

Chapter 2

Implementing Climate Governance: Instrument Choice and Interaction

Michael Mehling

Abstract At all levels of regulation, the legal response to both causes and impacts of climate change has shifted away from a segmented array of isolated measures and initiatives on specific aspects of global warming, such as policies to manage energy demand or promote research on sustainable alternatives, to an increasingly sophisticated network of regulatory standards, market mechanisms, and other innovative approaches. While the first elements of a new area of law are arguably emerging in the shape of common principles and objectives for sustainable energy use, the countless rules devoted to climate change are still but loosely related and far from becoming a coherent normative framework.

2.1 Introduction

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

Michael Mehling is President of the Ecologic Institute, Washington DC, and an Adjunct Professor at Georgetown University.

M. Mehling (✉)
Ecological Institute, 1630 Connecticut Ave. NW, Suite 300,
20009 Washington, DC, USA
e-mail: mehling@ecologic-institute.us

mechanisms has also brought along new shortcomings, 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. Partly, this can be ascribed to a dramatic change in the conception and focus of environmental regulation: as economic considerations acquire greater weight in decision making, increased preoccupation with the cost and efficiency of policies has resulted in a variety of flexible market incentives joining or supplanting more conventional performance and quality standards.¹

Such difficulties have also overshadowed the design and implementation of many domestic climate policy portfolios. Looking back on the early stages of domestic climate regulation process, one might often garner the impression of an incremental, barely coordinated strategy, resulting in a coincidental rather than intended assortment of regulatory devices, not seldom based on overly rushed legislative schedules,² 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 growing systemic coherence of a distinct area of law.

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

¹ See generally Tom Tietenberg, "Economic Instruments for Environmental Regulation" 6.1 *Oxford Review of Economic Policy* (1990), at 17.

² 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* (New York, N.Y.: Harper & Row, 1957); Joseph A. Schumpeter, *Capitalism, Socialism and Democracy* (New York, N.Y.: Harper & Row, 1942).

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, for instance by harnessing market instruments.³ 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, 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.”⁴

In many ways, this evolution also has far reaching implications for the legal nature of climate cooperation. If current trends are any indication, the global response to climate change beyond 2012 will see a 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.⁵ As one observer has remarked about the outcome of recent negotiations, rather than adopting “a detailed, binding framework for furthering global climate cooperation”, the international community has instead embraced “a general political statement that privileges the voluntary actions of states and devalues the role of international law and global climate governance.”⁶

Should the crucial feature of enforcement also soften as it evolves towards responses more ‘in harmony with the cooperative spirit’⁷ required for climate cooperation, it could raise questions about the very role and limitations of international law.⁸

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

³ Frank Biermann, “Beyond the Intergovernmental Regime: Recent Trends in Global Carbon Governance”, 2 *Current Opinion in Environmental Sustainability* (2010), 284.

⁴ Patricia Birnie, “International Environmental Law: Its Adequacy for Present and Future Needs”, in Alexander Hurrell and Benedict Kingsbury, *The International Politics of the Environment* (Oxford: Oxford University Press, 1992), 51–84, at 54.

⁵ Jacob Werksman and Kirk Herbertson, “The Aftermath of Copenhagen: Does International Law have a Role to Play in a Global Response to Climate Change?”, 25 *Maryland Journal of International Law* (2010), 109–142; see also, more broadly, Lavanya Rajamani, “Addressing the ‘Post-Kyoto’ Stress Disorder: Reflections on the Emerging Legal Architecture of the Climate Regime”, 58 *International and Comparative Law Quarterly* (2009), 803–834.

⁶ David Hunter, “Implications of the Copenhagen Accord for Global Climate Governance”, 10 *Sustainable Development Law & Policy* (2010), 4–15, at 4, referring to the “Copenhagen Accord” adopted at the 15th Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP).

⁷ Critically Martti Koskenniemi, “Breach of Treaty or Non-Compliance: Reflections on the Enforcement of the Montreal Protocol”, 3 *Yearbook of International Environmental Law* (1992), 123–162, at 147.

⁸ 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: Oxford University Press, 2005); for an impassioned counterargument, see Mary E. O’Connell, *The Power and Purpose of International Law* (Oxford University Press, 2008).

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 under the Kyoto Protocol is also likely to resist the application of punitive consequences, regardless of whether these consequences are made legally binding or not.”⁹ But that must 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.¹⁰ Indeed, climate cooperation and its study appear particularly amenable to new vocabularies of governance, legitimacy and compliance, where preoccupation with the seemingly archaic language of formal international law and its binary focus on the observance or violation of rights and obligations may seem entirely outdated.¹¹ Aside from revising our understanding of climate cooperation, therefore, do we also need to leave behind the tools of international jurisprudence and reconceptualise the climate regime and its commitments through the lenses of more novel ways of thinking about international cooperation, such as transnational governance and global administrative law?¹²

2.2 Exploring the Boundaries of Domestic Climate Law

2.2.1 *Instrument Choice at the Domestic Level*

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,¹³ performance standards, subsidies, agreements, and

⁹ Anita M. Halvorssen and Jon Hovi, “The Nature, Origins and Impact of Legally Binding Consequences: The Case of the Climate Regime”, 6 *International Environmental Agreements: Politics, Law and Economics* (2006), 157–171, at 158.

¹⁰ Martti Koskenniemi, “The Fate of International Law: Between Technique and Politics”, 70 *The Modern Law Review* (2007), 1–32.

¹¹ For a critique of the ongoing turn to political science vocabularies, see Martti Koskenniemi, “Legitimacy, Rights and Ideology: Notes towards a Critique of the New Moral Internationalism”, 7 *Associations: Journal for Legal and Social Theory* (2003), 349–374.

¹² Anne-Marie Slaughter, *A New World Order* (Princeton, N.J.: Princeton University Press, 2005); Benedict Kingsbury, Nico Krisch and Richard B. Stewart, “The Emergence of Global Administrative Law”, 68 *Law and Contemporary Problems* (2005), 15–61.

¹³ Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2007: Mitigation* (Cambridge: Cambridge University Press, 2007), at 750; Organization for Economic Cooperation and Development (OECD), *Climate Change Mitigation: What Do We Do?* (Paris: OECD, 2007), available at: <http://www.oecd.org/dataoecd/30/41/41753450.pdf> (last accessed on 15 June 2012),

informational instruments.¹⁴ In practice, these instruments are applied alone or in varying combinations to different sectors, such as electricity generation, transport, buildings, and industry.¹⁵ 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 emissions will generate greater benefits than costs,¹⁶ but current political and economic decision making cycles are notorious for being myopic and providing little incentive for anticipatory governance or foresight.¹⁷ 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.¹⁸ In the context of climate change, therefore, both the rationale of policy instruments and the manner in which they are designed have

at 18–22. Pricing models date back to Arthur Cecil Pigou, *The Economics of Welfare* (London: Macmillan and Company, 1920), and notably include emissions charges and taxes set to cover the marginal damage caused by polluting activities, thereby internalizing their costs; quantity rationing, in turn, is based on work by John H. Dales, *Pollution, Property and Prices* (Toronto: University of Toronto Press, 1968), at 92–100, and W. David Montgomery, “Markets in Licenses and Efficient Pollution Control Programs”, 5 *Journal of Economic Theory* (1972), 395–418, both building on Ronald H. Coase, “The Problem of Social Cost”, 3 *Journal of Law and Economics* (1960), 1–44, and generally requires the creation of a market for tradable emission allowances, where each allowance confers the right to discharge a specified quantity of pollutants for a limited duration of time; for further details, see Thomas H. Tietenberg, *Emissions Trading: Principles and Practice* (2nd ed., Washington, DC: Resources for the Future, 2006). For a discussion of relative merits, see Martin L. Weitzman, “Prices vs. Quantities.” 41 *Review of Economic Studies* (1974), 477–491.

¹⁴This 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 Office of Technology Assessment, *Environmental Policy Tools: A User’s Guide (OTA-ENV-634)* (Washington, DC: U.S. Government Printing Office, 1995), at 81–89.

¹⁵In 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, see OECD, *Climate Change Mitigation*, supra, note 13, at 11, 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.

¹⁶Especially 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* (Washington, DC: Congress of the United States, 2008), at 11.

¹⁷Leon Fuerth, “Forward Engagement: A New Wrinkle, in Time?”, 8 *International Affairs Review* (2004), 1–5.

¹⁸Nicholas Stern, *The Economics of Climate Change: The Stern Review* (Cambridge: Cambridge University Press, 2006), at 63, 191.

been sensitive to economic concerns from a number of important stakeholders, prompting widespread adoption of flexible or suasive incentives alongside more coercive regulatory prescriptions.¹⁹

With this broad range of available instruments 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,²⁰ 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?
- *Institutional feasibility*: is the policy instrument likely to be viewed as legitimate, gain political acceptance, be adopted and ultimately implemented?²¹

While these criteria are widely advocated, albeit with slight variations,²² 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

¹⁹ 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 H. Oates, *The Theory of Environmental Policy* (2nd ed., Cambridge: Cambridge University Press, 1988), at 177; and Nathaniel O. Keohane et al., “The Choice of Regulatory Instruments in Environmental Policy” 22 *Harvard Environmental Law Review* (1998), 313–367, at 313; as a result, conventional regulation, criticized for belonging to an “extraordinarily crude, costly, litigious and counterproductive system of technology-based environmental controls” (see Bruce A. Ackerman and Richard B. Stewart, “Reforming Environmental Law”, 37 *Stanford Law Review* (1985), 1333–1365, at 1333), has been increasingly joined or supplanted by market incentives, all with an aim to “improve the command system through better balancing of regulatory costs and benefits, improved risk analysis and management and greater flexibility” (Richard B. Stewart, “A New Generation of Environmental Regulation?” 30 *Capital University Law Review* (2001): 21–182, at 21).

²⁰ Lawrence H. Goulder and Ian W.H. Parry, *Instrument Choice in Environmental Policy* (Washington, DC: Resources for the Future, 2008), at 2.

²¹ IPCC, Mitigation, *supra*, note 13, at 751.

²² Similar criteria are e.g. reported in the broader academic literature, see, for instance, Thomas Sterner, *Policy Instruments for Environmental and Natural Resource Management* (Washington, DC: Resources for the Future, 2003), at 133–134, who lists 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 et al., “Overview: Comparing Instrument Choices”, in Winston Harrington et al. (eds), *Choosing Environmental Policy* (Washington, DC: Resources for the Future, 2004), 1–22, at 5, who list effectiveness, efficiency, equity and fairness, non-intrusiveness, and public participation; or OTA,

and any selection largely dependent on specific circumstances.²³ Additionally, climate governance tends to address several market failures and seek a variety of outcomes, thus necessitating the use of more than one instrument.²⁴ Yet with the simultaneous operation of various instruments comes a risk of adverse interactions or even redundancies.²⁵ Some instruments will pursue more than one objective,²⁶ and the extreme uncertainties underlying causes and impacts of climate change as well as policy outcomes further complicate the evaluation of relevant instruments.²⁷ As the next section illustrates, similar complexities are also faced when seeking to apply evaluation criteria to international regimes; many of the considerations guiding the debate on domestic instrument choice are, however, transferable to some extent.²⁸

2.2.2 *Instrument Interactions at the Domestic Level*

Growing in consecutive stages, the domestic body of rules devoted to climate policy in most jurisdictions has evolved into a comprehensive and highly diverse regulatory strategy. But as with most entities that develop over time, it has not always grown in a systematic fashion, rather adding layer upon layer to accommodate new challenges and international commitments. In recent years, for instance, the German climate strategy has been subject to growing criticism for consisting of “several barely coordinated measures and actions” whose “interaction, mutual enhancement,

Policy Tools, supra, note 14, at 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, *Theory*, supra, note 19, at 57–78; Goulder et al., *Instrument Choice*, supra, note 20, at 3–23. Of course, actual practice has often “diverged strikingly from the recommendations of normative economic theory”, see Keohane et al., “Choice”, supra, note 19, at 313, and will be strongly influenced by local traditions, cultures, institutions, and infrastructures, with institutional capacity especially constraining viable choices in developing countries, see Bell (2003): 22.

²³ Goulder et al., *Instrument Choice*, supra, note 20, at 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.

²⁴ Jan Tinbergen, *On the Theory of Economic Policy* (Amsterdam: North Holland, 1952).

²⁵ Organization for Economic Cooperation and Development (OECD), *Instrument Mixes for Environmental Policy* (Paris: OECD, 2007), at 27.

²⁶ William A. Knudson, “The Environment, Energy, and the Tinbergen Rule”, *Bulletin of Science, Technology & Society* (2008), at 308.

²⁷ Martin L. Weitzman, “The Extreme Uncertainty of Extreme Climate Change: An Overview and Some Implications”, Unpublished Manuscript, available at: <http://www.economics.harvard.edu/faculty/weitzman/files/ExtremeUncertaintyCliCh.pdf> (last accessed on 15 June 2011), at 8–10.

²⁸ Richard B. Stewart, “Instrument Choice”, in Daniel Bodansky et al. (eds), *Oxford Handbook of International Environmental Law* (Oxford: Oxford University Press, 2007), 147–181, at 159.

and mutual cancellation” are not fully known.²⁹ Its instruments have been censored for “being introduced, modified or expanded in a random manner”, resulting in regulatory overlap and excessive government intervention, all of which, in turn, is “stifling the market.”³⁰

While such verdicts mostly originate with representatives from industry and commerce, the sectors most affected by environmental and energy policies, they are not entirely unfounded: even an Advisory Council of the German federal government observed that interactions between different policies had been “insufficiently considered”,³¹ suggesting that the German basket of instruments for greenhouse gas mitigation deserved further attention. Generally speaking, thus, such an instrument mix can be the outcome of a carefully guided process, or merely the accidental convergence of various measures adopted by decision makers in a political system to achieve a set objective.³²

Leaning more towards the latter category, it appears, global warming legislation has been adopted over time and in response to situational demands, sacrificing systemic coherence for a profusion of divergent terminologies and altogether various degrees of overlap, ambivalence and inconsistency. Important issues are frequently governed by executive ordinances and decrees rather than statutory law, constituting a violation of the constitutional doctrine of essentiality, which requires that substantial issues be governed by formal parliamentary acts.³³

With energy and environmental regulation in the Member States largely initiated by Community law, many of the foregoing shortcomings can be traced back to the supranational level, where the adoption of legislation is a process strongly guided by regulatory competition between the Member States³⁴ and often finds its basis in a precarious compromise in the Council.

²⁹ Carsten Kreklau, Commercial Manager of the Federation of German Industries (BDI), in the *Süddeutsche Zeitung* of 17 July 2001, available at <http://www.sueddeutsche.de/deutschland/artikel/162/9153> (last accessed on 15 June 2012): “Das gegenwärtige Instrumentarium zur Klimavorsorge besteht bereits aus vielen, kaum aufeinander abgestimmten Maßnahmen und Aktionen. Die Wechselwirkungen, die gegenseitige Verstärkung sowie die Auslöschung zwischen den bereits jetzt bestehenden Instrumenten sind noch nicht in vollem Umfang bekannt. Es geht vor allem (...) um die ungeklärten Wechselwirkungen und daraus resultierenden Begrenzungen wirtschaftlicher Tätigkeit.”

³⁰ Wirtschaftsrat der CDU e.V., *Macht der Emissionshandel den bestehenden Instrumentenmix überflüssig?* (Berlin: Wirtschaftsrat, 2004).

³¹ Wissenschaftlicher Beirat beim Bundesministerium für Wirtschaft und Arbeit, “Zur Förderung erneuerbarer Energien”, 15 *Zeitschrift für Umweltrecht* (2004), pp. 400 *et seq.*, at p. 401:

³² Georg Hermes, “Instrumentenmix im Energieumweltrecht” in Martin Führ, Rainer Wahl and Peter von Wilmowsky (eds.), *Umweltrecht und Umweltwissenschaft: Festschrift für Eckard Rehbinder* (Berlin: Erich Schmidt, 2007), 569, at 572.

³³ This doctrine is derived from the principle of democracy contained in Article 20 (1) of the German Basic Law (*Grundgesetz für die Bundesrepublik Deutschland*) of 23 May 1949, BGBI. Part I (1949), at 1.

³⁴ See generally Adrienne Héritier, Christoph Knill and Susanne Mingers, *Ringling the Changes in Europe: Regulatory Competition and the Transformation of the State* (Berlin: de Gruyter, 1996), *passim*.

Looking back in time, these challenges might also find their origin in the very history of environmental legislation, which evolved from earlier rules on trade supervision and traditionally relied on a rigid system of administrative permits and control.³⁵ Its ambit was commonly limited to the regulation of impending threats to public safety, such as acute pollution and other perilous activities, rather than distant, elusive environmental risks.³⁶ Given their innate affinity to pollution prevention and control, however, measures taken to mitigate global warming were initially often assigned to the same area of law governing noise and air pollution. In Germany, for instance, a central act of legislation in this field, the Federal Ambient Pollution Control Act, mentions protection of the atmosphere amid its objectives, which is commonly understood to include the global climate.³⁷

And yet, the very notion of climatic change has, by definition, originated from a precautionary outlook, seeing how it involves diffuse, cumulative manifestations of risk rather than localised and immediate danger. Unlike conventional pollutants, therefore, greenhouse gases were generally not subject to any form of management in the past, with the ability to emit greenhouse gases limited by the capacity of an installation only. Elaborating climate policies within the regulatory ambit of pollution control is, however, proving less and less viable, as legislators are compelled by economic constraints and supranational commitments to engage in a paradigmatic shift of regulatory traditions and vest flexible mechanisms and market incentives in the guise of formal law.

Unsurprisingly, significant challenges have followed from this transition for administrators and the legislature, and the latter has only succeeded in embracing a more general, preventive stance to environmental protection within the past decade. Attempts to speed up the pace of reform, for instance by supplanting traditional regulation with flexible market instruments, have often been guided by purely theoretical assumptions on the merits of a particular approach, resulting in an overly narrow focus on select mechanisms at the expense of the remaining elements in the policy architecture and the operation of the policy as a whole.³⁸ As with any process requiring swift adaptation to rapidly changing circumstances, the result has ultimately been characterised by no small amount of tension and outright conflicts.

³⁵ See Gerhard Feldhaus, “Zur Geschichte des Umweltrechts in Deutschland”, in: Klaus-Peter Dolde (ed.), *Umweltrecht im Wandel* (Berlin: Erich Schmidt, 2001), 15, at 17–9; Klaus-Georg Wey, *Umweltpolitik in Deutschland: Kurze Geschichte des Umweltschutzes in Deutschland seit 1900* (Opladen: Westdeutscher Verlag, 1982), 27, at 105–27, pointing to the origins of modern pollution legislation in the area of “Gewerberecht” and its close relationship with measures to avert danger, or “Gefahrenabwehr”, still found in current police legislation.

³⁶ Martin Winkler, “Die neue Betreiberpflicht: Klimaschutz und Emissionshandel”, 14 *Zeitschrift für Umweltrecht* (2003), 395, at 395–396.

³⁷ Hans D. Jarass, *Bundes-Immissionsschutzgesetz* (6th ed., Munich: C.H. Beck, 2005), Section 1, annot. 4.

³⁸ Erik Gawel, *Umweltpolitik durch gemischten Instrumenteneinsatz* (Berlin: Duncker & Humblot, 1991), at 2.

2.2.2.1 Internal and External Conflicts – An Analytical Framework

Generally speaking, one can discern *four* categories of conflicts arising from the introduction of modern climate policies into the existing legal and constitutional order. 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 utilisation 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 liberalisation rules. Likewise, the polluter pays principle adopted as a central tenet of environmental policy is inherently at odds with the requirement in many emissions trading systems to allocate a significant majority of emission allowances for free to operators under emissions trading rules.³⁹ Accordingly, the divergent objectives of climate policies and legislation in other issue areas are not always easy to reconcile.

Conflicts can also follow from *divergent regulatory approaches*, notably when conventional rules based on state intervention and “command and control” meet flexible policies based on the price signals of functioning 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 standard of technology in participating 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.⁴⁰ In order to resolve this conflict, implementation of emissions trading in the European Community necessitated a legislative amendment of pollution control legislation to exempt market participants from the general performance standard.⁴¹

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

³⁹ See generally, Jonathan R. Nash, “Too Much Market? Conflict Between Tradable Pollution Allowances and the ‘Polluter Pays’ Principle”, 24 *Harvard Environmental Law Review* (2000), 465, at 505.

⁴⁰ Hans-Joachim Koch and Annette Wieneke, “Das europäische und deutsche Anlagenehmigung-srecht als Ordnungsrahmen eines Emissionshandels”, in Hans-Werner Rengeling (ed.), *Klimaschutz durch Emissionshandel* (Cologne: Heymanns, 2001), 99, at 115.

⁴¹ This amendment affected Council Directive 96/61/EC of 24 September 1996 concerning Integrated Pollution Prevention and Control (IPPC Directive), Official Journal L 257 of 10 October 1996, 26.

energy sources automatically increases the supply of unused allowances in the trading market and thereby disrupts the price signal required to influence corporate decisions. 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 subsidise CO₂ emissions originating outside of the power generation sector, rendering them an environmentally useless, but economically costly instrument.

A further illustration of conflict between two flexible instruments can be discerned in the overlap of emissions trading and voluntary declarations on climate protection by private enterprise. Under a voluntary declaration adopted by major sectors of German industry in 2000, these had pledged emissions reductions in exchange for a suspension of further regulatory measures; with the introduction of emissions trading throughout Europe, however, the federal government was bound to impose an aggregate limit on emissions for most parties to the agreement. Evidently, this did not conform with the reasoning of the earlier arrangement, although the government had no choice in the face of binding supranational commitments.

A third category of frictions can arise when implementing climate legislation in the context of *constitutional doctrines* and *fundamental rights*. On the broader level of constitutional law, the federal organisation 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 operationalisation, 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 has been seen to be discriminatory towards sectors covered by the trading scheme, as opposed to other sectors which faced no aggregate emission limits. And altogether, with greenhouse gases traditionally subject to no form of management, the new trading system has been held 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.⁴²

And finally, tensions may arise between different *regulatory planes*, that is, divergent climate policies in domestic, supranational, and international law. What is

⁴² For an overview of the arguments and their proponents, see my discussion in “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* (Aachen: Shaker, 2004), pp. 162 *et seq.*

legal on the domestic plane, for instance, may conflict with precepts of supra – or international law. A salient illustration are all forms of incentives for the promotion of renewable energy sources and energy efficiency measures, as well as the free allocation of allowances to participants in the emissions trading scheme. Depending on the circumstances *in casu*, such benefits may be classified as state aid under the competition rules of the European Community⁴³ or as a subsidy under the Agreement on Subsidies and Countervailing Measures (SCM) administered by the World Trade Organisation.⁴⁴

While there have been numerous efforts to reconcile separate normative environments by way of conflict or exception clauses, the tedious example of environmentally motivated trade restrictions has shown that institutions tend to prioritise their own agenda at the expense of any competing rules and objectives.⁴⁵ A second example is the admissibility of taxes or other charges on bunker fuels for aviation, which – although permissible under domestic law⁴⁶ – are precluded by anachronistic exemptions under the Chicago Convention on International Civil Aviation⁴⁷ as well as a number of bilateral agreements, formally known as “Bilateral Air Service Agreements” (BASAs).⁴⁸

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 products supplied for use as fuel for the purpose of air navigation.”⁴⁹ All this has prevented legislators in

⁴³ See Articles 87 and 88 of the Treaty Establishing the Economic Community (EC Treaty), as amended by the Treaty of Nice Amending the Treaty on European Union, the Treaties Establishing the European Communities and Certain Related Acts, Nice, 26 January 2001, in force on 1 February 2003, OJ C 80/56 of 10 March 2001.

⁴⁴ Agreement on Subsidies and Countervailing Measures, opened for signature 15 April 1994, 1869 *United Nations Treaty Series* (1994) 14.

⁴⁵ For an overview, see Sabrina Shaw and Risa Schwartz, “Trade and Environment in the WTO: State of Play”, 36 *Journal of World Trade* (2002), 129.

⁴⁶ Eckhard Pache and Joachim Bielitz, “Rechtliche Rahmenbedingungen einer Kerosinbesteuerung auf innerstaatlichen Flügen”, 16 *Zeitschrift für Umweltrecht* (2004), 297–301.

⁴⁷ See article 24 of the Convention on International Civil Aviation (Chicago Convention), Montreal, 7 December 1944, in force on 4 April 1947, 15 *United Nations Treaty Series* (1944), pp. 295 *et seq.*, 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.

⁴⁸ Members of the International Civil Aviation Organisation are required to deposit all such bilateral agreements with the Secretariat, which has compiled the roughly 3,000 BASAs in existence in a two-volume collection, ICAO, Document 9511, *Digest of Bilateral Air Transport Agreements and Supplement 1*.

⁴⁹ 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, OJ 2003 L 283/51; 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.

several jurisdictions from implementing effective measures to contain emissions from the most rapidly growing source of greenhouse gases,⁵⁰ delaying any progress and forcing decision makers to resort to emissions trading as the only permissible measure.⁵¹

2.2.3 Coherence by Design: Envisioning a Domestic Climate Management Regime

Legislation implementing domestic climate policy is frequently encumbered by a number of tensions and outright conflicts. Increased harmonisation and simplification within an integrated policy framework also suggest themselves as a possible channel of improved energy and climate regulation, including better delivery of central objectives and principles to often wary addressees. Of course, a solution at the international or regional level would be preferable for various reasons, notably to lessen the concern about impacts on competitiveness and environmental efficacy. On the international plane, however, the consensus required for a sufficiently ambitious climate regime is currently absent, with the international community already facing challenges in the adoption of fairly moderate targets. At the regional level, in turn, legislative bodies tend to lack the necessary powers for comprehensive regulation of greenhouse gases, as is illustrated by the European Union, where political opinion might be more favourable than in an international setting, but the establishing treaty confers no comprehensive power to legislate climate and energy policy. With that in mind, the following sections will outline some considerations relating to the establishment of a domestic scheme to manage greenhouse gas emissions, starting with the possible sources of a legal mandate, the most important objectives, and tentative design elements.

2.2.3.1 The Legal Context – Identifying a Mandate

Before addressing the material objectives and design options of a comprehensive management regime for greenhouse gases, the current legal framework should first be assessed with a view to potential bases for such sweeping reform. In an area as sensitive as energy and climate change, after all, far-reaching policies are likely to find many linkages with fundamental tenets of constitutional law and economic

⁵⁰ Intergovernmental Panel on Climate Change (IPCC), *Special Report on Aviation and the Global Atmosphere* (Cambridge: IPCC/WMO/UNEP, 1999), especially chapter 6.

⁵¹ See, notably, Proposal for a Directive of the European Parliament and of the Council amending Directive 2003/87/EC so as to Include Aviation Activities in the Scheme for Greenhouse Gas Emission Allowance Trading within the Community of 20 December 2006, COM(2006) 818 final.

regulation, all of which could impede the adoption of a uniform regime. At the same time, however, the legal order has gradually evolved to accommodate new and increasingly urgent environmental concerns, providing various gateways for a genuine mandate to support the adoption of a stringent climate policy architecture.

First and foremost, mitigation objectives entered by the government provide a strong foundation for comprehensive measures to meet these binding commitments, something a harmonised and consistent strategy is likely to facilitate. At the level of legal doctrine, one can point to the state objectives of environmental protection and intergenerational sustainability enshrined in constitutional documents such as the German Basic Law,⁵² as well as the principle of coherence affirmed by many constitutional courts, effectively ruling out legislation that stipulates irreconcilable obligations for one and the same addressee.⁵³ Further support for a harmonised and consistent management scheme may be derived from the principle of integration, which has been vested in the status of positive law by the Member States of the European Community,⁵⁴ and the principle of proportionality, which could potentially impose a limit on cumulative burdens flowing from the overlap of different measures and policies.⁵⁵

In many jurisdictions, energy and climate legislation has, to date, been based on the existing power to regulate economic activity as well as, more specifically, ambient air pollution.⁵⁶ Accordingly, there has been ample discussion whether the comprehensive management of greenhouse gases automatically incurs a violation of the fundamental right to engage in economic activity, manifested in an alleged right to use air as a resource and a medium for the absorption of emitted greenhouse gases. Indeed, in a decision on the responsibility of the state to compensate damage arising from air pollution, the German Federal Constitutional Court observed in a that “as a medium, ‘air’ is not subject to a management system under public law pursuant to which the holders of basic rights would generally be barred from access,

⁵² See Article 20a of the German Basic Law, as amended on 27 October 1994, BGBl. Part I (1994), 3146, which reads: “[t]he state, aware of its responsibility for present and future generations, shall protect the natural sources of life within the framework of the constitutional order through the legislature and, in accordance with the law and the principles of justice, the executive and the judiciary.”

⁵³ In its judgment of 7 May 1998 in Case 2 BvR 1991/95, Records of the Federal Constitutional Court (*BVerfGE*) (1998), 106, at 118, the Federal Constitutional Court addressed the permissibility of municipal waste and packaging charges, and found that “[t]he rule of law binds all legislative organs of the Federation and the *Länder* to coordinate their legislation in such a way as to prevent norm addressees from being confronted with countervailing rules which render the legal order contradictory” (translation by the author).

⁵⁴ See Article 6 of the EC Treaty, *supra* note 43, which reads: “Environmental protection requirements must be integrated into the definition and implementation of the Community policies and activities referred to in Article 3, in particular with a view to promoting sustainable development.”

⁵⁵ On this argument, see Michael Kloepfer, *Umweltrecht* (3rd ed., Munich: C.H. Beck, 2004), Chap. 5 Annot. 284.

⁵⁶ See Article 74 (1) Nos. 11 and 24 of the German Basic Law.

and according to which use would depend on allocation by state bodies subject to their discretion.”⁵⁷

Applied to the context of climate change, such an understanding would preclude the comprehensive management of greenhouse gas emissions within an overarching framework, and would, instead, favour legislation in response to situational threats and narrowly defined issue areas. Unsurprisingly, that very approach has also been responsible for the current policy architecture, where individual policies and measures have accumulated without overall coordination, resulting in the conflicts identified in the preceding section.

Called upon to decide a challenge against the emissions trading legislation in Germany, for instance, the Federal Administrative Court has clarified that “air” could never fall within the ambit of private property, and that, instead, the rules on emissions trading merely regulate the use of property “insofar as is necessary for the general interest.” In other words, the Court concluded that the emissions trading scheme was an appropriate, necessary and proportional means of protecting the global climate, and that it had merely led to the partial reorganisation of that specific area of law without infringing on the vested rights, both nationally and under Community law, of market participants.⁵⁸ Given the growing currency and media attention afforded to climate change in recent months, this perception is likely to have become more popular, providing the dogmatic basis for stringent and comprehensive management of greenhouse gas emissions in Germany.

2.2.3.2 Integrated Greenhouse Gas Management – Clinching the Objective

Any attempt to create an overarching framework for the management of greenhouse gas emissions will subsequently require the definition of uniform policy objectives. Not only is specification of a common purpose a prerequisite for the determination of substantive principles and regulatory instruments, but its very existence may also have a unifying effect on the subsequent implementation process. Clear objectives have therefore proven essential for effective governance of environmental challenges in the past.⁵⁹ Materially, however, these objectives will vary with the substantive scope afforded to the management scheme.

When deciding on the scale of the policy architecture, legislators will be called upon to make a strategic decision on its perimeters. Generally speaking, they can choose to either focus on greenhouse gas emissions and their limitation, or also include broader aspects of energy market regulation and its concurrent aims of

⁵⁷ See Federal Constitutional Court, Decision of 26 May 1998, Case 1 BvR 180/88, 51 *Neue Juristische Wochenschrift* (1998), 3264, at 3266 (translation by the author).

⁵⁸ See, notably, the judgment by the Federal Administrative Court (*Bundesverwaltungsgericht*), 30 June 2005 (BVerwG 7 C 26.04), affirming that the introduction of emissions trading violated neither European fundamental rights nor the provisions of the Basic Law.

⁵⁹ Rudolf Steinberg, *Der ökologische Verfassungsstaat* (Frankfurt am Main: Suhrkamp, 1998), at 171.

energy security and an affordable, competitive energy supply. Although inherently different from mitigation policies, in turn, measures to adapt to global warming could also be included within the ambit of a management regime.

In all cases, however, substantive guidance will follow from any quantitative reduction commitments entered under international or supranational law, helping define the level of ambition that needs to be pursued with the overall management scheme. By necessity, moreover, a management scheme will have to address central aspects of the energy sector, given that achievement of the foregoing reduction targets will be conditional on a gradual transition to sustainability through improved efficiency in the exploitation of energy resources as well as in the generation, conversion, distribution, and end use of energy, but also a shift in the structure of energy sources towards increased use of renewable energy.⁶⁰

Still, if the elaboration of a comprehensive management scheme is also meant to reduce tensions and conflicts between this scheme and other policies as well as within the scheme itself, it should aspire towards some general objectives of a systemic nature. Altogether, the management scheme should strive for the largest possible degree of consolidation and integration, ensuring the compatibility, consistency and complementarity of its various constituent policies and measures. With normative unity a central condition for the success of greenhouse gas mitigation, individual elements of this strategy must be deployed in conformity with the existing regulatory framework.⁶¹

By way of illustration, emissions reduction policies should be aligned with energy market rule to avoid tensions between the pursuit of a more sustainable energy supply and further market liberalisation. Ultimately, a comprehensive management scheme should avoid sending the contradictory signals relayed by current policies in place, and instead foster a high degree of harmony in its terminology, substantive goals and principles, and regulatory instruments. Another priority should be placed on curbing the excess regulation of earlier decades, reducing normative complexity and redundant bureaucratic obligations.⁶²

Clear, simple and transparent norms may help reduce administrative costs and also promote identification by their addressees, thereby improving the prospects for adequate implementation. Accordingly, a comprehensive management scheme could seek to streamline mandatory procedures and consolidate permitting requirements. Given the dynamic nature of climate change and evolving responses at the regional and international plane, finally, the management scheme should be sufficiently flexible to accommodate external change. In order to safeguard the

⁶⁰ For an overview, see Martin Jänicke and Tobias Wiesenthal, "Eckpunkte und Entwicklungslinien einer nachhaltigen Energiewirtschaft", 15 *Zeitschrift für Umweltrecht* (2004), 385, at 385.

⁶¹ See, for instance, Annex VIII No. 9 of Directive 2005/32/EC of the European Parliament and of the Council of 6 July 2005 establishing a Framework for the Setting of Ecodesign Requirements for Energy-using Products and amending Council Directive 92/42/EEC and Directives 96/57/EC and 2000/55/EC of the European Parliament and of the Council, OJ 2005 L 191/29.

⁶² Michael Rodi, "Instrumentenvielfalt und Instrumentenverbund im Umweltrecht", 15 *Zeitschrift für Gesetzgebung* (2000), 231, at 234.

coherence of the overall scheme, however, future amendments should be subjected to an appropriate assessment procedure designed to identify potential impacts, as should any legislation adopted by administrative entities based on powers conferred to them.⁶³

Such a Greenhouse Gas Management Act would ideally consist of a general part outlining the shared objectives, definitions, and principles, and a specific part focusing on individual sectors or issue areas, and the measures adopted within its ambit. In the general part, accordingly, the legislator could draw attention to mitigation commitments entered under international law and specify a global greenhouse gas reduction target, breaking this aggregate objective down to different sectors and activities. General principles could include a duty to take protective and preventive action against climate change, or the duty to use energy efficiently.

As for the selection of suitable instruments, the overall aim should be to arrive at a combination of different instruments capable of influencing individual and collective allocation decisions in line with the objectives defined earlier, and addressing all sources of greenhouse gas emission within the substantive and geographic scope of the Greenhouse Gas Management Act. All instruments currently in use or otherwise discussed for global warming mitigation are theoretically available, including:

- regulations and standards specifying mandatory abatement technologies or minimum requirements for pollution output;
- taxes and charges imposed on undesirable activity by a source;
- tradable permit schemes establishing a limit on aggregate emissions by specified sources and allowing trade among them;
- voluntary agreements between a government authority and one or more private parties with the aim of achieving emissions reductions beyond compliance with regulated obligations;
- subsidies and incentives awarded to an entity for performing a specified action;
- information instruments requiring public disclosure of environmentally related information, including labelling programmes and rating and certification systems; as well as
- research and development measures involving direct government funding and investment for innovative approaches to mitigation or the infrastructure of emissions reductions.⁶⁴

⁶³ As a suitable model for such an assessment, one might refer to the legislative impact assessment required by Section 44 of the Common Rules of Procedure of the Federal Ministries (*Gemeinsame Geschäftsordnung der Bundesministerien* – GGO), 26 June 2000, Legislative and Ministerial Gazette (*GMBI*) (2000), pp. 525 *et seq.*, as well as the creation of a special institution with the National Norm Review Committee Act (*Gesetz zur Einsetzung eines Nationalen Normenkontrollrates* – NKRK), 14. August 2006, BGBl. I (2006), pp. 1866 *et seq.*

⁶⁴ This list is based on the draft Working Group III contribution to the Intergovernmental Panel on Climate Change Fourth Assessment Report, *Climate Change 2007: Mitigation of Climate Change* (Cambridge: Cambridge University Press, 2007), Chapter 13.1.1, available on the Internet at: <http://www.mnp.nl/ipcc/pages_media/FAR4docs/chapters/CH13_Policies.pdf> (last accessed on 1 June 2007), and is by no means comprehensive.

Further instruments might include planning and impact assessment procedures as well as liability rules and criminal sanctions, to name but a few. In order to achieve the strategic objectives of greater consolidation and integration, however, it is imperative that these instruments be carefully screened on the basis of appropriate criteria prior to their inclusion in a Greenhouse Gas Management Act, in order to avoid inconsistencies, conflicts and regulatory overlap.⁶⁵ And this is the most challenging stage in the elaboration of a suitable instrument mix. Commonly cited criteria of policy choice, such as those outlined by the Intergovernmental Panel on Climate Change in consecutive Assessment Reports, are generally too formulaic and abstract to allow for the contextuality of selection processes and the manner in which policy instruments are both formulated and implemented within a sophisticated matrix of interests, procedures and institutional mandates as well as material legal constraints.

Accordingly, criteria such as environmental effectiveness, cost effectiveness, distributional considerations and institutional feasibility may provide initial guidance, but are unable to determine the outcome of any given selection process.⁶⁶ Additional criteria, such as market conformity, administrative and transaction costs, political acceptance and legitimacy, openness to innovation, and the degree of flexibility and reflexiveness, may also prove helpful, but are equally unable to place the choice of instruments on a purely rational, objective and universally acceptable basis. In that sense, scholars and decision makers will arguably face their most important task when it comes to identifying suitable selection criteria based on the actual necessities at hand, engaging in an interdisciplinary and practically relevant discourse.⁶⁷

2.3 Instrument Choice at the International Level

Past decades have seen an astounding proliferation of international arrangements in the area of the environment. A widespread perception that these have proven only marginally successful sparked growing interest, both institutional and academic, in the conditions and requirements of improved environmental governance. Over time, this shift in attention from the design of new international environmental arrangements to their evaluation and improvement has elicited a number of individual and collaborative research efforts across academic disciplines, producing a

⁶⁵ See, for instance, European Commission, *Green Paper on Market-Based Instruments for Environment and Related Policy Purposes*, 28 March 2007, COM(2007) 140, at pp. 8 *et seq.*

⁶⁶ Gawel, *supra* note 38, at 9, affirms that such theoretical criteria suffer from insufficient information on complex chains of causality, physical damage functions, persuasive valuation criteria based on contingent perception of utility, and macroeconomic costs of reallocating production factors to environmental protection, all rendering such welfare-based approaches to the description of instruments “at best a general reference system depicting ideal conditions in society” (translation by author).

⁶⁷ See, for instance, Rodi, *supra* note 62, at 241.

wealth of output and generating intense debate. In effect, 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.⁶⁸ 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.⁶⁹

But even within these narrow categories, terms 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. Research on the effectiveness of international environmental governance, for instance, was initially prompted by a shared concern about the ability of cooperative arrangements to influence state behavior, and hence focused on issues of regime design and improved compliance management. But definitions of what exactly constitutes “effective” governance differed widely in earlier research, with some authors merely seeking behavioral change or observable political effects, 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. Although later research has become more critical 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 behavioral or physical change.

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. 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.

⁶⁸ Michael Zürn, “The Rise of International Environmental Politics: a Review of Current Research”, 50 *World Politics* (1998), 617–649, at 649.

⁶⁹ 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* (Cambridge: MIT Press, 2008), 79–114.

Overall, there can be little doubt that our comprehension of international environmental cooperation has been greatly advanced, from the earliest stages of diplomatic negotiations to the final application and enforcement of individual arrangements. Nonetheless, studies of regime performance have so far failed to yield a set of clear and robust generalizations about the conditions for successful environmental governance. In particular, aspects other than compliance and effectiveness, such as economic impacts, fairness, and legitimacy, have received less systematic consideration in the absence of large, integrated research networks. Future work is likely to address such remaining gaps while further improving the clarity and transparency of analysis. Standardized definitions of key concepts, more rigorous comparison of findings across projects and disciplines, and use of advanced methods such as statistical analysis, simulations, and integrated case studies will help aggregate cumulative knowledge about the dynamics that affect regime formation and implementation. In the meantime, however, the research agenda remains heterogeneous, underscoring the earlier assertion that no single approach can capture the diverse ways of looking at international environmental cooperation, calling instead for a case by case determination of suitable evaluation criteria.

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 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. Comparisons across surveys become virtually impossible.