Paper was the distinctive point in this research. Then, both the he secondary data and the results of all the interviews which were transcribed were examined by the qualitative content analysis. Although the research tried not to involve deficiencies in both the data collection and the data analysis, it should be admitted that this research does involve deficiencies in both of them. Although there may be other deficiencies, the section discusses problems on the secondary data, problems on the semi-structured interviews and problems on the qualitative content analysis as these are considered as especially problematic.

Problems on the secondary sources

Neutrality in the secondary sources

Researcher should be like a judge who is neutral and decides cases after carefully and objectively hearing and considering propositions of both the plaintiff and the defendant. Like a judge, researcher should be neutral and should carefully and objectively take into consideration propositions of all sides of those who are related to a certain issue in order to draw the whole picture of the issue (Judd *et al.*, 1991). Then, it should be admitted that the judge of this 'case' might fail to be as neutral as the judge should be. The judge in this research, especially in the interpretation of events in the 1960s, the 1970s and the 1980s, did not hear neutrally propositions of all sides. Because it was almost impossible to directly hear propositions of all sides in order to investigate events in thirty to forty years ago, the investigation was almost perfectly dependent on the secondary sources.

However, most secondary sources were often not free from bias. Especially, it should be emphasized that the research on the events in the 1970s was significantly based on the secondary sources that were published by the anti-automakers' side because there were a few of publications

from the automakers' side. For example, the empirical research for the automobile air pollution policies in the 1970s was significantly dependent on the work of Hajime Nishimura ('Sabakareru jidosha'), the work of Hideyuki Kawana ('Document Nihon no kogai, vol.2, Kankyo cho') and the work of Michio Hashimoto ('Shishi kankyogyosei') because they depicted in more detail what was happening in decision making processes in the 1970s. However, all of them were apparently on the anti-automakers' side. Hajime Nishimura was a member of the research team of the seven major cities that was established to make the government enforce the 1976 emission standards as described in chapter 6 (p.174) (Nishimura, 1976). Hideyuki Kawana was a journalist but he was definitely an environmentalist (Kawana, 2001). Michio Hashimoto was an 'environmental bureaucrat', working for both MoH and EA. He always stood for victims of industrial pollution and resigned his job because EA eased the national ambient air quality standard on NOx because of strong demand from the industry side (Asahi Shinbun, 30 April 2008).

Their works seem to involve bias. For instance, as described in chapter 6 (p.174), the research team of the seven major cities concluded that the 1976 emission standards were feasible because Toyo Kogyo and Honda admitted that their rotary engine and the CVCC engines were able to satisfy the requirements of the 1976 emission standards *with a little effort*. On the contrary, the specialist committee of the central pollution council concluded that the standards were not feasible because none of the automakers had been able to achieve the standards. Nishimura (1976) strongly claimed that the research carried out by his team was turned out to be right while the investigation of the specialist committee of the central pollution council was turned out to be wrong, because the automakers could achieve the 1978 emission standards (originally the 1976 emission standards) only a few years after the postponement of the 1976 emission standards.

However, as Nishimura (ibid) admitted, the research team was unable to obtain technical information from the automakers. Further, Toyo Kogyo and Honda did not say that they had satisfied

the requirements. It might be probable that the automakers were really unable to achieve the standards when whether the 1976 emission standards could be enforced or postponed was examined. There were no objective evidences that the automakers were in reality able to satisfy the requirements in the postponement of the 1976 emission standards though there were at the same time no objective evidences to indicate that they were really unable to do so. Further, Nishimura (ibid) mentioned with irony that the auto industry had to be proud of its loyal employees because the information that automakers could achieve the standards was not leaked from them. However, it can be said instead that such information was not leaked because none of them could satisfy the standards.

In addition, though the research extensively utilized newspapers as the secondary sources, it may be too naïve to say that articles in newspapers were neutral (Groseclose and Milyo, 2004; Nelson, 2003). For example, Asahi Shinbun was used in this research but the newspaper is the left-wing and its columns and even articles were often on the anti-automakers' side or the environmentalist side (Aoyama, 2005; Hongo, 2005). Further, the diet paper was also not free from bias. For instance, concerning the diet paper related to the postponement of the 1976 emission standards and the enforcement of the 1978 emission standards, most statements utilized in this research were those of members of the socialist party and the communist party, both of which tended to stand on the anti-automakers' side because only some of the LDP members such as Yoshio Hayashi spoke for the auto industry.

It seems that the secondary sources on automobile air pollution policies in the 1970s are preoccupied with the idea that the auto industry was dishonest and evils. The thesis should admit that the empirical research was mostly based on such idea because the judge heard mostly the propositions of the anti-automakers' side as the judge could not hear the propositions of the automakers' side due to the limited number of publications written by the automakers' side.

Definitely, the research had to investigate the propositions of the automakers' side in more detail if it was possible, and it was in reality not possible to do so despite exhausting efforts. Consequently, the research had to involve bias inherent in the secondary sources. It seems that this may be the limit of this sort of research which tries to interpret events in thirty to forty years ago (see McCulloch, 2004; Sanghera, 2008; Sommer and Sommer, 1997).

In addition, although academic works may not be always neutral, they, at least in principle, try to be neutral in describing and analysing policy events (Sommer and Sommer, 1997). Thus, if researchers had investigated and analysed policy-making processes of automobile air pollution policies when they could access to all sides related to a certain issue, the bias problem might have been improved. However, as such academic works were not available, the bias problem could not be reduced.

Varying amount of the secondary sources between policy events

The amount of the secondary sources that could be collected significantly differed between policy events. For instance, though a huge amount of the secondary sources could be collected for the policy events on the Japanese Muskie law in the 1970s, the amount of the secondary sources for those in the 1960s and the 1980s was limited. The secondary sources tend to be abundant where the focused policy event is a big issue, significant policy change, sensational, receiving the huge public concern and media attention and so on (Sommer and Sommer, 1997). If the focused policy event is a minor issue, small policy change, less sensational and receiving little public concern and media attention, writers might not publish books, documentary books and memoirs partly because they would not be sold well as readers may not be interested in such a minor policy event.

In addition, even newspapers may select articles which would attract readers (Newton, 1989; Sommer and Sommer, 1997). Thus, newspapers tended to pick up on automobile air pollution

policies when the public might be highly interested in automobile air pollution policies or automobile air pollution policies were significantly advanced (e.g. automobile air pollution policies in the 1970s). Further, the number of the diet paper significantly varied between policy events. Politicians generally tend to pick up on issues receiving the high public concern in the Diet in order to improve their image and obtain votes (Sone and Kanazashi, 1994). This tendency in the Diet paper was more obvious than newspapers. As discussed in Chapter 3 (p.117), because emission standards needed not to be examined in the Diet, politicians picked up on issues on emission standards when they were big social problems. As described in the introduction of Chapter 7, consequently, where emission standards and automobile air pollution policies were not big social problems, these issues were rarely picked up by politicians.

As shown above, the number of the secondary sources significantly differed between policy events. As a result, it was seriously difficult to collect them when emission standards and automobile air pollution policies were not serious social problems. While the number of the secondary sources was limited when emission standards and automobile air pollution policies were not big social problems, the secondary sources tended to stand on the anti-automakers' side when they were big social problems. In order to interpret policy events in thirty to forty years ago, the investigation generally had to be dependent on the secondary sources and this research indicates the limits of the interpretation of them (Judd *et al.*, 1991).

Problems on the semi-structured interviews

Difficulty and reliability in the interviews with state bureaucrats and staff of the automakers

Because of the difficulty to access to the state bureaucrats and staff of the automakers, the research was able to conduct only one interview with each state bureaucrat and each staff of the

automakers. Consequently, the research was not given an opportunity to clarify some ambiguous points identified after interviews and to conduct the follow-up interviews with them. They might result in both the reliability and validity problems in the interview research (Kvale, 1996). Because it was apparent before the interviews that the research had only one interview to each of them, the researcher should have considered inclusion of structured questions in the interviews (see Miles and Huberman, 1994).

The research conducted interviews to other subjects before conducting interviews to those who were difficult to be accessed to in order to understand sufficiently interview topics in advance. Thanks to the previously conducted interviews, possible answers were already obtained when interviews with them were conducted. Then, it could save time to use structured questions when the researcher conducted the interviews with them. The researcher did not use the 'Choose A, B, C or D' type question in the interviews. Undoubtedly, this type of questions may be much easier to be answered for interviewees (Judd *et al*, 1991; Kvale, 1996). The research did not use them at all because of the fear that they would restrict openness of the interviews. However, because of the fear to lose the openness, the research might have lost some of reliability and validity. It seems that the research was too much dependent on the belief that the qualitative/less structured approach is superior to the quantitative/structured approach (see Flick, 2002). However, the flexible utilization of both approaches might have improved the research (Judd *et al*, 1991).

Problems on the qualitative content analysis

Subjectivity and reliability in the qualitative content analysis

In this research, the secondary data and the results of all the interviews which were transcribed, were examined by the qualitative content analysis. In the qualitative content analysis, first,

categories were created in accordance with the research questions. Then, subcategories of possible words and phrases were created based on the literature on the policy networks framework. Next, the researcher reviewed all transcripts and highlighted all words, phrases, sentences and even paragraphs that seemed to relate to each category. Then, the researcher coded all highlighted words, phrases, sentences and even paragraphs by using the categories and subcategories. Next, words, phrases, sentences and paragraphs that could not be coded into one of these subcategories were given new codes and new subcategories for them were created at the same time. It seems that this research procedure involved reliability problems and subjectivity problems.

First, it should be admitted that the researcher might have overlooked crucial words, phrases, sentences, and paragraphs that had to be coded. Although all texts were reviewed twice in order to increase reliability, the possibility that the crucial words, phrases, sentences, and paragraphs were overlooked might be not low. Rather, it may be natural to assume that some of them at least were accidentally overlooked. This may be a limit of this research that sought to interpret events in thirty to forty years ago based on a huge amount of the secondary sources by a single researcher.

Second, with some exceptions, the researcher had to create new subcategories in the categories of interests, appreciative systems, resources, rules of the game and strategies, because most highlighted words, phrases, sentences and paragraphs that seemed to relate to each category were not specified by the literature review. They were given new codes and new subcategories for them were created not because they related to each category but because they 'seemed' to relate to each category. Clearly, though the researcher sought to create new categories, based on the definitions or common understandings shared by the literature, other researchers may interpret texts differently and propose different subcategories. Especially, the selection of both rules of the game and the appreciative systems may be disputable because they were generally not explicitly expressed in texts, while resources and strategies were often explicitly mentioned. Rules of the game and the appreciative

systems were normally obtained by the interpretation of certain phrases, sentences and paragraphs. Thus, it may be probable that other researchers may deny the interpretation of the researcher and suggest other rules of the game and the appreciative system. Again, if this analysis was carried out by plural researchers, the subjectivity problems and the consequent reliability problems might have been reduced (CSU, 2008; Sommer and Sommer, 1997). As long as a single researcher conducts the analysis, these problems might be unavoidable (see Krippendorff, 2004).

Third, the subjectivity problems may exist in other categories too though new subcategories were not created in those categories based on the interpretation of the text. Based on the interpretation of certain phrases, sentences and paragraphs, the research specified core policy network members and dominant alliances, the frequency of interaction and the consensus of the core members, power distribution, resource distribution and key drivers for policy change. The research identified them by the interpretation of certain phrases, sentences and paragraphs because they were often not expressed explicitly. In addition, specifying them in policy events in the 1980s was severely difficult because of the limited amount of the secondary resources. In specifying them, several kinds of 'proofs' could be obtained from the texts in policy events in the 1970s. On the contrary, in order to specify them, only one or a few kinds of, proofs could be found from the texts in policy events in the 1980s, which might decrease the reliability and even the validity of the research.

Finally, it seems that the research involves both the subjectivity problems and the reliability problems because the research was too much dependent on the qualitative approach with excluding the possibility to utilize the quantitative approach. For instance, the research decided which resource was more powerful by the interpretation of the texts. However, the research could count the frequency of certain resources appeared in the texts and could express the frequency in number along with the text interpretation (Sommer and Sommer, 1997; Mayring, 2000). If the researcher specified a certain resource more powerful because of the interpretation of the texts and at the same

time because of the fact that the resource appeared in the texts more frequently than others, the argument that the resource was more powerful than others might have become relatively objective and reliable. By combining both approaches in the analysis, the subjectivity problems might have been reduced and the reliability of the research might have been improved (Sommer and Sommer, 1997; Mayring, 2000).

The subjectivity/ reliability problems seem unavoidable in the content analysis of the policy events in the 1960s, the 1970s and the 1980s because it was difficult to confirm if the results of the analysis might be valid. The researcher could confirm the validity of the results of the analysis in policy events in the 1990s and the 2000s by the follow-up interviews. However, it might be severely difficult to find someone who could check the validity of the results of the analysis in policy events in thirty to forty years ago. As mentioned several times, the interpretation of this kind of old policy events might hardly avoid the subjectivity/ reliability problems. One way to reduce the subjectivity and increase the reliability might be conducting the analysis as a team (Sommer and Sommer, 1997). However, this research could not afford to carry out the research as a team.

Suggestions for Policy-Makers

This research extensively examined the evolution of emission standards in Japan. Then, based on the research, the thesis seeks to deliver key messages to policy-makers so that they can improve automobile air pollution policy. There are four kinds of key messages that the thesis attempts to deliver: the power of people, the expenses of cooperative relationship with the auto industry, the positive effects of ecological modernisation and the role of local policy-makers.

Remember that the key to change is the power of people.

It has been seemingly thought that the auto industry is overwhelmingly strong and that automobile air pollution policy reflects the interests of the auto industry. It is true that the auto industry is really strong and the industry has been able to influence automobile air pollution policy. However, the research found that the power of people could strongly affect automobile air pollution policy especially where their voice became big and could not be ignorable and where they started to actively act to make their demand come true. Whether the automakers can increase profits depends on the consumers and whether LDP can increase seats in the Diet depends on the voters. Both consumers and voters are the public.

As shown in this research, the automakers and LDP have been highly concerned of the public demand and they have tried to avoid negative public image. In addition, there is severe competition both between the automakers and between the LDP members. The automakers always compete to satisfy the public demand more quickly and more strongly. Thus, where the public demand is 'cleaner automobiles', it cannot be unavoidable that some automakers will try to produce cleaner automobiles though other automakers may seek to act collectively to continue producing 'dirty automobiles'. As a result, as long as the public demand keeps unchanged, all automakers may eventually need to provide cleaner automobiles to meet the consumers' demand.

Similarly, as far as LDP is concerned, LDP members will need to establish strict automobile air pollution policy where the public demand is the establishment of strict automobile air pollution policy. If some LDP members do not try to satisfy the public demand, others may attempt to do so in order to have better and cleaner images, which may lead to a great public support and then a chance to a higher position within LDP. Thus, it may be difficult to neglect the public demand especially where the public demand is strong. Further, if LDP does not try to meet the public demand for clean air quality, other opposition parties may propose strict automobile air pollution policy in order to obtain the public support and then votes. Therefore, the automakers may seek to produce cleaner

automobiles and LDP may attempt to carry out strict automobile air pollution policy AS LONG AS they are certain that a high degree of public demand for clean automobiles and clan air quality continues. As this research showed, if the automakers do not clearly recognize whether the public really want 'expensive but clean automobiles' or 'cheap but dirty automobiles', the automakers would be less motivated to produce cleaner automobiles, leading to the slow development of cleaner automobiles. In addition, if LDP cannot recognize that the voters will continuously strongly demand clean air quality at the expense of increase in automobile price, LDP would not seek to carry out strict automobile air pollution policy.

Therefore, this research suggests for policy-makers that the key to developing automobile air pollution policy is making the public constantly highly concerned of automobile air pollution. This thesis proposes the strong promotion of environmental education in order to make it come true. The strong promotion of environmental education must be crucial because people tend to be highly concerned of automobile air pollution when they are given the sufficient amount of information and knowledge on automobile air pollution and automobile air pollution policy. In addition, in order to let people appropriately understand the situation of automobile air pollution policy and the necessity for strict automobile air pollution policy, disseminating information of automobile air pollution and making it easily accessible to people should be necessary, along with the strong promotion of environmental education. Undoubtedly, knowing the current situation of automobile air pollution will lead to the high public environmental concerns on automobile air pollution. For instance, the success of TMG in both the establishment of the innovative automobile air pollution policy for diesel automobiles and the early implementation of the 2007 emission standards resulted mostly from its environmental education for and dissemination of information to the public. TMG attempted to 'educate' its people by holding a number of meetings and conferences and publishing a wide range of documents on automobile air pollution and automobile air pollution policy in order to make

the public highly concerned of automobile air pollution.

National Geographic and the international polling firm GlobeScan (2008) have currently conducted research which has measured and monitored consumer progress toward environmentally sustainable consumption in 14 countries around the world; 14 countries include Australia, China, India, Japan, Canada, United States, Mexico, Brazil, France, Germany, Hungary, Russia, Spain and United Kingdom. According to the research carried out by them, Japan was regrettably ranked as 11th. Particularly, the research found that Japanese were less motivated to purchase hybrid automobiles and that they tended to ride automobiles alone. Based on the results, it can be expected that the Japanese people are not so highly concerned of automobile air pollution. Thus, it should be crucial to make them highly concerned of automobile air pollution by the strong promotion of environmental education as well as the dissemination of information.

Remember that cooperative relationship with the auto industry involves expenses.

From the 1980s to the 1990s, emission standards were steadily reinforced, keeping them one of the strictest emission standards in the world. Clearly, the cooperative and mutually trusting relationship between the government and the auto industry contributed to the steady reinforcement of emission standards. Because emission standards were reinforced at similar paces and by similar degrees based on the agreement between the government and the auto industry, the auto industry could reduce emissions from their automobiles without worrying about the unexpected excessive costs brought by the sudden reinforcement of emission standards. Further, the agreement was based on the cooperative and mutually trusting relationship between the government and the auto industry. Thus, the cooperative relationship between them might be crucial in the gradual development of emission standards in the 1980s and the 1990s.

However, the cooperative relationship between the government and the auto industry may involve

costs. In order to keep the cooperative relationship, the government has not allowed other groups to enter policy-making processes in emission standards. Consequently, new ideas could hardly come into the discussions of emission standards and automobile air pollution policy in general because emission standards have been the most dominant policy tool. New ideas may involve alternative engines, fuels, exhaust gas reduction technologies and even other policy tools such as road pricing. Namely, because of the exclusively close relationship between the government and the auto industry, automobile air pollution policy has been inflexible. For instance, the policy option to promote diesel passenger automobiles has been mostly neglected in the discussions of automobile air pollution policy in Japan. Consequently, while the number of petrol passenger automobiles in 2004 was about 3.4 millions, the number of diesel passenger automobiles in 2004 was about only 5,000 (Isuzu, 2008). On the contrary, almost a half of newly registered passenger automobiles in EU as a whole was the diesel passenger automobile (ibid). Further, other policy tools such as road pricing have been less developed in Japan. For example, though in the UK, the London congestion charge has been introduced, which is a fee for some motorists travelling within the Congestion Charge Zone (CCZ) in London, such policy tool has not been introduced in Japan though road in Tokyo is as congested as London.

In order to improve automobile air pollution policy, it should be necessary to allow other actors to enter policy-making processes in emission standards (automobile air pollution policy) so that a wide range of new perspectives can be discussed in the discussion of automobile air pollution policy. In addition, involvement of the public into policy-making processes can be highly recommended because it would let automobile air pollution policy rightly reflect the interests of the public. Further, policy-makers should make policy-making processes transparent. It can be supposed that, because policy-making processes in emission standards have been closed, other ideas have been easily excluded. However, by making its processes transparent, excluding other ideas would come to be

less easy without appropriate justification. Automobile air pollution cannot be apparently solved only by reducing emissions from petrol passenger automobiles and different kinds of policy alternatives should be considered in order to improve automobile air pollution. The thesis does not deny that the exclusively cooperative relationship between the government and the auto industry contributed to automobile air pollution policy and improvements in automobile air pollution in Japan. However, it seems that automobile air pollution policy which depends on both the cooperative relationship between the government and the auto industry and the reduction of emissions mainly from petrol passenger automobiles by emission standards has been reaching its limits. In order to further improve automobile air pollution, a wide range of policy ideas should be considered by encouraging involvement of other actors in policy-making processes and making policy-making processes transparent, even at the expense of the cooperative relationship. Policy-makers should contribute to the auto industry not by keeping the cooperative relationship but by creating the auto market desirable for green automakers in which consumers are willing to buy lower emission automobiles to make them continuously highly concerned of automobile air pollution by the strong promotion of environmental education.

Remember that there can be positive effects of ecological modernisation by setting stringent emission standards.

The story in the 1970s in this research told that the strictest emission standards in the world-the Japanese Muskie law-triggered innovations in emissions reduction technologies for the passenger automobiles in Japan so that Japanese automakers could export greenest passenger automobiles to foreign auto markets, especially American and European auto markets, leading to the dominant positions of the Japanese automakers in those markets because the demand for clean passenger automobiles was high in those markets.

It seems that this positive effect of the Japanese Muskie law confirms a main proposition of ecological modernisation. Stringent environmental policy tends to be recognized as a barrier to economic growth and environmental protection is often seen as a zero-sum problem (Hajer, 1995). In addition, it is often considered that economic development may be the source of environmental degradation (Gouldson and Murphy, 1997). Namely, 'the relationship between economic development and environmental protection has been seen as one of mutual antagonism' (Gouldson and Murphy, 1997: p.74).

On the contrarily, theories of ecological modernisation propose that policies for economic growth and those for environmental protection can be in principle reconciled, to synergistic effect (Gouldson and Murphy, 1997, 1998). Further, ecological modernists, as Hajer (1995) points out, suggest that strict environmental policy will be rather rewarding and can be a positive sum solution to environmental problems (Hajer, 1995).

The international success of the Japanese automakers thanks to their highly advanced emissions reduction technologies stimulated by the stringent emission standards has been recognized as a crucial example of ecological modernisation (Weale, 1992). Mr Laurence Brinkhorst, the Director-General of the environment directorate of the European Commission, talked about it before a House of Lords select committee about the draft Fourth Environmental Action Programme:

Secondly-and here it is the old Japanese hand who is speaking-I have become very much concerned-and I think this is a view largely shared by other departments-that environment and technology, environment and competition, have become brothers and sisters. It is not because of the low prices of Japanese products that the Japanese are making inroads in all kinds of areas (whether we speak about cars or computers), but it is largely because of the quality of their products and in the field of cars, for instance, the very high emissions standards (HMSO, 1987 cited in Weale, 1992:

p.77).

Policy-makers should remember that the stringent emission standards of the Japanese Government stimulated innovations in emissions reduction technologies of the Japanese passenger automobiles, resulting in a huge increase in their international sales and creation of great benefits for the Japanese automakers and then for the Japanese economy. However, it should be also remembered that innovations might not be achieved only by the stringent emission standards of the Government. As described in the story of the 1970s, other factors such as the tendency of the public to buy low emission automobiles and government support for the automakers, such as preferential tax regimes for green automobiles, might be important for the automakers to keep highly motivated to promote innovations. In other words, it can be suggested that the Government should not only establish stringent emission standards but also create desirable circumstances for green automakers in which consumers are willing to buy green automobiles by, for instance, promoting environmental education, and efforts of automakers to develop, produce and sell green automobiles are supported by a wide range of policies including the preferential tax regimes.

As Weale (1992: p.76) points out, because environmental amenity is a superior good, it is likely that the demand for pollution control may increase. Thus, it may be highly advantageous for the automakers to have the technical and production capacity for production of greener automobiles and more advanced emissions reduction technologies (see Weale, 1992). Therefore, promoting 'green' innovations of the automakers might be crucial by establishing stringent emission standards along with creating desirable circumstances for green automakers.

Remember that the circumstances surrounding local policy-makers have been changing.

The final message from this research is to be delivered for local policy-makers. The research

discovered that the circumstances surrounding local policy-makers have been changing because of the availability of Internet. As shown in the section on the operation of TMG (p.235), the availability of Internet allowed TMG to access easily, cheaply and quickly to a wide range of the information which had been monopolized by both the state and the auto industry. Further, through Internet, TMG could easily deliver its messages to its people and give them a variety of information to them. Moreover, TMG could make its people highly concerned of automobile air pollution partly by holding on-line debates. Thus, it may be clear that the availability of Internet has changed circumstances surrounding local policy-makers and one TMG officer clearly admitted this point.

During the fieldwork, most local government officers rather than those of TMG claimed that TMG could have carried out such an innovative operation because of its huge budget and personnel. However, the operation was prepared mainly by only two officers and there was only one PC in their office when they started the preparation in 1999. Apparently, any local governments have more than two environmental officers and there must be more than one PC in their office. It seems that most local policy-makers have not yet recognized the changing circumstances in policy-making surrounding them because of Internet. Because of the accessibility to a wide range of information and a variety of things that Internet can do, local policy-makers now can do more than what they have been able to do. Local policy-makers now can literally be *policy-makers* though they have been generally nothing but implementers of national policy.

Suggestion for Future Research

In examining the historical development and policy changes of emission standards, the research has also observed those of automobile air pollution policies in general. Following the observation, it seems that the politics of automobile air pollution has been shifting from the government style of

politics to the governance style of politics. The final section seeks to examine 'governance' in the modern policy-making of automobile air pollution in Japan.

From Government to Governance?

In terms of automobile air pollution policies, as it had been solely dependent on emission standards, the small number of actors including MITI, MoT, EA, LDP and the auto industry had been able to join its policy making process. However, as the number of measures for automobile air pollution including measures for freight transport (e.g. modal shift and joint transport/delivery) and those for passenger transport (e.g. improving public transport services) has increased mainly because of the automobile NOx law as described in chapter 7, the number of actors involved in automobile air pollution policies has increased too. Local governments, the truck transport industry and the oil refining industry are some of the new comers.

Until recently, although it did not perfectly conform to the government model, automobile air pollution policies had been, it seems, established as in the government model or the model of 'constitutional/formal understandings of systems of government', in which government operates independently and monolithically (Atkinson and Wilks-Heeg, 2000: p.12). The model usually assumes that government is a 'stand alone' institution separated from wider social forces and that there is only one centre of political power (Stoker, 1998: p.19).

Contrarily, the 'governance' model emphasizes the complex reality of contemporary politics, and challenges the government model as limited and misleading (Atkinson and Wilks-Heeg, 2000). According to the governance model, politics has shifted from studies of the government to 'governance' (Atkinson and Wilks-Heeg, 2000: p.35; Stoker, 1998: p.19; Stoker, 2000: p.3; Rhodes, 1997: p.52; Rydin, 1993: p.117). Stoker (1998: p.18) identifies five propositions concerning governance; it refers to a set of institutions and actors that are drawn from but also beyond

government; it identifies the blurring of boundaries and responsibilities for tackling social and economic issues; it identifies the power dependence involved in the relationships between institutions involved in collective action; it is about autonomous self-governing networks of actors; it recognizes the capacity to get things done which does not rest on the power of government to command or use its authority, and it sees government as able to use new tools and techniques to steer and guide. Rhodes (1997: p.53) also specifies four characteristics of governance: interdependence between organizations; continuing interactions between network members caused by the need to exchange resources and negotiate shared purposes; game-like interactions rooted in trust and regulated by rules of the game negotiated and agreed by network participants; and a significant degree of autonomy from the state.

The governance perspective first recognizes that government does not stand alone and rather it works together with other actors (Stoker, 1998; see also Dunleavy, 1980: p.47) As Rhodes (1997: p.51) points out, a system of governance involves 'complex sets of organizations drawn from the public and private sectors'. Public actors are not confined to the central institutions but beyond it, and they also contain quasi-public actors or quangos (Atkinson and Wilks-Heeg, 2000; Jessop, 2000; Stoker, 2000). Private and voluntary actors involve business organizations, non-profit organizations (NPOs), non-governmental organizations (NGOs) and co-op. Further, recently, supra-national organizations such as the UN and the EU have come to be involved in the national policy-making. Those actors comprise complex interorganizational networks and the development of such networks is a significant characteristic of modern politics (Mandell, 1990).

Second, while the government model specifies the firm boundaries (Rydin, 1993: p.96), the governance model identifies the blurring of boundaries between public, private and voluntary actors (Rhodes, 1997; Stoker, 1998). Again, government has come to work together over a variety of social and economic issues with other actors 'across boundaries within the public sector or between the

public sector and private or voluntary sectors' (Stoker, 2000: p.2). Contracting-out and public-private partnerships are prominent characteristics of public services in many countries, and consequently private and voluntary actors recently have come to be more involved in decision-making and service delivery (Stoker, 1998: p.19). Such a governing style of government makes the boundaries between and within public and private sectors blurred. This leads to a shift in responsibilities for grapple with social and economic issues to private and voluntary actors, and thus responsibilities have become blurred, and private and voluntary actors have currently taken up some responsibilities (Stoker, 1998: p.21; Kooiman, 1993a: p.1)

Third, related to the first and second issues, the governance perspectives recognise power dependence between public, private and voluntary actors, or between the network members. As Stoker (1998: p.22) points out, implications of power dependence are; organizations committed to collective action are dependent on other organizations; in order to achieve goals, organizations have to exchange resources and negotiate common purposes; the outcome of exchange is determined not only by the resource of the participants but also by the rules of the game and the context of exchange. No single actor is thus monolithic or dominant, or power is dispersed and none has the power to unilaterally force others (Kickert, 1993: p.192; see also Kooiman, 1993b). This is a central part of the policy networks framework too.

Fourth, the governance perspectives recognize the networks of a wide variety of participants are autonomous from the state and self-organising. Self-organized systems of control among the key participants are seen as more effective than government-imposed regulation. The networks are not just autonomous but self-organizing. As Kickert (1993: p.275) points out, 'autonomy not only implies freedom, it also implies responsibility.' The networks have institutional arrangements so that the networks function effectively. Ostrom has identified self-organizing networks in his work on the management of common-pool resources in poor rural communities (Ostrom, 1990; Keohane and

Ostrom, 1995). His work has found that an effective self-organized system requires a variety of institutional arrangements such as sanctions and incentives.

The proponents of the governance model suggest that contemporary politics has those prominent features of governance. Concerning the features of the governance model, it seems that politics of automobile air pollution was less like the governance model. As clarified in the previous chapters, politics of automobile air pollution has both the power-dependence and autonomous features of the governance model. However, until recently, politics of automobile air pollution contained a very limited number of actors and did not have either complex sets of organizations from both the public and private sectors or complex interorganizational networks. Either, public actors did not work with many private actors and contracting-out had not been a feature of politics of automobile air pollution. Consequently, the boundaries between the private actors and public actors or even between the public actors were clear, and the private actors were never given much responsibility.

However, it seems that politics of automobile air pollution is moving to the governance style. Politics of automobile air pollution is now involving a wide range of both private and pubic actors, although the complex interorganizational networks between them have not been still clearly observed. In addition, to a certain extent, local governments have been recently required to be responsible for automobile air pollution and it has been necessary for private actors such as factories and truck transport companies to make their plan to reduce emissions because of the automobile NOx law. Thus, boundaries both between the private actors and the public actors and between the public actors may have been becoming blurred.

Shifts from the government style to the governance style in politics of automobile air pollution may be observed but this empirical study is not persuasive enough to conclude that the governance style of politics is the feature of contemporary politics of automobile air pollution because findings only indicate shifting from the government style to the governance style, and the research did not examine

other measures for automobile air pollution policies in the automobile NOx law except the vehicle category regulation. Though politics of the vehicle category regulation seems to shift to the governance style, politics of emission standards may have been still more like the government style. Thus, it would be necessary to investigate politics of other measures on automobile air pollution.

The land of automobile air pollution policies has been ruled by three noble families including MoT, EA and the auto industry, though the other two noble families, MITI and LDP, were entitled to enter and even govern the land whenever necessary. Before the automobile NOx law was carried out, the whole world was their ruled land. However, automobile air pollution policies have been becoming fragmented and specialized because of the law.

Then, it seems that the world of automobile air pollution policies has been being divided into a number of territories. Though the noble families were first dominant in all the territories, as a wide range of new families came to those new territories, their influences have been being reduced. In this respect, Richardson (1982b) and Heclo (1979) are right in their proposition that policy networks in the modern society are becoming issue networks. However, paces and directions of shifts to the governance style of politics seem to be different from one territory to another. Thus, investigation of shifts of politics of other measures of automobile air pollution policies may be necessary in order to clarify both differences in pace and direction between them and conditions to move smoothly or hardly to the governance style.

As well as examining politics of other areas of automobile air pollution, it would need to be investigated whether the trends towards the governance style can be applied to politics of other policy areas such as social welfare, medicine and education, and the governance is in other words becoming the feature of modern politics of Japan.

From local government to local governance?

Another theme for future research that can be suggested is local governance. As discussed above, the governance style of politics is the feature of contemporary politics. Then, how about local politics? Is contemporary local politics moving to the governance style of politics? A number of local political researchers including Stoker (1998) and Rydin (1993) maintain that governance is the feature of local politics too. In Japan, it seems that local politics is less like the governance style. According to the follow-up research by interviews to a TMG officer (I14), although TMG had networks with other public and private local actors, networks had been very much fragmented and ad hoc. According to him, as TMG had been an implementer of national policies, although TMG often talked with both other public and private actors, all that TMG had to do was just to enforce the national policies and it did not need to negotiate with other actors over national policies.

However, as local governments may be becoming required to make policies because of increasing responsibility as a result of conversion to the governance style of politics at the national level, they need to interact with other actors more often than before, and local governments, other public actors and private actors may become dependent on each other as mentioned above. Indeed, TMG realized its responsibility for automobile air pollution and it depended on other public actors such as the local governments of Chiba, Saitama and Kanagawa and private actors including exhaust gas purification manufactures in making its own automobile air pollution policies. It can be supposed that as the governance styles of politics develop more at the national level, the governance styles of politics at the local level may advance too. Then, if the national politics is becoming the governance style in Japan, it would be necessary to investigate if the shift happens at the local level.

Conclusions

This chapter first examined the two big questions that had led to this research and the research

hypotheses; '*how does the British policy networks framework relate to Japan when relationship between policy actors is crucial in policy-making processes?*' and '*does the framework help to explain policy change in Japan when relationship between policy actors matters in policy-making processes?*' Concerning the first question, it has been concluded that the British policy networks framework greatly relates to Japan when relationship between policy actors is important in policy-making processes. However, in order to make the framework more relevant to Japan, it may be necessary that the framework pays more attention to interpersonal relationships, individuals and individual companies; and it considers whether different interests can co-exist without conflicts and how well participants are incorporated into networks.

As far as the second question is concerned, it has been concluded that the British framework can help to explain policy changes in Japan when relationship between policy actors matters in policy-making processes. However, in order to more effectively understand policy changes, it can be suggested that the policy networks framework take into consideration other associated policy networks and relationships between policy networks.

After examination of those two big questions, the chapter highlighted and examined problems identified in the research within the recent development of the British policy networks studies. The highlighted problems included the 'micro-level' problem, the problem on the frequency of contacts, the 'endogenous factors versus exogenous factors' problem, the problem on interrelationship between policy networks and the problem on dominant interests. In addition, the section examined the dialectical approach which has been developed to deal with the often criticized aspects of the British policy networks framework. The next section discussed the limitations of the qualitative methods utilized in this research and examined problems on the secondary data, those on the semi-structured interviews and those on the qualitative content analysis.

Then, the chapter made four kinds of suggestions for policy-makers including 'the power of

people', 'the expenses of cooperative relationship with the auto industry', 'the positive effects of ecological modernisation' and 'the role of local policy-makers'. Finally, the chapter emphasised the necessity of future research on the governance nature of politics of automobile air pollution. Results of this research provided some evidences that politics of automobile air pollution was shifting from the government style of politics to the governance style of politics at both the national level and the local level. However, because findings only indicated shifting from the government style to the governance style and the research did not investigate other measures for automobile air pollution policies in the automobile NOx law except the vehicle category regulation, it has been suggested to examine if the politics of automobile air pollution policies has shifted or has been shifting in the politics of automobile air pollution to look at both emission standards and the vehicle category regulation examined in this research as well as other measures for automobile air pollution. Further, in order to examine whether this shift is a feature of the modern policy-making in Japan, it is necessary to investigate if the shift can be observed in other policy issues. Finally, the section emphasized the necessity to investigate if the shift from the government style of politics to the governance style of politics happens even at the local level.

Only a limited number of analyses of policy-making based on the British policy networks framework have been carried out in Japan. However, this research may indicate it greatly relates to Japan and it helps effectively policy changes in Japan, when relationship between policy actors is crucial in policy-making processes, although some modifications might be needed in order to make the framework more effective to analyse policy-making and policy changes in the Japanese context. In addition, the framework seems an appropriate framework when the governance styles of policy-making have been analysed. This thesis ends with a great expectation that this research would stimulate other researchers on public policy to adopt this framework and make it more suitable for analysis of policy-making in Japan.

Appendix A. List of Diet Paper

	House of Councillors (HC) / House of Representatives (HR)	Date	Speaker (Position)	Name of Committee
C1	HC	09/02/1965	Yasuhisa Miyamoto (Head of the maintenance department in the automotive bureau in MoT)	Unyu-3
C2	HR	10/02/1965	Nobuo Tatebabyashi (Chief of the environment and health bureau of MoH)	Sangyokogaitaisaku tokubetsu-2
C3	HR	16/02/1966	Tametsugu Tsuboi (Chief of the automotive bureau in MoT)	Sangyokogaitaisaku tokubetsu-2
C4	HC	25/02/1966	Michio Hashimoto (Head of the pollution section of the environment and health bureau in MoH)	Sangyokogaitaisaku tokubetsu-4
C5	HC	11/03/1966	Shunichi Kurosawa (Deputy director-general of STA)	Sangyokogaitaisaku tokubetsu-5
C6	HC	18/03/1966	Nobuo Tatebayashi (a) Mitsunori Ueki (b) (LDP) Fumiyoshi Amita (C) (Traffic investigator of the traffic bureau in NPA)	Sangyokogaitaisaku tokubetsu-6
C7	HR	25/03/1966	Ken Yasui (a) (Director-general of the Prime minister's office) Shoichi Akazawa (b) (Vice-chief of the heavy industry bureau in MITI) Yasuhisa Miyata (b) (Head of the maintenance department of the automotive bureau in MoT)	Sangyokogaitaisaku tokubetsu-7
C8	HR	06/04/1966	Yasuhisa Miyata (a) Shoichi Akazawa (b) Chiyozo Noma (c) (Japan socialist party)	Sangyokogaitaisaku tokubetsu-8
C9	HR	07/04/1966	Shoichi Akazawa	Sangyokogaitaisaku tokubetsu-9
C10	HR	13/04/1966	Hanji Umehara (b) (Senior vice-president of Toyota)	Sangyokogaitaisaku tokubetsu-11
C11	HR	15/04/1966	Chihaya Kawaide (a) (Chief of the heavy industry bureau in MITI) Shogo Itakawa (b) (Japan socialist party)	Shoko-27
C12	HC	15/04/1966	Zenko Suzuki (Minister for health)	Sangyokogaitaisaku tokubetsu-8
C13	HR	21/04/1966	Takeo Miki (Minister for international trade and industry)	Sangyokogaitaisaku tokubetsu-13
C14	HC	22/04/1966	Riichiro Nakagawa (a) (Head of the industrial location department of the industry bureau in MITI) Yasuhisa Miyata (b)	Sangyokogaitaisaku tokubetsu-9
C15	HC	03/06/1966	Yasuhisa Miyata (a) Riichiro Nakagawa (b)	Sangyokogaitaisaku tokubetsu-11
C16	HC	18/05/1967	Kazutaro Kanno (Minister for international trade and industry)	Yosan-15
C17	HC	13/06/1967	Nobuo Tatebayashi	Naikaku-16
C18	HR	22/06/1967	Mikio Mizuta (Minister for finance)	Okura-24
C19	HC	20/07/1967	Ken Shiroyama	Sangyokogaitaisaku

Continued			(Head of the maintenance department of the automotive bureau in MITI)	tokubetsu-18
C20	HC	21/07/1967	Nobuo Tatebayashi	Sangyokogaitaisaku tokubetsu-19
C21	HC	08/08/1967	Tetsuya Tabuchi (Democratic social party)	Shoko-2
C22	HC	09/11/1967	Nobuyuki Uchimura (a) (Minister's secretariat of MoT) Yoshiaki Tanaka (b) (Head of the automotive section of the heavy industry bureau in MITI)	Sangyokogaitaisaku tokubetsu-1
C23	HR	20/12/1967	Yoshiaki Tanaka	Unyu-2
C24	HR	19/03/1968	Masaru Kawamura (a) (Democratic social party) Kiyoshi Iemoto (b) (Chairman of the safety and pollution committee of JAMA)	Kotsuanzen tokubetsu
C25	HR	08/05/1968	Torazo Shimamoto (a) (Japan socialist party) Tadashi Sonoda (b) (Minister for health)	Sangyokogaitaisaku tokubetsu-8
C26	HR	09/05/1968	Nobuyuki Uchimura (a) Senichi Tanigaki (b) (Parliamentary vice-minister for health)	Sangyokogaitaisaku tokubetsu-9
C27	HC	15/05/1968	Shizue Kato (Japan socialist party)	Sangyokogaitaisaku tokubetsu-10
C28	HC	22/05/1968	Momotaro Yanagida (a) (LDP) Tadashi Sonoda (b)	Sangyokogaitaisaku tokubetsu-12
C29	HR	09/08/1968	Sanae Honda (Vice-chief of the heavy industry bureau in MITI)	Kessan-1
C30	HR	18/02/1969	Kiichiro Muto (Chief of the support bureau in MoH)	Sangyokogaitaisaku tokubetsu-3
C31	HC	18/02/1969	Masayuki Fujio (Parliamentary vice-minister for MITI)	Sangyokogaitaisaku tokubetsu-3
C32	HR	25/02/1969	Torazo Shimamoto	Yosaniinkai bunkakai
C33	HR	11/04/1969	Ryuichi Okamoto (Japan socialist party)	Kensesu
C34	HR	11/06/1969	Shogo Itakawa	Unyu-31
C35	HC	12/06/1969	Ken Harada (Minister for transport)	Unyu-22
C36	HC	19/06/1969	Mitsunori Ueki (Parliamentary vice-minister for MITI)	Unyu-24
C37	HC	20/06/1969	Masayoshi Ohira	Honkaigi-29
C38	HC	26/06/1969	Katsuji Kawamata (a) (Chairman of JAMA) Masayoshi Ohira (b) (Minister for international trade and industry)	Unyu-26
C39	HR	08/07/1969	Mikio Omi (New komei)	Shoko-40
C40	HR	23/07/1969	Izumi Inoue (Japan socialist party)	Shakai-23
C41	HC	25/03/1970	Yusaku Onaga (Chief of the automotive section in the heavy industry bureau of MITI)	Kotsuanzentasaku tokubetsu-3
C42	HR	05/05/1970	Kuniichiro Takahashi (First Chief of national road section in the road bureau in MoC)	Sangyokogaitaisaku tokubetsu-13
C43	HR	09/06/1970	Michio Hashimoto	Sangyokogaitaisaku tokubetsu-14
C44	HR	10/06/1970	Keisuke Idemitsu (President of PAJ) Katsuji Kawamata	Sangyokogaitaisaku tokubetsu-15

C45	HC	21/07/1970	Tsuyoshi Suzuki (Japan Socialist Party)	Unyu-1
C46	HR	11/08/1970	Koichi Hamada (LDP)	Sangyokogaitaisaku tokubetsu-18
C47	HR	11/08/1970	Kazuhiko Nomura (Chief of the automotive bureau of MoT)	Unyu-28
C48	HC	11/09/1970	Tetsuya Tabuchi (a) Yusaku Onaga (b)	Kotsuanzentaisaku tokubetsu-2
C49	HR	12/11/1970	Sadanori Yamanaka (Director-general of the management and coordination agency)	Sangyokogaitaisaku tokubetsu-23
C50	HR	05/12/1970	Sadanori Yamanaka	Sangyokogaitaisaku tokubetsu-2
C51	HC	17/12/1970	Kazuhiko Nomura (a) Sadanori Yamanaka (b)	Kogaitaisaku tokubetsu-6
C52	HC	18/12/1970	Tetsuya Tabuchi (a) Sadanori Yamanaka (b)	Kogaitaisaku tokubetsu-7
C53	HR	05/02/1971	Hachiro Moriguchi (Head of the pollution department in the safety and pollution bureau of MITI)	Sangyokogaitaisaku tokubetsu-2
C54	HC	10/02/1971	Rikio Mibo (Deputy director-general of MoT)	Kogaitaisaku tokubetsu-2
C55	HC	16/02/1971	Kazuhiko Nomura	Unyu-3
C56	HR	03/03/1971	Shoichi Akazawa	Shoko-6
C57	HR	12/05/1971	Hachiro Nishida (Democratic Socialist Party)	Sangyokogaitaisaku tokubetsu-1
C58	HR	14/05/1971	Hachiro Moriguchi	Sangyokogaitaisaku tokubetsu-16
C59	HR	20/07/1971	Buichi Oishi (Director-general of EA)	Kogaitaisaku tokubetsu-2
C60	HR	08/10/1971	Buichi Oishi	Kogaitaisaku tokubetsu-5
C61	HR	01/03/1972	Shiro Yajima (a) (Head of the heavy industry bureau of MITI) Yoshimi Takeuchi (b) (Chief of the planning section in the air quality bureau of EA)	Yosan-7
C62	HR	23/03/1972	Shigejiro Morita (a) (Japan Socialist Party) Buichi Oishi (b) Takezo Watanabe (C) (Democratic Socialist Party)	Yosan daiichibunka-1
C63	HR	24/05/1972	Yasuo Nakamura (Chief of the automotive section in the heavy industry bureau of MITI)	Unyu-11
C64	HC	25/05/1972	Kazuhiko Nomura	Chihogyosei-29
C65	HR	31/05/1972	Yoshimi Takeuchi	Kotsuanzen tokubetsu-11
C66	HC	22/09/1972	Naganori Koyama (a) (Director-general of EA) Hisashi Kageyama (b) (Chief of the maintenance department in the automotive bureau of MoT) Eiji Yamagata (c) (Head of the heavy industry bureau of MITI)	Kogaitaisakuoyobi kankyohozen tokubetsu-2
C67	HR	29/03/1973	Shohei Tsukada (Japan Socialist Party)	Okura-19
C68	HC	29/03/1973	Soroku Yamagata (Head of the air quality bureau of EA)	Unyu-5
C69	HC	29/03/1973	Kazumi Nonoyama (Japan Socialist Party)	Shoko-3
C70	HR	03/04/1973	Fumio Takagi (Head of the tax bureau of the Ministry of	Okura-21

Continued			Finance)	
C71	HC	09/04/1973	Soroku Yamagata	Yosan Daiichibunka-4
C72	HR	13/04/1973	Torazo Shimamura (a) (Japan Socialist Party) Takeo Miki (b) (Director-general of EA)	Kogaitaisakunarabini Kankyohozen-15
C73	HC	14/06/1973	Shunichi Kasuga (Japan Communist Party)	Shoko-12
C74	HR	20/06/1973	Makoto Kataoka (Head of the transport bureau of the national police agency)	Shoko-32
C75	HC	06/07/1973	Torazaburo Shintani (a) (Minister for transport) Masaoki Kobayashi (b) (Head of the automotive bureau of MoT)	Kotsuanzentaisaku tokubetsu-10
C76	HR	24/12/1973	Takao Fujimoto (a) (Parliamentary vice-minister for EA) Takeyoshi Komiya (b) (Democratic Socialist Party)	Kogaitaisakunarabini kankyohozen-2
C77	HR	20/02/1974	Izumi Inoue (a) Taizo Nakamura (b) (Head of the automotive bureau of MoT)	Kotsuanzentaisaku tokubetsu-6
C78	HR	20/02/1974	Takeo Miki (a) Itaru Yonehara (b) (Japan communist party)	Kogaitaisakunarabini kankyohozen-5
C79	HR	26/03/1974	Itaru Yonehara	Kogaitaisakunarabini Kankyohozen-13
C80	HC	27/03/1974	Taizo Nakamura (a) Tetsu Ueda (b) (Japan socialist party) Yasuhiro Nakamura (c) (Minister for international trade and industry)	Yosan-18
C81	HR	28/03/1974	Takako Doi (a) (Japan socialist party) Takeo Miki (b)	Kogaitaisakunarabini kankyohozen-14
C82	HC	15/05/1974	Takeo Miki (a) Hitoshi Kasuga (b) (Head of the air quality bureau of EA)	Kogaitaisakunarabini kankyohozentoku-13
C83	HR	17/05/1974	Sukio Iwadare (a) (Japan socialist party) Takeo Miki (b)	Kogaitaisakunarabini Kankyohozen-24
C84	HR	22/05/1974	Ikuo Kobayashi (a) (Chief of the automobile pollution section in the air quality bureau of EA)	Kotsuanzentaisaku Tokubetsu-17
C85	HC	29/05/1974	Takeko Kutsunuge (a) (Japan communist party) Hitoshi Kasuga (b)	Kogaitaisakuoyobi Kankyohozen tokubetsu-14
C86	HR	09/08/1974	Matsuhei Mouri (a) (Director-general of EA) Hitoshi Kasuga (b)	Kogaitaisakuoyobi Kankyohozen tokubetsu-1
C87	HR	21/08/1974	Torazo Shimamoto (a) Hitoshi Kasuga (b) Sukio Iwadare (c)	Kogaitaisakuoyobi Kankyohozen-2
C88	HR	11/09/1974	Kiyoshi Kawashima (a) (President of Honda) Eiji Toyota (b) (Chairman of JAMA) Torazo Shimamoto (c) Sukio Iwadare (d) Hitoshi Kasuga (e)	Kogaitaisakunarabeni Kankyohozen-3
C89	HR	23/10/1974	Yoshio Hayashi (a) (LDP) Hitoshi Kasuga (b) Tomio Okamoto (c)	Kogaitaisakunarabini Kankyohozen tokubetsu-4

Continued			(New komei)	
C90	HR	22/11/1974	Yoshio Hayashi (a) Sukio Iwadare (b) Motoji Kinoshita (c)	Kogaitaisakunarabini Kankyohozen-5
C91	HC	06/12/1974	Hajime Nishimura (a) (Associate professor of Tokyo university) Osamu Yatabe (b) Takeko Kutsunuge (c)	Kogaitaisakunarabini Kankyohozen tokubetsu-6
C92	HC	17/12/1974	Takeo Miki (Prime minister)	Honkaigi-3
C93	HR	18/12/1974	Danji Ito (a) (Chief of the air quality commission of the central pollution council) Eiji Toyota (b) Torazo Shimamoto (c) Keizo Hatta (d) (Head of a specialist committee on automobile pollution of the central pollution council) Sukio Iwadare (e) Motoji Kinoshita (f)	Kogaitaisakunarabini Kankyohozen-2
C94	HC	21/12/1974	Yu Koyanagi (Japan socialist party)	Yosan-2
C95	HR	24/12/1974	Torazo Shimamoto (a) Hitoshi Kasuga (b)	Kogaitaisakunarabini Kankyohozen-3
C96	HC	25/12/1974	Tadataka Kondo (Japan communist party)	Kogaitaisakunarabini Kankyohozen tokubetsu-2
C97	HR	31/01/1975	Takeo Miki (a) Tetsuzo Fuwa (b) (Japan communist party)	Yosan-3
C98	HR	12/02/1975	Itaru Yonehara	Shoko-1
C99	HR	14/02/1975	Keizo Hatta (a) Torazo Shimamoto (b) Sukio Iwadare (c) Taketoshi Nakajima (d) Kiyoshi Nobusawa (e) (vice-parliamentary minister for EA) Takako Doi (f)	Kogaitaisakunarabini Kankyohozen-3
C100	HR	18/02/1975	Motoji Kinoshita (a) Taketoshi Nakajima (b)	Kogaitaisakunarabini Kankyohozen-4
C101	HR	19/02/1975	Tatsuo Ozawa (Director-general of EA)	Kotsuzanzen tokubetsu-3
C102	HR	20/02/1975	Yoshio Hayashi (a) Takako Doi (b) Tatsuo Ozawa (c) Taketoshi Nakajima (d)	Yosan-17
C103	HC	21/02/1975	Yasushi Morishita (a) (LDP) Osamu Yatabe (b) Tadataka Kondo (c)	Kogaitaisakunarabini Kankyohozen tokubetsu-3
C104	HR	25/02/1975	Torazo Shimamoto (a)	Kotaigaisakunarabini Kankyohozen-5
C105	HR	28/02/1975	Nakajima Taketoshi (a) Kiyoshi Kitagawa (b) (Chief of the pollution prevention section of the maintenance department in the automotive bureau of MoT)	Unyu-5
C106	HC	14/03/1975	Susumu Kato	Kessan-7
C107	HR	18/03/1975	Takahiro Yokomichi (a) (Japan socialist party) Keijiro Nakahashi (b) (Head of the tax bureau of the ministry of finance)	Okura-18
C108	HR	18/03/1975	Takashi Shuto (Head of the revenue bureau of the ministry of finance)	Chihogyosei-10

C109	HR	20/03/1975	Hiroyoshi Sezaki (Japan communist party)	Kagakugijyutsu shinkotaisaku tokubetsu-3
C110	HC	23/05/1975	Tatsuo Ozawa	Kogaitaisakunarabini Kankyohozen tokubetsu-7
C111	HR	04/07/1975	Yoshio Hayashi	Kogaitaisakunarabini Kankyohozen tokubetsu-19
C112	HR	23/10/1975	Seiji Masamori (a) (Japan communist party) Toshio Komoto (b) (Minister for international trade and industry)	Yosan-4
C113	HC	11/11/1975	Itaru Yonehara (a) Takao Tominaga (b) (Chief of the automotive section in the information machinery industry bureau of MITI) Kenji Tatsuke (c) (Chief of the maintenance department in the automotive bureau of MoT)	Yosan-5
C114	HR	20/11/1975	Itaru Yonehara	Kogaitaisakunarabini Kankyohozen-4
C115	HR	10/02/1976	Yonosuke Narazaki (a) Tatsuo Ozawa (b)	Yosan-4
C116	HR	24/04/1976	Haruo Shimada (a) (Chief of the second tax system section in the budget bureau of the ministry of finance) Hiroshi Morioka (b) (Head of the internal revenue bureau of the ministry of home affairs)	Chiohogyosei-6
C117	HR	13/05/1976	Saburo Saegusa (a) (LDP) Kazuo Niwa (b) (Chief of the automotive section in the air quality bureau of EA)	Kotsuanzentaisaku tokubetsu-6
C118	HC	20/10/1976	Michio Hashimoto (a) (Head of the air quality bureau of EA)	Kogaitaisakunarabini Kankyohozen tokubetsu-2
C119	HR	04/03/1977	Kenjiro Yamahara (Japan communist party)	Yosan-19
C120	HR	15/03/1977	Heiji Ogawa (Commissioner of the national public safety commission)	Chihogyosei-3
C121	HR	23/03/1977	Jiro Kainuma (a) Masataka Okura (b) (Head of the tax bureau of MoF) Masaru Mizuno (c) (Chief of the second tax system section in the tax bureau of MoF)	Okura-13
C122	HR	21/04/1977	Ken Saito (Head of the planning and pollution bureau of MITI)	Kogaitaisakunarabini Kankyohozen-10
C123	HR	27/10/1977	Takako Doi	Kogaitaisakunarabini Kankyohozen-5
C124	HR	22/03/1978	Sukio Iwadare	Kogaitaisakunarabini Kankyohozen-6
C125	HC	29/03/1978	Takeko Kutsunuge	Kogaitaisakunarabini Kankyohozen tokubetsu-7
C126	HR	23/06/1978	Eiji Yamagata (a) (Commissioner of the planning and pollution commission of the Japan steal association) Yoshio Hayashi (b) Mitsuo Higashinaka (c)	Kogaitaisakunarabini Kankyohozen-25

Continued			(Japan communist party)	
C127	HR	05/07/1978	Sukio Iwadare (a) Hisashi Yamada (b)	Kogaitaisakunarabini Kankyohozen-26
C128	HC	27/07/1978	Takeko Kutsunuge	Kogaitaisakunarabini Kankyohozen tokubetsu-2
C129	HR	20/02/1981	Hyosuke Kujiraoka (Director-general of EA)	Yosan-13
C130	HR	17/03/1981	Hyosuke Kujiraoka	Kankyo-2
C131	HR	27/02/1982	Takeshi Kusano (a) (New Komei) Masayoshi Yoshizaki (b) (Head of the air quality bureau of EA)	Yosaniinkai daiichibukakai-2
C132	HR	06/04/1982	Atsushi Iijima (Head of the automotive bureau of MoT)	Unyu-10
C133	HR	15/04/1982	Noriyoshi Uno (Chief of the maintenance department in the automotive bureau of MoT)	Naikaku-12
C134	HR	22/03/1983	Takako Doi	Kankyo-5
C135	HC	30/03/1983	Masayoshi Yoshizaki	Kogaioyobi kotsuanen tokubetsu-5
C136	HR	27/04/1984	Yasuo Fukuoka (New Komei)	Shoko-13
C137	HC	27/03/1985	Hiroshi Hayashibe (a) (Head of the air quality bureau of EA) Jinichi Katayama (b) (Japan socialist party) Shigeru Ishimoto (c) (Director-general of EA)	Kankyo tokubetsu-3
C138	HR	07/06/1985	Shinichiro Ogawa (a) Shigeru Ishimoto (b)	Kankyo-6
C139	HR	26/11/1985	Hiroshi Hayashibe (a) Yasutaka Fukuda (b) (Chief of the technological planning section of the land technology department in the regional transport bureau of MoT) Naoki Kuroda (c) (Chief of the automotive section in the machinery information industry bureau of MITI)	Kankyo-1
C140	HC	28/03/1986	Hiroshi Hayashibe	Kankyo tokubetsu-3
C141	HR	09/05/1986	Hiroshi Hayashibe	Kankyo-4
C142	HR	28/10/1986	Takashi Kosugi (a) (LDP) Emi Iwasa (b) (Japan communist party)	Kankyo-2
C143	HR	12/12/1986	Keishige Hasegawa (Head of the air quality bureau of EA)	Kankyo-3
C144	HR	18/08/1987	Sukio Iwadare (a) Keishige Hasegawa (b)	Kankyo-2
C145	HR	21/08/1987	Shigeaki Haruta (a) (New Komei) Keishige Hasegawa (b) Emi Iwasa (c)	Kankyo-3
C146	HR	22/08/1987	Akira Numata (Head of the public health bureau of TMG)	Kankyo-4
C147	HR	25/08/1987	Sukio Iwadare	Kankyo-5
C148	HC	09/09/1987	Toshio Horiuchi	Kankyo tokubetsu-6

Continued			(Director-general of EA)	
C149	HR	22/03/1988	Emi Iwasa	Kankyo-2
C150	HR	13/04/1988	Shintaro Ishihara (Minister for transport)	Unyu-7
C151	HR	13/09/1988	Toshio Horiuchi (a) Emi Iwasa (b)	Kankyo-1
C152	HR	25/10/1988	Keishige Hasegawa	Kessan-7
C153	HR	19/05/1989	Masahisa Aoki (Director-general of EA)	Kankyo-2
C154	HR	21/11/1989	Emi Iwasa (a) Setsu Shiga (b) (Director-general of EA)	Kankyo-1
C155	HR	27/03/1990	Keiwa Okuda (Minister for internal affairs)	Chihogyosei-6
C156	HC	29/03/1990	Keiwa Okuda	Chihogyosei-2
C157	HC	30/05/1990	Keiji Furuichi (a) (Head of the air quality bureau of EA) Takeko Kutsunuge (b)	Kankyo tokubetsu-3
C158	HR	07/03/1991	Masatoshi Matsunami	Naikaku-5
C159	HC	15/03/1991	Narayoshi Asano (a) (Chief of the planning section in the air quality bureau of EA)	Chihogyosei-3
C160	HC	17/04/1991	Kazuo Aichi (Director-general of EA)	Kankyo tokubetsu-4
C161	HR	18/04/1991	Tetsughige Nishio (Chief of transport pollution strategy office of the planning section in the air quality bureau of EA)	Chihogyosei-10
C162	HC	24/04/1991	Keiji Koichi (a) Kunji Tabuchi (b) (Japan socialist party)	Kankyo tokubetsu-5
C163	HC	20/09/1991	Ken Takeuchi (Editor of Asahi Shinbun)	Gaikoanzenhosho nikansuruchosakai
C164	HC	25/09/1991	Mayumi Moriyama (a) (LDP) Takeko Kutsunuge (b)	Kankyo tokubetsu-2
C165	HR	26/02/1992	Atsuo Yagihashi (Head of the planning and coordination bureau of EA)	Kankyo-1
C166	HR	10/03/1992	Shozaburo Shiokawa (a) (Minister for internal affairs) Tsuneo Taniguchi (b) (Vice-minister for internal affairs)	Chihogyosei-3
C167	HR	12/03/1992	Masanori Goto (Japan socialist party)	Yosaniinkai daigobunka-2
C168	HR	12/03/1992	Teruo Saito (Chief of the transport pollution strategy office of the planning section in the air quality bureau of EA)	Yosaniinkai dainanabunka-2
C169	HR	03/04/1992	Shozaburo Nakamura (a) (Director-general of EA) Naoto Kitamura (b) (LDP) Tadatoshi Akiba (c) (Japan socialist party) Fumio Iriyama (d) (Chief of the environment and health department in the planning and coordination bureau of EA) Kazuo Saito (e) (Japan socialist party) Sukio Iwadare (f) Misao Saito (g) (New Komei)	Kankyo-4

Continued			Hidehiro Konno (h) (Chief of the general affairs section of the machinery information bureau of MITI) Iwao Teramae (i) (Japan communist party)	
C170	HR	07/04/1992	Fumio Iriyama (a) Yuriko Hase (b) (Japan socialist party) Tomiko Oakazaki (c) (Japan socialist party) Shozaburo Nakamura (d) Yuji Tokizaki (e) (Japan socialist party) Takeshi Saito (f) (Chief of the air quality section of the central pollution council) Jyunji Azuma (g) (New Komei) Iwao Teramae (h)	Kankyo-5
C171	HC	07/04/1992	Akio Saito (Chief of the transport pollution strategy office of the planning section in the air quality bureau of EA)	Shoko-6
C172	HC	22/04/1992	Shozaburo Nakamura	Kankyo tokubetsu-6
C173	HC	13/05/1992	Katsumi Saruta (a) (Professor of Kanagawa university) Yasuhiro Osato (b) (Professor of Waseda university) Masatoshi Hattori (c) (Head of the environment bureau of the Osaka government) Suematsu Suzuki (d) (New Komei) Isao Mizoguchi (e) (Professor of Hokkaido university)	Kankyo tokubetsu-7
C174	HC	20/05/1992	Fumio Iriyama (a) Shozaburo Nakamura (b) Takahiko Kondo (c) (Chief of the development section in the petroleum department of the resource and energy agency) Sumiko Simizu (d) Takeko Kutsunuge (e) Eiichi Nakamura (f) (Rengonokai)	Kankyo tokubetsu-8
C175	HC	25/05/1992	Sadao Fuchigami (Japan socialist party)	Honkaigi-17
C176	HC	29/03/1993	Fumio Iriyama (a) Yasuko Takemura (b) (Japan socialist party)	Kankyo tokubetsu-4
C177	HR	27/04/1993	Tsuneo Nakajima (a) (Chief of the automobile pollution section in the air quality bureau of EA) Akio Kosugi (b) (Chief of the security and environment section of the safety department of the automobile transport bureau of MoT)	Gaimu-6
C178	HC	10/06/1993	Toshiko Hamayotsu (Director-general of EA)	Kankyo tokubetsu-5
C179	HC	09/11/1994	Susumu Osawa (Head of the air quality bureau of EA)	Kankyo tokubetsu-3
C180	HR	10/03/1995	Emi Iwasa	Kankyo-6
C181	HC	26/04/1996	Sukio Iwadare	Kankyo tokubetsu-8

Continued			(Director-general of EA)	
C182	HR	19/02/1997	Ichiro Takahashi (LDP)	Yosan-16
C183	HR	21/02/1997	Ryo Nomura	Kankyo-2
C184	HR	20/05/1997	Toshiaki Araya (Head of the automobile transport bureau of MoT)	Unyu-15
C185	HC	04/12/1997	Makiko Suehiro (Liberal democratic party)	Unyu-2
C186	HC	24/09/1998	Sho Hirose (Head of the air quality bureau of EA)	Kokudo kankyo-5
C187	HR	09/03/1999	Sho Hirose	Kankyo-2
C188	HR	25/02/2000	Kayoko Shimizu (a) (Director-general of EA) Sho Hirose (b) Yoko Fujiki (c) (Japan communist party)	Kankyo-2
C189	HC	14/03/2000	Takuji Hashimoto (Vice-parliamentary minister for EA)	Kankyo-2
C190	HC	16/03/2000	Sho Hirose	Kokudo kankyo-4
C191	HR	04/08/2000	Masahiro Tabata (New Komei)	Kankyo-1
C192	HR	15/11/2000	Ritsuo Hosokawa (a) (Democratic party) Yoriko Kawaguchi (b) (Director-general of EA)	Unyu-1
C193	HC	06/12/2000	Yoriko Kawaguchi	Kokudo kankyo-1

Appendix B. List of Interviews

Number	Role	Organization
I1	Officer in the automobile and environment department	MoE
I2	Associate professor	National graduate institute for policy studies
I3	Environmental specialist	MLIT
I4	Retired officer in the information management department	MLIT
I5	Local officer in the automobile and environment group	Aichi prefectural government
I6	Assistant director in the planning investigation team of the automobile pollution office in the air quality section of the environment and life department	Chiba prefectural government
I7	Local officer in the environment and life environment department	Chiba prefectural government
I8	Local officer in the environmental policy section of the environment and safety department	Ishikawa prefectural government
I9	Local officer in the subsection of automobile air pollution of the air quality section in the environmental management bureau of the health and life department	Hyogo prefectural government
I10	Local officer in the air and water quality section of the environment and agriculture department	Kanagawa prefectural government
I11	Assistant director in the development team for automobiles and the environment of the air and water quality section of the environment and agriculture department	Kanagawa prefectural government
I12	Local officer in the group for automobiles and the environment of the traffic environment section in the environmental management office of the agriculture and fishery department	Osaka prefectural government
I13	Planner for automobiles in the section for restoration of blue sky in the environmental department	Saitama prefectural government
I14	Planner in the planning section of the general affairs department in the environmental bureau	TMG
I15	Local officer in the planning section of the general affairs department in the environmental bureau	TMG
I16	Head of the automobile pollution office in the air quality section in the environmental conservation department of the environmental bureau	Chiba municipal government
I17	Chief examiner in the automobile section in the pollution department of the environmental bureau	Kawasaki municipal government
I18	Local officer in the traffic environment section in the pollution department of the environmental conservation bureau	Yokohama municipal government
I19	Subsection chief in the traffic environment section in the pollution department of the environmental conservation bureau	Yokohama municipal government
I20	Subsection chief in the environmental subsection	Automaker A
I21	Manager in the environmental section of the production, environment and safety department	Automaker B
I22	Chief engineer in product design and planning division	Automaker C

I23	Assistant manager in production and planning division	Automaker C
I24	Chief manager in the management planning department	Automaker D
I25	Chief in the central research institute	Automaker E
I26	Chief in the engine development department	Automaker F
I27	Senior researcher for the power and the environment in the general research institute	Automaker G
I28	Chief manager in the domestic sales department	Automaker H
I29	Manager in the management and planning group	Automaker I
I30	Chief manager in the planning group of the environmental department	Automaker J
I31	Manager in the automobile catalyst technology department	DPF manufacturer A
I32	Chief manager in the DPF engineering group of the production development department	DPF manufacturer B
I33	Manager in the design department	DPF manufacturer C
I34	Subsection chief in the management department	Bus company A
I35	Subsection chief in the transport department	Bus company B
I36	Chief manager in the environmental promotion department	Truck transport company A
I37	Chief manager in the quality control department	Truck transport company B
I38	Managing director in the personnel and general affairs division	Retailer A (supermarket chain)
I39	Director in general affairs department	Retailer B (supermarket chain)
I40	Head of the environmental promotion office	Retailer C (supermarket chain)
I41	Chief manager in the social and environmental promotion department	Retailer D (convenience sore chain)
I42	Head of the environmental promotion department	Retailer E (convenience sore chain)
I43	Head of the public relations and environment department	Drinks maker
I44	Chief researcher in the development and operations department	Oil company A
I45	Manager in the public relations section of the general affairs department	Oil company B
I46	Manager in the society, environment and safety department	Oil company C
I47	Director	NGO
I48	Director	NPO

Appendix C. Passenger Automobiles, Trucks and Buses: 1955-2000

Unit: 1000 Vehicles

Year	Passenger Automobiles	Trucks	Buses	Total
1955	157	693	35	1,501
1960	440	1,321	57	3,403
1965	2,289	4,689	105	8,123
1970	7,270	8,083	175	16,528
1975	16,044	10,281	218	27,870
1980	22,751	12,697	228	37,333
1985	25,027	83,18	230	46,363
1990	30,882	86,13	242	57,944
1995	37,755	87,68	245	68,104
2000	42,056	81,35	236	74,583

Sources: Unyuhakusho (MoT, 1966); Jidoshahoyudaisu Suiihyo (AIRA, 2005)

Appendix D. Road Freight and Passenger Transport: 1955-2000

Year	Freight Transport (Unit: Billion Ton Kilometres)	Passenger Transport (Unit: Million Passengers)
1955	10	4,262
1960	20	7,900
1965	48	14,863
1970	135	24,033
1975	129	28,411
1980	178	33,515
1985	205	34,679
1990	274	47,209
1995	294	45,396
2000	313	45,574

Sources: Sujidemiru Jidosha (Jidosha Kotsukyoku of MLIT, 2002);
Unyu Hakusho (MoT, 1964, 1966, 1971, 1992, 1996); Yusokikanbetsu Kamotsuyusoryo (SBSRTI, 2005)

Appendix E. Automobile Production: 1963-2000

Year	Passenger automobiles	Trucks	Buses	Total
1963	407,830	86,2781	12,920	1,283,531
1965	696,176	116,0090	19,345	1,875,614
1970	3,178,708	206,3883	46,566	5,289,157
1975	4,567,854	2,33,7632	36,105	6,941,591
1980	7,038,108	3,913,188	91,588	11,042,884
1985	7,646,816	4,544,688	79,591	12,271,095
1990	9,947,972	3,498,639	40,185	13,486,796
1995	7,610,533	2,537,737	47,266	10,195,536
2000	8,359,434	1,726,818	54,544	10,140,796

Sources: Yonrinsha seisandaisu (JAMA: http//www.jama.or.jp: accessed: 7 December 2006);
Jidosha Guidebook (Jidosha shinkokai, 1972)

Appendix F. Freight and Passenger Transport in Tokyo and Osaka

		From Tokyo/Osaka To Another Prefecture	From Another Prefecture to Tokyo/Osaka	Within Tokyo/Osaka	Sum	Total
Freight (unit:1000 ton)	Tokyo	4,827	6,187	22,552	33,566 (12.3%)	56,804 (20.8%)
	Osaka	3,460	4,127	15,649	23,238 (8.5%)	
Passenger (unit:1000 passengers)	Tokyo	8,469	7,048	133,063	148,630 (23.2%)	200,052 (31.2%)
	Osaka	2,869	1,945	46,608	51,422 (8.0%)	

Source: Unyuhakusho (MoT, 1968)

Appendix G. Members of the Specialist Committee

- Keizo Hatta (Professor of Tokyo University)
- Kyoji Ito (Professor of Tokai University)
- Toshio Sotoyama (Professor of Keio University)
- Takaaki Kida (the transport pollution chief of the institute of transport safety and pollution in MoT)
- Haruo Shimamura (the commissioner of the pollution committee of the petroleum association of Japan)
- Katsuo Hanawa (the national research institute of police science)
- Jyoji Yamaie (the research planner of the mechanical engineering laboratory of MITI)
- Naoomi Yamaki (the second pollution chief of the national research institute for pollution and resources)
- Noboru Yamate (the first head of the environmental hygienic office in the national hygienic laboratory)
- Kiyoshi Iemoto (the commissioner of the safety and pollution committee of JAMA and the vice-president of Hino)
- Soroku Yamagata (the head of the air quality bureau in EA)
- Kodai Sakakibara (the auto pollution chief of the air quality bureau in EA)

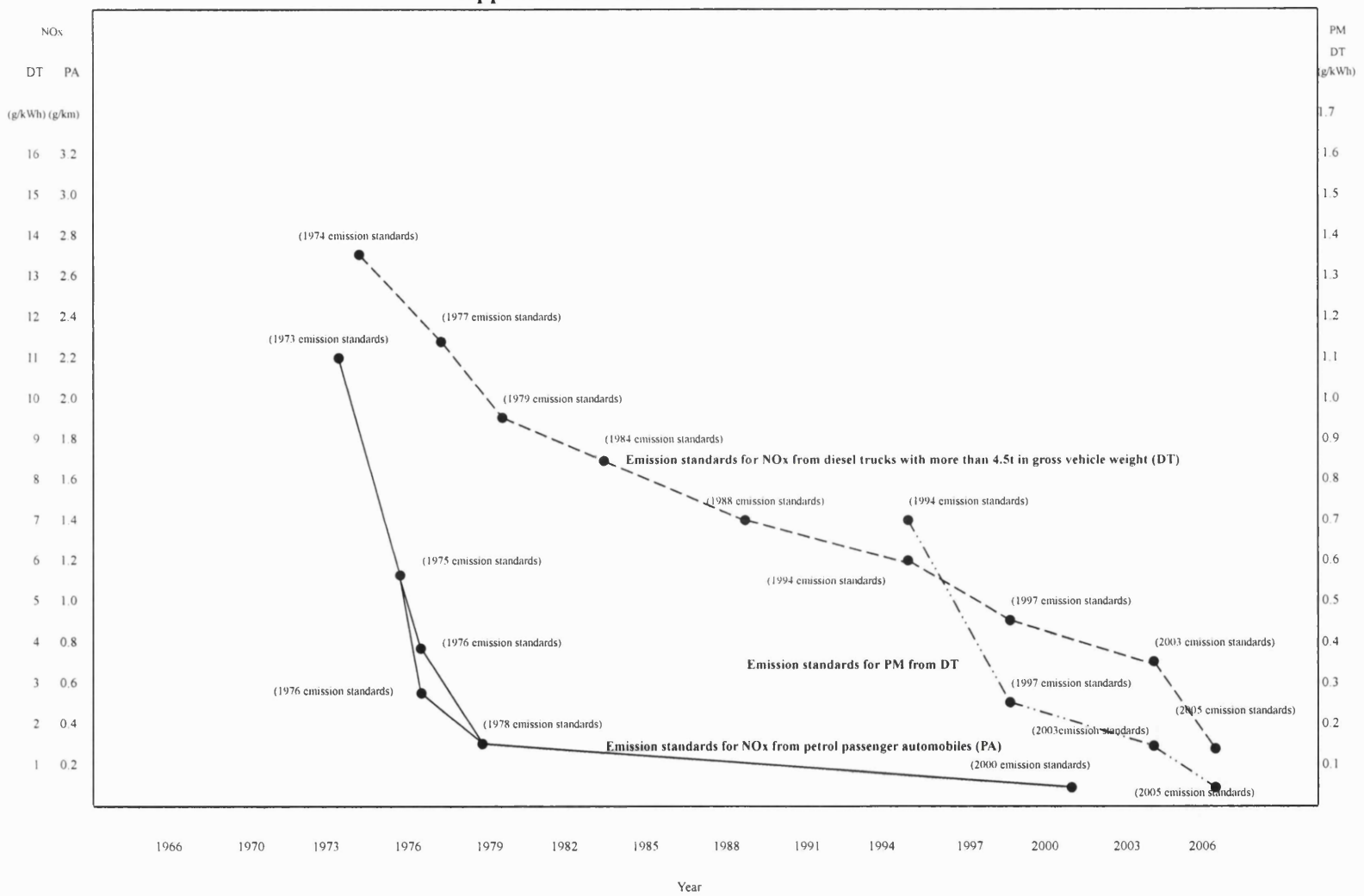
Cited from Kawana (1988: pp.254-255).

Appendix H. CVCC Engines

CVCC is an acronym for Compound Vortex Controlled Combustion and it means that:

C ("Compound") represented the engine mechanism with two combustion chambers: main and auxiliary. V ("Vortex") represented the vortex, or swirl, generated in the main chamber. Caused by a jet of flame from the prechamber injected via a nozzle, the vortex had the effect of increasing the speed of engine combustion. CC ("Controlled Combustion") represented the engine ' s ability to properly control the speed of combustion.
(Honda, 2007: available from:
http://world.honda.com/history/challenge/1972introducingthecvcc).

Appendix I. Evolutions of emission standards



Appendix J. Tables of Answers

J-1. Before the first policy change

Questions/Policy Change	Before the First Policy Change
Core policy network members Dominant alliances	MoT, MITI, Auto Industry (AI) MoT-AI
Interests	MoT-ministerial interests (promoting appropriate road transport) AI-economic interests MITI-ministerial interests (economic)
Appreciative systems	Automobile air pollution policies (AAPs) are technical matters (inappropriate maintenance); AAPs need to be little harmful to economic activity of AI; automobile air pollution is due to the insufficient supply of roads; automobile air pollution is a local problem
Resources	MoT-granting access to policy-making processes, giving protection for AI, the authority for road administration and expertise and knowledge AI-economic resources, ability to influence results in implementation, technical information MITI-the authority for industrial pollution and economic issues, giving protection for AI, granting access to decision-making processes and expertise and technical knowledge
Rules of the game	Consultation, consensus, secrecy and territoriality; free economic activity of the AI needs to be respected
Strategies	Consultation, incorporation, protection and technical and financial assistance, manipulation of technical information and cooperation
Frequency of interaction Consensus	MoT-AI: frequent and low quality MITI-AI: less frequent and low quality Sharing basic values and accepting the legitimacy of the outcome
Power distribution	Distributed to all but unequally
Resource distribution: Within the core policy network Within participating organizations	 Equally distributed to all in number but unequally distributed in terms of influences A little hierarchical distribution
Key drivers for policy change	N/A

J-2. First policy change

Questions/Policy Change	First Policy Change: Establishment of the First Emission Standards
Core policy network members Dominant alliances	MoT, AI, MITI MoT-AI
Interests	MoT-ministerial interests (promoting appropriate road transport) AI-economic interests MITI-ministerial interests (economic)
Appreciative systems	AAPs are technical matters (inappropriate maintenance, engines); AAPs need to be little harmful to economic activity of AI; automobile air pollution is due to the insufficient supply of roads; automobile air pollution is a local problem; and emission standards need to be the same as those of the US.
Resources	MoT-granting access to policy-making processes, giving protection for AI, the authority for road administration and expertise and knowledge AI-economic resources, ability to influence results and technical information MITI-the authority for industrial pollution and economic issues, giving protection for AI, granting access to decision-making processes and expertise and knowledge.
Rules of the game	Consultation, consensus, secrecy and territoriality; free economic activity of AI needs to be respected
Strategies	Negotiation and bargaining, incorporation, technical and financial assistance, manipulation of technical information and cooperation
Frequency of interaction Consensus	MoT-AI: frequent and middle quality MITI-AI: less frequent and low quality Sharing basic values and accepting the legitimacy of the outcome
Power distribution	Distributed to all but unequally
Resource distribution: Within the core policy network Within participating organizations	 Equally distributed to all in number but unequally distributed in terms of influences A little hierarchical distribution
Key drivers for policy change	The establishment of emission standards in the US, deterioration of the air quality partially because of increased automobile air pollution and the increased public concerns on automobile air pollution

J-3. Second policy change

Questions/Policy Change	Second Policy Change: Establishment of both the First Emission Standard on NOx (established in 1970 and enforced in 1974) and the 1975 emission standards
Core policy network members Dominant alliances	MoT, AI, MITI MoT-AI
Interests	MoT-ministerial interests (promoting appropriate road transport) AI-(mainly Toyota)-economic interests AI-(mainly Honda)-environmental economic interests MITI-Ministerial interests (economic)
Appreciative systems	AAPs are technical matters; and AAPs need to be little harmful to economic activity of AI; and emission standards need to be the same as those of the US.
Resources	MoT-granting access to policy-making processes, giving protection for AI, the authority for road administration and expertise and knowledge. AI-economic resources, ability to influence results in implementation and technical information MITI-the authority for industrial pollution and economic issues, giving protection for AI, granting access to decision-making processes and expertise and knowledge.
Rules of the game	Consultation, consensus, secrecy and territoriality; free economic activity of AI needs to be respected
Strategies	Negotiation and bargaining, strong incorporation, technical and financial assistance, manipulation of technical information and cooperation
Frequency of interaction Consensus	MoT-AI: very frequent and good quality MITI-AI: less frequent and low quality Sharing basic values and accepting the legitimacy of the outcome
Power distribution	Distributed to all but unequally
Resource distribution: Within the core policy network Within participating organizations	 Equally distributed to all in number but unequally distributed in terms of influences A little hierarchical distribution
Key drivers for policy change	Deterioration of the air quality because of increased automobile air pollution (photochemical smog), high public demands and necessity to achieve the US emission standard for export

J-4. Third policy change

Questions/Policy Change	The Third Policy Change: Decision to enforce the Japanese Muskie Law
Core policy network members Dominant alliances	MoT, AI, MITI, EA, LDP MoT-AI
Interests	MoT-ministerial interests (promoting appropriate road transport) AI-economic interests MITI-ministerial interests (economic) EA-ministerial interests (environmental) LDP-party interests (environmental interests or the establishment of the Japanese Muskie law)
Appreciative systems	AAPs are technical matters; AAPs need to be little harmful to economic activity of AI; and emission standards need to be the same as those of the US.
Resources	MoT-giving protection for AI and the authority for road administration AI-economic resources, ability to influence results in implementation, technical information and expertise and knowledge MITI-the authority for economic issues, giving protection for AI, granting access to decision-making processes and expertise and knowledge. EA-the authority for environmental administration, granting access to policy-making processes, public support and LDP support. LDP-the authority to make policy proposals passed in the Diet and formally establish emission standards, legitimate power over ministries and ability to reflect interests of stakeholders into policies.
Rules of the game	Consultation, consensus, secrecy and territoriality; free economic activity of the AI needs to be respected.
Strategies	Negotiation and bargaining, strong incorporation, technical and financial assistance, manipulation of technical information, cooperation and support by authorization
Frequency of interaction Consensus	MoT-AI: very frequent and good quality MITI-AI: frequent and good quality EA-AI: less frequent and low quality LDP-AI: less frequent and low quality Sharing basic values and accepting the legitimacy of the outcome
Power distribution	Distributed to all but unequally
Resource distribution: Within the core policy network Within participating organizations	 Equally distributed to all in number but unequally distributed in terms of influences A little hierarchical distribution
Key drivers for policy change	The US Muskie Law, agreement between the Japanese and US government; high public demands enhanced mainly by serious automobile air pollution and activities of TMG

J-5. Fourth policy change

Questions/Policy Change	The Fourth Policy Change: Establishment of the 1975 Emission Standards
Core policy network members Dominant alliances	MoT, AI, MITI, EA, LDP MITI-AI
Interests	MITI-ministerial interests (economic) MoT-ministerial interests (promoting appropriate road transport) AI-economic interests Some automakers (mainly Toyota and Nissan): economic interests Other automakers (mainly Honda and Toyo Kogyo): environmental economic interests EA-ministerial Interests (environmental) LDP-party interests (environmental interests or the establishment of the Japanese Muskie law)
Appreciative systems	AAPs are technical matters; AAPs need to be little harmful to economic activity of AI; and emission standards need to be the same as those of the US.
Resources	MoT-giving protection for AI and the authority for road administration AI-economic resources, ability to influence results in implementation and technical information MITI-the authority for economic issues, giving protection for AI and granting access to decision-making processes EA-the authority for environmental administration; granting access to policy-making; public support; LDP support LDP-the authority to make policy proposals passed in the Diet and formally establish emission standards, legitimate power over ministries and ability to reflect interests of stakeholders into policies.
Rules of the game	Consultation, consensus, secrecy and territoriality; free economic activity of AI needs to be respected.
Strategies	Negotiation and bargaining, strong incorporation, technical and financial assistance, manipulation of technical information, cooperation and support by authorization
Frequency of interaction Consensus	MoT-AI: frequent and good quality MITI-AI: very frequent and high quality EA-AI: less frequent and low quality LDP-AI: less frequent and low quality Disagreement to basic values but accepting the legitimacy of outcomes
Power distribution	Distributed to all but unequally
Resource distribution: Within the core policy network Within participating organizations	 Equally distributed to all in number but unequally distributed in terms of influences A little hierarchical distribution
Key drivers for policy change	Technological development of Honda and Toyo Kogyo driven by the US Muskie law and severe competition among the automakers, and high public demands enhanced mainly by serious automobile air pollution.

J-6. Fifth policy change

Questions/Policy Change	The Fifth Policy Change: Postponement of the 1976 Emission Standards
Core policy network members Dominant alliances	MoT, AI, EA, MITI, EA, LDP MITI-AI, LDP-AI
Interests	MoT-ministerial interests (promoting appropriate road transport) AI-economic interests Some automakers (e.g. Toyota)-economic interests Other automakers (e.g. Honda)-environmental economic interests MITI-ministerial interests (economic) EA- ministerial interests (weak environmental) Some EA members (e.g. Ikuo Kobayashi)-strong environmental interests Other EA members (e.g. Hitoshi Kasuga)-weak environmental interests LDP-party interests (economic interests or postponement of the Japanese Muskie law) Some LDP members (e.g. Kakuei Tanaka)-economic interests Other LDP member (e.g. Takeo Miki)-environmental interests
Appreciative systems	AAPs are technical matters and there are technical difficulties to reduce emissions; AAPs are one of the most important economic issues and they need to be little harmful to economic activity of AI; and emission standards need to be the same as those of the US.
Resources	MoT-giving protection for AI, the authority for road administration and expertise and knowledge AI-economic resources, ability to influence results, interpersonal relationships with MITI, LDP support (e.g. kakuei Tanaka, Yoshiro Hayashi) and technical information MITI-the authority for economic issues, giving protection for AI, granting access to decision-making processes, interpersonal relationships with AI, LDP support (e.g. Kakuei Tanaka, Yoshiro Hayashi) and expertise and knowledge EA-the authority for environmental administration, granting access to policy-making processes, public support, LDP support (e.g. Matsuhei Mouri and Takeo Miki), the support from local governments and expertise and knowledge LDP-the authority to make policy proposals passed in the Diet and formally establish emission standards, legitimate power over ministries and ability to reflect interests of stakeholders into policies.
Rules of the game	Consultation, consensus, secrecy and territoriality; free economic activity of AI needs to be respected.
Strategies	Negotiation and bargaining, strong incorporation, technical and financial assistance, manipulation of technical information and giving pressures
Frequency of interaction Consensus	MoT-AI: frequent and good quality MITI-AI: highly frequent and high quality EA-AI: less frequent and low quality LDP-AI: very frequent and high quality Disagreement to basic values but accepting the legitimacy of the outcome
Power distribution	Distributed to all but unequally
Resource distribution: Within the core policy network Within participating organizations	 Equally distributed to all in number but unequally distributed in terms of influences A little hierarchical distribution
Key drivers for policy change	The postponement of the US Muskie law and the oil crisis

J-7. Sixth policy change

Questions/Policy Change	The Sixth Policy Change: Establishment of the 1978 Emission Standards
Core policy network members Dominant alliances	MoT, AI, EA, MITI, EA, LDP MITI-AI, LDP-AI
Interests	MoT-ministerial interests (promoting appropriate road transport) AI-environmental economic interests Some automakers (e.g. Toyota)-economic interests Other automakers (e.g. Nissan)-reactive environmental economic interests Other automakers (e.g. Honda)-proactive environmental economic interests MITI-ministerial interests (economic) EA- ministerial interests (environmental) LDP-party interests (environmental interests or the establishment of the 1978 emission standards) Some LDP members (e.g. Takeo Miki)-environmental interests Other LDP members (e.g. Yoshiro Hayashi)-economic interests
Appreciative systems	AAPs are technical matters and there are technical difficulties to reduce emissions; and AAPs are one of the most important economic issues and they need to be little harmful to economic activity of AI.
Resources	MoT-giving protection for AI, the authority for road administration and expertise and knowledge AI-economic resources, ability to influence results, interpersonal relationships with MITI and technical information MITI-the authority for economic issues, giving protection for AI, granting access to decision-making processes, interpersonal relationships with AI and expertise and knowledge EA-the authority for environmental administration, granting access to policy-making processes, public support, LDP support, the support from local governments and expertise and knowledge LDP-the authority to make policy proposals passed in the Diet and formally establish emission standards, legitimate power over ministries and ability to reflect interests of stakeholders into policies.
Rules of the game	Consultation, consensus and territoriality; free economic activity of AI needs to be respected
Strategies	Negotiation and bargaining, strong incorporation, technical and financial assistance, manipulation of technical information, financial incentives and support by authorization
Frequency of interaction Consensus	MoT-AI: frequent and good quality MITI-AI: very frequent and good quality EA-AI: less frequent and low quality LDP-AI: less frequent and low quality Disagreement to basic values but accepting the legitimacy of the outcome
Power distribution	Distributed to all but unequally
Resource distribution: Within the core policy network Within participating organizations	 Equally distributed to all in number but unequally distributed in terms of influences A little hierarchical distribution
Key drivers for policy change	The 'clean' administration of Takeo Miki; the severe competition among the automakers and the consequent successes of the automakers in technological development for the 1978 emission standards; and tendency of the public to buy low emission automobiles and high public demands because of disclosure of inappropriate decision-making of the postponement on the 1976 emission standards and inappropriate relationship both between MITI and AI and between LDP and AI.

J-8. Stability in emission standards between the sixth policy change and the seventh policy change

Questions/Policy Change	Stability in emission standards between the sixth policy change and the seventh policy change
Core policy network members Dominant alliances	MoT, AI, EA, MITI, EA, LDP MoT-AI
Interests	MoT-ministerial interests (promoting appropriate road transport) AI-weak environmental economic interests MITI-ministerial interests (economic) EA- ministerial interests (environmental) LDP-party interests (weak environmental economic)
Appreciative systems	AAPs are technical matters and there are technical difficulties to reduce emissions; and automobile air pollution is a local problem.
Resources	MoT-giving protection for AI, the authority for road administration and expertise and knowledge AI-economic resources, ability to influence results in implementation, interpersonal relationships with MITI and technical information MITI-the authority for economic issues, giving protection for AI, granting access to decision-making processes, interpersonal relationships with AI and expertise and knowledge EA-the authority for environmental administration, granting access to policy-making processes, public support, LDP support, the support from local governments and expertise and knowledge LDP-the authority to make policy proposals passed in the Diet and formally establish emission standards, legitimate power over ministries and ability to reflect interests of stakeholders into policies.
Rules of the game	Consultation, consensus, secrecy and territoriality; free economic activity of the AI needs to be respected
Strategies	Negotiation and bargaining, strong incorporation, technical and financial assistance, manipulation of technical information, financial incentives and support by authorization
Frequency of interaction Consensus	MoT-AI: very frequent and good quality MITI-AI: very frequent and good quality EA-AI: less frequent and low quality LDP-AI: less frequent and low quality Sharing basic values and accepting the legitimacy of the outcome
Power distribution	Distributed to all but unequally
Resource distribution: Within the core policy network Within participating organizations	 Equally distributed to all in number but unequally distributed in terms of influences A little hierarchical distribution
Key drivers for the stability	Having the strictest emission standards in the world, automobile air pollution becoming a local problem because of the relaxation of the national ambient air quality standard and recognized technical difficulties to reduce emissions and little technological competition among automakers

J-9. Seventh policy change

Questions/Policy Change	The seventh policy change: the establishment of the emission standards for PM from diesel automobiles
Core policy network members Dominant alliances	MoT, AI, EA, MITI, EA, LDP MoT-AI
Interests	MoT-ministerial interests (promoting appropriate road transport) AI-strong environmental economic interests MITI-ministerial interests (environmental economic) EA- ministerial interests (environmental) LDP-party interests (environmental economic)
Appreciative systems	AAPs are technical matters and there are technical difficulties to reduce emissions; and automobile air pollution is a local problem.
Resources	MoT-giving protection for AI, the authority for road administration and expertise and knowledge AI-economic resources, ability to influence results in implementation, interpersonal relationships with MITI and technical information MITI-the authority for economic issues, giving protection for AI, granting access to decision-making processes, interpersonal relationships with AI and expertise and knowledge EA-the authority for environmental administration, granting access to policy-making processes, strong public support, strong LDP support, the support from local governments and expertise and knowledge LDP-the authority to make policy proposals passed in the Diet and formally establish emission standards, legitimate power over ministries and ability to reflect interests of stakeholders into policies.
Rules of the game	Consultation, consensus, secrecy and territoriality; free economic activity of AI needs to be respected
Strategies	Negotiation and bargaining, strong incorporation, technical and financial assistance, manipulation of technical information, financial incentives and support by authorization
Frequency of interaction Consensus	MoT-AI: very frequent and good quality MITI-AI: very frequent and good quality EA-AI: frequent and middle quality LDP-AI: less frequent and low quality Sharing basic values and accepting the legitimacy of the outcome
Power distribution	Distributed to all but unequally
Resource distribution: Within the core policy network Within participating organizations	 Equally distributed to all in number but unequally distributed in terms of influences A little hierarchical distribution
Key drivers for the policy change	The global environmental movements and the consequent recognition of the state, industries and the public to do something to improve the environment, the establishment of emission standards for PM in the EU and the US, wide recognition of serious health effects of DEP.

J-10. Eighth policy change

Questions/Policy Change	The eighth policy change: the great reinforcement of emission standards for NOx and PM
Core policy network members Dominant alliances	MoT, AI, EA, MITI, EA, LDP MoT-AI
Interests	MoT-ministerial interests (appropriate road transport) AI-strong environmental economic interests MITI-ministerial interests (environmental economic) EA- ministerial interests (environmental) LDP-party interests (environmental economic)
Appreciative systems	AAPs are technical matters and there are technical difficulties to reduce emissions; and automobile air pollution is a local problem.
Resources	MoT-giving protection for AI, the authority for road administration and expertise and knowledge AI-economic resources, ability to influence results in implementation, interpersonal relationships with MITI and technical information MITI-the authority for economic issues, giving protection for AI, granting access to decision-making processes, interpersonal relationships with AI and expertise and knowledge EA-the authority for environmental administration, granting access to policy-making processes, strong public support, strong LDP support, the support from local governments and expertise and knowledge LDP-the authority to make policy proposals passed in the Diet and formally establish emission standards, legitimate power over ministries and ability to reflect interests of stakeholders into policies.
Rules of the game	Consultation, consensus, secrecy and territoriality; free economic activity of AI needs to be respected
Strategies	Negotiation and bargaining, strong incorporation, technical and financial assistance, manipulation of technical information, financial incentives and support by authorization
Frequency of interaction Consensus	MITI-AI: very frequent and good quality MoT-AI: very frequent and good quality EA-AI: frequent and middle quality LDP-AI: less frequent and low quality Sharing basic values and accepting the legitimacy of the outcome
Power distribution	Distributed to all but unequally
Resource distribution: Within the core policy network Within participating organizations	 Equally distributed to all in number but unequally distributed in terms of influences A little hierarchical distribution
Key drivers for the policy change	The global environmental movements and the consequent recognition of the state, industries and the public to do something to improve the environment and judgements of courts on three air pollution cases.

J-11. Ninth policy change

Questions/Policy Change	The ninth policy change: the early implementation of the 2007 emission standards
Core policy network members Dominant alliances	MoT, AI, EA, MITI, LDP MoT-AI
Interests	MoT-ministerial interests (promoting appropriate road transport) AI-strong environmental economic interests MITI-ministerial interests (environmental economic) EA- ministerial interests (environmental) LDP-party interests (environmental economic)
Appreciative systems	AAPs are technical matters and there are technical difficulties to reduce emissions; and automobile air pollution is a local problem.
Resources	MoT-giving protection for AI, the authority for road administration and expertise and knowledge AI-economic resources, ability to influence results in implementation, interpersonal relationships with MITI and technical information MITI-the authority for economic issues, giving protection for AI, granting access to decision-making processes, interpersonal relationships with AI and expertise and knowledge EA-the authority for environmental administration, granting access to policy-making processes, strong public support, strong LDP support, support from local governments and expertise and knowledge LDP-the authority to make policy proposals passed in the Diet and formally establish emission standards, legitimate power over ministries and ability to reflect interests of stakeholders into policies.
Rules of the game	Consultation, consensus, secrecy and territoriality; free economic activity of AI needs to be respected
Strategies	Negotiation and bargaining, strong incorporation, technical and financial assistance, manipulation of technical information, financial incentives and support by authorization
Frequency of interaction Consensus	MoT-AI: very frequent and good quality MITI-AI: very frequent and good quality EA-AI: frequent and middle quality LDP-AI: less frequent and low quality Sharing basic values and accepting the legitimacy of the outcome
Power distribution	Distributed to all but unequally
Resource distribution: Within the core policy network Within participating organizations	 Equally distributed to all in number but unequally distributed in terms of influences A little hierarchical distribution
Key drivers for the policy change	Deterioration of air quality by NOx and PM, increased public demands by the operations for diesel trucks carried out by TMG, judgments on the Amagasaki air pollution case, the establishment of the strict EU emission standards for PM, the availability of internet and the consequent easy accessibility to information on automobile air pollution and emission standards, instability of the appreciative systems because of the operations by TMG.

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