



Publics and counter-publics of net-zero

Jose Maria Valenzuela^{*}, Javier Lezaun

Institute for Science, Innovation and Society (InSIS), University of Oxford, UK

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ABSTRACT

The proliferation of pledges to reach net-zero emissions has revealed a wide range of understandings of what such a pledge entails. The lack of international standards to define decarbonisation pathways and the many kinds of speculative offsets available for net-zero calculations have generated a multiplication of public commitments not tethered to any specific mechanism of accountability. Many have criticised this state of affairs as a governance vacuum allowing extravagant forms of ‘greenwashing,’ with corporations and countries asserting ostensibly ambitious goals without adopting verifiable instruments for their delivery. This paper addresses the situation from a slightly different perspective, exploring instead how net-zero pledges create new climate publics and counter-publics. Drawing on three case studies (UK national net-zero policy, the Race to Zero campaign, and the Science Based Targets Initiative), and informed by a pragmatist understanding of ‘public’ and ‘public formation,’ we examine how the adoption of a formal but ambiguous target leads to a collective consideration of consequences, thus expanding the range of actors engaged in disputes over alternative climate futures.

1. Introduction

A net-zero pledge is a promise to achieve a future state of affairs in which anthropogenic emissions of greenhouse gases will be “balanced” by an equivalent amount of greenhouse gas removals. The scientific understanding that the cumulative level of CO₂ emissions is the dominant factor in global warming has led to a shift in international climate policy towards this end-state, most notably through the adoption in the Paris Agreement of a commitment “to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century” so as to limit the increase in the global average temperature to 1.5 °C above pre-industrial levels (UNFCCC, 2015: Art. 4.1). Net-zero has since become a hegemonic concept in climate policy, at least in OECD countries, with dozens of governments and thousands of corporations declaring their intention to reach net-zero emissions by a certain point around the middle of the century (Allen et al., 2022).

Beyond a general commitment to “balancing” emissions and removals, there is great heterogeneity in how actors define net-zero and in the structure of their commitments (Hans et al., 2022). In virtually all instances, however, a net-zero pledge is a forward-looking statement that identifies a deadline for achieving ‘climate neutral’ status, and charts a more or less detailed path for reaching that goal. These statements are generated within concrete governance arrangements and are mediated by the tools available at any given moment to represent economic, technological, and climatic futures. Pledges are thus promissory acts with material consequences to the extent that they serve as blueprints to reorganise social, political and economic life. They are an example of what Jens Beckett (2016) calls ‘fictional expectations,’ projections of a future state of affairs that serve to reduce uncertainty in the present by orienting actors

^{*} Correspondence to: Institute for Science, Innovation and Society (InSIS), 64 Banbury, Oxford OX2 6PN, UK.
E-mail address: jose.valenzuela@insis.ox.ac.uk (J.M. Valenzuela).

towards a specific, if prospective and rarely fully articulated, end-in-view (cf. Dewey, 1922, 224–226).

The rapid proliferation of net-zero pledges has led to multiple efforts to regulate, govern, and prescribe their form and scope (Green & Hale, 2021). These efforts tend to focus on ensuring a degree of coherence between an actor's self-declared ambitions and the climate stabilisation goals set in the Paris Agreement, and on specifying a set of actions that would ensure the fulfilment of those ambitions. A net-zero governance arrangement might for example demand a sequencing of the pledge into short-term and long-term emissions reduction goals, the specification of separate targets for emissions reductions and "like-for-like" greenhouse gas removals, or a strict definition of the acceptable uses of offsets (e.g. Rogelj et al., 2021; Smith, 2021; Fankhauser et al., 2022). Governance initiatives are generally oriented towards enhancing the "quality" or "integrity" of a pledge (HLEG, 2022), and tend to be technocratic to the extent that they entrench the role of expert opinion and numerical quantification in the validation of pledges.

Our approach to net-zero governance in this article is somewhat different. We are interested in how the expanding universe of net-zero pledges changes the field of climate politics by giving form to new forms of antagonism. From our perspective, the sprawling set of controversies over net-zero – the multiplication of pledges and the intensification of debate over their meaning and validity – speaks more to the potential of the concept to open up new spaces of debate and public formation than to its obvious limitations as an instrument for the auditing of climate action. The ambiguities built into the very concept of net-zero – especially over what "balancing" emissions and removals means in practice – combined with the power of an explicit commitment to achieve such a balance by a specific date, draw a variety of new actors into the fray of climate politics and create fresh opportunities for public accountability. This public potential of net-zero depends, however, on the mechanisms used to convert fictional expectations into plausible and legitimate futures.

2. A pragmatist lens to publics and public-formation

To understand how a pledge can trigger new constellations of climate publics, we draw on a pragmatist understanding of publics and their formation. In *The Public and Its Problems*, John Dewey (1927) defined a public as a form of political association brought into being by the recognition or anticipation of collective consequences. "[T]he public," Dewey argued, "consists of all those who are affected by the indirect consequences of human action, to such an extent that it is deemed necessary to have those consequences systematically cared for" (Dewey, 1927, 15). As Noortje Marres puts it, a public "comes about when actors are implicated in a particular distribution of problematic effects" (Marres, 2012; 43), and this implication cannot be governed through existing institutional arrangements or administrative routines. To quote Walter Lippmann: "The hardest problems are problems which institutions cannot handle. They are the public's problems" (Lippmann, 1927: 121 cited by Marres, 2005). Rather than providing a rationale for expanding the jurisdiction of technical experts, "the emergence of a strange, unfamiliar, complex issue... is an enabling condition for democratic politics" (Marres, 2005). "Problems," as Andrew Barry puts it, "generate the demand for forms of democratic debate and engagement that will invariably come to transcend given institutional and procedural settings" (Barry, 2021: 99).

Net-zero can be seen as such a "problem" or "issue." The concept emerged from an evolving scientific understanding of the drivers of global warming, but was transposed into policy before concrete institutional arrangements could be created to specify its practical meaning. It is best seen as a 'meta-concept,' to borrow Christopher Ansell's term: a higher-order vision that is intended to guide action but does not define specific local practices. Meta-concepts, Ansell notes, have directional force in that "they set up an attraction towards some ideal state," but do not prescribe a particular path to reach that goal (Ansell, 2011: 50). They express a "soft teleology" that orients actors towards a particular future but allows them to interpret that future differently, depending on their problems, contexts, and ends-in-views. Meta-concepts like net-zero are powerful, as Ansell notes, "because publics can form around them" (Ansell, 2011: 47), since they attract actors without compelling them to a specific course of action, and thus animate processes of reflexive experimentation to spell out their meaning (Ansell and Bartenberger, 2016).

As a meta-concept, net-zero combines two features that greatly expand the range of imagined climate futures: it extends anticipation to mid-century time horizons, and it incorporates greenhouse gas removals as a core component of climate action. A net-zero future is compatible with an infinite diversity of empirical worlds, because the end-state can accommodate multiple and deeply conflicting understandings of the urgency of "zero" (by how much should we reduce greenhouse gas emissions by mid-century), and very different approaches to the integrity of "net" (what form and scale of greenhouse gas removal will be necessary to balance residual emissions) (see Fankhauser et al., 2022). A formal declaration of intent to achieve net-zero emissions by a specific time thus leads actors to try to figure out and make explicit the full range of consequences – for themselves and for others – of pursuing that goal. The sheer proliferation of pledges means that these implications reach far across geographies and deep within societies, bearing on all sectors of private and public life (Keyßer & Lenzen, 2021).

These efforts to characterise consequences rely on anticipatory devices, special instrumentalities dedicated to charting pathways compatible with climate stabilisation goals (Beck and Mahony, 2018). In conjuring credible futures, these devices are constitutive of climate action choices. As McLaren and Markusson note (2020), the historical evolution of the international climate governance regime shows a constant interplay between the tools used to represent plausible climate futures and the goals adopted by that regime. The emphasis of the Kyoto Protocol on emissions reductions, for example, can only be understood in relation to the rise of Integrated Assessment Models and their ability to define lower and higher bounds of emissions compatible with safe levels of climate change. Similarly, the development of coupled socio-technical pathways and Earth System Models was a crucial precondition for the focus of the Paris Agreement on temperature outcomes (see also van Beek et al., 2020).

As the privileged instrumentality of the international climate policy regime, modelling often serves to narrow down the scope of public formation. Most governance processes use models and simulations as coordination devices to materialise a preferred future, generally defined in technocratic terms. IPCC imaginaries of net-zero, for example, hinge on assumptions about future technological developments – specifically, the ability to quickly scale up greenhouse gas removal capabilities (Beck and Mahony, 2018; Braunreiter

et al., 2021). Futures that sit less comfortably with core institutional assumptions – a rapid phase-out of fossil fuels, for example, or planning for degrowth – are rarely incorporated into the official exercises in anticipation. Yet if anticipatory devices can constrain the imagination of plausible futures, they can also expand it.

In what follows, we illustrate our argument with three salient examples of contemporary net-zero governance. The first is the processes triggered in the UK by the adoption of a legally binding commitment to achieve net-zero emissions by 2050. The second case is the best known mechanism of international coordination for net-zero pledges by non-state actors, the UNFCCC's Race to Zero (RtZ) campaign. The third example is the Science-Based Targets Initiative (SBTi), a highly influential private standard-setting effort. These three examples are themselves interrelated. RtZ was promoted by the UK Government-designated Climate Champion between 2019 and 2022, and SBTi is part of RtZ. This close alignment signals their partial representativeness, and by extension a limitation in the empirical scope of this article. RtZ and SBTi have made only limited in-roads outside high-income economies. Our argument about the potential of net-zero governance to reshape climate politics is thus largely limited to the conditions of developed liberal democracies.

3. Net-zero governance in practice

3.1. National targets and their discontents: UK's net zero ambition

Our first case is an example of national net-zero governance. In 2019, the UK Parliament amended the Climate Change Act to set the target of achieving net-zero emissions by 2050, making the UK the first country in the world to have a legally binding obligation to achieve a balance of emissions and removals by mid-century. The governance of this new target relied on the institutional mechanisms created by the 2008 Climate Change Act. That Act mandated the Government to set legally binding "carbon budgets" defining a limit to the amount of greenhouse gases that could be emitted in the UK over a five-year period. It also established the Climate Change Committee (CCC), a non-departmental public body with the power to advise and evaluate governmental climate action. CCC issues regular "progress reports" on the UK Government's climate efforts, including via direct communication with the UK Parliaments and Assemblies. Its May 2019 recommendation to adopt a net-zero target had paved the way for the Conservative Government's decision to enshrine that goal in law (CCC, 2019).

Not long after the adoption of the net-zero target, CCC began to voice concerns over the slow pace of policy action. In its 2020 Progress Report to the UK Parliament, it indicated that the initiatives announced by the Government "do not yet measure up to meet the size of the Net Zero challenge" (CCC, 2020: 13). This view, expressed in multiple public communications, helped coalesce parliamentary pressure on the Government to act with greater urgency. New coalitions emerged to advance this agenda, such as the Net Zero All Party Parliamentary Group, a coalition of Members of Parliament (MPs) and Peers from all parties pressing the Government "to accelerate policy change" towards the net-zero target.

When it adopted the net-zero target in 2019, the Government had promised a full and detailed Net Zero Strategy to flesh out an agenda for achieving this goal. This document was published in October 2021. Titled *Build Back Greener*, it advanced several concrete commitments, including the full decarbonisation of the UK's electricity system by 2035, the phasing out of petrol and diesel vehicles by 2030, and significant investment to support low-emissions homes. The Government calculated that these policies would achieve a significant reduction of emissions, but would still leave between 75 and 81MtCO₂e of GHG to be removed annually from the atmosphere in order to balance remaining emissions by 2050. In its review of *Build Back Greener*, the CCC welcomed its comprehensiveness but again stressed the lack of delivery mechanisms or concrete implementation pathways (CCC, 2021). In particular, the Committee highlighted the absence of a decarbonisation strategy for agriculture and land use, and the lack of progress in establishing the so-called 'Net Zero Test' – an administrative mechanism that would assess whether a policy and planning decision was "consistent" with reaching net-zero emissions by 2050.

The publication of the Government's strategy did not allay public criticism over the pace of policy action. Instead, it created a more precise target for public mobilization. Perhaps the most striking example was the case brought by several environmental campaign organisations to the UK High Court to request a judicial review of the strategy. In their petitions, the claimants argued that *Build Back Better* showed the Government had failed its obligations under the Climate Change Act to adequately prepare and report on policies for meeting carbon budgets (section 13 and 14 of the Act). In 2022, the High Court ruled in the claimants' favour and found the Government in breach of both sections of the Act.

This landmark case revolved around the question of whether the Government had legally sufficient information when it adopted its Net Zero Strategy, and whether Parliament and the public at large were in a position to conduct a proper evaluation of it. The High Court found that when it published *Build Back Greener* the Government had not had a detailed breakdown of the emissions reductions that would be achieved by each individual policy, and thus had issued a strategy without an adequate understanding of the risks to its delivery. During the hearings, it was also discovered that the policies included in the strategy would add up to only 95 % of the reductions needed to meet the sixth carbon budget (2033–2037), and that this fact had been omitted in the published document, thus preventing Parliament from performing its oversight function. In the High Court's view, these actions represented breaches of the Government's obligations under the Climate Change Act. In reaching this conclusion, the Court drew extensively on the CCC's repeated assessment that *Build Back Greener* lacked adequate, individually quantified policies.

The case exemplified how a target can be translated into a mechanism of public accountability via national legislation and the attendant judicial review process. The High Court used an existing administrative rule – the Government's obligation to provide detailed information about policies to meet the goals of the sixth carbon budget (2033–2037) – to evaluate the adequacy of the actions adopted to meet a longer-term target (net zero emissions by 2050). The key question before the Court was whether the policies announced by the Government had sufficient *specificity* to allow a reasoned public assessment of their merits and of the risks to their

delivery.

The question of specificity stands here in a complex relationship to *uncertainty*. The Government acknowledged different forms of uncertainty in the pathways to net-zero identified in its strategy. In relation to the carbon budgets, for example, *Build Back Greener* offered a set of ranges for emissions reductions in different sectors between 2020 and 2037. To flesh out possible trajectories to net-zero emissions by 2050, the strategy presented three alternative scenarios: High Electrification; High Resource; High Innovation. These scenarios had been formulated “in consultation with internal experts,” but were produced primarily through the UK TIMES Model, a least-cost optimisation energy system model developed by academic researchers and the Government’s Department of Business, Energy and Industrial Strategy (BEIS).

These three scenarios mobilised the language of uncertainty, but only in relation to technological dimensions of the problem. As the Government pointed out: “The exact technology and energy mix in 2050 cannot be known now, and our path to net zero will respond to the innovation and adoption of new technologies over time” (H.M. Government, 2021: 68). Yet despite this acknowledgement of uncertainty, the scenarios achieved a remarkable narrowing down of options. This is best seen in relation to the expected scale of “engineered” greenhouse gas removals. The sixth carbon budget assumed a range of removals between 15 and 44 MtCO₂e per year by 2037. In contrast, the net-zero strategy anticipated that by 2050 engineered removals would amount to between 75 and 81 MtCO₂e per year. This much smaller uncertainty range was achieved by assuming that, by 2050, “technological” forms of removal (direct air capture and bioenergy with carbon capture and storage) would be operating under fewer physical and economic constraints.

Other examples of scenarios in UK net-zero policy suggest alternative ways of using these anticipatory devices. Before *Build Back Greener* was published, the Electricity System Operator began to incorporate a net-zero emissions target into its Future Energy Scenarios (FES). These projections describe alternative infrastructure systems that could deliver net-zero energy by 2050, and were developed through consultations with a broad range of stakeholders within the energy sector. In practice, they served to institutionalise the engagement of a diverse set of actors in discussions about the consequences of different pathways to net-zero. These discussions often acquired a significant degree of specificity – ranging from how ports on the South Coast will become energy hubs to the implications of siting in Shetland renewable energy infrastructures capable of producing fourteen times that territory’s energy needs (to use two examples from the 2022 consultation; ESO, 2022).

While the Electricity System Operator’s scenarios enable actors to deliberate on plausible and fairly open-ended net-zero futures, the publication of the Government’s strategy helped sharpen the lines of conflict on net-zero in national politics. The most visible fractures were within the Government’s own Parliamentary group, with different factions within the Conservative Party advancing opposing interpretations of net-zero and its consequences. In January 2022, the Net Zero Support group was created “to demonstrate and maintain Conservative support for net-zero carbon emissions and policies needed to deliver this.” Its leader, Chris Skidmore (who in 2019 had signed the 2050 net-zero target into law in his capacity as Energy Minister), conducted an official review of the Government’s strategy. The resulting report, *Mission Zero*, made the economic case for net-zero as “the growth opportunity of the 21st century,” emphasising the role of “green technologies” (including greenhouse gas removal) as a key area of international competition in which the UK should play a leading role (Skidmore, 2023).

At the other end of the (Tory) spectrum, Conservative MPs critical of net-zero coalesced around the Net Zero Scrutiny Group. Through speeches in Parliament and coverage in sympathetic media outlets, this group articulated a broad repudiation of net-zero as essentially “anti-growth.” Most fully expressed in Ross Clark’s book *Not Zero: How an Irrational Target Will Impoverish You, Help China (and Won’t Even Save the Planet)*, this position criticizes the UK’s net-zero strategy for sacrificing national prosperity, relying on highly speculative, unproven technologies (for greenhouse gas removal, for example) while depriving the country of the economic benefits of fossil fuels.

Increasingly, public debate in Parliament and national media has fixated on the political significance of the target itself as a proxy for competing imaginaries of post-Brexit Britain, rather than on the articulation and discussion of alternative climate policies. Under Prime Minister Sunak, the Government has moved to derogate or postpone several key net-zero commitments, including the phasing out of petrol and diesel cars by 2030. “We have stumbled into a consensus about the future of our country that nobody seems to be happy with,” Sunak declared in September 2023. For many in the Conservative Party, net-zero has come to represent another divisive issue in a set of ‘culture wars’ that, they hope, could render an electoral advantage in the 2024 general election.

The ultimate effect of this dynamic has been to reduce net-zero politics to a binary choice, in favour or against the target, preempting the more diverse and pluralistic range of publics that emerge when the potential consequences of individual policies are opened up for participatory anticipation. In decrying a false “consensus” and promising “more accountability from elected representatives and more transparency for the British public,” Sunak was effectively describing the shortcomings of the policy process the UK Government set in motion in 2019, and its failure to translate an ambitious climate action target into new opportunities for institutional innovation and political debate.

3.2. Carrot & stick : the Race to Zero campaign

Our second example is the UNFCCC Race to Zero campaign (RtZ), the main international coordination mechanism for net-zero target setting by non-state actors. RtZ was established in 2020 by the Climate Change High-Level Champions, an initiative led by two individuals elected by the present and forthcoming president of the UNFCCC Conference of the Parties (COP) – Chile and the UK at the time of its launch.

In specialised business media, RtZ is often described as both a campaign and a standard-setting body. It is definitely the first and only partially the latter. It seeks to recruit organisations into a broad-based effort towards global net-zero emissions, and its fundamental mission is to define the criteria for membership in this campaign. These criteria, formulated with the help of an Expert Peer

Review Group, comprise a set of procedural principles – or meta-criteria, in RtZ parlance – to determine whether a candidate can be considered to be at the “starting line” of the race towards net-zero, absolute zero or net negative emissions. Known as the Five ‘P’s (pledge, plan, proceed, publish, persuade), these criteria describe high-level organisational activities. For example: “Pledge at the head-of-organisation level to reach (net) zero in the 2040s or sooner, or by mid-century at the latest, in line with global efforts to limit warming to 1.5 °C.” RtZ provides an Interpretation Guide and a Lexicon to clarify the meaning and implications of these criteria. Agreeing to pledge, plan, proceed, publish and persuade does not mean that the actor in question is in track to reach net-zero by a declared date, only that it “has begun the process” of getting there.

RtZ has served as a test bed to develop a definition of net-zero applicable to individual actors – something that the IPCC, focused on net zero as a global target, has not done. According to the RtZ Lexicon, an actor can be said to have reached net-zero when it “reduces its emissions following science-based pathways, with any remaining GHG emissions attributable to that actor being fully neutralised by like-for-like removals (e.g. permanent removals for fossil carbon emissions) exclusively claimed by that actor, either within the value chain or through the purchase of valid offset credits” (RtZ, 2021).

This definition opens a number of areas of contention. What counts as a “science-based” pathway? What constitutes a “like-for-like” removal? Who decides whether a particular kind of offset credit is “valid”? RtZ provides no answer to these questions, which are tackled instead by standard-setting initiatives like the Science-Based Targets Initiative (discussed further below), or B Corp Climate Collective, both of which offered certification schemes for climate change mitigation plans before RtZ came along. RtZ has nudged these and other private initiatives to develop certification schemes for net-zero pledges within the umbrella of the campaign.

RtZ has avoided developing its own scenarios to flesh out plausible net-zero futures, relying instead on IPCC research for that purpose, and delegating the choice of technical instrument to the actors and initiatives that subscribe to its campaign. However, the process of updating and reformulating its own membership criteria has served to elucidate the potential implications of net-zero pledges.

A salient example of the resulting dynamics is the evolving relationship between RtZ and the financial industry, as represented by the Glasgow Financial Alliance for Net Zero (GFANZ). Launched at COP26 and co-chaired by Mark Carney and Michael Bloomberg, GFANZ was created to “connect the financial community to the Race to Zero campaign.” It includes both individual companies and sector-specific business coalitions, such as the Net Zero Asset Managers Initiative, the Net Zero Banking Alliance, or the Net-Zero Insurance Alliance. Less than a year after its launch, more than 450 finance companies managing \$130tn of assets had signed up to this pledge. Their affiliation with GFANZ required an “alignment” of their investment and lending practices with RtZ criteria.

In 2021 and 2022, RtZ conducted several consultations with experts and civil society groups to revise these criteria. The overall goal was to “raise the bar on net zero delivery” (RtZ, 2022a), adjusting its principles to the evolving scientific understanding of climate stabilization, and in the process shoring up the legitimacy of the campaign in the eyes of key constituencies. The most salient change, introduced in June 2022, was the addition of an explicit requirement for campaign members to phase down and out all unabated fossil fuels. RtZ argued that such a requirement was already “implicit” in the commitment to reach (net) zero “in line with global efforts to limit warming to 1.5 °C,” but the campaign thought it was now time to “refine” this criterion and make its implications explicit by reformulating it as follows: “Pledge at the head-of-organisation level to reach (net) zero GHGs as soon as possible, and by mid-century 2050 at the latest, in line with the scientific consensus on the global effort needed to limit warming to 1.5 C with no or limited overshoot, *recognising that this requires phasing down and out all unabated fossil fuels as part of a global, just transition*” (RtZ, 2022b). The Interpretation Guide was updated to further explicate this point: “RtZ members must restrict the development, financing, and facilitation of new fossil fuel assets in line with appropriate scenarios. **Across all scenarios, this includes no new coal projects**” (RtZ, 2022b; in bold in the original).

In the new version of the Interpretation Guide, RtZ also included new criteria for identifying these “appropriate scenarios”: they should “be based in the latest, widely recognized climate science,” provide for no or limited temperature overshoot, not interfere with the pursuit of other SDGs, and “not make unrealistic assumptions on development and deployment of future technologies” (RtZ, 2022b). The Guide mentions as good examples the scenarios developed by the IPCC and International Energy Agency, but offers no further advice on how to determine whether a particular scenario is compatible with other SDGs or relies on unrealistic assumptions on future technologies (one could arguably fault IPCC and IEA scenarios on these two counts).

Nigel Topping and Mahmoud Mohieldin, High-level Climate Champions for COP26 and COP27, explained the revisions of RtZ membership criteria as an effort to sort out the actors who were truly committed to the cause and those who were unwilling to back up their pledges with real action. “The clarity these criteria provide,” they argued, “together with strengthened data transparency, will help us identify the progress made and gaps remaining. They will clearly show those actors who are truly moving ahead versus those who are trying to find loopholes. We urge all Race to Zero actors to keep stepping up, or risk being removed from the Race!” (Climate Champions, 2022).

The GFANZ co-chairs welcomed these revisions, in particular the demand to end all financing for new coal projects, but the business press began to report disquiet among GFANZ members. “Carney is all carrot, and Race to Zero is creating a stick,” complained a person closely involved with the initiative (Walker et al., 2002). Critics mentioned the potential legal liabilities that might arise from net-zero pledges as their implications were becoming clearer. As a senior executive from a participating financial institution put it to the *Financial Times*:

“I am close to taking us out of these global green commitments — I’m not going to allow third parties to create legal liabilities for us and our shareholders. It is immoral and irresponsible... What if we get it wrong, make a mistake or someone lies? Then the bank can be sued, that is an unacceptable risk” (Morris et al., 2022).

That risk rose materially when the US Securities and Exchange Commission moved to make climate risk disclosure mandatory for all publicly traded companies. The proposed rule (The Enhancement and Standardization of Climate-Related Disclosures for Investors)

included, among other obligations, new standards for the disclosure of targets, transition plans, scenario analysis and other tools used by companies to define their climate mitigation plans (SEC, 2022). In addition to exposure to potential litigation and regulatory action, critics cited as another reasons for concern the growing political pressure in the United States against integrating environmental, social, and corporate governance (ESG) considerations in investment decisions, and the related risk that participation in net-zero alliances would be subject to anti-trust action.

As a result of these pressures, in September 2022 RtZ reversed some of the more recent changes. In a re-revision of its membership criteria, RtZ dropped the explicit ban on new coal projects, stating only that “Each Race to Zero member shall phase out its development, financing, and facilitation of new unabated fossil fuel assets, including coal, in line with appropriate global, science-based scenarios” (RtZ, 2022b; see also Hale, 2022; Mundy et al., 2022). RtZ also abandoned plans to recruit civil society groups to an independent accountability body that would have had the power to report members of the campaign thought to be in breach of its principles.

Despite the backtracking, in October 2022 GFANZ announced that from now on it would “encourage” but no longer “require” that the companies and financial sector alliances it represents partner with RtZ or meet its criteria. This loosening of the link between GFANZ and RtZ has not prevented key actors from abandoning the former. In December 2022, Vanguard Group, one of the world’s largest asset managers, announced its withdrawal from the Net Zero Asset Managers (NZAM) initiative and consequently from GFANZ. Vanguard argued that participation in this initiative was generating “confusion” among its investors about the company’s views “regarding the applicability of net zero approaches to the broadly diversified index funds” (Vanguard, 2022). In other words, a clarification of the implications of signing up to the RtZ principles, particularly with respect to investments in fossil fuel companies, was creating too much confusion over the company’s own asset allocation criteria. Immediately following Vanguard’s announcement, and reflecting the deepening politicization in the United States of membership in net-zero alliances, the Texas Senate Committee on State Affairs excused the company from testifying as part of its investigation on the investment practices of financial services firms. At the same time, advocates for stronger climate action lambasted the company’s about-face. A few months later, climate action groups were running a TV ad campaign targeting the company. “When you save with Vanguard, you’re an owner of a catastrophic climate future.”

The example reveals how the collective anticipation of consequences triggers a process of public formation. The anticipatory device, in this instance, is not a mathematical model of a project scenario, but the process of revising a criterion for membership in a net-zero campaign. Explicating or “making explicit” what acting “in line with global efforts to limit warming to 1.5 °C” means, particularly in relation to investments in new fossil fuel projects, brought to the fore the tension between RtZ’s original intention to create an ever-expanding coalition of actors aligned with its principles, and the desire to translate that alignment into meaningful action. The latter fragmented the larger coalition into a set of better delineated publics and counter-publics. One effect of this clearer delineation is to create new targets for public mobilization. The campaign against Vanguard is a small but typical example. The shift within the UNFCCC system towards what UN Secretary-General António Guterres describes as “zero tolerance for net-zero greenwashing,” is another. When, at the COP27 meeting, Guterres announced the conclusions of a new High-Level Expert Group on the Net-Zero Emissions Commitments of Non-State Entities (HLEG), he went out of his way to call out those companies that had made net-zero pledges but continued to invest in new fossil fuel extraction. “Using bogus ‘net-zero’ pledges to cover up massive fossil fuel expansion is reprehensible. It is rank deception. This toxic cover-up could push our world over the climate cliff. The sham must end.”

3.3. Private technocratic governance: SBTi

The Science Based Targets Initiative (SBTi) is a collaboration between CDP (formerly the Carbon Disclosure Project), the World Resources Institute, the UN Global Compact, and the World Wildlife Fund for Nature. It was created in 2015 to help companies set emission targets in line with the temperature goals of the Paris Agreement, and provides an array of resources to support its clients as they engage in the “target-setting journey.” That journey starts with a formal expression of commitment to set a science-based target, and finalises with the validation and disclosure of the company’s climate action plans. To certify these plans, SBTi uses “a combination of science and principled judgments” (SBTi, 2021c).

In 2021, SBTi introduced a new Corporate Net Zero Standard “to steer the economy to net-zero by 2050” (SBTi, 2021a). For its development, SBTi drew on the International Energy Agency’s Net Zero Roadmap, as well as input from its own Expert Advisory Group and two rounds of public consultations. In the standard, SBTi defines a state of corporate net-zero as a situation in which a company has reduced its scope 1, 2 and 3 emissions to zero “or to a residual level that is consistent with reaching net-zero emissions at the global or sector level in eligible 1.5 °C scenarios or sector pathways.”¹ The company must also be able to “neutralize any residual emissions at the net-zero target date and any GHG emissions released into the atmosphere thereafter” (SBTi, 2021b:8). “Neutralization” refers to “measures that companies take to remove carbon from the atmosphere and permanently store it to counterbalance the impact of emissions that remain unabated” (SBTi, 2021b). As a general principle, and allowing for differences by sector, the Net Zero Standard requires companies to strive to eliminate 90–95 % of 2020 emissions before 2050, leaving 5–10 % of emissions to be neutralised by removals. Carbon credits cannot be counted as emission reductions toward the achievement of near-term targets, but can be included in long-term plans as a way of neutralising residual emissions (or to finance additional mitigation beyond the validated emission

¹ Scope 1 refers to direct emissions from a company, including fuel combustion, company vehicles, and fugitive emissions. Scope 2 refers to the emissions from purchased electricity, heat and steam. Scope 3 refers to all other indirect emissions that occurs in a company value chain. In addition to the general net-zero standard, SBTi has developed or is in the process of developing specific guidance for Forest, Land and Agriculture, Iron & Steel, Cement, Maritime Transport and other economic sectors.

reduction targets).

Since its foundation, SBTi has always emphasised near-term action, highlighting reductions in emissions achieved within 5–10 years from the submission of a target. Yet certification of a net-zero plan involves a longer time horizon, and requires assessing methods of greenhouse gas removal that are not currently developed or deployed at scale. Both aspects stretch the methodologies that SBTi has traditionally used to calibrate corporate climate action plans. In presentation of the Net Zero Standard, SBTi has emphasized that validating net-zero emissions targets does not imply condoning lower ambition on near-term emissions reductions, nor should it lead to allowing an unwarranted use of credits or removals. Tom Dowdall, manager of SBTi Business Ambition for 1.5 °C campaign (and formerly a senior campaigner with Greenpeace International), describes the Initiative's approach as 'less Net, more Zero' (Dowdall, 2021). Yet, by greatly expanding the range of options available to companies, the new standard makes the job of certifying the quality of a target much harder. As SBTi attempts to police the boundaries of this enlarged field, its particular blend of "science" and "principled judgment" has attracted greater public scrutiny.

In the past, discussions of SBTi's validation processes rarely spilled out beyond the deliberations of its Expert Advisory Group, or discussions with the companies that participated in the target-setting process. Increasingly, however, and as SBTi has transitioned towards net-zero target validation, these practices have been subject to external criticism. In 2021, an academic review of the methodologies used by SBTi to certify targets found a tendency to exclude those that yielded the results most consistent with the 1.5 °C goal, and to favour others likely to result in global temperature overshoots (Bjørn et al., 2021; see rebuttal and counter rebuttal Chang et al., 2022; Bjørn et al., 2022).

An even more fundamental line of criticism focuses on the accountability of SBTi's decision-making processes. The academic review noted that the reasoning behind the choice of one methodology over another was not "entirely clear," and called for "[i]ncreased transparency by the SBTi and companies setting SBTs" in order "to strengthen the integrity of SBTs" (Bjørn et al., 2021). In the wake of this publication, Bill Baue, former member of SBTi's Expert Advisory Group, went public with his own criticisms, accusing SBTi of being compromised by a conflict of interest inherent in its own business model, as it charges companies fees to validate their climate plans. This, according to Baue, represented a "betrayal of the public's trust" (Baue, 2021). Echoing these claims, Jennifer Morgan, then Executive Director of Greenpeace International, pointed to "great public scepticism about this initiative" and demanded "an additional emphasis on transparency and accountability" (Farand, 2021). In an open letter to SBTi, a group of climate experts criticised the initiative for failing to scrutinise the emissions data reported by companies, and for not demanding that detailed greenhouse gas inventories be made public. "Without such transparency," the signatories argued, "climate mitigation claims are effectively inscrutable and not aligned with a "science-based" approach" (Carton et al., 2022). Although these criticisms were not directed at the Net Zero Standard per se, public challenges have become more acute with the proliferation of SBTi-validated net-zero targets. In 2022, for example, the Corporate Climate Responsibility Monitor found that the majority of companies with a SBTi-validated net-zero target did not have plans consistent with the decarbonisation of at least 90 % of their full value chain emissions. SBTi was thus "lending credibility to low quality and misleading targets" (New Climate Institute, 2022: 6).

These questions have only grown in relevance as SBTi takes on para-regulatory functions in some jurisdictions. In November 2022, the White House announced a new rule that would mandate companies contracting with the US federal government to have emissions reduction targets validated by SBTi, and to disclose environmental impacts through CDP (one of SBTi's founding partners). Given the position of the US federal government as the world's largest purchaser, the rule potentially creates a cascade of affected actors across virtually all value chains, leading observers to raise questions about the key role that "a small roundtable of sustainability consultants" plays in the world of corporate climate action (Morse, 2023).

With SBTi as the nexus of public and private climate target-setting, interrogations of the organisation's criteria have expanded beyond the merits of specific accounting methods to encompass broader questions of equity and justice in climate action – on the role it accords in its calculations to historic emissions, for example, or the allowances it makes for companies based in developing countries. SBTi's response to these challenges has focused on changing its own governance processes, for example by appointing a new Board of Trustees or creating a Technical Council to review its standards, guidance and methods. It has also reached out to new experts and stakeholders to flesh out a more detailed formulation of the Initiative's position on normative dimensions of net-zero, such as how to incorporate considerations of climate justice in evaluating net-zero aspirations of actors in developing countries.

SBTi exemplifies the potential for net-zero governance initiatives to become sites for a proliferation of concerned publics. This is partly the effect of SBTi's own success, which makes the methodologies it uses to assess corporate action plans a matter of public concern. As a result, a previously technocratic process for adjudicating the merits of climate targets has been opened up for scrutiny. The Net Zero Standard has tilted the balance of "science" and "principled judgment" towards the latter, leading to a proliferation of voices asking for a full and transparent articulation of the normative principles guiding its decisions.

4. Discussion: net-zero as an arena of public formation

This article has presented three examples of how net-zero governance becomes a site of political contestation and public formation. Our cases encompass experiences of national policy, international co-operation, and private standard-setting, each offering a distinctive trajectory of problematization (Laurent, 2017; Barry, 2021).

In the case of UK governance, net-zero has become increasingly politicized in at least two ways. First, the adoption in 2019 of a legally binding target has created new channels for public mobilization to demand a faster translation of the target into verifiable policies. The High Court case is particularly relevant in this regard, because it offers an instantiation of the sort of public accountability that the adoption of the target enabled. This accountability, channelled through the mechanisms created by the Climate Change Act, effectively put additional pressure on Government to produce data and disclose information to enable adequate public scrutiny of

governmental action (or inaction). At the same time, net-zero has become politicized as a proxy for larger ideological and party-political disputes over the future of the UK and its place in the world. This debate does not necessarily focus on specific policies – although announcements such as the phasing out of petrol and diesel cars might come to stand for a larger set of energy and climate transitions – but on net-zero as a marker and symbol of social and economic change.

In the case of the RtZ campaign, we observe the consequences of trying to articulate (or “make explicit”) the meaning of a pledge. Conceived as a mechanism to determine whether an actor can be said to be at the “starting line” in the race towards net-zero, RtZ performs its governance function through the formulation and explication of a series of generic meta-criteria. The back and forth over whether these meta-criteria imply a complete ban on the financing of new coal projects shows how explication can become a terrain for characterizing new issues and their publics. Changes in the relationship between RtZ and GFANZ exemplify one of the most significant political effects of net-zero governance: to clarify what certain actors are *not* willing to do or commit to in pursuit of their own self-declared net-zero ambitions. This clarification opens up new spaces for public mobilization – it sharpens divisions and distinctions among GFANZ members, for example, and creates new and more precisely defined targets for climate activism.

SBTi represents an example of how the technocratic adjudication of what counts as an acceptable net-zero plan becomes increasingly contested and subject to public scrutiny. Because net-zero is compatible with an endless plurality of empirical worlds, certifying a target as more or less aligned with this end-state has tilted the organisation’s peculiar combination of “science” and “principled judgement” towards the latter. As SBTi becomes the de facto standard-setter for corporate net-zero plans, a growing number of actors begin to parse its particular mixture of expertise and normative assumptions.

Across the three cases, several conditions are key to the public-making potential of net-zero. The first is a search for *legitimacy* by different net-zero governance initiatives. Our three examples unfold in a competitive environment, and seek to shore up their authority by claiming alignment with other overlapping initiatives. Broome and Seabrooke (2020) describe the latter process as “recursive recognition,” in which particular governance tools gain legitimacy through “recursive sequences of knowledge production from public and private sources” (Broome and Seabrooke, 2020: 373). In our case, national policy processes, international coordination mechanisms under the auspices of UNFCCC, and private certification initiatives operate in a single ecosystem of governance tools and criteria, and gain or lose legitimacy by virtue of their alignment or lack thereof.

The second condition is *publicity*. “There can be no public,” Dewey wrote, “without full publicity in respect to all consequences which concern it” (Dewey, 1927, p. 190). A net-zero pledge initiates a cascade of publicity by publicly committing an actor to a goal. A key point of contestation is the extent to which the actor making a net-zero pledge is then required to disclose plans, inventories, scenarios, and to document the extent of progress achieved against its stated targets. This issue, often framed as a call for greater “transparency,” not only affects those making the pledge but also the actors and institutions seeking to govern these processes. Many of the publics that have coalesced around UK net-zero policy, RtZ and SBTi define their mission in terms of bringing greater public scrutiny to the principles and methodologies used to define, evaluate and certify net-zero targets. By the same token, opposition to net-zero is not only expressed by a refusal to adopt a target, but also by resistance to disclose information that would allow external actors to determine the practical meaning of a pledge.

The third condition is a participatory deployment of *anticipatory devices*. Anticipatory devices offer concrete empirical instantiations of a net-zero world, and help actors consider the consequences of a particular net-zero pledge. Models and scenarios are obvious examples, but less technical processes, like the (re)formulation of criteria for membership in a net-zero campaign, can also serve to elucidate the implications of pursuing a net-zero target. Anticipatory devices can be used to foreclose questions, by establishing an official but opaque imaginary of a mid-century net-zero world. The manner in which scenarios were deployed to flesh out the UK Government’s net-zero strategy closely approximates this use. These scenarios were grounded in assumptions about the pace and direction of technological development, but left many other dimensions of the problem – including political and institutional change – unexamined. This use of anticipatory devices tends to limit the opportunities for public formation by reducing the number (and quality) of relevant issues. When they are used as venues for open deliberation, on the other hand, anticipatory devices can serve as engines of public formation by incorporating new “vectors of contestation” into the question of what a plausible net-zero future could or should look like (Barry, 2021).

5. Conclusion

Net-zero has been a highly successful way of re-formulating climate ambition, anchored in the international commitment to balance emissions and removals in the second half of the century. Even enthusiastic supporters of the Paris Agreement, however, have been disappointed by the subsequent focus on formalistic target-setting at the expense of other dimensions of climate action highlighted in that Agreement (Khosla et al., 2023).

At the same time, net-zero has been a very active space of experimentation in new forms of institutional action. The concept carries a plethora of unanswered questions – about the nature of the “balance” being pursued, the scope of the residual emissions that should remain in the second half of the century, or the manner of their “neutralization” via greenhouse gas removals, to name some obvious headings. As net-zero governance initiatives seek to bring clarity and specificity to these questions, they open up a virtually endless range of issues and thus offer multiple opportunities for public-formation. The resulting publics and counter-publics engage in active contestation not only over competing imaginaries of the future, but over what imagining a plausible climate future should mean in practice.

From a pragmatist perspective, net-zero is thus an instrument of problematisation (Barry, 2021). It defines a future end-state and reveals material interdependencies among actors affected by the pursuit of that goal. As pledges to reach net-zero emissions proliferate the publics and counter-publics of net-zero demand that these fictional expectations become more concrete and transparent if they are

to remain legitimate. Net-zero governance initiatives like the three described in this article thus materialise an increasingly intense arena of political conflict.

Declaration of Interest statement

The authors declare no conflict of interest.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

No data was used for the research described in the article.

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