1

Introduction

The Concept of Smart Mixes for Transboundary Environmental Harm

Judith van Erp, Michael Faure, Jing Liu, Markos Karavias, André Nollkaemper and Niels Philipsen

1.1 INTRODUCTION

The complex nature of transboundary environmental problems, such as global warming, ozone depletion, land degradation, oil pollution and biodiversity loss, and the risks associated with such problems, pose a fundamental challenge to policy makers worldwide, namely that of designing an effective global environmental governance system.

An important part of the quest for such a governance system, though one that has been recognised only relatively recently, consists of finding 'smart mixes' of regulatory instruments. We define this term in Section 1.2, but at this stage already note that the idea is that particular combinations of instruments may work better than others.

An example of such a smart mix constitutes the combination of safety regulation and civil liability in the US Oil Pollution Act (OPA). Normally, under the OPA the civil liability of tanker owners is limited to a financial cap. However, a responsible party can lose its right to limitation if the incident was caused by the violation of an applicable federal safety, construction or operating regulation. The construction of the civil liability regime therefore provides incentives for compliance with safety regulations intended to prevent oil spills.[1]

The emergence of the notion of smart mixes is one further stage in the development of modern environmental regulation. This development is intimately linked with the realisation that many environmental problems are transboundary in nature. Initially, such problems arose from the use of transboundary resources (such as rivers), or from the movement of pollutants across national boundaries. The advancement of science gradually generated concern over problems of a wider reach, namely global commons problems, such as the depletion of the ozone layer,

[1] See Chapter 13.

climate change, biodiversity loss or depletion of fish stocks. This has led to the expansion of the scope of environmental law from domestic to international to global.

Parallel to the expansion of the scope of environmental law to address transboundary and global problems, a wider variety of regulatory and governance actors and instruments has emerged. Traditional top-down command-and-control rules prohibiting or restricting environmentally harmful industrial activities[2] have been supplemented by a diverse spectrum of regulatory approaches. Gradually, starting in the mid-1980s a shift took place in the way of thinking about environmental law, both on the international and domestic plane. The ascent of a neoliberal thinking gave birth to the assumption that environmental problems, previously thought to require direct state intervention, could also be solved by (combinations of) deregulation, privatisation, voluntarism, outsourcing, and/or the use of market and suasive mechanisms.[3] This assumption has affected the character of environmental policy instruments, and a diversification of instruments has occurred, both at the domestic and international plane. This can be illustrated by the fact that in 1992 a call for the 'effective use of economic instruments and market and other incentives' was included in chapter 8 (C) of the UN's Agenda 21 for sustainability.[4]

Second, the emergence of global value chains, and other forms of increased connectivity – such as the current revolution in forms of information technology – have facilitated and stimulated private forms of regulation.[5] Thus, private actors (such as corporations, NGOs, regulatory intermediaries[6] and citizen initiatives[7]) and transnational networks have assumed key roles alongside states. A constellation of private environment-related instruments has emerged, such as standardisation instruments, certification/labelling schemes, transparency initiatives and corporate codes of conduct. The coexistence of the regulatory state, with its proliferating private or hybrid modes of regulation, has led to a pluralist environmental governance system.[8]

In sum, transnational environmental governance conjures an image of polycentricity. A diversity of international and domestic laws and regulations operate in parallel with market-based and suasive instruments and private standards promulgated by nonstate entities, and private actors operate alongside state actors and international organisations.

[2] Gunningham (2009).
[3] For a detailed classification of instruments, see Gunningham, Grabosky & Sinclair (1998), at 37–92.
[4] United Nations Conference on Environment & Development, Agenda 21, Rio de Janerio, Brazil, 3–14 June 1992, (Agenda 21), https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf.
[5] Auld (2014).
[6] Abbott, Levi-Faur & Snidal (2017).
[7] Trevisanut (2014).
[8] See *inter alia* the contributions to Van Rooij, McAllister & Kagan (2010).

Despite – or perhaps because of – this polycentricity, the success of environmental governance remains modest, as evidenced by the state of the natural environment. Scholars have responded by engaging in empirical analyses of the effectiveness of a number of international environmental treaties, regimes,[9] and regulatory instruments.[10] While for a long time the effectiveness of the treaties and instruments was examined in isolation, scholarly approaches are increasingly responding to the increased pluriformity and complexity of the global regulatory landscape. A growing body of international law scholarship is shifting the focus from single regulatory instruments to more holistic analyses of interactions between regulatory institutions and between various levels of governance – international, state, local and within markets – as all of these contribute to the environmental outcome.[11] An important contribution is made by the scholarship on regime complexes, which studies complex and interwoven institutional landscapes consisting of nested, overlapping and parallel regimes.[12] This scholarship often views regime complexity as a source of ineffectiveness, as it finds that the interconnected and interdependent character of different regimes governing the same subject area generates a variety of problematic interactions, results in suboptimal outcomes, and creates a variety of structural opportunities for actors to strategically exploit regulatory diversity to further their self-interest. This raises the question of whether international governance interactions can also create positive incentives for environmental protection. For example, the rise of global value chains and other forms of international connectivity enables more stringent regimes to cast 'shadows of hierarchy' to less stringently regulated areas.[13]

This volume is induced by the quest for positive regulatory interactions and proposes that conceptions of 'smart regulatory mixes'[14] may enable an analytical way forward. The idea behind smart regulation is that various regulatory and governance instruments, both public and private and both international and local, can be combined into mixes of complementary instruments and actors, tailored to the specific needs of the situation. Such a 'smart mix' approach acknowledges that all environmental policy instruments taken separately (for example, liability rules,

[9] See Sand (1992); Young (1999).

[10] Early research tended to assess instruments independently, and, thus to conceptualize policy design as a zero-sum option. The question was often reduced to the superiority of one instrument to another in certain situations. See Howlett (2004), at 2–3; Woodside (1986), at 775–793. Later research incorporated the effectiveness of a combination of a variety of policy instruments. See *inter alia* Faure (2012).

[11] Winter (2011); Eberlein, Abbot, Black, Meidinger & Wood (2013).

[12] Raustiala & Victor (2004); Alter & Meunier (2009); Orsini, Morin & Young (2013).

[13] Borzel & Risse (2010, 2016).

[14] The concept of Smart Regulation was initially coined by Gunningham, Grabosky & Sinclair (1998).

taxation, emission trading or command-and-control regulation) have particular limitations,[15] thus justifying a need for a combination of instruments. A smart mix combines multiple instruments or programmes that interact; and can engage a wide circle of actors and networks.

The concept of 'smart regulation' does not necessarily mean that instrument mixes can easily be purposively designed. In situations of polycentric governance, combinations of institutions and actors emerge spontaneously and interact, often in unexpected and unintended ways, within governance networks. Governance arrangements are path-dependent, and their impact is context-specific and depends on the specific institutional, social, economic and environmental conditions. The idea that regulators could rationally and independently select and combine instruments out of a toolbox, or that regulatory mixes could be purposefully designed by a central actor, is mostly a fiction.

However, this does not mean that attempts to coordinate and orchestrate the interaction of instruments are entirely fruitless. Social change occurs through accident, evolution or intervention, and mostly through a combination of these three processes.[16] Although, as Goodin stated, 'institutions are often the product of intentional activities gone wrong', at least some form of intentionality almost always plays a role. Thus, studies oriented towards institutional design should acknowledge the multiplicity of designers and interactions of their intentions rather than advocating a Grand Design.[17]

This project is grounded in the conviction that a better understanding of instrument interactions can contribute to institutional design that is tailored to a specific situation where the need for environmental regulation arises. The contributions to this volume attempt to draw lessons from the experiences that have been gained with existing instrument mixes. These suggest that some instrument combinations are more effective than others; certain conditions are more beneficial to the emergence of smart mixes, and some actors have more effective strategies than others. Future instrument mixes can benefit from these lessons, whether they are purposively designed or incrementally shaped and reshaped.

This volume will look specifically into four key areas of environmental concern, namely deforestation, greenhouse gas emissions, overfishing and marine oil pollution. Of course, the selection of four areas as the testing ground of smart regulation evokes the question of context. The causes and drivers for each of the four threats to the environment vary highly, and therefore the appropriate strategy to address them will likely be context-specific. Other studies have also found that outcomes of regulatory instruments are influenced by the political and institutional context of

[15] See Faure (2014), at 690.
[16] Goodin (1996).
[17] Ibid.

specific countries[18] and the composition of the particular market[19] in which these instruments operate. This entails that conclusions about what constitutes a smart mix of instruments are necessarily context-specific. Therefore, this volume does not aim to identify 'the' optimal mix that would apply to all scenarios. Rather, it will seek to establish whether, in particular contexts, existing 'mixes' of forms of regulation and instruments in relation to the aforementioned four areas of concern have been 'smart' in addressing both the causes of environmental pollution and drivers for its prevention.

Identifying 'smart mixes' in a context-sensitive way has several benefits. First, the identification of such mixes may inspire a shift of research paradigm from the choice among regulatory strategies to the interaction between regulatory strategies.[20] Second, it may provide valuable insight into the design aspects of mixing forms of regulation and instruments that prove effective in a particular context. Finally, it may allow for a context-specific understanding of the role of nonstate entities within the framework of global environmental governance. Thus, the focus on smart mixes brings a complementary, yet distinctive, focus to the field of transnational environmental law and governance, and possibly also beyond that, to regulatory theory.

1.2 THE CONCEPT OF 'SMART MIXES'

The concepts of 'smart mixes' and 'smart regulation' were introduced by Gunningham and Grabosky in their seminal book in 1998,[21] and have been widely adopted since. 'Smart regulation' departs from a broad interpretation of 'regulation' that is not limited to state-based law[22] but also includes self- and co-regulation and a wide variety of other forms of social control exercised by business and NGOs.[23] 'Regulation' thus can take various forms: international treaties; domestic law; private standards; economic incentives; transparency and information disclosure; and procedural rights. 'Smart regulation' thus fits in the broader shift from 'government' to 'governance' in networks of states, businesses and civil society.[24]

Essential to smart regulation is the idea that the *combination* of regulatory instruments and actors is often more effective than a single instrument, and that instruments can be complementary. Since most instruments and actors have strengths and weaknesses in specific circumstances, combining instruments and regulatory actors into a mix allows them to take advantage of their strengths while

[18] Liu, Faure & Mascini (2017).
[19] Auld (2014).
[20] Cf. Eberlein et al. (2013).
[21] Gunningham, Grabosky & Sinclair (1998).
[22] Gunningham (2009).
[23] Gunningham & Sinclair (1999), at 49–76.
[24] Gunningham (2009); Howlett & Rayner (2004).

compensating for their weaknesses.[25] For example, command-and control regulation may be dependable and predictable, but also inflexible and inefficient; economic incentives, on the other hand, are generally flexible and efficient, but less dependable. Smart mixes combine instruments tailored to specific environmental goals and circumstances. They also can balance coercive and noncoercive regulatory techniques, and organise public regulation in such a way that it mobilises, facilitates and supports third-party regulation and informal social control.

Precisely because there is no one single instrument that can be considered as the silver bullet that would solve all environmental problems, smart regulation necessarily entails a search for smart mixes of instruments. The challenge for regulators and policy makers is thus to assess how the regulatory instruments and other governance initiatives regarding a certain environmental problem interact, and, where possible, to coordinate and orchestrate this interaction to stimulate a productive and compatible mix in a particular context.

A 'smart mix' does not necessarily include many instruments.[26] If too many instruments are included, there is a risk that the mixing of instruments simply results in a 'messy mix', rather than in a 'smart mix'.[27] Some instruments are even inherently incompatible and will turn out ineffective or even counterproductive when combined, such as command-and-control regulation imposing fixed performance levels on industry, in combination with economic instruments, such as tradable pollution rights. As performance standards limit choice, and tradable rights enable flexibility, their combined outcome will be at least suboptimal.[28] Other combinations, however, such as industry self-regulation backed up by command-and-control regulation, may be complementary.[29]

Smart combinations of instruments do not only appear between different policy instruments at the domestic level, but also between different levels of governance. One could, for example, imagine a combination of standard setting at the international level (for example, by a treaty aiming to reduce overfishing) with an implementation at the domestic level via regulatory standards, quotas and certification by the Marine Stewardship Council (MSC).[30] Therefore, one needs to examine how different forms of regulation and instruments incorporate, promote, limit or replace one another, also at different levels of governance.[31] To some extent, of course, most environmental treaties rely on domestic implementing measures; therefore, a combination of instruments is inherent in international regulation.

[25] Gunningham & Sinclair (1999).
[26] Ibid.
[27] See Peeters (2014), at 173–192.
[28] Gunningham & Sinclair (1999).
[29] Gunningham, Grabosky & Sinclair (1998).
[30] See Stokke (2012); Garcia, Rice & Charles (2014).
[31] See Stewart (2008), who indicates that the distinctive characteristics of international environmental regulation also affect the instrument choice in the international context.

However, this does not necessarily mean that all combinations of international and national (implementing) law and regulations are necessarily productive; and in that respect, the concept of smart mixes may have conceptual traction to help us identify which combinations do or do not work.

The concept of 'smart regulation' has been adopted by various states and supranational authorities – though mostly without using that very term. One particularly influential adoption of a 'smart' approach is perhaps in the UN Guiding Principles on Business and Human Rights, implementing the UN's 'Protect, Respect and Remedy' Framework.[32] An express application can be found in the Canadian Smart Regulation initiative (2005).[33] 'Smart' and 'better' regulation also are often used in the context of deregulation in policy practice,[34] although this is far from the original purpose of these ideas.

In further clarifying the concept of smart mixes, we will identify four aspects of the concepts: the elements of the mix; forms of regulation; policy instruments; and the emergence of mixes.

1.2.1 *The Elements of the Mix*

A wide variety of mixes can be thought of, such as mixes of actors, levels of governance and institutional structures. As alluded to in Section 1.1, this volume will focus on (1) the forms of regulation – law versus private instruments, (2) the level of regulation and (3) the specific policy instruments. The three dimensions are interconnected. Thus, a specific policy instrument, whether command-and-control, market-based or informational, may be included in an international treaty, a domestic statute or a set of private standards. Of course, certain policy instruments, such as permits and environmental taxes, can only be adopted by States and thus will necessarily form part of the law. Many others, however, can be instituted either by States, private actors or both, such as certification and performance/process standards.

1.2.1.1 Forms of Regulation

Demarcating lines are often drawn between regulation by law (whether international or domestic), as the quintessential forms of public regulation, and private standards or guidelines, promulgated by corporations or NGOs. The latter category is sometimes called 'soft law' to distinguish it from formal legal rules, but that term is rather inaccurate as in reality, private regulation cannot be labelled as 'law', and it

[32] www.ohchr.org/Documents/Publications/GuidingPrinciplesBusinessHR_EN.pdf, also see Eijsbouts (2013).
[33] Hanebury (2006), at 33–63.
[34] Wood & Johannson (2009).

may also be far from 'soft'. Preferred-buyer agreements imposing private standards on suppliers in global value chains, reputational sanctions invoked by NGOs or media publicity or the threat of withdrawal of a certificate may exercise stronger influences on behaviour than formal public regulation. Especially in the area of transnational environmental problems, the capacity of states to regulate and enforce vis-à-vis transnationally operating actors may be limited, and nonstate monitoring and enforcement may have important added value.

Dichotomous conceptions of relations between international law, domestic law and private regulation make for blunt thinking about the modalities and actors involved in environmental governance. It appears that international law and private standards constitute two ends of the spectrum, between which a host of innovative and collaborative hybrid forms of regulation exists. In other words, public, private and hybrid forms of regulation interact on all levels of governance. This phenomenon has been examined in the governance literature under the heading of the 'layering of rules'.[35] Analyses of 'smart regulation', should take into account how law relates to other forms of regulation and governance, both public and private, and both domestic and international, to enable insight on the significance of the law in the wider context of environmental governance.

One particular question with regard to the relation between public and private forms of regulation, and between international and domestic law and institutions, concerns the role of state law. Whereas the state has traditionally been considered to have exclusive regulatory power, modern and pluralist forms of regulation have introduced many other nonstate, private, hybrid and supranational regulatory actors, as well as broad governance regimes, leading to the question if the state is just 'one actor among many' or still 'primus inter pares'.[36] How important is state law in a smart mix of regulatory initiatives? Does it exercise a 'shadow of hierarchy' and is that a necessary component in a smart regulation regime, or can 'governance without a state'[37] work, and under what circumstances? As previous research has shown, it is most likely that public and private regulation need to complement or even reinforce each other, as each has its own strengths and the one cannot replace the other.[38]

The transnational environmental governance literature has pointed out that the role of state law changes in a transnational governance setting from 'command and control' to orchestration and participation in governance networks.[39] This gives more prominence to the question, as formulated by Auld,[40] 'how the diversity of private governance processes interact with the diversity of intergovernmental

[35] On the concept of 'layering', see Bartley (2011), at 517–542.
[36] Gunningham (2009).
[37] Borzel & Risse (2010).
[38] Liu, Faure & Mascini (2017).
[39] Abbott & Snidal (2009), at 501–576.
[40] Auld (2014), at 250.

processes that are directly or indirectly affecting a particular social or environmental problem'. State law can be an important form of directive orchestration, by, for example, relaxing legal requirements for firms that adhere to transnational CSR schemes, by imposing requirements on standard setting arrangements and their monitors, or by threatening with mandatory regulation. Nevertheless, states often lack the authority, power, and administrative capacity necessary for directive orchestration, and more facilitative forms of orchestration are more likely to be successful in the transnational arena. These can range from subsidising NGOs to convening actors to providing knowledge and technical assistance to transnational standard-setting bodies. However, some authors question the ability of states to effectively steer and orchestrate at all (see Chapter 3).

1.2.1.2 Policy Instruments

Public, private and hybrid regulation can be further broken down to specific policy instruments. Among various ways to categorize instruments,[41] this volume will distinguish between substantive and procedural instruments and, within the category of substantive instruments, between command-and-control regulation, market-based economic instruments and suasive instruments.[42] The substantive instruments essentially target polluting behaviour that has direct environmental implications. The procedural instruments only indirectly impact the environment by establishing/supporting institutions or by targeting third parties, whose behaviour in turn influences the behaviour of polluters.[43]

[41] There are mainly two approaches of classification: the 'resource' and the 'continuum' approach. According to the former, the instruments are categorised according to the resources actors use in the governing process, such as nodality (information), authority, treasure and organisation. See Hood (1983). The latter approach ranges the instruments against some choices government/actors must make in the implementation process. See Dahl & Lindblom (1953). See further, Howlett (1991), at 2–4, in which the author argues that the first approach focuses on the differences between instruments and their technical aspects while the second focuses on the similarities and the contextual aspects.

[42] Typologies and classifications abound. Vedung differentiates between sticks, carrots and sermons, Bahr uses the typology of command-and-control, economic and suasive instruments, whereas Wurzel adopts the category of regulatory, market-based and suasive instruments. Cf. Vedung (1998), at 21–58; Bahr (2010); Wurzel, Zito & Jordan (2013). On the international level, Sand (2003) has referred to sticks, carrots and games. Bodansky (2010) refers to command-and-control measures, informational measures and market-based approaches. A similar approach is used by Sands & Peel (2012) and Stewart (2008). See also Wiener (1999).

[43] According to Howlett, substantive instruments directly affect 'the production and delivery of goods and services in society', including advice, training, licenses, grants, taxes, administration, public enterprises, etc. Procedural instruments are 'designed to indirectly affect outcomes through the manipulation of policy process', including information provision/withdrawal, treaties and commissions creation, interest group funding/creation, government reorganisation and so on. Howlett (2000), at 412–31.

TABLE 1.1 *Elements of a Mix*

		Public Regulation		Private/Hybrid Regulation
		International Law	Domestic Law	
Substantive Instruments	Command and Control	Process Standards ('driftnet fishing' ban) Product Standards ('double hull' tankers under MARPOL) Emission Standards (atmospheric emissions from aircraft)	Permits/Licences/ Performance/ Process-Related Standards Zoning/Planning Regulation Generally	Performance/ Process-Related Standards Planning
	Economic Instruments	Emission Trading Schemes International Law Rules on Liability Investment Incentives (under the CDM)	Environmental Taxes Emission Trading Schemes Subsidies/Public Procurement Policies Liability and Property Right–Based Instruments	Emission Trading
	Suasive Instruments		Public Voluntary Agreements Certification	Certification Environmental Management and Audit Schemes, Codes of Conduct CSR
Procedural Instruments		Access to Information/ Information Disclosure (cf. the obligation to conduct an EIA) Public Participation Access to Justice	Access to Information/ Information Disclosure Public Participation Access to Justice	Access to Information/ Information Disclosure Public Participation Access to Justice

We summarize the various options in Table 1.1, which shows that the substantive instruments can increasingly be found at all the different levels (international/domestic/private or hybrid). For example, command-and-control types of instruments specifying required or prohibited conduct for particular regulated actors[44] can have their origins at the international level (for example, the phasing out of so-called single-hull tankers to prevent oil pollution), but also at the domestic level

[44] Stewart (2008), at 150.

(via permits, zoning and planning) but to some extent in private or hybrid regulation as well. The same is the case for economic instruments. Incentive systems that impose a price or opportunity cost on a unit of pollution[45] can, for example, be found in the international climate change regime, but also in international treaties governing liability rules. Taxation, emission trading and subsidies can also be found at the domestic level, and economic incentive systems are, to an important extent, also incorporated in private or hybrid regimes. This shows the enormous potential of mixes, both between different instruments and between different levels of governance.

1.2.2 *The Emergence of 'Mixes'*

When various instruments apply to the same environmental problem, they interact into a mix. In their seminal analytical framework on transnational business governance interactions, Eberlein et al. distinguish four forms of potential interaction between governance instruments: competition; coordination; cooptation and chaos. Competition between regulatory governance instruments can take the shape of competition for price (certification schemes); products (more or less stringently regulated); reputation; or participants. Competition, it has been argued, leads to a race to the top *or* bottom: both effects can occur depending on the circumstances and actors. Coordination can occur out of deliberate design and negotiations between governance actors,[46] but also through exchange and learning. Cooptation occurs when a governance actor or instrument increasingly dominates the other or when norms converge through meta-governance. Last, chaos is related to unpredictable and undirected interactions and regime complexity. These characterisations are not static, but dynamic, as the character of interactions is likely to change over time.

The focus on 'instruments' as a central concept in this volume brings along a specific interest in the dynamics and development of instruments, rather than a static perspective. Path dependencies are a source of both stability and dynamic change, as they generate advantages for some actors, processes and interests.[47] Instruments may evolve through processes of experimentation and learning,[48] as well as through exercise of power and contestation.[49] For example, as they develop, certification schemes can change from voluntary and suasive to more controlling and coercive as market pressures leave producers less and less choice over the course of time as the certificate gains significance. Thus, the actual working mechanism of an instrument is not given by nature, but depends on how it is constructed and enacted. This volume takes a specific interest in the pathways through which

[45] Ibid., at 151.
[46] Von Moltke (2011).
[47] Auld (2014).
[48] Overdevest & Zeitlin (2014).
[49] Auld (2014).

instruments and instrument mixes evolve. Chapter 7 on fishery, for example, shows that private certification institutions like the Marine Stewardship Council (MSC) have played a considerable role in influencing the management of transboundary fish resources in regional fisheries management organisations. However, the pathways through which MSC has attempted to create change very much differed depending upon, *inter alia*, the specific structure of the regional fisheries management organisation involved. The chapter shows that the pathways used (in this case by private organisations) to reach particular goals may therefore diverge in practice.

The prevailing focus in 'smart regulation' literature is on the *design* of smart regulatory mixes, as is also reflected in the formulation of 'design principles'.[50] Although examples exist of deliberately designed transnational environmental regulatory governance arrangements, such as the EU's FLEGT VPAs,[51] many regulatory mixes emerge spontaneously as regulatory instruments and actors interact and integrate in the course of their operation. More particularly in the area of transboundary regulation, a 'grand design' is not very likely, as this would require a powerful supranational actor or at least a high degree of consensus among participants on the best governance regime. These conditions are often absent in international settings: the 'orchestration deficit' is, in fact, considered the greatest limitation to transnational 'new governance',[52] as the lack of orchestration leads to suboptimal outcomes in the sense that private regulation is not optimally aligned to the public interest.

The optimism that smart regulation breathes about the potential of regulatory design has been subject to critique by authors who argue that smart-regulation literature fails to acknowledge political interests and institutional limitations.[53] For example, Von Moltke has argued that while a merger of various environmental regimes and treaties governing the same subject area – such as climate change, maritime pollution or air pollution – would have obvious gains in terms of coordination, the interests of organizations and stakeholders of each treaty inhibit the merger – or even the clustering – of instruments, and have made this politically impossible.[54] Similar resistance can be found with regard to public-private governance mixes: in an overview of several case studies of CSR throughout the world, business organisations are consistently found unwilling to engage with public regulators: instead, they prefer to keep private governance private. Businesses' opposition to smart mix regulation suggests that the metaphor of a partnership is seriously misguided and that, in reality, the relationship between public and private regulators is often 'dysfunctional'.[55] In addition to political opposition from

[50] Wood & Johannson (2009); Gunningham & Sinclair (1999).
[51] Trubek & Trubek (2006).
[52] Abbott & Snidal (2009).
[53] Baldwin & Black (2008); Hanebury (2006).
[54] Von Moltke (2011).
[55] Kinderman (2016).

businesses, institutional factors – such as limitations to regulatory competence; poor instrument fit with the existing regulatory style; and dependencies on other regulators – may limit the available instrument options. These constraints are likely to result in a much more limited 'menu' of instruments to choose from and combine than that imagined by smart regulation theory, and in some situations, it may even be impossible to achieve a smart mix.[56] Last, path dependencies play a role in the selection of instruments, their competition and survival, and their evolution.[57] Existing characteristics of markets, political systems, and other institutional factors may influence how mixes of regulatory instruments are composed, how actors perceive the costs and benefits of compliance and participation, and how effectively they function in their specific context.

The contributions to this volume take this critique into account by paying attention to the dynamics in the development of regulatory mixes, including path dependencies, institutional constraints, and the role of power. In general, this volume departs from the prevailing focus on the deliberate design or even manipulability of smart mixes in 'smart regulation' literature. Instead, it takes a more bottom-up approach by asking – quite irrespective of the question of design – whether, and in what respect, certain mixes that have emerged are smart, as well as how instruments play out in local circumstances; and what their unintended consequences are – both positive and negative. In other words, rather than looking for evidence from a positivist perspective, we take a constructivist perspective by studying regulatory mixes as social constructions, shaped through interactions in dynamic institutional structures and by the meaning they have for different actors in different circumstances.[58]

As indicated previously, this volume does not presume that mixes of instruments are the product of deliberate design. Instead, it asks how regulatory mixes have emerged, by whom and to what extent attempts at orchestration have been carried out and why they have been successful. Although instrument mixes may sometimes be the result of effective orchestration, they presumably are more often a question of experimentation or 'bricolage' and sometimes this may even simply be uncoordinated. In particular, the involvement of NGOs cannot always be controlled by state or international actors. This is not to say, however, that the outcomes and impacts of unplanned mixes cannot be 'smart' and effective.

1.3 EVALUATING THE 'SMARTNESS' OF THE MIX

The fundamental concept around which this volume revolves is that of the 'smartness' of the mix. Scholars have used a variety of criteria to evaluate environmental

[56] van Gossum, Arts & Verheyen (2010).
[57] Auld (2014); Auld, Renckens & Cashore (2015).
[58] Reus-Smit (2005).

governance or instruments. For example, economists usually focus on efficiency and effectiveness,[59] and political scientists and lawyers explore legitimacy, coherence, equity and unintended effect.[60] This volume chooses *effectiveness* as the primary criterion: we define the 'smartness' of a regulatory mix ultimately by its effectiveness, as it provides a direct evaluation of the practical influence of a mix.[61] Where necessary and relevant, other and related criteria will be used, such as coherence, efficiency, unintended effects, legitimacy and the adaptability of the instrument mixes.[62]

1.3.1 *The Criterion of Effectiveness*

The goal of this volume is to examine whether mixes of regulation and other instruments can contribute to the improvement of the quality of the environment. We thus view effectiveness of a mix of instruments primarily in terms of its impact, in terms of its contribution to the sustainable (rather than just temporal) reversal or alleviation of an environmental problem (*problem-solving effectiveness*). Therefore, the key and final criterion in evaluating the overall effectiveness of a mix is the degree to which it contributes to environmental problem solving.

This notion of effectiveness comprises elements of several common conceptualisations of effectiveness, in particular effectiveness in terms of output and outcomes.[63] The output of a regulatory arrangement refers to the extent of compliance with legal obligations (*legal effectiveness*). Outcome refers to the ability of a mix to induce states, private actors and individuals to modify their behaviour (*behavioural effectiveness*). Problem solving introduces a more dynamic perspective, in which effectiveness is not limited to predetermined goals but also includes overcoming negative side effects or new problems that have emerged as a result of an instrument mix. Obviously, outputs, outcomes and impacts are closely related. They may constitute 'three distinctive steps in a causal *chain* of events, where one serves as a starting point for analysing the subsequent stages'.[64]

In an ideal scenario, assessing the effectiveness of instrument mixes would require a point of reference against which observed outputs, outcomes and impacts can be compared.[65] Obviously, however, transnational environmental problems and their governance mechanisms are entirely unsuitable for the application of the social scientific 'gold standard' of randomized controlled trials. For some environmental

[59] Richards (2000), at 222.
[60] Cf. Howlett & Rayner (2007), at 1–18; Meidinger (2002); Oikonomou et al. (2014). The adaptiveness, accountability and legitimacy of governance structure have received intense attention under the Earth System Governance Project. See Biermann et al. (2009).
[61] Cf. Mitchell (2008).
[62] Mintz (2014).
[63] Mintz (2013).
[64] Underdal (2001).
[65] Mitchell (2008), at 897.

problems, data are available that enable the measurement of developments in environmental quality, such as air quality or levels of (de)forestation. However, the reliability of these data is not always obvious, particularly in nondemocratic regimes or remote and inaccessible ecosystems. Also, it is not always possible to establish a causal relation between a regulatory regime and its effects, such as reduction of environmental harm. Comparing different situations with varying regulatory mixes is often impossible given the complex and context-specific nature of environmental problems and arrangements.[66] In addition, changes in environmental quality are long-term processes, and it is hardly possible to isolate the contribution of concrete instruments and instrument mixes from other factors contributing to improvements or deterioration of the environment, as well as to assess the resilience of positive outcomes over time. The effectiveness of regulatory instruments is also a dynamic question: certification schemes, for example, may have high take-up upon initiation, but face the challenges of exit and free riding over time.[67] On the other hand, competition between instruments can lead to ratcheting up of standards, mutual learning and convergence.[68] All in all, any assessment of effectiveness therefore usually contains many provisional claims, caveats, limitations and contextual restrictions, and caution should be exercised when claiming 'success'.

Despite the popularity of the concept of 'smart regulation' in environmental policy and beyond, surprisingly few studies have provided concrete examples and analyses of smart mixes in terms of effectiveness. However, several case studies of smart mixes have provided examples of effective and less effective instrument mixes. Van Erp and Huisman[69] analysed how the regulation of disposal of electronic waste moved from a legal prohibition of exporting hazardous waste directed towards the single target group of exporters, to a mix of preventative interventions directed towards a variety of partners in the supply chain of electronic waste. Supranational regulation in the shape of EU directives – obliging manufacturers to substitute harmful and toxic material with safer alternatives – was complemented with self-regulation through an industrial code of conduct. In addition, and uncoordinated by public regulators, Greenpeace undertook the initiative towards naming and shaming manufacturers with suboptimal disposal policies, which is likely to have stimulated corporate adherence to legal and industry norms.

Another case study (by Howlett and Rayner), this one of Canadian shellfish aquaculture,[70] reveals that economic incentives are not particularly suitable for industries with large amounts of Small and Medium-Sized Enterprises (SMEs), while these are important players in the move towards more sustainable fishery. SMEs do not always have the capacity and communicative structure to receive,

[66] Liu, Faure & Mascini (2017).
[67] Auld (2014).
[68] Eberlein et al. (2013).
[69] Van Erp & Huisman (2010), at 579–590.
[70] Howlett & Rayner (2003).

process and respond to information about economic incentives. Also, industry–government partnerships require the participation of industry associations, and thus depend on their effective organization, as SMEs are too small in themselves to organize partnerships. Smart regulation is often directed to including large organized private actors and supranational bodies, but fails to involve small businesses and citizens, who are important in realizing sustainability and preventing environmental damage on a day-to-day basis.[71]

This volume will add to these early studies by providing case studies and analyses in the areas of fishery, forestry, climate change and oil pollution. We will analyse various mixes between instruments in these areas (either international and domestic and/or between various policy instruments) and will assess to what extent these mixes can be considered 'smart' in terms of effectiveness.

1.3.2 *Coherence, Efficiency, Unintended Effects, Legitimacy and Adaptability as Criteria for Smart Mixes*

While the goal of this volume is to examine whether mixes of instruments can contribute to the improvement of the quality of the environment, many of the contributions to this volume demonstrate that effectiveness is closely intertwined with other criteria such as coherence, efficiency, legitimacy, the absence of unintended negative effects and adaptability. Where such criteria are related to effectiveness, the contributions in this volume also use these criteria and their contribution to the effectiveness of instrument mixes.

The coherence of an instrument mix is a particularly relevant issue when studying combinations of instruments. The parallel operation of two or more forms of regulation or instruments gives rise to problems of coordination. They may complement or antagonize each other, which would make their combined effects deviate from the aggregate of effects that result when these instruments are used individually.[72] In this light, coherence assumes a significant role in securing the 'smartness' of the mix. This is particularly the case with instruments targeting the same activities and actors. For example, both public regulation and forest certification regulate the forest management activities of forest owners and operators. Both include specific standards regarding riparian buffer zone, biodiversity protection, forest tenure and so on. Whether the multiple layers of standards are conflicting or consistent with each other influences the behaviour of forest owners and hence the extent to which the problem solving occurs.

Using coherence as an evaluation criterion directs the attention to the relation between policy instruments. With regard to this relation, scholarship on international regime complexes (IRC) may provide useful insights. Like smart mixes,

[71] Wood & Johannson (2008).
[72] Simões, Huppes & Seixas (2005).

regime complexes are combinations of different relations. Relations between regimes can have a 'nested' character when one institution is hierarchically superior over others, or they can be overlapping, when different regimes in different issue areas possess authority over the same behaviour without being mutually exclusive or hierarchical.[73] Keohane and Victor have added the concept of 'loosely coupled' regime complexes being positioned in between highly fragmented and highly integrated regime complexes, and being neither nested nor overlapping.[74] Transnational climate change, for example, is highly fragmented, with multiple regimes regulating different subtopics around the globe, and involving a large variety of actors.[75]

The IRC literature has highlighted several types of costs that fragmentation can have. Overlapping regimes may generate inconsistencies between them, and induce competition between regimes and forum shopping, which may undermine regulation. However, and perhaps surprisingly, fragmentation can also have benefits: it may allow fine-tuning to specific contexts; by allowing for benchmarking, it makes learning and quality improvement possible; and by offering flexibility, fragmentation makes it possible to modify arrangements in response to changing conditions. These benefits are particularly likely to emerge with some form of orchestration within the network.[76] Last, the IRC literature draws attention to dynamics in relations between regimes, as they can move from chaotic to more coherent over time. These insights may be useful in the analysis of smart mixes.

Like the measurement of effectiveness, assessing the degree of coherence, as well as its costs and benefits, is not straightforward. For example, the competing interests between forestry and agriculture in forest areas are important drivers for deforestation. The interaction of forest regulation and agriculture policies hence has an important effect in addressing deforestation. However, since they target different activities of forest owners/operators and farmers, the coherence of these instruments cannot be judged in a straightforward way.

Other criteria may also be relevant in examining instrument mixes and their effectiveness, such as efficiency, legitimacy, unintended effects and the adaptability of the governance system. The costs generated by regimes and instruments can also be far from trivial and may influence the success or choice of instrument mixes.[77]

Legitimacy and accountability are crucial for private regimes since, unlike the state, which has sovereign authority according to constitutional law, private regimes rely on the voluntary acceptance and uptake by private regulatees and the public.[78] The importance of legitimacy, however, is not at all restricted to private instruments,

[73] Alter & Meunier (2009), at 13–24.
[74] Keohane & Victor (2011), at 7–23.
[75] Abbott (2012), at 571–590.
[76] Ibid.
[77] Ibid.
[78] Bernstein & Cashore (2007).

particularly in the international area where regulatory competition and the existence of multiple governance instruments may enable venue shopping. Even with international treaties, legitimacy-related elements such as capacity building, financial assistance or other mechanisms to help countries comply with the agreement when it is clear that they are unable to comply may enhance compliance.[79]

One last factor that needs to be considered is the adaptability and flexibility of the mix. Regulatory strategies are of course context-specific and path dependent, and for that reason mixes should also have the capacity to adapt to ever-changing circumstances, and new understandings of social and environmental problems.[80]

1.4 OUTLOOK

This volume brings together a variety of theoretical analyses and empirical case studies of smart instrument mixes to address transboundary environmental harm in a multilevel governance setting. This introductory chapter is followed by Chapters 2, 3, and 4, which discuss the theoretical background of smart mixes and together comprise Part I of the volume. In Chapter 2, Linda Senden discusses how relations between public and private actors in hybrid regulatory regimes can develop into complementary relations. She stresses the importance of the law for ensuring a smart public-private mix, as a smart mix requires constitutional guarantees to ensure not only its output but also input legitimacy. In Chapter 3, Philipp Pattberg and Oscar Widerberg draw upon complexity theory to argue that governance arrangements need to be studied in the broad and complex interaction network in which they operate, and support this argumentation with illustrations from global climate governance. In Chapter 4, Rüdiger Wurzel, Anthony Zito and Andrew Jordan provide a descriptive analysis of the emergence of smart mixes in various EU states, thus demonstrating the variation in adoption of smart mixes between countries.

Part II of this volume addresses case studies of the two environmental issues – forestry and fishery – in which private governance is relatively strong. In these areas, certification plays an important governing role. Forestry and fishery are also characterised by a divide between the global North and South, with the North often imposing extraterritorial rules on the South. This part of the volume comprises three case studies of fishery governance – Chapter 5 (Richard Barnes); Chapter 6 (Markos Karavias); and Chapter 7 (Agnes Yeeting and Simon Bush) – more precisely, of certification in combinations with state law and policy – and two case studies of forest governance – Chapter 8 (Jing Liu) and Chapter 9 (Constance McDermott). Finally, Chapter 10 (Lars Gulbrandsen) draws upon both forest and fisheries certification to address the engagement of public actors with certification programmes.

[79] Gupta (2011).
[80] Auld (2014).

Part III of this volume presents case studies on the global problem of climate change and its most important cause; oil extraction and pollution. In some of these cases, state and international regulation form the main ingredient of the instrument mix. In Chapter 11, Neil Gunningham extends the smart instrument mix concept to the analysis of 'deep green' initiatives with the aim of more fundamental transformation such as the divestment movement. The fossil fuel divestment movement is an example of a successful instrument mix without involvement of states. In Chapter 12, Marjan Peeters and Matthias Müller address the role of EU information disclosure obligations to enable citizen and NGO control of greenhouse gas emission reduction schemes. In Chapter 13, Michael Faure and Hui Wang present a case study of Marine Oil Pollution, and in Chapter 14 Jan van Tatenhove analyses mixes of governance arrangements in offshore oil production.

In Part IV of the book, The final chapter (Chapter 15) draws the case studies together and presents conclusions.

REFERENCES

Abbott, K. 2012. 'The Transnational Regime Complex for Climate Change'. *Environment and Planning C: Government and Policy* 30, 571–590.

Abbott, K., Levi-Faur, D. & Snidal, D. 2017. 'Introducing Regulatory Intermediaries'. *The Annals of the American Academy of Political and Social Science* 670(1), 6–13.

Abbott, K. & Snidal, D. 2009. 'Strengthening International Regulation through Transnational New Governance: Overcoming the Orchestration Deficit'. *Vanderbilt Journal of Transnational Law* 42, 501–576.

Alter, K. & Meunier S. 2009. 'The Politics of International Regime Complexity'. *Perspectives on Politics* 7, 13–24.

Auld, G. 2014. *Constructing Private Governance: The Rise and Evolution of Forest, Coffee, and Fisheries Certification*. New Haven, CT, Yale University Press.

Auld, G., Renckens, S. & Cashore, B. 2015. 'Transnational Private Governance between the Logics of Empowerment and Control'. *Regulation & Governance* 9(2), 108–124.

Bahr, H. 2010. *The Politics of Means and Ends*. Abingdon, Routledge.

Baldwin, R. & Black, J. 2008. 'Really Responsive Regulation'. *The Modern Law Review* 71(1), 59–94.

Bartley, T. 2011. 'Transnational Governance as the Layering of Rules'. *Theoretical Inquiries in Law* 12, 517–542.

Bernstein, S. & Cashore, B. 2007. 'Can Non-state Global Governance Be Legitimate? An Analytical Framework'. *Regulation & Governance* 1(4), 347–371.

Biermann, F., Betsill, M., Gupta, J., Kani, N., Lebel, L., Liverman, D., Schroeder, H. & Siebenhüner, B. 2009. *Earth System Governance: People, Places and the Planet, Science and Implementation Plan of the Earth System Governance Project*. Bonn, The Earth System Governance Project.

Bodansky, D. 2010. *The Art and Craft of International Environmental Law*. Cambridge, MA, Harvard University Press.

Börzel, T. A. & Risse, T. 2010. 'Governance without a State: Can it Work?'. *Regulation & Governance* 4(2), 113–134.

Börzel, T.A. & Risse, T. 2016. 'Dysfunctional State Institutions, Trust, and Governance in Areas of Limited Statehood'. *Regulation & Governance* 10(2), 149–160.
Dahl, R. & Lindblom, C. 1953. *Politics, Economics and Welfare*. Chicago, IL, University of Chicago Press.
Eberlein, B., Abbott, K., Black, J., Meidinger, E. & Wood, S. 2013. 'Transnational Business Governance Interactions: Conceptualization and Framework for Analysis'. *Regulation & Governance* 8, 1–21.
Eijsbouts. J. 2013. 'Guest Editorial'. *The Dovenschmidt Quarterly* 4, 165–167.
Faure, M. G. 2012. 'Effectiveness of Environmental Law: What Does the Evidence Tell Us?'. *William & Mary Environmental Law and Policy Review* 36(2), 293–336.
2014. 'The Complementary Roles of Liability, Regulation and Insurance in Safety Management: Theory and Practice'. *Journal of Risk Research* 17(6), 689–707.
Garcia, S. M., Rice, J. & Charles, A. 2014. *Governance of Marine Fisheries and Biodiversity Conservation: Interaction and Coevolution*. Hoboken, NJ, John Wiley & Sons.
Goodin, R. 1996. *The Theory of Institutional Design*. Cambridge, Cambridge University Press.
Gunningham, N. 2009. 'Environmental Law, Regulation and Governance: Shifting Architectures'. *Journal of Environmental Law* 21(2), 179–212.
Gunningham, N., Grabosky, P. & Sinclair, D. 1998. *Smart Regulation: Designing Environmental Policy*. New York, Oxford University Press.
Gunningham, N. & Sinclair, D. 1999. 'Regulatory Pluralism: Designing Policy Mixes for Environmental Protection'. *Law & Policy* 21(1), 49–76.
Gupta, Y. 2011. 'Regulatory Competition and Developing Countries and the Challenge for Compliance Push and Pull Measures'. In Winter, G. (ed.), *Multilevel Governance of Global Environmental Change. Perspectives from Science, Sociology and the Law*. Cambridge, Cambridge University Press, 455–469.
Hanebury, J. 2006. 'Smart Regulation – Rhetoric or Reality?'. *Alberta Law Review* 44(1), 33–63.
Hood, C. 1983. *The Tools of Government*. London, Palgrave McMillan.
Howlett, M. 1991. 'Policy Instruments, Policy Styles and Policy Implementation: National Approaches to Theories of Instrument Choice'. *Policy Studies Journal* 19(2), 1–21.
2000. 'Managing the "Hollow State": Procedural Policy Instruments and Modern Governance'. *Canadian Public Administration* 43, 412–431.
2004. 'Beyond Good and Evil in Policy Implementation: Instrument Mixes, Implementation Styles, and Second Generation Theories of Policy Instrument Choice'. *Policy and Society* 23(2), 1–17.
Howlett, M. & Rayner, J. 2004. '(Not so) "Smart Regulation"? Canadian Shellfish Aquaculture Policy and the Evolution of Instrument Choice for Industrial Development'. *Marine Policy* 28(2), 171–184.
2007. 'Designing Principles for Policy Mixes: Cohesion and Coherence in "New Governance Arrangements"'. *Policy and Society* 26, 1–18.
Keohane, R. & Victor, D. 2011. 'The Regime Complex for Climate Change'. *Perspectives on Politics* 9, 7–23.
Kinderman, D. 2016. 'Time for a Reality Check: Is Business Willing to Support a Smart Mix of Complementary Regulation in Private Governance?'. *Policy and Society* 35, 29–42.
Liu, J., Faure, M. & Mascini, P. 2017. *Environmental Governance of Common-Pool Resources*. London, Routledge.
Meidinger, E. 2002. 'The New Environmental Law: Forest Certification'. *Buffalo Environmental Law Journal* 10, 214–303.

Mintz, J. A. 2013. 'Assessing National Environmental Enforcement: Some Lessons from the United States Experience'. *The Georgetown International Environmental Law Review* 26, 1–12.

2014. 'Measuring Environmental Enforcement Success: The Elusive Search for Objectivity'. *Environmental Law Reporter* 44(9), 10751–10756.

Mitchell, R. 2008. 'Compliance Theory: Compliance, Effectiveness and Behavior Change in International Environmental Law'. In Bodansky, D., Brunnée, J. & Hey, E. (eds.), *Oxford Handbook of International Environmental Law*. Oxford, Oxford University Press, 893–921.

Oikonomou, V. et al. 2014. *Understanding Policy Contexts and Stakeholder Behaviour for Consistent and Coherent Environmental Policies: A Synthesis of Results from the APRAISE Project.*

Orsini, A., Morin, J. & Young, O. 2013. 'Regime Complexes: A Buzz, a Boom, or a Boost for Global Governance?'. *Global Governance: A Review of Multilateralism and International Organizations* 19(1), 27–39.

Overdevest, C. & Zeitlin, J. 2014. 'Assembling an Experimentalist Regime. Transnational Governance Interactions in the Forest Sector'. *Regulation & Governance* 8(1), 22–48.

Peeters, M. 2014. 'Instrument Mix or Instrument Mess? The Administrative Complexity of the EU Legislative Package for Climate Change'. In Peeters, M. G. W. M. & Uylenburg, R. (eds.), *EU Environmental Legislation. Legal Perspectives on Regulatory Strategies*. Cheltenham, Edward Elgar, 173–192.

Raustiala, K. & Victor, D. 2004. 'The Regime Complex for Plant Genetic Resources'. *International Organization* 58(2), 277–309.

Reus-Smit, C. 2005. 'Constructivism'. In Burchill, S., Linklater, A., Devetak, R., Donnelly, J., Paterson, M., Reus-Smit, C. & True, J., *Theories of International Relations*, 3rd edn. Basingstoke, Palgrave, 188–212.

Richards, K. 2000. 'Framing Environmental Policy Instrument Choice'. *Duke Environmental Law & Policy Forum* 10, 221–285.

Sand, P. H. (ed.). 1992. *The Effectiveness of International Environmental Agreements: A Survey of Existing Legal Instruments*. Cambridge, Cambridge University Press.

Sands, P. & Peel, J. 2012. *Principles of International Environmental Law*. Cambridge, Cambridge University Press.

Simões, S., Huppes, G. & Seixas, J. 2015. A Tangled Web: Assessing Overlaps between Energy and Environmental Policy Instruments in Place along Electricity Systems. *Environmental Policy and Governance* 25(6), 439–458. https://onlinelibrary.wiley.com/doi/abs/10.1002/eet.1691.

Stewart, R. B. 2008. 'Instrument Choice'. In Bodansky, D., Brunnée, J. & Hey, E. (eds.), *Oxford Handbook of International Environmental Law*. Oxford, Oxford University Press, 147–181.

Stokke, O. S. 2012. 'International Fisheries Politics: from Sustainability to Precaution'. In Andresen, S., Lerum Boasson, E. & Hønneland. G. (eds.), *International Environmental Agreements: An Introduction*. London/New York, Routledge, 97–116.

Trevisanut, S. 2014. 'The Role of Private Actors in Offshore Energy: Shifting Models of Participation'. *International Journal of Marine and Coastal Law* 29(4), 645–665.

Trubek, D. & Trubek, L. 2006. 'New Governance & Legal Regulation: Complementarity, Rivalry and Transformation'. *Columbia Journal of European Law* 13, 539–564.

Underdal, A. 2001. 'One Question, Two Answers'. In Miles, L., Andresen, S., Carlin, E., Skjaerseth, J., Underdal, A. & Wettestad, J. (eds.), *Environmental Regime Effectiveness: Confronting Theory with Evidence*. Cambridge, MA, The MIT Press, 3–45.

United Nations Conference on Environment & Development, Agenda 21, Rio de Janeiro, Brazil, 3–14 June 1992, (Agenda 21), https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf.

Van Erp, J. & Huisman, W. 2010. 'Smart Regulation and Enforcement of the Illegal Disposal of Electronic Waste'. *Criminology & Public Policy* 9(3), 579–590.

Van Gossum, P., Arts, B. & Verheyen, K. 2010. 'From "Smart Regulation" to "Regulatory Arrangements"'. *Policy and Science* 43, 245–261.

Van Rooij, B., McAllister, L. & Kagan, R. A. (eds.). 2010. 'Pollution Law Enforcement in Emerging Markets'. *Law & Policy* (special issue) 32(1), 1–13.

Vedung, E. 1998. 'Policy Instruments: Typologies and Theories'. In Bemelmans-Videc, M.-L., Rist, R. & Vedung, E. (eds.), *Carrots, Sticks and Sermons: Policy Instruments and their Evaluation*. New Brunswick, NJ, Transaction Publishers, 21–58.

Von Moltke, K., 2011. 'On Clustering International Environmental Agreements'. In Winter, G., (ed.), *Multilevel Governance of Global Environmental Change. Perspectives from Science, Sociology and the Law*. Cambridge, Cambridge University Press, 409–429.

Wiener, J. 1999. 'Gobal Environmental Regulation: Instrument Choice in Legal Context'. *Yale Law Journal* 108, 677–800.

Winter, G. (ed.). 2011. *Multilevel Governance of Global Environmental Change: Perspectives from Science, Sociology and the Law*. Cambridge, Cambridge University Press.

Wood, S. & Johannson, L. 2009. 'Six Principles for Integrating Non-governance Environmental Standards into Smart Regulation'. *Osgoode Hall Law Journal* 46(2), 345–395.

Woodside, K. 1986. 'Policy Instruments and the Study of Public Policy'. *Canadian Journal of Political Science* 19, 775–793.

Wurzel, R. K. W., Zito, A. R. & Jordan, A. J. 2013. *Environmental Governance in Europe: A Comparative Analysis of New Environmental Policy Instruments*. Cheltenham, Edward Elgar.

Young, O. (ed.). 1999. *The Effectiveness of International Environmental Regimes*. Cambridge, MA, The MIT Press.