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Instrument Choice for Climate Change Mitigation: A Legal Perspective

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DOCTORAL DISSERTATION

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Abstract

On all levels of regulation, policies to mitigate climate change are undergoing rapid proliferation, coupled with an evolution of underlying regulatory paradigms. While the resulting policy mix has yielded initial successes in various regions and jurisdictions, it has also proven increasingly prone to regulatory conflicts, lacking policy durability and a general trend towards fragmentation. This study and the accompanying articles trace such shortfalls in the current climate policy landscape to a flawed, yet uncritically perpetuated theoretical framework for instrument choice, and highlights both conceptual weaknesses in the underlying criteria as well as important historical policy making processes that reveal their limited bearing in practice. Rather than rely on the utopian promise of rational and objective guidance such criteria tacitly espouse when choosing our collective response to a challenge as important as climate change, this study argues that stronger consideration of the law and jurisprudential methods can improve the final policy design by avoiding conflicts and tensions while affording the policy outcomes with a greater level of legitimacy.

Tiivistelmä

Kaikilla sääntelyn tasoilla, ilmastotoimet ovat nopeasti levittäytymässä ja ovat samalla läpikäymässä paradigmaattista muuntautumista vapaaehtoisten kannustimien, hintasäännöstelyn ja määrällisten rajoitusten suuntaan. Vaikka tästä johtuva toimien kirjo onkin eri lainkäyttöalueilla alkuvaiheessa ollut menestyksestä, se on myös enenevässä määrin johtanut sääntelyristiriitihin ja yleisesti ottaen lainkäytön pirstoutumiseen. Voisi väittää, ettei mikään ilmastonmuutoksenkaltainen globaali haaste voi täysin välttää tämänkaltaisia vaikeuksia. Kuitenkin tämä väitöskirja jäljittää monet näistä vajeavaisuuksista virheellisiin ja kuitenkin kritiikittömästi toistettuihin oppeihin, siitä minkä perusteella ilmastopolitiikan välineet valitaan, ja korostaa sekä käsitteellisiä heikkouksia että tärkeitä historiallisia päätöksentekoprosesseja, joissa näillä opeilla oli vähän tai ei lainkaan vaikutusta poliittiseen lopputulokseen. Sen sijaan, että seuraisimme utooppista lupaus rationaalisista ja objektiivisista kriteereistä, tämä teos väittää että lopputulosta voidaan parantaa, ristiriitoja vähentää ja jännitteitä välttää antamalla laille ja lainopin metodeille suurempi huomio, jolloin saavutetaan myös enemmän legitimizeettiä. Teoksen päätelmät sisältävät useita suosituksia koherentin ilmastopolitiikan muotoilemiseksi kansainvälisellä, alueellisella ja kansallisella tasolla.

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1 Introduction

1.1 Background and Relevance

The global environment, and, more specifically, the advent of climate change have placed new and challenging demands on the existing legal framework. On all levels of regulation, be it the domestic, regional or international plane, conventional assumptions about the appropriate policy response to environmental pressures have been put to question, while new approaches, based on widely divergent and occasionally untested premises, are in various stages of operation. Both the rationale of policy instruments and the manner in which they are vested in law have undergone change, with flexible market incentives, including different forms of pricing and quantity rationing, supplanting more conventional regulation through technology standards and performance targets.¹ Accordingly, the policies instated to mitigate climate change can nowadays draw on a larger selection of policy instruments than ever before. With this, however, also comes a need for criteria which justify and guide processes of choice between contending models of environmental regulation. Different jurisdictions have approached this challenge with varying degrees of success and vastly divergent approaches to the optimal ‘instrument mix’, justifying the need for a critical and comparative perspective in their study and evaluation.

Despite lawyers playing a substantial role in operationalizing policy, they have made a surprisingly modest contribution to the theoretical and conceptual framing of policy instrument choice. In the area of energy and climate policies, for instance, the Intergovernmental Panel on Climate Change – along with most textbooks on environmental policy and economics – have consistently espoused theoretical considerations of effectiveness, efficiency and distributional justice – frequently defined through the limited lens of mainstream economics² – as the principal criteria for policy instrument choices. As a comparative analysis of past instrument selection processes reveals, however, different actors have widely disagreed about these criteria when it

¹ For further detail, see *infra*, Sections 2 and 4.

² For further discussions, see *infra*, Sections 3 and 4.

comes to their practical application, going so far as to use them as arguments to advance particular interests during policy debates or diplomatic negotiations.³

On an epistemic level, moreover, such criteria are conceptually indeterminate and value-contingent in nature, suggesting that it is only their ambiguity which allows stakeholders to agree on them in the first place.⁴ A number of case studies drawn from historical climate policy choices across the Atlantic demonstrates how legal and institutional realities frequently take precedence over theoretical instrument choice criteria, countering the veneer of objective rationality these criteria claim to afford to the selection of climate policy instruments in the first place.⁵ At the same time, the case studies illustrate how inadequate consideration of the legal and institutional contexts into which new policies are born has resulted in an instrument mix characterized by regulatory inconsistencies and outright conflicts.⁶

As we are, with every passing year, reminded of the unprecedented urgency, scale, and daunting social and economic implications of the climate challenge⁷ as well as our ongoing collective failure to rise up to it,⁸ the issue of policy instrument choice for climate change mitigation acquires substantial practical relevance. If, by relying on a flawed or misleading theoretical framework of instrument choice, we place our political and financial resources in the

³ See, for instance, the reference to purported violations of international trade law invoked by opponents of border carbon adjustment to support a politically preferred policy position, Michael A Mehling and others, ‘Designing Border Carbon Adjustments for Enhanced Climate Action’ (2019) 113 *American Journal of International Law* 433.

⁴ For a detailed analysis based on the criterion of ‘effectiveness’, see Michael A Mehling, ‘Betwixt Scylla and Charybdis? The Concept of Effectiveness in International Environmental Law’ (2002) 13 *Finnish Yearbook of International Law* 129.

⁵ See the empirical case studies contained *infra*, in Section 5.

⁶ See, for further detail, *infra*, Section 6.3.

⁷ See, for instance, the analysis contained in Intergovernmental Panel on Climate Change (IPCC), ‘Global Warming of 1.5°C: An IPCC Special Report on the Impacts of Global Warming of 1.5°C Above Pre-Industrial Levels and Related Global Greenhouse Gas Emission Pathways, in the Context of Strengthening the Global Response to the Threat of Climate Change, Sustainable Development, and Efforts to Eradicate Poverty’ (Intergovernmental Panel on Climate Change (IPCC) 2018) <<https://www.ipcc.ch/sr15>> accessed 10 March 2019.

⁸ See, for instance, United Nations Environment Programme (UNEP), *The Emissions Gap Report 2019* (United Nations Environment Programme (UNEP) 2019) <<https://wedocs.unep.org/bitstream/handle/20.500.11822/30797/EGR2019.pdf>> accessed 20 January 2020.

service of policy instruments that are not commensurate with the threat they are intended to address, we risk losing precious time in our collective response to one of the most existential challenges of our time.⁹ Regulatory conflicts and lacking compatibility of policies with their legal and institutional context are only one expression of such incommensurability. Of similar importance is the political durability of our chosen policy solutions, as evidenced by the experiences countries such as the United States or Australia, where significant policy progress can be swiftly undone with one election;¹⁰ and there, too, the criteria guiding instrument choice can introduce vulnerabilities if they reflect normative considerations that are not aligned with the preferences of those bound by climate policies or cooperative arrangements, therefore lacking legitimacy.

Drawing on a typology of mainstream criteria of instrument choice, this study highlights the need for stronger integration of jurisprudential methods in the selection process, both as a means to avoid a loss of cohesion in the legal system, but also because law – as a reflection of popular consent – has a bearing on the legitimacy of the policy debate and endows interests that might otherwise be overheard with a formally entitled voice. Drawing on the unique methodological skills of lawyers allows for a more robust understanding of agreed policy objectives and, in turn, of how criteria of instrument choice can be applied in practice. Dissecting the choice of policy instruments and cooperative arrangements for climate change mitigation based on the existing theoretical literature, and testing mainstream criteria of instrument choice against historical policy pathways with a focus on the legal and institutional realities that shaped actual decision making in the real world, are therefore at the centre of this research exercise; but it also advances a normative proposal for stronger consideration of legal and institutional determinants of instrument choice, as described in the next section.

⁹ On this broader theme, see the narrative in the introduction of Michael A Mehling, ‘The Comparative Law of Climate Change: A Research Agenda’ (2015) 24 *Review of European, Comparative & International Environmental Law* 341.

¹⁰ The inordinate role of political economy constraints on the long-term success of climate policies is a central theme explored in Endre Tvinnereim and Michael A Mehling, ‘Carbon Pricing and Deep Decarbonisation’ (2018) 121 *Energy Policy* 185.

1.2 Research Question

What determines the selection of one policy instrument over another in the collective effort to mitigate climate change?¹¹ Which proven or alleged properties of different approaches to climate governance and regulation influence this process, ultimately guiding a decision? While it is widely agreed that no single model can serve as a panacea for all regulatory purposes, a number of criteria have gradually evolved in various academic disciplines, dominated by economics. On a sufficiently general level, these might involve considerations of effectiveness and expediency, economic feasibility and efficiency, political legitimacy, and, finally, equitability. From a legal point of view, however, the determinants guiding such a choice must also take into account the normative framework of rules, principles and institutional mandates reflecting past and present expressions of consent to public authority in different substantive issue areas.

In the context of climate change, therefore, this study and its accompanying articles propose a systematic assessment of mainstream instrument choice criteria in order to shed light on the underappreciated role lawyers can play in advancing the theory and understanding of instrument choice processes, and also to identify the unique epistemic contribution that the legal discipline can make to this important area of enquiry. Specifically, it seeks to provide new insights on the following research questions: a) What criteria are generally proposed to guide the choice of policy instruments and cooperative arrangements for climate change mitigation, both at the domestic and international level? b) How do these criteria fall short in epistemic terms, for instance due to conceptual indeterminacy, intrinsic ontological uncertainties, and underlying normative biases and value assumptions? c) how have these criteria evolved within different academic disciplines, and what role have lawyers played in the discussion of instrument choice in the past? And, finally, d) what contribution can lawyers make to the instrument choice debate, both by adding a set of legal

¹¹ Adaptation to the impacts of climate change tends to rely on a different set of policy instruments than those focused on climate change mitigation (see below, Section 2). While many of the theoretical and practical considerations discussed in this study will also apply to climate change adaptation, the focus is expressly placed on mitigation, both to limit the scope of the analysis and because the relevant research literature is considerably more mature. As the instrumental sophistication of climate change adaptation continues to evolve, however, critical study of the criteria of instrument choice in that field should also be pursued.

and institutional criteria as well as by enriching the epistemological and methodological underpinnings of instrument selection processes?

1.3 Methodology

While relating to the eventual substance of the law, a theoretical analysis of the processes that guide instrument choice in climate policy imposes considerable challenges on traditional methods of jurisprudence. The selection of policy instruments largely occurs within the political debates that precede the creation of law enacting such instruments; by the same token, instruments adopted within the discretionary scope afforded by existing law are, again, chosen with a view to circumstances located both within and beyond the law itself. Consequently, and understandably, the dynamic and variegated arguments, interests, and values that motivate processes of instrument choice have been approached with an interdisciplinary programme in the academic literature, with a strong dominance of economics.

For this study, therefore, the methodological starting point has been to survey the existing epistemic framework and rationality of policy instrument choice as defined in economic and regulatory theory.¹² Building on this conventional understanding of policy instrument choice, the study then applies a critical analysis of policy discourses and draws on insights from epistemology, linguistics, contemporary social theory and qualitative methods of the social sciences to highlight normative biases and conceptual limitations of the mainstream criteria canon.¹³ At various points, the study deploys traditional methods of legal doctrine and exegetic analysis,¹⁴ complemented by

¹² See, notably, my survey of the economic theory of policy interventions to address climate change in Section 4.1 and, in greater detail, in Michael A Mehling, 'Governing Cooperative Approaches under the Paris Agreement' [2020] *Ecology Law Quarterly*. In so doing, it draws both on normative and positive regulatory theory, that is, the theory and methods guiding *ex ante* analysis of alternative regulatory options and *ex post* explanation of past instrument choices. For further background on regulatory theory, see, in particular, Robert Baldwin, Martin Cave and Martin Lodge, *Understanding Regulation: Theory, Strategy, and Practice* (2nd edn, Oxford University Press 2011); Neil Gunningham, Peter N Grabosky and Darren Sinclair, *Smart Regulation: Designing Environmental Policy* (Clarendon Press 1998); Anthony I Ogus, *Regulation: Legal Form and Economic Theory* (Oxford University Press 1994).

¹³ See, in particular, Mehling, 'Betwixt Scylla and Charybdis?' (n 4).

¹⁴ Albeit with legal doctrine focusing on theoretical and critical legal dogmatics, as described in Kai T Kokko, 'Methods of Environmental Law in Finland' (2014) 59 *Scandinavian Studies in Law* 285, 289, 293–294.

comparative law case studies and process tracing,¹⁵ to identify the gap left in instrument choice discourses because of the relative absence of a meaningful and genuine contribution of the legal discipline, framed here as the ‘silence of lawyers’.¹⁶ Considerations of democratic theory and deliberative jurisprudence are, finally, recruited to argue a theoretical case for the epistemic and normative benefits of stronger involvement of lawyers in instrument choice debates.¹⁷

The study is organized as follows: First, in Section 2, it provides an overview of the wide range of policy instruments available to political decision makers as they choose their response to climate change and its mitigation. Section 3 then proceeds to describe the mainstream canon of theoretical criteria guiding the choice of policy instruments and cooperative arrangements for climate change mitigation at the domestic and international level, and highlights the relative absence of a genuinely legal contribution to this theoretical framework. Section 4 offers an explanation for the subordinate role of lawyers in instrument choice debates by tracing the evolution of relevant scholarship in economics, and the largely unidirectional diffusion of theoretical arguments from economics into the legal discipline. In doing so, however, this section simultaneously identifies the missed opportunity presented by this limited contribution of the legal discipline.

Section 5 goes on to show, through a comparative case study of three areas of climate policy choice, the significant bearing of legal and institutional considerations in historical instrument selection processes, underscoring the practical importance of the theoretical gap in the relevant literature left by insufficient integration of lawyers and their unique methodologies. This theme is elaborated on at a more conceptual level in Section 6, which outlines the important epistemic and normative contributions jurisprudence can make to the scholarly debate on policy instrument choice, and then seeks to provide a systematic survey of legal and institutional determinants of instrument choice based on the overarching precept of avoiding or minimizing conflict in domestic and international legal orders. By basing the analysis throughout on an interdisciplinary theoretical programme and empirical insights from actual domestic and

¹⁵ See the case studies, *infra*, in Section 5, drawing on the comparative law approaches and research questions described in Mehling, ‘The Comparative Law of Climate Change: A Research Agenda’ (n 9).

¹⁶ See *infra*, Section 3.4.

¹⁷ See, in particular, *infra*, Section 6.2.

intergovernmental instrument choice processes, the study arrives at conclusions which are both of academic interest and practical relevance.

2 Policy Instruments for Climate Change Mitigation¹⁸

Decision makers seeking to address the causes and effects of climate change can take recourse to a portfolio of policy instruments, including pricing controls and quantity rationing, performance standards, subsidies, agreements, and informational instruments.¹⁹ In practice, these instruments are applied alone or in varying combinations to different sectors, such as electricity generation, transport, buildings, and industry.²⁰ By diverting resources and capital away from the production of conventional goods and services, and often into costly abatement measures, these instruments can have a detrimental effect on economic growth in the short term. Over the medium and longer term, the various co-benefits of mitigation action, such as energy savings, reduced health impacts, or improved energy security, suggest that a carefully designed strategy to lower greenhouse gas

¹⁸ This subsection draws heavily on Michael A Mehling, ‘Frameworks for International Climate Cooperation: Assessing the Alternatives’ (2013) 4 *Journal of International Organizations Studies* 13, 17–18; Michael A Mehling and others, ‘The Role of Law and Institutions in Shaping European Climate Policy: Institutional and Legal Implications of the Current Climate Policy Instrument Mix’ (Ecologic Institute 2013) Working Paper 2.9 <<https://cecilia2050.eu/publications/133.html>> accessed 17 January 2020.

¹⁹ This is a very broad categorization of policy instruments, and further differentiation is possible; in 1995, for instance, the Congressional Office of Technology Assessment divided environmental policy instrument in tools without fixed targets (technical assistance, subsidies, information reporting, liability, and pollution charges), multisource tools with fixed targets (challenge regulations, tradeable emissions permits, integrated permitting), and single-source tools with fixed targets (harm-based standards, design standards, technology specifications, and product bans), see OTA, *Environmental Policy Tools: A User’s Guide* (Office of Technology Assessment 1995) 81–89.

²⁰ In a majority of sectors, greenhouse gas mitigation will be achieved by improving the efficiency with which energy is used or by reducing its carbon intensity, but in agriculture, forestry, and certain chemical and industrial processes where emissions are not related to energy use, different approaches – such as stabilization or expansion of carbon sinks – are applied; see Organisation for Economic Co-operation and Development (OECD), *Climate Change Mitigation: What Do We Do?* (OECD Publishing 2008) 11; Alan J Krupnick and others, ‘Toward a New National Energy Policy: Assessing the Options’ (2010) 8–9 <<http://www.rff.org/research/publications/toward-new-national-energy-policy-assessing-options>> accessed 16 January 2020.

emissions will generate greater benefits than costs,²¹ but current political and economic decision making cycles are notorious for being myopic and providing little incentive for anticipatory governance or foresight.²² Additionally, while the social cost of action is expected to be lower than the impacts of unabated climate change, it will nonetheless rise over time as readily available abatement options are exhausted and more costly solutions need to be explored.²³

In the context of climate change, therefore, both the rationale of policy instruments and the manner in which they are designed have been sensitive to economic concerns from a number of important stakeholders, prompting widespread adoption of flexible or suasive incentives alongside more coercive regulatory prescriptions.²⁴ Mainstream environmental policy literature broadly categorises these instruments as economic or market-based instruments that address market externalities by incorporating – at least to a certain extent – the external costs of production or consumption in the price, and non-market based instruments that impose obligations or encourage and discourage certain behaviour through non-monetary incentives (see Table 1).

Table 1: Instruments for Climate Change Mitigation²⁵

Market-based Instruments	Non-Market Based Instruments
Pricing and Support Instruments <i>(e.g., taxes; subsidies; public procurement; feed-in tariffs)</i>	Command-and-Control Regulation <i>(e.g., performance and technology standards)</i>

²¹ Especially when taking into consideration the expected costs of climate change impacts, such as extreme weather events, flooding, crop losses, vector-borne diseases, and biodiversity loss, see e.g. Congressional Budget Office (CBO), ‘Policy Options for Reducing CO₂ Emissions’ (CBO 2008) CBO Study 2930 11 <<https://www.cbo.gov/sites/default/files/110th-congress-2007-2008/reports/02-12-carbon.pdf>> accessed 16 January 2020.

²² Leon Fuerth, “Forward Engagement: A New Wrinkle, in Time?”, 8 *International Affairs Review* (2004), 1-5.

²³ Nicholas Stern, *The Economics of Climate Change: The Stern Review* (Cambridge University Press 2007) 63, 191.

²⁴ Limiting the economic burden requires equalization of marginal abatement costs across the economy and for each source, something price- and quantity-based instruments are said to achieve better than rigid technology standards, see William J Baumol and Wallace E Oates, *The Theory of Environmental Policy* (2nd edn, Cambridge University Press 1988) 177; Nathaniel Keohane, Robert N Stavins and Richard Revesz, ‘The Choice of Regulatory Instruments in Environmental Policy’ (1998) 22 *Harvard Environmental Law Review* 313, 313. For further discussion of the underlying economic theory, see *infra*, Section 4.1.

²⁵ Source: Mehling and others (n 18) 15.

Quantity Rationing with Trading <i>(e.g., cap-and-trade and baseline-and-credit systems; green certificate markets)</i>	Suasive Instruments <i>(e.g., education; public information campaigns; reporting and labelling; voluntary agreements)</i>
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3 Criteria of Instrument Choice: The Orthodoxy²⁶

3.1 Instrument Choice at the Domestic Level

With the broad range of available policy instruments for climate change mitigation comes a need for reliable criteria to guide and justify selection processes between contending approaches to climate governance. While it is widely agreed that no single model can serve as a panacea for all regulatory purposes,²⁷ a number of criteria have gradually evolved in various academic disciplines to evaluate individual instruments and their combination in a coordinated portfolio. At a sufficient level of abstraction, the following criteria are typically proposed:

- *Environmental effectiveness*: how well does a policy instrument meet its intended environmental objective? How certain is its level of environmental impact?
- *Cost effectiveness*: can the policy achieve its objectives at a lower cost than other policies? Does it create revenue streams that can be reinvested?
- *Distributional considerations*: how does the policy impact consumers and producers? Can it be considered fair and equitable?
- *Political and administrative feasibility*: is the policy instrument likely to be viewed as legitimate, gain political acceptance, be adopted and ultimately implemented?²⁸

²⁶ This section relies heavily on Michael A Mehling, ‘Implementing Climate Governance: Instrument Choice and Interaction’ in Erkki J Hollo, Kati Kulovesi and Michael Mehling (eds), *Climate Change and the Law* (Springer 2013).

²⁷ Lawrence H Goulder and Ian WH Parry, ‘Instrument Choice in Environmental Policy’ (2008) 2 *Review of Environmental Economics and Policy* 152, 2.

²⁸ Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2007: Mitigation of Climate Change. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press 2007) 751.

While these criteria are widely advocated, albeit with slight variations,²⁹ it bears noting that processes of instrument choice are often complicated by the fact that individual criteria tend to compete with each other, rendering tradeoffs inevitable and any selection largely dependent on specific circumstances.³⁰ Additionally, climate governance tends to address several market failures and seek a variety of outcomes, thus necessitating the use of more than one instrument; yet with the simultaneous operation of various instruments comes a risk of adverse interactions or even redundancies. Some instruments will pursue more than one objective,³¹ and the extreme uncertainties underlying causes and impacts of climate change as well as policy outcomes further complicate the evaluation of relevant instruments.³²

²⁹ Similar criteria are e.g. reported in the broader academic literature, see, for instance, Thomas Sterner and Jessica Coria, *Policy Instruments for Environmental and Natural Resource Management* (2nd edn, Routledge 2011) 133–134, who list efficiency (in various forms, such as static and dynamic allocative efficiency, efficiency in the use of public funds, and transaction costs), effectiveness, fairness, effects on income distribution and other aspects related to the distribution of welfare, incentive compatibility, and political feasibility; Winston Harrington, Thomas Sterner and Richard D Morgenstern, ‘Overview: Comparing Instrument Choices’ in Winston Harrington, Richard D Morgenstern and Thomas Sterner (eds), *Choosing Environmental Policy: Comparing Instruments and Outcomes in the United States and Europe* (Routledge 2004) 5, who list effectiveness, efficiency, equity and fairness, non-intrusiveness, and public participation; OTA (n 19) 143–147, requiring that policies be cost-effective and fair, place the least demands on government, provide assurance to the public that environmental goals will be met, use pollution prevention when possible, consider environmental equity and justice issues, be adaptable to change, and encourage technology innovation and diffusion; see also Baumol and Oates (n 24) 57–58; of course, actual practice has often ‘diverged strikingly from the recommendations of normative economic theory’, see Keohane, Stavins and Revesz (n 24) 313; and will be strongly influenced by local traditions, cultures, institutions, and infrastructures, with institutional capacity especially constraining viable choices in developing countries, see Ruth Greenspan Bell, ‘Choosing Environmental Policy Instruments in the Real World’ (Organisation for Economic Co-operation and Development (OECD) 2003) CCNM/GF/SD/ENV(2003)10/FINAL 22 <<http://www.oecd.org/environment/cc/2957706.pdf>>.

³⁰ Goulder and Parry (n 27) 2. For instance, assuring a reasonable degree of fairness in the distribution of impacts, or ensuring political feasibility, often will require a sacrifice of cost-effectiveness.

³¹ William A Knudson, ‘The Environment, Energy, and the Tinbergen Rule’ (2009) 29 *Bulletin of Science, Technology & Society* 308, 308.

³² Martin L Weitzman, ‘On Modeling and Interpreting the Economics of Catastrophic Climate Change’ (2009) 91 *Review of Economics and Statistics* 1; Martin L Weitzman, ‘Fat-Tailed Uncertainty in the Economics of Catastrophic Climate Change’ (2011) 5 *Review of Environmental Economics and Policy* 275.

Importantly, as the third criterion – political and administrative feasibility – already implies, implementation of a policy instrument also will invariably depend on ‘real-life constraints’, a broad category which, *inter alia*, includes aspects of political acceptability, administrative capacity, and other considerations. It is broadly framed in the literature to encompass a variety of aspects which determine feasibility beyond the criteria of effectiveness and cost-effectiveness, and one of these – political acceptability – is arguably the most decisive determinant of any policy outcome.

Unlike effectiveness and cost-effectiveness, however, such ‘real-world constraints’ cannot be purely evaluated at an abstract conceptual level, instead requiring an assessment of the actual context of political decision making. Legal and institutional considerations form a central part of this context, and an attempt to frame and categorise such legal and institutional factors affecting instrument choice for climate change mitigation – which has been absent in the literature to date – can be found in a later section of this summary.³³ First, however, the next subsection will illustrate how similar complexities are also faced when seeking to apply evaluation criteria to international regimes.³⁴

3.2 Instrument Choice at the International Level³⁵

Both the nature of climate governance as well as its objectives differ fundamentally between the national and international level. Unlike domestic climate policy, which can rely on public institutions endowed with authority to enforce obligations and settle disputes, international cooperation presupposes that sovereign states assent voluntarily to any obligations they assume and subsequently implement these.³⁶ Yet climate change is a complex and long-term challenge

³³ See *infra*, Section 6.3.

³⁴ Richard B Stewart, ‘Instrument Choice’ in Daniel M Bodansky, Jutta Brunnée and Ellen Hey (eds), *The Oxford Handbook of International Environmental Law* (1st edn, Oxford University Press 2007) 159.

³⁵ This subsection, again, draws on Mehling, ‘Frameworks for International Climate Cooperation’ (n 18); Mehling, ‘Betwixt Scylla and Charybdis?’ (n 4).

³⁶ Jonathan B Wiener, ‘Global Environmental Regulation: Instrument Choice in Legal Context’ (1999) 108 *Yale Law Journal* 677, 683.

that can only be solved through collective action,³⁷ and any abatement efforts – or absence thereof – will have repercussions on the international community in its entirety, as well as on the position of domestic constituents in the states undertaking such efforts.³⁸ For instance, while all states will benefit from the greenhouse gas controls adopted by any one state, the acting state will enjoy only a small share of the benefits of its own efforts.³⁹ Given this inherent disposition to encourage free-riding and generate spillover effects, countries thus have a strong incentive to limit emissions only ‘so long as it were assured that all others would reduce their emissions as well.’⁴⁰

Conversely, domestic entities in active states will face a rising regulatory burden, potentially placing them at a disadvantage *vis-à-vis* competitors in countries without comparable environmental constraints; in a global economy with increasingly free movement of trade and investment, such differences in the ambition of national abatement efforts can have far-reaching consequences, both in economic and environmental terms. Accordingly, international climate cooperation needs to achieve a balance between substantive ambition, scope of participation, and level of compliance.

Any set of criteria used to evaluate different models of global climate cooperation needs to reflect this underlying reality of international environmental governance.⁴¹ Consequently, the categories guiding an assessment and classification of contending international governance architectures can only be informed by, but not identical to, the criteria set out for the domestic level in the preceding section. Unlike the domestic level, where the research community and scientific bodies have formulated a widely applied canon of evaluation criteria, no benchmarks of

³⁷ Arild Underdal, ‘Complexity and Challenges of Long-Term Environmental Governance’ (2010) 20 *Global Environmental Change* 386, 386.

³⁸ William Hare and others, ‘The Architecture of the Global Climate Regime: A Top-down Perspective’ (2010) 10 *Climate Policy* 600, 602.

³⁹ Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (Cambridge University Press 1990); differentiating on Garrett Hardin, ‘The Tragedy of the Commons’ (1968) 162 *Science* 1243; Mancur Olson, *The Logic of Collective Action: Public Goods and the Theory of Groups*, vol 124 (Harvard University Press 1965).

⁴⁰ Scott Barrett and Michael Toman, ‘Contrasting Future Paths for an Evolving Global Climate Regime’ (2010) 1 *Global Policy* 64, 67.

⁴¹ Stewart (n 34) 161.

comparable authority have yet been defined for the international debate. Instead, different approaches to the study of international relations and global governance have resulted in very diverse assessment metrics, each premised on a particular outlook and understanding of cooperation between states and the social, political or economic priorities it is meant to address. A rich and insightful literature has emerged on the assessment of regimes, treaties, and institutions, some of which has also informed the understanding of international climate cooperation.

As I describe at length in my article on the effectiveness in international environmental law,⁴² a widespread perception that international arrangements in the area of the environment have proven only marginally successful has sparked growing interest, both institutional and academic, in the conditions and requirements of improved environmental governance. In effect, at one point, research on the role and consequences of environmental regimes, treaties, and institutions became such a dominant part of the study of international relations at one point that it compelled a scholar to speak of a ‘veritable growth industry’ and a ‘driving force’ in his field.⁴³ Much of the resulting literature has focused on specific dimensions of regime performance, with the greatest weight being afforded to questions of effectiveness, followed by research on economic impacts, fairness, and equity.⁴⁴

Still, as I highlight in the aforementioned article, the terminology and definitions have varied greatly due to elusive concepts involving daunting evaluative and analytical problems that have given rise to much disagreement, both in method and approach and in substantive views. Significant variations in the focus of relevant studies, as well as the distinct intellectual backgrounds and orientation of their authors, have resulted in very different approaches to the measurement of performance in terms of outputs, outcomes, and impacts. Definitions of what exactly constitutes ‘effective’ governance, in particular, has differed widely in earlier research,

⁴² Mehling, ‘Betwixt Scylla and Charybdis?’ (n 4).

⁴³ Michael Zürn, ‘The Rise of International Environmental Politics: A Review of Current Research’ (1998) 50 *World Politics* 617, 649.

⁴⁴ Ronald B Mitchell, ‘Evaluating the Performance of Environmental Institutions: What to Evaluate and How to Evaluate It?’ in Oran R Young, Leslie A King and Heike Schroeder (eds), *Institutions and Environmental Change* (The MIT Press 2008).

with some authors merely seeking behavioral change or observable political effects,⁴⁵ while others set the threshold higher by looking for an improvement in – or even resolution of – the situation that necessitated cooperation in the first place.⁴⁶ Although later research has become more critical

⁴⁵ Owen J Greene, 'Environmental Regimes: Effectiveness and Implementation Review' in John Vogler and Mark F Imber (eds), *The Environment and International Relations* (Routledge 1996) 200; Peter M Haas, Robert Owen Keohane and Marc A Levy, 'The Effectiveness of International Environmental Institutions' in Peter M Haas, Robert O Keohane and Marc A Levy (eds), *Institutions for the Earth: Sources of Effective International Environmental Protection* (MIT Press 1993) 7 ('observable political effects'); Kal Raustiala, David G Victor and Eugene B Skolnikoff, 'Introduction and Overview' in David G Victor, Kal Raustiala and Eugene B Skolnikoff (eds), *The Implementation and Effectiveness of International Environmental Commitments: Theory and Practice* (MIT Press 1998) 1; Oran R Young, 'The Effectiveness of International Governance Systems' in Oran R Young, George J Demko and Kilaparti Ramakrishna (eds), *Global Environmental Change and International Governance* (University Press of New England 1996) 10 ('behavioral effectiveness').

⁴⁶ See, e.g., John E Carroll, 'Conclusion' in John E Carroll (ed), *International Environmental Diplomacy* (Cambridge University Press 1988) 276 ('when measured against getting the problem solved, and that should be the only real measure'); Alfred Endres, Michael Finus and Frank Lobigs, 'Symbolische Umweltpolitik im Zeitalter der Globalisierung? Zur Effektivität internationaler Umweltverträge aus ökonomischer Sicht' (2000) 1 *Perspektiven der Wirtschaftspolitik* 73, 73 ('[u]nter der Wirksamkeit eines Vertrages verstehen wir, daß sein Abschluß ... zu einer Wohlfahrtssteigerung ... führt'); Carsten Helm and Detlef Sprinz, 'Measuring the Effectiveness of International Environmental Regimes' (2000) 44 *Journal of Conflict Resolution* 630, 635 ('perfect regime'); Kai T Kokko, 'A Legal Method and Tools for Evaluating the Effectiveness of Regulation: Safeguarding Forest Biodiversity in Finland' [2009] *Nordisk Miljörättslig Tidskrift* 57, 57; Robert O Keohane, 'Analyzing the Effectiveness of International Environmental Institutions' in Robert O Keohane and Marc A Levy (eds), *Institutions for Environmental Aid: Pitfalls and Promise* (MIT Press 1996) 14 ('[t]he proof of effectiveness is to be seen in the improvement of the targeted aspect of the natural environment'); Sebastian Oberthür, *Umweltschutz durch internationale Regime: Interessen, Verhandlungsprozesse, Wirkungen* (Leske und Budrich 2007) 47 ('die Verhaltenswirkungen, die im Sinne einer Problemlösung positiv zu bewerten sind'); Raustiala, Victor and Skolnikoff (n 45) 1 (ability to 'help solve environmental problems'); Lawrence E Susskind, *Environmental Diplomacy: Negotiating More Effective Global Agreements* (Oxford University Press 1994) 12 ('tangible environmental improvements'); Oran R Young, *International Governance: Protecting the Environment in a Stateless Society* (Cornell University Press 1994) 3 ('[a]n effective governance system is one that channels behavior in such a way as to eliminate or substantially to ameliorate the problem that led to its creation'); Young, 'The Effectiveness of International Governance Systems' (n 45) 8–9 ('problem solving' and 'goal attainment'); Oran R Young and Marc A Levy, 'The Effectiveness of International Environmental Regimes' in Oran R Young (ed), *The Effectiveness of International Environmental Regimes: Causal Connections and Behavioral Mechanisms* (MIT Press 1999) 5.

in terms of applied methods and concepts, even a recent shift to more empirical and quantitative approaches has failed to altogether eliminate some of the more persistent epistemic challenges in the study of regime effectiveness, including identification of the purpose of cooperation and of causal connections between governance systems and subsequent behavioural or physical change.⁴⁷

While the conceptual limitations of this line of research are thus readily apparent, the work to date reflects a sophisticated intellectual effort to determine whether international environmental cooperation plays a role in shaping collective action and social practices. Progress has been made, in particular, when it comes to distinguishing normative and utilitarian motives for state behavior and extending the perception of environmental compliance beyond binary treaty observance to a more managerial process focused on clarity, capacity, and priority, in which soft incentives and facilitation play as much a role as traditional legal coercion.⁴⁸ More recently, scholars have responded to the rapid growth in environmental regimes by focusing on regime fragmentation and overlap, discussing options to manage conflicts and leverage synergies between multiple levels of governance and concurrent governance systems.⁴⁹

Existing surveys of alternative approaches to international climate governance have already devoted significant intellectual effort to defining generally applicable criteria for the evaluation of cooperative frameworks. What is more, they have been, to a greater or lesser extent, able to build on the cumulative insights offered by previous research on the assessment of domestic environmental policy and international environmental governance. Still, the criteria proposed in relevant literature to date are fairly heterogeneous. Only one criterion – environmental effectiveness – is common to all proposals, and even that is characterized by variations in the

⁴⁷ Mehling, ‘Betwixt Scylla and Charybdis?’ (n 4); see also, for the domestic context, the similar analysis by Michael Rodi, ‘Wirkungen und Erfolgsbedingungen von Umweltrecht’ in Michael Rodi (ed), *Recht und Wirkung* (Carl Heymanns Verlag 2002).

⁴⁸ Abram J Chayes and Antonia H Chayes, *The New Sovereignty: Compliance with International Regulatory Agreements* (Harvard University Press 1998); tracing this evolutionary process in international environmental law Tuomas Kuokkanen, *International Law and the Environment: Variations on a Theme* (Kluwer Law International 2002) 261.

⁴⁹ For a survey of these trends in the context of international climate cooperation, see Harro van Asselt, Francesco Sindico and Michael A Mehling, ‘Global Climate Change and the Fragmentation of International Law’ (2008) 30 *Law & Policy* 423.

conceptual definition and scope. Other criteria, such as economic implications and considerations of equity, feature in a majority of studies, but again, their material content varies substantially.⁵⁰

In my article on frameworks for international climate cooperation, I survey the existing literature on the assessment of international regimes for climate cooperation, and also account for more recent trends in international climate cooperation, to propose a new matrix of criteria including:

- *Level of ambition*: how suitable is a regime or institution to contribute to the mitigation of climate change and, given the increasingly evident inevitability of some measure of atmospheric warming, the adaptation to its impacts?
- *Compliance facilitation and control*: how clear and determinate are commitments under the regime, how robust the incentives for compliance, and what mechanisms – whether facilitative or coercive – have been adopted to address non-compliance, as well as the to ensure sufficient transparency of efforts undertaken by participants?
- *Institutional capacity*: what is the capacity to monitor implementation by participants, perform procedural functions, and facilitate the operation of regime elements?
- *Participation and inclusiveness*: what is the geographic scope of participation and commitments under the regime?
- *Systemic coherence*: how is coordination between institutions ensured, for instance through mandates that specify clear and separate responsibilities, or through inclusion of conflict clauses and procedures that address potential overlaps?
- *Political and economic feasibility*: how does the regime account for considerations of equity and fairness? What are the expected economic costs of implementation and their distribution across countries?⁵¹

It bears emphasizing that these criteria neither seek perfect analytical stringency, nor claim to be exhaustive in scope; they perpetuate many of the ambiguities and biases identified in my criticism

⁵⁰ Mehling, 'Frameworks for International Climate Cooperation' (n 18).

⁵¹ *ibid* 26–30.

of effectiveness as a criterion of instrument choice.⁵² Their conceptual shortcomings and caveats are discussed in greater depth in the article setting out the proposed matrix.⁵³ As in the domestic context, moreover, none of these criteria is inherently more important than its counterparts; instead, the importance of each criterion will largely depend on the context and priorities of those applying them, with inevitable trade-offs and a need to balance or give weight to different criteria. Rather, what the proposed framework hopes to provide is a practical framework for the evaluation and comparison of alternative models of climate governance, providing some continuity *vis-à-vis* relevant past efforts while adding a stronger legal and institutional dimension.

3.3 Aligning Policy Instruments in an Instrument Mix⁵⁴

A criterion of instrument choice that is rarely if at all considered in the established canon of selection criteria is the functional and systemic compatibility of two or more instruments or forms of climate cooperation implemented alongside each other. Lacking coordination can result in highly detrimental conflicts and tensions between concurrent climate policy measures, and deserves consideration in the context of instrument choice. The causes and implications of such conflicts and interactions are briefly outlined in this section.

A starting point is the acknowledgment that different market failures contribute to anthropogenic climate change, from the negative externality of greenhouse gas emissions and the positive externality of innovation spillovers, to information asymmetries, bounded rationality, and principal-agent problems.⁵⁵ Accordingly, policies adopted to correct these market failures can pursue objectives other than emissions abatement, such as the promotion of innovation, inducing

⁵² Mehling, ‘Betwixt Scylla and Charybdis?’ (n 4).

⁵³ Mehling, ‘Frameworks for International Climate Cooperation’ (n 18).

⁵⁴ This section draws on Section 2 of Michael A Mehling and Emil Dimantchev, ‘Achieving the Mexican Mitigation Targets: Options for an Effective Carbon Pricing Policy Mix’ (Secretaría de Medio Ambiente y Recursos Naturales (SEMARNAT) 2017) 17–18 <https://www.gob.mx/cms/uploads/attachment/file/415520/Achieving_the_Mexican_Mitigation_Targets.pdf> accessed 17 January 2020.

⁵⁵ On the concept of market failures, see *infra*, Section 4.1.

structural transformation, or increasing energy security.⁵⁶ A widely accepted precept, the ‘Tinbergen Rule’, states that each policy target requires at least one policy instrument for all policy goals to be achieved,⁵⁷ thereby providing the theoretical justification for a climate strategy that harnesses a variety of policy instruments in an instrument portfolio.

In keeping with this rationale, there is growing recognition that a single policy instrument will prove insufficient to address climate change.⁵⁸ Additional policy measures are indicated to correct the various market failures underlying climate change, as reliance on individual instruments alone may delay necessary action and significantly increase welfare costs.⁵⁹ In particular, policies that foster research, development, demonstration, and market deployment of low-carbon technologies are considered vital to drive innovation and bring forward the range of technology options needed to make deep emissions cuts.⁶⁰ Additionally, barriers to behavioral change – such as information asymmetries, bounded rationality, and lacking availability of finance – can require policy instruments targeted to each of these market failures.⁶¹ Over time, the innovation and efficiency improvements spurred by different policies may also foster a more favorable political context for strengthened efforts to advance other policy instruments.⁶²

Transitioning to a low-carbon economy will therefore require a balanced and coordinated strategy that leverages a combination of policy approaches. Such a strategy, in turn, will invariably

⁵⁶ Dieter Helm, ‘Economic Instruments and Environmental Policy’ (2005) 36 *Economic & Social Review* 205, 214; Knudson (n 31) 308.

⁵⁷ Jan Tinbergen, *On the Theory of Economic Policy* (North-Holland Publishing Co 1952); Leif Johansen, *Public Economics* (North-Holland Publishing Co 1965) 12.

⁵⁸ Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2014: Mitigation of Climate Change. Working Group III Contribution to the IPCC Fifth Assessment Report* (Cambridge University Press 2015) 1173; Stern (n 23) 308.

⁵⁹ Daron Açemoglu and others, ‘Transition to Clean Technology’ (2016) 124 *Journal of Political Economy* 52.

⁶⁰ Daron Açemoglu and others, ‘The Environment and Directed Technical Change’ (2012) 102 *American Economic Review* 131; Christoph Bertram and others, ‘Complementing Carbon Prices with Technology Policies to Keep Climate Targets within Reach’ (2015) 5 *Nature Climate Change* 235; Stern (n 23) 308.

⁶¹ Xavier Labandeira and Pedro Linares, ‘Second-Best Instruments for Energy and Climate Policy’ in Ibon Galarraga, Mikel González-Eguino and Anil Markandya (eds), *Handbook of Sustainable Energy* (Edward Elgar 2011).

⁶² Gernot Wagner and others, ‘Energy Policy: Push Renewables to Spur Carbon Pricing’ (2015) 525 *Nature* 27.

result in a policy instrument portfolio, also referred to as a ‘policy mix.’⁶³ But in practice, concurrent policy objectives and instruments in a policy mix are not always clearly defined or easily distinguishable.⁶⁴ Moreover, the positive theory of government suggests that political and institutional dynamics result in policy accretion,⁶⁵ where some policy instruments are introduced for purely symbolic reasons or concealed motivations. Negative policy impacts, for instance on low-income households or vulnerable industries, may require additional policy interventions, further increasing the number of instruments in the mix. In the end result, policy portfolios are not necessarily the result of a rationally conceived and fully coordinated process.⁶⁶

With the simultaneous operation of different policy instruments also comes an increased likelihood of interactions,⁶⁷ especially where instruments pursue more than one objective or undermine other policy objectives and therefore necessitate tradeoffs.⁶⁸ Depending on the instrument type, objectives, and context, such interactions can be positive or negative. They are more likely to be beneficial when each of the affected instruments addresses a different market failure with sufficient specificity, whereas adverse interactions are more likely when multiple policies seek to correct the same market failure.⁶⁹

When combined with other policy instruments, for instance, carbon pricing – which aims to compensate the negative externality of emissions⁷⁰ – can yield synergies from the simultaneous operation alongside policies targeting a different market failure. Examples include financial incentives to internalize the positive knowledge spillover of innovation in renewable energy

⁶³ Organisation for Economic Co-operation and Development (OECD), *Instrument Mixes for Environmental Policy* (OECD 2007) 27; Michael Rodi, ‘Instrumentenvielfalt und Instrumentenverbund im Umweltrecht’ (2000) 15 *Zeitschrift für Gesetzgebung* 231.

⁶⁴ Tinbergen (n 57) 37.

⁶⁵ Helm (n 56) 213–214.

⁶⁶ Benjamin Görlach, ‘Emissions Trading in the Climate Policy Mix: Understanding and Managing Interactions with Other Policy Instruments’ (2014) 25 *Energy & Environment* 733, 735.

⁶⁷ Organisation for Economic Co-operation and Development (OECD), *Instrument Mixes for Environmental Policy* (n 63) 27.

⁶⁸ Knudson (n 31) 309–311.

⁶⁹ Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2014: Mitigation* (n 58) 1181.

⁷⁰ For further discussion of the underlying economic theory, see *infra*, Section 4.1.

technology, where the combination with carbon pricing has been shown to allow emissions mitigation at lower cost than either policy would achieve alone,⁷¹ or policies to overcome behavioral barriers, such as bounded rationality or information asymmetries.⁷²

Given its economic rationale of promoting mitigation at least cost, however, carbon pricing is also vulnerable to adverse interactions and even outright redundancies when implemented alongside other instruments that address the same market failure. Performance standards targeting particular technologies, for instance, will interfere with the ability of carbon pricing to equalize abatement cost across the economy and identify the most cost-effective abatement options. If the carbon price is higher than the marginal abatement cost under such complementary policies, it becomes redundant;⁷³ if the carbon price is lower, however, the simultaneous application of directed technology mandates will curtail the compliance flexibility of emitters and increase the cost of achieving the same environmental outcome. With a pricing approach, such as a carbon tax, the interaction should not compromise the environmental effectiveness.⁷⁴

By contrast, the introduction of complementary policies alongside a quantity rationing approach that involves tradeable units, such as an emissions trading system, can result in undesirable emissions leakage, in this specific constellation also referred to as the ‘waterbed effect’: because the overall emissions level is determined by the number of units in circulation, emissions reductions achieved under the complementary policy will displace units that can be used to offset emissions elsewhere under the emissions trading system, effectively only shifting the

⁷¹ Vlassis Oikonomou, Alexandros Flamos and Stelios Grafakos, ‘Is Blending of Energy and Climate Policy Instruments Always Desirable?’ (2010) 38 *Energy Policy* 4186; Stephen H Schneider and Lawrence H Goulder, ‘Achieving Low-Cost Emissions Targets’ (1997) 389 *Nature* 13.

⁷² Goulder and Parry (n 27); Kenneth Gillingham, Richard G Newell and Karen Palmer, ‘Energy Efficiency Economics and Policy’ (2009) 1 *Annual Review of Resource Economics* 597.

⁷³ Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2014: Mitigation* (n 58) 1182.

⁷⁴ Cedric De Jonghe and others, ‘Interactions Between Measures for the Support of Electricity from Renewable Energy Sources and CO2 Mitigation’ (2009) 37 *Energy Policy* 4743; Lawrence H Goulder and Robert N Stavins, ‘Challenges from State-Federal Interactions in US Climate Change Policy’ (2011) 101 *American Economic Review* 253.

location and timing of emissions under the determined limit.⁷⁵ Additionally, the increase in unit supply will, *ceteris paribus*, exert downward pressure on unit prices until all units in circulation are again demanded, thereby weakening the price signal in the market.⁷⁶ Although observers have countered that such an effect will not occur whenever unit supply exceeds emissions,⁷⁷ it still has an important bearing on the design of climate policy portfolios, and underscores the need to consider policy interactions in instrument choice.

For climate policy makers exploring the adoption of multiple climate policy instruments or forms of cooperation, the foregoing observations translate into a number of recommendations. A starting point can be derived from the Tinbergen Rule: just as each target requires its own policy, each policy should seek to address a different market failure, and do so with the greatest level of specificity possible. Policies adopted to promote climate mitigation should avoid the simultaneous pursuit of other policy objectives, such as labor or industrial policy goals.⁷⁸ Because political economy considerations may nonetheless require that individual instruments invoke concurrent policy priorities, limiting the overall number of instruments may also be indicated.⁷⁹ Level of governance and sectoral coverage of complementary policies both have an important bearing on interactions, which suggests a preference for either full or no policy overlap: to avoid the ‘waterbed effect’ described above, for instance concurrent pricing through a carbon tax and quantity rationing with an emissions trading system requires that both instruments have identical coverage, or that the carbon tax have broader coverage, including all sectors and activities covered by the emissions trading system.⁸⁰

⁷⁵ Samuel Fankhauser, Cameron Hepburn and Jisung Park, ‘Combining Multiple Climate Policy Instruments: How Not to Do It’ (2010) 1 *Climate Change Economics* 209; Goulder and Stavins (n 74); Lawrence H Goulder, ‘Markets for Pollution Allowances: What Are the (New) Lessons?’ (2013) 27 *Journal of Economic Perspectives* 87.

⁷⁶ Goulder (n 75) 16.

⁷⁷ Adam Whitmore, ‘Puncturing the Waterbed Myth: The Value of Additional Actions in Cutting ETS Greenhouse Gas Emissions’ (Sandbag 2016) <<https://sandbag.org.uk/project/puncturing-the-waterbed-myth/>> accessed 17 January 2020.

⁷⁸ Görlach (n 66) 736.

⁷⁹ Knudson (n 31) 309.

⁸⁰ Mehling and Dimantchev (n 54) 18.

It bears noting that interactions can also occur at the international level. With the growing number of formal and informal arrangements active in the area of climate cooperation, concerns about potential interactions, such as an overlap of activities and mandates, are acquiring increased weight. As I discuss in the article on frameworks for international climate cooperation, such cooperation can range along a continuum in which one extreme is a comprehensive and integrated governance system for the entire issue area and the other extreme is total fragmentation.⁸¹ Conflicts and tensions between different institutional arrangements can potentially compromise the effectiveness of cooperation. At the same time, properly integrated regimes will ideally complement each other and leverage synergies.⁸² This highlights the need to ensure some level of coordination between institutions, for instance by adopting mandates that specify clear and separate responsibilities, or by including conflict clauses and procedures that address potential overlaps.

But systemic coherence is not purely an issue at the level of institutions active in the area of climate policy: regimes may also interact with each other at a material or conceptual level, be it horizontally between regimes devoted to different issue areas such as climate change and international trade, or vertically at different levels of implementation. On the latter, because climate policies and measures ultimately have to be carried out and enforced at the domestic level, successful cooperation frameworks need to take into account potential interactions with local or regional rules and institutions. Again, however, a trade off may exist between high levels of integration and more loosely organized, flexible cooperation. Typically, integrated arrangements will be more cumbersome and time-consuming to establish and more apt to entail compromises that dilute the content of their substantive provisions.⁸³

3.4 Instrument Choice and the Silence of Lawyers

Economic theory and other academic disciplines help frame available instruments and provide valuable insights on the abstract criteria which could determine both the selection of individual instruments and their arrangement in an optimal policy mix. In a world devoid of historical

⁸¹ Mehling, 'Frameworks for International Climate Cooperation' (n 18).

⁸² Harro van Asselt, *The Fragmentation of Global Climate Governance* (Edward Elgar 2014).

⁸³ Oran R Young, 'Effectiveness of International Environmental Regimes: Existing Knowledge, Cutting-Edge Themes, and Research Strategies' (2011) 108 Proceedings of the National Academy of Sciences 19853.

coincidence, irrational preferences, and widely diverging interpretations of the objectives and priorities of climate change policy, these criteria would likely provide a reliable explanation or predictor of instrument choice processes. In the real world, however, experience has shown policy makers to also be guided by many other motivating factors, suggesting the utility of an empirical perspective on existing instrument portfolios to complement the analytical approach prevalent in most existing literature.

In this context, prior legal and institutional⁸⁴ frameworks are an important determinant of policy decisions. Existing rules, principles and doctrines setting out the behavioural parameters – notably the rights and duties – of public and private actors as well as the objectives of public policy create a densely occupied landscape within which instruments for climate change mitigation need to operate. Failure to ensure the compatibility of new instruments with their regulatory context will not only compromise their ability to function, but may also threaten their very admissibility as a matter of law.

A subtler role is exercised by institutional structures, which comprise informal manifestations of social order, such as culture, habits, and customs, as well as formal organisations, such as governmental or intergovernmental bodies, and their own internal mandates, procedures and dynamics. Although the influence of institutions on policy decisions is less obvious than the binary permissibility standard of most legal rules, they still have a profound impact on the feasibility and appeal of contending policy options and their implementation.

Such legal and institutional considerations are only rarely represented in the mainstream literature on instrument choice in environmental and climate policy, and where they are mentioned, they tend to receive only cursory attention with scarce attempts at consistent and systematic treatment. Altogether, where legal scholarship has had to address the selection of policy instruments, it has tended to embrace the established criteria presented earlier in this summary, offering few independent contributions to the broader understanding of instrument choice. As the following section illustrates, the limited role of lawyers in this debate is owed in large part to the

⁸⁴ The term ‘institution’ is used here to denote a structure or mechanism of social order and cooperation governing individual or collective behaviour in pursuit of social purposes. A common feature of institutions is their permanence, that is, their ability to transcend individual actors, decisions, and interests.

disproportionate influence of economics and the quantitative social sciences on framing the academic study of instrument choice.

This presents a foregone opportunity, however, to identify important barriers to the operation of climate policies in practice, and also to question disciplinary assumptions and reveal normative biases that underlie the accepted canon of instrument choice criteria. Section 5 below traces how legal and institutional constraints played had a far greater role in determining climate policy choices in the real world, and Section 6 provides a systematic framework for improved understanding of such legal and institutional factors, and ventures an argument about the role law and jurisprudence could play as epistemic tools to guide such an improved understanding. First, however, Section 4 describes the uneasy relationship of lawyers and economic narratives of instrument choice, drawing on the remarkable rise and diffusion of market mechanisms as economic instruments of climate policy.

4 Theoretical Case Study: Lawyers and the Ascent of Markets

Recent decades have seen the gradual ascendance of market mechanisms as an instrument of climate policy, tracing an unparalleled trajectory from theoretical prescription to practiced legal reality.⁸⁵ Conceptually, these mechanisms reflect a departure from the conventional toolbox of environmental law and policy, which had traditionally relied on instruments such as liability rules and sanctions to control environmental degradation and overuse.⁸⁶

An expanding toolbox is, of course, not without precedent in environmental law: different forms of administrative regulation, including building permits, operating licenses, and technology standards, have been added over time to limit the harmful effects of industrial activity. Yet as the scale and number of environmental challenges proliferated, so did the density of regulatory constraints, stirring concern about their growing economic cost.⁸⁷

⁸⁵ See Daniel H Cole, 'Origins of Emissions Trading in Theory and Early Practice' in Stefan E Weishaar (ed), *Research Handbook on Emissions Trading* (Edward Elgar 2016).

⁸⁶ David B Schorr, 'Historical Analysis in Environmental Law' in Markus D Dubber and Christopher Tomlins (eds), *The Oxford Handbook of Legal History* (Oxford University Press 2018).

⁸⁷ See Bruce A Ackerman and Richard B Stewart, 'Reforming Environmental Law' (1985) 37 *Stanford Law Review* 1333; Allen V Kneese and Charles L Schultze, *Pollution, Prices, and Public Policy* (Brookings Institution 1975);

Such preoccupation with cost, coupled with an economic slowdown, fiscal constraints and a broader trend towards deregulation and market liberalization in many jurisdictions, precipitated the eventual diffusion of concepts from economic theory into environmental law and policy.⁸⁸ And while this process had its origins in a domestic context, markets have long since also become an established feature of international environmental law, including in the realm of climate cooperation.⁸⁹

In a relatively short period of time, scholars and practitioners of environmental law have come to embrace policy instruments that harness flexible market forces rather than legal coercion. Along the way, they have seen their professional vernacular evolve in line with the changing conceptual foundations of their field, while their discipline has ceded some of its former authority in environmental policy debates to the compelling empiricism and quantitative approaches of the social sciences.⁹⁰

More than a mere recalibration of how different academic pursuits influence environmental policy formation, however, the ascent of market mechanisms has engendered new markets worth more than some traditional commodity markets.⁹¹ Supporters argue that they have also helped meet

Robert N Stavins (ed), *Project 88: Harnessing Market Forces to Protect Our Environment* (Project 88 1988) <http://scholar.harvard.edu/files/stavins/files/project_88-1.pdf>.

⁸⁸ Robyn Eckersley, 'Markets, the State and the Environment: An Overview' in Robyn Eckersley (ed), *Markets, the State and the Environment: Towards Integration* (London: Macmillan & Co. 1995) 7, 10; see Section 4.1 for further details on the underlying economic theory, and Section 4.2 for a discussion of the diffusion of market approaches to law and public policy.

⁸⁹ I trace the role of, and experience with, market mechanisms for climate change mitigation in much greater detail in Mehling, 'Governing Cooperative Approaches under the Paris Agreement' (n 12).

⁹⁰ Robert W Hahn, 'The Impact of Economics on Environmental Policy' (2000) 39 *Journal of Environmental Economics and Management* 375; Wallace E Oates, 'From Research to Policy: The Case of Environmental Economics' (2000) 4 *International Journal of Urban Sciences* 1.

⁹¹ At its peak, for instance, the annual market value (including secondary markets) for Certified Emission Reductions (CERs) under the Clean Development Mechanisms of the Kyoto Protocol was US\$ 32,8 billion, exceeding the size of global markets for commodities such as silver, nickel or lead, see Karan Capoor and Philippe Ambrosi, 'State and Trends of the Carbon Market 2009' (World Bank 2009) Report 48998 31 <<http://documents.worldbank.org/curated/en/281731468336837686/State-and-trends-of-the-carbon-market-2009>> accessed 14 February 2019.

environmental policy objectives at reduced cost, while fostering increased levels of innovation and participation. Critics, by contrast, have pointed to conceptual and normative limitations of market approaches – including tensions with entrenched legal doctrines – and drawn attention to implementation shortfalls in the real world. In short, academic debate about the merits of market mechanisms is far from over, and offers a strong case study for the role of lawyers and legal arguments in the debate on instrument choice for climate change mitigation.

4.1 Economic Theory of Environmental Markets

Understanding the theoretical rationale of market mechanisms requires some engagement with fundamental concepts and terminology of standard economics. Economic theory ascribes environmental challenges to different market failures, caused by, *inter alia*, positive or negative externalities,⁹² market power and concentration, split incentives, and information asymmetries. For economists, such market failures denote an inefficient allocation of goods and services,⁹³ justifying an intervention in the form of public policy.⁹⁴

As already mentioned earlier, policy makers seeking to address the causes and effects of environmental threats can take recourse to a broad portfolio of policy instruments.⁹⁵ A subset of policy instruments influences behaviour through explicit price signals,⁹⁶ and is therefore

⁹² On the notion of externalities, see, seminally, James M Buchanan and Wm Craig Stubblebine, ‘Externality’ (1962) 29 *Economica* 371.

⁹³ Francis M Bator, ‘The Anatomy of Market Failure’ (1958) 72 *Quarterly Journal of Economics* 351.

⁹⁴ In ‘The Problem of Social Cost’ (1960) 3 *The Journal of Law & Economics* 1, Ronald H. Coase famously argued that no government intervention would be necessary between parties affected by certain types of market failures if these can engage in unobstructed bargaining without transaction cost, since they could agree on a Pareto efficient outcome. Coase himself conceded that these conditions are never met in practice, limiting the practical significance of his theorem, see Ronald H Coase, ‘The Institutional Structure of Production’ (1992) 82 *American Economic Review* 713, 717.

⁹⁵ See *supra*, Section 2.

⁹⁶ Johannes B Opschoor and Hans Vos, *Economic Instruments for Environmental Protection* (OECD Publishing 1989) 3; Organisation for Economic Co-operation and Development (OECD), *Environmental Policy: How to Apply Economic Instruments* (OECD Publishing 1991) 117.

commonly referred to as economic instruments.⁹⁷ While definitions vary, this category of instruments tends to include pricing and quantity controls with trading, both of which are widely credited with achieving environmental policy objectives at the lowest cost.⁹⁸

Various explanations are cited for this superior efficiency: decisions are decentralized, helping overcome regulatory failures such as the information asymmetry between policy makers and those responsible for environmental harm, or efficiency losses through rent seeking and regulatory capture.⁹⁹ By allowing the market to determine resource allocation, moreover, these instruments also incentivize action where it is cheapest, and are considered more successful at promoting innovation¹⁰⁰ and avoiding sunk investments in obsolescent technologies.¹⁰¹

One way to harness these benefits relies on quantity controls coupled with the creation of a market for a defined, tradable unit, such as a permit to emit a specified amount of a pollutant for a specified duration of time.¹⁰² Because the units can be traded, this policy approach results in the

⁹⁷ Opschoor and Vos (n 96); Robert N Stavins, 'Market-Based Environmental Policies' in Paul R Portney and Robert N Stavins (eds), *Public Policies for Environmental Protection* (2nd edn, Routledge 2000).

⁹⁸ William J Baumol and Wallace E Oates, 'The Use of Standards and Prices for Protection of the Environment' (1971) 73 *Swedish Journal of Economics* 42; Carolyn Fischer and Richard G Newell, 'Environmental and Technology Policies for Climate Mitigation' (2008) 55 *Journal of Environmental Economics and Management* 142; Stavins, *Project 88* (n 87) 15, 19.

⁹⁹ Regulatory or government failures collectively denote the cognitive, organizational, and political limitations of public authorities, including regulatory capture, capacity constraints and information asymmetries, see James Buchanan and Gordon Tullock, 'Polluters' Profits and Political Response: Direct Controls versus Taxes' (1975) 65 *American Economic Review* 139; and more generally Charles Wolf Jr., *Markets or Governments: Choosing between Imperfect Alternatives* (2nd edn, MIT Press 1993) passim <<https://mitpress.mit.edu/books/markets-or-governments-second-edition>> accessed 5 March 2019.

¹⁰⁰ Scott R Milliman and Raymond Prince, 'Firm Incentives to Promote Technological Change in Pollution Control' (1989) 17 *Journal of Environmental Economics and Management* 247. This common assumption has also been questioned, however, see e.g. David M Driesen, 'Does Emissions Trading Encourage Innovation?' (2003) 32 *Environmental Law Reporter* 10094; Margaret R Taylor, 'Innovation under Cap-and-Trade Programs' (2012) 109 *Proceedings of the National Academy of Sciences* 4804.

¹⁰¹ Helm (n 56) 215.

¹⁰² Thomas D Crocker, 'The Structuring of Atmospheric Pollution Control Systems' in Harold Wolozin (ed), *The Economics of Air Pollution: A Symposium* (WW Norton 1966); John H Dales, *Pollution, Property & Prices: An Essay in Policymaking and Economics* (University of Toronto Press 1968); W David Montgomery, 'Markets in Licenses

emergence of a market, displaying dynamics that are not entirely dissimilar to those in conventional markets for goods and services. Such quantity controls with trading are therefore often referred to as market mechanisms.¹⁰³

Like economic instruments more generally, market mechanisms promise various theoretical benefits relative to conventional regulation. If the quantity control – such as an overall limit in pollutant emissions¹⁰⁴ – is adequately enforced, it guarantees the desired policy outcome, setting this policy option apart from pure pricing approaches, such as an environmental tax.¹⁰⁵ Still, by incorporating tradable units, market mechanisms also reveal an explicit price for environmental harm at the intersection of demand and supply, with the latter determined by the regulator. That price, in turn, internalizes some or all of the social cost of environmental degradation in the private cost of underlying behaviour,¹⁰⁶ partly or fully correcting the underlying market failure.¹⁰⁷ As such,

and Efficient Pollution Control Programs’ (1972) 5 *Journal of Economic Theory* 395. All the foregoing are grounded in the theorem set out by Ronald H. Coase in ‘The Problem of Social Cost’ (n 94).

¹⁰³ Admittedly, this definition departs from the abstract understanding of market mechanism as the ‘mechanism through which buyers and sellers interact to determine prices and exchange goods, services, and assets’, see Paul A Samuelson and William D Nordhaus, *Economics* (19th edn, McGraw-Hill 2010) 26. The term ‘market mechanism’ is nevertheless retained throughout this chapter in view of its accepted use in international environmental governance. We are encouraging authors to reduce the “speaking” portions of footnotes to save words. Reduces nuance I know but necessary to keep within the word limit!

¹⁰⁴ Aside from such an absolute limit, or ‘cap’, quantity rationing can also occur with a baseline (such as a business-as-usual projection or a defined performance standard) and crediting of environmental improvements relative to this baseline, be it at project, sectoral or economy-wide level, see Organisation for Economic Co-operation and Development (OECD), *Domestic Transferable Permits for Environmental Management: Design and Implementation* (OECD Publishing 2001) 19 <<https://doi.org/10.1787/9789264192638-en>>.

¹⁰⁵ Because behavioural responses to a change in price are not perfectly predictable – for instance due to varying degrees of price elasticity – a pure pricing approach can require continuous adjustment to ensure achievement of a defined quantitative outcome, see e.g. Jean Tirole, ‘Some Political Economy of Global Warming’ (2012) 1 *Economics of Energy & Environmental Policy* 121.

¹⁰⁶ For the conceptual origin of the distinction between social and private cost, see Arthur C Pigou, *Wealth and Welfare* (Macmillan & Co 1912).

¹⁰⁷ While quantity controls with trading are fundamentally distinct from Pigouvian pricing set at the level of the social cost of externalities, as described by Arthur C Pigou, *The Economics of Welfare* (Macmillan & Co 1920), the variable market price of transacted units does send a price signal to market participants, thereby internalizing the externality at

market mechanisms can help operationalize the polluter pays principle¹⁰⁸ enshrined in the domestic law of many jurisdictions as well as in international environmental documents.¹⁰⁹

Market mechanisms often impose a declining quantity over time, progressively reducing the number of tradable units in the market. As prices for units rise in response to growing scarcity, the demand for them should gradually decrease, creating a continuous incentive to reduce environmental harm. Entities with relatively lower compliance costs will sell unused units to entities with relatively higher compliance costs. Under conditions of perfect competition, trading should thus result in an equilibrium where marginal abatement costs are equalized across all regulated entities, and abatement of environmental harm occurs where it yields the largest net benefit to society.¹¹⁰ In that optimal state – formally described as a ‘Pareto equilibrium’¹¹¹ – a market mechanism will ensure that no compliance entity can contribute to the environmental policy objective at lower cost than any other. Compared to more rigid policy mandates, market mechanisms can leverage this superior efficiency to lower the private and social cost of achieving environmental policy objectives.¹¹²

least in part; see Kenneth J Arrow, ‘The Organization of Economic Activity: Issues Pertinent to the Choice of Market versus Non-Market Allocation’ in U.S. Congress Joint Economic Committee (ed), *The Analysis and Evaluation of Public Expenditures: The PPB System* (US Government Printing Office 1969).

¹⁰⁸ On the use of economic instruments to implement the polluter pays principle, see Opschoor and Vos (n 96) 3. For an early discussion of the principle, including definitions and examples, see generally Organisation for Economic Co-operation and Development (OECD), *The Polluter Pays Principle: Definition, Analysis, Implementation* (OECD Publishing 1975).

¹⁰⁹ At the international level, see e.g. UN Conference on Environment and Development, ‘Rio Declaration on Environment and Development’ (3-14 June 1992) UN Doc A/CONF.151/26 (vol I), Annex 1, Principle 16.

¹¹⁰ Baumol and Oates (n 24) 177; Thomas H Tietenberg, *Emissions Trading: Principles and Practice* (2nd edn, Resources for the Future 2006) 27.

¹¹¹ Based on the criteria described by Vilfredo Pareto in his seminal *Manuel d’économie Politique* (Alfred Bonnet tr, V Giard & E Brière 1909) 354 <<https://gallica.bnf.fr/ark:/12148/bpt6k5518153f>> accessed 4 March 2019.

¹¹² Cost savings from market mechanisms depend on various factors, such as market size, heterogeneity of abatement cost across compliance entities, transaction costs, and stringency of quantity controls; theoretical estimates have suggested potential savings of up to 95% compared to conventional regulation, whereas empirical studies have shown cost reductions closer to 50%, see A Denny Ellerman and others, *Markets for Clean Air* (Cambridge University Press 2000) 294 <<https://www.cambridge.org/de/academic/subjects/economics/natural-resource-and-environmental-economics/markets-clean-air-us-acid-rain-program?format=PB>> accessed 5 March 2019; Tietenberg (n 110) 58–59.

4.2 Instrument Choice and the Turn to Markets

Given the multiple benefits ascribed to them in economic theory, market mechanisms have seen a remarkable ascent in climate policy design: within thirty years from being first described in the theoretical literature, they were already endorsed by the international community through formal consensus.¹¹³ They are particularly suited to address climate change because the anthropogenic greenhouse gases responsible for climate change are not in themselves toxic and the damage function of their accumulation in the atmosphere is shallow in the short run, which allows for spatial and temporal flexibility in the policy response.¹¹⁴ Climate change is unique, moreover, in that the underlying causes are diffuse, widely heterogeneous, and virtually ubiquitous activities, necessitating policy solutions that are scalable and cost-effective. As abatement costs rise over time – with cheap abatement options being, by design, exhausted first¹¹⁵ – the cost-effectiveness of market-based instruments is seen as increasingly important to sustain policy ambition over the long term.¹¹⁶

This rise of market mechanisms in climate policy is inseparably linked to the sophistication of instrument choice theory, which has been dominated by economic thought and its preoccupation with the costs and benefits of alternative policy options. Although other criteria for instrument choice are routinely mentioned, such as environmental effectiveness and distributional impacts,

See, however, also Daniel H. Cole and Peter Z. Grossman, who draw attention to the underappreciated role of administrative costs to show that market mechanisms will not always lower total economic cost, ‘Toward a Total-Cost Approach to Environmental Instrument Choice’ in Timothy Swanson (ed), *An Introduction to the Law and Economics of Environmental Policy: Issues in Institutional Design* (Elsevier Science Ltd 2002) <[https://doi.org/10.1016/S0193-5895\(02\)20011-1](https://doi.org/10.1016/S0193-5895(02)20011-1)> accessed 6 March 2019; on the role of transaction costs, see also Robert N Stavins, ‘Transaction Costs and Tradeable Permits’ (1995) 29 *Journal of Environmental Economics and Management* 133.

¹¹³ Referring to the introduction of market mechanisms in the international climate regime: Cole (n 85) 25.

¹¹⁴ Dieter Helm, ‘Economic Instruments and Environmental Policy’ *Economic & Social Review* 36/3 (2005) 205, 223.

¹¹⁵ Nicholas Stern, *The Economics of Climate Change: The Stern Review* (Cambridge University Press 2007) 63, 191.

¹¹⁶ Collectively referred to as ‘carbon markets’, market mechanisms for climate change mitigation have in common a quantity limitation which generates demand for units, and an ability of market participants to purchase or sell units at the respective market price. Although other greenhouse gases may be included, the term ‘carbon market’ is widely used because tradable units are mostly denominated in terms of carbon dioxide equivalent (CO₂e), see Richard Newell, William Pizer and Daniel Raimi, ‘Carbon Markets 15 Years after Kyoto: Lessons Learned, New Challenges’ *Journal of Economic Perspectives* 27/1 (2013) 123, 124.

the cost effectiveness of policy instruments has generally enjoyed the greatest attention in academic literature.¹¹⁷

Given this preoccupation with cost effectiveness, economists have focused their attention on the perceived ‘first-best’ market instruments, with much of their scholarly research devoted to narrow theoretical debates about relative merits – again expressed in terms of cost – of different instrument designs.¹¹⁸ Much of this research has been criticized for ignoring political and other secular constraints, emphasizing ‘elegance at the expense of realism.’¹¹⁹ Yet the mathematical formalization it provided extended epistemic authority to market mechanisms, legitimizing them in the eyes of the research community and helping overcome ‘the inertia of the status quo’ that otherwise favoured more traditional forms of regulation.¹²⁰

More than merely engaging in a theoretical debate, economists have thus shaped the discourse about market mechanisms, using their discipline as a performative tool to advance policy choices in the real world.¹²¹ By presenting a systematic and coherent framework for instrument

¹¹⁷ See, for instance, Goulder and Parry (n 27); Keohane, Stavins and Revesz (n 24).

¹¹⁸ See, for instance, assessments of the relative merit of price- and quantity-based approaches under conditions of uncertainty: Marc J Roberts and Michael Spence, ‘Effluent Charges and Licenses Under Uncertainty’ (1976) 5 *Journal of Public Economics* 193; Martin Weitzman, ‘Prices vs. Quantities’ (1974) 41 *Review of Economic Studies* 477. The same questions have remained topical in economic literature until the current day, see, e.g., Cameron Hepburn, ‘Regulation by Prices, Quantities, or Both: A Review of Instrument Choice’ (2006) 22 *Oxford Review of Economic Policy* 226; Larry S Karp and Christian P Traeger, ‘Prices versus Quantities Reassessed’ (CESifo Group 2018) Working Paper 7331 <http://www.cesifo-group.de/DocDL/cesifo1_wp7331.pdf> accessed 6 March 2019.

¹¹⁹ Robert W Hahn, ‘Economic Prescriptions for Environmental Problems: Lessons from the United States and Continental Europe’ in Robyn Eckersley (ed), *Markets, the State and the Environment: Towards Integration* (Macmillan & Co 1995) 129 <https://doi.org/10.1007/978-1-349-14022-0_7> accessed 8 March 2019.

¹²⁰ *ibid* 153; Tietenberg (n 110) 4–5, 48; Nicholas D Hanley, Stephen Hallett and Ian Moffatt, ‘Why Is More Notice Not Taken of Economists’ Prescriptions for the Control of Pollution?’ (1990) 22 *Environment and Planning A: Economy and Space* 1421.

¹²¹ See, for instance, Richard Lane, ‘The Promiscuous History of Market Efficiency: The Development of Early Emissions Trading Systems’ (2012) 21 *Environmental Politics* 583; Oates (n 90) 146. Drawing on the example of markets for greenhouse gas emission units, see in greater detail Michel Callon, ‘Civilizing Markets: Carbon Trading between in Vitro and in Vivo Experiments’ (2009) 34 *Accounting, Organizations and Society* 535; Donald MacKenzie, ‘Making Things the Same: Gases, Emission Rights and the Politics of Carbon Markets’ (2009) 34 *Accounting, Organizations and Society* 440.

choice and focusing research efforts on those instruments that best conformed to self-defined criteria, they helped narrow the configuration of options available for rational collective action, severing discussions about means from their intended ends, and shifting policy negotiations from public arenas to the confined world of policy experts.¹²²

It would not take long before these conceptual prescriptions found their way into political discourse, bolstered by a broader shift in governance philosophy towards market liberalisation and scepticism of government intervention.¹²³ With traditional forms of regulation now marked as economically inferior by theoretical research, practical experimentation with market mechanisms for conventional pollutants began as early as 1974.¹²⁴ The perceived success of these initial experiences, once more affirmed through economic analysis,¹²⁵ prompted a surge in public interest

¹²² Arno Simons and Jan-Peter Voß, 'Politics by Other Means: The Making of The Emissions Trading Instrument as a "Pre-History" of Carbon Trading' in Benjamin Stephan and Richard Lane (eds), *The Politics of Carbon Markets* (Routledge 2014) 64 <<https://www.taylorfrancis.com/books/e/9781134590056/chapters/10.4324%2F9781315886985-11>> accessed 6 March 2019; Robyn Eckersley, 'Introduction' in Robyn Eckersley (ed), *Markets, the State and the Environment: Towards Integration* (Macmillan & Co 1995) 2 <https://doi.org/10.1007/978-1-349-14022-0_1> accessed 8 March 2019.

¹²³ David M Driesen, 'Alternatives to Regulation? Market Mechanisms and the Environment' in Robert Baldwin, Martin Cave and Martin Lodge (eds), *The Oxford Handbook of Regulation* (Oxford University Press 2010) 205 <<https://www.oxfordhandbooks.com/view/10.1093/oxfordhb/9780199560219.001.0001/oxfordhb-9780199560219-e-10>>.

¹²⁴ On this date, a market mechanism – 'netting' – was first deployed to reduce industrial air pollution in the United States, see Robert W Hahn and Gordon L Hester, 'Where Did All the Markets Go? An Analysis of EPA's Emissions Trading Program' (1989) 6 *Yale Journal on Regulation* 109; idem, 'Marketable Permits: Lessons for Theory and Practice' (1989) 16 *Ecology Law Quarterly* 361; Errol Meidinger, 'On Explaining the Development of "Emissions Trading" in U.S. Air Pollution Regulation' (1985) 7 *Law & Policy* 447.

¹²⁵ As Lane notes, the ambivalent performance of the earliest trading experiments did not detract the economic community from praising market mechanisms as such, see Lane (n 121) 598. Later on, experience with the U.S. Acid Rain programme provided a more favourable case study for economic analysis, see, e.g., Ellerman and others (n 112); Robert N Stavins, 'What Can We Learn from the Grand Policy Experiment? Lessons from SO₂ Allowance Trading' (1998) 12 *Journal of Economic Perspectives* 69.

and scholarly engagement across disciplines. Highly visible activities such as ‘Project 88’¹²⁶ and endorsement by reputable actors and organizations broadened the debate and afforded further legitimacy to the use of market mechanisms in environmental policy.¹²⁷

In the social sciences, scholars began deploying a variety of analytical and empirical methods to evaluate these mechanisms. Writing on climate change alone, they have covered topics as far afield as the policymaking processes and support coalitions that underpin carbon markets,¹²⁸ the diffusion of carbon trading across jurisdictions,¹²⁹ issues of legitimacy and social justice,¹³⁰ and the role of underlying cultural paradigms.¹³¹ Market mechanisms have resonated with different research trends over time, such as ecological modernization,¹³² new environmental policy

¹²⁶ ‘Project 88’ was convened ahead of the 1988 federal elections by two members of the U.S. Senate, with broad participation from academia, private companies, public policy, and civil society, and helped prompt legislative action to create the largest domestic market mechanism to date, the U.S. Acid Rain program, see Stavins, *Project 88* (n 87).

¹²⁷ In the early 1990s, for instance, the Organisation for Economic Co-operation and Development (OECD) and the United Nations Conference on Trade and Development (UNCTAD) issued reports endorsing the use of market mechanisms for global climate cooperation, see the various sources cited in Simons and Voß (n 122) 62–63.

¹²⁸ See, e.g., Jonas Meckling, *Carbon Coalitions: Business, Climate Politics, and the Rise of Emissions Trading* (MIT Press 2011) <<https://mitpress.mit.edu/books/carbon-coalitions>> accessed 4 December 2016; Peter Newell and Matthew Paterson, *Climate Capitalism: Global Warming and the Transformation of the Global Economy* (Cambridge University Press 2010); Benjamin Stephan and Richard Lane (eds), *The Politics of Carbon Markets* (Routledge 2014).

¹²⁹ Jørgen Wettestad and Lars H Gulbrandsen (eds), *The Evolution of Carbon Markets: Design and Diffusion* (Routledge 2018).

¹³⁰ Steffen Böhm and Siddharta Dabhi (eds), *Upsetting the Offset: The Political Economy of Carbon Markets* (MayFly Books 2009) <http://mayflybooks.org/?page_id=21> accessed 7 March 2019.

¹³¹ Janelle Knox-Hayes, *The Cultures of Markets: The Political Economy of Climate Governance* (Oxford University Press 2016).

¹³² See, e.g., Peter Christoff, ‘Ecological Modernisation, Ecological Modernities’ (1996) 5 *Environmental Politics* 476; Maarten A Hajer, *The Politics of Environmental Discourse: Ecological Modernization and the Policy Process* (Oxford University Press 1997); Arthur PJ Mol, ‘Ecological Modernisation and Institutional Reflexivity: Environmental Reform in the Late Modern Age’ (1996) 5 *Environmental Politics* 302; Albert Weale, *The New Politics of Pollution* (Manchester University Press 1992).

instruments (NEPI),¹³³ smart regulation, and eco-pragmatism.¹³⁴ Their ability to reconcile economic and environmental concerns provided a common theme in much of the early social science literature, and has only recently given way to a more critical focus on the ideological premises, hegemonic power structures, social and ethical shortcomings, and time-space discontinuities associated with market mechanisms.

Invariably, the discussion also percolated through to environmental law scholarship. While by no means the earliest mention of market mechanisms by a legal scholar,¹³⁵ an influential article written by two pioneers of environmental law conveys the thrust with which supporters of regulatory innovation sought to reform traditional environmental controls, describing these as ‘extraordinarily crude, costly, litigious and counterproductive.’¹³⁶ In their praise of market mechanisms, they not only saw a means of overcoming the perceived shortfalls of incumbent instruments, but also ways to ‘make environmental law more democratically accountable and bureaucratically effective.’¹³⁷

Already at a semantic level, the widely embraced classification of conventional policy instruments as ‘command and control’ regulation marked a victory for market advocates,¹³⁸ forcing critics on the defensive. And yet, a sense of the inevitability of market mechanisms, even ‘irrational

¹³³ Bruno Dente (ed), *Environmental Policy in Search of New Instruments* (Springer 1995); Andrew Jordan, Rüdiger KW Wurzel and Anthony R Zito, “‘New’ Instruments of Environmental Governance: Patterns and Pathways of Change’ (2003) 12 *Environmental Politics* 1.

¹³⁴ Daniel A Farber, *Eco-Pragmatism: Making Sensible Environmental Decisions in an Uncertain World* (University of Chicago Press 2000) <<https://www.press.uchicago.edu/ucp/books/book/chicago/E/bo3622123.html>>.

¹³⁵ See, for instance, the brief discussion by later Associate Justice of the U.S. Supreme Court Stephen Breyer, ‘Analyzing Regulatory Failure: Mismatches, Less Restrictive Alternatives, and Reform’ *Harvard Law Review* 92/3 (1979) 547, 582.

¹³⁶ Ackerman and Stewart (n 87) 1333.

¹³⁷ *ibid* 1365.

¹³⁸ A Denny Ellerman, ‘Are Cap-and-Trade Programs More Environmentally Effective than Conventional Regulation?’ in Jody Freeman and Charles D Kolstad (eds), *Moving to Markets in Environmental Regulation* (Oxford University Press 2006) 49 <<https://www.oxfordscholarship.com/10.1093/acprof:oso/9780195189650.001.0001/acprof-9780195189650-chapter-3>>.

exuberance' about their benefits,¹³⁹ could not fully conceal lingering tensions between the normative worldview of lawyers and the instrumental rationality of economics, whose uneasy confluence is equally apparent in the persistent controversy around the role of cost-benefit analysis in environmental law.¹⁴⁰

Still, market mechanisms would not have acquired the outsized role they play in contemporary environmental policy without support from the legal profession, whose representatives acted both within government and as advocates in civil society. At the domestic level, for instance, C. Boyden Gray, White House Counsel to President George H. W. Bush, was one of the main architects of the 1990 Clean Air Act Amendments that introduced a national emissions trading market in the United States. Even in the environmental community, where market approaches met with initial scepticism, a lawyer emerged as their main proponent: for over three decades, Frederic D. Krupp, president of the powerful advocacy group Environmental Defense Fund, has wielded his influence to champion use of markets at the domestic and international level.¹⁴¹

Because the central benefit ascribed to market mechanisms arises from differences in abatement cost, a larger market can leverage greater efficiency gains, arguing in favour of the broadest possible deployment. Unsurprisingly, therefore, market approaches were also soon considered for international environmental challenges. With its global scale, high economic stakes, and unique physical features, climate change attracted the most active discussion of markets as

¹³⁹ Lisa Heinzerling, 'The Environment' in Peter Cane and Mark Tushnet (eds), *The Oxford Handbook of Legal Studies* (Oxford University Press 2003) 712–713.

¹⁴⁰ See, for instance, the strong endorsement by Cass Sunstein, *The Cost-Benefit Revolution* (MIT Press 2018); Michael A Livermore and Richard L Revesz (eds), *The Globalization of Cost-Benefit Analysis in Environmental Policy* (Oxford University Press 2013); and the scathing critique by Frank Ackerman and Lisa Heinzerling, *Priceless: On Knowing the Price of Everything and the Value of Nothing* (The New Press 2004).

¹⁴¹ Frederic D. Krupp, 'New Environmentalism Factors in Economic Needs' *Wall Street Journal* (20 November 1986) 34.

part of intergovernmental cooperation, and economists customarily led the charge.¹⁴² Lawyers, however, were once again critical in seeing the idea through to implementation.

Perhaps the most pivotal moment for weaving markets into the fabric of international environmental governance occurred during the negotiations resulting in adoption of the Kyoto Protocol,¹⁴³ when the United States – represented by two influential lawyers¹⁴⁴ – insisted on inclusion of market mechanisms as a condition for agreement.¹⁴⁵ As countries proceeded to render this framework operational, they were able to draw on prior work by legal scholars that ‘borrowed’¹⁴⁶ insights from domestic experiences to recommend how market instruments be implemented under international law.¹⁴⁷

Just as the rise of market mechanisms at the domestic level was buoyed by a broader shift in regulatory culture and the preferred balance between governments and markets,¹⁴⁸ their diffusion to the international level coincided with broader trends in international law and diplomacy. For decades, the defining geopolitical struggle revolved around a deep ideological rift

¹⁴² Published in 1997, the ‘Economists’ Statement on Climate Change’ was by then the largest public statement in the history of the profession, and endorsed an ‘international emissions trading agreement’ to address the climate challenge, see Stephen J Decanio, ‘The Economics of Climate Change’ (Redefining Progress 1997) 2.

¹⁴³ Kyoto Protocol to the United Nations Framework Convention on Climate Change (adopted 10 December 1997, entered into force 16 February 2005), 2303 UNTS 162 (Kyoto Protocol).

¹⁴⁴ These lawyers were Ambassador Stuart Eizenstat, head of the U.S. delegation, and Vice President Albert Gore jr., who broke the deadlock in the final hours of negotiations by offering concessions in return for an international market framework, see Eric Pooley, *The Climate War: True Believers, Power Brokers, and the Fight to Save the Earth* (Hyperion Books 2010) 37.

¹⁴⁵ Sebastian Oberthür and Hermann E Ott, *The Kyoto Protocol: International Climate Policy for the 21st Century* (Springer 1999) 189 <10.1007/978-3-662-03925-0>.

¹⁴⁶ Jonathan B Wiener, ‘Something Borrowed for Something Blue: Legal Transplants and the Evolution of Global Environmental Law’ (2001) 27 Ecology Law Quarterly 1295.

¹⁴⁷ Richard B Stewart and Jonathan B Wiener, ‘The Comprehensive Approach to Global Climate Policy: Issues of Design and Practicality’ (1992) 9 Arizona Journal of International and Comparative Law 83.

¹⁴⁸ Jason J Czarnezki and Katherine Fiedler, ‘The Neo-Liberal Turn in Environmental Regulation’ (2016) 2016 Utah Law Review 1.

between central planning and market economies, with the latter appearing triumphant after the end of the Cold War.¹⁴⁹

More recently, growing complexity and interdependence in international relations have occasioned calls for a shift away from the enforcement of binary rules in ‘regulatory’ treaties to a more ‘managerial’ style relying on transparency and facilitation through flexible cooperative arrangements.¹⁵⁰ Traditional intergovernmental cooperation has, in turn, ceded considerable terrain to a fragmented topography of informal networks and partnerships, in which varying constellations of state and non-state actors resort to public as well as private norms when addressing transboundary challenges.¹⁵¹

With their shared eschewal of state-centric planning and regulation, these trends have collectively provided a favourable context for the ascendance of market mechanisms in international environmental governance. Yet while economists have continued to engage in nuanced debate about the relative strengths and weaknesses of markets, the legal community seems more or less reconciled to their existence. With some notable exceptions, lawyers working on market mechanisms have tended to examine these ‘with the overall aim of promoting their use.’¹⁵²

Lacking the quantitative skills to evaluate – let alone challenge – the complex calculations of their economist counterparts, lawyers may feel unable to weigh the theoretical merits of market approaches. The ‘imperialism of economics’ – as one commentator frames it – already manifests itself in the complex and inaccessible terminology used by its scholars, including central concepts in the literature on instrument choice for environmental and climate policy.¹⁵³ Instead, the vast

¹⁴⁹ John Williamson, ‘Democracy and the “Washington Consensus”’ (1993) 21 *World Development* 1329.

¹⁵⁰ Chayes and Chayes (n 48).

¹⁵¹ Kati Kulovesi, Michael A Mehling and Elisa Morgera, ‘Global Environmental Law: Context and Theory, Challenge and Promise’ (2019) 8 *Transnational Environmental Law* 405.

¹⁵² Sanja Bogojević, ‘Trading Schemes’ in Emma Lees and Jorge E Viñuales (eds), *The Oxford handbook of comparative environmental law* (Oxford University Press 2019) 936 <[https://portal.research.lu.se/portal/en/publications/market-mechanisms-in-environmental-law\(a6e0987e-8721-4695-93f3-f708de62dd97\)/export.html](https://portal.research.lu.se/portal/en/publications/market-mechanisms-in-environmental-law(a6e0987e-8721-4695-93f3-f708de62dd97)/export.html)> accessed 14 January 2020.

¹⁵³ Robert Cooter, ‘Law and the Imperialism of Economics: An Introduction to the Economic Analysis of Law and a Review of the Major Books’ (1981) 29 *UCLA Law Review* 1260, 1263, using the example of efficiency as a concept: ‘Economists draw on many different forms of this concept, such as efficient production, efficient exchange, Pareto

majority of relevant legal research has traditionally focused on more familiar terrain, such as regulatory design and structuring of market transactions. As the next section highlights, however, that presents a missed opportunity: legal scholars can, and have, meaningfully contributed to the critical assessment of functional, conceptual, and normative aspects of market approaches.

4.3 Markets and their Limits

Scholarship on the deficiencies of market mechanisms is substantial, and often as sophisticated as the economic literature on instrument choice favouring their deployment. Only a short overview of such critical strands can be presented here, focusing on three dimensions of criticism: design and implementation failures, theoretical and conceptual shortcomings, and normative or ideological flaws. As the references show, legal scholars have contributed to the literature on each of these dimensions, including with some of the earliest analyses of the potential shortfalls of market mechanisms and other economic instruments in practice.¹⁵⁴

Most objections have been levelled within the first category: functional challenges in the operation of markets that result from imperfect design and implementation. Because market mechanisms are premised on an artificially constrained supply of intangible and instantly transferable administrative carbon units, they are particularly dependent on a robust governance framework and credible policy mandates. Risks and shortcomings that follow from these unique properties include, for instance, susceptibility to corruption and abuse,¹⁵⁵ or loopholes that incentivise pollution and reward routine behaviour.¹⁵⁶ These functional shortfalls are discussed at length in the case studies of carbon markets in my article on the governance of cooperative approaches under the Paris Agreement.¹⁵⁷ At a conceptual level, markets have also been censored

efficiency, national income maximization, wealth maximization, and utilitarian efficiency. Most economists move easily from one form to another, but the subtle shifts in significance are lost upon noneconomists’.

¹⁵⁴ Howard Latin, ‘Ideal versus Real Regulatory Efficiency: Implementation of Uniform Standards and “Fine-Tuning” Regulatory Reforms’ (1985) 37 *Stanford Law Review* 1267.

¹⁵⁵ Ruth Greenspan Bell, ‘The Kyoto Placebo’ (2006) 22 *Issues in Science and Technology* 28.

¹⁵⁶ Michael Wara, ‘Is the Global Carbon Market Working?’ (2007) 445 *Nature* 595.

¹⁵⁷ Mehling, ‘Governing Cooperative Approaches under the Paris Agreement’ (n 12), especially Part II.

for undermining supplemental measures¹⁵⁸ and lowering costs in the near term at the expense of innovation in the long term.¹⁵⁹ What both groups of criticisms have in common is that they can be at least partially rectified with improved policy design, and the evolution of market approaches has indeed shown many valuable lessons put into practice.¹⁶⁰

More fundamentally, however, critics have also raised normative concerns, likening market mechanisms to a commodification of the environment through which monetary value is assigned to intangible goods.¹⁶¹ This, in turn, creates the impression of a ‘right to pollute’ in violation of an established principle of environmental governance.¹⁶² By privatising public discourse, moreover, complex decisions that affect society at large are devolved to the logic of market transactions, supplanting collective planning processes and weakening democratic accountability.¹⁶³

From the outset, the debate on markets and their assessment has also included an ideological component, with opponents decrying them as a manifestation of capitalism¹⁶⁴ that conceals underlying power structures and exacerbates distributional biases.¹⁶⁵ Such censure of markets is often framed in terms of equity and justice, providing a fertile angle for contributions by lawyers.¹⁶⁶ For some commentators, for instance, international use of markets risks perpetuating colonial exploitation patterns by allowing wealthy countries to deplete affordable abatement

¹⁵⁸ David M Driesen, ‘Emissions Trading versus Pollution Taxes: Playing “Nice” with Other Instruments’ 48 *Environmental Law* 29.

¹⁵⁹ Driesen, ‘Encourage Innovation?’ (n 100).

¹⁶⁰ See, for instance, the essays collected in Wettestad and Gulbrandsen (n 129).

¹⁶¹ Robert E Goodin, ‘Selling Environmental Indulgences’ (1994) 47 *Kyklos* 573.

¹⁶² Jonathan R Nash, ‘Too Much Market: Conflict between Tradable Pollution Allowances and the Polluter Pays Principle’ (2000) 24 *Harvard Environmental Law Review* 465.

¹⁶³ Alice Kaswan, ‘Energy, Governance, and Market Mechanisms’ (2018) 72 *Miami Law Review* 476.

¹⁶⁴ See, for instance, the essays collected in Böhm and Dabhi (n 130).

¹⁶⁵ Robert Baldwin, ‘Regulation Lite: The Rise of Emissions Trading’ (2008) 2 *Regulation & Governance* 193, 203.

¹⁶⁶ See, e.g., the essays collected in Benjamin J Richardson and Klaus Bosselmann, *Environmental Justice and Market Mechanisms: Key Challenges for Environmental Law and Policy* (Kluwer Law International 1999) <https://digitalcommons.osgoode.yorku.ca/faculty_books/303>.

opportunities in the developing world, causing poorer countries to forfeit space for economic growth.¹⁶⁷

All these concerns are also in evidence during the negotiation processes accompanying elaboration of market approaches at the international level. As I discuss in my article on the governance of cooperative approaches under the Paris Agreement, practical experiences with market mechanisms have been, at best, ambivalent, and securing consensus for their further advancement has only become more challenging over time.¹⁶⁸ Still, in the relevant literature on instrument choice, lawyers have nonetheless played a subordinate role, with normative and often highly theoretical analyses more commonly originating in other social sciences, such as critical geography and political ecology. That legal considerations can play a pronounced role in the practice of instrument choice for climate change mitigation is illustrated in the following section, which traces historical choice processes on both sides of the Atlantic.

5 Empirical Case Study: Instrument Choice across the Atlantic

With a view to illustrating the selection of policy instruments for climate change mitigation in the real world, this section ventures a micro-comparison¹⁶⁹ of specific climate policy choices in Europe and the United States, tracing these back to features of the respective legal system. Despite similar socioeconomic circumstances¹⁷⁰ and a history of close cooperation and shared cultural

¹⁶⁷ Emily Richman, 'Emissions Trading and the Development Critique: Exposing the Threat to Developing Countries' (2003) 36 *New York University Journal of International Law and Politics* 133.

¹⁶⁸ Mehling, 'Governing Cooperative Approaches under the Paris Agreement' (n 12).

¹⁶⁹ A micro-comparison focuses the analysis on a specific institution or problem, as opposed to a macro-comparison of legal fields or systems more generally, see Peter De Cruz, *Comparative Law in a Changing World* (3rd edn, Routledge 2006) 219.

¹⁷⁰ For instance, both regions resemble each other in terms of their market-based economic system, production patterns, and affluent living standards, with per capita Gross Domestic Product (GDP) diverging by a margin of less than 25 per cent; likewise, primary energy consumption by source is surprisingly similar in Europe and the United States, with oil, natural gas and renewable energy providing nearly identical shares of the primary energy need in each region; see generally Michael A Mehling, 'Facing Climate Change across the Atlantic: How Far Apart Are Europe and North America?' in Kurt Hübner (ed), *Europe, Canada and the Comprehensive Economic and Trade Agreement* (Routledge 2011) 260.

heritage, Europe and North America have responded to the threat of global climate change in remarkably different ways.¹⁷¹ Internationally, the European Union has enjoyed a reputation as a forerunner in the adoption and implementation of sustainable energy and climate legislation, ostensibly ‘doing more than any other part of the world to address global climate change and to share the burdens associated with it’;¹⁷² by contrast, and symptomatically for federal climate policy in the United States, ‘the U.S. Congress has passed, and the President has signed, no statutes that explicitly require public entities or private companies to mitigate their impact on the global climate.’¹⁷³

Disciplines other than law, notably comparative politics, have dedicated ample scholarly effort to explain these observed differences across the Atlantic. In their diagnosis of European climate leadership, for instance, commentators have variously highlighted the opportunity to strengthen European visibility and power on the global stage,¹⁷⁴ a virtuous leadership cycle in domestic policy making and strong networks of environmental advocacy groups,¹⁷⁵ and generally favourable conditions for ambitious climate policy due to strong public support.¹⁷⁶ Meanwhile, an absence of party discipline and entrenched partisanship, strong lobbying forces and multiple veto points, and a generally less supportive public have been blamed for halting progress on federal climate legislation in the U.S. In recent years, there has thus been a wealth of research on the role

¹⁷¹ For general overviews, see Mehling, ‘Facing Climate Change across the Atlantic’ (n 170); and Joseph E Aldy, Camilla Bausch and Michael A Mehling, *Climate Change and Energy Security: Lessons Learned* (American Institute for Contemporary German Studies 2008).

¹⁷² Paul G Harris, ‘Europe and the Politics and Foreign Policy of Global Climate Change’ in Paul G Harris (ed), *Europe and Global Climate Change: Politics, Foreign Policy and Regional Cooperation* (Edward Elgar 2007) 31.

¹⁷³ Michael B Gerrard, ‘Introduction and Overview’ in Michael B Gerrard and Jody Freeman (eds), *Global climate change and U.S. law* (2nd edn, American Bar Association 2015) 1.

¹⁷⁴ Sebastian Oberthür and Claire Roche Kelly, ‘EU Leadership in International Climate Policy: Achievements and Challenges’ (2008) 43 *The International Spectator* 35, 43.

¹⁷⁵ Miranda A Schreurs and Yves Tiberghien, ‘Multi-Level Reinforcement: Explaining European Union Leadership in Climate Change Mitigation’ (2007) 7 *Global Environmental Politics* 19, 25.

¹⁷⁶ Jørgen Henningsen, ‘EU Energy and Climate Policy: Two Years On’ (European Policy Centre 2008) EPC Issue Paper No.55 7.

of interests, actors, and institutions underlying the different climate policy trajectories in Europe and the United States, yet relatively little in terms of comparative legal analysis.¹⁷⁷

This should come as a surprise: the incidence of widely divergent responses to a common challenge can also be a valuable source of insight for comparative legal analysis.¹⁷⁸ A question lawyers can ask is: What legal factors, if any, have prompted or accelerated the instrument choices underlying such divergence in the response to climate change, and can these factors be isolated from other socio-economic factors? Below, three issue areas will be singled out for a brief comparative analysis, exemplifying an application of the comparative law methodology I survey in my article on the comparative law of climate change:¹⁷⁹ the adoption of international climate commitments; the limitation of emissions from the power sector; and the promotion of renewable energy. Since the purpose of this comparison is to illustrate the role of laws and institutions in instrument choice, the analysis will not delve deeply into aspects of legal doctrine, but rather limit itself to highlighting a number of ways in which legal frameworks have shaped climate policy development across the Atlantic.

5.1 Entering International Commitments

While cooperation on energy issues dates back to the earliest stages of European integration, climate change was not mentioned in the primary law of the European Union until its insertion with the Treaty of Lisbon in 2009. Still, both the global nature of climate change as well as the desire to maintain uniform policy requirements across Europe provided a justification for harmonized action, with the shared competence on environmental protection¹⁸⁰ providing a basis for engagement at the international level. Reflecting the legal nature of the European Union as a supranational entity composed of sovereign States, treaty practice in areas of shared competences

¹⁷⁷ A notable exception is Cinnamon P Carlarne, *Climate Change Law and Policy: EU and US Perspectives* (Oxford University Press 2010) 237–343.

¹⁷⁸ See Jan Darpö and Annika Nilsson, ‘On the Comparison of Environmental Law’ (2010) 3 *Journal of Court Innovation* 315, 321.

¹⁷⁹ Mehling, ‘The Comparative Law of Climate Change: A Research Agenda’ (n 9).

¹⁸⁰ Originally conferred with the Single European Act of 1987, this shared competence is currently set out in: Consolidated Version of the Treaty on the Functioning of the European Union, [2012] OJ C326/47 (TFEU), Article 192.

is dominated by ‘mixed agreements’, that is, agreements to which both the EU and its Member States are party.¹⁸¹ For instance, the United Nations Framework Convention on Climate Change (UNFCCC)¹⁸² and its subsequent Kyoto Protocol¹⁸³ were adopted jointly,¹⁸⁴ requiring a qualified majority in the Council.¹⁸⁵ Under the Kyoto Protocol, the European Union committed to a reduction of greenhouse gases by 8% under 1990 levels by 2012, with efforts distributed internally among Member States through a burden-sharing agreement accounting for domestic circumstances such as the expectation of economic growth, the prevailing energy mix, and the structure of the industrial sector. Adopted in the form of a Council decision,¹⁸⁶ this agreement also required a qualified majority and was binding on the Member States. More recently, in its nationally determined contribution (NDC) submitted to the UNFCCC Secretariat in 2015, the EU expressed commitment to ‘adopting a global legally binding agreement’, and to achieving a ‘binding target of an at least 40% domestic reduction in greenhouse gas emissions by 2030 compared to 1990’.¹⁸⁷

¹⁸¹ Mixed agreements are a result of the doctrines of attributed powers and parallelism between internal and external competences; see Tom Delreux, ‘The European Union in International Environmental Negotiations: A Legal Perspective on the Internal Decision-Making Process’ (2006) 6 *International Environmental Agreements: Politics, Law and Economics* 231, 236; Rafael Leal-Arcas, ‘The European Community and Mixed Agreements’ (2001) 6 *European Foreign Affairs Review* 483, 494; the European Court of Justice recognized the existence of mixed agreements in ECJ, Case C-12/86, *Demirel v. Stadt Schwäbisch Gmünd*, [1987] ECR 3719, at paragraph 8..

¹⁸² United Nations Framework Convention on Climate Change (adopted 9 May 1992, entered into force 21 March 1994) 1771 UNTS 107 (FCCC).

¹⁸³ Kyoto Protocol to the United Nations Framework Convention on Climate Change (adopted 10 December 1997, entered into force 16 February 2005), 2303 UNTS 162 (Kyoto Protocol).

¹⁸⁴ Dominik Thieme, ‘Community External Relations: European Community External Relations in the Field of the Environment’ (2001) 10 *European Energy and Environmental Law Review* 252, 254.

¹⁸⁵ See TFEU (n 180), Article 218.8, with qualified majority defined as: ‘at least 55 % of the members of the Council, comprising at least fifteen of them and representing Member States comprising at least 65 % of the population of the Union’; see *ibid.*, Article 16.4.

¹⁸⁶ Decision 2002/358/EC of 25 April 2002 concerning the Approval, on Behalf of the European Community, of the Kyoto Protocol to the United Nations Framework Convention on Climate Change and the Joint Fulfilment of Commitments Thereunder, [2002] OJ L130/1; commitments ranged from a reduction of 28% for Luxembourg or 21% for Germany and Denmark, to an increase of no more than 27% for Portugal and 25% for Greece.

¹⁸⁷ Latvian Presidency of the Council of the European Union, Submission by Latvia and the European Commission on Behalf of the European Union and its Member States, Intended Nationally Determined Contribution of the EU and

The unanimous endorsement of this target by the heads of State and government in the European Council afforded it a high degree of commitment.¹⁸⁸

By contrast, the U.S. had signed and ratified the UNFCCC in 1992, following the formal ratification procedure set out in the US Constitution requiring the ‘advice and consent’ of a supermajority of two thirds of members in the Senate.¹⁸⁹ Only months after taking office in 2001, however, the administration of George W. Bush withdrew from the Kyoto Protocol which his predecessor’s administration had signed.¹⁹⁰ For nearly a decade following this decision, the U.S. played an at best passive and at times even obstructionist role in international climate diplomacy. It took another change in administration for the U.S. begin to play a more active role again, submitting a pledge in 2010 to reduce greenhouse gas emissions ‘in the range of 17%’ below 2005 levels until 2020, and ‘in conformity with anticipated U.S. energy and climate legislation’.¹⁹¹ When the leading climate bill failed in the Senate in 2010,¹⁹² the conditions for this pledge were

its Member States (6 March 2015),
<<http://www4.unfccc.int/submissions/INDC/Published%20Documents/Latvia/1/LV-03-06-EU%20INDC.pdf>>
accessed 16 January 2020.

¹⁸⁸ Conclusions of the European Council of 23 and 24 October 2014, EUCO 169/14, at para. 2.

¹⁸⁹ U.S. Constitution, Article II, Section 2, Clause 2: ‘The President ... shall have Power, by and with the Advice and Consent of the Senate, to make Treaties, provided two thirds of the Senators present concur.’

¹⁹⁰ Letter to Members of the Senate on the Kyoto Protocol on Climate Change (13 March 2001) 37 Weekly Compilation of Presidential Documents 444–445; see also Michael Lisowski, ‘Playing the Two-Level Game: US President Bush’s Decision to Repudiate the Kyoto Protocol’ (2002) 11 Environmental Politics 101.

¹⁹¹ Letter from Todd Stern, U.S. Special Envoy for Climate Change, to Yvo de Boer, Executive Secretary, UNFCCC (28 January 2010)
<https://unfccc.int/files/meetings/cop_15/copenhagen_accord/application/pdf/unitedstatescphaccord_app.1.pdf>
accessed 16 January 2020, further stating that ‘the final target will be reported to the Secretariat in light of enacted legislation’.

¹⁹² Known as the ‘Waxman-Markey-Bill’, this bill passed the House of Representatives by a narrow margin of 219 to 212 votes in June 2009; see HR 2454, American Clean Energy and Security Act of 2009, 111th Congress, 1st Session, 26 June 2009, yet no counterpart bill was ever submitted for a vote in the Senate. When the 112th Congress convened on 3 January 2011, the legislative docket was cleared, erasing all previous progress and requiring both houses to commence efforts anew.

no longer met, casting doubt on the feasibility of its achievement.¹⁹³ Nonetheless, in its second term, the administration of Barack Obama embarked on an ambitious agenda of domestic climate action,¹⁹⁴ which served as the basis for the U.S. NDC. With it, the U.S. committed to an economy-wide target of reducing greenhouse gas emissions by 26 to 28% below 2005 levels in 2025.¹⁹⁵ Unlike the European commitment, however, the U.S. NDC made no mention of being domestically binding.¹⁹⁶ Following yet another change of administration in early 2017, President Donald J. Trump acted on one of his central election campaign pledges and announced the U.S. withdrawal from the Paris Agreement at the earliest possible date.¹⁹⁷ The official withdrawal notice was submitted on 4 November 2019, the earliest date allowed under the withdrawal process set out in the Paris Agreement.¹⁹⁸

While the ability of Europe and the U.S. to enter international commitments has been primarily determined by domestic climate politics, legal features of each jurisdiction have also played an important role. Voting requirements for the ratification of international treaties, in particular, have proven inordinately challenging in the U.S., where the constitutional requirement of a supermajority in the Senate has resulted in failure to ratify a vast majority of international

¹⁹³ Nicholas M Bianco and others, ‘Can the U.S. Get There from Here? Using Existing Federal Laws and State Action to Reduce Greenhouse Gas Emissions’ (World Resources Institute (WRI) 2013) <<https://www.wri.org/publication/can-us-get-there-here>> accessed 17 January 2020.

¹⁹⁴ Executive Office of the President, ‘The President's Climate Action Plan’ (25 June 2013) <<https://www.whitehouse.gov/sites/default/files/image/president27sclimateactionplan.pdf>> accessed 17 January 2020.

¹⁹⁵ U.S. Cover Note INDC and Accompanying Information (31 March 2015), found at: <<http://www4.unfccc.int/submissions/INDC/Published%20Documents/United%20States%20of%20America/1/U.S.%20Cover%20Note%20INDC%20and%20Accompanying%20Information.pdf>> accessed 17 January 2020.

¹⁹⁶ See David A Wirth, ‘The International and Domestic Law of Climate Change: A Binding International Agreement without the Senate or Congress?’ (2015) 39 *Harvard Environmental Law Review* 515, 532.

¹⁹⁷ Michael A Mehling and Antto Vihma, ‘“Mourning for America”: Donald Trump’s Climate Change Policy’ (The Finnish Institute of International Affairs 2017) FIIA Analysis-8 22 <<https://www.fiia.fi/en/publication/mourning-for-america>> accessed 17 January 2020.

¹⁹⁸ See Michael R. Pompeo, ‘On the U.S. Withdrawal from the Paris Agreement’ (4 November 2019) <<https://www.state.gov/on-the-u-s-withdrawal-from-the-paris-agreement>> accessed 16 January 2020.

agreements on environmental and other matters.¹⁹⁹ Although the successful ratification of the UNFCCC in 1992 demonstrates that there, too, the obstacle is ultimately a political one, the possibility for a small minority in the Senate to block passage already serves as such a deterrent that most treaties do not even reach the Senate floor. Unsurprisingly, the decision to set out a range of potential outcomes in the mandate of the Ad Hoc Working Group on the Durban Platform for Enhanced Action – ‘a protocol, another legal instrument or an agreed outcome with legal force’²⁰⁰ – can be partly traced back to the influence of U.S. negotiators wary of the political gridlock in the Senate and looking for alternative pathways towards international agreement.

5.2 Limiting Emissions from Stationary Sources

One of the measures envisioned in the European Climate Change Programme of 2000, a political strategy setting out options for compliance with the Kyoto Protocol, was the introduction of emissions trading as a policy instrument to mitigate greenhouse gas emissions.²⁰¹ After intense discussions with stakeholders, the European Parliament and the Council adopted a directive in 2003 that establishes a regulatory framework for trade in greenhouse gas emission allowances, the European Union emissions trading system (EU ETS) covering the power sector and major energy intensive industries.²⁰² Interestingly, however, emissions trading was not always favoured as a policy instrument in Europe, making its unexpected and rapid ascendance an insightful case study for the relevance of legal factors in the choice of policy instruments. In fact, Europe had been vocally opposed to market-based instruments during the international negotiations preceding the Kyoto Protocol, only relenting when the issue threatened to derail progress due to insistence by

¹⁹⁹ On the unusually stringent voting requirements for international treaty ratification and the consequent failure of the U.S. to accede to countless major international conventions, see Nigel Purvis, ‘Paving the Way for U.S. Climate Leadership: The Case for Executive Agreements and Climate Protection Authority’ (Resources for the Future (RFF) 2008) DP-08-09 10 <<https://ideas.repec.org/p/rff/dpaper/dp-08-09.html>> accessed 17 January 2020.

²⁰⁰ Decision 1/CP.17, ‘Establishment of an Ad Hoc Working Group on the Durban Platform for Enhanced Action’ FCCC/CP/2011/9/Add.1 (15 March 2012).

²⁰¹ Commission of the European Communities Communication of 8 March 2000 on EU Policies and Measures to Reduce Greenhouse Gas Emissions - Towards a European Climate Change Programme (ECCP), COM(2000)88 4.

²⁰² Directive 2003/87/EC of 13 October 2003 Establishing a Scheme for Greenhouse Gas Emission Allowance Trading within the Community and amending Council Directive 96/61/EC, [2003] OJ L275/32.

countries such as the United States.²⁰³ Unlike the United States, where such instruments had been successfully deployed to reduce air pollution, Europe had not yet seen widespread use of market-based instruments for environmental protection.

Market-based instruments started receiving some attention as a suitable instrument to implement the legally vested polluter-pays principle,²⁰⁴ although the initial focus rested on the use of taxes, fees and charges, which were already much more widely established across Europe. Several attempts to pass legislation on a harmonized framework for carbon and energy taxes,²⁰⁵ however, failed to secure the unanimous support required in the Council for adoption of measures ‘primarily of a fiscal nature’.²⁰⁶ After further unsuccessful attempts to push relevant legislation through the Council,²⁰⁷ the Commission finally proposed a less ambitious directive establishing very low minimum tax rates for energy products, rendering it unsuitable as a centrepiece of EU climate policy.²⁰⁸ Several factors converged at that point to generate support for emissions

²⁰³ Its concern at the time was that ‘trading might provide a cheap way for the U.S., Canada, Australia, and New Zealand to “buy” themselves out of their obligations’; Europeans feared these States would avoid domestic efforts by acquiring excess emission rights – derisively coined ‘hot air’ – that had been assigned to Russia and several eastern European states under the Kyoto Protocol. Oberthür and Ott (n 145) 189.

²⁰⁴ See generally European Environment Agency (EEA), ‘Market-Based Instruments for Environmental Policy in Europe’ (European Environment Agency 2005) Publication EEA Technical report 8/2005 <https://www.eea.europa.eu/publications/technical_report_2005_8> accessed 17 January 2020. The principle is set out in TFEU (n 180) Article 191.2.

²⁰⁵ Starting with Commission of the European Communities Communication of 2 June 1992 on a Proposal for a Council Directive Introducing a Tax on Carbon Dioxide Emissions and Energy, COM(1992)226.

²⁰⁶ TFEU (n 180) Article 192.2.

²⁰⁷ Even a weakened version of the tax, which was limited to energy products and excluded carbon emissions, met with such resistance from industry and different Member States that it was later abandoned.

²⁰⁸ Directive 2003/96/EC of 27 October 2003 Restructuring the Community Framework for the Taxation of Energy Products and Electricity, [2003] OJ L283/51; under the directive, energy products are only subject to taxation if used as motor fuel or heating fuel; fuel used for industrial, commercial, and heating purposes is subject to preferential rates, and Member States may apply further exemptions, for instance to promote public transportation or renewable energy sources. For the time being, moreover, energy products used for international air and maritime transport are excluded from its scope.

trading,²⁰⁹ including the fact that a permitting approach already applied under European Union legislation on integrated pollution prevention and control was considered a viable model for an emissions trading directive, notably the use of an enumerated list of activities and installations.²¹⁰ In practical terms, that meant that existing structures and capacities related to monitoring, reporting, verification and enforcement of conventional pollution control obligations offered vital synergies for the implementation of a new regulatory framework on emissions trading.²¹¹ But it was the absence of a unanimity requirement in the Council that allowed this instrument to succeed over carbon taxation, with a legal consideration thus ultimately deciding the perennial dispute among economists about pricing versus quantity rationing.²¹²

In the United States, meanwhile, where both the theoretical concept of emissions trading was born and it saw its first practical operation,²¹³ the same political party which had originally

²⁰⁹ See, generally, Harro van Asselt, ‘Emissions Trading: The Enthusiastic Adoption of an “Alien” Instrument?’ in Andrew Jordan and others (eds), *Climate Change Policy in the European Union: Confronting the Dilemmas of Mitigation and Adaptation?* (Cambridge University Press 2010) 125; Brettny Hardy, ‘How Positive Environmental Politics Affected Europe’s Decision to Oppose and Then Adopt Emissions Trading’ (2007) 17 *Duke Environmental Law & Policy Forum* 297, 297; Jørgen Wettestad, ‘The Making of the 2003 EU Emissions Trading Directive: An Ultra-Quick Process Due to Entrepreneurial Proficiency?’ (2005) 5 *Global Environmental Politics* 1, 1.

²¹⁰ Directive 96/61/EC of 24 September 1996 Concerning Integrated Pollution Prevention and Control, [1996] OJ L257/26.

²¹¹ Mercedes Fernandez Armenteros, ‘Synergies Between the Emissions Trading Proposal and the IPPC Directive’ (2002) 2 *ELNI Review* 13. Still, in some Member States, perceived incompatibility with existing legal doctrines and fundamental rights and duties gave rise to litigation; see, e.g., Wolf Friedrich Spieth, *Europäischer Emissionshandel und deutsches Industrieanlagenrecht* (Erich Schmidt Verlag 2002). Ultimately, however, the legality of the EU ETS was upheld in landmark cases such as a lawsuit before the German Federal Administrative Court, which, in a decision of 30 June 2005, rejected claims from cement manufacturers that their rights of freedom of occupation and freedom of property as set out in Articles 12 and 14 of the German Basic Law had been breached by the implementation of the EU ETS, finding instead that the EU ETS merely regulated the use of property ‘insofar as is necessary for the general interest’; Federal Administrative Court (*Bundesverwaltungsgericht*), [30 June 2005] Case 7 C 26.04.

²¹² See, for the seminal discussion, Weitzman, ‘Prices vs. Quantities’ (n 118).

²¹³ The first markets for transferable pollution allowances were located in the United States, where they helped regulate air and water pollution. In 1977, the Clean Air Act was amended to include an offset system which gave new installations the right to commence operations in certain areas only after the resulting emissions had been offset against a reduction in emissions by other, existing sources; see Clean Air Act (CAA) § 173(a)(1)(A), 42 U.S.C. § 7503

championed markets for pollution control ironically became fiercely opposed as part of a broader agenda directed against climate action. What might have become the largest emissions trading system in history thus fell prey to partisan politics when the leading climate bill failed to secure passage in the Senate in 2010.²¹⁴ Unlike the House of Representatives, where the Committee on Energy and Commerce holds sole responsibility for initiating climate legislation, jurisdiction in the Senate is divided across a number of committees and, more importantly, a voting rule in the Senate calls for 60 votes to close the debate on a bill and proceed to a substantive vote.

With the failure to pass climate legislation, attention at the federal level subsequently shifted to the Environmental Protection Agency (EPA) and its regulatory powers to limit greenhouse gas emissions. Following a landmark decision of the Supreme Court in the case of *Massachusetts et al. v. Environmental Protection Agency et al.*, which declared that greenhouse gases are pollutants and hence fall within its jurisdiction,²¹⁵ the EPA had already adopted an Endangerment Finding under Section 202 of the Clean Air Act in 2009,²¹⁶ which is a prerequisite for the adoption of rules to limit greenhouse gas emissions from mobile and stationary sources. On this basis, the agency subsequently elaborated a mandatory rule on greenhouse gas reporting for large stationary emitters and performance standards for new or substantially modified emitters.²¹⁷

(a)(1)(A) (1994); another major amendment of the Clean Air Act in 1990 created a market for allowances to emit sulphur dioxide (SO₂), primarily directed at large electricity generating plants, see CAA §§ 410–416, 42 U.S.C. §§ 7651–7651o (1994); CAA § 402(3), 42 U.S.C. § 7651a(3) (1994). For a discussion, see Ellerman and others (n 112); Hugh S Gorman and Barry D Solomon, ‘The Origins and Practice of Emissions Trading’ (2002) 14 *Journal of Policy History* 293.

²¹⁴ HR 2454 (n 192) would have amended the Clean Air Act to set up an emissions trading system designed to reduce greenhouse gas emissions from covered entities accounting for 84.5% of overall emissions 17% below 2005 levels by 2020 and 83% below 2005 levels by 2050; see Larry Parker and Brent D Yacobucci, *Climate Change: Costs and Benefits of the Cap-and-Trade Provisions of H.R. 2454* (Congressional Research Service 2014) 4–5 <<https://pdfs.semanticscholar.org/82a6/90b46fe9d95088e83725ab9ff019d93aef2f.pdf>>.

²¹⁵ US Supreme Court, *Massachusetts et al. v. Environmental Protection Agency et al.*, [2007] 549 U.S. 497.

²¹⁶ Environmental Protection Agency, Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, Final Rule, Federal Register, Docket ID No. EPA-HQ-OAR-2009-0171 (7 December 2009).

²¹⁷ Environmental Protection Agency (EPA), Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, Federal Register, Docket ID No. EPA-HQ-OAR-2009-0517 (13 May 2010).

Likewise, for installations in the power sector, the EPA drew on its authority under the Clean Air Act to promulgate New Source Performance Standards (NSPS) and, for existing power plants, a comprehensive Clean Power Plan (CPP)²¹⁸ that aimed to reduce carbon dioxide emissions from electrical power generation by 32% relative to 2005 levels by 2030. And while the administration of Donald J. Trump has since rolled back these rules and replaced them with weaker standards,²¹⁹ the ironic fact remains that federal climate policy for stationary emitters in the U.S. – which championed market mechanisms at the international level against European resistance – is currently based on statutory command-and-control regulation rather than the comprehensive emissions trading system envisioned in failed legislation.²²⁰ Again, a formal voting requirement – rather than economic considerations of welfare maximization – determined the choice of policy instrument.

5.3 Promoting Renewable Energy

Although the European Union has been traditionally hesitant to influence the energy supply of its Member States given the implications for economic development and security, it recognized early on that some degree of harmonization in energy market regulation would be necessary to ensure an unrestricted internal market. Acknowledging that an expanded share of renewable energy sources also formed an important condition for the achievement of international climate commitments and greater independence from energy imports, the European Commission published a comprehensive White Paper for a Community Strategy and Action Plan in 1997, one consequence of which was the adoption of legislation on the promotion of electricity produced from renewable energy sources.²²¹ In order to achieve its objectives, this directive defined targets

²¹⁸ Environmental Protection Agency (EPA), Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, Docket ID No. EPA-HQ-OAR-2013-0602 (3 August 2015).

²¹⁹ See, for instance, the overview of challenged rules in Michael A Mehling, ‘A New Direction for US Climate Policy: Assessing the First 100 Days of Donald Trump’s Presidency’ (2017) 11 *Carbon & Climate Law Review* 3.

²²⁰ This ‘irony’ is also a theme discussed in Richard L Schmalensee and Robert N Stavins, ‘The SO₂ Allowance Trading System: The Ironic History of a Grand Policy Experiment’ (2013) 27 *Journal of Economic Perspectives* 103.

²²¹ Directive 2001/77/EC of 27 September 2001 on the Promotion of Electricity Produced from Renewable Energy Sources in the Internal Electricity Market, [2001] OJ L283/33.

for both the gross consumption of renewable energy in general and the consumption of renewable electricity, without, however, creating national obligations.

Prior to its adoption, the European Parliament had espoused the right of Member States to choose their own support mechanisms, whereas the European Commission issued a working paper that examined different support mechanisms, concluding that feed-in tariffs violated EU state aid rules.²²² In 2001, the Directorate-General for Competition at the European Commission unsuccessfully sought to harmonize support mechanisms and impose a European system of green certificates when it intervened in a case before the European Court of Justice in which the Court, however, determined feed-in tariffs to be legal.²²³ By the time a legislative reform was under negotiation in 2008, two thirds of all Member States had implemented domestic feed-in tariffs, while only one third had opted for renewable energy quota and tradable certificates.²²⁴ A court decision, thus, proved critical for the proliferation of a specific instrument to support renewable energy.

In the U.S., meanwhile, the division of powers between the federal government and the individual states has strongly limited the role of the federal legislator compared to Europe. After the Public Utility Regulatory Policy Act (PURPA) of 1978 ironically first introduced the notion of feed-in tariffs,²²⁵ this instrument never found the same success as it later did in the European Union. Promotion of renewable energy in the United States has largely been a matter addressed by

²²² See Inga M Ydersbond, 'Multi-Level Lobbying in the EU: The Case of the Renewables Directive and the German Energy Industry' (Fridtjof Nansen Institute 2012) FNI Report 10/2012 5 <<https://www.duo.uio.no/handle/10852/34448>> accessed 17 January 2020.

²²³ ECJ, Case C-379/98, *PreussenElektra AG v. Schleswag AG*, in the presence of *Windpark Reußenköge III GmbH* and *Land Schleswig-Holstein*, [2001] ECR I-2099.

²²⁴ Commission of the European Communities, Proposal of 23 January 2008 for a Directive of the European Parliament and of the Council on the Promotion of the Use of Energy from Renewable Sources, COM(2008) 19.

²²⁵ See Section 210(a) of PURPA, 16 U.S. Code Chapter 46, Pub. L. 95-617, 92 Stat. 3117, which requires the Federal Energy Regulatory Commission (FERC) to 'prescribe, and from time to time thereafter revise' rules requiring electric utilities to offer both the sale and purchase of electric energy from qualifying non-utility generation facilities. Section 210(b) of PURPA, *ibid.*, prohibits rates for power purchase agreements that exceed the cost the electric utility would have to pay otherwise, or its 'avoided cost'.

the states, over half of which have adopted some form of renewable portfolio standard (RPS).²²⁶ Inconsistencies between these programs and the legal treatment of renewable energy among states have resulted in a heterogeneous patchwork of state rules. By contrast, the U.S. Federal Government has relied on income and production tax credits, such as the renewable electricity production tax credit (PTC) and investment tax credit (ITC), but these have resulted in disruptive uncertainty each time the budget allocation for these tax credits has expired and a new budget allocation has to be secured. In this case, thus, the constitutional assignment of powers in the energy policy space has severely limited the efficiencies that might otherwise be harnessed if major measures to promote renewable electricity were instead taken at the federal level.

6 A Role for Jurisprudence

6.1 Change as Opportunity²²⁷

With energy production and consumption accounting for a vast majority of anthropogenic greenhouse gas emissions, climate policy invariably affects larger and also more sensitive areas of society, compelling change in nearly all domains of social behaviour and, notably, constraining economic activity at a much broader scale than any other area of environmental governance. As a result, decision makers have openly embraced alternative policy approaches based on flexible markets and price incentives, in the hope of limiting harmful effects on the economy and competitive distortions in the global marketplace. While the reasoning behind this changed orientation is understandable, the rapid growth and evolution of new mechanisms has also brought along new challenges, giving rise to conflicts at the level of individual rules and principles, all the way to systemic tensions within the overall configuration of the legal system.

Such difficulties have overshadowed the design and implementation of many domestic climate policy portfolios. Looking back on the early stages of domestic climate regulation process, one could often garner the impression of an incremental, barely coordinated strategy, resulting in

²²⁶ An RPS requires regulated utilities and electricity retailers to acquire a minimum percentage of the energy they sell in a given year from renewable energy resources.

²²⁷ This section draws on themes from Michael A Mehling, 'Enforcing Compliance in an Evolving Climate Regime' in Jutta Brunnée, Lavanya Rajamani and Meinhard Doelle (eds), *Promoting Compliance in an Evolving Climate Regime* (Cambridge University Press 2011).

a coincidental rather than intended assortment of regulatory devices, not seldom based on overly rushed legislative schedules,²²⁸ substantive disagreement between rival government agencies, and the challenge of balancing international commitments with domestic legal and political realities. Faced with changing demands in a politically exposed issue area, legislators and administrators have been mandated with elaborating an operational regime for activities which, previously, had been subject to no form of regulation. Confused by the unfolding disarray and widespread misinformation, affected stakeholders have often voiced their irritation at the lack of coherence and systematisation in climate law and policy.

And yet, as this area of law matures, one can already perceive efforts to streamline the current diversity of rules through shared definitions, common objectives, and dynamic referencing between different acts of legislation. Against the backdrop of efforts in several national jurisdictions to systematise the diversity of environmental statutes, ordinances, decrees, and other relevant sources of law in a uniform code, it should hardly surprise that suggestions have also been made to harmonise climate policy under a single domestic legal act, marking a departure from piecemeal regulation to an integrated system for the management of our atmosphere. Several countries have indeed gone down that path, illustrating the perceived need for greater systemic coherence of this area of law.²²⁹

At the international level, nations seeking to cooperate on climate change have always been forced to navigate a fine line between substance and process, general principles and specific rules, formal obligations and political commitments. Many of the core issues have been so divisive that progress has only been possible at the expense of specific and binding normative outcomes. As the

²²⁸ One might also draw attention to the current approach to political representation, which favours short-term measures over long-term strategic policies by exerting pressure on elected politicians to provide demonstrable results in time for the next popular vote, see generally Anthony Downs, *An Economic Theory of Democracy* (Harper 1957); Joseph A Schumpeter, *Capitalism, Socialism and Democracy* (3rd edn, Harper & Bros 1942).

²²⁹ See generally the growing trend towards adoption of national framework climate laws, as described in Alina Averchenkova, Samuel Fankhauser and Michal Nachmany (eds), *Trends in Climate Change Legislation* (Edward Elgar 2017).

negotiations on a future climate regime continue to unfold,²³⁰ it is becoming increasingly evident that international cooperation itself is undergoing fundamental change.

High levels of normative and analytical uncertainty, the complex nature of interrelated issues, and substantial costs associated with any meaningful policy efforts have all strengthened the role of actors beyond the nation state, and also prompted the exploration of innovative approaches to climate governance including market mechanisms.²³¹ Likewise, the traditional model of intergovernmental cooperation centred on a binding treaty is starting to give way to a more fragmented topography of regional and bilateral networks and partnerships,²³² where informal consultations take the place of legally enshrined rights and obligations, allowing states prepared to cooperate to do so ‘without unduly restricting their freedom of action.’²³³

In many ways, this evolution also has far reaching implications for the legal nature of climate cooperation, which has seen a marked shift in emphasis from binding obligations to more loosely organised coordination and facilitation in a system based on voluntary pledges, where national policy developments displace negotiated arrangements as the new benchmark of climate efforts.²³⁴ Should the crucial feature of enforcement also soften as it evolves towards responses

²³⁰ On the issues under negotiation in the so-called ‘Paris Agreement Work Programme’, see Harro van Asselt, Kati Kulovesi and Michael Mehling, ‘Negotiating the Paris Rulebook: Introduction to the Special Issue’ (2018) 12 *Carbon & Climate Law Review* 173.

²³¹ Frank Biermann, ‘Beyond the Intergovernmental Regime: Recent Trends in Global Carbon Governance’ (2010) 2 *Current Opinion in Environmental Sustainability* 284.

²³² See, generally, Kulovesi, Mehling and Morgera (n 151).

²³³ Patricia Birnie, ‘International Environmental Law: Its Adequacy for Present and Future Needs’ in Alexander Hurrell and Benedict Kingsbury (eds), *The International Politics of the Environment* (Oxford University Press 1992) 54.

²³⁴ Jacob Werksman and Kirk Herbertson, ‘The Aftermath of Copenhagen: Does International Law Have a Role to Play in a Global Response to Climate Change?’ (2010) 25 *Maryland Journal of International Law* 109; Lavanya Rajamani, ‘Addressing the “Post-Kyoto” Stress Disorder: Reflections on the Emerging Legal Architecture of the Climate Regime’ (2009) 58 *International and Comparative Law Quarterly* 803.

more ‘in harmony with the cooperative spirit’²³⁵ required for climate cooperation, it could raise questions about the very role and limitations of international law.²³⁶

After all, it would imply that climate cooperation is ultimately determined only by the interests, at any given time, of the regime participants. Whether commitments are enshrined in law would then become largely irrelevant, displacing binding norms to an anachronistic realm of burdensome procedures, an obstacle, some might even argue, in the formulation of effective cooperation strategies. In such a system, a ‘country that deliberately fails to abide by ... legally binding commitments ... is also likely to resist the application of punitive consequences, regardless of whether these consequences are made legally binding or not.’²³⁷ But if that were the case, it would surely beg the question: what normative force is then left to international climate law? For international lawyers, this question will resonate with a latent anxiety about the changing role and perception of their discipline, a departure from the application of objective rules in a coherent and enforceable system of norms to the politically guided management of technical, fragmented regimes.²³⁸

Overall, climate policy and cooperation appear particularly amenable to new vocabularies of governance, where preoccupation with the seemingly archaic language of traditional law and its binary focus on the observance or violation of rights and obligations may seem entirely outdated.²³⁹ As so often, however, change brings with it opportunity. In this case, lawyers – and especially legal scholars – have been prompted out of their habitual comfort zones of legal doctrine

²³⁵ Martti A Koskenniemi, ‘Breach of Treaty or Non-Compliance? Reflections on the Enforcement of the Montreal Protocol’ (1993) 3 *Yearbook of International Environmental Law* 123, 147.

²³⁶ For a polemic, yet relevant argument about the limitations of international law in affecting state behaviour, see Jack L Goldsmith and Eric A Posner, *The Limits of International Law* (Oxford University Press 2006); for an impassioned counterargument, see Mary E O’Connell, *The Power and Purpose of International Law* (Oxford University Press 2008).

²³⁷ Anita Halvorssen and Jon Hovi, ‘The Nature, Origin and Impact of Legally Binding Consequences: The Case of the Climate Regime’ (2006) 6 *International Environmental Agreements: Politics, Law and Economics* 157, 158.

²³⁸ Martti A Koskenniemi, ‘The Fate of Public International Law: Between Technique and Politics’ (2007) 70 *The Modern Law Review* 1.

²³⁹ For a critique of the ongoing turn to political science vocabularies, see Martti A Koskenniemi, ‘Legitimacy, Rights and Ideology: Notes towards a Critique of the New Moral Internationalism’ (2003) 7 *Associations: Journal for Legal and Social Theory* 349..

and exegesis, forced to engage with the often vastly different terminologies and conceptual frameworks of disciplines such as economics and political science. As they grapple with new policy instruments and new approaches to international cooperation, they have also had to acquire new epistemic sensibilities to comprehend and articulate the evolving parameters of their work. And it is this expanded facility which not only affords lawyers improved access to the complex literature on instrument choice in climate change mitigation, but also allows them – often for the first time – to engage in a more even-handed exchange with the representatives of those disciplines which have, until now, dominated this debate. What lawyers might bring to this debate is heuristically explored in the next section.

6.2 Law as an Epistemic Tool²⁴⁰

One aspect of the climate threat that is often underrepresented in discussions of policy instrument choice is its normative dimension. Although the explanatory value of empirical research cannot be overstated, no amount of observation can replace the difficult value judgments involved in determining the proper course of action.²⁴¹ Humanities, and notably ethics, play an essential role in understanding different concepts of value and justice, the underlying arguments, and how they might guide our choices.²⁴² Another normative discipline that has played a largely subordinate role in the debate about climate change is jurisprudence,²⁴³ and this section asks whether the law offers an underutilized tool to understand, predict, and shape climate policy choices. But what might a

²⁴⁰ This section draws on Mehling, ‘Betwixt Scylla and Charybdis?’ (n 4); Mehling, ‘The Comparative Law of Climate Change: A Research Agenda’ (n 9).

²⁴¹ Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2014: Mitigation* (n 58) 213–214.

²⁴² For excellent overviews of the attendant issues, see Donald A Brown, *Climate Change Ethics: Navigating the Perfect Moral Storm* (Routledge 2012); Stephen M Gardiner, *A Perfect Moral Storm: The Ethical Tragedy of Climate Change* (Oxford University Press 2011); James Garvey, *The Ethics of Climate Change: Right and Wrong in a Warming World* (Bloomsbury Academic 2008); Dale Jamieson, *Reason in a Dark Time: Why the Struggle Against Climate Change Failed - and What It Means for Our Future* (Oxford University Press 2014). For an illustration of how ethics and arguments of distributive and corrective justice can also result in very different policy prescriptions, contrast Eric A Posner and David Weisbach, *Climate Change Justice* (Princeton University Press 2010); and Henry Shue, *Climate Justice: Vulnerability and Protection* (Oxford University Press 2014).

²⁴³ See, e.g., Sarah Adams-Schoen and others, ‘A Response to the IPCC Fifth Assessment’ (2015) 45 *Environmental Law Reporter: News & Analysis* 10027.

discipline contribute that neither provides observational insight based on empirical analysis, nor can ascend a scaffolding of robust theory to summon innovative policy designs?

Overall, the legal profession enjoys a paltry reputation in the context of climate policy, and has even been implicitly blamed for the slow progress in finding a global solution.²⁴⁴ Lawyers will generally be invited to apply their professional skills to climate policy only when legal technicalities are at stake, for instance to comment on a legal dispute or the legality of a proposed measure. In part, this relative isolation of the legal discipline can be ascribed to its distinctive terminology, professional culture, and a claim to authority based on reflexive interpretation of legal sources rather than observation of measurable phenomena. In the language of systems theory, law forms a closed, autopoietic social system that postulates binary statements on the legality – or lack thereof – of individual and collective behaviour.²⁴⁵

Any measure taken by public authorities, for instance, will emerge into a densely populated system of doctrines, rules, and principles across all areas of social life²⁴⁶ that determine its validity and shape its implementation. Lawyers operating within this system will communicate in their professional vernacular as they leverage an established canon of hermeneutic methods to unlock the normative patterns woven into the dense fabric of the law.²⁴⁷ Although they can also step back and take an external view on the law and how it affects the world,²⁴⁸ other disciplines – such as

²⁴⁴ See, e.g., economist Jeffrey Sachs, quoted in: ‘UN Issued with Roadmap on How to Avoid Climate Catastrophe’, *The Guardian* (8 July 2014), as saying of the UNFCCC negotiation process: ‘It put the lawyers out front and left the technologists out of the room, and the result is that we have had 21 years of lawyering and no success in application of the international framework.’

²⁴⁵ Gunther Teubner, *Law As an Autopoietic System* (Blackwell Publishers 1993); Niklas Luhmann, *Das Recht der Gesellschaft* (Suhrkamp 1993) 38.

²⁴⁶ As Niklas Luhmann described it, ‘[a]ll collective human life is directly or indirectly shaped by law. Law is, like knowledge, an essential and all-pervasive fact of the social condition. No area of life – whether it is the family or the religious community, scientific research or the internal networks of political parties – can find a lasting social order that is not based on law.’ Idem, *A Sociological Theory of Law* (Routledge & Kegan Paul 1985) 1.

²⁴⁷ For a fundamental study of exegetic methods in the process of ascertaining valid law, see Erkki J Hollo, *Die Definition von geltendem Recht in der Rechtsfindung, rechtsvergleichend dargestellt an der Irrtumslehre* (Martinpaino 1981) passim.

²⁴⁸ François Ewald, ‘The Law of Law’ in Teubner Gunther (ed), *Autopoietic Law: A New Approach to Law and Society* (de Gruyter 1988).

sociology and anthropology – provide more valuable tools for an external observation;²⁴⁹ but knowledge of the law and how it operates – that is, proficiency in legal exegesis – remains indispensable to understand its internal logic and dynamic application.

Trained in the distinctive methods of their discipline, lawyers can make an important contribution to the epistemology of climate action. At this time in human history, where faith in universal truths based on a foundational premise has been largely replaced by a fluid pluralism of secular ideas,²⁵⁰ the only way of accessing a challenge involving unprecedented degrees of complexity, uncertainty and moral contingency is arguably through a consensual approach, built on a process of orderly discourse between free and equal subjects.²⁵¹ In democratic societies, lawmaking provides a structured process of deliberation and justification to distil a multitude of contending perceptions and interests into a uniform, communicable narrative²⁵² that, importantly,

²⁴⁹ Esin Öricü and David Nelken, ‘Developing Comparative Law’, *Comparative Law: A Handbook* (Hart Publishing 2007) 48.

²⁵⁰ Zygmunt Bauman, *Liquid Modernity* (Polity 2000); Ulrich Beck, *Risikogesellschaft: Auf dem Weg in eine andere Moderne* (Suhrkamp 1986); Alasdair MacIntyre, *Whose Justice? Which Rationality?* (University of Notre Dame Press 1988). For the legal implications of this broad societal trend, see Gunther Teubner, ‘Global Bukowina: Legal Pluralism in the World Society’ in Gunther Teubner (ed), *Global Law without a State* (Dartmouth 1997) 3; Paul S Berman, ‘Global Legal Pluralism’ (2007) 80 *Southern California Law Review* 1155, 1155.

²⁵¹ For the theoretical foundations of such a consensus theory of truth, see the *œuvre* of Jürgen Habermas on the theory of communicative action, e.g.: Jürgen Habermas, *Vorstudien und Ergänzungen zur Theorie des kommunikativen Handelns* (Suhrkamp 1984) 177–178. A related concept of deliberative democracy based on public reason rather than Habermas’ ideal discourse situation is presented by John Rawls, *Political Liberalism* (expanded ed, Columbia University Press 2005). On the role of communication in environmental law, see generally Erkki J Hollo, ‘Man, Environment and Law: Thoughts of Balance and Communication’ in Erkki J Hollo (ed), *Kansallinen oikeus ja liittovaltioistuva Eurooppa* (Suomalainen lakimiesyhdistys 2009).. For alternative proposals to draw on collective judgment for complex and contingent problems, see Silvio O Funtowicz and Jerome R Ravetz, ‘Science for the Post-Normal Age’ (1993) 25 *Futures* 739; James Surowiecki, *The Wisdom of Crowds: Why the Many Are Smarter Than the Few and How Collective Wisdom Shapes Business, Economies, Societies and Nations* (Doubleday 2004); Michael Polanyi, ‘The Republic of Science: Its Political and Economic Theory’ (1962) 1 *Minerva* 54.

²⁵² Jürgen Habermas, *Faktizität und Geltung: Beiträge zur Diskurstheorie des Rechts und des demokratischen Rechtsstaats* (Suhrkamp 1992) 499. That the aggregative concept of democratic rule reflected in liberal democracies also faces challenges, for instance the disproportionate impact of powerful interest groups, a passive citizenry, or information asymmetries among its members, has been discussed elsewhere; James F Bohman, *Public Deliberation: Pluralism, Complexity, and Democracy* (The MIT Press 1996); John S Dryzek, *Deliberative Democracy and Beyond:*

also affords participatory rights to otherwise marginalized segments of society.²⁵³ In an ideal setting, thus, law will offer the most formal expression of political consensus, enshrining the outcomes of contentious political debate in the categories of material rules and principles.

But at the same time, barriers to climate action may be deeply embedded in the sediment of law as principles and doctrines, some of which may even far predate our knowledge of climate change. Using the methods of their profession, lawyers can draw on this substrate to infer defensible interpretations through an established process of legal reasoning,²⁵⁴ bringing to light previously concealed obstacles to climate ambition, mapping the space for permissible action, and, wherever necessary, applying accepted criteria to balance the tensions and conflicts that will inevitably arise across different rights, duties, and objectives in the context of climate change.²⁵⁵ One need not subscribe to notions of the intrinsic determinacy of the law²⁵⁶ to recognize that its routines offer, on a practical level, greater legitimacy and transparency than raw anarchic debate, creating a space for civil discourse in which the legal process moderates the extremes that often dominate political deliberation.

Like the social sciences, therefore, law and its methods will not reveal a miraculous solution to the threat of climate change; but lawyers can do more than resolve disputes or ascertain the legality of climate policy proposals: in a debate characterized by a cacophony of competing voices, they offer access to the most robust expression of collective will, and do so through a process that perpetuates – as much as possible – the legitimacy of its interpretations, ultimately

Liberals, Critics, Contestations (Oxford University Press 2000). Whether that means that periodic elections and the principal-agent form of representation as an expression of aggregate preferences are insufficient bases of political authority, which instead needs to be justified to all those who will be bound by it through a process of collective reasoning and active public debate, will not be discussed here; see instead Amy Gutmann and Dennis F Thompson, *Why Deliberative Democracy?* (Princeton University Press 2004).

²⁵³ And this need not only include marginalized groups in the present, but should also help establish accountability towards future generations; see Hans Jonas, *Das Prinzip Verantwortung: Versuch einer Ethik für die Technologische Zivilisation* (Insel Verlag 1979) 56.

²⁵⁴ For an authoritative discussion, see Neil MacCormick, *Legal Reasoning and Legal Theory* (Oxford University Press 1978) 265–274.

²⁵⁵ For an interpretive theory based on the notion of the integrity of law, see Ronald M Dworkin, *Law's Empire* (Belknap Press 1986) 90.

²⁵⁶ See, for instance, Ronald Dworkin, 'No Right Answer' (1978) 53 *New York University Law Review* 1, 1–25..

increasing the acceptability of practical outcomes. When it comes to debates about instrument choice, they bring a unique skillset acquired in the course of their specialisation, that severs – to the extent that is possible – social, political, and moral theory from legal doctrine and breeds familiarity with vague and ambivalent language, as with the manifold purposes embedded in the law; their daily tasks afford them experience in interpreting texts through an established set of methods and process of legal reasoning, all with the aim of finding the best justification and most convincing interpretation to support their claims.²⁵⁷

It remains a peculiar fact that lawyers will generally disagree on the finer points of legal rules, yet share a general perception – bred by years of applying a rigid methodology and engaging in the distinct culture and language of the law – on which interpretations are acceptable and which entirely untenable. This is where law may help introduce a degree of articulated objectivity, if only on a formal basis, by identifying the purpose of rules and thus providing a better reflection of the consensus they reflect when it comes to operationalizing contested instrument choice criteria such as effectiveness or efficiency, each of which presume a certain desired outcome. The result will be far from perfect, and can only relate to objectives that have been legally vested in the first place; to the extent that notions such as effectiveness and efficiency aspire to a measure of legitimacy, however, it should still prove the altogether lesser evil.²⁵⁸

6.3 Legal and Institutional Barriers

Legal and institutional considerations play an important role in the selection of instruments for climate change mitigation policy. Not only will the specific legal and institutional context of any given jurisdiction directly affect how such policies operate, determining their viability and thereby

²⁵⁷ This relates to the constructive theory of interpretation suggested by Dworkin, who insists that law must seek to present itself ‘in its best light’ and find the ‘best justification’ rather than search for metaphysical answers, *idem* (n 255) 90.

²⁵⁸ It must be borne in mind, however, that any notion of effectiveness defined through the purpose contained in rules need not always conform to the objective of environmental protection: ‘[t]o advocate democracy is to advocate procedures, to advocate environmentalism is to advocate substantive outcomes’, and consensus will never be a guarantee for ecologically sound decisions, see Robert E Goodin, *Green Political Theory* (Polity Press 1992) 168. Therefore, as stated earlier, contingent notions of effectiveness – if used transparently – have their justification in academic research and are indeed necessary to criticise environmentally ineffective rules.

also their relative appeal compared to other instruments, but it also defines the mandates, rights, and duties of actors engaged in the policy making process, as well as the applicable procedures. A policy instrument chosen without adequate consideration of such parameters is less likely to be adopted and, if adopted, likely to be less effective – both in terms of achieving climate change mitigation objectives as well as doing so at least cost – than instruments that are more consistent with their legal and institutional context. Weak administrative capacities, legal challenges, and unclear mandates can undermine or delay the practical implementation of the most effective and efficient instrument in theory, as the example of quantity rationing through an emissions trading system has repeatedly shown.

Conceptually, the determinative power of law in climate policy choices arises from the principles of coherence and internal consistency of the legal order,²⁵⁹ and the resulting possibility of legal conflicts with existing rules, procedures and other norms which, in turn, may impede the implementation of particular policy options or even render their implementation unlawful. Generally speaking, one can discern four categories of conflicts arising from the introduction of climate policies into the existing normative order.²⁶⁰ First, there are conflicts of objectives, notably between environmental protection and energy market regulation. By way of illustration, the access to electricity grids and minimum feed-in rates guaranteed in many countries through rules on the promotion of renewable energy are conditional on utilization of specified technologies, with the scope of legislation limited to generation methods defined in the law itself.

On a theoretical level, this contradicts the general commitment to free competition set out in energy market legislation, for instance European Community liberalization rules. Likewise, the polluter pays principle adopted as a central tenet of environmental policy can be seen as inherently at odds with the practice in many emissions trading systems to allocate a significant share of

²⁵⁹ Luc J Wintgens, 'Coherence of the Law' (1993) 79 *Archiv für Rechts- und Sozialphilosophie* 483.

²⁶⁰ Here, I draw on the exploration of an integrated regulatory framework for implementation of overarching climate commitments set out in Michael A Mehling, 'Implementation of the Kyoto Protocol in Germany: Designing an Integrated Management Scheme for Greenhouse Gases' in Wybe T Douma, Leonardo Massai and Massimiliano Montini (eds), *The Kyoto Protocol and Beyond: Legal and Policy Challenges of Climate Change* (TMC Asser Press 2007).

emission allowances for free to operators under emissions trading rules.²⁶¹ Accordingly, the divergent objectives of climate policies and legislation in other issue areas are not always easy to reconcile, and can best be avoided at the stage of instrument selection.

Conflicts can also follow from divergent regulatory approaches, notably when command-and-control approaches meet flexible policies based on the price signals of markets and other financial incentives. An example for such colliding traditions can be seen in the relationship of emissions trading and many conventional ambient pollution control regimes, as the former relies on market forces to guide the choice of abatement technologies in covered installations, while the latter, in turn, tend to force rigid performance standards and emission ceilings on each individual operator. By requiring all installations – regardless of cost – to ensure a certain standard of technology, conventional regulation goes against the central premise of emissions trading, given that installations are no longer free to decide whether to acquire further allowances or invest in more efficient facilities.²⁶² In order to resolve such a conflict, implementation of emissions trading in the European Union necessitated a legislative amendment of pollution control legislation to exempt market participants from the general performance standard.²⁶³

But similar tensions can also occur between two mechanisms based on the same regulatory premise, exemplified by the way emissions trading interferes with the environmental performance of certain types of renewable energy promotion. At worst, the two incentives virtually cancel each other out as a means of reducing greenhouse gas emissions, given that the generation of electricity with renewable energy sources automatically increases the supply of unused allowances in the trading market and thereby disrupts the price signal required to influence corporate decisions.²⁶⁴ Moreover, the reductions achieved through renewable energy promotion could be achieved at lower cost if they were left entirely to operators participating in the market rather than a rigid promotion scheme. When this occurs, the renewable energy promotion rules ultimately subsidize

²⁶¹ See, generally, Nash (n 162) 505; on the practice of free allocation in the EU ETS, see Michael A Mehling, ‘Emissions Trading and National Allocation in the Member States: An Achilles Heel of European Climate Policy’ (2003) 5 Yearbook of European Environmental Law 113.

²⁶² See already the discussion *supra*, in Section 3.3.

²⁶³ This amendment affected Council Directive 96/61/EC of 24 September 1996 concerning Integrated Pollution Prevention and Control (IPPC Directive), [1996] OJ L257/26.

²⁶⁴ See the discussion of the so-called ‘waterbed effect’ *supra*, in Section 3.3.

CO₂ emissions originating outside of the power generation sector, rendering them an environmentally redundant and economically costly instrument.

A third category of frictions can arise when implementing climate legislation in the context of constitutional doctrines and fundamental rights. On the level of constitutional law, the federal organization of legislative and executive powers in many countries may impede effective elaboration and enforcement of climate policies, where a number of relevant issues fall within the purview of the federal legislator, but enforcement and administrative operationalization, in particular, have traditionally been the prerogative of the federate provinces or states. Also, responding dynamically to changing environmental circumstances may often necessitate the delegation of legislative powers to executive bodies, whereas many national constitutions require that important issues attain the democratic legitimacy of statutory law.

Given the universal nature of global warming and the ample scope of mitigating policies, moreover, subjects may be affected in their individual rights and freedoms in manifold ways. For instance, emissions trading was challenged early on as being discriminatory against sectors covered by the trading system, as opposed to excluded sectors which faced no aggregate emission limits. Altogether, with greenhouse gases traditionally subject to no form of management, the new trading system was held by some to violate the established balance between individual rights and public concerns, a balance which had found its reflection in the general freedom to engage in pollutant operations subject only to a bound decision of preventive control. Emissions trading, so the argument of critics, would curtail the legal position of operators and render their ability to exercise fundamental rights dependent on a discretionary permit.²⁶⁵

And finally, tensions may arise between different regulatory planes, that is, divergent climate policies in domestic, supranational, and international law. What is legal on the domestic plane, for instance, may conflict with precepts of supra- or international law. Two salient illustrations of how discussions of instrument choice can be affected by such conflicts across regulatory planes can be found in the article on linking of heterogeneous climate policies under

²⁶⁵ For an overview of the arguments and their proponents, see my discussion in Michael A Mehling, 'European Emissions Trading and Environmental Regulation in the Member States: Irreconcilable Conflict?' in Teresa Fajardo del Castillo, Christoph Holtwisch and Tereza Tichá (eds), *Strengthening European Environmental Law in an Enlarged Union* (Shaker 2004).

the Paris Agreement,²⁶⁶ as well as the article on the design of border carbon adjustments in accordance with international trade law.²⁶⁷ Recent developments have underscored the influence such legal considerations can exert on policy design and implementation: regarding linkage of subnational climate policies, the now formally initiated withdrawal process of the U.S. from the Paris Agreement²⁶⁸ raises serious questions about the future viability of the trading link between the subnational emissions trading systems in California and Québec, not least in view of the recent litigation against this link initiated by the U.S. federal government on the grounds of a claimed violation of constitutional law.²⁶⁹ Such legal risks will invariably influence future decisions of subnational jurisdictions in North America as to whether they will seek a similar link with other jurisdictions or not, yet legal considerations did not feature prominently in the academic debate about the benefits and design of a link that preceded the adoption of the linking agreement between California and Québec.²⁷⁰

While there have been numerous efforts to reconcile separate normative environments by way of conflict or exception clauses, the case of environmentally motivated trade restrictions has shown that institutions tend to prioritize their own agenda at the expense of any competing rules and objectives.²⁷¹ Policy debates about border carbon adjustments – now a policy priority for the European Union under the European Green Deal initiative of the newly appointed European

²⁶⁶ Michael A Mehling, Gilbert E Metcalf and Robert N Stavins, ‘Linking Heterogeneous Climate Policies (Consistent with the Paris Agreement)’ (2018) 48 *Environmental Law* 647.

²⁶⁷ Mehling and others (n 3).

²⁶⁸ Pompeo (n 198).

²⁶⁹ See U.S. Department of Justice, ‘United States Files Lawsuit Against State of California for Unlawful Cap and Trade Agreement with the Canadian Province of Quebec’ (Press Release 19-1,137 of 23 October 2019) <www.justice.gov/opa/pr/united-states-files-lawsuit-against-state-california-unlawful-cap-and-trade-agreement> accessed on 17 January 2020.

²⁷⁰ For further discussion of the history and evolution of this link, see Benjamin Görlach, Michael A Mehling and Ennid Roberts, ‘Designing Institutions, Structures and Mechanisms to Facilitate the Linking of Emissions Trading Schemes’ (German Emissions Trading Authority (DEHSt) 2015) 70–73 <https://www.dehst.de/SharedDocs/downloads/EN/emissions-trading/Linking_report.pdf>.

²⁷¹ For an overview, see Sabrina Shaw and Risa Schwartz, ‘Trade and Environment in the WTO’ (2002) 36 *Journal of World Trade* 129; see also generally Anja Lindroos and Michael A Mehling, ‘From Autonomy to Integration? International Law, Free Trade and the Environment’ (2008) 77 *Nordic Journal of International Law* 253.

Commission President Ursula von der Leyen²⁷² – serve as a powerful example of how concerns about legal risk can enter instrument choice processes, and in this case illustrate how concerns about compatibility with international trade law can impede adoption of a climate policy for over a decade even though the majority of trade law analyses and even a report by the World Trade Organization Secretariat itself suggest that policy option can be implemented without violation international trade obligations.²⁷³

A second example is the admissibility of taxes or other charges on bunker fuels for aviation, which – although permissible under domestic law²⁷⁴ – are precluded by anachronistic exemptions under the Chicago Convention on International Civil Aviation²⁷⁵ as well as a number of bilateral agreements, formally known as ‘Bilateral Air Service Agreements’ (BASAs).²⁷⁶ At the European level, moreover, Directive 2003/96/EC calls on Member States to ‘exempt ... from taxation under conditions which they shall lay down for the purpose of ensuring the correct and straightforward application of such exemptions and of preventing any evasion, avoidance or abuse ... energy

²⁷² See European Commission, ‘Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: The European Green Deal’ COM(2019)640 (11 December 2019), 5: ‘Should differences in levels of ambition worldwide persist, as the EU increases its climate ambition, the Commission will propose a carbon border adjustment mechanism, for selected sectors, to reduce the risk of carbon leakage. This would ensure that the price of imports reflect more accurately their carbon content. *This measure will be designed to comply with World Trade Organization rules and other international obligations of the EU*’ (emphasis added).

²⁷³ Ludvine Tamiotti and others, *Trade and Climate Change: A Report by the United Nations Environment Programme and the World Trade Organization* (United Nations Environment Programme and World Trade Organization 2009) 98–109.

²⁷⁴ Eckhard Pache and Joachim Bielitz, ‘Rechtliche Rahmenbedingungen einer Kerosinbesteuerung auf innerstaatlichen Flügen’ (2004) 16 *Zeitschrift für Umweltrecht* 297.

²⁷⁵ See article 24 of the Convention on International Civil Aviation (Chicago Convention) (adopted 7 December 1944, entered into force on 4 April 1947), 15 (1944) UNTS 295, elaborated by International Civil Aviation Organisation, Council Resolution on Environmental Charges and Taxes, adopted by the Council on 9 December 1996 at the 16th meeting of its 149th session, lit. 2 and 4.

²⁷⁶ Members of the International Civil Aviation Organisation are required to deposit all such bilateral agreements with the Secretariat, which has compiled the roughly 3000 BASAs in existence in a two-volume collection, ICAO, Document 9511, ‘Digest of Bilateral Air Transport Agreements and Supplement’ 1.

products supplied for use as fuel for the purpose of air navigation.’²⁷⁷ All this prevented legislators in several jurisdictions from implementing effective measures to contain emissions from the most rapidly growing source of greenhouse gases,²⁷⁸ delaying progress and forcing decision makers to resort to a market mechanisms instead as the only permissible measure. After more than a decade of inaction, the International Civil Aviation Organization (ICAO) adopted a global market mechanism – the ‘Carbon Offsetting and Reduction Scheme for International Aviation’ (CORSIA) – to stabilize global GHG emissions from international aviation from 2020 onwards.²⁷⁹ This again illustrates how legal considerations – rather than the vast economic literature on the relative merits of pricing controls and quantity rationing – determined a relevant instrument choice in practice.

Ultimately, however, any attempt to capture the many ways in which legal and institutional considerations can potentially affect political decision making processes related to climate change mitigation will by necessity remain incomplete. Accordingly, the foregoing enumeration of relevant factors is meant to serve as a heuristic orientation only. Only continued analysis of actual case studies – such as those described in the referenced articles on border carbon adjustments and linking of emissions trading systems – can yield a more accurate understanding of the considerations actually influencing instrument choice in different jurisdictions. This need for in-depth familiarity with relevant existing regulatory and institutional frameworks may also explain why such legal considerations criteria are rarely applied in mainstream literature on instrument choice, especially at any level of detail.

Still, while identification of the specific determinants of policy choice processes originating in legal and institutional frameworks can only occur against the background of a

²⁷⁷ See Article 14 (1) of Council Directive 2003/96/EC of 27 October 2003 restructuring the Community Framework for the Taxation of Energy Products and Electricity, [2003] OJ L283/51; Article 14 (2) of the Directive, however, allows Member States to limit the scope of this exemption ‘to international and intra-Community transport.’ Purely domestic flights, in other words, may be included in a kerosene taxation scheme.

²⁷⁸ See at length Nils Meyer-Ohlendorf, Michael A Mehling and Astrid Epiney, *Rechtliche Ausgestaltung von Nutzungsentgelten für globale Umweltgüter* (Erich Schmidt Verlag 2006).

²⁷⁹ See International Civil Aviation Organization (ICAO), Assembly Resolution A39-3, ‘Consolidated Statement of Continuing ICAO Policies and Practices related to Environmental Protection – Global Market-based Measure (MBM) Scheme’ (27 September-6 October 2016); for discussion, see Chris Lyle, ‘Beyond the ICAO’s CORSIA: Towards a More Climatically Effective Strategy for Mitigation of Civil-Aviation Emissions’ (2018) 8 *Climate Law* 104.

specific context, it is possible to narrow down the extensive range of conceivable factors by highlighting broader patterns and using these to outline broader categories. Without claiming comprehensiveness, such determinants of instrument choice can be grouped across three dimensions, as described below in Table 2.

Table 2: Legal and Institutional Determinants of Instrument Choice²⁸⁰

Factor	Context	Definition and Examples
Objectives and Mandates	Legal	<p>Mitigation targets: Mitigation targets and other relevant goals enshrined in existing legislation may have an effect on the selection of policy instruments for their achievement, and also on the stringency and level of ambition with which these instruments are implemented.</p> <p>Legal mandate: In multilevel governance systems, jurisdictions at a lower level in the normative or institutional hierarchy may be required to implement specific measures under a legal mandate that is binding by virtue of constitutional precept or voluntarily surrendered sovereignty, for instance in an international treaty or supranational organization.</p> <p>Competing objectives: Objectives related to social, economic, energy and other policies vested in law, including constitutional law, can promote or impede the adoption of certain policy instruments, and may need to be reconciled or balanced with the objective of climate change mitigation.</p>
	Institutional	<p>Institutional mandate: Purpose for which an institution was established and its mission; depending on its political weight and influence, the existence of an institution mandated with promoting climate change mitigation will generally facilitate the adoption of relevant policies, and favour more stringent instrument categories.</p>
Values, Principles and Culture	Legal	<p>Legal system: Legal tradition – common law or civil law – to which a jurisdiction belongs, notably with a view to the role of the judiciary and judicial precedent.</p> <p>Regulatory tradition: Different jurisdictions have traditionally favoured different instrument categories to address environmental challenges and risks. Some jurisdictions have been early adopters of deregulated markets and economic instruments for different policy areas, potentially increasing their experience with and openness for market-based approaches to climate change mitigation.</p>
	Institutional	<p>Political culture: A polity may be more or less likely to support regulatory constraints based on scientific recommendations. Likewise, the debate around instruments may be more consensual or confrontational, and some instruments may be viewed unfavourably by a majority of the public.</p> <p>Institutional dynamics: Institutions are subject to different internal dynamics. Some institutions are prone to procedural inertia and preoccupation with formal over substantive</p>

²⁸⁰ Source: Mehling and others (n 18) 15.

		priorities; weak institutional standing, weak leadership or cumbersome operating procedures can impede the effective and efficient achievement of institutional mandates.
Substance and Process	Legal	<p>Climate change law: Existence of a designated climate change law can be an indication of broad support for climate change mitigation measures, and will generally set out guiding objectives, principles, and mandates for substatutory regulations or decrees, which in turn set parameters for the selection of subsequent instruments. Conversely, a climate change law may also predetermine instrument choices or occupy the space for new policies.</p> <p>Complementary climate legislation: Different laws or regulations in the area of climate change mitigation can interact both synergistically or in detrimental ways. As with a central climate change law, moreover, previously existing measures can pre-empt certain instrument options and occupy a given space, thereby affecting decision making processes.</p> <p>Fundamental rights and doctrines as the basis of or constraint on climate legislation: Instruments meant to constrain emitting behaviour can violate the established balance between individual rights and public concerns, and impinge on fundamental freedoms afforded to natural or legal persons. Likewise, certain fundamental rights and doctrines may call for a minimum level of climate change mitigation efforts.</p> <p>Competing rules in other areas of law: Policy instruments adopted for climate change mitigation can also come in conflict with rules and principles in other legal regimes. Because decision makers will seek to avoid such conflicts and stay within the parameters of legality, such potential conflict points can also influence instrument choice processes.</p>
	Institutional	<p>Level of authority: Authority in multidimensional governance systems is frequently distributed among various institutional levels based on a carefully defined division of tasks and responsibilities. In some federal jurisdictions, for instance, authority will rest with a central power (such as the European Union or a central government) unless otherwise specified, whereas in others, it remains with decentralised entities (such as Member States, federate states, or municipalities). Often, legislative and enforcement responsibilities are assigned to different levels of authority.</p> <p>Relevant procedures: Different legislative procedures – for instance regarding voting majorities or involved participants – may be required for different instruments, influencing the feasibility of different policy options.</p>

7 Conclusions

The intention of this study has been to set out an argument in favour of the value of law and jurisprudence to both complement and improve upon the established canon of criteria for policy instrument choice in climate change mitigation. Drawing on the doctrinal concept of unity, or coherence, of the legal system, it has highlighted the constraints on instrument choice imposed by existing domestic and international legal orders, such as organisational mandates, procedural and

substantive rules, systems of rights, principles, and the policy objectives embodied therein. As the case studies have shown, theoretically attractive policy options have variously encountered legal challenges, and therefore failed to see implementation while other instruments – sometimes considered to be theoretically ‘second-best’ – have proven more successful in the real world. Legal and institutional determinants of the viability of policy instruments therefore need to be taken into account at an earlier stage in the decision making process, and should thus find entrance into the recognised canon of conceptual selection criteria.

But jurisprudence can also provide an important contribution to the application of already established criteria such as effectiveness and efficiency. As highlighted in the section on law as an epistemic tool,²⁸¹ these criteria are generally measured with a view to the achievement of defined objectives. While varying conceptions of the desired policy outcomes have been proposed in different settings, too little attention is devoted to the fact that climate policies – which ultimately represent a form of social governance – require a certain level of legitimacy to succeed in altering behaviour in required ways. As a reflection of popular consent, law and the objectives set out in legal documents and arrangements have the highest claim to legitimacy, thereby offering an important means to reduce contingency and instrumental bias.

The wording of legislation or international cooperative arrangements on climate policy will usually leave room for much discretion and specification, deferring further choices to secondary acts of legislation, diplomatic negotiations, and technical guidance by political, administrative, and scientific bodies, as well as, ultimately, the local and regional implementation through authorities. This is particularly apparent in the area of climate change, where scientific evidence is prone to change dynamically, while means of adaptation and mitigation continue to evolve. It is here where the exegetic skills and knowledge of the legislative framework acquired by lawyers through their formal education can provide important input to the policy debate.

Ultimately, however, a larger and more important question is prompted by the growing instrumental diversity in climate policy, and the proliferation of rules and regimes in different issue areas. While the first elements of a new field of law are arguably emerging in the shape of common

²⁸¹ See *supra*, Section 6.2.

principles and objectives,²⁸² the countless instruments devoted to climate change are still but loosely related and far from becoming a coherent normative framework. On the domestic level, this brings the risk of regulatory tensions and conflicts within different areas of climate policy itself; as well as with established principles and doctrines of general environmental regulation and other areas of law. A majority of jurisdictions have adopted comprehensive instrument portfolios to advance the mitigation of greenhouse gas emissions, in many cases evincing frictions between objectives, regulatory approaches, fundamental doctrines and basic rights, and regulatory planes.²⁸³

Internationally, such tensions and inconsistencies have manifested themselves in the shape of concurrent trends of deformalization and fragmentation, with attendant challenges prompting a foundational debate on the future of international environmental governance more generally; examples cited here included the interaction and potential conflicts between measures to mitigate climate change and the international regimes on trade and civil aviation. Clearly, one of the major priorities when choosing appropriate instruments for climate policy will lie in arriving at a suitable portfolio of policies and international arrangements, and this study has sought to identify the theoretical causes and conceptualize categories of conflicts with a view to their better avoidance.

Given the disproportionate influence of the economic discipline on the theory and academic discussion of instrument choice, it seems fitting to close with the words of a leading environmental economist who has himself had an outsized impact on the evolution of environmental and climate policy, including the literature on instrument choice. Writing in 1997 on the policy instruments for climate change, Robert N. Stavins acknowledged that ‘some of the greatest barriers to progress in dealing with the threat of global climate change are political hurdles domestically and institutional challenges internationally’, prompting him to caution against an ‘analytical dominance by economics.’²⁸⁴ Instead, he went on to write, ‘this is an area where economists can learn from their colleagues in political science and law. Over the past several decades, legal scholarship and political science have been significantly influenced by economics. Now, global climate change

²⁸² See, however, my caution in assuming the existence of a new area of law in Mehling, ‘The Comparative Law of Climate Change: A Research Agenda’ (n 9).

²⁸³ See *supra*, Section 6.3.

²⁸⁴ Robert N Stavins, ‘Policy Instruments for Climate Change: How Can National Governments Address a Global Problem?’ (1997) 1997 *The University of Chicago Legal Forum* 293, 327.

policy – with its centrally important political and institutional features – presents an opportunity for that favor to be repaid.²⁸⁵ And as this study and the accompanying articles have variously argued, that invitation is one that lawyers should not hesitate to accept.

²⁸⁵ Ibid.

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Annex: Articles Submitted for LL.D. Thesis

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