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## PART III

# Architecture and Governance



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# 11 Legally binding versus non-legally binding instruments

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*Although it now appears settled that the Paris agreement will be a treaty within the definition of the Vienna Convention on the Law of Treaties, debate continues over which provisions of the agreement should be legally binding. The legal character of the Paris agreement and its constituent parts may matter for several reasons, even in the absence of any enforcement mechanisms. Formulating an agreement in legally binding terms signals stronger commitment, both by the executive that accepts the agreement and by the wider body politic, particularly if domestic acceptance requires legislative approval. It can have domestic legal ramifications, to the extent that treaties prompt legislative implementation or can be applied by national courts. And it can serve as a stronger basis for domestic and international mobilisation. But, despite much empirical work over the past two decades, it has proved difficult to assess the strength of these factors in promoting effectiveness, both absolutely and relative to other elements of treaty design, such as an agreement's precision and its mechanisms for transparency and accountability. On the one hand, states exhibit a strong belief that the legal character of an agreement matters. On the other hand, some political agreements, such as the 1975 Helsinki Accords, arguably have had a greater influence on state behaviour than their legal counterparts. As a result, confident assertions, one way or the other, on the degree to which the legally binding nature of the Paris agreement does or does not matter seem unwarranted.*

Discussions of the legally binding character of the Paris outcome often mix together five related but distinct issues: (1) the legal form of the Paris agreement; (2) the legally obligatory character of its particular elements; (3) whether its provisions are sufficiently precise as to constrain states; (4) whether it can be applied judicially; and (5) whether it can be enforced. It now appears likely that the Paris agreement will take the form of a treaty. But it remains uncertain which provisions of the agreement will create legal obligations, how precise the agreement will be, and what mechanisms it will establish to promote accountability and compliance.

The 2013 Warsaw decision suggests that states' nationally determined contributions (NDCs) on mitigation will be a central element of the Paris outcome, but was expressly without prejudice to the legal character of these contributions. Will states have a legal obligation to implement and/or achieve their NDCs, or will NDCs represent non-legally binding aims or intentions, rather than obligations? Similarly, will the Paris agreement establish new financial obligations? And how much does the legally binding character of these provisions matter? These are among the central issues in the Paris negotiations.

## **1 Legal form of the Paris agreement**

The 2011 Durban Platform for Enhanced Action calls for the development of 'a protocol, another legal instrument, or an agreed outcome with legal force under the Convention applicable to all parties'. Although this formulation was deliberately vague, the negotiations reflect growing agreement that 'an agreed outcome with legal force' means a legally binding instrument under international law – that is, a treaty.

The Vienna Convention on the Law of Treaties (VCLT) defines a treaty as 'an international agreement concluded between states in written form and governed by international law'

(VCLT article 2(a)).<sup>1</sup> Treaties can be referred to by many terms, including ‘agreements’, ‘conventions’, ‘protocols’, ‘charters’, ‘accords’, and ‘amendments’. According to the VCLT, whether an agreement constitutes a treaty does not depend on its title, but on whether the parties intended the instrument to be governed by international law (Aust 2007). Although in some cases this may be ambiguous, treaties can usually be distinguished from non-legally binding instruments by the inclusion of ‘final clauses’, addressing issues such as how states express their consent to be bound (for example, through ratification or accession) and the requirements for entry into force – provisions that would not make sense in an instrument not intended to be legal in character.<sup>2</sup>

Could a decision by the Conference of the Parties (COP) satisfy the Durban Mandate? Arguably not. In general, decisions by international institutions such as the COP are not legally binding unless their governing instrument so provides.<sup>3</sup> The UN Charter provides a simple example. Article 25 of the Charter provides that member states *shall* carry out decisions of the Security Council, so this provision makes Security Council decisions legally binding. But otherwise, decisions by UN organs are not binding on the member states. Similarly, a COP decision could be legally binding if there is a ‘hook’ in the UNFCCC that gives it legal force. For example, Article 4.1 of the UNFCCC requires parties to use for their greenhouse gas inventories ‘comparable methodologies to be agreed upon by the COP’. But, otherwise, COP decisions are not legally binding, so a COP decision, by itself, would not satisfy the Durban Platform’s mandate that the Paris outcome have legal force (Bodansky and Rajamani 2015), and any element of the

- 1 In contrast, ‘treaty’ has a narrower meaning in US domestic law, referring to international agreements adopted with the advice and consent of the Senate, pursuant to Article II of the Constitution. As a result, only a subset of ‘treaties’ in the international sense are ‘treaties’ within the meaning of the US Constitution. Whether the Paris agreement would require advice and consent by the US Senate in order for the US to participate is uncertain and will depend, in part, on what the agreement provides. To the extent that it is procedural in character, could be implemented on the basis of existing US law, and is aimed at implementing or elaborating the provisions of the UN Framework Convention on Climate Change, then arguably the president could join the Paris agreement based on his existing legal authority (see generally Bodansky 2015).
- 2 For non-legally binding agreements, the functional equivalent of an entry-into-force provision is a provision specifying when the agreement ‘comes into effect’.
- 3 Brunnée reaches a different conclusion, namely, that a larger set of COP decisions should be considered binding, because she adopts a broader definition of ‘bindingness’ than suggested here (Brunnée 2002).

Paris outcome that is intended to be legally binding would need to be either contained in, or provided for by, the Paris agreement.

## **2 Mandatory character of particular provisions**

Under the principle of *pacta sunt servanda* ('agreements must be kept'), treaties are binding on the parties and must be performed by them in good faith (VCLT article 26). But this does not mean that every provision of a treaty creates a legal obligation, the breach of which entails non-compliance. Although they are sometimes confused, the issue of an instrument's legal form is distinct from the issue of whether particular provisions create legal obligations. The former requires examining the instrument as a whole, and depends on whether the instrument is in writing and is intended to be governed by international law, while the latter depends on the language of the particular provision in question – for example, whether it is phrased as a 'shall' or a 'should'.

Treaties often contain a mix of mandatory and non-mandatory elements. For example, Article 4.1 of the UNFCCC establishes legal obligations, because it specifies what parties 'shall' do to address climate change. By contrast, Article 4.2 formulates the target for Annex I parties to return emissions to 1990 levels by the year 2000 as a non-binding 'aim', rather than as a legal commitment.

Similarly, the Paris agreement might contain a mix of mandatory and hortatory provisions relating to parties' nationally determined contributions and other issues. For example, it might include commitments that parties maintain, report on, and update their NDCs throughout the lifetime of the agreement, but make the achievement of NDCs only hortatory. The choice regarding NDC-related obligations is therefore not simply whether to have legally binding NDCs or not. Rather, the question is what specific obligations, if any, parties will have with respect to their NDCs – and, in particular, whether these obligations will be purely procedural or also substantive in character.

### 3 Distinguishing the concept of legally binding from other dimensions of bindingness

What is the import of saying that the Paris agreement is a legal instrument or that one of its provisions is legally binding? It is difficult, if not impossible, to answer this question in a non-circular way. Ultimately, legal bindingness reflects a state of mind – most importantly of officials who apply and interpret the law (judges, executive branch officials, and so forth), but also to some degree of the larger community that the law purports to govern. It depends on what the British philosopher HLA Hart referred to as their ‘internal point of view’, a sense that a rule constitutes a legal obligation and that compliance is therefore required rather than merely optional (Hart 1994).

The concept of ‘legally binding’ is distinct from several other dimensions of ‘bindingness’ (Goldstein et al. 2001, Bodansky 2009, Stavins et al. 2014). First, it differs from whether an instrument is *justiciable* – that is, whether the instrument can be applied by courts or other tribunals. In general, courts can apply only legal instruments, so justiciability depends on legal form. But the converse is not the case – the legally binding character of an instrument does not depend on whether there is any court or tribunal with jurisdiction to apply it.

Second, the concept of ‘legally binding’ is distinct from that of *enforcement*. Enforcement typically involves the application of sanctions to induce compliance. As with justiciability, enforcement is not a necessary condition for an instrument to be legally binding. If an instrument is created through a recognised lawmaking process, then it is legally binding, whether or not there are any specific sanctions for violations. Conversely, enforcement does not depend on legal form, since non-legal norms can also be enforced through the application of sanctions.<sup>4</sup>

Third, the legal form of an agreement is distinct from its *precision*. Of course, the more precise a norm, the more it constrains behaviour. But legally binding instruments can be

4 For example, US law provides for the imposition of trade sanctions against states that ‘diminish the effectiveness’ of an international conservation program, whether or not a state has committed any legal violation (Pelly Amendment, 22 USC 1978).

very vague, while non-legal instruments can be quite precise. So the constraining force of precision is different from that of law.

In domestic legal systems, the elements of legal form, judicial application, and enforcement often go together. But this is much less common internationally. Many, if not most, international legal agreements provide no mechanisms for judicial application and little enforcement. So it is important to distinguish the different dimensions of bindingness.

Although the issue of legal form is binary – the Paris agreement either will or will not be a legal instrument, and its particular provisions either will or will not be legally binding (Raustiala 2005) – the Paris agreement could be more or less binding along other dimensions. For example, it could be more or less precise, and establish weaker or stronger mechanisms to promote accountability and compliance.

#### **4 Does the legally binding character of a rule matter and, if so, how?**

Will the Paris agreement be more effective in addressing climate change if it is a legal rather than a political instrument, and if parties' NDCs are legally binding obligations rather than non-binding aims? How much does the legal form of the Paris outcome matter? Opinions on these questions differ widely.<sup>5</sup>

The effectiveness of an international regime is a function of three factors: (1) the ambition of its provisions; (2) the level of participation by states; and (3) the degree to which states comply (Barrett 2003). Those who argue for the importance of a legally binding outcome in Paris focus primarily on compliance. But the legally binding character of the Paris agreement and its constituent elements could also affect ambition and participation, potentially in negative ways. So even if legal bindingness promotes compliance, as proponents argue, it may not increase effectiveness if its positive effects on compliance are outweighed by negative effects on participation and/or ambition.

<sup>5</sup> On the effectiveness of international law, compare Downs et al. (1996) with Simmons (2009).



In theory, the legal character of a norm might promote compliance in a number of ways, even in the absence of judicial application or enforcement (Abbott and Snidal 2002). First, treaties must be formally ratified by states, usually with the approval of the legislature. So acceptance of a treaty generally signals greater domestic buy-in and commitment than acceptance of a political agreement, which typically can be done by the executive acting alone.

Second, the internal sense of legal obligation discussed earlier, if sincerely felt, means that legal commitments exert a greater ‘compliance pull’ than political commitments, independent of any enforcement.

Third, to the extent that states take legal commitments more seriously than political commitments, this not only makes them more likely to self-comply; it causes them to judge non-compliance by other states more harshly. As a result, states risk greater costs to their reputation and to their relations with other states if they violate a treaty commitment than a political commitment, making non-compliance less attractive.

Fourth, legally binding agreements tend to have greater effects on domestic politics than political agreements, through their influence on bureaucratic routines and by helping to mobilize and empower domestic advocates.

Finally, legal obligations are at least capable of being applied by courts. So if legalised dispute settlement is available, either in an international tribunal or a state’s domestic courts, then the legal character of a norm would be a necessary condition of using these procedures.

Perhaps the best evidence that states take legal commitments more seriously than political commitments is that they are more careful in negotiating and accepting them – and, in many states, acceptance of treaties requires special procedures, such as legislative approval. This caution would be irrational if legal bindingness didn’t matter. The fact that treaties are more difficult to negotiate and to approve than non-legal instruments suggests that states view them as imposing a greater constraint on their behaviour.

But while there are good reasons to believe that legal form enhances compliance, other factors are also important. As elaborated by Wiener (2015) in his contribution

to this eBook, transparency and accountability mechanisms make it more likely that poor performance will be detected and criticised, thereby raising the reputational costs for the state concerned, regardless of whether a norm is legally binding. Like legal commitment, transparency and accountability mechanisms can also help mobilise and empower domestic supporters of an agreement. In addition, the precision of an instrument can enhance effectiveness, both because precise norms exert greater normative guidance and because violations are more apparent.

As a result of these factors, non-legal instruments can significantly affect behavior (Victor et al. 1998, Shelton 2000). Indeed, the 1975 Helsinki Declaration<sup>6</sup> has been one of the most successful human rights instruments, despite its explicitly non-legal nature, because of its regular review conferences, which provided domestic advocates with a basis for mobilisation and which focused international scrutiny on the Soviet bloc's human rights performance.

Similarly, with respect to ambition, the legal character of an agreement can cut both ways. On the one hand, it may make states willing to assume more ambitious commitments, by giving them greater confidence that their actions will be reciprocated by others. On the other hand, it may also have a negative effect on ambition, if states are more concerned about locking themselves into potentially costly commitments than about non-compliance by other states.

Finally, since states are cautious about entering into legal agreements (or have special requirements for ratification that raise additional hurdles), making an instrument legally binding may reduce participation. The US declined to participate in the Kyoto Protocol, in part, because of the legally binding nature of Kyoto's emission targets and the impossibility of getting Senate consent to ratification. Similarly, far fewer countries, arguably, would have participated in the Copenhagen Accord, by putting forward emissions pledges, if the Accord had been a legally binding instrument that made countries' pledges legally binding.

<sup>6</sup> Conference on Security and Cooperation in Europe, Final Act (1 August 1975), Article 10 in *International Legal Materials* 14: 1292.

How do these countervailing factors play out? Thus far, it has been next to impossible to answer this question empirically. To do so, one would need to hold all other factors constant, and vary only the legal form of an agreement. Despite significant efforts over the last two decades to determine the significance of legal bindingness internationally, we still do not have any definitive answers (Stavins et al. 2014).

## 5 Conclusion

To satisfy the Durban Platform's requirement that the Paris outcome have legal force, the Paris agreement must constitute a treaty within the definition of the Vienna Convention on the Law of Treaties; a COP decision would not suffice. But this does not mean that every provision of the Paris agreement must create a legal obligation or that parties' NDCs in particular must be legally binding. The Paris agreement could contain a mix of mandatory and non-mandatory provisions relating to parties' mitigation contributions, as well as to the other elements of the Durban Platform, including adaptation and finance.

One cannot definitively say how much the legally binding character of the Paris agreement matters. Making the agreement legally binding may provide a greater signal of commitment and greater assurance of compliance. But transparency, accountability, and precision can also make a significant difference, and legal bindingness can be a double-edged sword if it leads states not to participate or to make less ambitious commitments. Thus, the issue of legal form, though important, should not be fetishised as a goal of the Paris conference.

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# 12 Comparing emission mitigation pledges: Metrics and institutions

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*A key element in the emerging international architecture will be practical mechanisms to compare domestic efforts to mitigate global climate change. How do countries decide whether and to what degree pledges by their peers – often expressed in different forms that stymie obvious apples-to-apples comparison – are sufficient to justify their own actions now and more ambitious actions in the future? We describe a number of desirable features of metrics that might be used for ex ante comparisons of proposed pledges and ex post assessments of subsequent actions delivering on those pledges. Such metrics should be comprehensive, measurable, and universal. In practice, however, no single metric has all these features. We suggest using a collection of metrics to characterise and compare mitigation efforts, akin to employing a suite of economic statistics to illustrate the health of the macroeconomy. We illustrate the application of a suite of metrics to several countries' mitigation pledges (their intended nationally determined contributions in the UN climate talks). In the pledge and review model emerging in the climate change negotiations, participation, compliance, and ambition can be enhanced if this collection of metrics can illustrate comparable actions among peers, both prospectively and retrospectively. The latter, in particular, highlights the need for a well-functioning policy surveillance regime.*

## **1 Introduction**

Countries will pledge to mitigate their greenhouse gas emissions as part of the negotiations leading up to the Paris climate change talks in December 2015. These pledges will take on many different forms: targets versus 1990 or 2005 base year emissions, percentage improvements in the ratio of carbon dioxide to GDP, percentage

abatement versus a ‘no-policy’ reference (or ‘business-as-usual’) case, renewable power goals, energy efficiency goals, afforestation goals, and more. Understanding the comparability of the pledged mitigation efforts will play a critical role in the negotiating process.

Why? To build confidence among countries, there will need to be a common understanding of how pledges expressed in different forms stack up against one another. Similar efforts among similar countries would likely be seen as a ‘fair’ deal, likely a necessary condition for countries both to live up to their pledges now and to increase ambition in the future (Ostrom 1998, Barrett 2003, Cazorla and Toman 2003). Comparable mitigation effort costs across countries also could represent a relatively cost-effective agreement and help level the playing field internationally for energy-intensive industries (e.g. Aldy et al. 2010). This interest in comparability of effort is emerging in domestic politics, both from environmental advocates who believe that such assessments can enable a ratcheting up of ambition as well as business leaders concerned about the potential adverse competitiveness impacts of climate change policy.

Comparing efforts requires metrics. Yet official agreement on specific metrics and a comprehensive policy surveillance mechanism is a tall order. To help inform the difficult task ahead, we have developed a set of three basic design principles and illustrate how an array of metrics might satisfy them. Because no single metric does well in meeting all the principles, we recommend a portfolio approach that assesses countries’ estimated emission levels, emission abatement, carbon and energy price effects, and costs of implementation.

It is worth noting that we emphasise the role of metrics as a *facilitative* mechanism. Metrics are presented without any attempt to emphasise what countries *should* do. A clean, non-judgemental presentation of information, we believe, will encourage and facilitate reciprocity and stronger action. In contrast, a long literature across an array of disciplines has attempted to prescribe what countries should do based on ethical principles and a long-term objective (e.g. Groenenberg et al. 2004, Michaelowa et al. 2005, den Elzen et al. 2006, Höhne et al. 2006, Gupta 2007, Hof and den Elzen 2010, Bosetti and Frankel 2012).



## **2 History of comparability in international climate negotiations**

The concept of comparable effort has evolved over the past several decades in international climate change negotiations. The 1992 UN Framework Convention on Climate Change and the 1997 Kyoto Protocol set emission targets for developed countries and established the first and most enduring notion of comparability: emissions levels relative to a 1990 base year. By defining quantitative emissions limits this way, particularly in the Kyoto Protocol, negotiators effectively defined effort as the percentage reductions in emissions relative to 1990. This turned out to be a simplistic and potentially misleading approach that fails to distinguish between purposeful reductions and those achieved by chance. For example, Russia's emissions have remained well below 1990 levels since the Kyoto Conference due to the state of its economy, not a broad and effective emission mitigation programme.

The term 'comparability of effort' first emerged explicitly in the text of the 2007 Bali Action Plan, which noted that the concept should guide consideration of developed countries' emission mitigation efforts. At the 2009 Copenhagen Conference, the EU and Japan each announced domestic emission targets that included an unconditional pledge plus a further, more ambitious component conditioned on whether other developed countries committed to 'comparable' reductions. At the same time, there was no concrete definition of what 'comparable' meant to the EU and Japan. Moreover, different countries undoubtedly held different perspectives on how to measure and compare effort – and whether to also include the pledges by the fast-growing emerging economies, such as China and India. To promote the transparency of these mitigation pledges and facilitate a better understanding of effort, the Copenhagen Accord and the 2010 Cancun Agreements called for 'international consultations and analysis' and 'measurement, reporting, and verification' – review mechanisms comprised of reporting, technical analysis, and a period of consultation with other parties (see Wiener 2015 for further discussion of measurement, reporting, and verification).

The emerging international climate architecture reflected in decisions at the 2014 Lima climate talks further advanced the concept of pledge and review, building on the Copenhagen model. A number of countries – including the US, the EU, and Russia – tabled their mitigation pledges, referred to as 'Intended Nationally Determined

Contributions' (INDCs) in the negotiations, by the initial 31 March 2015 deadline, and more are expected to do so over the course of 2015. Through this pledge process, the Lima Call for Climate Action notes that countries may submit additional information, including data, analysis, methods, and descriptions of implementation policies that may promote the transparency and credibility of countries' INDCs.

This evolution illustrates how economics can inform the implementation of the comparability of mitigation efforts concept. In the 2009 Copenhagen Accord and in what is expected for Paris, countries' emission mitigation pledges take on different forms. A negotiator can no longer do a simple accounting like the one required in the 1997 Kyoto talks. Instead, economic data and analysis will be necessary to determine the credibility of countries' pledges.

### **3 Principles for choosing comparability metrics**

We identify three principles to help inform the selection of metrics to use in comparing nations' mitigation efforts (see also Aldy and Pizer 2015).

- **Comprehensiveness.** An ideal metric should be comprehensive, characterising the entire effort actively undertaken by a country to achieve its mitigation commitment. Such a metric would clearly reflect all climate-related policies and measures – and exclude non-policy drivers of climate outcomes. It should take on similar values for countries undertaking similar mitigation efforts.
- **Measurability and replicability.** A metric should be measurable and replicable. The ability to replicate a given metric without subjective assumptions, using available public information, enhances the credibility of review. An emphasis on observable characteristics of effort, such as emissions, energy and carbon prices, and/or use of particular zero-carbon technologies, also creates an incentive for countries to undertake actions that can be measured this way. This further facilitates transparency.
- **Universality.** Metrics should be universal. Given the global nature of the climate change challenge, metrics should be constructed for and applicable to as broad a set of countries as possible.

In practice, there will be tradeoffs among principles in identifying and constructing the metrics. For example, changes in emission levels over time may be measurable and universally available in all countries, but this measure may not comprehensively represent mitigation effort. Mitigation cost may be a more comprehensive measure of effort, but is not easily measured.

## **4 Comparability metrics: Emissions, prices, and costs**

Mitigation efforts can be measured many different ways, and the nations of the world are far from agreeing on a single way to do so. But the strengths and weaknesses of popular metrics begin to emerge when we examine how they stack up against our basic principles. These metrics fall into three general categories: those that focus on emissions, prices, and costs. Emissions (and other physical measures) are typically the outcomes that matter for the environment. Prices on carbon and energy taxes reflect the economic incentives created by government policies to reduce emissions and energy use. Cost metrics measure useful economic resources diverted away from current consumption and non-climate investment and toward abatement.

### 4.1 Emissions and related metrics

We noted that an early comparability metric was emissions relative to 1990 levels, as specified in the Kyoto Protocol. More recently, countries including the US and Japan have focused on emissions relative to 2005 levels. Ultimately, choices like this come down to each country's interest in achieving a more favourable baseline. And, as we saw in the Russian example, changes in emissions over time may have nothing to do with effort. One popular approach to dealing with the particular influence of economic activity is to focus on emission intensity, or tonnes of CO<sub>2</sub> per GDP. Prior to the 2009 Copenhagen talks, China and India each proposed emission goals structured as percentage reductions in the ratio of emissions to GDP (as did the Bush administration in 2001). Such metrics can ensure that a country is not penalised as a climate laggard simply because of faster economic growth, nor is it rewarded simply because of economic decline.

Unfortunately, emissions intensity as a measure of mitigation effort is confounded by several issues. Growing countries tend to experience a decline in emission intensity owing to technology improvements and changing economic structures rather than purposeful mitigation effort. It is difficult to know what level of intensity improvement represents effort versus growth effects. Also, faster growing countries typically experience a faster decline (Aldy 2004, Newell and Pizer 2008). This makes it difficult to compare countries growing at different rates. It also means that countries growing faster or slower than expected will find it easier or harder, respectively, to meet a target. One could instead compare levels of emission intensity rather than trends, but this involves the problematic conversion of local currencies into a single currency.

In recent years, regulators in some developing countries have become more interested in emission goals specified as percentage reductions from a forecast level in a future year. While more comprehensive than other emission metrics in theory, in practice, calculating the emission forecasts requires subjective judgements. If the forecast comes from the government setting the goal, there is an obvious incentive to make the forecast high in order to make the target seem more ambitious than it truly is. Even if the forecast is unbiased, comparing a goal to forecast emissions is only more comprehensive in a *prospective* analysis. Retrospectively, comparing observed emissions to a forecast can still confuse mitigation effort with other non-mitigation events that affect emissions. A comprehensive retrospective metric would compare observed emissions to an analysis of what emissions would have been absent mitigation policies; in essence, a retrospective forecast.

## 4.2 Carbon and energy prices

An observed carbon price bears a direct connection to effort, as it measures the economic incentive to reduce emissions created by a country's mitigation policies; it also reflects marginal cost. Comparing carbon prices across countries measures the degree to which a country is undertaking more or less expensive per-tonne mitigation efforts. Since countries implement domestic carbon taxes and tradable permit markets in their local currencies, comparisons will require the use of (and raise questions of the appropriate) currency exchange rates (similar to comparisons of emissions intensity). Moreover,

carbon prices will not reflect mitigation efforts associated with non-price policies – such as efficiency standards and renewable mandates – and most carbon prices are not applied to all of a country’s emissions. A country also may undermine the effectiveness of the carbon price by adjusting taxes downwards for firms covered by the carbon price, through so-called fiscal cushioning.

Alternatively, one could consider implicit (or ‘effective’) carbon prices that estimate the average cost of abatement associated with a specific climate policy or collection of policies. Such implicit prices have the advantage of potentially being applied to a broader set of policies, but the disadvantage of not being directly observed. Instead, they are produced by model simulations. Implicit prices also do not reflect actual impacts on energy prices, which is often the focus of those concerned about economic competitiveness as well as a necessary incentive for improving end-use energy efficiency.

This leads us to consider energy prices directly. Energy prices are transparent and measurable with high frequency. Energy prices permit a net assessment of all price-based policies (including carbon pricing) and thus can mitigate concerns that a country is engaging in fiscal cushioning and speak directly to competitiveness concerns and incentives for end-use efficiency. This would again fail to capture effects from non-price regulations and be a poor measure of effort for countries with significant non-price policies, including the US (see Burtraw 2015 for further discussion of US greenhouse gas regulations).

#### 4.3 Economic costs

Ultimately, concern about the costs of combating climate change represents one of the most, if not the most, significant impediments to serious action by countries around the world. Costs are also closely aligned with most economists’ notions of effort. A metric to compare effort based on costs – expressed as a share of national income or per capita – could examine whether comparable countries bear comparable costs from their actions. A metric based on the cost of actual policies would have the potential disadvantage of rewarding costly but ineffective policies. A complementary metric could examine the cost of achieving the same emission outcome but using the least

costly policy (see McKibbin et al. 2011 for an illustration of this approach). This would highlight the potential advantages of some policies (that reduce more emissions with lower mitigation costs) over others. Estimating costs, however, requires economic assumptions and detailed modelling frameworks for evaluating economic changes in specific sectors and national economies.

#### 4.4 Synthesis of metrics

No single metric scores well against all the principles. Table 1 illustrates the challenges for each type of metric in satisfying our three design principles. Those easily measured – emissions levels and intensity compared to historic levels – do not discriminate between effort and happenstance. Prices provide an observable snapshot for certain policies but not others. Emission abatement and abatement costs probably best represent effort but require subjective assumptions and modelling to estimate. Credible differences in opinion over assumptions will produce different results, complicating any comparison and potentially undermining confidence in the transparency and review regime. The necessary modelling tools are also quite limited outside of the largest developed and developing countries.

With these considerations in mind, it is easy to see why we recommend a portfolio of metrics, and why considerable work remains to construct the more comprehensive measures of abatement and cost. Such an approach would mirror how analysts describe the health of the macroeconomy with a suite of economic statistics that includes GDP, the unemployment rate, the inflation rate, and interest rates.

**Table 1** Synthesis of principles and metrics for comparability of effort

Metric	Principle	Measurable and replicable	Universal
Emission levels	Comprehensive No – a poor estimate of effort because it conflates natural trends	Yes – public domain data for energy and fossil CO <sub>2</sub> available	Yes for fossil CO <sub>2</sub> data, which exist for all countries; additional work needed for all GHGs
Emission intensities	Better than emission levels as it controls for economic trends, but a noisy signal	Yes – public domain data for energy and fossil CO <sub>2</sub> available	Yes for fossil CO <sub>2</sub> /GDP; additional work needed for GHG/GDP
Emission abatement	Yes – most comprehensive among emission-related metrics	Challenging – requires modelling tools / subjective choices to determine counterfactuals	No – few modelling platforms evaluate more than 10 countries
Carbon prices	No – captures effort per tonne, but says little about quantity of tonnes or aggregate effort	Explicit – yes; implicit – requires detailed analyses	No, given few explicit CO <sub>2</sub> pricing policies; modelling tools necessary for implicit CO <sub>2</sub> prices
Energy prices and taxes	No – inadequate for non-energy emissions; fails to account for non-market regulatory instruments	Yes, but unclear how to aggregate	Yes, but requires more detailed data collection than currently in public domain
Abatement costs	Yes – best measure of effort	Challenging – requires modelling tools/subjective choices to determine counterfactuals and to model costs	No – few modelling platforms to comprehensively evaluate more than 10 countries

## **5 The review of pledges on the road to Paris and beyond**

Analyses that compare climate change pledges and actions across countries are increasingly relevant as we transition to unilateral pledges of domestic action and policy within international negotiations. The emerging architecture calls for countries to state what they intend to do, form views about the adequacy of each other's efforts, and react accordingly as they implement policies and make further pledges in the future.

No single metric comprehensively measures effort, is easily measured, and is universally available for all countries. Moreover, each country will prefer to emphasise measures that improve their own appearance. This makes it unlikely that an official metric will emerge. Instead, countries will advertise and utilise the metrics they prefer. Analysis is necessary to translate among metrics, particularly harder to measure metrics.

Compiling data and conducting this analysis of metrics will require a serious, transparent, and legitimate process (Aldy and Stavins 2012, Aldy 2014). In his contribution to this eBook, Wiener (2015) emphasises how provisions for such a process could be addressed in the UNFCCC negotiations. Whether or not such an official surveillance process emerges in Paris or thereafter, independent researchers can fill the gap in the meantime. An array of easily available metrics could be developed and data collected by existing international organisations to facilitate comparisons.

For example, we have drawn from the data the US (US Department of State 2014a,b) and the EU (European Union 2014a,b) recently published in their initial biennial reports to illustrate a set of metrics for their respective nationally determined contributions (Table 2). An initial assessment of comparability of effort could draw from these biennial reports, with a few caveats. First, independent assessments of the 'business as usual' (BAU) forecasts in the biennial reports would enhance the credibility of claims of emission reductions relative to BAU. Second, modelling is also required to estimate future prices and costs (for an example, see Aldy et al. 2015). Third, only a small set of developing countries have submitted biennial reports to date, requiring the use of other data sources and analyses for assessing and comparing the mitigation effort represented by their INDCs. A rigorous comparability of effort exercise would draw from multiple data sources and analyses conducted by a set of independent experts (Aldy 2014, Aldy and Pizer 2015).



**Table 2** Metrics for the EU and US Intended Nationally Determined Contributions

	United States <sup>1</sup>	European Union <sup>2</sup>
Announced target	-26 to -28% relative to 2005 in 2025	-40% relative to 1990 in 2030
GHG emissions		
Target in tonnes (MMTCO <sub>2</sub> e)	5252	3364
Relative to 1990 (%)	-17	-40
Relative to 2005 (%)	-27	-35
Relative to 2025 BAU (%)	-25	-9
Relative to 2030 BAU (%)	-25	-25
GHG/GDP <sup>2</sup>		
2015 kgCO <sub>2</sub> e/US\$ (2005)	0.45	0.35
Target 2025	0.28	0.25
Target 2030	0.25	0.20
Δ(GHG/GDP)		
2015-2025 (%/year)	-4.9	-3.4
2015-2030 (%/year)	-4.1	-3.7
Electricity price 2025	(requires modelling)	(requires modelling)
Gasoline/diesel fuel price 2025	(requires modelling)	(requires modelling)
Natural gas price 2025	(requires modelling)	(requires modelling)
Marginal abatement costs (US\$/tCO <sub>2</sub> e)	(requires modelling)	(requires modelling)
Mitigation costs per GDP (%)	(requires modelling)	(requires modelling)

*Notes:* To simplify presentation, we assume a -27% target in calculating US measures. The EU 2025 measures are based on a linear interpolation between the EU's 2020 target (-20%) and its 2030 target. EU GDP estimates are converted from 2005 euros to 2005 US dollars using the OECD's 2005 purchasing power at parity exchange rate of 0.857 euros/dollar (<http://stats.oecd.org/Index.aspx?DataSetCode=PPPGDP>). All other data used to construct the metrics are drawn from the first biennial reports by the EU and US to the UNFCCC (EU 2014a, 2014b; US 2014a, 2014b). Note reductions relative to forecasts use 'with existing measures' forecasts for both countries (Table 6(a) in the Common Tabular Format of the biennial reports).

Unofficial but independent expert analysis could further synthesise these data to estimate metrics that require forecasts and modelling. In turn, stakeholders and other users could provide feedback on the feasibility, integrity, and precision of available metrics and estimates. This enables further refinement and improved estimates going forward. In addition, the work on developing metrics for ex ante comparisons of effort

can inform the data collection and analysis needs for ex post reviews. The retrospective review of pledges will be more informative and more effective if countries plan in advance for such reviews by implementing data collection and dissemination protocols. Given that Paris is just the beginning of an ongoing process of policy commitments, these refinements and improvements can ultimately feed into greater confidence and stronger ambition among all countries.

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# 13 Towards an effective system of monitoring, reporting, and verification

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*Information is essential to assessing policies, but information may also be costly. This chapter discusses information systems for monitoring, reporting and verification (MRV) of climate change policy. It enumerates six essential roles for MRV: (1) assessing the performance of national policies, (2) comparing across national efforts (and thereby bolstering credibility and mutual confidence to reduce free riding), (3) assessing aggregate international action towards global goals, (4) evaluating alternative policy instrument designs, (5) facilitating cross-national linking, and (6) enabling adaptive learning. The diversity of national pledges now emerging in the international climate regime only heightens the need for MRV. The chapter argues that even if national policies are diverse and targeted, MRV should cover a broad scope of policies and outcomes to ensure comprehensive impact assessment, while keeping costs low to ensure net benefits, to attract participation, and to avoid discouraging ambition.*

## **1 Introduction**

Information is essential to good policy (Mackaay 1982). We need to know whether policies are making a difference, how much, and in what ways compared to relevant alternatives. Successful environmental policy, in particular, depends on good information about the extent of problems and about the relative performance of

<sup>1</sup> I am grateful for discussions with Joe Aldy, Valentin Bellassen, Scott Barrett, Dan Bodansky, Jim de Melo, Billy Pizer, Igor Shishlov, and others; and for research assistance by Stephen Youngblood.

alternative policy measures (Esty 2004). Information can enhance policy performance and public accountability. Around the world, countries are increasingly adopting systems to monitor and evaluate information for both prospective policy assessment and retrospective policy evaluation (Wiener 2013).

Information can itself be used as a policy instrument, when rules mandate information disclosure by governments or businesses in order to foster accountability through public awareness of actions and outcomes, and to motivate actors to ensure their compliance and enhance their ambition. As Jeremy Bentham posited, ‘the more strictly we are watched, the better we behave’ (Bentham 1796). Careful empirical studies show that well-designed information disclosure policies can spur actors facing disclosure (and concerned about their reputations) to make even greater reductions in pollution than required by direct regulation (Benneworth and Olmstead 2008).

At the same time, however, information can be costly, both in the direct expenses for its production (hence the calls to relieve administrative burden, reduce paperwork, and cut red tape), and in the inhibitions that disclosure may impinge on autonomy and decision making (hence the calls to shield privacy and deliberation) (Schauer 2011). There can be tradeoffs among the benefits and costs of expanded information requirements. The cost of information can distort choices when some actors have more information than others (Stiglitz 2000), and too little information can impede choices and the evaluation of policy measures. But excessive information disclosure can also be undesirable, overwhelming and confusing decision makers (Ben-Shahar and Schneider 2014).

Optimal information policy seeks to reconcile these tradeoffs (Mackay 1982: 110, Ogun 1992: 116). It does so by designing reporting protocols and selecting metrics that are accurate and comprehensive, by generating useful indicators, and by targeting audiences who can use them well, yet without imposing excessive costs, encouraging evasion, or overloading recipients with too much information (Weil et al. 2006, Ben-Shahar and Schneider 2014).

Further, if the costs of information are borne by private actors or by countries while the benefits of information are widely shared, then information itself – like climate protection – will have the character of a public good, with incentives for actors (firms or national governments) to underinvest in providing such goods while free riding on



others' provision (Barrett 2003). If this is significant, then information can require some form of collective action, such as an international agreement to collect, share and check – i.e. to monitor, report and verify.

## **2 Challenges facing information for climate change policy**

For climate change policy, good information policy is more crucial than ever. A well-designed system of monitoring, reporting and verification (MRV) will be essential to the success of the evolving international climate regime (Aldy 2014, Bellassen and Stephan 2015). To succeed, a system of MRV will need to be designed in a way that enhances the benefits and reduces the costs of this information.

After two decades, the 1992 United Nations Framework Convention on Climate Change (UNFCCC) is entering a new phase. The 1997 Kyoto Protocol to the UNFCCC had sought agreement on quantitative emissions limitation targets, applicable to 'Annex I countries' (generally, although not all, wealthier countries), leaving to each country the choice of measures to achieve its national target; but Kyoto provided no quantitative targets for 'Non-Annex I countries' (generally, although not all, lower-income countries). Some key Annex I countries did not join Kyoto's targets (e.g. the US, at the time the world's largest national emitter and now the second largest), and some key Non-Annex I countries soon became much larger emitters (e.g. China, now the world's largest national emitter).

The IPCC reports that Annex I countries, as a group, actually met their aggregate targets in both the UNFCCC (reducing their aggregate emissions below 1990 levels by 2000 – partly due to the economic downturn in former Soviet countries) and in the Kyoto Protocol (reducing their aggregate emissions more than 5.2% below 1990 levels by 2012) (Stavins et al. 2014, Section 13.13.1.1, pp. 59-60). But these emissions reductions by the group of Annex I countries under the UNFCCC and Kyoto Protocol did not succeed in reducing *global* emissions, because rapid increases in emissions from Non-Annex I countries (major developing countries) drove overall growth in global emissions over the past two decades (Stavins et al. 2014, Section 13.13.1.1, p. 60).

After important talks since 2009 in Copenhagen, Cancun, Durban, and Lima, negotiations in Paris in December 2015 will seek to launch a new phase of the UNFCCC for the year 2020 and beyond. This new regime is calling on each country to propose its own ‘Intended Nationally Determined Contribution’ (INDC), to be melded into a global effort and reviewed (and updated) over time. As under Kyoto, countries may choose their own sets of measures to reduce their emissions of various greenhouse gases (GHGs) in various economic sectors – such as energy and electricity, transportation, agriculture, and forests – and using various policy instruments – such as technical standards, performance standards, taxes, allowance trading markets (both within and across countries), reducing subsidies, and adaptation measures, among others. But unlike Kyoto, the INDC approach now enables countries to aim their actions at, and report their results against, differing baselines, differing targets, and differing time periods. Also unlike the targets under Kyoto, the call to adopt INDCs now applies to all countries. The regime of INDCs is expected to enable each country to choose its own level of ambition according to its national circumstances, and to offer financial assistance from wealthier to poorer countries.

The flexibility for each country to design its own INDC may attract wider participation, which is important to address global emissions and global impacts effectively. (Incomplete participation would leave key sources of emissions unaddressed and may also lead to cross-country leakage of emitting activities, thus undermining the environmental effectiveness of the incomplete regime.) But the INDC approach may also invite free riding if countries pledge to do little more than they would have done anyway (Barrett 2003). Assessing and comparing efforts across these differing INDCs will be challenging (see the chapter by Aldy and Pizer in this book). Countries may formulate INDCs with differing scopes (e.g. gases, sectors), differing timing (e.g. base year, target year), differing targets (e.g. reductions below emissions in a past base year, reductions below a projection of future business as usual (BAU) emissions, or peak emissions to occur in a future year), and differing units of measurement (e.g. total emissions or emissions per unit of economic activity), all of which will complicate efforts to ascertain what these policies are pledging to achieve, what they actually achieve, how they compare with each other, and how they add up to yield global outcomes. Countries could potentially choose INDC metrics that are difficult to verify (such as reductions below BAU, which is a model projection), or that mask low ambition and

free riding. Countries might adopt measures to limit emissions but also simultaneously adopt other domestic policies to subsidise their industries or otherwise ‘cushion’ the economic burden of the emissions limitation measures, thus undermining their actual emissions reductions in ways that may be difficult for outsiders to monitor and verify (Wiener 1999, coining the term ‘fiscal cushioning’, Rohling and Ohndorf 2012).

Many countries already have their own domestic MRV systems. Examples include the US GHG Reporting Rule and the reporting under the EU Emissions Trading System (Smith 2012). Countries might also act together in ‘plurilateral’ groups (Stewart, Wiener and Sands 1996, Stewart and Wiener 2003) or ‘clubs’ (Stewart et al. 2013, 2015, Nordhaus 2015, Keohane et al. 2015), requiring some form of MRV to document the collective actions of the group.

### **3 Key roles of MRV in climate policy**

Any climate policy will need MRV to assess its effectiveness and impacts. The flexibility of the INDC process, and the diversity of the terms of potential INDCs and club initiatives, increase the need for, but also the challenges to, a well-designed system of MRV (Stewart et al. 2013: 384-391).

MRV of climate policies will be crucial for at least six roles, including:

- a. *Measuring the actual performance of countries’ implementation of their INDCs towards their own stated goals over time.* If a country or a club pledges to achieve something by a certain date, how will others know if that pledge has been accomplished? How will the country or club itself know what it has accomplished? What will the ‘review’ stage of ‘pledge and review’ actually examine? MRV is essential to tracking these results and ensuring policy accountability.
- b. *Comparing efforts and results across countries.* Actors will want to know how well different jurisdictions are achieving their pledges compared to other jurisdictions. As Aldy (2014) and Aldy and Pizer (2014, 2015) detail, MRV is needed to produce and check the information from ‘policy surveillance’ to compare national or club efforts. This comparison may also encourage the level of ambition of each country or club – knowing what others are doing may build the confidence of each actor in

the credibility of others' efforts, and thereby attract participation, compliance, and ambition (Barrett 2003).

- c. *Comparing the performance of different policy designs and instruments.* Policies should be compared in terms of their efficacy (such as reducing GHG emissions), costs (direct industry compliance costs and broader social opportunity costs), and ancillary impacts (both co-benefits and countervailing harms in other environmental, social and economic outcomes) (Wiener 1995, Shindell 2015). For example, reducing emissions from deforestation may also affect biodiversity and local human populations; switching from coal to gas or nuclear may reduce CO<sub>2</sub> emissions and also reduce other conventional air pollutants, yet also increase other risks; solar and wind energy may affect biodiversity; biofuel production may affect deforestation and food prices; and so on. This comparison of policy design and performance goes beyond comparing overall national efforts to examining at a more detailed scale the cost-effectiveness or cost-benefit evaluation of different policy options deployed within countries. Evaluating a comprehensive set of policy impacts follows from UNFCCC Article 4(1)(f), which calls for impact assessment of mitigation policies. Sharing this learning across countries can foster international diffusion of improved policy designs (Wiener 2013). Still, as Aldy and Pizer (2014, 2015) discuss, different methods for comparing differing national measures will involve different criteria, and no single comparison method will fully satisfy all criteria. Aldy (2014: 282) notes that there can be a choice between comparing efforts and comparing outcomes, each of which has its pros and cons. Ideally, MRV would cover both efforts and outcomes, in order to test the relationship of policy design to outcomes and thereby help states select the best policy designs for future use. Testing actual policy performance requires broad MRV covering both the specific policy and associated data on other variables that might also be influencing the outcomes that seemed to be due to the policy, such as other social trends and other public policies.
- d. *Aggregating the sum of countries' progress towards global climate protection objectives.* For example, in order to assess how likely aggregate measures will be to limit global average surface warming to no more than 2°C above pre-industrial temperatures, or whatever other overall goal(s) may be selected, MRV will be

needed to collect and check data for each jurisdiction and combine these data on a common metric.

c. *Facilitating cross-country connections.* For example:

- Linking of emissions trading markets across countries or clubs could employ MRV (using common metrics) to track trades and ensure that allowance transfers represent real emissions reductions that satisfy emissions limits in the buyer's jurisdiction (Stewart et al. 1996, Wiener 1999, Stewart et al. 2013, Bodansky et al. 2014, Keohane et al. 2015; see also the chapter by Stavins in this book). In the same way, common MRV can facilitate trading across the member states of a multi-state union – such as the EU or the US – or a plurilateral club. Common MRV coupled with recognition of allowances or credits from other states adhering to such common MRV can enable states to opt in to multi-state trading without formally agreeing to link their markets (as proposed by Monast et al. 2015, and facilitated by US EPA in its Clean Power Plan final rule issued in August 2015).
- An international carbon tax (or coordinated national carbon taxes) (see the chapter by Wang and Murisic in this book) would need MRV of emissions to ensure compliance with the tax, and to test its efficacy in reducing emissions. An emissions tax may be more susceptible than a quantity-based approach to fiscal cushioning in ways that are difficult to monitor and verify (Wiener 1999, Rohling and Ohndorf 2012). But the general point is that, whichever instrument is employed to limit emissions, MRV will need to include attention to other policies as well in order to assess the overall impact. Here, climate MRV may draw lessons from other efforts to assess overall fiscal policies, such as IMF assessments of macroeconomic stability.
- Matching international financial and technical assistance to where it is most needed or most effective will require MRV to measure the results of such assistance (Carraro and Massetti 2012).
- If countries adopt border trade adjustments that seek to treat the emissions embedded in imports in a way that is similar (non-discriminatory) to emissions from domestic production (such as a border carbon tax, or a border allowance requirement, on imports) (Nordhaus 2015, see also the chapter by Fischer in

this book), then MRV will be required to assess the emissions policies adopted by the source country of the imports (i.e. the exporting country) to calibrate the magnitude of the border trade adjustment in the importing country.

- f. *Fostering adaptive updating of policies and MRV methods over time.* By measuring the actual performance of climate policies, MRV can enable retrospective and repeated performance evaluation, that is, evidence-based decision making that supports planned adaptive policy revision over time (McCray et al. 2010). Further, MRV methods are not static or exogenous; designing policies to reward dynamic advances in approaches to MRV (such as by setting default emissions factors but inviting sources to seek more abatement credit if they demonstrate more accurate MRV) can promote adaptive improvement over time in the MRV methods themselves (Wiener 1994, Aldy 2014: 281, 283, 289).

#### **4 Improving MRV for climate policy**

MRV has been addressed in past climate agreements, such as the national communications and emissions inventories under the UNFCCC. But this MRV system remains incomplete, with still patchy monitoring of different sources, sectors and gases, sporadic reporting by different sets of countries, and inconsistent verification by different types of auditors at different scales (national, firm, project site) with different payment contracts (Aldy 2014: 285-288, Bellassen and Stephan 2015). Data remain uncertain for some types of sources or countries, and marginal investment in MRV does not always correspond to the marginal value of information (or ‘materiality’, see Bellassen et al. 2015). At the same time, in some MRV protocols, the cost per tonne of emissions is already quite low, offering grounds for optimism that improved MRV can be implemented without undue cost (Bellassen and Stephan 2015, Bellassen et al. 2015).

Some past international agreements have developed effective MRV, such as for arms control and nuclear non-proliferation (Ausubel and Victor 1992). These regimes offer some lessons for climate policy. Arms control agreements call on states to regulate themselves (or their military forces), whereas international climate agreements call on states to regulate private subnational and transnational actors, which may make MRV more complicated for climate (Ausubel and Victor 1992). Further, the perceived high

national benefits of arms control and non-proliferation have justified major investments in MRV, whereas the incentive to invest in MRV for shared global climate benefits may be weaker. On the other hand, climate MRV could be easier to the extent that emissions limitations policies can be monitored over years whereas arms control and non-proliferation accords require immediate or very rapid detection of non-compliance. To be sure, arms control and non-proliferation accords have not always succeeded, and indeed some such agreements have been rejected when their MRV systems failed to satisfy critics. For example, the Comprehensive Test Ban Treaty (CTBT) faced objections that underground testing might be difficult to monitor, and the 2015 nuclear non-proliferation accord with Iran faces acute debate over the likely efficacy of its MRV provisions, including limits on immediate inspections by the International Atomic Energy Agency (IAEA) (on this debate over MRV, see Welsh 2015).

Successful arms control and non-proliferation agreements have often relied on a combination of MRV strategies, including not only national reporting (which other parties may not find credible) but also on-site inspections (including unannounced in-country inspections by expert teams), visible indicators of non-compliance, and verification via remote sensing with ‘national technical means’ such as satellites (Ausubel and Victor 1992). Remote sensing by satellites (sometimes supplemented by telescopes or *in situ* sensors) can monitor changes in land use and forest cover (GFOI 2014). Remote sensing could also detect the status of key facilities and technologies, such as carbon capture and storage (CCS) projects, adaptation infrastructure, and geoengineering projects. But such remote sensing will still require on-site observers to verify actual changes, and even reporting the installation of specific technologies will still require corroboration to verify that the technology is operating and actually reducing emissions or damages (as illustrated in the recent scandal of VW diesel engines that were designed to limit emissions in the laboratory but then increase emissions on the road). Satellites will soon monitor GHG emissions fluxes from countries – NASA’s Orbiting Carbon Observatory 2 (OCO-2), launched in July 2014, ‘will be collecting space-based global measurements of atmospheric CO<sub>2</sub> with the precision, resolution, and coverage needed to characterize sources and sinks on regional scales’ (NASA 2015), and its OCO-3

will be launched in late 2016.<sup>2</sup> Fisheries management agreements have also employed satellite and on-board ‘vessel monitoring systems’, both to track vessel movements and to monitor fish catches. Similarly, climate MRV can employ both satellite sensing and on-site inspections, with audits by neutral third parties (such as auditing firms, environmental non-profit organisations or intergovernmental organisations).

As discussed above, information has both benefits and costs. Seeking more accurate and comprehensive MRV may foster transparency, accountability and comparability. It may improve credibility and mutual confidence and thereby attract participation. It may enable assessment, aggregation, comparison, policy design evaluation, cross-country connections, and adaptive learning. But making MRV more accurate or comprehensive may also raise its cost. In some cases, broadening the scope is net beneficial – through expanding target benefits in reduced GHG emissions, promoting co-benefits in air quality, and avoiding perverse countervailing risks from other gases or substitute technologies (Wiener 1995, Shindell et al. 2012, Shindell 2015), as well as by achieving economies of scale in broader applications of the same MRV methods across more sources and transactions (Bellassen et al. 2015). But in other cases a broader scope may yield only minor gains in coverage at high cost – such as lowering the reporting threshold to cover small facilities (Bellassen et al. 2015: 324-325). Estimating emissions factors may be a lower-cost approach to small emitters (McAllister 2010). Costly MRV may not only yield smaller net benefits, but may also lead countries to evade reporting or to reduce the ambition of their pledges in anticipation of costly accountability.

The new climate regime can make progress by designing MRV provisions that collect needed and accurate data in ways that countries find acceptable and even attractive. Burdensome MRV may deter participation and ambition; low-cost but effective MRV may encourage participation and ambition. Design elements for low-cost but effective MRV might include, among others, international financial assistance for monitoring and reporting (Aldy 2014: 284, 290); regular national reporting using shared international MRV guidelines and reporting protocols; standardised BAU projections from joint expert modelling exercises; on-site inspections by joint expert teams; remote sensing of

2 See [https://en.wikipedia.org/wiki/Orbiting\\_Carbon\\_Observatory](https://en.wikipedia.org/wiki/Orbiting_Carbon_Observatory).



sources, sinks and emissions fluxes (e.g. from energy emissions, transport emissions, process emissions, and land use change and forests/REDD+) (Esty 2004: 156, 177); and independent verification auditors, paid by neutral funds such as the UNFCCC, another UN body, the GEF, World Bank, or other MRV fund (not paid by the countries or actors being audited, because that may create a conflict of interest leading auditors to overstate achievements, as seen in securities market ratings agencies). Data about emissions and policy impacts should be translated even-handedly into comparable metrics of performance to facilitate comparison, aggregation, policy design evaluation, and adaptive updating. Learning about methods of MRV should be shared across countries, perhaps through neutral clearinghouses. Lower-income countries may need financial assistance to implement effective MRV, and higher-income countries may see such financing as mutually beneficial because better MRV can help reduce emissions globally, bolster confidence and reduce free riding, detect and avoid leakage, and facilitate linking.

The scope of MRV – what it measures and hence what data must be tracked – should be calibrated to maximise its net benefits. A more comprehensive scope gives a more complete impact assessment, but also requires more information and analysis; a more narrow scope reduces the information and analysis costs, but may also neglect or even encourage unintended consequences that undermine larger objectives (Wiener 1995). To be fully comprehensive (a criterion highlighted in UNFCCC Art. 3(3)), the scope of MRV should cover all relevant climate policies – not only the mitigation options selected in each INDC, but all GHGs in all sectors (including those targeted by the INDC as well as others not yet targeted but potentially still affecting the climate), sinks (such as forests/REDD+), co-benefits (such as air quality and public health, because they may motivate participation and ambition by all countries and notably by developing countries) (Shindell et al. 2012, Shindell 2015), countervailing risks (to avoid adverse side effects, see Wiener 1995, as indicated in UNFCCC Art. 4(1)(f)), and costs (to enable policy design comparisons). And it should cover all countries – even those not adopting (ambitious) INDCs – in order to monitor and prevent leakage of emissions from regulated to less regulated countries.

Fully comprehensive MRV should also cover other climate policies being undertaken beyond emissions limits, such as technology R&D, financing, adaptation, and

geoengineering (solar radiation management, or SRM). Adaptation may be largely motivated by its local benefits, but international reporting on adaptation can share learning on best practices across jurisdictions, and can help match international adaptation funding to demonstrated results. Reporting on SRM research projects could be crucial to enabling international learning about the pros and cons of SRM options (Keith et al. 2010) and to preventing unwise deployment of risky SRM projects (Stavins et al. 2014, Section 13.4.4). Unlike emissions limits which confront incentives to free ride and avoid effort, SRM may conversely confront incentives to be a unilateral first mover; as a result, international cooperation may seek to restrain hasty SRM, and MRV of SRM may thus be more akin to MRV for arms control and non-proliferation (Stavins et al. 2014, Section 13.4.4; see also the chapter by Barrett and Moreno-Cruz in this book). Compared to MRV of emissions reductions, MRV of SRM geoengineering efforts may require greater emphasis on rapid real-time warnings through remote sensing, and verification through on-site inspections.

Where measurement is currently uncertain (as for some sectors, see Bellassen et al. 2015), that is not itself a reason to ignore or deny credit to emissions reduction efforts in those sectors. Rather, measurement uncertainty calls for adaptive policies that reward dynamic advances in MRV methods, such as by calibrating the degree of credit to the demonstrated accuracy of MRV, thereby creating an incentive for actors to improve MRV methods and reduce measurement uncertainties (Wiener 1994). In this sense, MRV is not static or exogenous, but rather endogenous: improvements in MRV methods depend on the incentives provided in climate policies.

## **5 Conclusion**

The new climate regime is not a single treaty, but a complex of multiple agreements, INDCs, clubs, and transnational networks (Keohane and Victor 2011, Stewart et al. 2013, Stavins et al. 2014, Sections 13.3-13.4; see also the chapters by Keohane and Victor, and Stewart et al. in this book). Hence, comprehensive MRV should cover climate measures under not only the UNFCCC, but also other international agreements that bear on climate, such as GHG limits under the Montreal Protocol, the international aviation agreement (ICAO), and the network of low-carbon cities, among others (Stewart et al. 2013).

What we measure strongly shapes what we manage. The prospect of MRV (including its scope and cost) will have an important role in shaping the climate policies that countries adopt and implement. In turn, the system for MRV will be shaped by its benefits and costs, and by its ability to attract participation of key countries – for example, by keeping costs low, and by highlighting local co-benefits such as air quality and adaptation.

After COP21 in Paris, even if the climate policy regime is a complex of diverse and fragmented national commitments and institutions, it will be desirable to construct a comprehensive MRV system that embraces the multiple components and actors of the regime complex for climate. MRV itself is likely to be less costly than measures to limit emissions (especially if broadly applied to achieve economies of scale), and indeed can increase the net benefits of such measures. Investing in well-designed comprehensive MRV will likely be worth the costs, especially compared to adopting policy measures to limit emissions and realising only later that weak or absent MRV means that we know little about what those (costly) measures actually accomplished. A comprehensive MRV system would broadly cover all the gases, sectors and impacts noted above. Comprehensive MRV would promote the key functions of assessing and comparing national policies, aggregating global efforts, evaluating policy designs, facilitating linking, and promoting adaptive learning. To keep costs low and engage innovative public-private partnerships, components of this broad MRV system could be undertaken by different actors, such as intergovernmental organisations, national governments, auditing firms, university researchers, non-profit organisations, and private businesses. Designing MRV to cover co-benefits, countervailing risks, and adaptation, and to foster financing and allowance trading links, as noted above, could help shape socially desirable policies and offer added incentives for participation by low-income as well as wealthy countries. MRV of SRM geoengineering projects will be important for learning, and for restraining hasty deployment posing adverse side effects. Altogether, a comprehensive MRV system would provide the information essential to assessing and enhancing the success of the climate regime.

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# 14 After the failure of top-down mandates: The role of experimental governance in climate change policy

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*The failure of the Kyoto process to generate an effective and integrated international regime reflects a lack of willingness of major states, in the presence of uncertainty, to make commitments to a demanding set of targets and timetables. In conjunction with strong conflicts of interest and fragmentation of power and capability, the result has been a decentralised ‘regime complex for climate change’ rather than an integrated international regime. Since ‘top-down’ approaches have failed, it is important to think about how more experimentalist, ‘bottom-up’ arrangements might work, by decomposing problems into smaller units that facilitate testing and learning. For such an approach to be effective for climate change issues, three tasks must be performed: (1) participants need to articulate their shared goals; (2) there must be significant costs to participants of inaction – a ‘penalty default’ that can induce cooperation where it is not spontaneously forthcoming; and (3) institutions to assess national pledges and help stitch them together must be developed. The most optimistic scenario for Paris is that it sets in motion a process that promotes learning and cooperation and that, over time, could have transformative impacts on the politics of climate cooperation.*

The failure of the Kyoto process to generate an effective and integrated international regime has allowed for the emergence of what we have called ‘the regime complex

<sup>1</sup> We acknowledge discussions with Ottmar Edenhofer, Bryce Rudyk, Michael Oppenheimer, Richard Stewart and Charles Sabel. This chapter is based, in part, on Keohane (2015) and Sabel and Victor (2015).

for climate change' (Keohane and Victor 2011). We interpret the decentralised and partially overlapping regulatory efforts that now exist as reflecting strong conflicts of interest and fragmentation of power and capability. The issue now is whether there is a pathway forward that is both feasible and effective. Timetables and binding targets have not worked, attracting few countries outside of the EU; that is, 'top-down' approaches have failed. This is the theme of Section 1 of this chapter. In Section 2 we look at how 'bottom-up' might actually evolve in productive directions.

## **1 The top-down approach: Failure and poor prospects**

It is now widely recognised that the Kyoto approach was a failure. The Framework Agreement on Climate Change – the 'UN F triple-C' agreement – made in 1992 contained few specifics and no meaningful commitments beyond the obligation to report. In the Berlin Mandate, agreed in 1995, rich countries agreed to exempt developing countries from obligations, without a clearly specified phase-out period. But the developing countries grew rapidly – China is by far the largest emitter today and emissions of other developing countries are growing fast (IPCC 2014). Developing countries have a strong and legitimate interest in ensuring that action on climate change will not condemn them to perpetual poverty by slowing rates of economic growth. But once given an entitlement to emit, countries classified as 'developing' were reluctant to give it up even as their growth, and emissions, rose. And rich countries – not just the US but also Australia, Canada, and eventually Japan – were unwilling to accept costly limits on their own emissions that would not solve the problem as long as developing countries' emissions were rising so fast. The EU was the one notable exception, and it went ahead with costly controls – largely driven by its own internal political needs. With all these diverging preferences, diplomatic deadlock resulted (Victor 2011, Hale et al. 2013).

In this context, it is easy to understand why Kyoto was more of a façade than a real scheme for policy coordination. It largely ratified what countries would have implemented anyway – except perhaps the US, which never joined. And it was steeped with accounting tricks that were abused as well. Particularly striking was the abuse of the Clean Development Mechanism (CDM), through which host governments sought certification of proposed credits for projects and dealt with verifiers who were

dependent on the host governments for future business. Purchasers of the credits had few incentives to assure that projects were genuine, only that the credits were certified. Not surprisingly, some estimates indicate that many of the permits represented phony emissions reductions (Wara 2008). Indeed, the CDM even generated perverse incentives, reducing incentives for developing country governments to enact policies permanently reducing their emissions in favour of continuing overall high-emissions policies and then earning credits from projects that had inflated emissions baselines.

So Kyoto got it wrong in two ways: at the core of the regime, states did not have incentives to commit to ambitious targets, much less legally binding ones; and at the periphery, many of the characteristic dysfunctions of international organisations manifested themselves.

The current round of talks is premised on an arrangement that has been called ‘pledge and review’, although the exact names vary. Some call this approach to negotiating international commitments through pledges and smaller groups of commitments the ‘building blocks’ approach. Others refer to the scheme as building ‘coalitions of the willing’ (Falkner et al. 2010, Stewart et al. 2013). Today, formally, climate diplomacy calls these bottom-up pledges ‘Intended Nationally Determined Contributions’, or INDCs. In this pledge and review scheme, targets are not legally binding but once the pledges are made and accepted, states are expected to have incentives to fulfil them for reputational reasons. Indeed, this process has already begun to unfold, such as with the bilateral pledges announced by the US and China in November 2014. The US had an incentive to declare serious pledges of its own in order to induce China to do so as well – reciprocity is often important in world politics. But the incentives for this process to work remain weak. The Lima Declaration of December 2014 encouraged countries to submit targets by 31 March 2015. But when that deadline approached only a handful of parties – the US, the EU, and a few others – had actually bothered to submit pledges. The new planning goal for these pledges is early October 2015, leaving the Climate Change secretariat just a month to figure out what the totality of all the pledges implies for the overall health of the planet. The news is unlikely to be good; indeed, a growing number of studies are pointing to the reality that widely discussed goals of stopping global warming at 2°C is impractical, and the models used to study those scenarios are based on unrealistic technological and political assumptions (Fuss et al.

2014). Similarly, grand aspirations in Lima to develop strong review mechanisms that could monitor implementation and compliance with INDCs are, so far, leading to more disagreement than practical institution building.

Pledge and review can be seen in two ways. It can be seen cynically, merely as a euphemism for not changing policy in any substantial way. In this view, pledge and review essentially constitutes what Stephen D. Krasner calls ‘organised hypocrisy’ – pretending to take serious steps while actually proceeding with business as usual (Krasner 1999). On the ground, in Asia, trends are strongly toward more emissions. In India and Vietnam, there are scores of coal-fired power plants either under construction or in the serious planning stages. In India, for example, there are 381 gigawatts of coal-fired plants under construction or planned, which would more than triple current capacity of about 178 gigawatts, and in Vietnam the capacity of plants under construction or planned is over 48 gigawatts – a sixfold increase over current capacity. Over two-thirds of the new power plants under construction or planned in these countries will be coal-fired. The talk is all of limitations on emissions, but the reality is more emissions.<sup>2</sup>

Of course, the full story is a complex one. More economic growth means higher demand for electric power. But some countries are diversifying their power industries in ways that are slowing, if not stopping, the growth in emissions – in China, for example, a slower economy, aggressive energy efficiency, and support for new power sources including nuclear and renewables are leading to ‘peak coal’ in the next few years and most likely a peak in emissions over the next decade. That’s better news than unfettered growth in emissions, but slower growth is still a far cry from the cuts of 50% or more from current levels that would be needed globally to stop warming.

But public cynicism may be counterproductive – sometimes, surprises occur. And in any case, hypocrisy is what Judith Shklar called an ‘ordinary vice’ (Shklar 1985), and not as bad as some other vices because at least it recognises virtue even if it does not observe it. The positive spin on pledge and review is that it could start a process of commitments, monitoring, persuasion, and imitation that could eventually generate

<sup>2</sup> Research by Phillip Hannan based on data and methodology explained in Hannam et al. (forthcoming); see also IEA (2014).

some meaningful action on climate change. The Lima Declaration's vision for INDCs and review, for example, provides for the engagement of experts from civil society and the private sector, which some commentators argue could be used to facilitate 'bottom-up' arrangements to promote emissions reductions measures (Stewart et al. 2015a, 2015b). In any case, for the negotiators there is now little alternative to trying to make pledge and review work, since the mandatory targets and timetables approach is dead in the water.

If approached without illusions about likely breakthroughs, the Paris meeting can at least avoid a demoralising setback – it can avoid becoming a 'Copenhagen II'. Indeed, there is growing evidence that the French government hosts are organising themselves around exactly that mission – to avoid failure. But there is little reason to be optimistic. It seems likely that both pledge and review and attempts to foster 'bottom-up' arrangements without a binding overall agreement will have insufficient effects on this massive problem. We need to think more about these issues outside of the 'UN F Triple-C box'.

## **2 Towards an effective experimental governance of climate change**

Climate change is marked by two intertwined sets of characteristics that make integrated, top-down bargaining all but impossible. The first set is political – the fragmentation of power and authority in the international system, and the corresponding absence of a hegemon to impose order on actors with sharply divergent interests. The second is cognitive – uncertainty about the feasibility of achieving policy outcomes, such as lower emissions, at acceptable costs. This uncertainty explains the inability of any country or firm that takes deep decarbonisation of emissions seriously to identify *ex ante* what behavioural, technological and regulatory commitments will actually prove most effective. This shroud of uncertainty about the actual burdens of various commitments exacerbates the bargaining problems; the bargaining problems in turn heighten the sense of uncertainty as key parties cannot anticipate – and must fear – how counterparts will react to the frustration of expectations (Young 1989a, 1989b). If it is unknown at the time of bargaining which commitments really can be fulfilled and how others will respond if some are not, bargaining among parties with sharply different

interests will be highly complex and cautious to the point of paralysis. Risk-averse players will prefer deadlock to codifying ambitions that may prove too costly or simply unattainable (Abbott and Snidal 2000, Hafner-Burton et al. 2012).

Mindful of these difficulties in pursuing top-down bargaining, at best Paris will represent one step on a long road of efforts to build an effective bottom-up system. But pledge and review, although not a solution to the climate problem, *could* lead to a process of experimentation and momentum building. That is, it could help governments and other critical players determine what is feasible through coordination and it could establish some momentum in negotiations, so that countries not making serious efforts could be embarrassed as laggards. Countries willing to do more could learn how to connect and integrate their efforts into truly interdependent, deep cooperation. In an optimistic scenario, this process could, through a series of increasingly serious steps, move pledge and review to a more coordinated and effective effort in the long run.

Although such an outcome may not be likely, we see it as possible and we believe, therefore, that it is worthwhile to explore how such a positive process might unfold – and what would be necessary within and outside the UNFCCC process. Many conditions would need to be satisfied for this experimental and momentum-building process to work. There needs to be serious review, countries need to be willing to adjust their commitments in light of new information, and there need to be incentives for integration over time. Meeting these conditions is far from assured. Yet in the absence of any assured pathway to success, it is worthwhile to explore this experimental, momentum-building scenario.

The central insight of experimental governance (XG) is that seemingly impossible large problems can be decomposed into smaller units that facilitate testing and learning from experiments. Originally developed for understanding regulation and the provision of complex public goods, such as education, under uncertainty in the US and the EU (Sabel and Zeitlin 2008), XG has similar potential applications at the global level (De Búrca et al. 2014). XG emphasises that regulator and regulated, alike, rarely know what is feasible when they begin to tackle a problem under uncertainty; it prizes a diversity of efforts rather than monopoly. It identifies and continuously improves upon solutions that work – and pushes them to scale – while siphoning resources away from those that don't.

Applied to climate, XG suggests a focus on three tasks. First, participants need to articulate their shared goals in a way that implies specific initial actions, to be reviewed systematically with the expectation that they will be adjusted over time. Such an experimental process may make agreement on goals easier to secure because the actors know that specific steps toward achieving the target are subject to careful review, in which they will have a part. While the UNFCCC process has set some goals – such as articulated in Article 2 and with the goal of stopping warming at 1.5-2°C degrees – these goals have been either too abstract or unachievable to specify near-term actions.

Various groups of ground-level actors are then assigned responsibility for achieving pieces of the goal. They are authorised to search for and develop solutions as their experience suggests, but on the condition that they report results to the convening authority. The results are then compared through various forms of peer review so successes can be quickly identified and generalised if possible, failures rejected early on, and faltering efforts corrected in view of the advances of more promising ones. Where experience warrants, the goals themselves are revised – targets tightened, relaxed, or extended to new domains – and the revised goals are the starting point for the next round of local exploration. Over the next few years – perhaps as early as Paris – there will need to be a rethinking of the widely discussed goals of stopping global warming at 1.5 or 2°C (Victor and Kennel 2014). That process, bound to be highly controversial, would benefit from tangible ground-level knowledge about what countries can actually do to regulate emissions.

The second key task is to ensure that there are significant costs to participants of inaction. The engine that drives experimental governance is not a starry-eyed assumption that actors want solutions. Instead, XG relies on a ‘penalty default’ that can induce cooperation where it is not spontaneously forthcoming. A penalty default is a draconian sanction – exclusion from a valued market or denial of an indispensable permit or license – imposed for persistent violation of the regime’s norms. It is a form of enforcement that does not prescribe solutions – which may be impossible to agree on because states likely to be targeted will block them – but that forces the actors to cooperate unless they are willing to risk losing control of their joint fate. Under the shadow of a penalty default, experimental governance uses deliberation to help actors

redefine their interests. Penalty defaults are thus at one and the same time information forcing and deliberation enhancing.

Other published work explores in more detail where penalty defaults may arise in the international system (De Búrca et al. 2014, Sabel and Victor 2015). Here we point just to the need for these penalties as an engine for cooperative efforts. Important sources of penalties in climate change will include the threat of trade sanctions and loss of markets, and, within countries, the threat of regulatory intervention that firms might forestall through actions of their own to self-regulate effectively.

There will be tremendous pressures in the multilateral context to avoid or disarm the mechanisms, such as trade sanctions, that could be used to threaten penalties that inspire experimentation and cooperation. Universal forums abhor unilateral and club actions. It will be important to resist efforts to outlaw penalties such as trade sanctions; a vague agreement at Paris would be preferable to one that eliminated the possibility of enacting such penalty defaults.

A third task is to develop the institutions that will be needed to assess national pledges and help stitch them together into more integrated and demanding international cooperation. A suite of agreed metrics will be necessary, as discussed in the contribution to this eBook by Aldy and Pizer (2015). Pledges should contain not just information about what countries aspire to do but also what has been tried, what worked, and what failed. Pledges could also be made conditional on others' actions and experimental, so they would signal to other countries what nations will try, not just what they will do. Introducing such an experimental orientation could lead to more constructive bargaining around joint gains as well as to more robust learning about what really works. Making productive use of these pledges will require institutionalised arrangements to ensure that reviews are serious so there is genuine monitoring of pledges and pressure to fulfil them (Victor et al. 1998).

An open question is exactly how the UN system would perform these monitoring and review functions. In the past the Climate Change secretariat has been assigned similar tasks, but it hasn't been given the authority needed for serious monitoring and review – an outcome that is hardly surprising since the UNFCCC operates under consensus rules and many members are wary of untested review mechanisms. The IPCC can't



take on this role because it is not designed to make political judgements. All of these official UN institutions face the problem that their authority depends upon consensus and the very act of performing serious monitoring and review almost guarantees that some states will object. The best options probably lie outside the UN system, but are supportive of it. NGOs, supported by expert knowledge, could play a big role. Some countries could volunteer to have their national pledges scrutinised closely because they want to demonstrate how effective reviews actually work. These analyses would be reviewed in the peer-reviewed literature, after which IPCC could cite them.

### **3 Conclusion**

The inability of nations to develop an integrated top-down climate regime is now widely accepted, and that new reality will be on full display at COP21 in Paris. The road to Paris is being paved with bottom-up efforts, most notably the scheme of national pledging organised around INDCs.

Whether this new strategy will be any better than the status quo – an anarchic outcome in which countries follow their self-interests and there is no real international collaboration –remains to be seen. Some of the pledges being made for Paris are encouraging, although we are sceptical that Paris will take the world very far, in itself, toward mitigating climate change. But the Paris meeting could set in motion a process that promotes learning and cooperation and that, over time, could have transformative impacts on the politics of climate cooperation. Whether that happens will hinge on whether the INDCs become more informative, whether countries that want cooperation can threaten penalties to those who don't, and whether new institutions are created that will review, assess and eventually help merge the INDCs into more collective efforts. Some of that can be done inside the UNFCCC box, but the hardest tasks – such as threatening sanctions and building effective review mechanisms – will require sympathetic efforts from the outside as well.

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# 15 A building blocks strategy for global climate change

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*The likely future global climate regime, based on nationally determined, non-legally binding commitments, is not by itself likely to produce emissions reductions sufficient to prevent dangerous climate change. There is, however, already significant mitigation occurring outside the context of the UNFCCC that could potentially be scaled up to fill the gap. This chapter, expanding on earlier work, proposes a building block strategy that focuses on incubating and scaling up multilateral and multi-stakeholder initiatives in discrete sectors with mitigation potential. It outlines three paradigms – clubs, linkage and dominant actor – that provide a conceptual and institutional framework for mobilising non-climate interests of actors in order to generate associated climate benefits. Finally, it suggests that recent institutional developments in the UNFCCC could be used as a platform to launch and enhance these non-UNFCCC initiatives, compatible with the emerging UNFCCC strategy.*

## **Introduction**

Current UNFCCC negotiations signal a future global regime for climate action based primarily on voluntary (and likely not legally binding) commitments by individual countries. As this country-driven strategy cannot *by itself* ensure that individual country undertakings will in the aggregate achieve sufficient reductions to prevent dangerous climate change, complementary transnational strategies must be developed to fill the gap.

The building block strategy outlined in this chapter focuses on multilateral and multi-stakeholder initiatives around specific sectors of opportunity with high mitigation

potential (Stewart et al. 2013a,b). These initiatives will enlist the enterprise and resources of public and private actors, including firms and NGOs, international organisations, and subnational jurisdictions, as well as states. The strategy relies on three distinct institutional paradigms – clubs, institutional linkages, and dominant market actors – to build such initiatives.

Recognising the highly uneven support among various public and private actors for climate mitigation, the building blocks strategy seeks to capitalise on an array of other incentives to initiate actions that will reduce emissions. These incentives include profits for businesses, enhanced economic development and energy security for developing and other countries, mission advancement for development funders, and avoiding competitive disadvantage (as a result of leakage) for firms in jurisdictions that have adopted mitigation regulations. Here we propose institutional structures to mobilise such incentives. In some cases, these initiatives could be supported by governmental or other actors committed to climate mitigation for its own sake, including specifically the UNFCCC.

The building block strategy avoids the problem of reaching agreement across a large group of countries as well as the risk entailed in national commitments to deep, economy-wide emission reductions. The strategy would produce multiple climate dividends: immediate emissions reduction through the deployment of the individual building block initiatives; significant learning about the costs of mitigation action and the characteristics of durable initiatives (Sabel et al. 2015), leading to more, and more effective, initiatives; and increased trust through demonstrating action and creating institutions that regularise interactions between public and private actors, which may lead to greater long-term ambition.

## **The building blocks strategy**

In order to enhance existing action, foster new action, and complement the UNFCCC, the building blocks strategy embraces a variety of special-purpose initiatives in specific sectors that would:

1. Enlist a limited number of public and/or private actors;

2. Focus on sectors and opportunities with high mitigation potential;
3. Tap actor incentives other than a desire to promote climate mitigation;
4. Not necessarily be legally binding; and
5. Not necessarily be formally linked to the UNFCCC.

Smaller-scale initiatives avoid the problems involved in negotiating and implementing a comprehensive global treaty (Downs et al. 1998). It is often easier to reach agreement among a smaller number of participants both on substantive goals as well as critically important procedural issues like monitoring and other arrangements to ensure compliance (Barrett 2003). Mobilising a suite of specific, incremental undertakings also reduces the cost of initiative failure and permits institutional and policy experimentation and learning (Sabel et al. 2015).

The uneven support for mitigation across states and governments has stymied global agreement; intense support in some jurisdictions does not compensate for indifference or opposition in others. The building block strategy adapts to this situation by mobilising material incentives such as economic gains, increased adaptation capacity and health, economic development, energy security, and other benefits. At the same time, the strategy recognises that many actors – both public and private – are motivated at least in part by climate protection. It draws on these pockets of support, including in governments that are unwilling to commit to economy-wide emissions caps but are prepared to participate in more limited undertakings to reduce emissions.

To make broad progress on emission reductions, it is critical to engage directly the actors beyond national governments, including sub-national jurisdictions, firms, NGOs, and international regulatory bodies with missions other than climate, such as the Montreal Protocol, the International Civil Aviation Authority (ICAO), the International Maritime Organization, and the multilateral and regional development banks. These actors are not and cannot be parties to the UNFCCC and many are effectively fenced out of its deliberations and programmes. As much of the climate emissions, and therefore the resulting climate mitigation action, occur as a result of decisions by these actors, their participation is necessary (Heede 2013).

The building block strategy provides a clear path forward to both avoid a plethora of disaggregated and disparate initiatives, and incentivise those initiatives that produce

positive climate co-benefits. It does this in two ways. First, we detail the club, linkage and dominant actor paradigms. These provide a systemic framework for a) analysing potential institutional and initiative opportunities, and b) identifying the incentives and actors that would be required to mobilise each initiative. The three paradigms involve somewhat different incentive structures and institutional logics, but each depends on opportunities to align non-climate incentives with activities that reduce emissions. Careful design is needed to target incentives that will tap actors' non-climate motivations and also produce positive climate outcomes. Second, we outline the essential role of institutional entrepreneurs and the prospect of building on elements of the UNFCCC (particularly the collaborative pre-2020 mitigation action process under Workstream 2) to more effectively and efficiently discover and implement building blocks initiatives.

## **Clubs**

Recently, there has been much discussion of climate clubs to achieve emission reductions (Weischer et al 2012, Green et al. 2015, Nordhaus 2015, Victor 2015). The building block strategy focuses on incentivising clubs that produce a tangible 'club' good (e.g. new technology, pooled finance, pooled risk or common standards) that confers economic or other non-climate benefits such as reduced energy costs, energy security, or profitable R&D innovations. In order to prevent freeriding, these benefits are limited to members of the club who abide by its rules, which ensure that the club activities reduce emissions as well as provide benefits to members (Buchanan 1965). The incentives for participation, however, need not be uniform for all members (Hannam et al. 2015). Businesses or some developing countries may join a club in order to receive economic benefits limited to members, while other states and subnational jurisdictions may join and support the club activities in order to advance the global public good of climate protection that reduces emissions.

We see clubs being formed by industry, governmental authorities at different levels, NGOs, and international organisations, often in combination. Actual and potential examples include:

1. **Industry or industry-government clubs for research, development and deployment.** An example is the International Smart Grid Action Network (an arm



of the International Energy Agency), which aims to develop and deploy renewable transmission and smart grids across national borders.

2. **Green trade liberalisation clubs.** A group of countries is negotiating a general agreement on liberalised trade in green goods (Keohane et al. 2015).
3. **Standard-setting clubs.** Public-private expert bodies could form to harmonise technical standards to reduce transaction costs and increase the spread of technologies.
4. **Transnational supply chain regulatory clubs.** Following the example of the Forest Stewardship Council and its certification system and mark for sustainable timber, industry and NGOs could jointly develop performance standards and private certifying arrangements to leverage consumer demand for low GHG goods and services (Vandenbergh 2007).

## Linkage

The linkage strategy leverages existing transnational organisations with missions other than climate protection through initiatives – undertaken by policy entrepreneurs within and outside of institutions – that further the organisation’s basic mission while also achieving emission reductions. Strategic pockets of support within these organisations, along with flexibility in organisational mandates, may enable these policy entrepreneurs. This strategy economises by using existing organisations where entirely new institutions or programmes with explicit climate objects could not proceed. Like all building block strategies, each linkage initiative will be targeted to the interests of particular actors (in this case, those engaged in the existing organisation) and structured to produce net climate benefits.

Examples include:

1. **Extending the scope of existing environmental agreements to reduce emissions.** Discussions are already underway to extend the scope of the Montreal Protocol to include currently unregulated ozone-depleting substances (ODS) or ODS substitutes that are also GHGs.

2. **Adding an emissions reduction component to an existing non-environmental multilateral agreement.** For example, the ASEAN Agreement on Transboundary Haze capitalised on the ongoing relationships between the ASEAN countries to produce an environmental benefit. A similar strategy could be used to mobilise actions aimed at reducing emissions as a co-benefit.
3. **Preference of low-emission technologies in bilateral and multilateral development programmes.** A number of countries have prohibited their official development assistance from being used, except in very limited circumstances, to fund coal power generation.

### **Dominant market actors**

The third strategy leverages the power of governmental regulators or firms with a dominant position in specific global or regional market sectors. Their dominant position enables them to promote GHG regulation throughout the sector in order to advance their interests. A regulatory jurisdiction with a major market share in goods or transportation services may thus be able to induce economic actors outside the jurisdiction to follow its rules in order to access its market or maintain scale economies in production. Relating to this phenomenon, there has been analysis of the ‘California effect’ (regarding Californian motor vehicle emission standards) and the ‘Brussels effect’ (regarding EU product regulations) (Bradford 2013). Regulating jurisdictions may actively pursue this strategy in order to protect their firms from competitive disadvantage. Dominant firms in industry may gain economic and strategic benefits by acting as first movers to adopt regulatory standards. Other firms can be induced through market pressures and network effects to follow the standards, which can be designed to enhance the dominant firm’s position. The dominant firm may cooperate with government regulators to secure their adoption of the standards.

This strategy can advance climate protection when regulatory programmes that reduce GHG align with the incentives of dominant government or private market actors. Where dominant public or private actors enjoy sufficient economic, strategic, or other gains from acting as first movers with regulatory or market standards, they may act unilaterally with the goal of inducing others in a sector to follow suit. In some cases,

dominant public and private actors may effectively collaborate by using the regulatory power of the public actors to propagate a standard that was set.

Examples of this strategy include:

1. **Product or performance standards.** A dominant firm or group of firms in a climate-beneficial technology, such as components for wind turbines or grid technologies, may adopt or promote government adoption of regulatory standards that will give it competitive advantage.
2. **Market entry condition.** The extension of the EU's Emissions Trading System for regulating domestic emissions to international airlines serving Europe has already been proposed, and spurred action at ICAO. A group of major maritime port jurisdictions could impose enhanced fuel efficiency standards as a condition for using the port.

## **Launching initiatives and linking the building blocks strategy to the UNFCCC**

As illustrated above, we already see significant action based on each of the three building blocks strategies. But the existing initiatives have not appeared spontaneously. They have required both that the incentives of the actors are aligned, and also that one or more entrepreneurs ferret out opportunities for action, identify and convene appropriate actors, structure the parameters of the initiative including institutional/legal arrangements, and ultimately launch the initiative. The existing building blocks have been sparked by all manner of initiative entrepreneurs: oil firms in the Canadian Oil Sands Innovation Alliance (a technology sharing club); the International Renewable Energy Agency (IRENA) in the development of initiatives on renewables in Africa and the small islands; and even the United Nations Secretary-General's Climate Change Support Team in the development of multiple initiatives at the 2014 Climate Summit.

The uptake of opportunities by policy entrepreneurs within the initiatives can be enhanced by providing assistance in accessing information on opportunities in areas of high mitigation potential, locating potential actors, structuring initiatives, accessing technical and financial resources, and by providing a platform to gain visibility. The

UNFCCC itself has significant resources for such assistance: technical knowledge (e.g. on project implementation and monitoring through the Clean Development Mechanism and capacity-building know-how through the Durban Forum on Capacity Building); access to potential sources of finance (e.g. the Green Climate Fund, the Global Environment Facility and the Adaptation Fund); as well as the political participation of 196 countries and significant convening power to bring in non-state actors. Of particular interest as global support for building block initiatives are the institutions that are developing under the Workstream 2 pre-2020 mitigation ambition mandate – the Technical Expert Meetings (TEMs), high-level events, and the Non-state Actor Zone for Climate Action (NAZCA) portal.

**Technical information: The TEMs.** The TEMs have become a hub of discussion among state and non-state experts on mitigation opportunities as well as the co-benefits of action and the barriers to overcome them, and, where known, the strategies and resources needed. They not only provide an opportunity for initiative entrepreneurs to engage directly with experts, but also provide informational outputs (e.g. technical papers and an online menu of policy options) for continued learning.

**Political and financial engagement: The annual high-level event on increased pre-2020 action.** These new high-level events focusing on specific initiatives in areas of high mitigation potential are now held alongside the annual Conference of the Parties (COP); the first of these was held in Lima. They are designed to bring together high-level public and private actors to launch new initiatives and provide an opportunity for initiative proponents to attract new public and private participants, and tap the financial and other resources of the UNFCCC.

**Visibility and continued engagement: The NAZCA portal.** The portal – a UNFCCC website that recognises voluntary action by non-state actors – already includes a substantial number of the currently existing international cooperative initiatives. At present, the portal does not count the emissions reductions that are occurring as a result of the initiatives, either individually or in the aggregate. If the methodological and political considerations are overcome, a form of monitoring and reporting could be added to the NAZCA portal, which would give further and continued recognition and engagement of the initiatives of non-state actors, separate from the obligations of states to take action and report.

## Mobilising action

There are significant opportunities for mobilising climate action through the building block strategies. This mobilisation is necessary to complement and support country mitigation programmes in achieving the overriding goal of ensuring that emissions peak and begin to decline in the near term. Capitalising on these opportunities will require concerted effort from public and private actors to participate in initiatives and act as initiative entrepreneurs. Also needed are support systems that assist entrepreneurs in creating new initiatives. While many see the UNFCCC as only focusing on the ‘ends’, particularly targets for national emissions reductions, the recent institutional developments that we outlined above have allowed for a new focus on the ‘means’ of developing climate action. While these new UNFCCC institutional developments provide some of the necessary components of acting as a support system for building block initiatives that would complement initiatives by national governments, they are not well linked, and there is no institutional focus on supporting initiatives from idea, to incubation, to launch. The UNFCCC does not have to be the only support system. There is much that NGOs, businesses, governments, research institutes and foundations can and should do to assist initiative entrepreneurs.

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# 16 Climate change policies and the WTO: Greening the GATT, revisited

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*The thrust of our argument in this chapter is that the present WTO ‘negative contract’ is a legal constraint that does not suffice to promote climate change-friendly policies, as WTO members do not have to adopt similar policies. Moreover, some of their policies might be judged inconsistent with the WTO, even if adopted in order to address externalities and distortions. To illustrate, we assume that Home, a WTO member, wishes to employ one of three instruments of different ‘intensity’ (labelling, domestic tax, and subsidy) to mitigate climate change. Can it do so while respecting its obligations under the WTO contract? Our response is affirmative when Home chooses the second option, and negative when it uses the first and the third options. The negative response is due to the bizarre manner in which the WTO Appellate Body, the highest court in the WTO infrastructure, has understood non-discrimination in the context of the Technical Barriers to Trade (TBT) Agreement, and the inertia/lack of foresight by trade delegates who did not extend the carve-out for ‘green subsidies’ that had been agreed in 1995 beyond 2000. Needed changes at the multilateral level require delegation of sovereignty to move towards a contract that would require positive steps from the WTO membership in order to avert climate change. As an immediate amendment, the reinsertion of the clause of non-actionable subsidies should be considered. Until greater delegation of sovereignty is accepted, the fight against climate change on the trade front will be substantially aided if the WTO were to embrace and accommodate clubs that have endorsed this objective.*

<sup>1</sup> For helpful discussions and comments, we are indebted to Scott Barrett, Jagdish Bhagwati, Carolyn Fischer, Henrik Horn, Damien J. Neven, and Luca Rubini. This is a shortened version of Mavroidis and de Melo (2015).

## **1 Introduction**

Up until the launch of the Doha Round, the climate change and trade regimes evolved separately through stand-alone negotiations. Trade policy and the WTO enter the design of the upcoming climate regime architecture once one accepts that the first-best option of global carbon pricing is unachievable because of non-participation by a subset of countries. From a *Realpolitik* perspective, one must first understand how climate change policies fare under the current WTO mandate and ensuing legal discipline. The focus of the framers of the GATT was on tariff protection, leaving to members the freedom to design all domestic policies (including environmental) to their liking. Once a social preference had been revealed, it would apply in non-discriminatory terms, that is, without distinguishing between domestic and imported goods. Protection could take one form only (tariffs), and it became negotiable. This is why the GATT is often referred to as a ‘negative integration’ contract. As discussed in the working paper version of this chapter (Mavroidis and de Melo 2015), environmental policies have changed little from the GATT to the WTO.

Section 2 reviews how the three main instruments to address climate change mitigation objectives (labelling, taxes, and subsidies) fare under the current WTO regime. Section 3 discusses needed changes in the WTO, emphasising implementable improvements inspired by existing and former elements of the world trade architecture.

## **2 Instruments to deal with trade-related conflicts**

Quantitative restrictions are illegal in the WTO. Hence, members cannot, in principle, block imports of products that pollute the environment unless they apply similar measures to domestic products. Again in principle, WTO members can also differentiate the customs treatment of imports depending on whether they fight climate change or not, but this is an instrument of limited effectiveness as tariffs are mostly bound and applied tariffs are, on average, in the range of 1-5%. Moreover, the Harmonized System (HS) that provides the basis for tariff classifications does not contain classifications that distinguish between goods based on whether they avert climate change or not. Classifications to this effect are thus ‘national’ (i.e. decided unilaterally), so that if a WTO member adds its own classification i.e. at the 8 and 8+ digit level, it is at the

risk of a legal challenge (a potential complainant could argue that renewable and non-renewable energy are like products, and hence by imposing a lower customs duty on the former than that imposed on the latter, a WTO member would be violating the most-favoured-nation, or MFN, obligation). There is no case law that directly addresses this issue, but there is the risk of litigation.

Reversing a decision under US-Tuna (Mexico) in US-Shrimp, the Appellate Body (AB), the highest judicial organ of the WTO, held that unilateral policies are not illegal simply because they are unilateral. If they meet the relevant statutory criteria, then unilateral policies, including climate change policies, can perfectly well exist within the WTO regime. The Uruguay Round agreements reproduced the negative integration ‘spirit’ of the GATT. The WTO did strengthen the disciplines towards subsidies, making subsidies (i.e. every government intervention that confers benefits to specific recipients rather than to the public at large) either prohibited or ‘actionable’. Only two categories of subsidies are prohibited – namely, export and local content subsidies – while a third category that included environmental subsidies was classified as ‘non-actionable’ over a five-year period up to 1 January 2000 (Art. 31 of the Agreement on Subsidies and Countervailing Measures, or SCM). All other subsidies are ‘countervailable’, e.g. either through unilateral (imposition of countervailing duties) or multilateral action (dispute before a Panel), whereby affected member states will impose a burden on the subsidising member equal to the benefit granted through the scheme. As the agreement on a non-actionable category was not renewed, a scheme that qualifies as a subsidy under the SCM Agreement is nowadays either a prohibited or an actionable subsidy. As a result, WTO members cannot subsidise producers in order to change their process and production methods (PPMs) to produce in a way that will avert climate change. They can, of course, always subsidise consumers. Political economy-related transaction costs often explain why similar measures do not see the light of day.

Against this background, three challenges facing the upcoming climate regime involve the WTO: first, a predictable time path for the price of carbon that would involve reforms of the subsidy code to handle the removal of fossil fuel subsidies and the application of subsidies at the international level to develop abatement technologies; second, border tax adjustments to tackle the different forms of carbon leakage, especially that related to the ‘competitiveness channel’ for energy-intensive, trade-exposed manufacturing

(see the chapter by Fischer in this book); and third, labelling to distinguish PPMs that avert climate change from those that do not.

Acknowledging that climate change subsidies are no longer allowed, we consider three instruments to mitigate climate change.

## 2.1 Environmental labels

Home adopts a labelling scheme distinguishing between products that are not produced in manner that causes climate change and products that are. This is particularly important in the current climate negotiations, as the IPCC estimates that 38% of the reductions in CO<sub>2</sub> emissions to hit the 2°C target will have to come from the use of energy-efficient (EE) products (energy-saving products that minimise economy-wide energy consumption, and energy-efficient products in a performance-based sense). Along with minimum energy performance standards, comparative labelling to distinguish goods according to their PPMs is the most common policy instrument to promote EE.

Home then sets a ceiling on CO<sub>2</sub> emissions of cement clinkers (HS 252321), with products whose emissions exceed the ceiling not allowed to be sold lawfully sold in its market. Here it is irrelevant whether the PPM has been incorporated in the traded good or not. The Agreement on Technical Barriers to Trade (TBT) that applies to labelling schemes covers both incorporated inputs (termed ‘physical characteristics’) as well as non-incorporated PPMs. It is further irrelevant whether compliance with the scheme is mandatory for goods to be traded (‘technical regulation’) or not (‘standard’). The substantive obligations are identical irrespective of the ‘intensity’ of the measure, and case law has anyway blurred this distinction.<sup>2</sup> Finally, note that this is a domestic, not a trade instrument so, *prima facie*, the test of likeness will not revolve around the Harmonized System (HS) classification of the product but, as discussed below, on consumers’ reactions.

Foreign complains that the labelling scheme is unnecessary and discriminatory. The recent AB report on US-Tuna II (Mexico) reflects the current state of affairs. Labelling schemes must be *necessary* and applied in a non-discriminatory manner. The term

<sup>2</sup> Mavroidis (2015) discusses this issue in detail.

“necessary” has been consistently interpreted to denote the least restrictive option to achieve an objective unilaterally set by the regulating state, which is not justiciable. In the example, if the regulating state cannot afford to subsidise, it could still use the tariff. In light of the above, it is hard to imagine how a labelling scheme cannot be judged necessary. As in *US-Tuna II (Mexico)*, where a labelling scheme was found to be TBT-consistent on similar grounds, we expect the measure to pass muster in this respect. The costly part of the endeavour will be conformity assessment falling on exporters.

Assuming that Foreign cannot pass this first test, Foreign can still attack Home’s measure and argue that it is discriminatory since, irrespective of emissions released, a widget is a widget is a widget. The problems for Home then come when reviewing the consistency of the measure with non-discrimination. In *US-Tuna II (Mexico)*, the AB held that consumers would decide on likeness. If so, most likely they will be purchasing the cheaper of the two goods, i.e. the one with highest embodied CO<sub>2</sub> emissions. By not conditioning purchasing decisions on the volume of CO<sub>2</sub> emissions, the two goods will be judged ‘like’ goods. By treating two like goods in an unlike manner, Home will be violating its obligation to not discriminate. This is what the AB decided in *US-Tuna II (Mexico)*.

Why not compare climate change-averting domestic to climate change-averting imported goods (i.e. labelling schemes in Home and Foreign)? In the *Chile-Alcoholic Beverages* case (and later in the *EC-Asbestos* case), the AB established that this comparison is not the right one. Case law has thus upheld that it is up to consumers to decide whether regulatory distinctions that create submarkets are legitimate or not. The measure cannot be saved through recourse to GATT Article XX, as consistent case law suggests that this defence is not available to violations of the TBT Agreement.

This is a deplorable state of affairs for climate change mitigation endeavours. Mavroidis (2013) explains why likeness should be a question of policy – not market-likeness (as perceived by consumers) in the TBT context. Governments will intervene only when they disagree with the behaviour of private agents; otherwise, why intervene in the first place? Similar statutes should thus pass the test of legality with flying colours. Alas, this is not what happens. In the end, the problem here is not major, since all that is required is a change in case law. Since the law as it stands does not prejudice the outcome at all, it leaves the question of establishing likeness in the hands of adjudicators.

## 2.2 Environmental taxes

Here we are dealing with a border measure, and the likeness test will revolve around the (inadequate) HS classification of the product. Horn and Mavroidis (2011) discuss this issue in substantial detail. Now, Home opts to adjust the level of taxation on the content of CO<sub>2</sub>, such as a tax of \$10 per tonne of CO<sub>2</sub> released in the production of cement clinkers (HS 252321). Here we shift from the TBT Agreement to the GATT, since we are dealing with a tax collected at the border and the legal test is not identical, although consumers, yet again, are kings. If consumers prefer the more CO<sub>2</sub>-intensive imported cement, the treatment will be judged ‘less favourable’ for imported goods, and hence GATT-inconsistent (in EC-Seals, the AB ruled that producers of seal bags could not market their bags in the EU market, whereas producers of other bags could). The treatment will be judged less favourable, since ‘like’ goods will be paying ‘unlike’ taxes.

Unlike what happens in the TBT labelling case, though, Home will be in a position to justify its measures under GATT Article XX(g). Clean air is an ‘exhaustible natural resource’ (US-Gasoline, AB), and the measure must simply ‘relate to’ its protection. This means that Home must demonstrate a rational connection between the tax differential and the protection of clean air, a rather easy-to-meet standard. CO<sub>2</sub> does pollute the air, and the less air is polluted, the cleaner it is. Tax disincentives to pollute ‘relate to’ the objective sought (the protection of clean air); hence, Home would prevail under the GATT.

Home could impose higher customs duties against polluting goods instead of adjusting domestic taxes at the border, as discussed by Fischer in her chapter in this book. But to do so, it would have to enter sub-classifications in the headings at the 10- or 12-digit level to distinguish the tariff treatment of goods made using renewable energy from those ‘same’ same goods when made using fossil fuels – a difficult exercise. The consistency of similar sub-classifications with the WTO is currently an open issue. Moreover, since tariffs are at an all-time low, the potential for ‘meaningful’ tariff advantages through similar schemes is limited.

### 2.3 Subsidies

Under the current WTO regime, ‘green’ subsidies are prohibited. The elimination of such subsidies signalled the end of the distinction between ‘good’ and ‘bad’ subsidies, thus defying economic logic that calls for the removal of market failures. Subsidies to consumers that are not specific are available, but they are accompanied by higher transaction costs than subsidies to producers (more transactions and higher verification costs). Moreover, even though there is no case so far, a complainant might be in position to show that, in spite of a subsidy having been paid to consumers, *de facto*, only a few companies have profited. In this case, a complainant could request withdrawal of the scheme. In the end, the limits to addressing climate change through subsidies are quickly understood when one takes on board the negative integration character of the WTO

## 3 Is the WTO a hindrance to environmental protection?

With foresight, Esty (1994) argued 20 years ago that the WTO was being negotiated without paying sufficient attention to environmental concerns. While some problems WTO members face when wishing to adopt measures to mitigate climate change can be dealt with by pre-empting the discretion of WTO ‘courts’ (e.g. labelling), most derive from the overall attitude of the WTO legal regime towards global public goods. The framers of the WTO focused on improving a series of pre-existing agreements and did not consider the need to internalise the growing transnational externalities. A few scattered initiatives, like the ongoing negotiation of environmental goods, are a step in the right direction, but are insufficient. A total recall – call it a WTO 2.0 – that would not *allow* but would *oblige* WTO members to adopt a different attitude towards protecting and serving public goods, and give priority to this objective when and if conflicts with trade obligations arise, is what is needed. Consider, then, implementable reforms at the multilateral and plurilateral levels.

### 3.1 Reforms at the multilateral level

Two improvements are necessary. Monitoring of subsidies for fossil fuels is the starting point. Collins-Williams and Wolfe (2010) have adequately explained why WTO members are disincentivised from providing information about their subsidies, since supply of similar information is self-incriminating. Note, though, that as Aldy (2015) explains in detail, the G20 Fossils Subsidies Agreement call for external review is a step forward. Hence, this is an area where the wishes of the G20 and the reality at the WTO are in conflict. Here, the WTO (the common agent) could be mandated by members to play a more active role in marshalling evidence worldwide on similar subsidies. Second, the provision on non-actionable subsidies needs to be re-inserted in the WTO, and this time improved so as to correspond to whatever is needed to fight climate change. Those who fear that the frontier between green policies and ‘blue’ industrial policies is more of a line in the sand than a distinction set in stone will be comforted to know that local content subsidies are prohibited. Assuming effective monitoring of schemes along the lines discussed by Wiener in his chapter in this book, subsidisers will find it hard to help domestic producers sell their technology through subsidies allegedly aimed at averting climate change.

Furthermore, assuming that a generic category of non-actionable subsidies has been re-introduced, the WTO legal regime could preempt the wrong exercise of discretion by Panels and the AB by including illustrations of the type of subsidies that should qualify as ‘green’, and therefore as non-actionable subsidies. For example, it could be spelled out that all subsidies paid to consumers to purchase renewable energy are non-actionable. The WTO membership could go further and, inspired by practice, exonerate other types of subsidies as well. Indeed, in the same way that it has been possible to include an indicative list of schemes that qualify as export subsidies in the SCM Agreement, the WTO membership should be in a position to agree on a list of schemes that should qualify as non-actionable.

### 3.2 Reforms at the plurilateral level

Plurilateral agreements that bind a subset of the WTO membership – assuming authorisation by the plenum – is another route to address the climate mitigation



objective. The ongoing negotiation on environmental goods, where a subset of the WTO membership is willing to reduce tariffs on goods that address climate change-related concerns, will eventually take the form of a plurilateral agreement. Hoekman and Mavroidis (2015) and de Melo and Vijil (2015) both forcefully argue why this avenue should be encouraged in the future functioning of the WTO. Mentioning six tasks that have eluded multilateral negotiations, Victor (2015) also advocates the ‘climate club’ approach.<sup>3</sup>

Climate clubs should not be viewed as attempts to curb multilateralism. Both critical mass and plurilateral agreements share one feature in common: they keep the umbilical cord to the WTO intact, as MFN is observed in the former case, while accessions are open to non-original members in the latter. A combination of the two could be of particular interest in the fight against climate change. WTO members could agree, for example, that a certain threshold of world production of energy-intensive goods are particularly harmful towards the environment and incite climate change. Assume, for example, that cement production, which accounts for 5-7% of global CO<sub>2</sub> emissions, has been singled out. Signatories to a critical mass plurilateral agreement could agree to the staged reduction of CO<sub>2</sub> emissions. They could further agree that, before the agreement has entered into force, WTO members representing, say, 80% of world cement production will have ratified it.

Punishing non-participants is not envisioned in the critical mass and plurilateral approaches discussed above. Nordhaus (2015) explains and shows how a set of climate amendments to international law that would “explicitly allow for uniform tariffs on non-participants within the confines of a climate treaty... [and] prohibit retaliation against countries who will invoke the mechanism” could entice participation by non-members (p. 1349). He then shows that the use of ‘carbon duties’ is an effective sanction to prevent leakage only, but that uniform tariffs on imports are more effective in preventing free-riding. This penalty turns out to be reasonably well targeted and it is also incentive-compatible (it imposes costs on the defectors and confers benefits to the

3 The tasks best-suited for being addressed in a climate club include enticing reluctant countries to participate using carrots and sticks, designing smart border measures, crafting conditional commitments, crafting and demonstrating technology strategies and tackling easier problems like short-lived climate pollutants.

punisher). In conclusion, the huge benefits of belonging to the WTO in terms of MFN access could be made an effective enticement for participation.

Nordhaus does not go into the details of the legal amendments required. The problem is that under the current negative integration contract, countries cannot be told to adopt climate-mitigation policies, and nor can a club of countries raise their bound tariffs – even in a non-discriminatory manner – against non-members, since under a preferential trade arrangement (PTA) members are only allowed to reduce tariffs against outsiders. Moreover, as we have explained above, there is more promise in pushing outsiders to join the club through domestic taxes (which are unbound) than through customs tariff differentiations, the overall level of which is very low. And of course, the credibility of similar threats will depend on whether the WTO ‘courts’, in case of litigation, adopt our approach regarding the relevance of Article XX(g) of GATT. As discussed above, re-inserting Article 8 SCM might help, but it would have little effect in tackling the immensity of the problem, as the punisher is being punished while the free-rider benefits from abatement by club members.

A more promising approach would be for club members to adopt a regime of mutual recognition/equivalence (which is easier to do among club members who have relatively high within-group trust). Then, a coalition of the willing could agree on ‘optimal’ regulatory standards that should be followed and that would be implemented via conformity assessments.<sup>4</sup> In this case, outsiders would have to demonstrate that their production processes are equivalent to those prevailing among club members to profit from market access.

While it is unrealistic to expect that WTO members will have similar preferences in mitigating climate change, legislators need to ensure that both a defence by those willing to defend is provided through the WTO legal arsenal while at the same time, proactive behaviour is condoned. The former is the case indeed, as our discussion of border tax adjustments above shows. The latter remains to be seen under the current legal contract where members are reluctant to transfer sovereignty even when it is quite obvious that absent multilateral action, distortions will not be addressed. In this setting,

<sup>4</sup> In Nordhaus’ model, the tariff punishment is credible because it acts like an optimal tariff. Achieving credibility would be even harder for regulatory standards.

re-inserting Article 8 SCM and allowing ‘coalitions of the willing’ seems the most promising way to move forward. The GATT was not ‘greened’ and we have paid the price – one that the WTO, alas, cannot afford to pay anymore.

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