Hitting the target? Analysing the use of targets in climate law

Article

Accepted Version

Hitting the Target? Analysing the Use of Targets in Climate Law

Chris Hilson[*]

ABSTRACT

Climate targets have become prominent in the media and public debate recently, largely as a result of pressure exerted by groups such as Extinction Rebellion, who have advocated a target of net zero emissions of greenhouse gases by as early as 2025. The current article aims to draw some of the heat out of that debate and to shed some light on the issues raised by climate targets, including their level of ambition. It does so by developing a taxonomy of climate targets – setting out the choices confronting those designing national responses – and then examining those choices through a normative, values framework. Given the threat posed by climate change to humans and the ecosystems of which they are a part, it is important that climate targets are optimally constructed. The taxonomic and values framework laid out in the current article is designed to help with this.

KEYWORDS: climate change, targets, net zero, nationally determined contributions, temperature, mitigation, adaptation

1. INTRODUCTION

Climate targets are very much in vogue. They have come to the fore after a period when, some have claimed, too much attention has been given to regulatory instruments (such as cap and trade).[1] A number of high-profile climate change litigation cases have involved challenges to government action on climate targets,[2] which has helped to raise their profile. Targets have also taken centre stage in recent protest action beyond the law, including for example by Extinction Rebellion (XR) in London and other cities worldwide since April 2019, where a cut in greenhouse gas (GHG) emissions to net zero by 2025 has been central to their demands.[3] This protest and much of the litigation has, not by accident, taken place at a time when countries across the world have had to set their minds on targets because of the need to come up with and implement nationally determined contributions (NDCs) under the Paris Agreement on climate change.

A target is, briefly stated, the end result one wishes to achieve. In a law and policy context, a target is typically expressed in concrete terms, often as a numeric figure to be achieved by a certain date. The current article explores targets as a regulatory tool in the context of climate change,

[*] School of Law, University of Reading, UK (c.j.hilson@reading.ac.uk).

[1] David Leonhardt, 'The Problem with Putting a Price on the End of the World', The New York Times Magazine, 9 April 2019.

[2] See eg ClientEarth's Drax judicial review <https://www.clientearth.org/drax-legal-case-taking-uk-government-to-court-over-europes-largest-gas-plant/>; *R (Plan B. Earth)* v *Secretary of State for BEIS*, 22 Jan 2019, <https://planb.earth/wp-content/uploads/2019/01/Court-of-Appeal-decision.pdf>; *Urgenda*, 20 Dec 2019, <https://www.urgenda.nl/en/themas/climate-case/>; *Gloucester Resources Limited* v *Minister for Planning* [2019] NSWLEC 7; Case T-330/18 *Carvalho* v *European Parliament and Council*, 8 May 2019 (currently under appeal (C-565/19 P)); Climate Case Ireland, <https://www.climatecaseireland.ie/>; Klimaatzaak Belgium, <http://www.lse.ac.uk/GranthamInstitute/litigation/vzw-klimaatzaak-v-kingdom-of-belgium-et-al-court-of-first-instance-brussels-2015/>; ENvironnement JEUnesse (ENJEU) Québec, <https://enjeu.qc.ca/wp-content/uploads/2019/07/190711_Jugement_GaryDDMorrison.pdf>; *Leghari* v *Pakistan*, Case No: W.P. No. 25501/2015; *Family Farmers and Greenpeace Germany* v *Germany*, <http://climatecasechart.com/non-us-case/family-farmers-and-greenpeace-germany-v-german-government/>, all accessed 4 February 2020.

[3] <https://rebellion.earth/the-truth/demands/> accessed 5 November 2019.

distinguishing them from regulatory instruments (such as cap and trade) which are then put into place to ensure that the relevant targets are met. Much of the existing regulatory literature treats tools and instruments interchangeably.[4] Landry and Varone, for example, state that 'a policy instrument, or a tool, is a means of intervention by which governments attempt to induce individuals and groups to make decisions and take actions compatible with public policies.'[5] Of course, targets share this quality of wanting to induce action. However, it is useful to separate out targets (and here I reserve the description of tools for them), because they represent the end point you want secured, at which regulatory instruments are then aimed.

Given that global heating poses an existential threat to both humans and other species, it is important to have an in-depth understanding of the nature of climate targets: they form a key element of climate governance[6] regimes and we do not have the time to get them wrong. While there is a limited, emerging literature on climate targets, this has mainly come from the disciplines of policy analysis and climate science.[7] Where legal academics have examined targets they have done so mostly indirectly, in looking at domestic climate legislation[8] or international law on climate change.[9] The current article seeks to add to this literature by analysing climate targets much more squarely and directly, across different levels of governance (though with a focus on national targets). After exploring what we mean by climate targets, including first distinguishing them from other future planning tools such as goals and objectives, I set out a novel normative framework by which climate targets can be assessed. This framework draws on different values ranging from – among others – certainty and flexibility, through democracy and accountability, to effectiveness and cost-effectiveness. I then proceed to establish a taxonomy of climate targets, considering a series of important, often binary, choices which confront the architects of national climate law regimes, working to ensure that NDCs are in the end delivered domestically. These include whether targets

---

[4] Arie Freiberg, *The Tools of Regulation* (Federation Press 2010).

[5] Réjean Landry and Frédéric Varone, 'Choice of Policy Instruments: Confronting the Deductive and the Interactive Approaches' in Pearl Eliadis, Margaret M Hill and Michael Howlett, *Designing Government: From Instruments to Governance* (McGill-Queen's University Press 2005) 107-8.

[6] Governance is used here and elsewhere in the article in its broadest sense to refer to the way in which climate change as a problem is governed or regulated (including at different scales, from the international to the sub-national). It is not being employed in its narrow sense of including non-state actors (so as to distinguish governance from government). Corporate climate targets (including via eg the Science Based Targets Initiative and Climate Action 100+) are obviously crucial to governance in the latter sense, but lie beyond the scope of the current article.

[7] See eg William Dietrich, 'The Challenge of Selecting Goals: Case Studies Regarding the Use of Critical Levels', CSIA Discussion Paper 95-05 (Kennedy School of Government 1995); Nils Meyer-Ohlendorf, Matthias Duwe; Katharina Umpfenbach and Keighley McFarland, *The Next EU Climate and Energy Package – EU Climate Policies after 2020* (Ecologic Institute 2014); Piero Morseletto, Frank Biermann and Philipp Pattberg, 'Governing by Targets: Reductio ad Unum and Evolution of the Two-degree Climate Target' (2017) 17 International Environmental Agreements 655.

[8] Rob Fowler, 'Emissions Reduction Targets Legislation' in T Bonyhady and P Christoff (eds), *Climate Law in Australia* (Federation Press 2007); Richard Lazarus, 'Climate Change Law in and Over Time' (2010) 2 San Diego Journal of Climate & Energy Law 29.

[9] Jacqueline Peel, 'Climate Change Law: The Emergence of a New Legal Discipline' (2008) 32 Melbourne University Law Review 922; Daniel Bodansky, 'The Legal Character of the Paris Agreement' (2016) 25 RECIEL 142; Lavanya Rajamani, 'The 2015 Paris Agreement: Interplay Between Hard, Soft and Non-Obligations' (2016) 28 JEL 337; Daniel Bodansky and Lavanya Rajamani, 'The Evolution and Governance Architecture of the United Nations Climate Change Regime' in Urs Luterbacher and Detlef Sprinz (eds), *Global Climate Policy: Actors, Concepts, and Enduring Challenges* (MIT Press 2018). Cf, for a specifically focused piece, Lavanya Rajamani and Jacob Werksman, 'The Legal Character and Operational Relevance of the Paris Agreement's Temperature Goal (2018) 376 Phil Trans R Soc A.

should be: inclusive or non-inclusive; net or absolute; set with a baseline, fixed level or intensity-based; binding or non-binding; short term or long term; and ambitious or unambitious. This taxonomy is then assessed in terms of the normative values set out earlier: as we shall see, those taxonomy choices will often have clear consequences for one or more of those values. A long-term, binding target, for example, may provide for both certainty and flexibility, but with question marks over accountability and effectiveness. My overall argument is that climate targets need to move beyond the recent headline shouting phase to a position where the pros and cons of various choices around targets are better understood. The taxonomy and the normative framework I set out aim to assist with this shift. Climate law is, fundamentally, about controlling global temperature increases and thus also anthropogenic emissions of greenhouse gases (GHGs), which climate science has firmly linked to such increases. Targets are, as we shall see, key to both of these elements. Climate targets are also important for tracing the distinct shape of climate law as an academic discipline. One of the ways in which climate law differs from environmental law is in its regulatory architecture: while targets feature in environmental law, they do not have the same overarching presence as we see in climate law; and the long-term nature of some of the core targets within climate law is again a unique feature.

2. WHAT ARE CLIMATE TARGETS? TARGETS VERSUS GOALS, AIMS AND OBJECTIVES

In considering climate targets, it is important at the outset to have a sense of what we mean by climate targets and how these differ from other types of future directed planning tools such as goals, aims and objectives which are also found in climate law. While all four are set in the present and involve a desired, future end result, targets are the most tightly drawn and concrete of them all. A climate target will invariably be expressed as a numeric figure, often as a percentage reduction from a baseline year, and for the most part to be achieved by a certain date. One might, for example, have a target like the EU's, which is to achieve at least 40% cuts in GHGs from 1990 levels by 2030.[10]

Morseletto et al distinguish between targets and goals as follows: 'Goals are non-operational overarching objectives that usually require targets in order to achieve them'.[11] Although this usefully describes the relationship between goals and targets, it arguably muddies the waters by defining goals in terms of objectives. While aims and goals are synonymous, objectives are more concrete and measurable steppingstones to be achieved in order to meet general and abstractly expressed aims or goals. Targets share this quality of being more concrete and measurable but are more likely than objectives to be expressed in numeric or quantitative terms (making them even more readily measurable).

Perhaps the best-known example of a goal in climate law is to be found among the UN's Sustainable Development Goals.[12] There are seventeen of these, including Goal 13 on climate change. Like the other goals, this is set out in quite abstract terms, expressing a need to 'take urgent action to combat climate change and its impacts'. Each goal then has a set of more concrete targets and

[10] European Council (23 and 24 October 2014) – Conclusions, EUCO 169/14.
[11] (n 7) 657.
[12] <https://sustainabledevelopment.un.org/sdgs> accessed 12 August 2019.

indicators attached to it. In the case of Goal 13, most of what are described as targets are in fact rather abstract and lack a numerical element.[13] The indicators specify what one is to measure to assess whether the individual target has been achieved. The general absence of concrete targets in Goal 13 is no accident. There is an explicit acknowledgement that 'the United Nations Framework Convention on Climate Change [UNFCCC] is the primary international, intergovernmental forum for negotiating the global response to climate change.'[14] In order to avoid regime conflict and overlap, it is there and to the Paris Agreement that we must mainly look for future planning on climate change. Article 2 of the UNFCCC formally describes itself as an objective and reads as follows:

> The ultimate objective of this Convention … is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.

A more abstract goal or aim on climate change might, for example, be to prevent anthropogenic global warming reaching dangerous levels. However, as one can see, Article 2 contains some more concrete and measurable elements than this (such as 'stabilization of greenhouse gas concentrations in the atmosphere') which places it more towards the objectives end of the spectrum.[15] Article 2 of the Paris Agreement states that the Agreement is designed to enhance 'the implementation of the Convention [UNFCCC], including its objective', and does so in part by setting out a concrete and measurable temperature target:

> [to hold] the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change.[16]

This is an important target, which will be returned to further below. As we shall see, the Paris Agreement also has a net zero GHG emissions target, albeit within a rather unambitious timeframe. It is otherwise rather thin on substantive targets because, in contrast to its Kyoto predecessor, it requires states themselves to come up with their own targets via NDCs. In this regard article 4(4)

---

[13] With the exception of target 13.A on climate finance, which requires relevant states to 'Implement the commitment undertaken by developed-country parties to the [UNFCCC] to a goal of mobilizing jointly $100 billion annually by 2020 from all sources to address the needs of developing countries', <https://sustainabledevelopment.un.org/sdg13> accessed 12 August 2019. This climate finance target was made in 2009 at the UNFCCC COP 15 in Copenhagen, via Decision 2/CP.15. Decision 1/CP.21 of 2015 requires the COP to set a new collective quantified target (or 'goal') from this USD 100 billion per year as a floor, before 2025 [53].

[14] <https://sustainabledevelopment.un.org/sdg13> accessed 12 August 2019. See also UN General Assembly Resolution 73/232, 'Protection of Global Climate for Present and Future Generations of Humankind', 20 December 2018, which restates this while adding in the Paris Agreement.

[15] The relevant UN web page states that it 'Sets a lofty but specific goal', thus equating goals and objectives (although the 'specific' adjective perhaps avoids this), https://unfccc.int/bigpicture> accessed 12 August 2019.

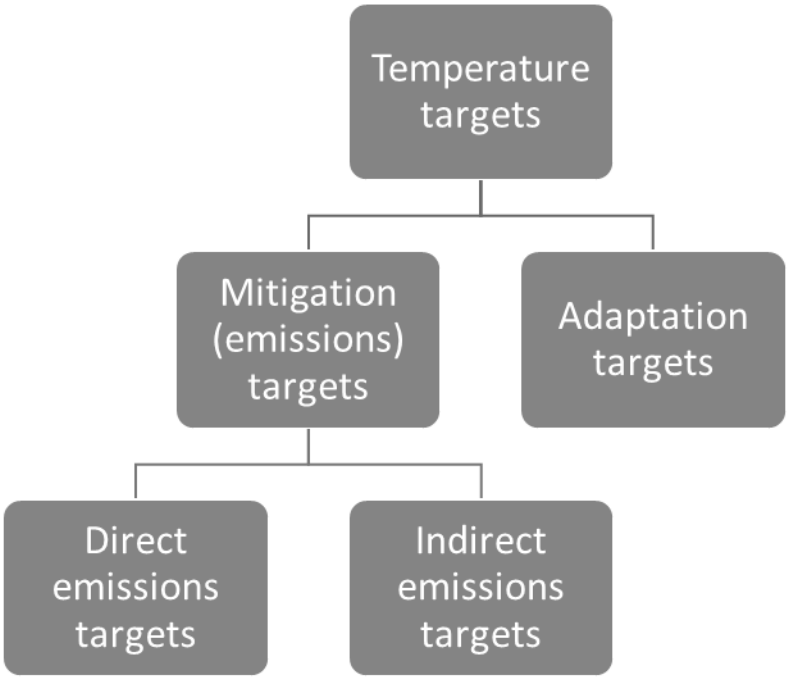
[16] Art 2(1)(a). Although art 4(1) in fact refers to this target in art 2 as a 'long-term temperature goal', and the relevant UN web page refers to it as a 'central aim' of the Agreement, <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement> accessed 12 August 2019, I count this as a target because of its concrete numeric element.

states that 'Developed country Parties should continue taking the lead by undertaking economy-wide absolute emission reduction targets', with developing countries encouraged 'to move over time towards economy-wide emission reduction or limitation targets.' 'Economy-wide' means an overall national GHG emissions reduction figure rather than just one for limited economic sectors, and 'absolute' is used here in contrast to intensity-based targets which express emissions reductions on a population (per capita) or GDP basis.

3. VARIETIES OF CLIMATE TARGETS

Having considered the nature of climate targets compared with other climate planning tools such as goals and objectives, we now turn to examine the various types of climate law targets in the sense of what they are aimed at. As Figure 1 below shows, climate law targets can be broadly divided into temperature targets and then mitigation targets and adaptation targets.[17] GHG mitigation targets consist of emissions reduction targets in a general, umbrella sense. These can then themselves be split into emissions targets in a narrow sense (direct emissions targets) and activity-based targets (indirect emissions targets).

Figure 1: Types of Climate Law Targets



Temperature targets are unique to climate change and have become closely associated with the Paris Agreement, which, as we saw above, famously contains a target to keep the increase in the

[17] One might also add climate finance targets (n 13).

global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C. No future date is set for the targets to be met because we do not want to get up to them; the target is, rather, a negative one – not to reach the relevant global temperature or to remain well below it. Increases above these two target temperatures are associated with really dangerous and dangerous levels of global warming respectively.[18] However, while very much cemented and put centre stage by Paris, the idea of a 2°C temperature target can be traced, in the social sciences, at least as far back as the 1970s, to the environmental economist William Nordhaus, and in the sciences to the late 1960s.[19] The EU Council of (Environment) Ministers fastened on this target quite early on, in 1996.[20] It was formally enshrined in international climate policy only much later, in 2010 at the UNFCCC COP at Cancun.[21]

Insofar as there is an emerging literature on climate targets, those relating to temperature have been its main focus. The literature has, for example, considered: the legal relevance of the temperature targets;[22] whether we stand any chance of remaining within them[23] (or whether we are already heading for catastrophic warming that will require 'deep' adaptation[24]); whether the temperature targets and emissions reduction targets are well matched;[25] whether the temperature target is the wrong one (and the focus should only be on emissions reduction targets;[26] and whether the temperature target is largely symbolic and stands as a disembedded object within international climate governance, doing little relevant work.[27]

As noted above, mitigation emissions reduction targets can be split into direct emissions targets and indirect, activity-based emissions targets. The former have often involved a target explicitly set in terms of reducing net GHG emissions by a given percentage, from a historical baseline date, and can either be general (economy-wide) or set on an industry sector basis. They can be characterised as direct because they are targeting emissions directly. The second, in contrast, sets the target by reference to an activity you want to see more of (for example renewables or energy efficiency) in

---

[18] Art 2 of Paris with its numeric temperature targets can thus be considered as a quantitative expression of the qualitative 'dangerous' objective in Art 2 of the UNFCCC quoted earlier (Yun Gao, Xiang Gao, Xiaohua Zhang, 'The 2°C Global Temperature Target and the Evolution of the Long-Term Goal of Addressing Climate Change—From the United Nations Framework Convention on Climate Change to the Paris Agreement' (2017) 3 Engineering 272. However, 1.5°C is really now the dangerous threshold, with 2°C the 'really dangerous' one: Kevin Anderson and Alice Bows, 'Beyond 'Dangerous' Climate Change: Emission Scenarios for a New World' (2011) 369 Phil Trans R Soc A.

[19] Samuel Randalls, 'History of the 2°C Climate Target' (2010) 1 WIREs Climate Change 598.

[20] Council of the European Union, 1939th Council Meeting, Luxembourg, 25 June 1996, <http://europa.eu/rapid/press-release_PRES-96-188_en.htm?locale=en> accessed 12 August 2019. This was in the run-up negotiations to the Kyoto Protocol, demonstrating EU leadership.

[21] Decision 1/CP 16, UNFCCC.

[22] Rajamani and Werksman (n 9).

[23] Adrian E Raftery and others, 'Less Than 2 °C Warming By 2100 Unlikely' (2017) 7 Nature Climate Change 637; IPCC, 'Global Warming of 1.5 °C' (2018).

[24] Jem Bendell, 'Deep Adaptation: A Map for Navigating Climate Tragedy', University of Cumbria, Institute for Leadership and Sustainability (IFLAS) Occasional Papers Volume 2, <http://www.lifeworth.com/deepadaptation.pdf> accessed 2 August 2019.

[25] Katsumasa Tanaka and Brian C O'Neill, 'The Paris Agreement Zero-emissions Goal Is Not Always Consistent with the 1.5 °C And 2 °C Temperature Targets' (2018) 8 Nature Climate Change 1.

[26] Andrew Jordan and others, 'Going Beyond Two Degrees? The Risks and Opportunities of Alternative Options' (2013) 13 Climate Policy 751; Oliver Geden, 'An Actionable Climate Target' (2016) 9 Nature Geoscience 340.

[27] Morseletto and others (n 7).

order, in the end, to also reduce GHG emissions,[28] or, conceivably, less of (such as coal fired power stations or diesel cars).[29] Such targets are, again, generally set in percentage terms. The EU, for example, has set a renewables target of at least a 32% share for renewable energy by 2030.[30] Rather than being expressed as a percentage reduction from a *past*, historical baseline, they may, like here, take the form of a percentage share of renewables in the final consumption of energy, or a percentage reduction in energy consumption by a future date in comparison with a projected *future* consumption figure without energy efficiency measures in place. This second type of emissions reductions target can be characterised as indirect because they are targeting emissions indirectly, via the mechanism of a valued (or, potentially, unwelcome) activity.

Perhaps the best-known example of combined direct and indirect targets can be found in the EU. As we have seen, its 2030 climate and energy framework contains targets of at least 40% cuts in GHG emissions from 1990 levels and at least a 32% share for renewable energy; it also targets at least a 32.5% improvement in energy efficiency.[31] The fact that the EU has chosen to have three separate mitigation-related targets rather than just one, direct one, is noteworthy. As Meyer-Ohlendorf et al have observed, there are advantages to having separate targets (for example, a separate renewables target promotes renewables rather than just gas or nuclear)[32] but also, potential disadvantages such as inconsistency and inefficiency[33] – values similar to those discussed below in the normative framework.

Next, there are adaptation targets which, as Figure 1 illustrates, can also be seen as linked to temperature targets: the scale of adaptation that needs to be taken is very much dependent on the level of temperature increase. In part because adaptation is much more wide-ranging in scope than mitigation,[34] one does not find a small number of headline targets in the way seen with the EU's 2030 climate and energy framework mitigation targets above. There would potentially be too many of them in adaptation because there are numerous different areas that require adaptation measures (including, for example, infrastructure of various kinds, nature conservation, housing, agriculture, and commercial property) and what needs doing is likely to vary by location. Which is not to say that adaptation targets do not exist in practice – they do, but they are not particularly common, and in any event they may be targets that have been set in other policy contexts which just happen to have a bearing on adaptation. In England's second National Adaptation Programme for example, among the few concrete targets are, first, that water companies are expected to reduce leakage by at least an average of 15% by 2025[35] and, second, in order to increase woodland resilience, up to 38,000 hectares of new woodland are to be planted by 2023.[36] The first of these is very much one from a

[28] As the Explanatory Memorandum to the draft revised EU Renewables Directive observed, 'Renewable Energy Sources (RES) contribute to climate change mitigation through the reduction of greenhouse gas emissions', COM/2016/0767 final, para 1.1.
[29] I am grateful to one of the referees for the latter point.
[30] (n 10).
[31] ibid. The renewables and energy efficiency targets were revised upwards to these levels in 2018.
[32] Which may be important for reasons of eg encouraging innovation in renewables, and for energy security.
[33] (n 7) 18-19.
[34] Which, in contrast, is mostly quite tightly focused on emissions and energy.
[35] DEFRA, 'The National Adaptation Programme and the Third Strategy for Climate Adaptation Reporting: Making the Country Resilient to a Changing Climate', July 2018, HC 1403 2018-19, 11.
[36] ibid 14.

separate, OFWAT, economic regulator context, where leakage has long been a concern and not one solely based on climate change reasons.

Section 58 of the UK Climate Change Act 2008 requires the Programme for adaptation to climate change to set out 'objectives' in relation to adaptation to climate change along with proposals and policies and time-scales for 'introducing' them. However, as we have seen, objectives are typically slightly less concretely defined than targets, and a timescale for introducing a policy is not the same as a target date for meeting it. The Act, in other words, does not require the Secretary of State to set targets as such. Neither does one find adaptation targets at EU level. While the EU has an adaptation strategy, this again contains looser 'objectives', key among which is promoting Member State action on adaptation, encouraging them to create national (and local) adaptation strategies.[37] As for the Paris Agreement, its key article 7 on adaptation speaks only of establishing a 'global goal' on adaptation, with Parties obliged to engage in adaptation planning processes and the implementation of actions, plans and policies.

It is of course possible to come up with typologies of climate targets that differ from the temperature, direct and indirect mitigation and adaptation ones presented above. Dietrich,[38] for example, distinguishes between upstream, midstream and downstream climate targets. He places both emissions reduction targets in a narrow sense and activity-based targets into the upstream category. Temperature change targets then count as midstream and adaptation targets as downstream. His typology is aimed at 'categorizing the different points in the causal sequence at which policies could interfere with the causal chain'.[39] Thus, if you do not control GHG emissions, then you will end up causing temperature rise, and if you do not control temperature rise, then you will end up having to put in place adaptation measures. It does not, however, reflect the target hierarchy that has emerged strongly since the Paris Agreement. For climate law, it is this *legal* hierarchy that is important. Paris does not place temperature targets in the middle, in the midstream column but, rather, at the top of the hierarchy, at which the mitigation targets are aimed (as in Figure 1 above). To call this a legal hierarchy does not mean that the relevant targets are binding: under article 2 of Paris, the temperature targets are couched in distinctly aspirational rather than legally binding terms ('aims to'). Rather, what it means is that the temperature targets represent first order policy targets and GHG emissions targets sit underneath these as second order targets which are designed to meet them. Article 4 of Paris can certainly be read in this way because it talks about global peaking of emissions, and then net zero emissions being achieved in the second half of the century being designed '*(i)n order to achieve* the long term temperature goal set out in Article 2.'[40] The Paris Agreement also links adaptation to the temperature target, with article 7(1) noting the need to have 'an adequate adaptation response in the context of the temperature goal referred to in Article 2'. While, as seen above, Paris itself does not contain adaptation targets, Figure 1 deliberately also has adaptation targets sitting underneath temperature targets. That is because, as adverted to earlier, adaptation responses, including any targets set at national level, will inevitably be conditioned by progress in meeting temperature targets.

[37] 'An EU Strategy on Adaptation to Climate Change', COM/2013/0216 final. This has subsequently been reviewed: COM (2018) 738, 'Report on the Implementation of the EU Adaptation Strategy'.
[38] (n 7).
[39] ibid 10.
[40] Emphasis added. See Geden (n 26).

Finally, in considering what we mean by a climate target, it is also worth considering the distinction between targets as a regulatory tool and regulatory instruments such as cap and trade. The relationship between the two is, at first sight, a straightforward one: a target is set and then instruments are put in place in order to meet it. In practice, however, it is not always easy to draw a clear dividing line between the two, because many regulatory instruments themselves have targets within them. This means that while you cannot really have a separate target without an accompanying instrument, it is possible to have an instrument without a separate target, because the instrument may contain its own target.[41] So, for example, a target for electric vehicle take-up, which is an indirect climate target, will require separate regulatory instruments (such as vehicle taxes or subsidies) to meet it. In contrast, the EU Vehicle Emissions Regulation[42] is an instrument. It is designed to be technologically neutral and hence does not specify electrification,[43] but instead sets standards for GHG emissions from vehicles which must be met by a particular year. It is, in this way, similarly aimed at increasing decarbonised vehicle usage within a certain timeframe.

The legal architecture of EU climate policy is also confusing in this regard. The EU 2030 direct GHG emissions target (of at least 40% cuts from 1990 levels by 2030) is implemented via the cap and trade EU Emissions Trading System (ETS),[44] the Effort Sharing Regulation[45] and the Land Use, Land Use Change and Forestry (LULUCF) Regulation.[46] The Effort Sharing Regulation is subsequently itself translated into variable national targets (reflecting differing GDP per capita). Member States must then create instruments to achieve these Effort Sharing targets. In EU terms, the Effort Sharing Regulation is itself a type of (legislative) instrument too, but not a regulatory one in that it is not, on its own, a regulatory instrument like a standard, a tax, subsidy, or a cap and trade system.[47] There is, in other words, a complex mix of targets and instruments here.

4. ASSESSING TARGETS

In the same way that regulatory instruments can be assessed in terms of a range of values,[48] so too can climate targets. The normative values I set out here were derived via an inductive process, from looking at climate law, including various policy examples of climate targets and also the literature on targets and on administrative law and regulation.

Choices about climate targets – for example over their ambition – have implications, which often lie somewhat under the surface in current public debates, across the range of values set out in this section. Just as we will see with targets taxonomy, some of these normative values themselves apply

[41] Or may not be directed at a target at all.
[42] Regulation 443/2009 setting emission performance standards for new passenger cars [2009] OJ L140/1 (as amended).
[43] Leaving room for eg hydrogen-based vehicles.
[44] Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading within the Union [2003] OJ L275/32, as amended (notably by Directive 2018/410 [2018] OJ L76/3).
[45] Regulation 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 [2018] OJ L156/26.
[46] Regulation 2018/841 on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework [2019] OJ L156/1.
[47] Cf the EU ETS, which is both a legislative and regulatory instrument.
[48] eg Chris Hilson, *Regulating Pollution: A UK and EC Perspective* (Hart 2000); Landry and Varone (n 5).

in an oppositional binary. Thus, there are principles of political economy with market-based systems in opposition to state or command-based economies. XR's favouring of a net zero target by 2025 is, for example, likely to require a tilt much more towards the latter than the former. However, markets are typically preferred by liberal conservatives because of the space they are said to leave for the value of individual freedom.[49] They are also favoured because of the greater likelihood, over a command-based system, that they will lead to a cost-effective solution. Critics of markets, however, point out that they tend to be blind to the value of equity. In a climate context, one might frame this value in terms of climate justice. Of course, one can easily overstate the market-state binary: after all, markets are reliant on clear laws set and enforced by the state.[50] In markets, legal certainty is a key rule of law value, which is important to enable individuals and companies to plan for the future.[51] Typically associated with legal rules, it stands in opposition to the value of flexibility, which is often linked with discretion.[52] As we shall see, both are important ingredients of target-setting: on the one hand climate targets are all about setting a clear and certain destination point on the basis of which government, industry and individuals can make plans; however, on the other hand, targets also need to retain an element of flexibility to enable them to adapt to changed circumstances such as new scientific evidence. Furthermore, the need for legal certainty should not stand in the way of governments taking necessary action in the face of scientific or policy uncertainty: this is the province of the precautionary principle.

In liberal democracies, there is also an expectation that targets will be set democratically while respecting human rights and that, once set, targets will be met. The latter raises the value of public accountability, which can be defined as 'the duty to give account for one's actions to some other person or body.'[53] In a domestic climate change context, it will typically be a government minister being held to account for climate targets being met, and that accountability may be legal, to citizens via the courts, or political, to parliament. Finally, effectiveness and proportionality are two other linked values. Effectiveness involves ensuring the means used do in fact deliver the ends sought. With proportionality, it is important that the means do not go beyond what is necessary to achieve those ends.

Although these normative values are being presented here as mainly relevant in relation to national target setting, it is important to bear in mind the NDC backdrop to this. With that international law context in mind, it is worth noting that many of these values can be traced back to the UNFCCC and the Paris Agreement. Thus, the principles article 3 of the UNFCCC includes the values of equity – both intergenerational, and intragenerational, with the latter including the idea of common but differentiated responsibilities and respective capabilities (CBDR-RC). It additionally mentions precaution, while observing that 'policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible costs.' Effectiveness is also referenced in the preamble to the Convention. The Paris Agreement echoes a number of these – notably equity and effectiveness – and also adds human rights.

[49] Friedrich Hayek, *The Road to Serfdom* (Routledge 1979).
[50] Friedrich Hayek, *The Constitution of Liberty* (Routledge 1960) 222.
[51] Hayek (n 49) 54.
[52] Hayek (n 50) 226; Denis Galligan, *Discretionary Powers: A Legal Study of Official Discretion* (Clarendon 1990).
[53] Colin Scott, 'Accountability in the Regulatory State' (2000) 27 Journal of Law & Society 38, 40.

Table 1 below sets out these various values in terms of a market-state continuum from left to right in the Table. Hence the values most associated with the market are listed in the left-hand column and those with the state in the right-hand column (with market and state column headings also themselves representing values). The middle, 'Hybrid' column is taken up by values which, depending on context, could speak to either market or state action.

Table 1: Normative Values

Market-based[54]	**Hybrid**	**State/Command-based**
Individual freedom	Legal Certainty	Equity/climate justice
Cost-effectiveness	Flexibility	Public accountability
	Effectiveness	Proportionality
		Precaution
		Democracy and human rights

5. A TARGETS TAXONOMY

In this, taxonomy section, we now move on to consider the architectural or regulatory design choices available when setting national climate targets. These choices have important implications for the values discussed in the previous section. Thus, we saw that choices on target ambition, for example, are likely to have a key bearing on whether one can continue to rely predominantly on the market economy or if a greater move towards state planning is likely to be needed. The design choices outlined in this section include whether targets are: inclusive or non-inclusive (partial); net or absolute; set in relation to a historical or a future baseline, fixed level, or intensity-based; binding or non-binding; short term or long term; ambitious or unambitious. I merely set out the (mostly) binary design choices in this section without passing comment on the normative values involved with those choices, the application of which is left for section 6 of the article.

5.1 Inclusive or partial?

What gets included in GHG emissions targets and thus how they are measured is crucial for how stringent and ambitious they truly are. Are all GHGs, beyond just CO2, included? Are all industrial sectors covered (for example international aviation and shipping)? Are production emissions from goods which are manufactured offshore but consumed in-country counted? Can domestic emissions

[54] There are other values that could go in this column for different policy contexts (eg market accountability, on which see eg Jerry Mashaw, 'Accountability and Institutional Design: Some Thoughts on the Grammar of Governance' in Michael Dowdle (ed), *Public Accountability: Designs, Dilemmas and Experiences* (Cambridge University Press 2006) 115, 122, 127. However, they have not been included because they do not arise here in a national climate targets context.

be offset by international credits? Answers to all these questions will have an important bearing on the strength in practice of the relevant targets. Under the UK Climate Change Act, all 6 Kyoto gases are included.[55] However, international aviation and shipping emissions have not, historically, been included[56] and neither have other extraterritorial emissions like overseas production.[57] Furthermore, buying in international carbon credits is allowed under the Act.[58] These territorial limitations have undoubtedly watered down the otherwise apparent strength of the target; as a result, the UK's record on cutting emissions has been called into question by campaigners, including Greta Thunberg.[59] Nevertheless, those limitations, while controversial, are all currently unexceptional as a matter of international law: under the UNFCCC and Paris Agreement, GHG emissions inventory reporting is not expected to include emissions beyond those on the national territory, nor emissions from international aviation and shipping as part of country totals,[60] and international credits can be used to offset national emissions.[61]

5.2 Net or absolute emissions reduction?

Another important question to consider in target design is whether the target should be based on absolute[62] GHG emissions reductions, or net emissions (i.e. positive emissions minus negative removals from, for example, relevant sinks[63]). The UK Act targets *net* emissions. Section 1 states the target as 'the net UK carbon account' to be at least 100%[64] lower than the 1990 baseline by 2050.[65] The UK's 'Annual Statement of Emissions for 2017'[66] explains the idea of the net carbon account thus: 'The starting point is UK emissions for the year … from all sources, including those from land use, land use change and forestry (LULUCF).'[67] To produce a net figure, 'these are then adjusted to

---

[55] s 24 and s 92. Cf eg New Zealand with its significant livestock sector, where biogenic methane is excluded from the main GHG emissions target in the Climate Change Response (Zero Carbon) Amendment Act 2019 (s 5Q).

[56] s 30(1). The UK is not alone in this – see eg New Zealand (n 55), s 5R.

[57] s 29.

[58] s 11 and ss 26-27.

[59] Rachel Schraer, 'Climate Change: Is Greta Thunberg Right About UK Carbon Emissions?', BBC News, 26 April 2019.

[60] Decision 18/CMA 1, Annex, Section II, [53], states that parties should not include international aviation and marine bunker fuel emissions in national totals but should, where disaggregated data are available, nevertheless report them distinctly.

[61] See 2006 IPCC Guidelines for National Greenhouse Gas Inventories (as amended), vol 1 General Guidance and Reporting, ch 1; UNFCCC Reporting Guidelines on Annual Inventories 24/CP.19; UNFCCC arts 4(2), 12(1); Paris Agreement arts 6, 13(7).

[62] Absolute is being used here in contrast to net emissions reductions. Cf eg art 4(4) of the Paris Agreement quoted earlier (end of section 2), which states that 'Developed country Parties should continue taking the lead by undertaking economy-wide *absolute* emission reduction targets' (emphasis added). This is a different use of absolute which means not *intensity*-based targets set on a GDP or per capita basis. This latter use will be discussed further below.

[63] Defined in art 1(8) UNFCCC as 'any process, activity or mechanism which removes a greenhouse gas … from the atmosphere'.

[64] Changed from 80% by The Climate Change Act 2008 (2050 Target Amendment) Order 2019 No. 1056.

[65] Although government documents often describe the Act (as do many legal commentators) as one which sets a target to *reduce the UK's greenhouse gas emissions* by at least 80% by 2050 (HM Government, Policy Statement: Implementing the Climate Change Act 2008: The Government's Proposal for Setting the Fourth Carbon Budget (May 2011) [5] – see also the Ministerial Foreword, p 3).

[66] BEIS, March 2019, <https://www.gov.uk/government/publications/annual-statement-of-emissions-for-2017> accessed 12 August 2019.

[67] ibid 3.

take into account removals of carbon dioxide from the atmosphere by sinks associated with LULUCF activity … and then further adjusted to account, for example, for carbon units which have been brought in from overseas by Government and others (e.g. installations covered by the EU ETS) to offset UK emissions ('credits').'[68] The final adjusted figure represents the net UK carbon account. The idea of 'net' emissions illustrated here is important because, in talking about emissions reductions targets, one might be tempted to think that it is all about reducing emissions of GHGs by sources. It is not: most countries are like the UK in seeking to achieve a net target, which allows, for example, removal of GHGs by relevant sinks rather than relying wholly on absolute cuts in GHG emissions. This is, again not uncontroversially, permitted under international climate law, with both the UNFCCC and the Paris Agreement providing for GHG reporting based on 'anthropogenic emissions by sources and removals by sinks'.[69] However, what amounts to a relevant anthropogenic sink is far from clear and country reporting practice varies enormously.[70]

As noted earlier, emissions targets may be direct or else indirect (such as for energy efficiency and renewables). Similar issues around 'net' figures can also arise with the latter, indirect targets. In California, for example, section 1 of the 100 Percent Clean Energy Act 2018[71] sets a target for the state to plan for '100 percent of total retail sales of electricity … to come from eligible renewable energy resources and zero-carbon resources by December 31, 2045.' The inclusion of 'zero-carbon resources' here means that the target is in effect a net one that can be met not only via renewables but also, for example, by fossil-fuel based power with carbon capture and storage (CCS). Article 3(1) of the revised 2018 EU Renewables Directive, in contrast, has an absolute renewables target: 'Member States shall collectively ensure that the share of energy from renewable sources in the Union's gross final consumption of energy in 2030 is at least 32%.'[72]

5.3 Baseline, fixed level or intensity-based?

Another choice relates to whether targets should be set in relation to a baseline – past or future – or be of a fixed or an intensity-based nature. Under the 1997 Kyoto Protocol, only Annex 1 developed countries were subject to binding emissions targets, which were set as a percentage reduction from a historical baseline in the form of a base year – typically 1990.[73] The more recent the base year, generally the more challenging the target is, because emissions in 1990 would be higher than in

[68] ibid.
[69] UNFCCC art 4 and Paris Agreement arts 4(14) and 13(7).
[70] IPCC (n 61); Giacomo Grassi and others, 'The Key Role of Forests in Meeting Climate Targets Requires Science for Credible Mitigation' (2017) 7 Nature Clim Change 220; Stephen Ogle and others, 'Delineating Managed Land for Reporting National Greenhouse Gas Emissions and Removals to the United Nations Framework Convention on Climate Change' (2018) 13 Carbon Balance Manage. However, under the 2018 Decision 18/CMA 1, Annex, Section II, [30], parties are required to indicate the sources and sinks that are not considered in the national inventory report but for which estimation methods are included in the 2006 IPCC guidelines and explain the reasons for such exclusion.
[71] <https://www.elaw.org/US_Cal_100PercentCleanEnergyAct_2018> accessed 5 August 2019.
[72] Directive 2018/2001 on the promotion of the use of energy from renewable sources [2018] OJ L328/82.
[73] Art 3 Kyoto Protocol to the United Nations Framework Convention on Climate Change.

earlier decades. Of course, that remains less true of the very recent past (i.e. since 1990) because emissions have often begun to drop in that period.[74]

More recently, there has been a move towards advocating and implementing 'net zero' emissions by a future date. In theory this does not require a percentage emissions reduction from a past base year. Thus, section 5Q of the New Zealand Climate Change Response (Zero Carbon) Amendment Act 2019 sets a fixed level target that 'net accounting emissions of greenhouse gases in a calendar year, other than biogenic methane, are zero by the calendar year beginning on 1 January 2050 and for each subsequent calendar year.' In contrast, the UK net zero target in the Climate Change Act 2008 is expressed in relation to a base year, requiring the net UK carbon account to be at least 100% lower than the 1990 base year by 2050.

If one examines NDCs submitted under the Paris Agreement, not surprisingly, developed country NDCs tend to follow the percentage/base year model familiar from Kyoto. However, developing countries – for whom creating mitigation targets is a new expectation as a result of Paris – have often opted instead for a target based on percentage reductions compared to a future, counterfactual 'business as usual' (BAU) scenario or baseline.[75] The advantage of this option is that it easily enables them to provide an unconditional target reduction and then an additional one that is conditional on equitable support from developed countries.[76] Another option is for fixed level targets – either carbon neutrality[77] – or, much less commonly, specifying a level of GHG emissions in a particular year.[78] Finally, rather than adopt absolute[79] targets, some developing countries have chosen to use intensity targets which tend to specify percentage emissions reductions as a proportion of population (per capita) or GDP.[80]

5.4 Binding or non-binding?

National climate targets can be set so they are legally binding, or they can be non-binding in nature. To be binding they must be enshrined in legislation rather than being contained within non-binding policy documents. Thus, the binding UK net zero target is set out in an Act of Parliament (the Climate Change Act 2008), while the EU's commitment to net zero by 2050 is, at this stage, expressed only in

---

[74] Prue Taylor and Kate Scanlen, 'The UK Climate Change Act: An Act to Follow?' (2018) 14 Policy Quarterly 66, 67: 'While this target [in the UK Climate Change Act] was set before the Paris Agreement, it is still relatively ambitious. Many national pledges under the Paris Agreement use 2005 as a relative benchmark, which requires less emissions cutting than a 1990 target'.

[75] Manasvini Vaidyula and Christina Hood, 'Accounting for Baseline Targets in NDCs: Issues and Options for Guidance', Climate Change Expert Group Paper No.2018(2), OECD, April 2018; Mengpin Ge and Cihang Yuan, 'More than One-Third of National Climate Plans Aren't Easily Measured', blog, 28 November 2018, <https://www.wri.org/blog/2018/11/more-one-third-national-climate-plans-arent-easily-measured> accessed 30 December 2019. Eg Mexico, whose NDC mitigation target is 'to reduce unconditionally 25% of its Greenhouse Gases and Short Lived Climate Pollutants emissions (below BAU) for the year 2030', <https://www4.unfccc.int/sites/NDCStaging/Pages/Home.aspx> accessed 30 December 2019.

[76] Eg Mexico, whose separate, conditional target includes a 40% rather than 25% reduction.

[77] Ge and Yuan (n 75) Eg Bhutan.

[78] Ge and Yuan, ibid. Eg Argentina whose NDC specifies that it 'shall not exceed a net emission of 483 million tons of carbon dioxide equivalent (tCO2eq) by the year 2030'.

[79] See n 62.

[80] Eg China, whose targets include one to 'lower carbon dioxide emissions per unit of GDP by 60% to 65% from the 2005 level'.

non-binding policy.[81] Until the passing of the Climate Action Act (Klimaschutzgesetz) at the end of 2019, which enshrined its climate targets into legislation, Germany's federal targets were similarly policy-based and legally non-binding.[82] While necessary, legislative form is not sufficient for a measure to be truly binding because, as we saw with the temperature targets in the Paris Agreement earlier, the wording too must go beyond the aspirational ('aim to' there) and use binding language like 'must', 'shall' or being under a 'duty' to ensure the target is met.[83] Ultimately, under article 4(2) of Paris, Parties are not required to make their NDC mitigation targets binding – only to pursue measures 'with the aim of achieving' the objectives of their NDCs.[84]

5.5 Short-term or long-term?

The time frame for achievement of the relevant climate target is a further consideration for those designing climate change laws. Climate change is probably unique as an area of law and policy in having targets that have been set quite so far into the future – notably to 2050 in some instances. However, long-term targets are also often accompanied by short-term ones along the way to that more distant future date. In the UK, for example, these short-term targets can be found in the form of 5-year carbon 'budgets'. In Germany, the 2019 Climate Action Act provides for *annual* sectoral emissions budgets to 2030.[85]

5.6 Ambitious or unambitious?

The final choice is between ambitious or unambitious targets. Of course, in many ways this is not a choice that sits independently from the ones considered above. What gets included in the targets will, for example, clearly affect the level of ambition, as will the base year chosen and whether cuts in GHG emissions are to be net or absolute. However, for present purposes, target ambition is treated as a combination of both the substantive numeric target aimed for and the time at which it is to be reached. This takes us into the 'net zero' emissions debate. Aiming for net[86] zero as a

---

[81] European Commission, 'A Clean Planet For All - A European Strategic Long-Term Vision for a Prosperous, Modern, Competitive and Climate Neutral Economy' COM (2018) 773; 'The European Green Deal' COM (2019) 640 final; European Council Conclusions, 12 December 2019, EUCO 29/19, CO EUR 31 CONCL 9.

[82] Kerstine Appunn and Julian Wettengel, 'Germany's Climate Action Law', https://www.cleanenergywire.org/factsheets/germanys-climate-action-law-begins-take-shape> accessed 27 December 2019.

[83] Some early commentators (wrongly) argued that the language in the UK Act, despite being expressed in terms of a duty to achieve a specific outcome, would nevertheless only be regarded by the courts as aspirational or a duty to use 'best endeavours': Memorandum from Prof Christopher Forsyth (CCB 92) to the Joint Committee on the Draft Climate Change Bill (2006-07, HL 170-II/HC 542-II, Ev.238), cited by Colin Reid, 'A New Sort of Duty? The Significance of 'Outcome' Duties in the Climate Change and Child Poverty Acts' [2012] Public Law 749 (who refutes this argument).

[84] As Bodansky (n 9, 146) notes, otherwise, NDCs would effectively have been imposing Kyoto-like, binding targets on states, including developing countries and unwilling developed ones like the US.

[85] (n 82).

[86] The 'net' here echoes the earlier discussion about net emissions: although the assumption is that source-based emissions reductions will be a part of achieving net zero, it involves no target for GHG emissions reductions as such, simply requiring that GHGs released must be matched by those removed (eg by carbon capture and storage (CCS) and negative emissions technologies (NETs), many of which remain unproven at scale). See further R Stuart Haszeldine and others, 'Negative Emissions Technologies and Carbon Capture and Storage to Achieve the Paris Agreement Commitments' (2018) 376 Phil Trans R Soc A; CarbonBrief, 'Explainer: 10 Ways 'Negative Emissions' Could Slow Climate Change', 11 April 2016,

substantive target for the level of emission reductions required is obviously more ambitious than previous targets set in terms of percentage emissions reductions below (and often well below) 100%. However, some countries have gone further than net zero and legislated either for 'at least' net zero,[87] thus potentially allowing for negative emissions to outweigh rather than match positive ones, or have actively specified negative net emissions once net zero is reached.[88] This is more ambitious still.

Because, of course, the substantive target of net zero is itself already ambitious, the battleground over ambition has become focused on when it should be achieved. While the precise term net zero is not found in the Paris Agreement, Article 4(1) does contain this as a target, stating that parties should 'achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases.' The date set for this net zero target is a vague and unambitious one, with such a balance required only 'in the second half of this century'. As for national governments, those with a net zero target have committed to achieve it within differing timescales. Norway, for example, has a target of net zero by 2030,[89] Sweden by 2045 'at the latest',[90] and the UK,[91] France[92] and New Zealand[93] by 2050.

Similarly, although net zero is universally supported by the climate movement, there is, nevertheless, a significant variety of views within the movement as to when it should be achieved. Extinction Rebellion (XR), the climate civil disobedience group, for example, has in a number of countries called for GHG emissions to be reduced to net zero by 2025,[94] arguing that 2050 is far too late: 'Let's not mince words, 2050 is a death sentence: people are already dying and this will only get

<https://www.carbonbrief.org/explainer-10-ways-negative-emissions-could-slow-climate-change> accessed 30 December 2019.

[87] As in the UK (n 64).

[88] See Sweden: <http://www.swedishepa.se/Environmental-objectives-and-cooperation/Swedish-environmental-work/Work-areas/Climate/Climate-Act-and-Climate-policy-framework-/> accessed 5 August 2019.

[89] <https://www.regjeringen.no/en/topics/climate-and-environment/climate/innsiktsartikler-klima/agreement-on-climate-policy/id2076645/> accessed 20 November 2019. Albeit one likely to be heavily reliant on international credits (Erlend Hermansen and Bård Lahn, 'Climate Neutrality the Norwegian Way: Carbon Trading?', 17 Sept 2019, <https://cicero.oslo.no/no/posts/nyheter/climate-neutrality-the-norwegian-way-carbon-trading> accessed 20 November 2019.

[90] <http://www.swedishepa.se/Environmental-objectives-and-cooperation/Swedish-environmental-work/Work-areas/Climate/Climate-Act-and-Climate-policy-framework-/> accessed 20 November 2019.

[91] Within the UK, Scotland has committed to go beyond the UK target to achieve net zero by 2045: Climate Change (Emissions Reduction Targets) (Scotland) Act 2019.

[92] <https://www.citepa.org/fr/2019_11_b8/> accessed 20 November 2019.

[93] Climate Change Response (Zero Carbon) Amendment Act 2019.

[94] <https://rebellion.earth/the-truth/demands/>; <https://ausrebellion.earth/>; https://xrebellion.org.za/materialis/our-demands/#page-content, accessed 4 February 2020.

worse with far off dates.'[95] FoE England has, in contrast, opted for a 2045 date,[96] Greenpeace UK for 'well before 2045'[97] and FoE Scotland for 2040.[98]

Target dates are also important for the ambition of indirect targets. Norway has set a target that all new cars sold should be zero emission (electric or hydrogen) by 2025.[99] In the UK, the Government's Road to Zero strategy set a target for 'all new cars and vans to be effectively zero emission by 2040', leaving space for hybrids to continue to be sold.[100] The UK Committee on Climate Change stated that the target should be more ambitious, with the date ideally brought down to 2030.[101] In February 2020 the Government announced that it would bring forward the date to 2035 at the latest and that sales of hybrids would also be banned.[102]

6. Assessing the Taxonomy Choices in the Light of Normative Values

In the previous targets taxonomy section I set out a number of key design choices that confront policy makers in deciding on national climate targets, including among others, whether they should be inclusive or partial, binding or non-binding, short term or long term, and ambitious or unambitious. These are all important choices, but ones that can only be properly assessed in the light of the normative framework discussed in section 4, to which we now turn.

6.1 Inclusive or partial?

With inclusiveness, whether international credits should be counted under a target is linked to the values of cost-effectiveness and effectiveness. Supporters argue that emissions reductions ought to take place in countries where they can be carried out at least cost.[103] Allowing for trade in international credits means that high cost countries do not have to reduce emissions themselves but can instead buy them in. This delivers the same level of emissions reductions overall but at a lower cost, making credits a cost-effective solution. The trade-off here is with the value of effectiveness if,

---

[95] <https://rebellion.earth/2019/06/12/will-theresa-may-leave-a-legacy-or-pass-down-a-death-sentence/> accessed 9 August 2019.
[96] FoE, '12 Years to Save Our Planet: The Solutions to the Climate Crisis', Nov 2018, <https://friendsoftheearth.uk/climate-change/12-years-save-our-planet-solutions-climate-crisis> accessed 12 August 2019.
[97] Greenpeace, 'How Government Should Address The Climate Emergency', May 2019, <https://www.greenpeace.org.uk/wp-content/uploads/2019/04/0861_GP_ClimateEmergency_Report_Pages.pdf> accessed 6 August 2019.
[98] <https://foe.scot/campaign/climate-action/climate-bill/> accessed 12 August 2019. In both FoE cases this is 5 years shorter than the respective UK and Scottish government targets (of 2050 and 2045).
[99] <https://elbil.no/english/norwegian-ev-policy/> accessed 20 December 2019.
[100] I.e. electric with fossil fuel vehicles rather than 100% plug-in electric or hydrogen: 'By then [i.e. 2040], we expect the majority of new cars and vans sold to be 100% zero emission and all new cars and vans to have significant zero emission capability' (Department for Transport, 'The Road to Zero', July 2018, 7). The House of Commons Business, Energy and Industrial Strategy Committee criticised this approach, recommending that the target be 'truly' zero emission by 2032 ('Electric Vehicles: Driving the Transition', 14th report of session 2017-2019, HC 383, 19 October 2018).
[101] Committee on Climate Change, 'Net Zero: The UK's Contribution to Stopping Global Warming' (May 2019) 11, 178.
[102] BBC News, 'Petrol and Diesel Car Sales Ban Brought Forward to 2035', 4 February 2020, <https://www.bbc.co.uk/news/science-environment-51366123> accessed 4 February 2020.
[103] Committee on Climate Change (n 101) 131.

for example, the credits bought are not genuinely additional because the reductions would have been carried out in the host state anyway.[104]

6.2 Binding or non-binding?

Perhaps the most obvious of the taxonomies, values-wise, is whether a target is binding or non-binding. Having a legally binding target offers clear advantages in relation to legal certainty and accountability, but at the cost of flexibility, whereas non-binding targets offer flexibility at the cost of legal certainty and accountability. However, as we shall see below, it is important not only to look at this quality or taxonomy in isolation, but also to consider how it interacts with others such as whether a target is short or long term in nature. Having a very short, annual target that is binding may serve some values such as accountability for example, but at the potential cost of others like flexibility.

6.3 Short-term or long-term?

Andrej Babiš, the Czech prime minister, asked on his arrival at a June 2019 summit where the EU ultimately failed to agree a net zero target for 2050: 'Why should we decide 31 years ahead of time what will happen in 2050?'[105] The question is a reasonable one; what is surprising is the prime minister's apparent ignorance of the available positive answers to it. There are two key normative arguments for setting a long-term target. The first is that it enables an ambitious target to be set (in substantive numeric emissions reduction terms) which is nevertheless realistic[106] and hence likely to be 'effective' in terms of the values set out earlier. Thus, a target of, say, a 20% reduction in the next 10 years is not very ambitious. Making it, instead, a 100% reduction, in 10 years would be very ambitious but also unrealistic and hence ineffective. Making the 100% reduction a long-term target of, for example, 30 years out, is more likely to enable ambition to be combined with effectiveness.

Second, it makes it much more emphatically something that crosses over standard election cycles and political attention spans. Especially if the long-term target is legally binding, it can be regarded as a type of credible commitment[107] or precommitment strategy[108] which, in Lazarus' terms, provides climate legislation with important 'stickiness' or 'steadfastness'.[109] This equates to 'certainty' from the values outlined earlier: long-term, legally binding targets provide industry in particular with the certainty it needs to plan and commit to investment decisions which it knows will

[104] ibid.
[105] Jennifer Rankin, 'Central European Countries Block EU Moves Towards 2050 Zero Carbon Goal', The Guardian, 20 June 2019.
[106] What is realistic really needs to be broken down into what is socially, economically, physically, and politically feasible: Aled Jones, 'Net Zero Emissions by 2050 or 2025? Depends How You Think Politics Works', The Conversation, 2 May 2019, <https://theconversation.com/net-zero-emissions-by-2050-or-2025-depends-how-you-think-politics-works-116335> accessed 8 August 2019.
[107] Aileen McHarg, 'Climate Change Constitutionalism? Lessons from the United Kingdom' (2011) 2 Climate Law 469. A 'credible commitment' problem arises when short-term political incentives threaten long-term policy goals. The standard solution is to delegate power to an independent regulatory agency (such as a central bank, or the EU): Manuel Becker, Thomas Dörfler and Thomas Gehring, 'Credible Commitment Without Independent Regulatory Agent: 'Evidence From the Security Council's United Nations Compensation Commission' (2018) 12 Regulation & Governance 395.
[108] Lazarus (n 8) 34.
[109] ibid.

not then be wasted as a result of a sudden change in overall direction.[110] Industry groups have thus been among the most vocal in calling for long-term climate targets to be set.[111]

What then is the case against long-term targets? One issue is related to democracy as a value. Democracy involves the idea that all those affected by a decision should have a say.[112] However, in the case of targets set into the far future, they are effectively being made by the present generation of voting age and not by future generations whose interests will also be affected.[113] One way around this problem is to set targets in a way that the interests of future generations are represented, for example via a Commissioner-type device.[114]

Another obvious issue with long-term targets is that things can change over time and the target, which may have looked ambitious at the start, now looks rather less so. Indeed, this very accusation was recently levelled at the UK's original 2008 promise of reducing emissions 80% by 2050, which looked increasingly unambitious (hence the change made in 2019 to net zero). However, one might well argue, in response, that this is not a problem so long as the original long-term target, when made, is made revisable in law rather than being left stranded in and of the time that it was set. This is a matter of flexibility[115] as a value, or what one might term adaptable governance.[116] You need the ability to adapt the target if it looks like it is turning out to be unsuitable to changed circumstances – especially developments in the science showing that climate change is turning out to be worse than previously anticipated.[117] As Lazarus notes, in the end, climate legislation requires a combination of both steadfastness (certainty) and flexibility because while enabling clear planning is important, so too is the ability to change direction where this is objectively necessary.[118] Thus, in the UK, the Secretary of State has the power, under section 2(1) of the Climate Change Act 2008, to change its 2050 target under certain circumstances – tightly defined to avoid any changes based simply on political whim which long-term commitments are designed to avoid.[119] This power was exercised in 2019 to re-set the UK 2050 target down to at least net zero.[120]

---

[110] Jill Rutter and William Knighton, *Legislated Policy Targets: Commitment Device, Political Gesture or Constitutional Outrage?* (Institute for Government 2012). However, while long-term targets are important for investment decisions, as, if not more important, are actual policy instruments used to meet them and whether these are changed (as with eg UK policy on renewables subsidies): Sam Fankhauser, Alina Averchenkova and Jared Finnegan, *10 years of The UK Climate Change Act* (Grantham, LSE 2018) 26.

[111] Matt Mace, 'Business Leaders Call for EU Net-Zero Target', edie newsroom, 30 April 2019, <https://www.edie.net/news/9/Business-leaders-call-for-EU-net-zero-target/> accessed 9 August 2019.

[112] The 'all-affected' or 'affectedness' principle. See eg Robyn Eckersley, *The Green State: Rethinking Democracy and Sovereignty* (MIT Press 2004) 112-114; cf Clare Heyward, 'Can the All-Affected Principle Include Future Persons? Green Deliberative Democracy and the Non-Identity Problem' (2008) 17 Environmental Politics 625.

[113] Eckersley (ibid); Heyward (ibid) 630-632; Lazarus (n 8) 35.

[114] As in eg Part 3 of the Well-being of Future Generations (Wales) Act 2015, (establishing a Future Generations Commissioner for Wales).

[115] Lazarus (n 8) 34.

[116] Cf 'adaptive' governance which has much more of a normative quality beyond just adapting to changed circumstances (including eg stakeholder involvement in determining the common interest): Toddi Steelman, 'Adaptive Governance' in Christopher Ansell and Jacob Torfing (eds), *Handbook on Theories of Governance* (Edward Elgar 2016).

[117] This is a separate issue to whether one might need to adapt the policy instrument mix if it looks like the target will not be met. Both involve adaptable governance.

[118] Lazarus (n 8) 34.

[119] s 2(2).

[120] (n 64).

If one disadvantage of a long-term target is that the target itself can end up out of step with changed circumstances, another is that it may encourage people to act only as they approach the deadline. A long-term target may set one's horizons beyond immediate electoral cycles, but it does not guarantee that politicians will not be tempted to avoid acting during the earlier electoral cycles of the overall target period. By backloading rather than frontloading effort, there is a danger that climate tipping points may be triggered in the meantime and that the costs of doing everything late-on become excessive when compared with taking more measured steps along the way. This backloading risk associated with long-term targets is, in other words, troubling for both the values of effectiveness and cost-effectiveness. If political and legal accountability lie only after the target has been breached in the distant future, then this value is also compromised. Not surprisingly, examples one finds of long-term targets typically therefore come with some form of interim target-type arrangement which provides for a stepped approach. Under the UK Climate Change Act 2008 for example, alongside the long-term 2050 target, there is, as we have seen, a series of carbon budgets which set out what are effectively 5 yearly interim targets along the way. This is a key governance tool for dealing with the risks to effectiveness, cost-effectiveness and accountability arising from long-term targets: such budgets provide a trajectory to the final target, ensuring that the government remains effectively on course to meet it and in a cost-effective way. They can also be held to account in the meantime if they are veering off course.

Assuming these short-term, interim targets are legally binding, the issue arises of whether you can go overboard with your interim targets. In Germany, as we have seen, the new 2019 Climate Action Law contains binding annual targets towards 2030. This proved controversial when the draft law was under consideration, with Christian Democrat MP Andreas Lämmel speaking of a 'dictatorship of climate law' and commenting:

> for us 2030 is the next threshold. And all political activities are geared towards achieving the 2030 goals. Why then a rigid annual target? Somebody has to explain that to me. Imagine that you are preparing a major policy that will come into force next year that really should contribute. But you are suddenly missing last year's annual target. That's when this whole legal mechanism starts to kick in with immediate emergency programmes and all sorts of action. That is not politically responsible.[121]

Thus, one needs interim targets to prevent backloading,[122] but there is inevitably a trade-off between effectiveness, accountability and long-term cost-effectiveness on the one hand (served by short, interim targets) and other values such as flexibility, equity and short-term cost-effectiveness on the other (which may be served by avoiding overly short, interim targets). The German law, as passed, specifies that if an annual sector target is missed, the responsible ministry must issue a corrective action programme within three months, on the basis of which the Climate Cabinet will adjust the Climate Action Programme 2030 to ensure that the targets are met.[123] However, in order to allow for (short-term) cost-effectiveness and equity, there also remains scope for the federal government to decide whether the annual sector budgets need to be adjusted.[124]

---

[121] Based on English translation at <https://www.thegwpf.com/top-german-mp-warns-of-dictatorship-of-climate-law/> accessed 9 August 2019.

[122] As the interviewer noted in his reply: 'Maybe that's why it's so good to have these rigid annual targets, so that if we speak again say in the year 2029 and you tell me, sorry, but it's not possible by 2030?' (ibid).

[123] <https://www.bundesregierung.de/breg-en/issues/climate-action/klimaschutzziele-finanzieren-1694724> accessed 23 December 2019.

[124] ibid.

Finally, while one of the advantages of long-term targets listed above was that they can provide plenty of time for industry and society to adjust to what are likely to prove challenging transitions, one problem is that, especially if they are overly prescriptive,[125] they might end up locking society into a particular type of transition that turns out to be a poor choice. This problem involves a lack of knowledge of the future – not so much in terms of the science of climate change and its effects (although as we have seen, knowledge on that too may change), but more in terms of the shape of the post-carbon economy – in particular how the decarbonisation mix plays out precisely in practice. This cautions against setting some types of targets – notably indirect emissions targets – too far into the future. Technology forcing or encouraging innovation is one thing, but when you have not just a single issue (for example, the 1970s problem of local air quality and vehicle exhaust, where technology forcing was employed in the US),[126] but rather a polycentric mix of renewables, transport, domestic heating and cooking, energy efficiency and so on, then it becomes more difficult. One may end up producing the wrong or non-ideal mix or balance between them. The EU has recently confronted this very issue in setting its long-term climate policy. As we have seen, it has thus far eschewed setting legally binding targets over a long-term period. It has instead engaged principally in scenario planning based on various 'pathways' with different technologies,[127] which is arguably better suited than targets to handling polycentricity. In administrative law terms, this is a discretion-based approach as opposed to the rules-based approach of binding targets. Discretion, as we know, has the advantage of flexibility.[128] Certainty for business is normally a good thing, but not if it produces *undesirable* lock-in. We are back, in other words, to Lazarus' delicate balance between certainty and flexibility.

6.4 Ambitious or unambitious?

The date by which net zero emissions should be reached has become the touchstone of ambition in climate target setting. As we have seen, at the forefront of this have been XR's demands in a number of countries for the governments to commit to net zero by as early as 2025. This raises the issue of who should get to decide the level of ambition. In a democracy, we expect that to be democratically elected governments, who have to weigh up some of the inevitable trade-offs that we will come on to below. Social movements actors like XR apply important pressure – and one of their other core demands, of having a citizen assembly on climate change, obviously itself has a participatory democratic component – but, in a representative democracy, neither XR nor such an assembly are the ones ultimately to make the decision on ambition. Of course, in a *liberal* democracy operating under the rule of law, where democratic decisions threaten human rights then they can be challenged in court. It comes as no surprise then that we have seen human rights challenges to unambitious climate targets adopted by elected governments. The successful *Urgenda* challenge to the Dutch government's climate targets is just such a case.[129] As the Dutch Supreme Court observed, weak targets are capable of impacting negatively on the rights of residents of the Netherlands under Articles 2 (right to life) and 8 (right to private and family life) of the European Convention on Human Rights.

---

[125] Fankhauser and others (n 110) 26.

[126] David Gerard and Lester B Lave, 'Implementing Technology-Forcing Policies: The 1970 Clean Air Act Amendments and the Introduction of Advanced Automotive Emissions Controls in the United States' (2005) 72 Technological Forecasting & Social Change 761; Thomas O McGarity, 'Radical Technology-Forcing in Environmental Regulation' (1994) 27 Loyola of Los Angeles Law Review 943.

[127] European Commission, 'A Clean Planet for All' (n 81).

[128] Hayek (n 52); Galligan (n 52).

[129] (n 2).

The potential trade-off for setting ambitious short-term targets (or, rather, drastically shortening existing long-term targets) adverted to above is that they may be *too* ambitious in terms of being realistically achievable and hence effective. In addition, critics of the XR target have argued that it would come at an enormous cost, not only financially, but also in relation to social justice and individual liberty. In other words, it would have serious implications for four of the values outlined earlier – effectiveness, cost-effectiveness, climate justice, and individual freedom. Reducing emissions at such pace would likely require a combination of the virtual cessation of air travel, scrapping gas central heating and cooking, and petrol and diesel vehicles, and a switch to 100% renewable and nuclear energy. The first in this list (air travel) provides a good example of the effects on liberty; next, without careful 'just transition' arrangements in place, the two types of scrappage are most likely to hit the poor the hardest, which illustrates the (*domestic*) social/climate justice element; and both the scrappage and the final power generation examples are likely to come at significant financial cost because of the major infrastructural change required in such a short period. To do all of this by 2025 *may* be physically possible if the economy was put on a climate emergency 'war' footing as demanded by some,[130] but critics argue that it is not necessary to bear these various costs because we have time to act by a later date and still meet the relevant climate temperature target.[131] Furthermore, achieving net zero by 2050 would still enable the UK to meet its *international* equity or climate justice obligations as expressed in CBDR-RC.[132] In terms of the values discussed earlier, the 2025 target may also be considered disproportionate therefore.

What does this tell us in climate governance terms? The answer is that, in thinking about the temporal pace of targets, one needs to consider not only the benefits but also the costs and where these are likely to fall. A degree of precaution is obviously warranted, which includes not only precaution in relation to how the natural environment responds to climate change (because of the uncertainty over tipping points, there is a case for earlier targets), but also not waiting until all of the policy instrument levers have been meticulously planned to meet the target. The latter is what Greta Thunberg, in her speech to the UK Parliament, described as the need for 'cathedral thinking': 'We must lay the foundation while we may not know exactly how to build the ceiling.'[133] Nevertheless, as well as being precautionary, the response must also be proportionate and equitable.

Ultimately, the disagreement on target pace between XR protestors and conservative and centrist critics is as much about the values associated with political economy as it is about those like precaution, cost-effectiveness, proportionality and justice. A rapid decarbonisation by 2025 is likely to require a considerable degree of state planning, with little room left for market forces and

---

[130] Rob Merrick, 'UK Must Fight Climate Change on 'War Footing' Like Defeat of Nazis, Theresa May Told', The Independent, 29 April 2019.

[131] Jonathan Ford, 'Extinction Rebellion Has the Climate Problem Back to Front', Financial Times, 22 April 2019. The Committee on Climate Change's report on net zero (n 101) is premised on this ability.

[132] Committee on Climate Change (n 101) 8, 85, 128. Though not all agree with this: see eg Kevin Andersen, 'Brief Response to the UK Government's "Net-Zero" Proposal', blog, June 2019, <https://kevinanderson.info/blog/brief-response-to-the-uk-governments-net-zero-proposal/> accessed 30 December 2019.

[133] <https://www.theguardian.com/environment/2019/apr/23/greta-thunberg-full-speech-to-mps-you-did-not-act-in-time> accessed 12 August 2019; see also Alex Chalk MP, who, in introducing his private member's Bill, Climate Change (Net Zero UK Carbon Account) stated: 'When Sir Christopher Wren started St Paul's, he did not have a definitive design for every last aspect, and the dome ended up being radically revised as improved building technology made a more ambitious design possible. We need to start the project, and then row in behind the target with an ambitious programme of policies on issues ranging from house building standards to transport, agriculture and planting more broad-leaved trees' (Hansard,30 April 2019, Volume 659, col 150).

individual choice.[134] The Conservative government, in contrast, has been keen to leave time for private investment to help drive innovation to reach the desired endpoint. In the climate change policy debate on 23 April 2019, the then Minister for Energy and Clean Growth, Claire Perry stated:

> One of the challenges that I have heard is that we need a fundamental reworking of the market-based system to solve all our problems. My recollection is that centrally planned economies historically had some of the worst records on environmental pollution, climate change and emissions. I have seen the power of the private sector investment … the technology and innovation that come from competition and things such as the auction system … which have sent the costs of offshore wind tumbling over the past few years. The market-based system does deliver, but we need Government to set ambition, to regulate where required and to convene where necessary.[135]

What then can we conclude from this section? First, climate targets must be long term in order to combat the short-term thinking that is otherwise ingrained in both political and economic systems. However, they must be accompanied by short-term, interim targets in order to avoid slippage and backloading by politicians. And not everyone wants targets to be *too* long term because that can speak to a lack of ambition. In the end, it comes down to a trade-off between various values. Long-term targets provide much needed certainty, in particular for industry, who can have faith in the direction of travel and who are given time to make the necessary, transitions cost-effectively and flexibly within a standard market economy approach. The slower pace of transition is also less likely to create significant domestic social justice issues. However, long-term targets come at the expense of accountability and with risks – especially associated with backloading – to effectiveness and (long-term) cost-effectiveness. Short-term interim targets provide effectiveness and accountability to prevent slippage and backloading but potentially at the cost of political flexibility, (short-term) cost-effectiveness and equity. And ambitious, long-term targets which are drastically shortened – as with XR's 2025 target for net zero to replace 2050 – may give the appearance of delivering on certainty and accountability, but are likely to come at the expense of effectiveness and domestic social justice, and with much reduced flexibility in terms of allowing for a cost-effective market economy response.

7. Conclusion

Temporality has been a key strand in the current article, continuing a recent trend of examining the role of time in environmental law.[136] Law seeks to 'fix' the short-termism problem with politics and economics via legally binding distant future targets which serve as credible commitments. However, fixing political temporality risk via long-range targets is difficult: politicians may just seek to backload action, which comes at a financial cost and with the risk of missing the target, hence compromising the values of cost-effectiveness and effectiveness. Law therefore needs to impose interim targets. Nevertheless, as we have seen, if law becomes too short-termist (for example with annual binding

[134] Similar arguments have been made by Conservative critics of Germany's new climate law: Benjamin Wehrmann, 'Senior Conservative Says Proposed Climate Action Law would 'Paralyse' Germany', CLEW, 28 February 2019, <https://www.cleanenergywire.org/news/senior-conservative-says-proposed-climate-action-law-would-paralyse-germany> accessed 9 August 2019.

[135] Vol 658, col 671, 23 April 2019.

[136] Lazarus (n 8); Benjamin Richardson, *Time and Environmental Law: Telling Nature's Time* (Cambridge University Press 2017); Chris Hilson, 'Framing Time in Climate Change Litigation' (2018) 9 Oñati Socio-Legal Series 361; Elen Stokes, 'Wanted: Professors of Foresight in Environmental Law!' (2019) 31 JEL 175.

targets), then there is equally a potential trade-off with values such as flexibility, short-term cost-effectiveness and equity.

The economic system is typically short-termist like politics – after all, shareholders are seldom 'patient capital'. Law therefore needs to set binding, longer-term horizons for companies that force them away from the short-term competitive imperatives of the existing marketplace. The transition to a decarbonised economy requires technological innovation that will take time (especially if the transition is more market-led than state planned in nature). Law's binding targets (rules) provide much needed investment certainty, but if they are too long term then, at least with indirect targets, one may end up with undesirable technological lock-in. Innovation also requires flexibility, which is served by discretion, and flexible pathways may on occasions be preferable to binding long-term targets. Equally, if law is too ambitious over the short term (for example with XR's 2025 direct GHG emissions target), then there is likely to be too little time for market innovation, and moving in the direction of a planned economy on a war footing may or may not be effective in producing the necessary transition.

Because of the existential threat posed by climate change, climate targets are important, and in the current article I have sought to provide a taxonomy and set of normative values by which to assess them, in order to aid their optimal design. In the end, however, targets are in one sense the easy part, in that they can be set by politicians as a crowd-pleasing token, without too much thought or intention on follow-through.[137] More difficult is getting the correct programme of measures in place urgently, to ensure that the targets are actually going to be met. The Gilet Jaunes protests in France, which were precipitated by planned increases in fuel taxes as a regulatory instrument, show how controversial and prone to backlash the programme part can be, unless it too is properly designed in line with values such as social justice. It is there – in other words with the concrete implementation of targets – that the challenges of the transition to a post-carbon economy will truly be felt.

ACKNOWLEDGEMENTS

I am very grateful, for their comments, to audiences/participants at Oxford and Potsdam, Selam Abebe, and the anonymous referees.

[137] Lazarus (n 8) 33-34; Rutter and Knighton (n 110) 5.