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The promissory machine of green finance

Green finance has demonstrated remarkable resilience despite ongoing challenges. We address this puzzle by arguing that this resilience rests on a promissory legitimacy – credibility derived from future-oriented promises rather than present achievements. To advance this argument, we develop the concept of a promissory machine which produces green finance through the ordering logics of promises, themselves primarily directed at financial audiences. The machine further works to uphold the credibility of these promises through cycles of credibility work. A corollary is that green finance is constantly evolving, diversifying, and growing in complexity in ways that ultimately obscure the veracity of promissory claims. We contribute to debates on future temporalities by suggesting that the promises of green finance extend the present rather than creating possibilities for transforming it.

Keywords: green finance; promissory legitimacy; machine; temporalities; greenwashing

1. Introduction

A distinctive feature of capitalism since the 2008 financial crisis has been the growing entanglement of finance with environmental concerns. This is evident in the proliferation of environment-themed products such as green bonds and green exchange-traded funds (Bracking, 2024; Langley et al., 2021). It is also evident in a raft of market devices that have emerged to help financial intermediaries evaluate the environmental credentials of green assets (Perkins, 2021). Evidence, too, can be found in the growing number of private and public initiatives governing environment-related aspects of finance (McDonnell et al., 2022).

Yet green finance has invited, and continues to invite, suspicion and critique. Questions have been raised about its substantive contribution to environmental goals, and whether green finance is tantamount to greenwashing (Flood, 2003; Kaplan & Levy, 2025). As the recent 'ESG backlash' in the US illustrates, concerns have also been voiced about the economic rationale for green finance, and whether integrating environmental considerations into investment decisions aligns with fiduciary duty (Arjaliès & Bansal, 2023).

Despite these ongoing controversies, green finance has proved remarkably resilient, repeatedly displaying an ability to withstand and recover from setbacks. This paper addresses this puzzle. Specifically, we ask how green finance maintains its legitimacy in a contested field. Our central thesis is that this legitimacy depends less on what green finance achieves in the present and more on what it might plausibly achieve in the future. That is, it is predicated on 'promissory legitimacy' (Beckert, 2020), in the sense of future-oriented promises and their believability.

To better understand the role of promises in legitimising green finance, we advance the concept of a *promissory machine*. This machine functions to produce green finance through the ordering logic of environmental *and* economic promises. Promises serve to legitimise green finance not only to broader societal audiences but also to finance itself. The machine further works to uphold the credibility of these promises through what we term *credibility work*. A corollary is that green finance remains in constant motion – evolving, diversifying, and growing in complexity in ways that increasingly obscure the veracity of the promissory claims on which it is built.

We make several contributions. First, we offer a novel theorisation of how green finance is legitimated. By foregrounding the role of promises, we move beyond the literature's prevailing focus on market creation to examine how legitimacy sustains green finance over time. Second, we problematise the progressive potential often attributed to imagined futures. Rather than creating possibilities for change and performativity, i.e. the realisation of imaginaries (e.g., Beckert, 2016), we show how imagined futures serve as temporal repositories. They contain, rather than trigger, enactments of different futures, therefore extending the present. Third, we challenge conventional assumptions about greenwashing (Montgomery et al., 2024). Rather than merely the deception of external audiences (e.g., publics), a more accurate reading of green finance is that it largely constitutes 'self-deception' (Blühdorn & Deflorian, 2019).

Our argument is developed across four sections. First, we review existing literature and introduce the key theoretical ideas that inform our approach. Second, we elaborate our conceptualisation of the promissory machine, unpacking the mechanisms through which promissory legitimacy is continually produced. Third, we outline three core components – instruments, devices, and governance arrangements – that underpin the making and remaking of promises. Finally, we discuss the wider implications of our promissory framing.

2. From market emergence to the promissory sustenance of 'green' finance

We use the term green finance to refer to the assemblage of activities, actants, and flows involved in finance's growing entanglement with environmental concerns. Its emergence raises several questions that the existing literature seeks to address. One concerns *how* emergence has occurred. Various empirical objects involved in the development of green finance have been studied, ranging from individual product categories (e.g., green bonds), market devices (e.g., ESG ratings), to entire financial systems (Bracking, 2024; Crifo et al., 2019; Monk & Perkins, 2020; Slager et al., 2012).

Market emergence has been theorised through concepts such as field institutionalisation, category creation, sustainability transitions, marketization, and assetization (Giamporcaro & Gond, 2016; Langley et al., 2021; Neumann, 2023; Perkins, 2021).

Another question is *why* this emergence has come about. Green finance has been centrally positioned as a strategic endeavour to further capital accumulation. Within this frame, research has explored how environmental concerns have been curated into new or expanded investment opportunities, and how sustainability-related risks have been financialised to monetise uncertain futures (Bracking, 2019; Johnson, 2013; Parfitt, 2024; Sullivan, 2013; Taylor, 2023). Scholars have also shown how green finance has been used to re-legitimise the institutions of financialised capitalism and to serve as an outlet for the moral impulses of market professionals (Bracking, 2024; García-Lamarca & Ullström, 2022; Kish & Fairbairn, 2018; Perkins, 2021).

A further question asks *what* effects are implied by these developments. A recurring theme is that green finance primarily contributes to the expansion of a fictive, speculative economy that serves the interests of private financial actors (Bracking, 2015; Bracking & Leffel, 2021; van Veelen, 2021). Green ambitions are not redundant, but they have been subordinated to economic ones. The resulting detachment between environmental claims and substantive achievement is often interpreted as greenwashing – that is, as deliberate deception – in academic, regulatory, and insider accounts (Fancy, 2021; Parfitt, 2024).

The existing literature usefully problematises market emergence – that is, the graduation of green finance from a niche presence in the late-1990s to a significant financial market segment by the early to mid-2010s (Crifo et al., 2019; Dimmelmeier, 2023). Yet it says little about why interest in green finance persists despite ongoing concerns about its value, desirability, and effectiveness. It is also largely silent on how green finance has weathered a series of controversies and crises. For example, after a speculative boom in the early 2010s, venture capital (VC) investment in clean technologies declined sharply, largely driven by poor financial returns (Gaddy et al., 2017). Although some commentators at the time proclaimed the 'death of clean tech', VC investments have since experienced a resurgence (Rotman, 2023). Likewise, green bonds issued by oil & gas firms such as Repsol, and by airports such as the Hong Kong Airport Authority, have given rise to greenwashing claims (Cripps, 2007; Lester, 2022).

Yet most issuers and investors have remained undeterred by such criticism, with green and related sustainability bonds accounting for a growing share of total issuance.

At the heart of these issues is the continued legitimacy of green finance, where legitimacy is 'a generalised perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions' (Suchman, 1995, p.574). Past work on market emergence has not ignored legitimacy, but the primary focus has been on how different components of green finance are *made* legitimate in their move from niche to mainstream (Clark & Dixon, 2024). By contrast, we examine how green finance *maintains* its legitimacy as an established segment of financial markets.

To better understand the resilience of green finance, we find it particularly useful to draw from three literatures. First, we borrow from Beckert's (2020, p.318) idea of promissory legitimacy, defined as 'the legitimacy that political authority gains from the credibility of promises with regard to future outcomes.' Beckert originally articulated the concept within the context of neo-liberal capitalism and its exhausted promises. It has since been applied in other contexts, including international organisations (Robertson, 2022), domestic climate policy (Brodén Gyberg & Lövbrand, 2022), and qualification devices (Jourdain, 2025). We use promissory legitimacy to capture how the legitimacy of green finance is predicated on future-oriented visions, imaginaries and expectations, and their believability.

Relatedly, we ground ourselves in a growing body of work concerned with imaginaries of the future within markets. By its very nature, finance constructs certain temporalities, being predicated on expectations about future value and returns (Beckert, 2016; Tellmann, 2020). Recent work has placed imagined futures centre-stage, arguing that they are integral to the enactment of increasingly speculative, financialised capitalism (Beckert, 2016; Komporozos-Athanasiou, 2022; Leins, 2020). Imagined futures are understood as productive, affecting behaviours and identities, and ultimately manifesting in material arrangements. This literature highlights the role of narratives, expectations and socio-technical devices in the construction of financial imaginaries (Campbell-Verduyn, 2023; Vint, 2019). It also draws attention to the nature of futures constituted through promises. Within this context, Beckert (2016) argues that imagined futures can function as creative spaces for projecting alternative states and relations, thereby facilitating innovation and the materialisation of novel futures (see also Beckert

& Bronk, 2017). Conversely, Bear (2016) proposes a critical political economy of capitalist time, finding 'technologies of imagination' are complicit in generating distinctly capitalist timescapes marked by short-termism and volatility (Bear, 2017; Doganova, 2024). Rather than facilitating new states and relations, imagined futures enact speculative forms of financialised capitalism and thus reproduce rather than transform socioeconomic relations.

A third literature, and one that allows us to bind together concepts of promissory legitimacy and futures, is assemblage. Its utility here is to help us conceptualise the machinic way in which promises are produced. Assemblages are machine-like in that they comprise multiple components which work together to *produce* certain things that have material effects in the world (Thornton, 2020). A multiplicity of human and non-human elements is therefore involved in the production of promises. There is nothing essential about these: different elements may be enrolled at different times, in different places and in different parts of finance. What holds them together is the organising logic of the machine around which different elements of the green finance assemblage coalesce (Nail, 2017, p.25).

Assemblage is also valuable for foregrounding the *desires* that animate the promises of green finance. Deleuze and Guattari (2013) invoke the idea of a 'desiring machine' to capture how assemblages are productive by 'machining' human desires into realities (Buchanan, 2021, p.62). From this perspective, an assemblage approach emphasises the strategic and purposeful arrangement of component elements, and the goals these serve. It also helps us move beyond the idea that green finance is the product of a centralised masterplan by drawing attention to the distributed nature of the machine animated by shared desires.

Finally, assemblage theory offers an ontology of mobility. Assemblages exist in a state of flux. They can cohere (*territorialise*), come apart (*deterritorialise*), and subsequently recombine (*reterritorialise*) into new social forms. Their properties are thus mutable and emergent. Such an understanding is valuable in the present context where we are concerned with the making and re-making of promises, legitimacy and green finance.

Our theoretical argument is grounded in more than a decade of ethnographic and interview-based research across multiple field sites within green finance. Conducted separately and primarily focused on the European context, our projects examined green

bonds, climate-related investor coalitions, disclosure standard-setting, venture capital in clean tech, green central banking, and the development and use of green financial metrics by asset managers and asset owners. Collectively, the authors have conducted more than 300 interviews and 65 observations. Across these settings, a common pattern emerged: despite falling short of aspirational goals, there remained a persistent belief that they could still be realised in the future. This paper seeks to unpack and conceptualise this observation.

3. The promissory machine

Our central thesis is that green finance's resilience over recent decades should be understood as rooted in promises about what finance might deliver in the future. Promises legitimise green finance in the present, even if its material enactments fall short of what is required to fulfil stated ambitions. We invoke the *promissory machine* to conceptualise the functional configuration that sustains the green finance assemblage through the logic of promises. The machine organises the different elements of the assemblage (devices, capital, storylines, etc.), orienting them toward the pursuit of future states. Running through and energising the promissory machine is human desire for specific types of futures. This desire generates the visions, imaginaries, and expectations that constitute the promises of green finance.

Promises are structuring and productive. They are structuring by providing direction and purpose to the promissory machine. They are also productive by enacting manifestations of green finance, whether substantive or symbolic. These enactments are inchoate – partial and unfinished performations of what is being promised. Their incompleteness, in turn, instigates further rounds of activity aimed at advancing or realising the original promise. The promissory machine thus operates in cycles, where the material production of green finance continually gives rise to new or renewed promises. In this way, the machine is self-sustaining. However, its continued operation depends on the ability of the assemblage to credibly address the desires that animate it.

3.1 Promises for the present

Green finance is continually making promises. These take various forms. They can be environmental, asserting that green finance today will contribute to a more sustainable future. Others are economic, suggesting that green investments or loans will secure, or even enhance, future financial returns. Promises vary in their degree of specificity. Some are general and abstract. For example, an investor representative at a recent practitioner panel on 'securing a nature-positive future' stated: 'Nature finance and nature-based solutions are key tools in reversing biodiversity loss, transforming landscapes and value chains, and creating a more climate-resilient economy' (Lombard Odier, 2024). Others assume micro-level, calculative precision, akin to Beckert's (2016) 'fictional expectations.' In an impact investor's promotional materials, financing of clean energy by an 'Africa Go Green Fund' is projected to contribute to reductions of 760,000 tons of carbon dioxide (Calvert Impact, 2024). These economic and environmental promises may invoke different temporalities, ranging from more abstracted distant futures, through to more concrete and specified near futures. Similar to different degrees of substantive precision or generality, the temporal specification can vary from indefinite or vague to precise and concrete, e.g., in the context of claims to finance a 'nature positive future' versus 'halt and reverse nature loss by 2030 against on a 2020 baseline.'

Promises affirm the value and worth of green finance by aligning deferred outputs – that is, environmental benefits and enhanced returns – with existing desires to address planetary harm and generate profit. By offering a compelling vision of the future, promises help to justify the enrolment of environmental concerns into the conventional economic order of financial markets. Yet this future orientation does not render the present irrelevant. To sustain itself, green finance must demonstrate that the material foundations are being put in place, that progress is being made towards promissory goals, and that collective energies are being mobilised. What matters is that green finance today, and the infrastructure around it, must remain 'credible enough' to maintain collective belief that green finance *could* deliver on environmental or economic ambitions.

3.2 The audiences of the promise

Promises are produced, circulated and reproduced for different audiences. These audiences ultimately grant legitimacy to the diversity of activities, practices and policies bracketed under green finance. For civil and state audiences, green finance asserts a promissory legitimacy by signalling a direction of travel, and offering-up vignettes (e.g., investments, participation in collective action initiatives, etc.) that lend credibility to a central narrative: finance is working towards environmental sustainability, even if it is not there yet. For example, Barclays bank outlines how it intends to meet its net zero commitments, including by providing statistics on the amount of 'Sustainable and Transition Financing' it has already provided (Barclays, 2024). Based on promised outcomes, a core ambition is to demonstrate finance's commitment to environmental sustainability, thereby restoring, or at least safeguarding, its social licence.

However, while legitimation by civil society and state audiences remains important for high-profile financial actors exposed to critical publics, our key argument is that the primary audience for promises are market actors themselves. That is, promissory legitimacy has primarily been produced *by* finance *for* finance. To expand beyond its founding ethical niche, green finance has had to justify its instrumental value to mainstream financial actors using conventional financial logics (Clark & Dixon, 2024; Revelli, 2017). In this context, economic promises carry particular weight. Often couched in the language of financially-material sustainability-related risks, financial actors have sought to convince one another – and themselves – that integrating environmental considerations is important for safeguarding or enhancing future profit.

Financial actors are also critical audiences for environmental promises. Marketizing sustainability concerns depends on convincing investors that themed products and services – such as green bonds or impact mutual funds – will contribute meaningfully to environmental goals (van Veelen, 2021). Heightening focus on the credibility of environmental promises is the spectre of greenwashing. As evidenced by a series of cases in recent years, dubious environmental claims risk creating reputational and legal liabilities for financial institutions (Flood, 2003; Müller & Storbeck, 2025). Moreover, values- and purpose-driven professionals are unlikely to commit their labour, energies, and entrepreneurship to a project of green finance they no longer believe in. Doing so would not serve the affective goals of offering-up a sense of fulfilment,

relieving environmental anxieties, or helping to resolve tensions about their continued role in a sector implicated in environmental destruction (Lewis & Juravle, 2010; Paterson & Stripple, 2012; Quorning, 2024).

The ongoing participation of financial actors is therefore essential to the performative sustenance of green finance. These actors bring into being the very instruments, market infrastructure and capital flows which make the promise credible, investible, and a focus for collective efforts. The material enactments of green finance assembled through these dynamics help to reaffirm the legitimacy of the aspirational project.

3.3 Promissory failures and credibility work

However, promises are constantly rehearsed, tested, and eroded. We refer to moments when green finance is subjected to scrutiny, and its forward-facing legitimacy questioned, as *promissory failures*. Such failures arise when material enactments are inconsistent with environmental or economic promises. Examples include DWS – a German asset manager – spuriously relabelling conventional investment funds as ESG (environmental, social and governance) (Tricks, 2022). Another is the relative underperformance of green vs. conventional funds in the wake of the Covid-19 pandemic and invasion of Ukraine.

Promissory failures disorder the coherence of green finance by rupturing the link between the concrete assemblage itself and the desires that animate it. Yet these desires do not simply dissipate. Multiple actors have motives to perpetuate the promises of green finance. They include actors marketing sustainability-themed products and services, such as ESG data vendors (Boiral et al., 2021), through to professionals working in finance, NGO or government roles. Many individuals have staked their careers on the promise of green finance. Many, too, have a need to believe that finance can be re-tooled to ‘fix’ environmental crises.

Driven by this need to sustain the promise, the machine operates to rectify and repair failures which might otherwise cause the green finance assemblage to disassemble. It also operates to demonstrate ongoing progress towards promissory goals to strengthen the credibility of future-oriented claims. This *credibility work* forms an

essential dynamic of the promissory machine and how the assemblage seeks to maintain ongoing growth, diversification, and reach. Credibility work involves enrolling new and/or modifying existing material, discursive and imaginative elements. It involves greater quantification, sophistication, and seeming rigour. The ambition is to restabilise the assemblage – even if temporarily – by restoring the coherence and credibility of the promise through the reconfiguration of elements constituting the assemblage.

4. The productive apparatus of the promissory machine

To illustrate these dynamics, this section introduces three components of the green finance assemblage – products, devices and governance arrangements – involved in the production and sustenance of promises. We conceptualise green finance as an assemblage, with the machine as its organising logic for producing and reproducing promises.

4.1 Products

Central to the promissory legitimacy of green finance are products, meaning financial instruments which consider, or purport to consider, environmental factors. Products form an essential part of the material infrastructure that makes the transformational project of green finance appear real and an investible proposition. They moreover provide an anchor point around which visions of the future – and credible pathways to a green financial system – can be articulated to both civil, state, and market audiences.

Given their status as one of the most prominent exemplars of green finance, green bonds are used here to illustrate the role of products in the production and productivity of promises. Green bonds emulate, and thus closely resemble, conventional bonds (Perkins, 2021). Green exchange traded funds, green mutual funds, and green indexes are similarly grafted onto conventional financial products (Fichtner et al.,

2024). These qualities of familiarity, relatability, and calculability allow mainstream actors to participate in green finance through largely modular, continuity products. Products thus lend credibility to the imaginary that mainstream finance *can* be repurposed to achieve environmental goals.

Investments in green products may only be relatively small and make a limited contribution to solving environmental challenges in the present. Yet what matters is the belief that they are contributing to a broader project which *promises* to do so in the future. Green bonds continue to account for a comparatively small share (<10%) of total bond issuance. Moreover, there remain a dearth of evidence regarding their *system-wide* impacts, including their environmental additionality. Yet this misses the point. Green bonds allow financial market participants to invest in the idea, both financially, cognitively, and imaginatively, that they are taking genuine steps *towards* addressing environmental harms. (Bracking, 2024).

Well-versed theories of change provide the intellectual support for these beliefs. A central narrative articulated by their proponents – such as the Climate Bonds Initiative (CBI), a 'market-making' NGO – is that green bonds not only channel new capital to green projects. They are moreover a financial vehicle which, at scale, holds out the promise of repricing capital: green investment will become cheaper to finance than non-green investments. By foregrounding future-oriented ambitions and positioning green bonds as a means to an end, such imaginaries help to legitimise continued investments in a product whose environmental credentials have been the subject of ongoing debate (Flood, 2022).

Products also lie at the heart of green finance's economic promise. They are the location of revenue generation and extraction, playing a crucial role in a storyline of sustaining or strengthening financial returns. Green bonds have therefore been enthusiastically promoted as a forward-facing, financial 'opportunity'. For investors, green bonds provide new investment opportunities, such as in high-yielding green infrastructure and energy assets in emerging economies (Forrest, 2025). For issuers, green bonds offer the prospect of lowering the costs of financing by exploiting growing investor demand for sustainability-themed projects. The key point is that products help legitimise green finance by embodying the promise of future financial returns or savings. They serve as props for generating 'hype' (Knuth, 2018; Sullivan, 2013).

Another role for products is evidentiary. The credibility of the future-oriented imaginaries depends on offering sufficient 'proof of concept' in the present. It is within this context that confirmatory vignettes, case-studies, and statistics assume particular significance. Iterations of green bonds have therefore been mobilised as success stories to showcase green finance working in-situ. Examples include the IFC's 2011 benchmark bond and Cape Town's 2017 municipal bond. Such exemplars have been mobilised in support of narratives which speak to the future possibilities of green bonds and green finance more generally. For example, the IFC's green bond was used to show that demand for green bonds existed at scale (Monk & Perkins, 2020); while the Cape Town's bond demonstrated how the product could be successfully deployed by municipalities in the Global South to finance climate resilience projects (Neumann, 2023). Selective evidence of a so-called 'greenium' – a price premium paid by investors to acquire green bonds – has also been strategically mobilised by champions of the product. For example, the CBI provided evidence that 32% of green bonds in the first quarter of 2023 achieved a superior pricing for issuers (Harrison, 2023).

Progress and momentum are also evidenced through products. Statistics of market size and growth have emerged as a mainstay of green finance. The story of year-on-year expansion of green bond issuance from 2014 onwards has therefore been frequently (re-)told. It has allowed champions of green bonds, and green finance more generally, to show that green finance is fulfilling expectations. This is important for financial market participants themselves for their continued collective belief in, and commitment to, the project. In the absence of evidence about the system-wide impacts of green finance, growth enters as a convenient proxy for progress.

Products are important sites for credibility work. Criticisms of green bonds' environmental credentials have prompted a range of responses aimed at maintaining faith in their environmental promise. This has involved discursive interventions to single out bonds with dubious credentials as 'bad apples', indicative of inadequate knowledge, experience or guardrails, rather than symptomatic of a generalised shortcoming of the product. Repsol's 2017 bond is a case in point. While critiquing the bond itself, critics took care not to dismiss the possibility of oil & gas companies issuing green bonds in the future. Credibility work has also involved the development of new labels and species of environment and/or sustainability-themed bonds. Efforts to maintain the purity of the 'green' label was a factor in the efforts to institutionalise

transition bonds – intended to raise debt for dirty firms to become less dirty (Bracking et al., 2023). Credibility work has also manfiested in efforts to develop standards and other quality grades with a view to enhancing transparency, accountability and assurance. One of the motivations for developing the Green Bond Principles was to prevent greenwashing which might 'stigmatise' the product category (Perkins, 2021).

4.2 Devices

Assembling and re-assembling green finance depends on an analytical infrastructure of market devices. These range from relatively well-understood standards (Perkins, 2021), to research lacunae such as biodiversity risk assessments (Dempsey, 2013) and climate stress tests (Langley & Morris, 2020; Morris & Collins, 2023). They play an important role in constructing sufficiently credible, robust and calculable imaginaries of green finance – both in relation to environmental and economic promises.

To illustrate how devices manufacture and sustain promissory legitimacy we turn to imaginaries of a low carbon economy and net zero targets. These targets comprise a pledge to reach net zero emissions by a specific date, often accompanied by interim targets and a narrative of how they will be achieved. Their usefulness and legitimacy have become so consensual in finance that most globally significant asset owners, managers and banks have set targets (Martini & Creed, 2025).

Net zero targets embody the tantalising promise of achieving Paris climate goals. In common with many other devices (e.g., standards), they not only, or even primarily, operate to reassure publics of finance's commitment. Targets moreover allow financial actors (e.g., asset managers) to demonstrate to other financial actors (e.g., asset owners) that they plausibly *could* deliver on decarbonisation. We identify three main ways in which net zero targets, and their assessments, manufacture promissory legitimacy for themselves and the wider endeavour of green finance: by suggesting mathematical and scientific rigour, by providing technical fixes to promissory failures, and by resetting time.

Rigour and credibility of net zero targets are signalled by relying on quantitative, model-generated emission pathways and carbon budgets to demonstrate alignment with commonly accepted climate goals, e.g. a 1.5°C or a below 2°C future. Manifestations of

this can be found in constant references to the 'science-based' nature of net zero targets and the promulgation of highly detailed technical guidance by organisations such as the International Investor Group on Climate Change (IIGCC). By importing figures and devices such as climate scenarios or Integrated Assessment Models (IAMs) from the IEA, IPCC and academic institutions, 'green' finance borrows the legitimacy these institutions have in the eyes of both a mainstream finance audience and a climate-concerned public (Borie & Bracking, 2024). The employment of mathematical models and their seeming rigour, objectivity, and accuracy brings with it inherent credibility with a financial mainstream audience accustomed to model-based approaches to assessment and (e)valuation (Déjean et al., 2004).

Complexity also helps to insulate net zero from critique. Reliance on mathematised benchmarking targets using IAMs or multi-layered accounting systems escapes the comprehension and control of any one expert individual, let alone a financial professional or an interested member of the public. Individual targets and their implementation may still be criticised, for example, because of their backloading of mitigation efforts (ShareAction, 2023). The point instead is that the technical and scientific rigour of net zero targets – as a device for achieving medium and long-term climate goals – has helped them retain their promissory legitimacy. Even though current iterations fall short, targets *could* still deliver in the future.

Where controversies cannot be avoided, devices often become the locus of credibility work by providing technical fixes. When the Net Zero Asset Owner Alliance (NZAOA) – the major financial industry association explicitly created to further net zero targets – initially defined the procedures of setting targets, so-called economic intensity measures were proposed (Figure 1). Normalising emissions in this way found favour with many investors because it allows them to easily make comparisons across assets and portfolios. However, the emissions intensity measure also attracted criticism, notably on the grounds that it is detached from the physical realities of climate change. Movements in market prices and portfolio compositions potentially risk concealing important shifts in overall emissions (Fraser & Fiedler, 2023). The NZAOA responded to this critique by incorporating so-called physical intensity measures into its target setting protocol. Such physical intensity measures both respond to investors' desires to compare assets – at least within a single sector – and maintain a mathematical link to physical carbon budgets. Yet it still circumvents limits on absolute GHG emissions and

thus presents an elegant technical fix, temporarily pacifying a dilemma at the heart of capitalism: pursuing infinite growth on a finite planet. In an important sense, critique is mobilised to inform, direct, and narrate progress toward ever more complexity, sophistication, and rigour.

<<INSERT FIGURE 1 ABOUT HERE>>

A further way in which net zero targets maintain their promissory legitimacy is by extending the present through the 'resetting' of time (Collard & Dempsey, 2022). Time is reset in two main ways. The first is through changing the baseline against which progress over time is being measured. For example, an entity may merge with or acquire another, altering its emissions profile thus justifying new carbon budget allowances and targets, as happened when UBS acquired Credit Suisse and subsequently delayed its climate goals (Segal, 2025). A financial institution might alter its emission accounting practices, such as changing denominators in their carbon intensity metrics. Second, the entire measurement approach can be modified, for instance, when an investor switches from a temperature score to a maturity scale to measure its investments' climate credentials.

In both cases, the assessment of progress on net zero targets is effectively reset as past measures are no longer comparable with present ones, nor with future targets. The past becomes a blank page with no history or track record; it becomes the start of a new journey towards a new target; and the future remains a temporally distant place in which the promises of net zero targets *could* still be fulfilled. The identification of broken promises becomes obfuscated, creating an additional layer of technical complexity and protection from the assemblage deterritorialising, thereby ensuring the promissory legitimacy of green finance remains intact.

The development and deployment of a plethora of devices – which allow the environmental and economic promise to be calculated and imagined – demonstrates that green finance is more than a superficial mirage of 'cheap talk'. The core message is that a future green financial system is a realistic proposition, that finance has the tools to evaluate and deliver it, and is working hard to improve these. Devices sustain the coherence of the assemblage by materialising the building blocks of a sophisticated,

calculative infrastructure that renders the idea of a future green financial system plausible.

4.3 Governance

A third component of the promissory machine is a governance infrastructure – comprising the organisational and institutional arrangements through which green finance is curated, steered, and represented. These governance arrangements range from standard setting bodies such as the International Sustainability Standards Board (ISSB), investor networks and coalitions, through to deliberative fora such as UNEP FI Global and Regional Roundtables. Although governance legitimates green finance in many ways, our focus here is on two critical roles played by governance arrangements in sustaining promissory legitimacy: (1) performing seriousness; and (2) evidencing progress.

Seriousness is indicated by lending high-profile names, addresses, logos, and faces to the project of green finance. Their involvement makes green finance tangible by giving it a material presence in the present. Seriousness is also indicated through scale. Initiatives such as Principles for Responsible Investment (PRI, US$128 trillion) Climate Action 100+ (up to US$68), and the Glasgow Financial Alliance for Net Zero (GFANZ, up to US$130 trillion) all foreground their membership size, assets or commitments in their communications. Scale serves as a public marker of collective intent, commitment, and prospective impact. That hundreds of major financial institutions are onboard, working together and building a regulatory infrastructure, lends credibility to the veracity of finance's rhetorical claims.

In representing and embodying green finance, governance arrangements also become primary mechanisms for 'borrowing' legitimacy from authoritative organisations such as the United Nations (e.g., see the UNEP FI convened net-zero alliances) or from state institutions. Enrolling state authority as a mode of credibility work is a recurring mechanism of the promissory machine: where voluntary initiatives fail to address shortcomings, state authority tends to be enrolled. An example is the EU's High Level Expert Group tasked with developing standards for green bonds and

sustainable funds given the inability of private initiatives to manufacture consensus on these issues (Ahlström & Monciardini, 2022).

Governance arrangements also manufacture and sustain promissory legitimacy by evidencing progress. The example of Climate Action 100+ – an investor coalition which engages investee companies on climate change – is instructive. At the heart of the initiative lies an evaluative infrastructure. As well as 'success stories' of engagements with individual companies, Climate Action 100+ documents 'continued progress' through annual updates. Even seeming shortcomings are strategically reframed to bolster the promise. For example, Climate Action 100+ launched a Net Zero Benchmark in 2021, measuring target companies' performance against a set of climate-related ambitions. The Benchmark reveals serious deficiencies (e.g., 'most focus companies are not moving fast enough to align with the goals of the Paris Agreement' (Climate Action 100+, 2023, pg.16). Yet, rather than falsifying promises, these findings are deployed to argue that 'there is much more to do' (Climate Action 100+, 2023, pg.5), and to mobilise, coordinate and re-focus efforts to undertake this work. The value of the initiative, and the promises it makes, are reaffirmed.

Indeed, governance provides green finance professionals with a setting in which they can assure each other that it is sufficient to strive towards rather than to achieve a green or sustainable future, often by drawing on the metaphor of the journey (Archer, 2024). Since governance arrangements facilitate – or at least perform – collective action, this sense of purposeful progress also suggests change beyond isolated 'green' product launches or metric developments: it promises a (financial) system-wide development, thus adding to the credibility of the promissory regime which – in the form of governance – matches the systemic nature of the problem it seeks to address.

Governance also sustains momentum by constant institutional expansion, building, and diversification. Existing initiatives are elaborated, new ones created, and green finance expands into novel domains. An example is the growing number of initiatives related to nature and biodiversity (e.g., Nature Action 100), often modelled closely on earlier climate-focused institutions. With 'green' financial professionals building their careers, their expertise, as well as their personal convictions around promises, they themselves become an amplifying force of credibility work. With the stakes – professionally and personally – for them increasing the longer and more involved they are, the more invested they must become in maintaining the promise's

credibility. Hence, green financial professionals often expand their engagement in governance initiatives, or even set up their own ones.

A case in point is the constantly evolving disclosure regime and, prominently, the creation of the Taskforce on Climate-related Financial Disclosures (TCFD). The Taskforce was a reaction to the lack of 'clear, comparable and consistent information' in financial markets (TCFD, 2017). This jeopardised a central promissory thesis: by considering information on climate-related risks and opportunities, investors could safeguard or enhance future economic returns, as well as more efficiently steer capital toward climate goals (Christophers, 2017). By developing a global disclosure framework, the TCFD sought to keep this promise in sight. It soon became clear that the TCFD would remain chiefly focused on risk management and therefore in service of economic desires. This prompted some members of the TCFD's leadership – Mark Carney, Mary Shapiro, and Curtis Ravenel – to focus more on environmental ambitions. The result was the GFANZ, a private-sector-led initiative which sought to 'mobilise the trillions of dollars necessary to build a global zero emissions economy and deliver the goals of the Paris Agreement' (UN Climate Change, 2021). In the meantime, a combination of inconsistent TCFD-aligned reporting and frictions created by competing reporting standards triggered the creation of yet another disclosure governance initiative, the International Sustainability Standards Board (ISSB). A sister body to the influential International Accounting Standards Board (IASB), the ISSB was tasked with devising a single set of sustainability standards 'to meet investors' needs' (IFRS, 2021). Underlying the ISSB was the idea that, if only 'high-quality, transparent and globally comparable sustainability disclosures' were available, then investors would be able to properly assess risks and opportunities (Chair of the IFRS Foundation Trustees in O'Dwyer, 2021). The economic promise could be fulfilled. This promissory rationality also illustrates one of the key mechanisms of the machine: the recurring reporting cycles and growing sophistication from cycle to cycle – whether on the side of reporting entities or users of disclosed data – projects a sense of progress. At the same time, it requires constant work, keeping 'green' finance professionals busy which in turn fuels the promissory legitimacy of green finance: where hard work is being done and technical sophistication increases, results will follow. The disclosure regime hence epitomises the promissory nature of green finance.

5. Sustaining the unsustainable through promises

The promissory machine functions through the churn of promises – renewing, reinvigorating and strengthening these through credibility work. One consequence is that green finance is never static, but in perpetual motion as it evolves, adapts and responds. Importantly, the emergent nature of the green finance assemblage allows it to resist critique. It is never fully made, but is always in the making, with the timelines of completion either never settled, ill-defined, or reset. Final judgement can always be deferred.

As evidenced on numerous occasions, promissory failures may occur. Yet the distributed nature of finance allows it to absorb such blows. Green finance is an assemblage of multiple actors, asset classes, and instruments, territorialising differently across time and space. A corollary is that negative incidents, controversies, and broken promises in one area of green finance do not always spillover into others. For example, venture capital losses in 2000s-era clean tech did little to dampen enthusiasm for environment-themed investments in public equities. Similarly, controversies over green bonds financing 'clean coal' in China did not deter investors or issuers in other jurisdictions (Reuters, 2017). The multiplicity of the green finance assemblage reduces contagion across categories and space.

The distributed nature of green finance also means that it is difficult to definitively evaluate the system-wide, environmental promise. The dominant evaluative infrastructure is not designed to measure or track *aggregate* environmental outcomes generated by green finance. Much of it is configured for the micro-level, with the aim of enabling individual financial market participants to evaluate – *ex-ante* or *ex-post* – the 'greenness' of specific transactions, products, or other interventions and whether it is sufficient to meet their requirements (Perkins, 2021). To take one example: green bond second opinions (ex-ante) and reporting (ex post) provide insights into what green bonds are financing and data on their environment-related impact in practice (e.g., tonnes of GHG mitigated). The result: individual actors may understand whether their own financing fulfilled its promised impact. Yet, in the absence of a centralised ledger which collates these disaggregated contributions, the system-wide impact of green finance on public environmental goals remains opaque.

Another reason why the veracity of promises evades ultimate judgement is credibility work. This has contributed to a proliferation of financing instruments, market devices, and governance initiatives, themselves embedded in the dominant logics, configurations and structures of financialised capitalism. Their presence lends plausibility to the idea that the essential tools and infrastructure are being built to realise a green financial future. Yet multiplicity means that that the green finance assemblage has come to resemble a 'hall of mirrors' – a space where it is difficult to distinguish truth from illusion. Even deeply embedded practitioners do not always understand whether specific financing instruments, market devices, or governance initiatives 'work' as intended, and their ongoing enrolment may be something of a faith-based endeavour. The effect of multiplicity is to make it harder to write-off altogether the idea that environmental promises might not materialise. The future remains open.

Credibility work also obscures through complexification. On the one hand, more sophisticated calculative devices – data, methodologies and tools – have enhanced the technical capacity to evaluate promissory claims. The standardisation of reporting obligations under governance initiatives such as Climate Action 100+means that it is increasingly feasible to evaluate investor's net zero commitments. On the other hand, scientisation and technologization may render evaluations both more opaque and contestable. 'Science-based' assessments of financial or corporate actors' alignment with Paris climate goals are a case in point. Evaluations by organisations such as Transition Pathway Initiative (TPI) and Science-Based Targets Initiative (SBTi) are intended to offer rigorous, authoritative insights into the credibility of climate targets. Yet the very complexity of these assessments makes it challenging for all but a small number of actors to fully understand them – let alone dispute their veracity. For those that do (or purport to do so), they provide ample opportunities for actors to push back against unfavourable evaluations which undermine their promissory claims. Assumptions can be challenged, methodologies unpicked, and subjective judgements laid bare.

Propelled by the desires of legitimacy-granting audiences, the promissory machine keeps the promise alive through the ongoing (re-)emergence of the green finance assemblage. It is always 'under construction', building, expanding and complexifying through products, devices and governance arrangements. Yet, rather than transforming finance, the effect of the machine is to perpetuate and extend it.

Destabilising questions about whether the fundamental logics and structures of financialised capitalism are remotely compatible with the requirements of planetary sustainability are kept at bay. By (re)casting sustainability as an aspirational project, and by keeping finance in perpetual motion, the promissory machine simultaneously distracts (i.e., attention away from ongoing 'bads'), inspires (i.e., giving people virtuous purpose), and defers (i.e., judgement about whether green finance can actually deliver). A green, profitable future always remains possible around a corner yet to be turned. Meanwhile, the dominant institutions of financialised capitalism implicated in environmental destruction remain largely intact, if not emboldened by their foray into green finance. Entrenched patterns of accumulation, inequality and extraction continue to be reproduced, extending current arrangements while foreclosing opportunities for more just and transformative socio-ecological restructuring (Gabor, 2021; Tunn et al., 2025).

6. Conclusions and contributions

Despite ongoing critique and recurring promissory failures, green finance has proved remarkably resilient. Our argument is that this resilience rests on a specific temporality, one in which promised futures, rather than the past or present, serve as the ultimate reference point for evaluating green finance's legitimacy. We suggest that the constant production of promissory legitimacy (Beckert, 2020) is best understood as the machine-like enactment of desires for both environmental protection and financial returns. Promises are conjured, renewed, and reformulated in different versions and locations in a process marked by continual flux, distribution, and complexification. While promissory legitimacy captures the future orientation of green finance's maintenance, the machine provides the analytical vocabulary to characterise the volatile yet structured formations through which this promissory temporal regime is (re-)produced. The machine concept allows us to link the notion of a disembodied promise to the socio-materiality of an assemblage and thus concretises the promise's structural functionality described by Beckert (2020). We thus not only contribute to the literature on green finance by moving from the *attainment* to the *maintenance* of legitimacy (Dal Maso,

2024; van Veelen, 2021). Moreover, we move from a focus on *individual* product markets (Bracking, 2024), devices (Folkers, 2024) or organisation types (Thiemann et al., 2023) toward a more *integrated* view of the relational formations within green finance and their productive capacities. Such a perspective, in turn, offers a basis for critically assessing the potential and limitations of relying on private finance to pursue environmental goals.

Our analysis of the promissory machine challenges propositions in the greenwashing literature (Montgomery et al., 2024). While it is commonly assumed that greenwashing functions by deceiving others such as publics (Cho et al., 2018; Golka, 2023), we suggest that green finance is primarily configured to deceive itself (Newig, 2007). After all, the expansion of green financial practices predominantly takes place within and across financial institutions, rendering mainstream financial actors the primary audience in whose eyes green finance needs to legitimise itself. Furthermore, akin to the functionality of ignorance (Davies & McGoey, 2016), the collective refusal to reject green finance's promises is productive. It allows for the continued emotional gratification of practitioners themselves (García-Lamarca & Ullström, 2022; Heeb et al., 2022; Watt, 2021) associated with financial practices that do not yield the desired outcomes or are not grounded in robust environmental science.

By foregrounding the self-referentiality of green finance's claims, and how growing financial, professional and emotional stakes feed a need to believe in the promise, this paper offers a distinctive problem diagnosis. The greenwashing critique suggests that promissory failures can be met with the deterrence of bad-faith actors and transparency measures. We argue instead that financial professionals' beliefs in green finance's promises need to be challenged – both by themselves and others – to close the gap between current environmental practices and claims. In addition, while the concept of greenwashing suggests clarity regarding the hollow or broken nature of a promise, we show how the constant transformation and complexification of green finance structurally evade any definitive evaluation. This allows green finance to avoid a greenwashing diagnosis as a whole.

Lastly, we build on and contribute to an understanding of markets and economies centred on temporality and specifically futures (Bear, 2020; Doganova, 2024; Tellmann, 2020). Beckert (2016) and others (e.g., Emirbayer & Mische, 1998; Jasanoff & and Kim, 2013; Suckert, 2022) highlight the productive potential of futures

to bring about what is not yet there by means of anticipation and expectations. However, we show how promissory futures might contain transformation, rather than performatively produce it. Efforts deployed to achieve change are not aimed at the realisation of a desired future but are rather highly self-referential by constantly re-making the existing, i.e., the current role and state of green finance (Archer, 2024; Fichtner et al., 2024; Perkins, 2021). Promissory futures can thus serve as a temporal repository for the enactment of imagined worlds, continuously containing more fundamental change to a never realised future and thus extending the present indefinitely.

The reproduction of capitalist modes of accumulation by this promissory temporal mechanism is not achieved directly, however. Unlike the collapsing of futures into the near-term characterising the time techniques identified by Bear (2016) or the effective devaluation of futures via means of discounting examined by Doganova (2024), the future is left almost intact as a promised space for projections of desires and hopes. While speculative in nature, the promissory machine does therefore not neatly map onto the concept of speculation reinvigorated and defined by Bear (2020, p.3) as 'future-oriented affective, physical and intellectual labour that aims to accumulate capital'. The former half of this definition fits the psychological investedness of green finance professionals, the physical infrastructure of devices, products, and governance arrangements, and the constant endeavour of enhancing technical sophistication which are hallmarks of the promissory machine. The machine's aim is not, however, the immediate and direct accumulation of capital. Instead, as this paper shows, by legitimising a version of finance as such, it might serve a more basic function of systemic maintenance of a given mode of accumulation, i.e., involving the financialization and assetization of nature (Ouma et al., 2018).

Our contribution also enables a reinterpretation of recent claims about the so-called 'ESG backlash'. Developments such as the departure of asset managers from climate-focused coalitions should not be read as signalling green finance's demise. Instead, they can be interpreted as forms of credibility work. We thus depart from making ex ante assumptions that the promises of green finance are exhausted, drawing attention to how these promises are reformatted and re-expressed in new ways. For instance, exiting climate-focused coalitions has allowed asset managers to re-articulate their ongoing commitment to climate action, whilst managing critique originating in

Republican-run US geographies. It has been accompanied by efforts to increasingly frame the promise in economic terms, doubling down on the alignment of green finance and maximising future financial returns. This new emerging *gestalt* of green finance and its promises needs to be analysed to better understand its role in mediating between an escalating ecological crisis and financialised capitalism. After all, the promises of neoliberalism have been deemed exhausted before (Beckert, 2020), only to be reborn in new forms (Slobodian, 2025).

Figure 1. Absolute vs. intensity carbon metrics

Formula: Weighted by EV	Formula: Carbon Intensity by EV
$\sum_{i=1}^{n}\left(\frac{I_i}{EV_i}\times C_i\right)$	$\frac{\Sigma_{i=1}^{n}\left(\frac{C_i}{EV_i}\times I_i\right)}{\Sigma_{i=1}^{n} I_i}$
Weighted by Cap:	**Carbon Intensity by Revenues**
$\sum_{i=1}^{n}\left(\frac{I_i}{M_i}\times C_i\right)$	$\frac{\Sigma_{i=1}^{n}\left(\frac{C_i}{R_i}\times I_i\right)}{\Sigma_{i=1}^{n} I_i}$
I: Current value of investment in issuer i EV: Enterprise Value of issuer i M: Market Capitalisation of issuer i C: Carbon emissions of issuer i Other initiatives which are utilising similar metrics:[41] TCFD, PCAF	I: Current value of investment in issuer i EV: Enterprise Value of issuer i R: Annual revenues of issuer i C: Carbon emissions of issuer i Other initiatives which are utilising similar metrics: European Union Financial Supervisory Authorities (EBA, ESMA, EIOPA, PCAF and TCFD).

Source: UNEP (2022, p.39)

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