

# 1. Introduction

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## 1.1 MOTIVATION

In the landmark Paris Agreement adopted in 2015 the international community agreed to strengthen its response to climate change. The parties to the treaty will aim to keep the rise in global mean temperature well below 2°C above pre-industrial levels and will pursue efforts to limit the increase to 1.5°C.

Once the treaty was agreed the focus swiftly turned to implementation. By the time the Paris Agreement came into force in November 2016, over 160 countries had committed to emission targets and other mitigation and adaptation objectives through their nationally determined contributions (NDCs). The successful implementation of these pledges will be vital for meeting the Paris objectives. They are an important first step in securing the transition to a low-carbon, climate-resilient economy. How NDCs are implemented will also shape the ability of the international community to collectively increase ambition over time (Falkner, 2016).

Most countries were able to base their NDCs on existing domestic commitments and policy frameworks. There are today over 1,300 national climate laws worldwide, broadly defined as laws that address issues of climate change mitigation and adaptation. Further commitments have been made, and action has been taken, by sub-national entities – cities and regions – and by non-state actors, including many businesses and community groups.

The first objective of this book is to explore the economic, political and institutional dynamics that have led to this extraordinary burst in legislative activity. What are the factors that have enabled or constrained legislators and policy makers to take action about climate change? The question is of analytical interest in its own right – researchers like to ‘understand the causes of things’ (the maxim of our own university, the London School of Economics) – but it is also highly policy-relevant. A better understanding of policy drivers can inform legislators on the best strategies to enhance their existing policy frameworks.

Making enhancements will be essential. Despite the flurry of recent activity, most countries will have to strengthen their regulatory frameworks if they are to meet and, in due course, go beyond their Paris pledges (Rogelj et al., 2016; UNEP, 2016a). They will have to pass additional legislation and issue new executive orders to close the gap between policy ambition and policy delivery.

The second objective of the book is more normative. The book begins to explore what climate change legislation needs to contain to be effective and consistent with the Paris objectives. Much more research will be needed to thoroughly evaluate the different approaches to climate change policy that countries have taken so far, but the breadth of measures already in place allows some preliminary lessons.

The focus of the book is on climate action at the national level, by the parties to the Paris agreement. However, effective climate governance will require coordination across different levels of governance. The third objective of the book is to relate national climate legislation to the actions taken at the sub-national level and to the growing role played by the judiciary. We also reflect on the importance of domestic legislation in securing international cooperation.

The structure of the book reflects these objectives. There are three parts. Part I asks the descriptive question of how climate change legislation has come about. Part II asks more normatively what climate change legislation should contain to be effective. Part III puts national climate change legislation into its wider context, making the link to the important actions taken at other levels of governance.

We follow the same structure in this overview chapter, but we start with a brief description of the body of climate change laws and policies that have been enacted worldwide to date. They are at the centre of this book.

## 1.2 STATE AND TRENDS IN GLOBAL CLIMATE LEGISLATION

The Grantham Research Institute on Climate Change at the London School of Economics, in collaboration with the Sabin Center on Climate Change Law at Columbia Law School, maintains what is probably the most comprehensive global database on climate change laws and policies around the world. As of October 2017 the Climate Change Laws of the World database (formerly the Global Climate Legislation database) contained over 1,300 laws and policies that directly address climate change mitigation or adaptation and the transition to a low-carbon, climate-resilient economy. Box 1.1 contains a description of the laws and policies that are included in the data set.

### BOX 1.1 CLIMATE CHANGE LEGISLATION DATA

Much of the data on climate change legislation used in this book comes from Climate Change Laws of the World, a searchable online database that has been put together by the Grantham Research Institute on Climate Change and the Environment at the London School of Economics, and the Sabin Center on Climate Change Law at Columbia Law School. The full data set is available on the website of the Grantham Research Institute ([www.lse.ac.uk/GranthamInstitute/legislation](http://www.lse.ac.uk/GranthamInstitute/legislation)).

The Climate Change Laws of the World database aims to cover provisions in all aspects of public policy that are relevant to climate change. The criteria for inclusion are based on a fairly broad interpretation of the term climate change legislation. The database includes acts of parliament, executive decrees, presidential instructions and influential policies. We refer to all types as 'laws'.

Covering over 170 countries, the database includes laws dealing with the following issues:

- **Energy demand**, in particular energy efficiency, both in commercial and domestic settings; an example is Italy's 2010 Special Fund to Support the Implementation of Energy Efficiency Targets.
- Low-carbon **energy supply**, often aimed at renewable energy, such as Germany's Renewable Energy Sources Act, which was first passed in 2008 and amended periodically since.
- Curbing carbon emissions through **carbon pricing**, such as Japan's 2012 Tax Reform Act.
- Low-carbon **transport**; for example, Argentina's 2007 Decree 140, which among other measures establishes minimum efficiency levels for new automobiles.
- Land Use, Land Use Change and Forestry (**LULUCF**), and Reduced Emissions from Deforestation and Forest Degradation (**REDD+**); an example is Indonesia's 2011 Presidential Instruction for a Moratorium on Forest Concessions.
- **Adaptation** to climate change, including for example, coastal defence and climate-related disaster management; Gabon's National Climate Change Action Plan (Plan Climat), for example, contains a spatial plan to reduce vulnerability to coastal erosion.
- **Research and development** on climate change, to identify new products and practices, and/or increase local capacity for understanding climate change models and impacts; an example is Nepal's Climate Change Policy, a 2011 Executive Order, which sets as a target the establishment of a research centre for climate change research and monitoring.
- New **institutional arrangements**, to manage and support domestic responses to climate change and/or mainstreaming climate change management and financing; a good example is Bangladesh's 2009 Climate Change Trust Fund Act, which establishes a new institutional framework to fund adaptation activity.

Most climate laws address more than one of these dimensions. For example, Jordan's 2010 Renewable Energy and Energy Efficiency Law deals simultaneously with energy supply and energy demand.

Source: All examples are contained in the Climate Change Laws of the World database.

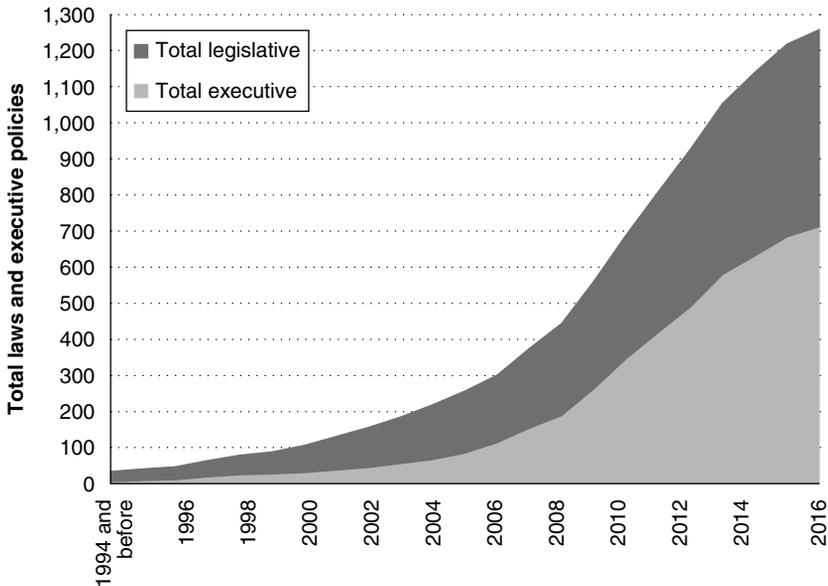


Figure 1.1 Legislative and executive acts up to 2016 (164 countries)

This stock of 1,300 laws is the result of over 20 years of policy making on climate change. In 1997, at the time the Kyoto Protocol was signed, there were only about 60 relevant laws and policies. Since then the number of climate laws and policies has doubled roughly every four to five years (Figure 1.1). This speaks for the growing attention that legislators are devoting to the issue and to their ambition to battle climate change (Nachmany et al., 2017).

Countries use different routes to address climate change. In some countries the primary avenue is acts of parliament, that is, formal laws passed by the legislative branch. In other countries, the policy direction is defined through executive policies, including, among others, executive orders, decrees, strategies and development plans. Approximately 44 per cent of entries in Climate Change Laws of the World are acts of parliament, and the remaining 53 per cent are executive policies.

The variations reflect different regulatory traditions and local contexts. For example, the executive branch, in the form of the National Development and Reform Commission, is the dominant agency in climate policy development in China, while the legislative branch takes the lead in countries with strong parliamentary traditions, such as the UK. Less legislative and more executive activity could also mean that a country is still at an early stage in climate policy development, when executive policies have yet to mature into legislation. Or it may be that legislative capacities are insufficient. In G20 countries almost two-thirds of climate interventions are legislative, in least developed countries it is less than one-quarter.

Climate change laws and policies differ in scope and ambition. Some laws are specifically focused on climate change, advancing explicitly greenhouse gas emissions reduction and adaptation to climate change. However, while over 75 per cent of countries have at least one such piece of regulation, climate-specific laws represent only a quarter of the data set. The remaining laws and policies address climate change and transitions to low-carbon economies through different prisms. Some adopt a narrower focus (for example, energy or forestry), while others incorporate climate change into wider frameworks, such as economic development strategies or green growth plans (Table 1.1).

The most prominent focus area is energy: almost 90 per cent of countries have energy regulations that address climate change to some extent. These laws and policies, concerned with electrification, energy efficiency and renewable energy, represent over 40 per cent of the laws and policies in the data set.

Climate change is also incorporated into general environmental regulation, as well as into forestry, transportation and agriculture legislation and policies, albeit on a much lower scale. Many of the contexts in which climate change is framed are consistent with the Sustainable Development Goals (SDGs), particularly with SDGs 1 and 2 (eradicating poverty and hunger); SDG 7 (affordable and clean energy); SDG 11 (sustainable cities and communities); SDG 15 (on forestry and biodiversity); and, of course, SDG 13 on climate action.

### 1.3 HOW CLIMATE CHANGE LEGISLATION COMES ABOUT

The first question that arises from the large body of climate change legislation that has now been enacted is how these laws came about. What prompted legislators to pass, on average, a climate change law per country every three years or, in the case of the most prolific legislators, closer to

Table 1.1 Key focus areas for laws

|                       | Energy | Climate change / low carbon transitions | General environment laws | Mainstreamed into development plans | Forestry | Green transport | Disaster risk reduction | Agriculture and food security | Other |
|-----------------------|--------|---|--------------------------|-------------------------------------|----------|-----------------|-------------------------|-------------------------------|-------|
| Number of countries   | 145    | 124                                     | 92                       | 71                                  | 47       | 18              | 15                      | 12                            | 38    |
| Per cent of countries | 88.4%  | 75.6%                                   | 56.1%                    | 43.3%                               | 28.7%    | 11.0%           | 9.1%                    | 7.3%                          | 23.2% |
| Number of laws        | 518    | 324                                     | 149                      | 97                                  | 60       | 19              | 20                      | 16                            | 53    |
| Per cent of laws      | 41.2%  | 25.8%                                   | 11.9%                    | 7.7%                                | 4.8%     | 1.5%            | 1.6%                    | 1.3%                          | 4.3%  |

one new climate law every year? We explore this question in Part I of the book. The three chapters in Part I describe the political economy of climate change legislation and identify some of the practical challenges faced by legislators.

In Chapter 2 (The national and international drivers of climate legislation), Abbie Clare, Sam Fankhauser and Caterina Gennaioli use the Climate Change Laws of the World database to offer a statistical, top-down review of the key factors that explain the passage of climate change legislation. They distinguish between national and international drivers.

Climate change is different from most other environmental problems in its global nature. Practically every country in the world is a signatory to the United Nations Framework Convention on Climate Change (UNFCCC), and their decisions on climate change are influenced by the UN process. This is the case even for adaptation to climate change, which is primarily a local issue. Clare et al. confirm that these international drivers are important, although not uniformly so. The Kyoto Protocol, for example, has had little impact on the number of climate laws passed, once other factors (such as national income) are controlled for.

The effect of national political dynamics on climate legislation is equally nuanced, but much less ambiguous. Clare et al. find that strong, unified governments are better able to pass climate change legislation. However, in democracies they will be unlikely to do so in election years. A particularly important factor of climate action is the passage of framework laws, which codify the political consensus and create clarity about the future direction of climate policy. In most countries, there is broad agreement among political parties about the direction of travel. Clare et al. find no significant difference in the legislative activities of left-wing and right-wing governments. Right-wing climate scepticism, which is prominent in countries such as Australia and the USA, is the exception rather than the rule and predominantly an Anglo-Saxon phenomenon.

Chapter 3 (Climate legislation in China, the European Union and the United States) complements this top-down overview with an in-depth analysis of climate policy in the world's largest greenhouse gas emitters. Isabella Neuweg and Alina Averchenkova describe how China, the European Union and the United States each face their own unique challenges on climate legislation and how they have taken different routes in developing and implementing climate policy.

China's approach to climate policy reflects a governance system that is driven more by executive orders than acts of parliament. Accordingly, China has chosen to embed its climate change objectives in successive five-year plans. More than other countries, China also recognizes the economic

opportunities in a low-carbon economy and combines environmental targets with measures to promote low-carbon industries.

EU governance is characterized by a strong system of laws and regulations, but policy making requires agreement across member states. Member states have decided to make climate policy an EU matter, setting binding EU-wide targets on carbon emissions, renewable energy and energy efficiency and setting up a pan-European emissions trading scheme. They also participate in the international climate change negotiations as a bloc. EU-wide collaboration on a transnational issue like climate change makes sense and many observers would see climate change policy as an EU success story, shortcomings in its flagship emissions trading scheme notwithstanding.

US policy makers have traditionally favoured market-driven solutions, but in the case of climate change the country has taken a regulatory approach. Where federal action has been taken, and much of it is now being reversed, it was based on existing legislation, the 1990 Clean Air Act. This reflects the contested nature of climate change policy at the federal level, which has made it difficult to get meaningful climate change legislation through Congress. Alongside the shift to regulatory approaches, this has increased the importance of states and sub-national actors in climate policy. State legislatures are moving ahead of the federal level, with progressive states such as California enacting world-leading climate legislation.

In Chapter 4 (Climate legislation in the least developing countries) Michal Nachmany, Achala Abeysinghe and Subhi Barakat depict the unique challenges of the least developing countries (LDCs) and trace their growing engagement with climate change. The motivations and challenges of LDCs are very different from those of industrialized economies, due both to their low emissions profile and their high vulnerability to climate impacts.

As energy-related emissions are low, the transition to a low-carbon economy of LDCs simultaneously serves mitigation, adaptation and development objectives. However, integrating climate change into general development plans remains a challenge. Fewer than half of the LDCs have done so (see also Nachmany et al., 2017). Other focus areas are disaster risk reduction, climate resilience, land use change and access to international climate finance, although there is still relatively little legislative activity in these areas. A growing number of countries are contemplating dedicated climate laws, but climate action is still predominantly pursued through policies and executive instruments, rather than formal acts of parliament.

## 1.4 WHAT CLIMATE CHANGE LEGISLATION SHOULD CONTAIN

Part II of the book explores the content of climate change legislation. While recognizing the importance of cultural and legislative differences, we begin to identify the emerging elements of good practice in climate change legislation. Over three chapters, we ask what climate change laws need to contain – in terms of the policies, targets and institutions – in order to be effective and consistent with the objectives of the Paris Agreement.

In Chapter 5 (The normative foundations of climate legislation) Fergus Green discusses the ethical, political, philosophical and legal foundations of climate change legislation. Climate legislation is informed and justified by notions of environmental ethics, human rights and inter- and intra-generational equity.

Green argues that none of the dominant normative frameworks that scholars have put forward – the liberal egalitarian-inspired climate justice framework, the utilitarian-inspired economic efficiency framework and international climate law – have been completely successful in providing normative guidance to climate legislators. Each framework is derived from a set of broad, highly abstract and politically unconstrained normative ideals, which are difficult to translate into tangible, practical and often politically contentious legislation.

Green believes that a more pragmatic framework at the interface of philosophy, politics, economics and law is beginning to take shape, which – while more fragmented, short term and local – might prove more successful in guiding domestic climate legislation.

In Chapter 6 (Institutional aspects of climate legislation) Alina Averchenkova and Michal Nachmany discuss some important principles that should be followed when designing the institutional arrangements for climate change policy. Climate action is complex and often controversial. It needs an institutional framework to legitimize, execute and scrutinize the targets and measures that have been put in place.

These arrangements will vary from country to country and depend on the political economy, institutional history and other local factors. Yet Averchenkova and Nachmany argue that certain key functions are common to and important for all arrangements. The institutional framework needs to ensure policies are durable, legitimate and effective. This requires the clear delineation of responsibilities, including between national and sub-national actors, mechanisms for stakeholder engagement and an efficient state bureaucracy. It may also require the creation of new dedicated bodies, for example to set and scrutinize targets, to mobilize and channel climate finance and for monitoring, reporting and verification (MRV).

Chapter 7 (Good practice in low-carbon policy) moves the discussion from institutional arrangements to policy instruments, with a focus on emission reduction measures. Alex Bowen and Sam Fankhauser explore the key policies that are required to move economies to a low-carbon trajectory. These interventions constitute the core content of climate change legislation and broader regulatory efforts to combat climate change. The starting point of the chapter is an understanding of the market, policy and behavioural failures that prevent private decision makers (households and firms) from adopting low-carbon solutions on their own accord.

The most fundamental such market failure is the fact that the economic, social and environmental risks associated with greenhouse gas emissions are not reflected in the price of high-carbon activities (Stern, 2007). A good way to incentivize emitters to control their carbon output is to put a price on carbon emissions. This can be done either through a carbon tax or an emissions trading scheme, and experience with both instruments is growing. However, command-and-control interventions are equally possible and have often been successful, for example in bringing down the carbon emissions of cars.

Putting a price on carbon is not the only intervention that requires legislative or regulatory attention. Bowen and Fankhauser cite a long list of additional problems, including failures in capital markets, externalities related to low-carbon innovation, network issues, barriers preventing the uptake of energy efficiency measures and ignorance about the co-benefits of action, for example in the form of better air quality and healthier lifestyles. There are also policy distortions, not least the subsidization of fossil fuels and the underpricing of energy. A wide range of policy solutions are available to deal with these associated market failures. Popular measures include feed-in tariffs and supplier obligations (to boost low-carbon technology), energy performance standards (to promote energy efficiency) and targeted credit lines and dedicated financial institutions (to overcome finance constraints).

Bowen and Fankhauser recommend a further set of interventions aimed at mitigating the wider socioeconomic impacts of carbon policies, in particular their effect on competitiveness and fuel poverty. Relevant interventions include, for example, measures to increase labour mobility, social safety nets and the protection of low-income households. These measures do not directly reduce emissions, but they make climate change policy fairer, less disruptive and more acceptable to the public.

## 1.5 CLIMATE CHANGE LEGISLATION IN THE WIDER CONTEXT

The final part of the book looks beyond the activities of national governments and parliaments. It contains three chapters that explore the place of national climate change legislation in a broader governance framework that also includes actions by sub-national governments, by the private sector and, increasingly, by the judiciary. We also connect national legislation back to the objectives of the Paris Agreement and the pledges national governments have made in Paris.

Chapter 8 (Climate policy at the sub-national level) discusses how national climate legislation is complemented by action at the regional, state and municipal level. Ibon Galarraga, Elisa Sainz de Murieta and Joan França document – with an extensive list of examples – how sub-national governments are increasingly taking the lead in climate policy, assuming commitments that often exceed those made at national level. They identify close to 100 regions that are committed to reducing their greenhouse gas output by at least 80 per cent by 2050.

Responsibility for the implementation of policies in key areas such as energy, transport and the environment is often devolved to the sub-national level. This gives cities and regions a formal role in national efforts to reduce emissions. Sub-national actors are also central to climate resilience. Adaptation to climate change is very context specific and requires the close involvement of local stakeholders. However, the coexistence of regional and national climate policies can create overlaps and coordination problems between competing policy instruments (Goulder and Stavins, 2010; Fankhauser et al., 2010). A high degree of collaboration among all levels of governance is therefore essential.

The importance of sub-national actors is increasingly recognized in international negotiations. The Paris Agreement includes an explicit requirement to integrate climate policies across all levels of government (Roman De Lara and Galarraga, 2016). Paris was the culmination of a deliberate process to embed sub-national and non-state actors more closely in the UNFCCC process. In 2014 the parties to the UNFCCC had launched the Non-State Actor Zone for Climate Action (NAZCA) platform and in the Lima Call for Climate Action had called on sub-national governments to support the efforts of national governments in both mitigation and adaptation (Hsu et al., 2015).

Chapter 9 (Regulating climate change in the courts) relates climate legislation, which is passed by parliaments, to climate litigation, which is pursued through the courts. Joana Setzer and Mook Bangalore document how the judiciary is playing an increasingly active role in climate policy,

both complementing and in some cases substituting for national legislation. They examine the state and trends of climate litigation across 25 jurisdictions outside the USA for which data exist, and analyse to what extent this litigation is influencing climate regulation.

Setzer and Bangalore find that climate litigation cases broadly fall into one of three categories. For some cases climate change is at the periphery of the argument. Others deal primarily with administrative matters, such as planning permissions. Only in the third category are climate change concerns at the core of the case. Within this last category, lawsuits oriented towards climate policies and legislation, information and disclosure, and loss and damage each represent approximately 7 per cent of the total court cases.

Looking at the outcomes of litigation cases, the courts have so far tended to enhance, rather than curtail, climate change regulation. While this finding is based on subjective assessments, and outcomes differ across jurisdictions, it confirms the important role that courts are beginning to play in regulating climate change.

Chapter 10 (Climate legislation and international commitments) returns to the interplay between national climate legislation and international efforts to combat climate change. Alina Averchenkova and Sini Matikainen outline the key implications of the Paris Agreement for domestic law making. Using data from *Climate Change Laws of the World* and other sources, they assess the consistency of domestic mitigation efforts by the G20 group of countries, which account for 80 per cent of global greenhouse emissions and over 85 per cent of global gross domestic product (GDP), with the Paris objectives.

The chapter demonstrates the centrality of domestic legislation for the Paris Agreement and the UNFCCC process more broadly. To be consistent with their pledges under the Paris Agreement (their NDCs), the parties to the agreement will need to adjust not just the level, but also the time frame and scope of their domestic targets. A year on from the adoption of the Paris Agreement, only a handful of the G20 countries are on track with implementing domestic legislation and regulatory frameworks that are consistent with their NDCs. The majority of countries have yet to adopt a domestic emission target that is consistent with their NDCs.

For Paris to be successful, countries will need to put much more emphasis on ensuring the credibility and faithful implementation of their commitments. Success also demands a more systematic assessment of the adequacy of domestic efforts and improved national processes for monitoring, reporting and verification (MRV). Monitoring progress should focus not only on whether targets are being met, but also on the consistency with a 1.5–2°C pathway agreed in Paris. This includes examining whether

national emissions trajectories are consistent with the temperature goal and whether timelines for the peaking of emissions are ambitious enough.

## 1.6 CONCLUSIONS

This book is aimed at parliamentarians, policy makers, students and analysts interested in legislative action against climate change. It provides an analytical guide to the practical aspects of climate change legislation – the factors that influence the passing of climate laws, an emerging understanding of the key features of good climate laws and a description of how national climate change legislation fits into a broader governance framework that also includes actions at the sub-national level, by the judiciary and non-state actors.

For many years a key concern of policy makers has been whether progressive action on climate change meant moving ahead of the international consensus. Policy makers asked why their country should be the only one taking action. It is now overwhelmingly clear that this is, and has for a long time, been a misguided concern. The Climate Change Laws of the World database on which much of this book is based contains over 1,300 climate laws or acts of similar importance in over 170 countries it covers. This is an average of seven to eight laws per country. The most prolific countries have over 20 climate laws on their statute books.

The more relevant question now is whether all this legislative activity has made a material difference. Are global greenhouse gas emissions lower than they would otherwise have been and are we better prepared for the consequences of climate change? Following the Paris Agreement we can ask more specifically whether the existing body of laws and regulations will be sufficient to meet the objectives of the treaty.

The scientific evidence is fairly clear that it is not. We are currently on course to a global mean temperature increase well in excess of 2°C (Rogelj et al., 2016). The emissions gap to 2°C for the year 2030 – the amount by which global greenhouse gas emissions need to be reduced beyond current commitments – is 12–14 GtCO<sub>2</sub>e, or about one-quarter of current annual emissions (UNEP, 2016a). Assessments of our preparedness for the degree of climate change we will be unable to avoid are patchier, but they too suggest considerable gaps (Fankhauser and McDermott, 2016; UNEP, 2016b).

This book offers some early indications of how legislators and policy makers at the national level may proceed to close the policy gap. It outlines normative frameworks, institutional solutions and policy prescriptions that have been tested in different national contexts. It also acknowledges

the importance of this context and the specific policy environment in which climate change laws are passed. Some generic prescriptions are emerging but one size will not fit all.

The study of climate change legislation is still at a relatively early stage. Despite over 25 years of policy experimentation and the passing of over 1,300 legislative acts, many open questions remain. More research is needed to evaluate much more thoroughly and systematically different institutional, policy and legislative options. In a first instance this entails a methodological understanding of what works technically, for example when it comes to the responsibilities of different institutions or the design of specific policies.

We also need more analysis on the political economy of climate change legislation. Understanding the public acceptability of different policy solutions is as important as knowing how they work technically. The policy prescriptions are often clear. Legislators know what needs to be done. The real difficulty is in enacting the right measures, preserving their ambition and maintaining the commitment through the political cycle.

There is considerable variation across countries in the way climate policy is enacted. Some countries rely on legislated mitigation targets (for example Brazil, Mexico, the UK), while others depend on executive orders (for example Indonesia, Russia, the USA) or strategic policy documents (Germany and South Africa). Acknowledging and understanding these variations is important: not just to develop a sense of good practice in climate legislation, but also to engender mutual trust in the individual efforts that each country makes.

This links questions of technical design and public acceptability directly to the issue of credibility. The success of the international negotiations depends crucially on the reliability of national pledges and on objective ways of assessing the likelihood that commitments will be met. Trust in each other's NDCs is essential to allow the international community to jointly ratchet up their commitments, as the Paris objectives demand.

## REFERENCES

- Falkner, R. (2016), 'The Paris Agreement and the new logic of international climate politics', *International Affairs*, **92**(5), 1107–25.
- Fankhauser, S., C. Hepburn and J. Park (2010), 'Combining multiple climate policy instruments: how not to do it', *Climate Change Economics*, **1**(3), 209–25.
- Fankhauser, S. and T. McDermott, eds (2016), *The Economics of Climate-resilient Development*, Cheltenham: Edward Elgar Publishing.
- Goulder, L.H. and R.N. Stavins (2010), 'Interactions between state and federal climate change policies', *Foundazione Eni Enrico Mattei Working Papers*, 487.

- Hsu, A., A.S. Moffat, A.J. Weinfurter and J.D. Schwartz (2015), 'Towards a new climate diplomacy', *Nature Climate Change*, **5**, 501–3.
- Nachmany, M., S. Fankhauser, J. Setzer and A. Averchenkova (2017), 'Global trends in climate change legislation and litigation', policy brief, Grantham Research Institute on Climate Change, London School of Economics, May.
- Rogelj, J., M. Den Elzen, N. Höhne, T. Fransen, H. Fekete, H. Winkler, R. Schaeffer, F. Sha, K. Riahi and M. Meinshausen (2016), 'Paris Agreement climate proposals need a boost to keep warming well below 2 C', *Nature*, **534**(7609), 631–9.
- Roman De Lara, M.V. and I. Galarraga (2016), 'The Paris Summit: the beginning of the end of the carbon economy', *DYNA Energía y Sostenibilidad*, **5**(1), 41–4.
- Stern, N. (2007), *The Economics of Climate Change: The Stern Review*, Cambridge: Cambridge University Press.
- UNEP (2016a), The Emissions Gap Report 2016, United Nations Environment Programme (UNEP), Nairobi.
- UNEP (2016b), The Adaptation Gap Report 2016, United Nations Environment Programme (UNEP), Nairobi.

