



“Paris compatible” governance: long-term policy frameworks to drive transformational change

A comparative analysis of national & sub-national case studies

Ecologic Institute project team

(in alphabetical order) Matthias Duwe, Mona Freundt, Ewa Iwaszuk, Doris Knoblauch, Melissa Maxter, Linda Mederake, Robert Ostwald, Arne Riedel, Katharina Umpfenbach and Elizabeth Zelljadt – with contributions by Jared Finnegan (LSE Grantham Institute) and Andreas Rüdinger (IDDRI)

Ecologic Institute

ecologic.eu

Acknowledgements

We want thank all the individuals who contributed to this report: our funders, our interviewees, our research partners at IDDRI and the LSE’s Grantham Institute and all the colleagues at Ecologic Institute who had a hand in bringing it together.

Disclaimer

The European Climate Foundation funded this report. The Ecologic Institute is appreciative of this support. Opinions expressed in this report represent the views of the authors and do not necessarily represent the official position or policies of the European Climate Foundation. The responsibility for the content of this publication lies solely with the authors.

About this report

The project that has allowed for the analysis presented here is part of a larger ongoing research effort to enhance our understanding of the development and effective implementation of long-term climate governance that can be compatible with the objectives of the Paris Agreement. Several of the issues touched upon in this paper will be explored in more detail in deeper and more detailed analyses of the cases of the UK climate act and the French energy transition law, being carried out by the Grantham Institute and IDDRI, respectively.

About the Ecologic Institute

The Ecologic Institute is a private not-for-profit think tank for applied environmental research, policy analysis and consultancy with offices in Berlin, Brussels and Washington DC. An independent, non-partisan body, the Ecologic Institute is dedicated to bringing fresh ideas to environmental policies and sustainable development. The Ecologic Institute’s work programme focuses on obtaining practical results. It covers the entire spectrum of environmental issues, including the integration of environmental concerns into other policy fields. Founded in 1995, the Ecologic Institute is a partner in the network of Institutes for European Environmental Policy. The Ecologic Institute acts in the public interest.

Feedback is welcome and can be provided via the channels listed below.

Contact

Matthias Duwe
Head, Climate
Ecologic Institute

Tel.: +49 (30) 86880-0
Fax: +49 (30) 86880-100
E-Mail: matthias.duwe@ecologic.eu

Summary

Governments around the world have adopted long-term climate frameworks, and many are in the process of developing such laws or strategies. These overarching long-term frameworks are critical to effectively implementing the Paris Agreement as tools for managing the necessary transformation of all sectors of the economy. Long-term frameworks help set appropriate long-term targets, chart pathways towards them, and identify the policies necessary to achieve them. They help build political support for climate change mitigation measures, engage stakeholders and expert advice, and create accountability. They can also facilitate raising ambition further — as foreseen under the new Paris system. Case studies of such long-term frameworks from different parts of the world show unique features, which this report presents as examples for policymakers and stakeholders interested in developing similar constructs compatible with the Paris Agreement.

The Paris Agreement signals the global consensus to take urgent action on climate change, but also establishes the long-term objectives necessary to do so. It introduces a new governance framework consisting of nationally determined contributions, five-year review cycles to increase ambition over time, and long-term strategies. Governments at different levels realize that effectively implementing Paris requires that new long-term governance frameworks be adopted in their domestic contexts also. Climate governance is a new field of study that requires urgent attention because of its relevance to successful implementation of the Paris Agreement. This report aims to contribute to the growing evidence base on effective long-term governance systems, and to support those policymakers interested in developing such frameworks.

Mindful of the different circumstances and respective design choices, the analysis of 13 case studies (six nation states, two sub-national states and five cities) provides for the following lessons, which could inform development of long-term climate laws and strategies around the world¹:

Overarching lessons

- Momentum: governments aiming to implement Paris turn to long-term framework laws
- Legal power: frameworks enshrined in law can more effectively drive transformational change
- Increasing ambition: legal frameworks can raise the bar
- Political commitment: stakeholder ownership is key for success and needs work to achieve

Design features

- External advice: dedicated institutions can provide expertise and transparency, need capacity
- Mind the gap: progress monitoring should include policy reviews
- Roadmaps to the future: short-term decisions must serve the transformation
- Innovative elements: carbon budgets, citizen engagement, climate justice
- Financial flows: policy specifics connect climate action to state budgets
- Getting started: various drivers can trigger the adoption of long-term frameworks

Sub-national experience

- City level frameworks can work well – but need support from and different strategies than national level ones

¹ Given the relative novelty of long-term climate governance, the present assessment is based largely on potential and not yet on measurable performance. That said, the experiences gained from more mature models provide a basis for predicting the potential impact of newer regimes.

These conclusions are further spelled out below, with examples for illustration.

Overarching lessons

- **Momentum: governments aiming to implement Paris turn to long-term framework laws**

Long-term climate governance frameworks are proliferating around the world and can increasingly be viewed as critical indicators of serious intention to implement the Paris Agreement. Most of these are legal frameworks, i.e. laws enacted by elected officials. Recent examples include Sweden’s Climate Act, Norway’s Climate Law (both adopted 2017), Berlin’s Energy Transition Law and Germany’s (non-binding) 2050 Climate Action Plan (adopted in 2016). Several of the more recent frameworks also take inspiration from the Paris objectives, explicitly considering “net zero carbon” or “carbon neutrality” as long-term goals (Sweden, Berlin, Sydney). There is growing interest in national long-term climate laws in other parts of the world (e.g. in the Netherlands, Spain, South Africa). The EU is negotiating an obligation for all its Member States to develop national long-term climate and energy strategies.

- **Legal power: framework laws provide clarity & stability, and thus transformational strength**

A long-term climate governance regime that has been adopted in the form of an overarching law or set of laws has advantages over non-binding regimes. Having adopted a robust framework law on climate can protect governments from exposure to challenges regarding their mitigation efforts (such as the case against the Dutch government for inadequate climate action). Conversely, having a framework enshrined in law means essential procedures of that law (target setting and delivery, policy implementation reviews, etc.) can be enforced by stakeholders through the courts (e.g. court challenge to the quality of the national climate mitigation plan in Ireland) to ensure that agreed processes are being adhered to.

Binding long-term governance also ends the debate about whether to commit to transformational change, giving the policymaking process and its supporting institutions a clear mandate – this allows for a coherent focus on implementation. Moreover, codifying long-term climate change frameworks into law provides a powerful symbolic signal of the highest possible commitment to delivering the transformational change needed to combat climate change. This is particularly true when long-term and near-term targets are explicitly enshrined in the legal text.

Germany, for instance, has high climate change mitigation ambitions due to historic cross-party support for climate action combined with continuous and strong political commitment from the very top of government. However, its long-term approach is non-binding – the country’s inability to adopt sufficient measures to meet its national 2020 target is casting doubts on the effectiveness of a framework not enshrined in law.²

- **Increasing ambition: legal frameworks can help raise the bar**

There is evidence that long-term climate governance frameworks allow for increasing mitigation ambition when they include an internal review similar to the process foreseen under the Paris Agreement. Mexico’s framework law foresees such a process explicitly, and it is likely to be triggered to account for the increased ambition decided in the build-up to the Paris Agreement. In Scotland, legislators are changing their framework law to increase the ambition of their near-term and long-term target based

² At the time of writing (November 2017, post-election negotiations on a future government are ongoing. If concluded successfully, these will set the direction on future climate policy and its governance features – including a possible revision of the current approach.

on a review by the (UK) Climate Change Committee. And France and Sydney put forward new strategies in 2017 with more ambitious targets as a consequence of the Paris Agreement. In France, this higher ambition is likely to be codified, and to inform the implementation of the national law.

- **Political commitment: stakeholder ownership is key for success and needs work to achieve**

Broad political support is crucial for the effectiveness of long-term climate policy frameworks. Case studies reveal several interesting strategies for engaging both policymakers and stakeholders. Systems that are able to combine support from political parties and from stakeholders are likely to be most effective. Case studies illustrate a range of approaches and have different strengths with either one of the two camps – and some strategies that may work for both.

One example is the **integration of climate change objectives into a shared positive vision of the future** (aligning it with economic and social objectives) used in Sydney and in Bogota. A means of fostering broad support among politicians is **cross-party development of the framework’s specifications** (this happened in Mexico, and in Sweden, for example – and historically in Germany).

Achieving **ownership by civil society and businesses** is being tried in particular in Berlin and Denver, for example, as a means of generating political support. In both cases, stakeholders have been directly involved in both preparation and implementation of the framework, in Berlin even its technical aspects. There, different constituencies together now form an Advisory Council.

Germany set up a previously unprecedented consultation process as input to its Climate Action Plan 2050 the government even paid for an independent evaluation, which revealed important lessons on process. Stakeholders expressed frustration with the lack of uptake of their recommendations – and there is a concern that a **lack of involvement by Parliament may have hurt political support**. However, the process triggered awareness and stimulated debate – it laid the foundation for further development of the future vision for 2050.

Design features

- **External advice: dedicated institutions can provide expertise & transparency, need capacity**

In most case studies, new institutions were created to coordinate the implementation of the long-term climate framework or to oversee its progress. In several instances, these are dedicated advisory councils or committees, set outside of normal administrative structures to provide additional and potentially more independent input to the process (e.g. UK, Sweden, Ireland, France, Scotland, Mexico, Berlin, Kempten). While their full impact depends on the extent of their mandate and their link to the political decisionmaking process, these entities have great potential to help reduce emissions in line with the Paris Agreement; they create a minimum level of information sharing and transparency, and support the quality of public debate on climate action. Thus, they can open up political space for discussion of options that might otherwise be lost, misunderstood or simply remain hidden from public view. These bodies are more powerful when they have sufficient resources to perform their role (not the case yet in France) and when their recommendations cannot easily be ignored by political decisionmakers. The UK Climate Change Committee and California’s Air Resources Board (a government agency) are prime examples.

- **Mind the gap: progress monitoring should trigger policy reviews for additional action**

To ensure that targets are being met, long-term frameworks require robust systems to monitor progress and fill implementation gaps. Most governance frameworks in the case studies employ a two-component system that links regular reporting and progress monitoring with policy implementation plans and updates to them. Failure to integrate a compulsory process for ensuring a long-term ‘cycle’ of policy monitoring and review from the outset has, for example, contributed to Germany’s implementation

stagnation and struggle to meet its national 2020 climate target. A mandatory process of five yearly carbon budgets linked to achieving the 2050 objective (see below) has also kept the UK on track to deliver its GHG emission reduction targets despite the unprecedented shocks of Brexit and the financial crisis. The majority of the case studies involve new institutions in this policy cycle, bringing in independent advice and creating transparency - which allows for more accountability for delivery of outcomes.

- **Roadmaps to the future: short-term policies must serve the long-term transformation**

To avoid lock-in effects, long-term frameworks should ensure that current climate policy development is explicitly linked to the decarbonisation pathway. Most of the overarching (economy-wide) frameworks analysed focus on the near term (2020), with many starting to look at least towards 2030 (e.g. Germany, California). However, some frameworks even include distinct roadmaps towards or mechanisms for the middle of the century (e.g. Mexico, France, Berlin) and some include backcasting exercises to link current policy choices to their long-term impact (e.g. France and the UK via periodic carbon budgets). Insufficient links between the near- and long-term can allow policymakers to lose sight of the enabling conditions necessary to deliver the scale of sectoral and economy-wide transformation implied by the Paris Agreement.

- **Innovative features: carbon budgets, citizen dialogues, just transition**

Several case studies offer features worth exploring for possible replication in other contexts. One noteworthy innovation is a key pillar of the UK's Climate Act - the first long-term, legally binding, whole economy climate framework of its kind (adopted in 2008) and still one of the most comprehensive governance models. In addition to a long-term emissions reduction target for 2050, the UK system includes five-year **emission budget periods**, respectively set twelve years in advance. This approach allows for **very specific and close progress monitoring, while providing flexibility** at the same time. It also connects the near-term and the long-term, as the road towards 2050 is continuously being paved in “instalments” that currently run to 2027-2032. The system has served as inspiration for the Scottish Climate Act and the French Energy Transition Law, which have both also introduced a carbon budget system, and could be put to use in other national contexts.

Other innovations include **directly involving citizens**, as opposed to targeting organised civil society, at the national level. In Germany, the stakeholder consultation process devised a specific methodology to involve randomly selected members of the population. In Ireland, the so-called Citizens' Assembly was consulted on climate policy specifically – with inputs provided by experts from the Advisory Council established under the Irish Climate Act.

Lastly, several frameworks explicitly recognize **justice issues connected to the long-term transition**. In Ireland, the Climate Act mandates that the government take into account climate justice when drawing up national mitigation or adaptation plans. In California, the main legislative act setting up a climate change framework (AB32) established an Environmental Justice Advisory Committee to provide policy input from stakeholders in disadvantaged communities. This was done especially with a view to avoiding pollution hotspots under the state's cap-and-trade system.

- **Financial flows: policy specifics connect climate action to state budgets**

Most long-term governance frameworks prescribe how to *identify* climate change policies but do not prescribe specific instruments. A few of the cases analysed here, however, explicitly stipulate that policy instruments – specifically financial ones – must be in line with the provision in the Paris Agreement on shifting financial flows. The Swedish law directly mandates that “climate policy and budgetary policy objectives (...) cooperate with each other”. The French law provides not only climate and energy target milestones but also a carbon tax with distinct values for 2020 and 2030 that must be implemented

via annual budget policy. The Mexican law refers to market-based mechanisms to achieve its targets, enabling consideration of a cap-and-trade system for the country.

- **Getting started: various drivers can trigger adoption of long-term frameworks**

While this analysis does not explore the origin each case study’s climate governance framework, it identifies several key drivers that could apply to other jurisdictions. One is the **momentum provided by the Paris Agreement** and its focus on the long-term objective. Another is the respective jurisdiction’s **development of a shared future vision**, a clear expression of the opportunities unlocked by linking near term climate policymaking to a long term economic vision. This triggered several of the long-term frameworks, particularly at the city level (e.g. in Sydney or Kempten). Coordinated, **targeted public campaigning** by civil society organisations also played a key role in several cases, most prominently the UK (at a time when the call for such a legal framework was relatively unheard of). Individual **leadership on climate change by popular politicians** has also made a contribution in several instances.

Sub-national systems

- **City level frameworks can work well – but need support from and different strategies than national level ones**

While city administrators typically lack the power to adopt overarching legal frameworks for long-term climate governance, these case studies show that cities can adopt effective variations of these arrangements with the right support and a tailored approach. Since they lack the leverage of national laws, **these non-binding systems require strong political commitment to work** - most cities need to deploy proactive strategies to generate this support, including direct engagement with citizens to create ownership on the ground. The cities surveyed have found innovative solutions in this regard.

The **integration of climate change objectives into a larger overall vision** for the future of a community is one of the tools chosen to generate and consolidate additional support (as several case studies have shown successfully). Arguably, cities have a comparative advantage over national and even regional governments in organising such processes because they can (1) involve larger relative shares of their population and thus reach a broader base for ownership of the joint vision and (2) tackle developments on the ground that are tangible in the everyday lives of their citizens.

Cities require not only political commitment on the ground but also the **necessary capacity** to carry out both development and implementation of ambitious strategy, and resources are an ingredient sometimes lacking at the level of individual communities. Financial and regulatory assistance from the national level can help enable more decisive action locally. Such incentives can be provided as part of national climate policy frameworks (as is the case in Germany – which is being used in Kempten).

Another technique that several cities deploy to make up for limited resources and internal capacity is the **use of existing standard or certification schemes that offer additional expertise**. For instance, the city of Kempten uses the progress monitoring and certification system "European Energy Award" which ensures high quality progress monitoring and provides external auditing. Denver became certified under the ISO 14001 Environmental Management System, which is used to evaluate and ensure a continued commitment to reduce GHG emissions as environmental considerations are integrated within agencies' existing goals, processes and plans. Sydney updated the way it reports on local area emissions in order to become compliant with the Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories, which is the new international benchmark for reporting city emissions. Moreover, the city's operations are certified as being carbon neutral by the National Carbon Offset Standard of Australia.

Figure: Assessment matrix with essential design elements that serve to approximate “potential effectiveness” – with values per case study

Main dimensions	Influencing factors	Respective design elements	National					Subnational				Cities			
			France	Germany	Ireland	Mexico	Sweden	United Kingdom	Scotland	California	Berlin	Bogota	Denver	Kempten	Sydney
			2015	2016	2015	2012	2017	2008	2009	2005	2016	2015	2015	2013	2017
Long-term stability	Political commitment	Political support	Broad	Broad	Broad	Broad	Broad	Broad	Broad	Broad	Broad	in flux	Broad	Broad	Broad
		Stakeholder involvement	Extensive	Extensive	Extensive	Limited	Extensive	Extensive	Extensive	Extensive	Extensive	Limited	Extensive	Extensive	Extensive
	Legal bindingness	Legal framework	Yes	No	Yes	Yes	Yes	Yes	Yes	Partially	Yes	No	No	No	No
	Adaptability	Adjustment option foreseen (main targets)	Yes	Yes	Limited	Yes	No	Yes	Yes	No	Limited	Limited	Yes	Limited	Yes
Transformational potential	Strength of the target	Long-term target defined	Yes (2050)	Yes (2050)	Vague	Yes (2050)	Yes (2045)	Yes (2050)	Yes (2050)	Yes (2050)	Yes (2050)	Yes (2050)	Yes (2050)	Yes (2050)	Yes (2050)
		Target enshrined in law	Yes	No	No	Yes	No	Yes	Yes	No	Yes	No	No	No	No
		Interim milestones, budgets	2030 & 5-yr budgets	2020, 2030, 2040	2020 (2030) via EU	2020, 2030 (INDC)	2030, 2040	5yr budgets, 12 yrs in advance	annual + 5yr budgets, 12 yrs in advance	2020, 2030	2020, 2030	2020, 2025, 2030, 2038	2020	No	2030
	Implementation stringency	Monitoring & evaluation process	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Foreseen	Yes	Yes	Yes
		Progress gap mechanism	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Foreseen	Partially	Yes	Yes
	Policy impact	Policies included or process for defining them	process & some specifics	process & some specifics	process & minor specifics	process & minor specifics	process & minor specifics	process in the law	process & minor specifics	process in the law	process in the law	Yes	specific policies, limited process	specific policies & a process	specific policies & proces
Overarching factor	Institutional set-up	New institutions with distinct mandates	Yes	to be established	Yes	Yes	Yes	Yes	can, but so far has not	Yes	Yes	Yes	Yes	Yes	staff capacity

Content

1	Introduction and background.....	10
2	Methodology: what makes for effective long-term climate governance frameworks?	11
2.1	Scope and research questions	11
2.2	Specific methodology	12
3	Case study results – comparative discussion across key design elements	15
3.1	Ability to steer a long-term course	18
3.2	Transformational potential of the framework.....	23
3.3	Overarching factor	28
3.4	Cross-cutting issues.....	29
4	Material data base – the case studies.....	31
4.1	Country: France	32
4.2	Country: Germany.....	37
4.3	Country: Ireland	43
4.4	Country: Mexico	48
4.5	Country: Sweden	54
4.6	Country: United Kingdom.....	58
4.7	Sub-national government: California.....	63
4.8	Sub-national government: Scotland.....	68
4.9	Sub-national government / city: Berlin, Germany	74
4.10	City: Bogotá, Colombia	79
4.11	City: Denver, USA.....	83
4.12	City: Kempten, Germany.....	88
4.13	City: Sydney, Australia	93
5	References	98

1 Introduction and background

With the adoption of the Paris Agreement (PA), the world community has signalled a consensus about the **long-term transformation** that is **required to avoid dangerous climate change** – and a collective commitment to a path towards that transformation. This joint understanding is expressed in the global temperature goals (Article 2.2a) which require global greenhouse gas emissions to peak “as soon as possible” and “rapid reductions thereafter” to bring emissions and sinks into balance “in the second half of the century” (Article 4.1 PA).

Modern political constellations are not well-equipped to adopt policies effecting fundamental transformation over the course of several decades. Battling **climate change thus presents a formidable governance challenge**. To date, countries around the world have adopted different administrative and policy frameworks to structure and organise their climate change mitigation efforts. Some countries have passed dedicated, overarching climate laws (UK or Mexico) that regulate the decarbonisation of their economies over long periods of time, while others base their efforts on executive orders (e.g. Indonesia) or climate plans and other strategy documents (e.g. Germany, South Africa). Some countries are only working towards short-term objectives – or are driven primarily by other national objectives. Only very few have not adopted any policies addressed directly towards climate action – of those, most will do so as part of their contributions to the Paris Agreement.

The transition towards a sustainable, climate friendly economy occurs at all levels of society – not just in national governments. **Throughout the world, cities and regions** hold considerable powers relevant to the decarbonisation pathway and **have recognized their role and responsibility to take action**. Many are leading the development of governance frameworks to prevent and adapt to climate change. Just like nation states and their governments, regions and cities are deepening their experience with domestic climate policies - an increasing number are specifically taking a long-term and transformational perspective.

The Paris Agreement represents an acknowledgement of these existing long-term aspirations and frameworks at all levels of government. At the same time, it serves as a catalyst for further action, amplifying the move towards developing policy action for transformational change.

Understanding better how administrations and communities can organise and manage the path towards a climate-friendly future is of **key importance to understanding how the transformational change required by Paris can be delivered**. This report seeks to contribute to the young field of study on long-term climate governance by showcasing examples. It provides insights as to which design elements long-term governance frameworks have proven or are likely to be effective in directing policies towards the Paris transformation.

The results are meant to **serve as input to policymakers around the world**, who are contemplating how to design their own domestic climate governance systems and structures in a way that unlocks social and economic opportunities and ensures implementation of the Paris Agreement.

2 Methodology: what makes for effective long-term climate governance frameworks?

2.1 Scope and research questions

This paper is part of a series of projects undertaken by Ecologic Institute concerning the governance conditions necessary to achieve transformational decarbonisation efforts at international, European, national, regional and city levels. Much of this work is a collaborative effort with other research institutions.

This paper specifically **analyses long-term climate governance frameworks**, with long-term defined as going explicitly beyond 2030 - the timeframe for most nationally determined contributions (NDCs) under the PA. The frameworks investigated here also must have the objective to radically reduce greenhouse gas emissions - this implies going beyond an incremental approach, instead toward a transformation of existing systems with respect to emissions.

Since long-term governance is key to the latter transformational dimension, its implications deserve spelling out. The drastic decarbonisation that the global community has agreed it will work toward under Paris implies fundamental changes to the current set of technologies and ways of powering and organising our economies. Investments in related infrastructure must shift to new and low-carbon systems very soon, since most of the related assets will be around for decades (be they a vehicle, building, industrial facility or power plant). Future emissions cuts may become harder to impossible given this “carbon lock-in,” or create stranded assets which constitute significant lost value to their owners – who are often companies that in turn provide jobs. Drastic short-term changes (= shocks) are harder to adapt to for human systems than organised transitions over longer periods of time.

Long-term climate governance (of the kind embodied by the Paris Agreement) is thus essential to ensuring that the long-term direction is clear, that decisions taken now are informed by a pathway towards that long-term direction (casting back from the future to the present) and that there is a system in place to check on progress and adjust efforts over time. **Which governance frameworks are effective** in bringing about such transformational change over the long-term?

There are as yet no empirical answers available to this question: there is no existing example of a successfully decarbonised society (yet), whose path towards that transformation may be studied. Therefore, research proceeds via qualitative approximations, expressed through a set of questions addressing underlying issues and current understanding of the dynamics about the nature of the transition required. Judging the overall effectiveness of a long-term governance system can constitute on the one hand an assessment of how well that system supports stable management of the transition (making sure sufficient progress is made over time to ensure that the jurisdiction reaches its targets), and on the other hand that system’s degree of transformational strength (“ambitiousness” or scale of change the system aims to achieve). As further research questions, these can be phrased as follows (see also Sartor et al., 2017):

- Is the adopted framework (likely to be) able to steer a steady course over long periods of time?
Meaning: To what extent is a governance framework able to withstand external shocks and changes in the political environment – and respond to additional information?
- Is the framework able to induce sustained structural transformation? Meaning: are the mechanisms included able to guarantee action, at a sufficiently ambitious level?

These questions can again be broken down into separate sets of questions that look at long-term governance frameworks’ individual design elements. The following section spells out the evaluation approach developed for this purpose and employed for the analysis.

2.2 Specific methodology

Case studies

To create a basis for analysis, we chose distinct cases of long-term climate policy governance frameworks, focusing on examples that seemed particularly advanced or ambitious (e.g. by the targets set or the degree to which they are enshrined in law). We sought a heterogeneous set of case studies, diverse not just geographically, but also regarding the level of governance at which they operate (national, regional, local level). As a result, the case studies do indeed differ significantly in terms of the respective features (level of legal constitution, degree of specificity, duration they have been in place, etc.). Geographically, the vast majority of cases where the level of ambition is sufficiently high to aim for a “Paris compatible transition” come from European countries. The list of case studies is included in Table 1 below, with France and the United Kingdom kindly provided by research colleagues from IDDRI and the LSE Grantham Institute, respectively.

Table 1: List of case studies included in the analysis

	Level	Case study	Geography
1	National	France	Europe
2	National	Germany	Europe
3	National	Ireland	Europe
4	National	Mexico	Central America
5	National	Sweden	Europe
6	National	United Kingdom	Europe
7	Sub-national government	California, USA	North America
8	Sub-national government	Scotland, UK	Europe
9	City/ Sub-national*	Berlin, Germany	Europe
10	City	Bogotá, Colombia	Latin America
11	City	Denver, USA	North America
12	City	Kempton, Germany	Europe
13	City	Sydney, Australia	Pacific

* Berlin represents a special case in that it is a city but also a federal state of Germany.

Breakdown of key influencing factors – sub-sets of questions

To assess the options for optimum design of long-term climate governance frameworks, we look at two fundamental qualities: 1) the ability to steer a (steady) course over longer periods of time (the stability of the “long-term” dimension) and 2) the actual ability to induce transformation (assuming that any effective long-term climate policy cannot but seek structural change). For these we identified key influencing factors. on the first quality implies factors such as the extent of the political commitment, the extent to which the framework is legally binding, and its adaptability. These in turn are represented in several design features - political commitment, for instance, can be divided into support within the political system (across parties) and buy-in from stakeholders. The second quality involves strength of

the long-term objective (how ambitious is it and how is it included in the system), the ability to create new policy action, and the stringency of implementation (through a progress monitoring system that can trigger activities to compensate for shortfalls).

The *institutional set-up* underpinning each long-term climate governance framework contributes equally to both the long-term stability dimension and the transformative potential dimension, depending on the type of institutions involved and their mandate. A well-structured long-term climate governance framework can enhance the long-term stability of a system by providing an additional (independent) actor and by engaging stakeholders; it can also support transformational potential through an active role in emission reduction progress monitoring and policy development. Each framework’s institutional set-up is thus treated outside of the two main dimensions as an overarching factor.

Table 2: Breakdown of overall effectiveness into individual design features

Effectiveness sub-themes	Influencing factor	Design feature
Ability to steer a long-term course	Political commitment	Support within the political system (level and depth)
		Extent of stakeholder participation – to create buy-in for framework and policies
	Legal bindingness	Formal legal status of the framework and individual elements
	Adaptability	Process for review foreseen at regular intervals? Important element: targets
Transformational potential	Quality of the long-term objective	Ambition of emission reduction goal, how it has been expressed and enshrined as the target
	Policy impact	Level of policy detail, process for policy creation and adoption
	Implementation stringency	Regular reporting, progress monitoring, gap filler procedures, enforcement
Overarching factor (contributing to both)	Institutional set-up	Dedicated capacity or institution? Distinct function? Strength of the mandate?

This multi-criteria construct cannot deliver hard data, but constitutes an assessment matrix that makes the underlying themes and common approaches among the different cases both visible and comparable.

Each of the case studies represents a different governance framework with different design features that accommodates the respective needs and (political and capacity) constraints of the country or city in question. The common methodology does not seek to imply *ex ante* that there is a universal “best practice” that can be transferred to all contexts. However, it provides a methodological lens through which to assess the governance roles played by individual elements of different approaches and creates a basis for informed comparison. Moreover, the focus on this core constellation of features reflects

the shared elements found to be important by other researchers in recent analysis of national long-term strategies.³

Process

Each case study underwent a desk research and literature review to identify key material and answer as many of the questions as possible on the respective design features of the governance systems and their origins. This work was complemented with interviews (at least one each) to fill data gaps and get an additional perspective on the respective qualities of the system in question and, where possible, also a review of the case study text itself.⁴

We have chosen to present our *discussion* of the features of long-term climate governance frameworks and the resulting conclusions *first* - in Sections 3 and 4, respectively. The 13 individual case studies follow that overall analysis in Section 5, due to their length (on average four pages each) and degree of detail.

³ Sartor et al., (2017, p. 6) state that “important ingredients for meaningful 2050 strategy development exercises seem to include: engagement with a wide range of stakeholders during strategy development; a clear role for evidence-based expertise to inform strategy development and monitor implementation; a clear legal and institutional frame-work to ensure the 2050 strategy’s implications are considered seriously when short-term policy is made; ...”.

⁴ For the case studies provided by individual external authors, no separate interviews have been carried out.

3 Case study results – comparative discussion across key design elements

The case studies have yielded a wealth of information – which are presented in detail in Chapter 4. This chapter explores the insights that can be generated from these examples and the analysis on the individual cases, using the evaluation matrix described under Section 2.2. The main design features (listed again in Table 3 below) serve as a tool to guide analysis and provide a structure for comprehensive comparative assessment across the different governance frameworks, drawing conclusions from each design feature.

Table 3: Evaluation matrix, broken down to main design features

Effectiveness sub-theme	Influencing factor	Design feature
Ability to steer a long-term course	Political commitment	Support within the political system (level and depth)
		Extent of stakeholder participation – to create buy-in for framework and policies
	Legal bindingness	Formal legal status of the framework and individual elements
	Adaptability	Process for review foreseen at regular intervals?
Transformational potential	Strength of the long-term objective	Ambition of emission reduction goal, how it has been enshrined in the target
	Policy impact	Level of policy detail, process for creation and adoption
	Implementation stringency	Regular reporting, progress monitoring, gap filler procedures, enforcement
Overarching factor (contributing to both)	Institutional set-up	Dedicated capacity or institution? Distinct function? Strength of the mandate?

This chapter does not intend to list all of the features for each case study – but cites specific examples for illustrative purposes. An overview of the key design features per case study is provided in Figure 1 along a simplified scale with traffic light colour coding.

Context: origin of long-term frameworks

Several few drivers can be identified⁵ for the ways in which long-term climate governance frameworks came into existence (which in several cases may act in combination), which may be worthwhile to consider before the exploration of individual design features.

Firstly, there is clearly a growing interest in the development of long-term climate governance frameworks. Recent examples include prominently the new climate laws adopted in 2017 in Sweden and in Norway (not included as a case study)⁶, and the recent decision to develop a climate law in the Netherlands (Clingendael, 2017). Other case studies included in this paper that are similarly freshly adopted

⁵ This paper could not delve deeply into the history of most case studies. Only in a few cases did we have insights into the processes and debates leading up to the adoption of the respective laws or strategies (a topic worthy of additional research). Thus, we did not include this dimension in the assessment in greater depth.

⁶ Norwegian climate law is available online at <https://lovdata.no/dokument/NL/lov/2017-06-16-60>

are France, Ireland (both 2015) as well as Berlin and Germany (both 2016). A common feature among these is the additional **impulse provided by the Paris Agreement** and its long-term visions, with even the build-up towards it having provided momentum for additional action at country and local level. The increasing number of climate laws in particular is evidence of a growing recognition of the need to square the long-term nature of the necessary transformation with the need for urgent policy action now – and **to provide a stable regulatory framework** to do so.

In several case studies, particularly those at the local/municipal level, a driver for the creation of a long-term governance framework are processes for the development of a “**shared vision of the future**” in combination with climate policy objectives. Here, the respective climate change framework’s emergence is part of the development of a larger positive vision for the city’s future (e.g. “Sustainable Sydney 2030”), a proactive approach by city administrators to identify inhabitants with a long-term outlook for their jurisdiction. The fact that integrated planning is mandatory for cities has aided many of these cases. In Kempten, development of the long-term strategy was part of a movement at the municipal level toward a positive economic and quality of life outlook for the community.⁷

For the UK and Scotland, with the “Big Ask” from civil society, one can clearly see the power of **targeted public campaigning** on the issue of adopting a climate law as key (especially important considering that these are (among) the first such frameworks adopted). A similar call was taken up by civil society groups in Ireland – and anecdotally, WWF-Norway claims to have “launched the idea of a Norwegian climate law in 2010” (WWF Norway, 2017).

In some case studies, one can see the commitment of **individual political leaders** as a contributing driver. The case of California belongs in this category, with former Governor Arnold Schwarzenegger championing climate change policy as governor. In Mexico, individual politicians (incl. Ministers) also made a key difference, championing further climate action and the development of a law. In Germany, the long-standing public and political support for climate action were harnessed by Chancellor Angela Merkel, who has tried to cultivate a “climate chancellor” image. On the municipal level, an example would be Clover Moore, Lord Mayor of the City of Sydney (in office for 14 years) initiated the strategy “Sustainable Sydney 2030” in the mid-2000s and remains strongly committed.

External incentives constitute another type of impulse for the creation of long-term governance frameworks. Denver, for instance, was recognized in an international network of cities – this contributed to the adoption of a long-term target. For Kempten, a national support programme (including financial assistance) served as the impulse for a more ambitious and comprehensive long-term strategy development process that helped the city to go an extra mile.

In principle, all of the rather different five drivers identified here can be actively pursued as part of a proactive strategy to initiate the adoption of a long-term climate policy framework, depending on the respective circumstances of the entity in question.⁸

⁷ One could argue that this sense of working towards a positive vision of the future can also be detected in the formulation of the Irish long-term objective to “transitioning to a low carbon, climate resilient and environmentally sustainable economy by the end of 2050” although it seems to largely not have been perceived that way.

⁸ Additional research may yield further influences (e.g. the importance of action at EU level for European countries) and potential correlation between the existence of individual drivers to the successful adoption of long-term frameworks.

Figure 1: Overview of assessment matrix per case study

Main dimensions	Influencing factors	Respective design elements	National					Subnational				Cities			
			France	Germany	Ireland	Mexico	Sweden	United Kingdom	Scotland	California	Berlin	Bogota	Denver	Kempton	Sydney
			2015	2016	2015	2012	2017	2008	2009	2005	2016	2015	2015	2013	2017
Long-term stability	Political commitment	Political support	Broad	Broad	Broad	Broad	Broad	Broad	Broad	Broad	Broad	in flux	Broad	Broad	Broad
		Stakeholder involvement	Extensive	Extensive	Extensive	Limited	Extensive	Extensive	Extensive	Extensive	Extensive	Limited	Extensive	Extensive	Extensive
	Legal bindingness	Legal framework	Yes	No	Yes	Yes	Yes	Yes	Yes	Partially	Yes	No	No	No	No
	Adaptability	Adjustment option foreseen (main targets)	Yes	Yes	Limited	Yes	No	Yes	Yes	No	Limited	Limited	Yes	Limited	Yes
Transformational potential	Strength of the target	Long-term target defined	Yes (2050)	Yes (2050)	Vague	Yes (2050)	Yes (2045)	Yes (2050)	Yes (2050)	Yes (2050)	Yes (2050)	Yes (2050)	Yes (2050)	Yes (2050)	Yes (2050)
		Target enshrined in law	Yes	No	No	Yes	No	Yes	Yes	No	Yes	No	No	No	No
		Interim milestones, budgets	2030 & 5-yr budgets	2020, 2030, 2040	2020 (2030) via EU	2020, 2030 (INDC)	2030, 2040	5yr budgets, 12 yrs in advance	annual + 5yr budgets, 12 yrs in advance	2020, 2030	2020, 2030	2020, 2025, 2030, 2038	2020	No	2030
	Implementation stringency	Monitoring & evaluation process	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Foreseen	Yes	Yes	Yes
		Progress gap mechanism	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Foreseen	Partially	Yes	Yes
	Policy impact	Policies included or process for defining them	process & some specifics	process & some specifics	process & minor specifics	process & minor specifics	process & minor specifics	process in the law	process & minor specifics	process in the law	process in the law	Yes	specific policies, limited process	specific policies & a process	specific policies & proces
Overarching factor	Institutional set-up	New institutions with distinct mandates	Yes	to be established	Yes	Yes	Yes	Yes	can, but so far has not	Yes	Yes	Yes	Yes	Yes	staff capacity

3.1 Ability to steer a long-term course

Political commitment: Support within the political system (level and depth)

Effective climate governance rests on the stability of the commitment because achieving the outcome is an inherently long-term process. The potential for fluctuating political support of stringent climate policy presents a significant risk to the stability of any long-term policy framework. Possibly the most dramatic recent example of such a shift occurred in Australia in 2014, when a change in government prompted repeal of the national carbon pricing instrument after only three years (Taylor, 2014). The politics of climate change in Australia have long been controversial, and thus the risk had been present during the three years the scheme had been in place. The legal nature of the instrument did not prevent its dismantling, although it took three votes to get a majority for the repeal). Conversely, in the UK, the broad political support has helped the Climate Act survive the shocks of the economic crisis and the Brexit vote. These examples illustrate that broad political support across individual parties and party coalitions is key to ensure that a long-term policy framework can steer a steady course over longer period of time.

Several factors could be identified⁹ from the case studies analysed:

One factor that has facilitated broader political support seems to be **political windows of opportunity and exposure over time**. Discussions about long-term climate policy frameworks started a good decade ago in most of the case study jurisdictions (and even earlier in California, for example). The year 2007 (+/-1) stands out in terms of high political and media attention to climate, as it was the year of the fourth IPCC Assessment report and the movie “An Inconvenient Truth”.¹⁰ This seems to have produced a galvanising moment that allowed for fundamental policy decisions. In some instances, the frameworks were adopted right before or during that time (e.g. UK, California, Scotland, Sydney) or emerged from the political debate started then (e.g. the post-Copenhagen Mexican law, the German Energy Concept) – with possibly the most protracted debate in Ireland (eight years between first public campaign and adoption of the act). Others took much longer, due to political setbacks (e.g. Ireland, Berlin). In all cases where debates on the current governance systems started already at an early stage (even the ones where adoption took place more recently), the political system had been exposed to the topic for an extended period, allowing for a certain degree of mainstreaming and a broadening of political support. Even in the protracted debate in Ireland (with different proposals for a climate law from different Parties and successive governments), the result now enjoys broad political support. Among the cases studied, Germany is possibly the one with the longest history of political debate and cross-party political support on climate change mitigation, which has certainly contributed to the adoption of the country’s long-term targets. The combination of public pressure and the concern over “losing face” internationally seems to have forced adoption of Germany’s 2050 climate plan after political conflict at the cabinet level.

A second dimension of broad political support is **cross-party policy development**. Both in the examples of Mexico (2011-2012) and in that of Sweden (2015-2017), the development of the respective law was a multi-party effort, resulting in broad support beyond the governments in place at the time. The historical origins of Germany’s action on climate change similarly involved multi-party Commissions

⁹ This paper could not look at the question whether individually specific political cultures (e.g. degree of partisan division) played a role in the formation of political support.

¹⁰ And the so-called „Stern Review“ had been published in 2006.

(starting in the late 1980s) that engaged in assessments of the science and analysis of reduction potentials and policy options – and tried to come to joint conclusions. However, parliamentarians were largely omitted from the consultation process of the 2050 Plan, which may have led to a lower direct political ownership from national level politicians, across parties. In the UK and in Sweden parliaments are directly involved in the process and decide on interim and the long-term targets, respectively. Also at the local level, cross-party engagement is observable, e.g. in Kempten. The Australian example cited at the start of this segment, may, however, indicate that there are clear limitations to such an approach in instances where the debate on climate changes is very polarised.

A third approach may be found in the strategy of **de-politicisation** that helped lay the groundwork for the long-term framework in California, where elected officials handed authority for virtually all elements of the framework (policy identification and development as well as progress monitoring, review, and enforcement) over to a regulatory body, which consulted extensively with stakeholders to arrive at proposals for how to achieve the targets. While this approach is not easily transferable directly to other political and administrative systems¹¹ (California's Air Resources Board has the mandate to promulgate regulations), there may be scope to involve similar governmental institutions elsewhere – or help design a new institution that is designed to be less politically charged (see also section on institutions below). The approach has certainly worked rather effectively thus far and holds much potential to keeping the Californian system stable over time.

The factors identified provide **evidence that it is in principle possible to proactively generate political support** for the adoption long-term climate frameworks. Of the three identified here, the latter two (or elements thereof) may well be used also in other countries or cities.

Political commitment: Extent of stakeholder participation – to create buy-in and ownership

There are clear differences among the case studies in how stakeholders were engaged, but also some common approaches. **Distinctions exist not just in the formats and the extent of the engagement¹², but also in terms of timing.** Although Mexico's political system, for example, traditionally has procedures for stakeholder consultations on policy instruments, it did not have an explicit stakeholder process as input to the development of its General Climate Law. The initiative for the law came from inside the country's parliament and was largely being negotiated between political parties, in all likelihood with the usual inputs from advocacy groups representing a diverse range of interests. It was not discernible whether this has in anyway affected the stakeholder attitude towards the law – which may be due to the fact that it is largely procedural in content (plus the long-term objective) and that stakeholders consider the *implementation* of the law, through individual instruments and actions, to be more immediately relevant.

In Germany, the elaboration of the 2050 plan was preceded by an extensive stakeholder process, which resulted in a joint document adopted by all stakeholder constituencies. The Ministry even commissioned an external evaluation at the end to identify possible lessons for future stakeholder involvement. However, several stakeholders involved criticised that the ministry's plan did not include most of the inputs received (which created frustration with the consultation process). Nevertheless, the debate

¹¹ One can argue that for EU climate policy the European Commission does at times take on a similar role, to help identify policies and develop proposals, as well as monitor progress and conduct reviews.

¹² It was not with the scope of the research into the case studies to consider whether there are specific traditions or cultures for how and when stakeholders are engaged in the countries, regions or communities concerned. Such information was thus only contained in a few individual case studies.

created through the stakeholder process itself is still seen as an important stimulus for the advancement of the conversation on a long-term transformation, inside individual communities and overall (see also Sartor et al., 2017, p. 10).

In Berlin, stakeholder input was sought at both the development and the implementation, making their **inputs count directly and at an early stage**. A range of different stakeholder interests are also represented in the newly (re)founded Berlin Council – making them **own the implementation process** also. Kempen also explicitly involved stakeholders in both the development and the implementation of its long-term strategy.

Stakeholder involvement on such important long-term issues with far-reaching impacts can even start **a shift in culture to engage citizens in policy-making**. In France, the “national debate” process that fed into the adoption of the energy transition law, for example, is seen as a paradigm shift in the way the government handles such external inputs. And the German consultation process was unprecedented at the national level.

Cities can have a different and more direct stakeholder connection as they can more easily **engage directly with their respective citizens** rather than “only” with civil society representatives (in the case studies, Sydney, Berlin and Kempen seem to make most use of it, but so does Denver, and to a lesser extent Bogotá). However, the example of the Irish Citizen Assembly shows that there are ways in which this can also be enabled at the national level. And in Germany’s stakeholder consultation process, for example, a specific procedure was devised to select individual citizens for involvement in the process.

Several case studies also highlighted that the transformational nature of climate policy (even in the short-term) can create friction among different stakeholder groups, often resulting in significant opposition by incumbent private actors concerned about the impact on their existing businesses or jobs. Engaging these groups can thus help create consensus and buy-in, but also slow down progress or water down the ambition of policies or targets. Since, however, concerned stakeholders (whether they represent private or public interests) will seek to have their voices heard even when no proactive stakeholder engagement is taking place, there is significant potential in making their inputs public and transparent through the creation of a distinct process for receiving them – and creating not just a one-way channel but space for a discussion and possible ownership. This can also **level the playing field for all stakeholders** vis-à-vis incumbent actors with traditionally strong lobby voices.

Overall, stakeholders play an important role in all case studies. **There is evidence in the case studies that it can pay off to involve stakeholders**, especially when it is made **meaningful to them and creates ownership**. The case studies provide examples for how to organise the engagement (with the recently adopted Berlin system possibly one of the particularly positive examples). Cities may be at an advantage in successfully involving citizens directly (also because the policies have a more direct impact on the stakeholders), but by no means exclusively so.

Political commitment combined – support among decision-makers and from stakeholders?

The evaluation matrix posits that the support among political decision-makers and from stakeholders are two sides of the same coin in that they can both contribute to the overall political commitment that exist for the framework in question – and thus the two dimensions deserve a consideration taken together and not just in isolation. The case studies show different combinations of political party support and broader stakeholder input and ownership.

First off, a look at examples where the two dimensions may not be entirely aligned. The Mexican case shows political support for the law but no explicit stakeholder process beforehand – and the German case had extensive engagement in the development process (of the 2050 plan) but then disappointment among stakeholders for how their inputs were taken up, and some political conflict inside the

government before adoption (despite the cross-party consensus on the overarching goals). The research undertaken could not definitely discern whether the two elements had an impact on one another (e.g. the cross-party support in Mexico may have sent a positive signal to stakeholders; and could the criticism from German stakeholders have affected political support for the plan in a negative way?).

Overall political commitment is intuitively strongest in cases that have both cross-party support and stakeholder buy-in. The UK and also Sweden could be an example for that category – but in the latter case it remains to be seen as the law has not even entered into force at the time of writing. In Berlin, there was extensive stakeholder engagement in the development process and there is cross-party support in principle - if not on all specifics. Again, the law is too recent to be able to judge if that combination will be of particular importance.

In Ireland, different parties had been in favour of adopting a climate act in principle, but differed on detail, which delayed the process. Civil society involvement was generally strong, but the actual history of climate policy implementation in Ireland has so far been weak due to powerful vested interests. The key question going forward will be whether the new legislative framework and its provisions on engaging stakeholders (such as the new National Dialogue) will be able to create a broader alliance for progressive implementation of the policies needed. Again, a deeper analysis of the process may yield insights into how the two may be correlated, that the work underlying the case study in this paper could not detect.

In sum, the combined analysis of the two dimensions does not yield strong conclusive insights – and further work may be required to identify potential themes. Considering the fundamental importance of broad political backing (across the spectrum and across interests) for the long-term stability of any climate policy framework, it can nevertheless be stated that **proactive strategies for achieving both of the dimensions should be deployed to enhance overall effectiveness.**

One potential means to win both political and broader public support could be the integration of climate policy with other important objectives to **create an integrated approach** – as seen e.g. in Sydney and Bogotá, where climate change was one of three key pillars in its development plan “Bogotá Humana 2012-2016”).

Legal bindingness: Legal nature of the framework and of individual elements

Most examples of the national/regional level have established their long-term governance systems in legal form, which is one of the reasons they were chosen as case studies. The only national case without a law is Germany.¹³ At city level, the opposite is true: most cities do not have the authority to establish laws applicable only to their territory – they must use other means. Berlin is the only example among the cities with a law, due to its specific circumstances of being a German state (= a recognized subnational jurisdiction like Bavaria or Lower Saxony) for administrative purposes.¹⁴

The key question is: **does having a legal framework make a difference** to long-term climate governance? The insights from the case studies suggest that **the answer is a strong “yes.”** The degree to which the climate change mitigation framework is enshrined in law signals its importance to all involved. A strong legal basis supports in particular the establishment of clear institutional procedures and mandates, facilitates the creation of new, dedicated bodies, and can endow them with important oversight

¹³ It was beyond the scope of the research on the case studies to be able to look at differences in legal systems and cultures to discern to what extent these had an impact on the design of the respective laws.

¹⁴ Other city-states in Germany are Hamburg and Bremen.

powers (see section on institutional set-up below). In the cases without a legal framework, the new institutions created appear to have a less prominent role to play in the overall process (e.g. true in the German system, for both the future scientific platform for the 2050 plan (no direct impact on the process, only information) and the existing “Energiewende” Monitoring Commission (similarly powerless thus far, information only, little attention given to its recommendations)).

Without a legal framework, the processes established through declarations of intent (in the form of strategy documents) for progress monitoring and reviewing policies can be more easily disregarded because doing so does not “break the law”. As per our understanding, the only instance so far in which the existence of a legal framework has indeed be used to enforce its implementation through the courts is Ireland.¹⁵ A group called Friends of the Irish Environment launched a legal challenge in October 2017 against the Irish Government, arguing that the lack of specificity and ambition with regards to policies in the national mitigation plan was in violation of the climate act. The High Court has ruled to accept the challenge (O’Faolain, 2017).

Of course, a legal framework can also be disregarded (or rather: disbanded) if political support falters – and the case studies without legal force can also be effective. However, the frameworks that lack a legal basis must make up for the lacking weight of the law by employing other strategies to generate additional support and buy-in (see section above). It seems evident that frameworks that have both the force of the law AND political commitment stand a better overall chance of being effective. In this sense, the **case studies with legal frameworks signal strong commitment through the codification in law** – and get the benefits on issues such as the institutional set-up also.

Adaptability: Process for review foreseen at regular intervals?

One of the key governance innovations of the Paris Agreement is the review process for improvement that establishes a five-year cycle starting with a progress assessment (the global stocktake - Article 14.2 PA) and demands reviewed contributions by Parties on that basis, with the principle included that these can only represent a “progression” over the previous pledge (Article 4.3 PA). This review was included as a central element, based on the understanding that countries’ initial contributions were unlikely to be sufficient to be on track towards the long-term objectives and would need to be ratcheted up. This same underlying logic can apply to national or local level long-term governance frameworks (Meyer-Ohlendorf et al., 2017) – and should be part of credible implementation of the Paris Agreement.

Reviews of operational elements or governance structures can be similarly important, if individual elements turn out not to be performing well (e.g. an institutional mandate if a reporting process needs improvement). Most EU climate policy instruments foresee processes for review of their own functioning, but this is not true for all the case studies in this report.

Most focus their review procedures on substance, requiring a review cycle combining information on progress with considerations about changes to the suite of policies (see “Implementation stringency” below). The Mexican system, for example, foresees reviews (mainly of policies) every two years and qualifies them, allowing only for changes that make the law *more* stringent. The law also foresees reviewing the target, via a more fundamental substantive review. Germany’s 2050 plan foresees reviews to both policies and the plan itself every five years, with the first taking place already in 2019, timed to be in line with the Paris Agreement’s cycle. California’s law requires an update of the “scoping plan” (the long-term approach by the agency in charge of implementing and enforcing nearly all of the state’s mitigation measures) every five years as well – but this is meant to ensure the target is met and does not include reviewing it. The latter case may be exemplary for most other instances of legal

¹⁵ We could not establish precisely in which of the climate act case studies this option for external legal challenges exists.

frameworks, which also have chosen not to integrate the quantified long-term objective directly in the law (Sweden, Ireland) – as a review of the target can take place without changing the legislation. Review process also exist in the Berlin system – and also in Sydney, for example.

In the case of both Mexico and Scotland there are **currently processes underway to** specifically adjust the respective laws to **adjust the target upwards**, influenced in both cases by the Paris Agreement to some extent (e.g. to reflect Mexico’s increased ambition in its NDC). In the Scottish case the ratchetting up of the target is also meant to reflect success in bringing down emissions beyond previous expectations – and was a recommendation by the Climate Change Committee.

A special case of target adjustment is represented in the innovation developed in the UK Climate Act (replicated in the French law), which sets explicit **carbon budgets for 5 year periods** (adopted 12 years in advance). This continuous process of **establishing specific, quantitative milestones on an ongoing basis** – based on inputs from the experts at the Climate Change Committee – provides a regular review opportunity for the target. With regard to adaptability, this feature also provides flexibility in that it establishes progress over periods, not individual years. Compared to the ten year milestones most other systems use, the five year periods provide more detail regardless.

There are thus several instances that allow for (and foresee) the review of the actual target (or milestones). Most long-term frameworks (including several climate laws), however, clearly **focus on reviews of policies** (which is, after all, an essential feature to ensure that action towards the target(s) is taken (see section below)) but are lacking the target review. Against the global objective under the Paris Agreement, the ambition levels of most long-term objectives are likely to require adjustment – and future climate governance frameworks should thus foresee such ratcheting up mechanisms to be compatible with Paris. To avoid the drawback that making a long-term framework easy to adjust or modify means it can then more easily be dismantled or rendered ineffective, provisions for such changes need to be phrased that specifies which elements to adjust under what conditions. The case studies show that this is best done in overarching climate laws.

3.2 Transformational potential of the framework

Strength of the objective: Level of the target, how has it been enshrined in the system?

For the power to affect transformational change, the frameworks depend strongly on the long-term objectives underlying them. The way these long-term targets have been formulated and how they have been included differs in many respects. In the following, a range of possible dimensions for this variation are explored.

Formulation and level of ambition

The case studies also differ as to the formulation of the ambition of the targets and the specificity of what they seek to achieve. The case studies show a whole range of different ways of formulating these objectives. Most use quantified targets, whereas the Irish transition objective does not include a number.

Attempts by the authors to devise a common methodology to judge the level of ambition displayed by the case studies have proven complex given the lack of sufficient comparable data. Moreover, not all quantitative targets follow the same metric – some cities apply a per-capita measurement, most other case studies use total emission volumes. One of the very few currently available data sources that

allows for comparison across countries is the Stockholm Environment Institute’s Climate Equity Reference Calculator (Kemp-Benedict et al., 2017)¹⁶. Given the methodology applied by the Calculator, nearly all case studies, with the exception of Bogotá, and to a lesser extent Mexico and Sydney¹⁷, were not in line with the 1.5°C and 2°C mitigation pathways for their midterm (2030) targets. However, it should be taken into account, that given its emphasis on historical responsibility and capability, the figures arrived at by the Climate Equity Reference Calculator would require most countries and regions in European Union, the US or Japan to achieve significant *negative* emissions already by 2030.¹⁸

One way that more recent long-term governance frameworks try to achieve a certain compatibility with the objectives of the Paris Agreement is the formulation to seek “carbon neutrality” (Berlin, Sweden, Sydney – France as per 2017 plan, and under consideration in the UK), meaning a net zero balance between emissions and sinks or offsets. This can be problematic, however, when it does not spell out (a) what the level of remaining emissions would be¹⁹ and (b) if it is not clear where the balancing sink capacity is to come from²⁰. The use of offsets in particular could be seen critically in this regard, as there will likely be limits on the availability of offsets globally by the middle of the century.

It is, however, possible to both target carbon neutrality and provide details on how that will be done, which is the case for the two case studies that have employed the term. Sweden, for example has set the goal to be carbon neutral by 2045 and explicitly seeks to go negative afterwards (which may make it the most ambitious target overall). The adopted target also spells out that the actual reduction would be at least -85% and that the remainder would be offset abroad (without providing detail). Berlin’s phrasing is very similar: carbon neutral with 85% reduction in 2050.

Interim targets: milestones and budgets

Almost all case studies include interim targets towards 2050 as a means of creating a more near-term sense of direction (as in “where do we go next?”). Few only have 2020 as an additional element (Ireland, Denver, Scotland), most state at least two - 2020 and 2030 (France, Mexico, California, Berlin) - or even set a milestone for each decade towards 2050 (e.g. Germany, Sweden).

In this context, the innovation of the five-year carbon budget periods (set 12 years in advance) that the UK has developed deserves highlighting again, as it provides for a continuous setting and checking on interim targets towards the long-term objective. Having these interim objectives set through a clear process, based on independent advice and with a given distance into the future (which creates enough visibility but also allows for some de-politicisation at the same time) gives a boost to interim targets and creates a particularly robust framework. The system has been copied in Scotland and upgraded with annual targets – and also in France, combined with decadal milestones.

¹⁶ The Calculator applies a generalized equity reference framework to determine national fair shares in a global effort to reduce GHG emissions. The tool estimates each country’s share in meeting the global mitigation requirement by 2030 using a weighted indicator that assesses country’s historical responsibility and capability to act (defined in income terms, as a proxy for the level of development).

¹⁷ For cities and regions, the country-wide figures were used, due to the lack of more detailed data.

¹⁸ Given equal weighing of the historical responsibility and capacity to act, the tool assessed that to achieve the 1.5°C mitigation pathway, the countries would have to achieve the following emissions reductions by 2030 below the 1990 levels: US – 149%, Germany -158%, Ireland – 163%, Sweden – 525%, Australia – 117% and Japan – 174%. Mexico would have to cut its emissions by 57% against the baseline, and Colombia would have to cut the emissions by 56% against the baseline. Source: (Kemp-Benedict et al., 2017)

¹⁹ This defines what the actual emission reduction objective is in tonnes

²⁰ “sinks” such as increases in carbon uptake from changes to land use and forestry practices could neutralize a jurisdiction’s emissions, but so could offset credits purchased from projects in other jurisdictions

Supporting targets (not on emissions)

A large number of case studies also set national quantitative targets other than those on greenhouse gas emission reductions, such as for renewable energy deployment and energy consumption (Germany, France, California – to name a few) – or related energy policy goals (such as the nuclear power target in France, which seeks to reduce its dependency on this technology). In several cases, these targets are also long-term or at least for interim milestones. An innovative case is the French law, that also includes details on expected carbon tax levels for 2020 and 2030 – which is a policy and not a target as such, but in terms of signalling a specific quantitative future level has a similar effect.

It was beyond the scope of this paper to detail such targets in all cases, so the overview is incomplete. However, the existence of parallel targets that directly have an impact on emissions levels may provide an additional level of commitment to the long-term and to transformation – and signal an increased degree of specificity of the long-term vision.

Legal nature of the targets

The question how the long-term targets are referenced in the governance framework is important and especially prevalent for the instances with legal frameworks. The majority of cases surveyed shows that the long-term target is enshrined directly inside the law (UK, France, Mexico, Scotland, Berlin – and also true for Norway’s 2017 law (not a case study), giving them the weight of the legal system and providing a clear public signal for transformation (even if the objectives themselves are not yet sufficiently ambitious).

The other cases studies reveal some odd choices made in this regard. Ireland’s law, for example, contains an unquantified “transition objective” that refers to no percentages or absolute tonnage amounts and no milestones – but such attributes do exist in other Irish policy documents and can thus be considered part of the same process. Similarly, many of the policies likely to contribute strongly toward emission reduction in California are enshrined in law, e.g. a quota for renewable electricity generation, but the 2050 target is not.²¹ Even in Sweden, the target was not included in the law directly but set through a decision by Parliament in a separate process. The individual reasons for not including the long-term objective in the law could not be precisely determined in all individual cases, but may partially stem from “commitment issues” (certainly the case in Ireland, where this choice has led to much criticism from environmental groups), meaning a reluctance to specifically make the quantified objective an element with legal force. This seems to be somewhat at odds with the purpose of establishing the law in the first place, which should be to put a governance system in place that works toward a specific long-term outcome.

These latter cases contrast interestingly with the situation in Germany, where there is no law that the targets could be enshrined in and where they exist only in government strategy documents. There are, however, very detailed milestones and all targets are indeed prominently “displayed” and have been in existence for over seven years now – and may thus have taken on a quasi-legal status (also due to the broad political support they still enjoy in principle). This example, plus the city level case studies that do not have the ability to include the targets in a legal fashion, illustrates that the strength of long-term targets may also be determined by their level of specificity and their prominence in the political discourse.

Summing up: The long-term targets are what defines the direction of travel and are thus an absolute **essential ingredient to any such governance framework**. The long-term governance frameworks

²¹ Under the purview of the state’s Public Utilities Commission rather than the agency in charge of reducing GHG emissions, accounts for a significant portion of the reductions the state has achieved so far

analysed show that most of them **need to likely improve their level of ambition** in the light of the globally agreed objectives of the Paris Agreement. Most governance system include **interim targets to provide a sense of a road towards the long-term**, with the use of carbon budgets an innovation that holds a number of benefits and can count as best practice. Some also put forward **long-term targets for related objectives**, such as renewable energy, which strengthens the transformational potential of the framework. Having the **quantitative objective directly in the law is the intuitive design and that favoured by the majority** of cases with legal frameworks thus far. Those case studies that do not have the targets enshrined in law (by choice or by the nature of their entities) need to compensate for it – and other means of public commitment to them seems to be one of them.

Policy Impact: Level of detail on policies, process for elaboration and adoption?

Any long-term objective is ultimately only a declaration of intent, unless backed with measures to create implementation action. There are some differences among the systems in this regard. Few of the laws analysed directly contain measures. Some make reference to individual policies or instrument types: the Mexican law mentions carbon pricing, California’s law mentions (but does not require) implementation of a cap-and-trade system, and the Swedish law requires the alignment of climate policies with the budgeting process. The French case is more specific, with quantitative levels for a carbon tax in the law for 2020 and 2030. Several of the non-legislative long-term plans and strategies (Germany and the city level case studies), however, include individual policies directly.

Most frameworks foresee the development of **policies to achieve the targets as a separate process**: they require formulation of policy packages or documents that contain specifics about how to reduce emissions. Most case studies specify the frequency at which these implementation plans are to be updated or expanded. California’s scoping plan (which contains the key policies) is reviewed every five years. In Mexico, there are special climate change programmes, detailing policies for a specific number of years into the future. The Swedish law foresees climate policy action plans every four years, alongside the electoral cycle. The Berlin law mandates the adoption and implementation of “Berlin energy and climate protection programme” (BEK) as a means of deciding on specific measures (with stakeholder input in the process). Germany’s 2050 plan expects a package of measures every five years (aligned to the Paris review cycle). In Ireland, a major process step following the adoption of the law was the work on of the development of the national mitigation plan, published this year (but which may be facing a legal challenge). Across the case studies, these documents mainly contain the summary of existing emission reduction measures and spell out intentions to adopt additional ones.

A key qualitative difference is the **time horizon** involved. A focus on shorter term implementation policies in terms of concrete measures to be taken is evident in many case studies and understandable from a practical perspective (policies start in the now – and the policy-makers adopting them can only truly account for the immediate future impact and not easily establish policies for decades into the future). However, the embedment in a framework towards longer-term goals **should ensure near-term policies are (directly) connected to these future goals**. However, this is achieved to differing degrees. The Denver plan, for example, spells out measures only through 2020, as did the first version of the Californian scoping plan. In contrast, the UK already published the third edition of its national climate strategy reports in October 2017, with a focus on policies to reduce emissions in line with the fourth and fifth of its national carbon budgets (together covering the time-frame 2023 - 2032). The French law stipulates the development of national low carbon strategies that combine carbon budget setting and the definition of trajectories together with the specification of policies. The Berlin Energy and Climate Protection Programme, also provides a roadmap towards the long-term objective. Mexico’s law requires separate strategy documents in addition to the special programme – a short-term

and a mid-term (2050) strategy, which covers the different time horizons and should allow for linkages being made between them.

In sum, all governance systems have designed a means to identify policies and to connect them to their short and long-term targets - to differing degrees. Making the connection to the long-term is key to **avoid lock-ins** and stranded assets. Clearly, in some cases, the long-term dimension is being built in explicitly (e.g. Berlin, Mexico, France – and UK) and there are **tools that can be used** in support. **Specification of pathways towards the goals**, including breaking them down for individual sectors, would be one. The case study work could not clearly identify in which instances actual backcasting work (from future targets to the current time) had been employed (one example being Kempten). This would support creating a strong link between decisions on current policy and the long-term transformation.

Implementation stringency: regular progress monitoring and gap filler procedures

The purpose of a monitoring system is to keep track of progress towards targets. Generating data and making it public can in itself create accountability through transparency.

All of the case studies provide for a reporting system of some kind.²² Some carry out this information gathering and publication within government institutions, others hand this task over to an external body (in some cases a “council” is created), to ensure independence and create credibility for the reports. Some systems have both: in Ireland and Sweden, for example the government must report to parliament on progress every year, and the advisory council also publishes a separate progress report. In the UK the Climate Change Committee presents the report and the government must respond to it. The German Energiewende monitoring is similar in principle but the institutions’ roles are reversed: there is an annual official governmental report, with the external commission providing a parallel, independent assessment (that is meant to be a response, but gets published at a similar time).

However, monitoring progress is rendered meaningless if there are no means to fill gaps or shortcomings to reaching the targets, should any occur. Regarding what to do if the jurisdictions are not on track to meeting their targets, there are no cases of pre-determined “compliance mechanisms” that auto-correct for shortcomings or impose penalties. Instead, in most systems such corrections are meant to occur through a cycle of (1) setting out policies for target achievement at regular intervals (see section above) and (2) ongoing (= annual) monitoring of progress in implementation – so that any gaps detected by the monitoring can be compensated through the new policies.

Overall, the case studies reveal an almost universally chosen approach with **two components connected in cycle to keep on track towards the targets**: (1) annual progress monitoring combined with (2) regular updates to policy implementation plans. Not in all cases is the link between the two, the “gap filler” function, made explicit.

The majority of cases involves **new institutions** in this task, **to create independence** in the assessment of progress and a source for external recommendations (see also the following section). While the actual impact of such arrangements cannot easily be predicted ex ante and may depend on the specific circumstances, the approach has an inherent quality in the transparency it provides.

²² In the case of Berlin, the specifics of these are yet to be adopted, similarly for Bogotá.

3.3 Overarching factor

Institutional set-up: Dedicated capacity? Distinct function? Strength of the mandate?

In most case studies, new institutions (and new structures) were created – some of them inside government, some external. Several systems have created both types side by side, for different functions. There are also individual hybrid cases, e.g. the INECC in Mexico, which is an institute created to provide analytical inputs that is overseen by governmental agencies.

Important elements for analysis of these new bodies are their respective mandates: what roles do they play, what powers do they possess, what is their respective capacity (in relation to the task) and composition in relation to other bodies. Not all of these factors could be analysed in detail in the case studies.

One (simplified) distinction that emerges from the analysis is that jurisdictions tend to create two types of institutions – either (1) managers / coordinators or (2) active monitors / expert watchdogs. In most cases, these two functions split along the line of internal and external institutions.

The internal ones are most often of the coordinating type (e.g. the Mexican Interministerial Commission on Climate Change, which brings together 13 different ministries, or the Special Climate Protection Unit in Berlin) or undertake governmental implementation duties, such as organising reporting for the government. Creating external bodies (such as INECC or the German Commission or the Swedish or Irish Councils, the UK CCC or the French Committee) is done largely to bring in additional information, to support progress monitoring, and to elaborate recommendations.

Such newly created external bodies also represent an opportunity to bring in a range of **stakeholders** and create ownership for the process and its outcomes (one example being the Berlin Climate Protection Council). This may, however, be in conflict with the function to bring in independent scientific advice.

For both governmental bodies as well as specifically created external ones, the **resources** needed for them to have the capacity to carry out their functions adequately are important. It was beyond the scope of this research to identify whether this capacity is being provided sufficiently in the case studies surveyed.

Independence from government is important for the credibility of the external bodies that should provide advice, but their intended and stated access to and potential **effect on governmental work largely determines their overall impact** in the system. Therefore, specification on what is to happen with reports produced and recommendations provided by any external bodies is key. In this regard, among the external institutions, the UK Climate Change Committee appears to have the strongest overall mandate among the cases analysed, since it does the preparatory work for the setting of the carbon budgets and the default is that the government takes on these recommendations – with deviation possible only with additional justification provided.

There are qualitative differences among the external institutions created in other case studies. The councils in Ireland, Sweden, Berlin are designed to play an important role in the implementation of the system – but compared to the UK model, they do not have an equally strong a mandate or potential direct impact. The obligation to respond to a report by an external body is already a step in the right direction for some case studies. The German example does not have that element at the moment. Germany has not yet installed a new institution for the 2050 Plan but signals it wants to create a scientific platform to bring in independent analysis. However, there is the Independent Monitoring Com-

mission for the Energiewende process. So far, the Commission’s impact is hardly discernible, unfortunately. Neither this Commission nor the future advisory platform have a legal basis other than appointment by the government – compounding their weak positions.

The key institution in the Californian system, the ARB, is a unique case because it is a government agency. It is particularly powerful in that it has the mandate to develop policies (by definition with stakeholder consultation), as well as promulgate and enforce them. In similar political systems in which the executive branch of government can exercise such powers, such an agency can play a valuable role in making the system effective.

At city level, the manager function is more prevalent – both in terms of coordination among different parts of the administration as well as a means of organising the process of devising implementation actions and carrying out the monitoring. The special unit on climate protection in Berlin or the individual climate protection manager positions such as the one in Sidney or that created and paid for under the “Masterplan” programme in Germany stand out in terms of administrative innovations inside of governments.

An important function of specifying the institutional arrangements for long-term climate governance lies in the clarification of responsibilities and hierarchies. In the Mexican case, for example, the development of the Special Programmes and the subsequent reporting is greatly helped by the fact that the General Law specifies that all Ministries need to respond to the call of the Environment Ministry as the coordinating institution. The mandates being given to a responsible lead entity can empower them vis-a-vis others. Such clear procedures and hierarchies seem more easily expressed and laid down as the rule in the form of legal frameworks.

Overall, **the importance of the institutional set-up cannot be understated**. Clear structures with explicit responsibilities and hierarchies inside the system are key to smooth implementation. Dedicated resources and staff capacity also immensely valuable in this regard. There is a lot of potential in the creation of new entities to support overseeing or organising the process. The Advisory Councils or Commissions create at minimum additional information and transparency, and thus potential for improvements. They are more powerful when their recommendations cannot easily be ignored by political decision-makers. In that sense, the UK Climate Change Committee still holds the strongest mandate among the “extra-governmental” institutions created for implementation support. There is strong indication from the case studies that **the institutional set-up is stronger when enshrined in law** (although the legally established bodies vary in functionality).

3.4 Cross-cutting issues

In addition to the design features identified ex ante as part of the overall assessment methodology, several issues have emerged from the case studies that merit attention. These are spelled out below.

Fresh frameworks – paper tigers

An issue that somewhat complicates the assessment, which was evident from the outset, is that the majority of case studies cannot be judged against performance yet. They are too recently adopted to have been able to prove themselves – even if they look good on paper. The Swedish law is not even in force yet, Berlin is also still in the process of establishing sub-systems and the German 2050 plan remains untested. In France and in Ireland, adopted in 2015, there are early signs of what implementation may look like, and there clearly is potential (both put forward national plans this year) – but it remains to be seen whether the system as established will work as desired (and in Ireland national critics even deploy a legal challenge). Thus, the analysis has had to focus on what can be drawn from the texts that exist and combine with other material (incl. expert judgements through interviews and other literature), but there is no guarantee that some case studies may not turn out to be paper tigers.

City specific insights

The inclusion of city level case studies has enriched the underlying data set for the assessment, even though few cities have actual legislative powers, which hampers their ability to establish strong mandates and binding procedures, making them more reliant on collaborative approaches and creating broad public and political support. At the same time, they can create “role model aspects”, such as on green public procurement in the case of Berlin. Several elements have emerged that seem specific to the special circumstances of cities as sub-national entities that seem worthy of note – and while it may signal a bias towards national system to be singling out the city level circumstances as “exceptions to the rule”, the form in which they are presented should not distract from the importance of the issues identified. A number of points have been directly integrated into the analysis presented above (access to citizens, integrating climate change in to broader future visions) but in addition there are the following two points.

- **Capacity and finance:** cities need to use external frameworks (national or international) to get at support to make up for capacity gaps (e.g. Kempten’s use of European Energy Award). Even Berlin, which had the power to establish a climate law, is heavily indebted and cannot easily adopt instruments that require public financing. Cities may thus depend on national level policies – and in some cases also on financial support for their climate mitigation activities (e.g. Kempten).
- **Short-term focus:** Real long-term dimension with transformative aspiration is less strong and visible for the several city case studies. Their focus is more short-term, it seems harder for them to plan ahead for the very long-term (e.g. Denver focus on 2020). Working towards concrete milestones in the mid-term (e.g. Sydney 2030) can help if those milestones are themselves routes explicitly in a longer-term framework or guided by a long-term objective. However, risks of lock-ins remain without very explicit back-casting and specific consideration of impacts of current policies on long-term emission developments.

4 Material data base – the case studies

The research for the case studies were carried out over a period of three months, starting in August 2017. A team of more than ten colleagues was involved to provide the respective underlying information and connect with experts for additional data and assessments.

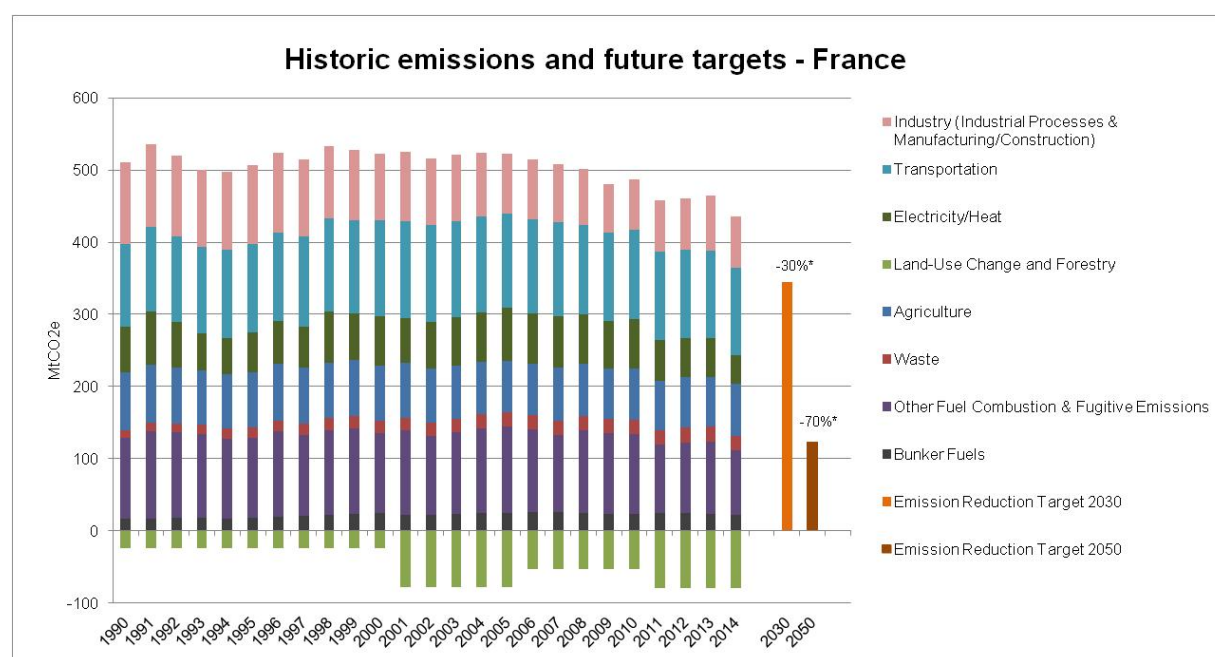
Each case study description follows the same basic structure: 1) a brief essential background on the nature of the case in question and its respective emissions profile 2) a description of the governance framework (including some political context and history) and 3) an analysis of the system, including main strengths and weaknesses.

4.1 Country: France

Essential background

France is the second largest economy and currently the third largest GHG emitter in the European Union (Eurostat, 2017a). Compared to 1990, France had reduced its GHG emissions by 16,6 % in 2016. These reductions have mainly taken place in the energy and industry sector (-40 %), while emissions in other sectors (agriculture, buildings) have stagnated and even increased by 11 % in the transport sector. Mainly due to its low-carbon electricity mix and decline in industry, the French GHG emissions are almost 20 % lower than the EU average on a per capita basis (7,14 and 8,75 tons of CO₂eq per year respectively) (Eurostat, 2017b).

Figure 2 Development of GHG emissions and targets in France.²³



Source: Own illustration, data retrieved from World Resources Institute (2017)

Description of the long-term climate policy governance framework

Historical origin

The French commitment towards the issue of climate change emerged hesitantly at the end of the 1980s. However, it was only after the adoption of the Kyoto Protocol in 1997 that France concretely translated into its national political agenda with a first parliamentary report in 1999, the ratification of

²³ The emissions data illustrated in the Figures 2-3 and 5-8 are based on open source data provided by the WRI *CAIT Climate Data Explorer*. The sectoral division is based on the UNFCCC CRF guidelines, yet in the graphs the emissions from the energy sector are split into sub-sectors. In the case of emissions from manufacturing/construction, the totals have been added to the industry sector. The totals calculated may not correspond with other representations as its purpose is to illustrate emission trends and emission reduction targets.

the Kyoto Protocol in 2000 and the legal recognition of the fight against climate change as a “national priority” in 2001 (Virlouvet, 2015). In 2003, the organisation of a first “national debate on energies” illustrated the progressive attempt to open up the political process to the stakeholders and the wider public, despite heavy criticism from environmental stakeholders.²⁴ In 2005, the new planning act for energy²⁵ defined for the first time a long-term decarbonisation target, with the objective of reducing total GHG emissions by a factor 4 to 5 between 1990 and 2050.²⁶ Furthermore, the law introduces an energy efficiency objective of improving the final energy intensity of the economy by 2 % per year until 2015, and by 2.5 % between 2015 and 2030.

In 2007, president Nicolas Sarkozy organised a broad stakeholder consultation process on ecological issues, the Grenelle Summit for the Environment (*Grenelle de l'Environnement*), including specific topics on energy and climate change. The subsequent Grenelle laws (2009 and 2010) translated the main recommendations into law, including a more specific legal commitment to the 75 % GHG emissions reduction target by 2050 and specific energy policy objectives and measures (regarding building retrofits and renewables in particular).²⁷

Source of today’s climate and energy targets: the energy transition law of 2015

Based on a campaign pledge, the newly elected president François Hollande launched a national stakeholder debate on the energy transition between November 2012 and July 2013. Held under the supervision of a steering committee consisting of six independent experts, the debate gathered over 100 representatives from various stakeholder groups (NGOs, local authorities, members of parliament, unions, etc.), with an additional 50 experts united in the “Expert committee”. The debate produced a number of reports on specific topics,²⁸ which led to a common synthesis report adopted in July 2013 that laid the ground for the subsequent law.

After several hurdles and delays, the new *Law on the Energy Transition for Green Growth* was finally adopted in the summer of 2015, right before Paris hosted the 21st Conference of the Parties (COP21) in December 2015.²⁹ The elaboration of the law provided ground for intense political negotiations: the second chamber (the Senate, controlled by the conservative opposition) repeatedly attempted to overturn the law and any constraints on nuclear power. A total of 5 readings (two in the Senate, three in the National Assembly), totalling 150 hours of public reading and over 5000 amendments were necessary before the final vote. This clearly showed that despite its success in shifting the nature of the

²⁴ Environmental NGOs and independent experts accused the debate of being primarily a political attempt to legitimize a predefined strategy of nuclear revival, rather than preparing a larger strategy for a sustainable energy system (Global Chance, 2003).

²⁵ “Loi de Programmation fixant les Orientations de la Politique Énergétique” (POPE), 13th of July 2015.

²⁶ However, the law remained rather vague in the specific commitment to this objective, stating that: “France supports the definition of the objective of dividing by 2 the global GHG emissions by 2050, which requires, taking into account the different consumption levels among countries, a division by 4 or 5 of the emissions for developed countries.”

²⁷ For a detailed review of the Grenelle law’s targets and measures, see (CGDD, 2011)

²⁸ A total of 7 working groups were created for the debate, including the following topics: Energy efficiency and conservation; energy scenarios; renewable and low carbon energies; costs and benefits of the transition; governance; professional transitions and skills; competitiveness of French companies within the energy transition.

²⁹ “Loi relative à la transition énergétique pour la croissance verte”, law 2015-992, 17th of August 2015.

political debate towards a more evidence-based approach, the **stakeholder debate had not succeeded in erasing the structural controversies** among decision-makers, who remained largely divided on key issues, such as the role of nuclear and renewables, as well as the planned effort on energy efficiency. Despite the strong opposition, the left-wing majority managed to adopt the law in July 2015.

With a total of 215 articles, it provides a clear and ambitious roadmap for the low-carbon transition until 2050, including the following headline objectives:

- A reduction of GHG emissions of 40 % by 2030 and 75 % by 2050 compared to 1990
- A reduction of final energy demand by 20 % between 2012 and 2050 and by 50 % until 2050
- Increasing the share of renewables to 23% of final energy demand by 2020 and 32 % by 2030 (40 % for electricity generation, 38 % for heat)
- Reducing the share of nuclear to 50 % by 2025
- Reducing the primary energy consumption of fossil fuels by 30 % between 2012 and 2030.

In addition to the general targets for the energy transition, the law also implemented a number of specific policy measures and significantly strengthened the overall climate governance and planning framework:

- Inspired by the UK Climate Act of 2008, the French energy transition act implemented the principle of **multi-annual carbon budgets**, encompassing several five-year periods (3 years for the first budget).
- Furthermore, a **national low-carbon strategy** has to be elaborated every five years, including carbon budgets, an indicative trajectory to achieve the long-term targets and specific recommendations for all sectors (including agriculture and land use).
- To improve the coherence of the planning framework in the short and mid-term the law also transformed the existing “multiannual investment framework” into a **broader multiannual energy planning framework** (*programmation pluriannuelle de l’énergie*, PPE): while the former was only targeting energy supply divided into three categories (electricity, gas, heat), the latter encompasses energy supply and demand, highlighting the key objectives for two subsequent five-year periods, including intermediary capacity targets for renewables, the reduction of nuclear power, the number of building retrofits, etc.
- To increase visibility and credibility, the law provides a **long-term trajectory for the evolution of the carbon tax** (referred to as the *energy and climate contribution*) until 2030: starting at 7 euros per ton of CO₂ in 2014, it should progressively reach 56 € in 2020 and 100 € by 2030.
- The law also created a new **Expert Committee** for the energy transition, composed of five independent energy and climate experts who are meant to provide a monitoring function and are to assess the various strategic plans. However, no dedicated resources have been made available for the experts serving on it – undermining the Committee’s capacity.
- The law foresees a **regular monitoring process**, with intermediary reporting every 2 years and a larger evaluation report at the end of each period to adjust the trajectory and **define new measures if needed**.

Despite being considered very ambitious and an “excellent achievement” by the International Energy Agency (IEA, 2017), the current law has received criticism denouncing the gap between ambition and implementation. Indeed, the lack of equally ambitious measures and financing mechanisms bears the risk of turning the strategy into a paper tiger (Rüdinger, 2015). France is currently lagging behind on almost all of its objectives, particularly in the deployment of renewable energies and the improvement of energy efficiency in buildings.³⁰ 2018 will mark the first official evaluation and revision of the two national strategies (the national low-carbon strategy and the multiannual energy plan).

Towards climate neutrality? The 2017 climate plan

In July 2017, the newly appointed Minister for Environment presented a new climate plan (a document produced outside the ones foreseen in the energy transition law, to present the new governments priorities), the first strategic document to explicitly take into account the conclusions of the 2015 Paris Agreement. As a headline objective and in line with the international commitment to the 1.5°C target, the new climate plan strengthens the long-term decarbonisation goal, replacing the existing 75 % reduction target with a more ambitious aspiration of becoming a “champion in the fight against climate change”, reaching *climate neutrality* by 2050.

Even though this new target is currently not legally binding, the upcoming revision of the national low-carbon strategy will aim at proposing an indicative roadmap to achieve a largely greenhouse gas neutral France by 2050 (including LUCLUF). Other significant measures of the plan include:

- An accelerated trajectory for the carbon price, reaching 86 € per ton of CO₂ by 2020 and 121 € by 2030
- Phasing out all diesel and petrol vehicles by 2040
- Prohibit new permits in France for all new exploitation of fossil fuels and phase out the use of fossil fuels until 2040
- A renewed commitment to the diversification of the power mix, including the target of reducing the share of nuclear in power generation from 75 to 50 % by 2025 and to phase out all coal power plants by 2022.

Through the new low-carbon strategy or other legislative means (such as the state budget law) several of these new targets could become part of the energy transition law.

Analysis

While being rather hesitant until then, the French climate governance framework has greatly benefitted from the political momentum initiated with the 2013 national debate on the energy transition and carried

³⁰ In 2015, the share of renewables in gross final energy consumption reached 15,2 %, the 2020 objective being 23 %. Together with the Netherlands, France is the country which is currently the furthest away from reaching its objective. Regarding building retrofits, the national target is to achieve at least 500.000 deep retrofits per year, while results indicate a maximum of 395.000 thermal retrofits per year, of which only several hundred correspond to deep energy retrofits (Guillet and de Rugy, 2016).

over until the organisation of the COP 21 in Paris at the end of 2015. Positive points include the following:

- Even though it did not manage to erase the structurally opposing views on energy policy across the main political parties, this process succeeded in adopting a very ambitious decarbonisation strategy through the 2015 energy transition act, including not only headline targets but also a more **robust governance framework**, including regular carbon budgets – and specific long-term policy elements, such as the carbon tax trajectory.
- Beyond the direct outputs (in terms of objectives and ambition) the adoption of the act can also be qualified as a success in terms of *process*. Indeed, the **extensive stakeholder consultation** process initiated with the national debate (and continued since) can be perceived as a paradigm shift, breaking with the cliché of a highly centralised and technocratic decision-making process in the energy sector (and more particularly, nuclear policy).
- The fact that the political changeover with the election of President Emmanuel Macron and a new majority did not alter the long-term objectives or the governance framework itself also speaks in favour of the **robustness of the political backing** for the system.

However, there are also weak points.

- The level of ambition displayed in the national strategy increasingly contrasts with **insufficient results in terms of implementation so far**, particularly in key sectors such as low-carbon mobility, renewable energies and energy efficiency in buildings. The upcoming process of evaluation and revision of the two key strategic documents (the national low-carbon strategy and the multiannual energy plan) provides a clear window of opportunity to take into account this “implementation gap”, but it remains to be seen whether this will also lead to a reinforcement of policy measures at a level required to achieve the mid and long-term objectives.
- Furthermore, although the national debate and the energy transition law increasingly acknowledged the importance of independent expertise in the policy process, the **role of the expert committee for the energy transition needs to be strengthened** (including dedicated financial resources) to be fully operational.

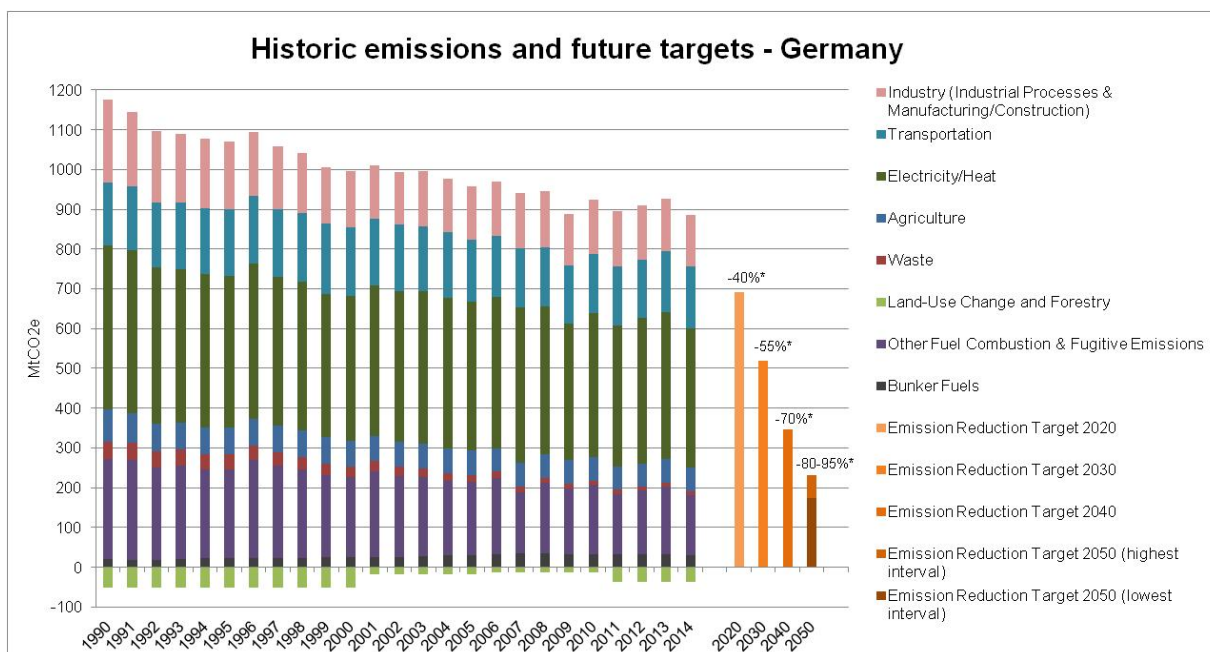
Overall, the Energy Transition law represents a step change in France’s long-term climate and energy policy. The detailed planning processes, the stakeholder input and the target setting and monitoring via carbon budgets make for an architecture with much transformative potential.

4.2 Country: Germany

Essential background

Germany is the EU’s largest economy and its biggest GHG emitter. Compared to 1990, Germany has reduced its GHG emissions by 27.6 %. However, most of these reductions occurred in the 1990s and 2000s. Since the economic crisis caused the largest drop of any single year in 2009, Germany’s emissions have remained more or less stable (see Figure 3).

Figure 3: Development of GHG emissions and targets in Germany.³¹



Source: Own illustration, data retrieved from World Resources Institute (2017)

Description of the long-term climate policy governance framework

Historical origin

To date, Germany has no overarching climate law that enshrines its climate policies and targets. However, as one of the world’s frontrunners in climate mitigation, Germany has gone through a number of processes to set GHG reduction targets and develop policy programmes. The first national “CO₂ Reduction Program” was adopted under Chancellor Kohl in 1990. It aimed at reducing CO₂ emissions by 25 to 30 % by 2005 compared to 1987. Gerhard Schröder’s red-green coalition (1998 – 2005) implemented two successive “Climate Protection Programs” in 2000 and 2005, which were more extensive in scope (Jacob and Kannen, 2015, p. 8). In 2000, the red-green government also brokered a deal to phase out nuclear energy and introduced the Renewable Energy Sources Act (EEG) to support the

³¹ See footnote 23

expansion of renewable energies. The law set into motion an unexpectedly dynamic growth in wind, solar and bioenergy investments.

Energy Concept of 2010: source of today’s near and long-term climate and energy targets

Germany’s current climate and energy targets date from 2010 and are laid down in a strategy document called ‘**Energy Concept**’ (BMWi, 2010). The overarching aim is to reduce GHG emissions by 80 to 95 % by 2050 (compared to the 1990 baseline). To underpin the GHG reduction effort, the Energy Concept includes a set of sub-targets for reduction of primary energy use and renewable energy expansion, covering both 2050 and milestones for 2020, 2030 and 2040. In addition, Germany has several target obligations that arise from EU legislation. Originally, the Energy Concept also contained a reversal of the 2000 decision to phase-out nuclear energy, but after the Fukushima accident in 2011, Chancellor Merkel changed path and proposed a new law to shut down all remaining reactors by 2022. In combination, the Energy Concept and the renewed nuclear phase out decision are now known as the so-called “Energiewende”, a German term for energy transition that had been coined more than 30 years earlier.³²

Figure 4 shows the Energy Concept’s full target set and progress made up until 2015. A mixed picture emerges: while Germany is likely to achieve its 2020 targets for renewable energy, it will most likely miss its GHG reduction target and all sub-targets relating to transport.


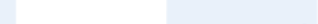
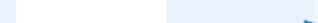

In addition to the climate and energy targets, the 2010 Energy Concept also contains a fairly general description of short-term implementing measures, but **no systematic approach to action planning**. Public participation is praised as important in the document. Yet, stakeholders were not involved in the process leading up to the concept’s adoption. The only external input came from a consortium of consultants providing modelling and scenarios. By contrast, the government did put a **monitoring** process in place in 2011 which includes an annual progress report produced by the government and a study by an **independent commission** of four renowned energy experts. When it became clear that existing policies are not sufficient to put Germany on track to reach its 2020 GHG reduction target, the Environment Ministry was asked to design short-term measures to fill the gap. Although the Climate Action Programme was adopted in 2014, it has so far failed as a **course correction mechanism**, mainly because government didn’t manage to agree on effective measures to reduce coal firing.

³² „Energiewende“ is, for example, the title of a book published in 1980 by researchers from the independent Öko-Institut (Institute for Applied Ecology), which described alternative energy scenarios for Germany. The term appears first in the 1970s. For a historical timeline see for example <https://www.carbonbrief.org/timeline-past-present-future-germany-energiewende> - accessed online October 17, 2017

Main elements of Germany’s climate governance framework: The Climate Action Plan 2050 of 2016

In 2013, the newly elected Grand Coalition of conservatives and social democrats reaffirmed the 2050 climate target in the Coalition Agreement. It was decided to underpin this target with concrete measures, which would be developed in a broad dialogue of all relevant ministries, stakeholders and the wider public. After an intensive stakeholder consultation process (see separate box for detail),³³ the government adopted the Climate Action Plan 2050 adopted in November 2016. The plan’s **objective** is to make Germany *largely* greenhouse gas neutral in 2050. The plan is not a binding law, but a strategy that defines pathways for the decarbonisation for different sectors of the economy. For the first time, the plan breaks the national 2030 GHG reduction levels down into sector-specific targets (see Table 4).

Figure 4: Germany’s climate and energy targets and progress achieved in 2015-16

	2015	2016	2020	2030	2040	2050	
Greenhouse gas emissions							
Greenhouse gas emissions compared with 1990	-27.9 %	-27.6* %	At least -40 %	At least -55 %	At least -70 %	-80 to -95 %	
Growth in percentage of energy consumption from renewable energies							
Percentage of gross final energy consumption	14.8 %		18 %	30 %	45 %	60 %	
Percentage of gross electricity consumption	31.5 %	31.7 %	At least 35 %	At least 50 % EEG 2025: 40 to 45 %	At least 65 % EEG 2035: 55 to 60 %	At least 80 %	
Percentage of heat consumption	13.5 %	13.4 %	14 %				
Percentage of transport sector	5.2 %	5.1 %	10 %**				
Reductions in energy consumption and increases in energy efficiency							
Primary energy consumption (compared with 2008)	-7.6 %	-6.6 %	-20 %			-50 %	
Final energy productivity (2008–2050)	1.3 % p.a. (2008–2015)	2.1 % p.a. (2008–2050)					
Gross energy consumption (compared with 2008)	-3.8 %	-4.1 %	-10 %			-25 %	
Primary energy requirement for buildings (compared with 2008)	-15.9 %					-80 %	
Heating requirement for buildings (compared with 2008)	-11.1 %		-20 %				
Final energy consumption for transport (compared with 2005)	+1.3 %		-10 %	-15 to -20 %			-40 %

*Estimate for 2016. **Target according to EU Directive 2009/28/EG

*Estimate for 2016 **Target according to EU Directive 2009/28/EG

Source: (BMUB, 2017)

³³ The consultation process received two evaluations, one was commissioned by the ministry, yet conducted independently via the analysis of documents from the consultation process, 66 interviews across all stakeholder groups and a symposium with the interviewees (Faas and Huesmann, 2017; Prognos, 2017) – a second evaluation was commissioned by Greenpeace (Rucht, 2016).

For each sector, the Climate Action Plan 2050 lists a number of **implementation actions**. However, the description lacks details on the timeline, responsibilities and budget for these measures. For example, the plan states that GHG reductions in the building sector will be achieved through a mix of policy measures like standards for new buildings, refurbishment strategies for the existing building stock, and the reduction of fossil fuels in heating, but doesn't give any more information on how and when these measures will be put in place. This is the result of an intense inter-ministerial negotiation process. When the Environment Ministry presented a first draft, the plan did include more concrete approaches, most notably an exit date for coal-firing, a major source of GHG emissions in Germany. However, Chancellor Angela Merkel and Sigmar Gabriel, then Minister for Economic Affairs and Energy, heavily criticised the draft. As a consequence, it was “trimmed down” substantially (Wettengel, 2016). The German Parliament had not been directly involved in the consultation process, which may have had a negative impact on political support for the plan (personal communication).

Table 4: 2030 GHG reduction targets by sector in the Climate Action Plan (compared to 1990)

Energy	Buildings	Transport	Industry	Agriculture	Total GHG
- 61-62 %	- 66 – 67 %	- 40-42 %	- 49-51 %	- 31 -34 %	- 55-56 %

Source: (BMUB, 2016, p. 8)

To provide more detail on future actions, the government intends to develop a **programme of measures** in 2018, with measures that have quantifiable GHG reduction effects. Moreover, annual climate action reports will be published **to track progress** and implementation of the measures. A scientific platform with institutions from the natural and social sciences will assess the effectiveness and impact of the specific measures on environmental, social, and economic aspects. Based on the outcome of these impact assessments, the Climate Action Plan 2050 and the programme of measures will be revised every five years. The next revision is scheduled for 2019/2020, in line with the revisions of the Paris Agreement commitments. The government intends to involve the public in the implementation and review of the programme of measures and plans to continue the existing public dialogue process (BMUB, 2016, p. 78).

Climate Action Plan 2050 – Stakeholder Dialogue („Bürgerdialog“)

The consultation process initiated for the development of the Climate Action Plan 2050 is noteworthy in that it was a first of its kind for Germany in terms of scope and size - and it is well documented and has received two independent evaluations.

The stakeholder **consultation process lasted for 1.5 years**, with the actual stakeholder input/dialogue phase conducted over a period of 6 months (October 2015 – March 2016). It included reaching out to citizens, business associations, civil society organisations and to states and municipalities to develop a catalogue of climate measures under the procedural guidance of the German Federal Environment Ministry (BMUB) for the inclusion into the development of the Climate Action Plan (BMUB, 2017b).

The citizens who received an invitation to take part in the stakeholder consultation were chosen at random with the goal of acquiring participants representing the cross-section of the German population. Out of over 76 000 citizens contacted for the first in-person meeting, 472 citizens took part (Faas and Huesmann, 2017).

Over the course of three meetings of delegates from each stakeholder group and several dialogue phases and working groups within the respective stakeholder groups, a **joint catalogue of 97 climate measures was formulated** and presented to the Environment Ministry (Prognos, 2017).

Engagement in the process required significant investment of time and energy for the stakeholders involved. The **process raised awareness of the transformation debate** amongst many constituencies – and the importance of the 2050 plan’s development, especially in the wake of the Paris Agreement’s adoption. It also may have served to galvanize positioning by some groups, e.g. civil society (personal communication).

As per the official evaluation, **all stakeholder groups encourage future consultation dialogues** to increase democratization in ministry processes, yet also stated **significant potential for improvement** on particular on matters of process. Especially stakeholders representing business expressed strong criticism (Faas and Huesmann, 2017; Prognos, 2017).

A key point of criticism, for most stakeholder groups, especially civil society and citizens, was the **absence of most of the joint recommendations** in the final draft Climate Action Plan 2050 prepared by the Ministry. Many felt this had devalued the effort of everyone involved, especially due to the lack of transparency and accountability by the ministry on why the inputs had been ignored (Prognos, 2017).

Analysis

Germany’s climate governance has developed from early target setting and short-term action programmes to a more sophisticated long-term planning process. There are several **strong points** in the current set-up:

- Germany has a **very elaborated target set**, covering both the long- and short-term as well as all relevant sectors. The **ambition level is relatively high**, although the Climate Action Plan’s objective of becoming “largely climate-neutral by 2050” leaves some room for interpretation.

- After following a top-down approach in the early years of climate policy, Germany has started an **intense process of stakeholder involvement** to support the development of its long-term strategy. The process has, however, not been without challenges, mainly because it failed to dissolve fundamental conflicts of interest. Frustration also resulted from the fact that the plans were watered down in the final intra-governmental negotiations.
- Compared to previous, more ad-hoc approaches, the Climate Action Plan presents **clear progress in terms of monitoring**. It foresees regular progress reporting, independent review and a clear process for new measures being proposed at regular intervals that are in line with the Paris process.

There are a number of weaknesses, too:

- Most importantly, the governance framework has so far not **delivered sufficiently effective measures to reach the 2020 GHG target**, let alone the transformative impetus to direct Germany towards full decarbonisation.
- The above, however, was not for lack of monitoring or attempts to correct course. The **main reasons are power struggles** where vested interest in the energy industry, the heavy industry and the auto-industry have so far managed to prevent the most effective measures from being adopted.

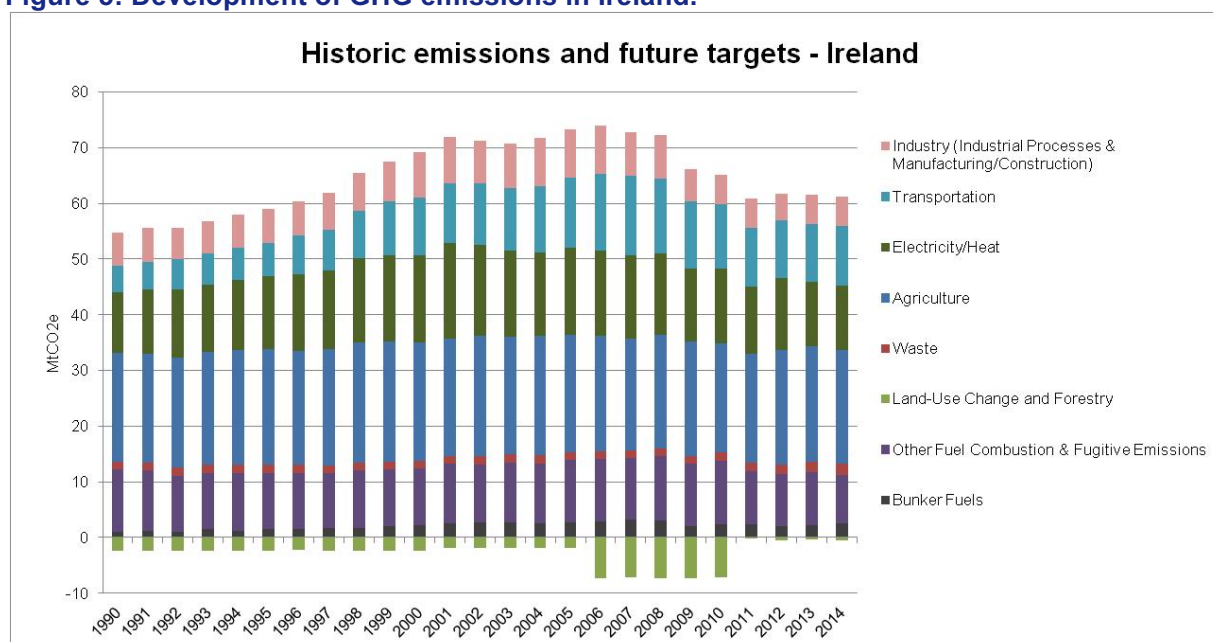
Nonetheless, the processes have stirred public debate and increased pressure on the government. In the negotiations for a new coalition between the conservatives, the liberals and the Green Party (ongoing at the time of writing (October 2017)) a fully binding climate law is potentially on the table again - as is a clear pathway to an exit from coal power.

4.3 Country: Ireland

Essential background

With a population of approximately 4.8 million inhabitants, Ireland is one of the smaller EU Member States. The GDP per capita has increased to EUR 58 800 in 2016 and is the second highest in the EU. During the last decade, per capita GHG emissions decreased to 13.45 tonnes of CO₂ equivalent (tCO₂e) in 2015, but remain above the EU average of 8.75 tCO₂e (Eurostat, 2017b). In 2015, Ireland’s GHG emissions amounted to 59 878.21 ktCO₂eq. Ireland’s GHG emissions reached its peak in 2001, but still exceed 1990 levels (56 102.77 ktCO₂eq) by 6.7 % as per 2015 (EPA-Ireland, 2017a). The agricultural sector is responsible for most of Ireland’s GHG emissions (33.1 %, in 2015) followed by the energy sector (19.7 %), the transport sector (19.8 %), and residential sector (10.1 %) (EPA-Ireland, 2017b) (see Figure 5).

Figure 5: Development of GHG emissions in Ireland.³⁴



Source: Own illustration, data retrieved from World Resources Institute (2017)

Description of the long-term climate policy governance framework

Historical origin

Climate policy in Ireland has historically suffered from a discrepancy between announcements of policy action and implementation, with “the mobilisation of special interests [...] a decisive factor” (Curtin and Hanrahan, 2012). Presently, the country is not on track towards its 2020 target for the sectors covered under the EU Emissions Trading System. The history of the overarching Irish climate law dates back

³⁴ See footnote 23

a good decade and is thus described here in more detail than for other case studies (enabled also through the documentation available, incl. in academic papers). In 2007, Friends of the Earth (FOE) Ireland followed the example of FOE UK’s “Big Ask” campaign, and proposed a “Climate Protection Bill” with a binding 2010 emission target, an independent advisory body and national carbon budgets (2010-2050) to reduce emissions by at least 60% in 2050 (FoE-Ireland, 2007). Despite opposition from farmers and civil servants, John Gormley (Greens), then Minister for Environment published a draft bill in 2010 with a 2030 (-40%) and a 2050 target (-80% GHG reductions), but the law was not adopted before the *Fianna Fail-Green Party* government fell in 2011 (Torney, 2017).

Fine Gael and *Labour* formed the new government coalition (2011-2016). In their election campaigns both parties had made pledges for climate legislation and proposed the adoption of a climate law in their Programme for Government (Torney, 2017). In early 2012, Phil Hogan (Fine Gael), then Minister for Environment published a draft bill. *Labour* was the driving force behind this draft but faced strong opposition from the civil service: in contrast to the Green Party-Fianna Fail draft, national targets for 2020, 2030 and 2050 were not included. In the new draft bill, the government also had the right to veto the reports of the National Advisory Body on Climate Change (Torney, 2017).

During the phase of the public hearings on the draft bill (May–July 2013) in the Oireachtas Joint Committee on Environment, Culture and Gaeltach, TDs (members of Dáil Éireann, the lower house of the Oireachtas) and NGO representatives focused on increasing the powers of the Advisory Body, as they realised that their attempts to stress the inclusion of emissions targets were unsuccessful. In November 2013, the Joint Committee published its recommendations, suggesting a clear “low carbon” definition, an independent advisory body in form of the Irish Fiscal Advisory Council, and the inclusion of the principle of climate justice in the bill (Torney, 2017).

In April 2014, the government published a revised draft bill, combined with a brief high-level strategy document, the National Policy Position on Climate Action and Low Carbon Development (DCCAE, 2014). The latter provides a government definition of “low carbon” and describes the government’s intention to develop climate mitigation and adaptation plans to achieve carbon neutrality in the agricultural and land use sector and a reduction of CO₂ emissions by 2050 of at least 80% (compared to 1990) in the electricity, transport, and building sector (DCCAE, 2014). Accordingly, the 2014 draft bill introduced separate planning processes for mitigation and adaptation. It also increased the frequency of reviews to every five years instead of seven. The membership of the Advisory Body was increased from 6-8 to 9-11 members, limiting the influence of the four ex-officio members (Torney, 2017).

Later in May 2014, the Irish government published a Green Paper on Ireland’s future energy policy, followed by a public consultation (DCENR, 2014). In December 2015, this process culminated in a White Paper on Energy Policy (DCENR, 2015). The White Paper presents an energy policy framework for 2030 and an energy vision for 2050 and beyond: “by 2050 [...] emissions from the energy sector will be reduced by between 80% and 95%, compared to 1990 levels. By 2100 our GHG emissions will have fallen to zero or below” (DCENR, 2015). Concrete proposals for policy measures are presented in separate work programmes. The framework is reviewed every five years and progress is updated annually (DCENR, 2015). This shows that Ireland has in fact expressed specific national long-term

climate and energy targets. However, these were developed in parallel to the Climate Act and are not mentioned in the law itself.

In 2015, the Stop Climate Chaos (SCC) coalition started a public campaign to make the bill more ambitious. Alan Kelley (Labour), then Minister for Environment accepted some of the demands: the principle of climate justice was included in the bill, and the general low carbon society transition target (as mentioned in the National Policy Position) must be considered when formulating national plans. And the bill explicitly recognizes the Council as an independent institution (Torney, 2017).

The Climate Action and Low Carbon Development Act of 2015

In December 2015, Ireland finally enacted its first overarching national climate law, the Climate Action and Low Carbon Development Act 2015 (hereafter referred to as “the Act”).

Targets: Despite the fact that other government documents spell out quantitative targets for 2050 and interim milestones (see above) the Act does not contain these but only sets a rather general 2050 “national transition objective”³⁵. However, the 2020 target that Ireland is already committed to under the EU’s internal effort sharing is referenced directly in two places (for the national mitigation plan and the reviews by the Council – see below).

Planning: Section 3(1) of the Act stipulates the development and **adoption of national plans** (every five years) for climate change mitigation and adaptation with the purpose to transform Ireland into a “low carbon, climate resilient and environmentally sustainable economy”. According to Section 3(1), the Minister for Environment, Community and Local Government is responsible for developing the national plans that are defined in the Section as “a national mitigation plan, and a national adaptation framework”. Sec. 3(2) determines that the government must approve these plans, before they can enter into effect. The government must also ensure that the objectives can be achieved in the suggested time period and that they are in line with Ireland’s climate policies as well as its commitments and obligations under various climate regimes (UN, EU) and take into account climate justice (Sec. 3(2)). Drafts of the national mitigation plan and adaptation framework must be published to allow the public to submit their opinion on these plans (Sec. 4(8); Sec. 5(3)).

Institutions: Moreover, Section 8 of the Act establishes the **Climate Change Advisory Council** (CALCDA, 2015). According to Section 9(1) the Climate Change Advisory Council (hereafter “Advisory Council”) consists of one chairperson and eight to ten ordinary members. Sec. 9(2) determines that the four ex officio members (the Director General of the EPA, the Chief Executive of the Sustainable Energy Authority of Ireland, the Director of Teagasc, and the Director of ESRI) must be ordinary members. Non-ex officio members and the chairperson serve for a maximum of five years (Sec. 9(5)), may be reappointed once (Sec. 9(7)), and are nominated by the Minister for Environment appointed by the government (Sec. 9(3)). Their selection must be based on the qualifications, expertise, and experience

³⁵ The direct wording is “the transition to a low carbon, climate resilient and environmentally sustainable economy by the end of the year 2050 (in this Act referred to as the “national transition objective”) (Section 3.1 of the Irish Climate Act).

needed for the proper functioning of the Advisory Council (Sec. 9(4)). The government has the power to remove members from the Advisory Council, due to health issues, misbehaviour, or if it “appears [...] to be necessary for the effective performance” of the institution (Sec. 10).

Reporting: According to Section 12, of the Climate Act the Climate Change Advisory Council reviews the GHG emission development and produces an **annual report** for the minister for environment. This annual report contains information on the development of GHG emissions and projections of future GHG emissions as well as **recommendations** that the Advisory Council “considers necessary” to fulfil the GHG reductions needed to achieve the national transition objective and to comply with international treaties and obligations. The government itself needs to send an Annual Transition Statement to Parliament

Review: Section 13 determines that the Advisory Council has to conduct one periodic review, 18 months after its establishment, to review the progress that has been made in relation to achieve Ireland's 2020 objective under the Effort Sharing Decision (see European Union, 2009) and in relation to the national transition objective. In addition, Sec. 13(2) gives the Advisory Council the right to review the progress of all mitigation plans and adaptation frameworks at any time and to submit its findings and recommendations to the Minister for Environment, which in turn must submit the report to the Government. According to sec. 11(1), the Advisory Council can also offer advice and make recommendations in relation to the development of the national mitigation plan and sectoral plans, on the approval of these plans and any other related policy to that is waiting for approval by the government. The government and the relevant ministers must take any advice and recommendations “into account”, when developing these plans and frameworks (Sec 4(7)(i); Sec. 7(1)(h)).

The first national low carbon transition and mitigation plan (2017)

After more than two years of development, Denis Naughten, Minister for Communications, Climate Action and Environment, published the first national low carbon transition and mitigation plan (National Mitigation Plan) on 19 July 2017 (DCCAE, 2017a). The National Mitigation Plan includes 106 mitigation actions for four emission intensive sectors (electricity generation, the built environment, transport and agriculture). Seventeen measures are new. The ministers responsible for these sectors have to implement these actions either on an ongoing basis or until a specified date (DCCAE, 2017a). Regarding the latter, most of the actions have a short-term horizon (2017-2020) and only a few must be implemented until 2030 (DCCAE, 2017a).

The absence of post-2030 long-term measures is justified with the uncertainty regarding technological development and availability of cost-effective solutions (DCCAE, 2017a). To clarify how Ireland will reach its national transition objective by 2050, reduction pathways are included in the national mitigation plan, which provide estimations about the nature and scale of the necessary mitigation actions (DCCAE, 2017a).

The plan also stipulates that progress and implementation is monitored by a new National Mitigation Plan High Level Steering Group (chaired by the minister for environment) (DCCAE, 2017b).

The National Mitigation Plan also foresees a two-year National Dialogue on Climate Action (2017-2019) to involve stakeholders in the further identification of policies. In 2017, the Irish “Citizen Assembly” (an informal body created by government to bring in advice from citizens), started its own ‘new national dialogue’ on climate change and plans to deliver policy recommendations to the Houses of the Oireachtas (Sargent, 2017) before the end of 2017.

Analysis

It took eight years between the first public proposal for an Irish climate law, inspired by developments in the UK, and its eventual adoption. Essential design elements were hard fought over – and now that implementation is underway, the system is starting to unfold (National Mitigation Plan, Council review).

This points to key positive elements in the Irish Climate Act, which centre around process and institutional set-up.

- The regular development of national mitigation (and adaptation) plans provides a vehicle for the identification and adoption of additional policies – and puts the environment ministry in charge (to whom the other ministries must provide input).
- The provisions on annual progress statements by the government are augmented by the work of the Advisory Council who provides detailed reviews, and which has already shown in its first report that it does not shy away from pointing out sore spots (such as the need for swift action to meet the 2020 target). Concerns over the independence of the Council’s work due to the small number of governmental representatives included seem thus not to have materialised.

However, especially on substance there are clear weaknesses.

- Understandably, Irish opposition parties and NGOs have criticized that the act does not include binding emission reduction targets and that it lacks a clear definition of what the 2050 “transition objective” actually means (McGee, 2015). In contrast to the detailed carbon budget approaches pioneered by the UK and Scotland, this presents a particularly glaring omission.
- Related to this point of criticism, the Climate Change Advisory Council has recommended the introduction of sectoral goals and milestones (CCAC, 2017). This would plug a key gap in the current framework. However, the Council’s mandate is limited to providing advice – and its utility will depend to some degree on the government’s willingness or ability to abide by it.

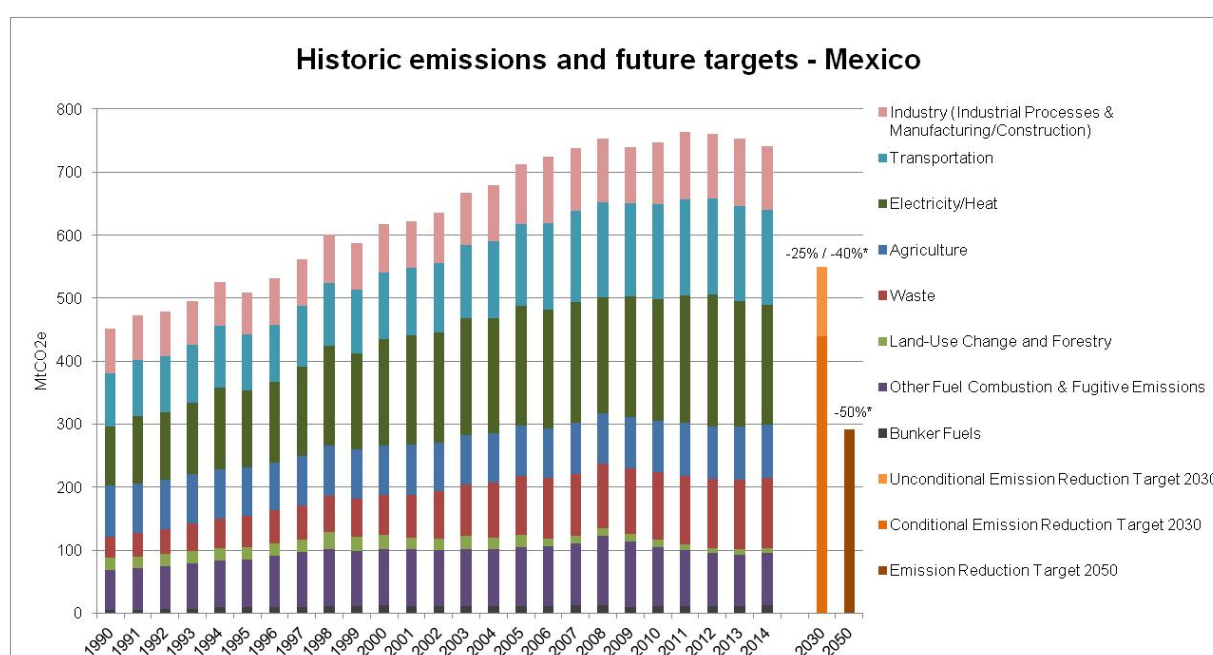
The development of the Ireland’s GHG emissions shows that the existing policies, enacted prior to the Climate Act were insufficient. The processes put in place through the Act provide at the very least significant transparency on the respective shortcomings – and a means of addressing them. Whether this will be sufficient to go from planning to action, remains to be seen.

4.4 Country: Mexico

Essential background

Mexico is the world’s 15th largest economy (The World Bank, 2017) and in 2013 was the 10th largest emitter, responsible for the 1.63 % of global emissions in that year (World Resources Institute, 2014). In 2013, GHG emissions were 40 % above 1990 levels. In the period 2002-2012, GHG emissions’ average annual growth rate was 2.5 %, whilst GDP average annual growth was 2.4 %. In 2013, transport accounted for 26 % of the total emissions, while electricity generation and agriculture caused 19 % and 12 % of total emissions respectively (SEMARNAT-INECC, 2016).

Figure 6 Development of GHG emissions and targets in Mexico.³⁶



Source: Own illustration, data retrieved from World Resources Institute (2017)

According to Mexico’s baseline projection, economy-wide emissions will amount to 1 236 million tonnes of CO₂ equivalent (MTCO₂e) by 2050, which is around 53 % above 2013 emissions of 665 304.92 of CO₂ equivalent (SEMARNAT-INECC, 2016).

Description of the long-term climate policy governance framework

Historical origin

The General Law on Climate Change (GLCC) entered into force on 6 June 2012. Mexico’s Federal Congress adopted the GCCL with the support of all major political parties, which is rare in Mexico’s

³⁶ See footnote 23

usually partisan congress. The law was adopted after two years of negotiation between Mexico’s three main parties. The 10th conference of the Parties (COP 10) in Cancun in 2010 had played an important role in the dynamic leading up to the introduction of the law. To take account of the Paris Agreement, Congress is currently discussing amendments to the GCCL, which include, for example, reference to the Paris Agreement or – possibly – a mandatory ETS.

Main elements of the Mexico General Law on Climate Change

The GLCC sets the general framework for Mexico’s climate policies. It regulates Mexico’s mitigation and adaptation policies. The law adopts indicative and conditional reduction targets for 2030 and 2050, establishes a number of institutions, regulates the responsibilities of the federal, state and local level of government and stipulates a number of guiding principles. In general terms, it regulates public participation and access to information. It also helps introduce a number of policies, including emission trading scheme, incentives for renewable energies and standard setting. It establishes a climate change fund.

In more detail, the GCCL’s main elements are:

Reduction Targets: The GCCL sets a number of GHG reduction targets:

- Transitory Article II is of particular importance. According to this provision, Mexico “adopts the indicative objective or aspirational goal of reducing its emissions by 30 % by the year 2020 with respect to the baseline scenario, as well as a 50 % reduction in emissions by 2050, as compared with the emissions in the year 2000”. These goals are conditional to an international regime that establishes financial and technological support for Mexico.³⁷ Importantly, Mexico’s NDC sets different targets: unconditional reductions of 25 % and reductions of 40 % conditional to international aid by 2030 (both compared to the baseline scenario of emission projections based on economic growth in the absence of climate change policies, starting from 2013).³⁸
- The unconditional target is consistent with the long term target of 50 % of the emission observed in 2000 by 2050, or about 310MtCO₂e total emission, which could be below 2tCO₂e per capita. It is important to note that the difference between the unconditional and the conditional target is significant, accounting to as much as 140 MtCO₂e or 20 % of the country’s emissions in 2013.
- As means for emissions reduction and carbon capture, the GCCL requires maintaining and increasing carbon sinks (Article 34.IIIa)). To this end, the national forest commission shall design

³⁷ “These goals may be achieved if an international regime is established including financial and technological support mechanisms, provided by developed countries for developing countries, including the United Mexican States.”

³⁸ According to Article 4.2 of the Paris Agreement, NDC targets are not legally binding. Since the NDC is Mexico’s more recent reduction commitment, it carries high political weight.

policies for the “transition to a rate of 0 % carbon loss in original ecosystems” (Transitory Article 3.IIa)).

- Article 32 envisages – as an option – the adoption of sector reduction targets – in consideration of availability of financial and technological resources and cost-efficiency analysis.
- In more general terms, Article 2 II determines the GCCL’s purpose to reduce emissions to levels that prevent dangerous interference with the climate system.³⁹
- According to Transitory Article III, the secretariat of energy, in coordination with the federal electricity commission and the regulatory energy commission, will “promote that electricity generation from clean energy sources to reach at least 35 % by 2024”. Clean energy includes gas and nuclear energy. According to the Energy Transition Law, Mexico’s targets of generation of electricity by clean energy are 25 % by 2018, 30 % by 2021 and 35 % by 2024.

Institutions – the National Climate Change System: The GCCL establishes the so-called National Climate Change System, which consists of several institutions and coordination agreements: the Inter-ministerial Commission on Climate Change, National Institute for Ecology and Climate Change, the Climate Change Council, the governments of the States, one representative for each of the legally-recognised national associations of municipal authorities, and representatives of the federal Congress (Article 40). In **more detail**, the National Climate Change System comprises at federal level:

- **Interministerial Commission on Climate Change (CICC):** The CICC is a body of 13 federal ministries.⁴⁰ Its mandate includes, among others, to formulate and implement national policies, to approve the National Climate Change Strategy, and to participate in the elaboration and implementation of the Special Climate Change Programme (SCCP).
- **Climate Change Council (C3):** The C3 gives advice to the CICC. It has also the function to follow-up on policies, actions, and goals provided for by the GCCL, as well as on the evaluations of the national strategy, programme, and state programmes. It is entitled to make proposals to the members of the NCCS. The C3 consists of representative from the social, academic and private sectors.
- **National Institute for Ecology and Climate Change (INECC), Article 15:** The INECC is a research institute which has the objective and task to:

³⁹ Exact wording: “regulate greenhouse gas and compounds emissions to achieve stabilization of their concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system, considering, as appropriate, the provisions of Article 2 of the United Nations Framework Convention on Climate Change and other provisions deriving therefrom”

⁴⁰ Ministry of Environment and Natural Resources, Ministry of Foreign Affairs, Ministry of Energy, Ministry of Finance and Public Credit, Ministry of Social Development, Ministry of the Interior, Ministry of the Navy, Ministry of Economy, Ministry of Agriculture, Livestock, Rural Development, Fisheries and Food, Ministry of Communications and Transportation, Ministry of Public Education, Ministry of Health, and Ministry of Tourism

- Coordinate the evaluation of climate policy – with public participation – as well as scientific and technology research (Article 22 I),
- Carry out sector analysis, including estimation of future costs and benefits,
- Evaluate “compliance with adaptation and mitigation objectives” (Article 15 VI),
- Issue recommendations on climate change mitigation and adaptation policies and actions (Article 15 VII).

The INECC is governed by the governing board, which is composed of the heads of various government agencies (Article 18).⁴¹ Appointed by the head of the federal executive branch, the director general leads INECC. The director general is bound by the decisions of the governing board. Although Article 13 grants the INECC “autonomous operational authority”, it remains part of the federal public administration.

National Climate Change Strategy (NCCS): The NCCS frames Mexico’s medium- and long-term policies. The NCCS must contain baseline scenarios, emissions projections and trajectory, as well as adaptation and mitigation goals for time spans of ten, twenty and forty years (Articles 62 and 64). Prepared by the Secretariat of Environment and Natural Resources, with the participation of INECC and the advice of the C3, the CCIC approves the NCCS. The secretariat, with the participation of the commission, reviews the NCCS at least once every ten years in the area of mitigation and once every six years in the area of adaptation. It provides public explanations if projected estimates deviate from evaluated results.⁴² In light of the review, the NCCS can be up-dated. Importantly, reviews and updates may under no circumstance undermine the goals, projections, and objectives previously proposed (Article 61).

Special Climate Change Programmes: implementing the NCCS, Special Climate Change Programs “establish objectives, strategies, actions, and goals to combat climate change, through the definition of priorities on adaptation, mitigation and research, as well as through the allocation of responsibilities, defining implementation timeframes, charging coordination of actions and of results, and identifying cost estimates, in accordance with the national development plan and the national strategy” (Article 66). The Secretariat of Environment and Natural Resources, with the participation and approval of the commission, elaborates the programmes (Article 66). In addition, states adopt their own programmes - in accordance with the national strategy, the programme, the provisions of this Law, and all other provisions deriving thereof (Article 71).

⁴¹ the head of the Secretariat of Environment and Natural Resources and comprised of the heads of the Secretariats of Agriculture, Livestock, Rural Development, Fishing, and Alimentation; Government; Social Development; Finance and Public Credit; Energy; and Health, as well as the head of the National Council on Science and Technology

⁴² States have the power to implement climate policies in accordance with these strategies (Article 8II), but States have the right to develop and implement their own climate change programs (Article 8 IV). At the same time, States are entitled to develop comprehensive strategies, programmes, and projects on the mitigation of greenhouse gas emissions (Article 8 IX)

Review: The *Coordination for Evaluation* evaluates Mexico’s climate change policy every two years – unless the CICC agrees on longer intervals. This body is composed of the chair of the INECC and six counsellors, representing academic, technical and industrial stakeholders. Following a public process conducted by the head of INECC, counsellors are appointed by the **CICC** four years (Article 23). They may be reappointed once. The *Coordination for Evaluation* may make public recommendations to the federal and state governments and municipalities (Article 98) as well as other members of the NCCS. The *Coordination for Evaluation* adopts its work programme, decisions and recommendations by simple majority of its members. The evaluation encompasses a broad range of policies but not of the reduction targets – unless the CICC decides otherwise (Article 102 XV). Transitional Article 2, however, provides that reduction goals will be reviewed for the publication of the next national strategy.

Analysis

As Mexico’s latest emission data are from 2013, it is not clear to what extent the 2012 GCCL had an impact on GHG emissions. Regardless of this uncertainty, Mexico’s climate law contains a number of positive and innovative elements:

- **Long-term and comprehensive approach with broad support:** The GCCL provides for long-term and comprehensive approach to climate change as it covers mitigation and adaptation until mid-century. Also in the light of broad support in parliament, this can help Mexico to steer a steady course over long periods of time.
- **Instrumental for the adoption of measures:** The GCCL has enabled a greater level of political focus on climate policies. It gives support to the environment ministry vis-à-vis other ministries, turning the ministry of environment from a petitioner into a demander. The GCCL was of critical importance for reducing gasoline subsidies and the discussion of Mexico’s emission trading scheme.
- **Review only up-wards:** The review of Mexico’s climate strategy can work only upwards (Article 61).

At the same time, the GCCL suffers from some **shortcomings**:

- **Vague terminology:** The law suffers from its vague wording. “Promotes” and “strengthens” are commonly used terms. The ambiguity in wording weakens the Mexico’s capacity to decarbonise its economy and to withstand changes in the political environment.
- **Weak targets:** Reduction targets are aspirational, indicative and conditional targets, weakening its weight considerably. Unconditional targets under the NDC remedy this weakness only to a limited extent as NDC are not legally binding (Article 4.2. of the Paris Agreement).
- **Institutional set-up:** Possible duplicative mandate of institutions could weaken implementation. INECC and the *Coordination for Evaluation* have similar mandates for the review system.
- **No specific compliance system:** Mexico has no specific and independent compliance system that regulates what happens if targets are not met or unlikely to be met. INECC’s management structure indicates that it is not an independent body but operates under government oversight.

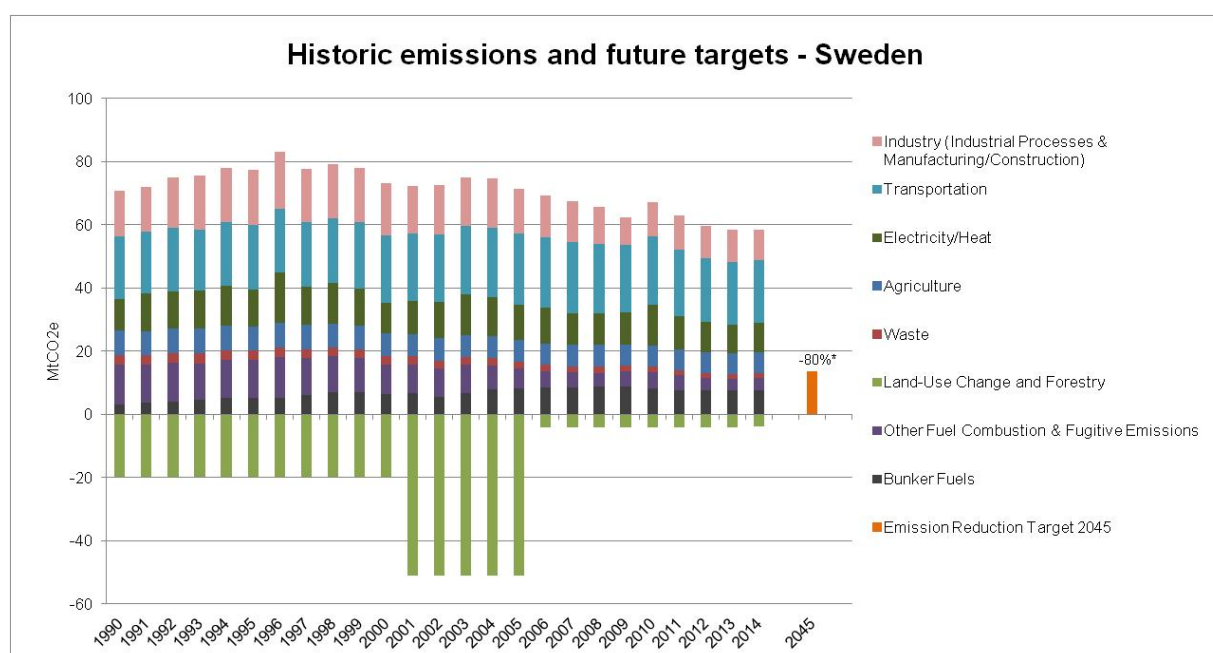
In sum, Mexico’s climate law establishes a comprehensive long-term framework with ambitious review mechanism but with some vague provisions and institutional mandates – and the GCCL’s reduction targets are only indicative and conditional.

4.5 Country: Sweden

Essential background

Sweden is EU’s seventh largest economy (The World Bank, 2017) and ranks as its 18th largest emitter (Eurostat, 2017b). In 2015, Sweden’s total GHG emissions (excluding LULUCF) were 53.7 Mt CO₂e. This amounts to reductions of about 25 % between 1990 and 2015. Between 2014 and 2015, the total GHG emissions decreased by 1 %. The graphic below shows Sweden’s total emissions and removals of greenhouse gases 1990-2015 (Swedish Environmental Protection Agency, 2017).

Figure 7: Development of GHG emissions and the future target in Sweden.⁴³



Source: Own illustration, data retrieved from World Resources Institute (2017)

Description of the long-term climate policy governance framework

Historical origin

The Riksdag, Sweden’s parliament, adopted the Climate Act in June 2017. The new law will enter into force on 1 January 2018. With the exception of the Swedish Democrats, all parties in parliament supported the law. The proposal for the law was developed by a cross-party committee, comprised of seven of the eight Swedish parliamentary parties.⁴⁴ Experts from NGOs, business, representatives or

⁴³ See footnote 23

⁴⁴ Swedish Democrats did not participate in the Committee.

municipalities took part in the committee. The committee’s report was sent to about 200 different stakeholders for comments. The law effectively replaced the existing national climate change plan which had been Sweden’s main climate policy document.

Sweden’s Act on Climate Change

The Climate Act (CA) is a central part of the general framework for Sweden’s climate policies. The CA requires the government to base its climate policy on the long-term emission target set by the Riksdag (Section 3 of the Act). It also stipulates that the government sets other reduction targets deemed necessary to reach the long-term goal. In more general terms, the CA obliges the government to conduct climate policies that aim at preventing dangerous interference with the climate system and that focus on reducing GHG emissions (Section 2). As another essential feature, the CA requires the government to present a climate report every year to parliament and to draw up a climate policy action plan every four years. Next to the CA, Sweden’s climate framework includes reduction targets adopted by parliament and a Climate Policy Council.

In more detail, Sweden’s climate framework includes the following elements:

- **Reduction targets:** With a decision of 15 June 2017, Parliament adopted a long-term target for 2045. Accordingly, by 2045, Sweden is meant to have net zero emissions of GHG and should thereafter achieve negative emissions. In 2045, emissions from activities on Swedish territory will be at least 85 % below 1990 emissions; remaining emissions will be off-set abroad. The Riksdag also passed new targets for 2030 and 2040. In 2030, emissions not covered by the EU emission trading scheme should be at least 63 % below 1990 emissions; in 2040, these emissions should be reduced by at least 75 %. 8 % of the 2030 reductions and 2 % of the 2040 reductions may be achieved through supplementary measures, such as enhancing forest sinks or by investing in climate projects abroad. By 2030, domestic transport emissions, excluding domestic aviation, will be reduced by at least 70 % (compared to 2010 levels). Complementing these targets set by parliament, an interparty agreement sets a target of 100 % electricity production from renewable energy by 2040. The agreement states explicitly that this renewable target is not a phase out date for nuclear power. The agreement also calls for adopting an energy efficiency target for the period 2020 to 2030 by the end of 2017.
- **Climate Policy Council:** Sweden’s government is in the process of establishing a Climate Policy Council (CPC), another essential element of the country’s climate framework. A government ordinance will be the CPC’s legal basis. The CPC will be a government authority (*myndighet*). The CPC’s mandate will be to assess Sweden’s climate policies, in particular progress towards target achievement. Apart from assessing policies, it is planned that the CPC will have the mandate to make recommendations and to propose measures. Other important aspects, such its composition, tenure, appointment and dismissal procedures, are still under discussion. It is not clear whether the CPC will be a purely scientific body or composed of stakeholders. The CPC is expected to be in place before 1 January 2018 when the Climate Act enters into force (Government Offices of Sweden, 2017).

- **Annual Climate Report in Budget Bill:** Every year, the government has to submit a climate report to the Riksdag (section 3 of the CA). In an effort to increase transparency and to raise political attention, the government must submit this report in its annual budget bill. The first climate report is to be presented in the second half of 2018. This climate report must contain (1) emissions trends, (2) a summary of the most important related decisions and their impact, and (3) an assessment of whether further measures are needed and when and how such measures should be adopted (Section 4 of the CA).
- **Requirement to align budget and climate policies:** According to section 2 of the CA, Sweden’s climate work “shall be conducted in such a way as to allow for climate policy and budgetary policy objectives to cooperate with each other.”
- **Climate Policy Action Plan:** Every four years, the government is obliged to adopt a Climate Policy Action Plan (CPAP). This plan is meant to set out how the government intends to achieve its climate targets. More specifically the CPAP describes Sweden’s commitments, its emission trends, the outcome and potential of mitigation measures (existing and planned) as well as measures needed to achieve the “national and global climate goals”. The first action plan is going to be presented in 2019.
- **Review and compliance:** The CA does not have a mechanism that specifically or even automatically addresses the risk of non-compliance. Instead, Sweden’s climate policy framework aims to increase transparency and to improve the conditions for review. This is expected to increase political pressure on the government to keep or bring Sweden’s emissions in line with its targets.

Analysis

As Sweden’s climate law will enter into force only in 2018, there is currently no evidence of the functioning or impact of this law. Despite the absence of factual evidence, the law contains a number of positive and innovative elements:

- **Broad support:** The law enjoys broad support across Sweden’s political spectrum. With one exception, all parties in parliament supported the law. 254 MPs voted in favour, only 41 against the CA.
- **Long term targets adopted by parliament:** Parliament adopts long-term targets. This is positive for three reasons. First, adoption by parliament marks broad political support. Once adopted, changing targets becomes more difficult. Second, a long-term target until mid-century and beyond clarifies the country’s long term journey to full decarbonisation. Third, targets adopted by parliament are helpful for discussions within the government.
- **Climate report part of the annual budget debate:** Budget debates receive high levels of public attention. They are a highlight in parliament’s calendar. Sweden’s experience with other policies shows that this system can raise the importance of an issue, in this case climate action. There is a risk that the climate report is buried in the many other issues of the budget bill.

- **Climate Policy Action Plan at the beginning of each electoral period:** The requirement to adopt the CPAP at the beginning of the term helps government and parliament to set out the climate policy agenda for the next term. This provides a good framework for objective evaluation, transparency and accountability.
- **Aligning budget and climate policies:** As an innovative and potentially particularly important provision, the CA sets the aim to align budgetary policy objectives and climate targets. This will help to increase the weight of climate considerations in Sweden’s budgeting process.

There are a few potential **weaknesses**:

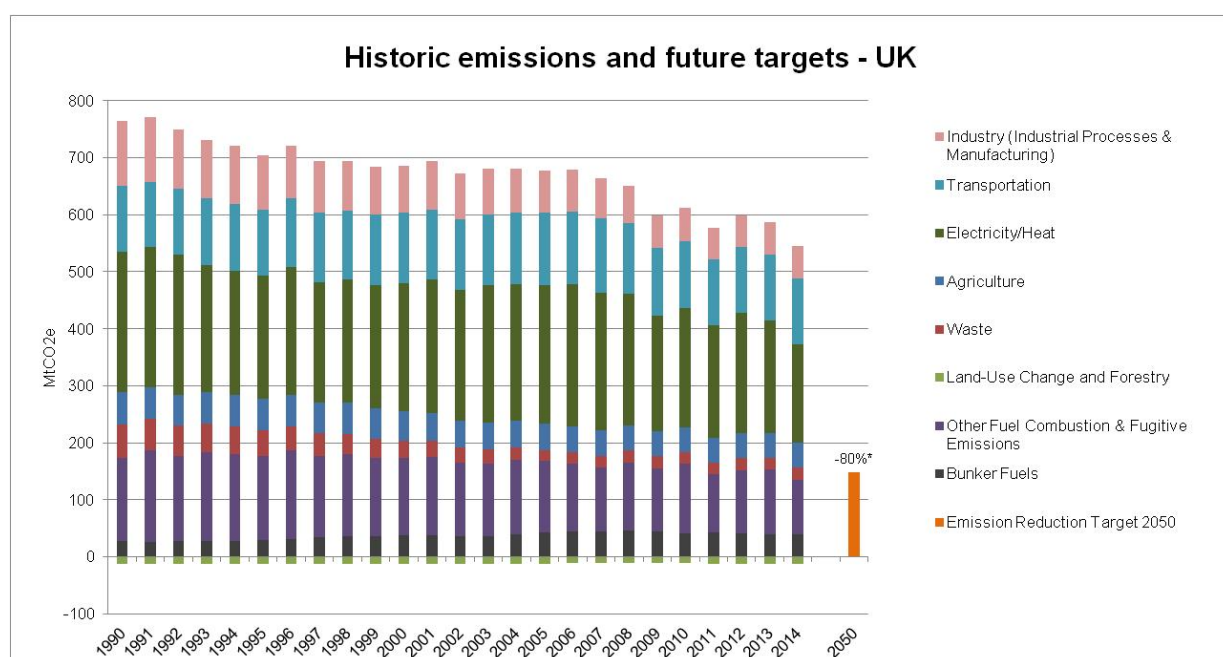
- **No legal requirement to have a target:** The law does not oblige parliament to set targets, let alone targets that are in line with the general objectives of the law stipulated in section 2. In consequence, it is legally possible that parliament repeals current targets and refrains from setting new targets. In other words, Sweden is not obliged to have reduction targets – although this is politically an unlikely scenario, given the broad support for the climate law and its overall objectives. A legally binding reduction target in the CA would have been a more robust indication of the country’s long term commitment because in this case changes in targets would require amendments to the law, not only a new decision by parliament.
- **No specific compliance mechanism:** Sweden climate framework lacks a dedicated compliance system – it is not clearly envisaged what happens if Sweden is likely to miss its targets.
- **CPC based on government ordinance and yet to be established:** The CPC will be established through a government ordinance, as is the case for all government authorities. For this reason, the government could repeal the ordinance without prior approval by parliament. This could weaken the CPC’s independence and standing. It makes the CPC less resilient towards changes in government. Essential technical details, such as the composition, duration of term, appointment and dismissal procedures of council members, are yet to be determined. They are particularly important for the CPC’s independence, credibility and performance.

4.6 Country: United Kingdom

Essential background

The United Kingdom (UK) is Europe’s third largest economy. Total GHG emissions in the UK have decreased by 38% between 1990 and 2015, from around 803 MtCO_{2e} to 496 MtCO_{2e}. In 2015, energy supply made up the bulk of the country’s GHG emissions, followed by transport, business, residential, agriculture, waste management, industrial processes, the public sector and LULUCF.

Figure 8 Development of GHG emissions and future targets the United Kingdom.⁴⁵



Source: Own illustration, data retrieved from World Resources Institute (2017)

Description of the long-term climate policy governance framework

Historical origin

In 2008, the UK Parliament adopted the Climate Change Act. The law was passed with the overwhelming support of all political parties, with only a handful of votes against the bill in the final reading. Passage of the Act was the result of several years of intense political engagement with climate change, starting with the 2005 G8 Summit in Gleneagles, where Prime Minister Tony Blair put the issue on the agenda, and subsequently the 2006 Stern Review on the Economics of Climate Change, which was commissioned by the then Chancellor of the Exchequer, Gordon Brown. The opposition Tory party, led by the newly-elected David Cameron, saw support for climate change as an opportunity to improve

⁴⁵ See footnote 23

their political image. Rather than opposing the bill, they called for stronger provisions. Industry leaders decided to back the bill, looking for an efficient, transparent and predictable approach to climate policy.

Leading NGO representatives were involved in its drafting – and the so-called “Big Ask” campaign by environmental group “Friends of the Earth” created an important public push for the concept of a climate change act (Carter and Childs, 2017). It was a unique constellation, and the Act continues to benefit from that early level of cross-party and public support.

Main elements of the Climate Change Act (2008)

The Act provides a long-term framework for reducing GHG emissions, meant to start the transition to a low carbon economy, encourage investment in low carbon goods and provide a signal to other countries. It contains a range of specific substantive and procedural elements:

Targets: The act establishes a **legally binding target** of at least an 80 % reduction in GHG emissions by 2050, relative to 1990 levels. To ensure that the country is on track to meet the long-term target, the act establishes five-year “**carbon budgets**”, which themselves are adopted in legislative form and which must be set at a level that is sufficient to ensure the UK meets its 2050 target – subject to flexibilities providing for banking and borrowing in cases of under or over performance between budgets. The first three carbon budgets run from 2008–2012, 2013–2017 and 2018–2022, and were set in law in May 2009. The fourth carbon budget, for 2023–2027, was approved by parliament in 2011, and the fifth budget, for 2028–2033, was approved in 2016. While the act establishes binding long- and short-term targets for the country and the mandatory budget setting process, each elected government is afforded the flexibility to choose the policy mix it thinks is best able to achieve them.

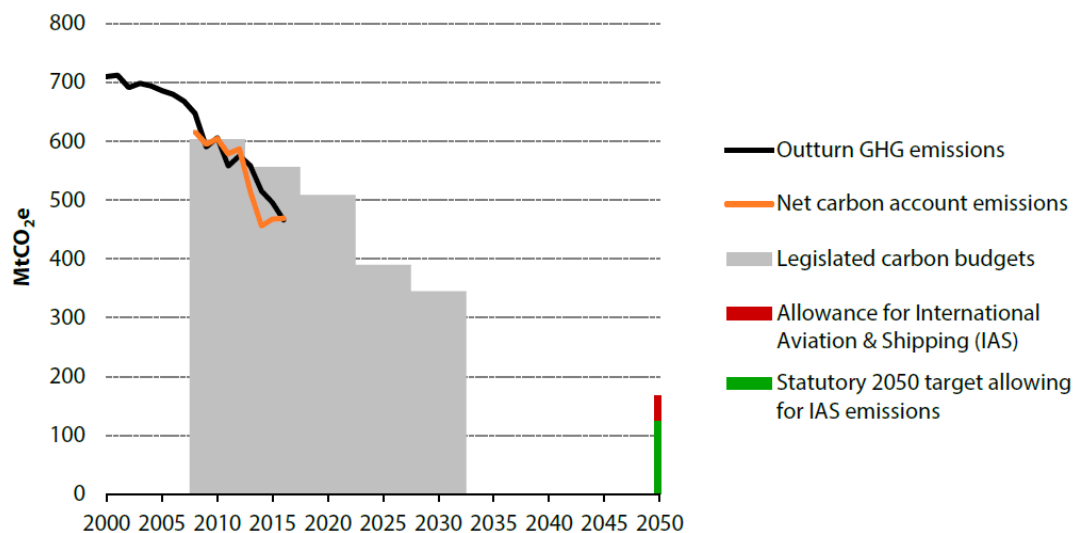
Institutional set-up: To provide independent expert advice and information to government⁴⁶, the act established the **Committee on Climate Change (CCC)**. The CCC is an independent, non-governmental public body with its own budget and secretariat. Its eight members are technical experts rather than representatives of particular stakeholder groups, although the chair is a former Environment Minister. The views of stakeholders are sought through the normal government process of public enquiries, hearings and departmental engagement, although the CCC itself also engages actively with stakeholders.

The primary role of the CCC is to advise the government on setting future carbon budgets and on progress in meeting them. The CCC does not have the power to set budgets itself (as for example monetary policy committees have on interest rates). Rather they are passed by parliament to give them legal force. The **act makes it difficult for governments to deviate from the CCC’s advice**, although in principle it is possible (and indeed the government has not always followed the CCC’s advice on smaller, technical matters). The CCC submits annual reports to parliament on the country’s progress

⁴⁶ The CC also provides the function to the devolved countries of the UK each of whom is bound by the Act. See case study for Scotland for detail on how the CCC is providing advice there.

toward targets and budgets, which the government must then respond to. Figure 9 provides details on the level of each carbon budget and progress toward achieving them.

Figure 9 Progress against carbon budgets



Source: (UK Committee on Climate Change, 2017a). Note: Net carbon account emissions refer to actual emissions, net of any trading activity under the EU Emissions Trading Scheme. IAS emissions are not included in the current carbon budgets, but factored into the 2050 target.

Policy strategies: Every five years, the government must also report to parliament its policies and proposals to meet the carbon budgets and set a limit on the purchase of international carbon credits for each budgetary period. The first of these reports, *The UK Low Carbon Transition Plan*, was published in 2009 (HM Government, 2009), followed by *The Carbon Plan* in 2011 (HM Government, 2011) and *The Clean Growth Strategy* in 2017 (HM Government, 2017). Where the UK fails to meet a carbon budget the Act required the Government to provide an explanation to parliament about the reasons for this failure and even more importantly government is required to set out its proposals for remedial action to parliament.

The UK has successfully met its first carbon budget (2008-12) and will meet the second (2013-17). However, carbon performance was helped by a lower than expected economic performance, with GDP growth much lower than anticipated when budgets were set. The government and the CCC expect that the third carbon budget (2018-22) will also be met, based on the policies and measures currently in place. However, there is a significant delivery gap for budgets four and five (2023-27 and 2028-32, respectively). The CCC estimates that current policies will deliver only half the emission reductions required by 2030 (UK Committee on Climate Change, 2017a).

In addition, the Act requires that the government report at least every five years on the risks of climate change to the UK and publish a programme setting out how these will be addressed. The first such climate change risk assessment was published in 2012. The Act also introduces powers for government to require public bodies and statutory undertakers to carry out their own risk assessment and

make plans to address those risks. The Act introduces an Adaptation Sub-Committee of the Committee on Climate Change to advise and scrutinise the government’s adaptation work.

In addition to the Climate Change Act, the UK has implemented a number of climate-related policies to achieve its greenhouse gas targets. Below is a selection of key policies:

- Carbon pricing
 - Climate Change Levy and related Climate Change Agreements with industry (2001)
 - Carbon Price Support (also known as the Carbon Price Floor) (2011)
- Renewable energy
 - Feed-In Tariff (FIT) for renewable energy (2010)
 - Contracts for Difference (CfDs) for renewable energy (2014)
 - Renewable Heat Incentive (2011)
- Transport
 - Renewable Transport Fuel Obligation (2008)

Analysis

The Climate Change Act has a number of strengths and some potential weaknesses. The positive points include:

- **Cross-party political support:** Only five MPs voted against the adoption of the act in 2008, showing a strong political consensus at the time. Since then it has continued to garner support from the two main political parties – Labour and the Conservatives. In addition, having the act in place has tended to secure cross-party political support for the adoption of the additional climate policies needed to achieve the carbon budgets.
- **Long-term binding target:** The long-term target provides clarity to business, citizens and other interested actors on the UK’s intention to transition to low-carbon economy.
- **Resilient governance:** The lifetime of the Act has coincided with the most severe economic and political shocks experienced by the UK since the war – banking crisis and Brexit universally viewed as seismic shocks. The Act is widely viewed as having kept the transition moving forward as demonstrated by the UK’s adoption of the most ambitious national 2030 target in the EU.
- **Expert advice and information:** The CCC has been a source of expert knowledge that is generally seen as credible and independent by interested actors. Furthermore, it provides a steady stream of up-to-date information to policymakers.

- **Long-term thinking and electoral incentives:** Requiring that MPs set carbon budgets twelve years in advance helps to get them to think long-term and can reduce their worries about the effect such budgets might have on their immediate re-election prospects.
- **Quality of political debate:** Early findings from ongoing research suggest that the act has improved the quality of the political debate around climate change policy by providing structure (through the requirement for regular reporting by the government) and information (via the Climate Change Committee) to the policymaking process.

The weaknesses lie in the following elements:

- **No policy requirements:** The act does not require governments to adopt any policy in particular. On the one hand, this affords each government flexibility in policy design, implementation and amendment. On the other, it can create uncertainty for industry and citizens as governments have changed policies dramatically and without warning.
- **Holding government to account:** The act does not contain any formal remedies if the government fails to meet its obligation under the act. However, UK law allows the possibility of a judicial review if the government were in breach of its legal obligations. To date, successive UK governments have thus generally complied with the act’s requirements, because the possibility of a judicial review is a credible threat and actively considered in the NGO community should the government fall behind in its obligations. Whether courts would rule for or against the government is of course an open question.

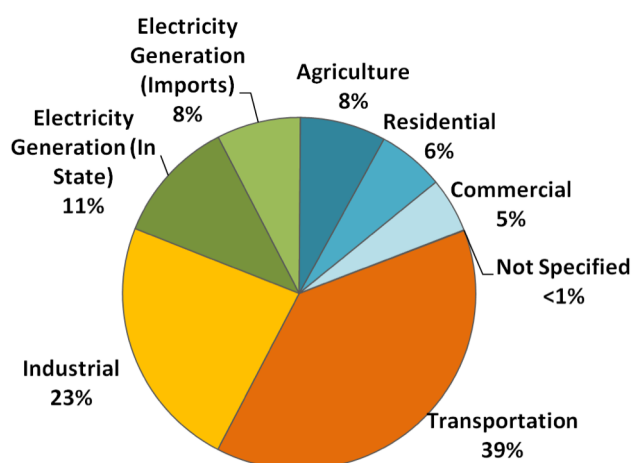
The UK’s Climate Act was the first of its kind and has served as inspiration to several overarching climate laws elsewhere. While its real test may lie in the next stage of its implementation, in kicking off the transformation in sectors other than energy, its procedures and institutions have proven their validity over the first decade.

4.7 Sub-national government: California

Essential background

California is the most populous state in the United States (US) and also has the largest economy in terms of GDP (2.6 billion USD in 2015). In 2015, California had the third *lowest* per capita energy consumption of all US states (Energy Information Administration, 2017a), but despite its favourable climate and energy efficiency programmes, still is the nation’s second *highest* emitting state (after Texas) at 440.4 million tonnes of CO₂e in 2015, with 39 % coming from the transport sector (see Figure 10). Currently, California also leads the nation in annual vehicle miles travelled. In 2015, utility-scale and private solar installations supplied roughly 10 % of California’s net electricity generation (Energy Information Administration, 2017b). The state is also a leading producer of hydro-electric and wind power in the US. Due to its size, California is unique among sub-national actors; its economic might places it among the world’s top economies and emitters.

Figure 10: CA GHG emissions by sector in 2015.



Source: California Air Resources Board (2017a).

Description of the long-term climate policy governance framework

Historical origin

In the 1950s and 1960s, California preceded the federal government in enacting state air quality restrictions, pertaining in particular to pollution from vehicles. Thus, under Section 207 of the US Federal Clean Air Act (FCAA) of 1970, California is authorised to implement stricter motor vehicle emission standards than those incumbent upon the rest of the country as set by the national Environmental Protection Agency (EPA). The FCAA further stipulates that other states may choose to follow California’s lead, i.e. comply with its air requirements rather than the federal ones; currently 15 do so. This waiver system makes California the de facto US standard for auto companies selling vehicles in the North American market.

California’s special treatment under the FCAA as well as its economic weight and first-mover status have allowed the state to influence climate policy beyond its borders and at higher political jurisdictions—a phenomenon known as the ‘California Effect’ (Schreurs, 2008). However, the state’s future role as a trendsetter is uncertain under the current US administration, as EPA administrator Scott Pruitt is ambiguous about continuing the waiver system (EESI, 2017).

Given the background above, including California’s long history of progressive policymaking with regard to air quality, the state can definitely be considered a “long-term” policy actor in the environmental arena. Indeed, California has what can be considered a long-term governance framework in terms of climate change policy – however, that framework is not a single law or legislative act as in this report’s other case studies. Rather, elected officials and regulators at various levels of government in California have passed acts that together constitute a “package” clearly aimed at long-term climate change mitigation. It is this package – and the role of its various components – that we take on as a case study and analyse in the sections below.

The main act associated with climate change mitigation in California is its famous **Global Warming Solution Act** or Assembly Bill 32 (AB32) passed by the state’s legislature in 2006. This bill not only codified into state law an actual emission reduction target (reducing the state’s GHG emissions to their 1990 levels, which was 427 Mt CO₂e, by the year 2020) at a time when targets were generally aspirational only and not enshrined in legislative acts, it also directed the state’s regulatory body for air quality (the Air Resources Board, or ARB) to figure out how best to achieve the target and required it to enact legally enforceable regulations to do so.⁴⁷ The enforcement is in turn also under the purview of the ARB.⁴⁸ This delegation to regulators carried strong implications for public participation in the mitigation effort, as ARB as a public agency must document and hold public hearings about all decisions regarding fulfilment of AB32’s targets. The ARB issued a scoping plan (California Air Resources Board, 2008) to ascertain which policies and approaches would be best for achieving the reductions required by AB32, concluding that a cap-and-trade system— covering not only power and industry but also the transport sector— would be the main instrument used, along with complementary measures including a Low Carbon Fuel Standard (California Air Resources Board, 2017) and stricter vehicle standards. After years of public consultation around cap-and-trade, in October 2011, the ARB adopted final rules for California’s emissions trading system (ETS), which has since linked with that of the Canadian province of Quebec (California Air Resources Board and Gouvernement du Quebec, 2013) and is after the EU ETS the largest carbon market in the world (Erica Gies, 2011; Hsia-Kiung et al., 2014).

Due to the magnitude of the effects of AB32, particularly the regulatory process it spawned, it is often considered “the” climate law in California – but its limited timeframe through 2020⁴⁹ and relatively unambitious target (1990 levels are only 15 % below California’s projected emissions under a business-

⁴⁷ Part 4 of the Global Warming Solutions Act of 2006 (Section 38562) reads “(a) On or before January 1, 2011, the state board shall adopt greenhouse gas emission limits and emission reduction measures by regulation to achieve the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions in furtherance of achieving the statewide greenhouse gas emissions limit, to become operative beginning on January 1, 2012.”

⁴⁸ Part 6 of the Global Warming Solutions Act of 2006 (“Enforcement”), Section 38580, reads “(a) The state board shall monitor compliance with and enforce any rule, regulation, order, emission limitation, emissions reduction measure, or market-based compliance mechanism adopted by the state board pursuant to this division.”

⁴⁹ Although AB32 applies only through 2020, it clearly states that enacting legislators expect it to be extended beyond that timeframe: under its Part 3 (“Statewide GHG emissions limit”), Section 38551, it reads “(b) It is the intent of the Legislature that the statewide greenhouse gas emissions limit continue in existence and be used to maintain and continue reductions in emissions of greenhouse gases beyond 2020. (c) The state board shall make recommendations to the Governor and the Legislature on how to continue reductions of greenhouse gas emissions beyond 2020.”

as-usual scenario in 2020) render it only an important component **of a larger package of acts** at both the executive and legislative levels in California **that together constitute a long-term framework**.

The other components of this framework package include the following:

- The **original executive order in 2005** by then-Governor Schwarzenegger, setting emissions targets for California for the years 2010, 2020 and 2050. The latter target is 80 % below 1990 levels (State of California, 2005) and therefore qualifies as part of the long-term framework discussed here. The executive order, at the time a direction-setting impetus for AB32, directed various state authorities and agencies to coordinate efforts to meet these targets and requires biennial reports on their progress toward that end.
- A **2015 executive order** by current California Governor Jerry Brown, which essentially upholds Schwarzenegger’s long-term target from a decade prior, and establishes a target of 40 % below 1990 levels by 2030 in order to ensure that the long-term target is met (State of California, 2015).
- An act of the California legislature passed in 2016 (not coincidentally following the same pattern of AB32 being enacted the year after the 2005 executive order) that enshrines the executive order’s 2030 target of 40 % below 1990 levels into state law. This **Senate Bill 32 (SB32)** codifies the target, but does not prescribe any specific policies or measures to meet it (State of California, 2016). It also does not mention the long-term (2050) target or how to reach it.
- In 2017 the California legislature passed an act extending the carbon market (**Assembly Bill 398**) created by the ARB as a result of AB32 to 2030 (State of California, 2017). That emission trading programme, similar to the EU ETS’s third phase, had only extended through 2020. The act explicitly states that the group established by Schwarzenegger in his 2005 executive order should continue its role in coordinating overall climate policy,⁵⁰ but does not explicitly reference a 2050 target.

The latter piece of legislation proved so controversial within state government that jobs were lost over it: the top Republican in California’s assembly resigned in August 2017, forced out by his party for having voted in favour of extending the ETS through 2030 – even though he had extracted concessions from Democrats in the bill’s final version, including reducing state fees paid by inhabitants of California’s largely Republican rural areas. Supporting cap-and-trade was considered supporting democrats and the governor by most members of his party (Bollag, 2017; Horseman, 2017; Marx, 2017).

AB32 requires **state-wide monitoring and reporting** of GHG emissions, and specifically tasks the ARB with enforcing compliance with that monitoring and reporting programme (State of California, 2006).⁵¹ Beyond that, the overall status of climate change in California (effectiveness of mitigation

⁵⁰ Section 2 (i) of AB 398 reads “It is the intent of the Legislature that the Climate Action Team established by the Governor to coordinate the efforts set forth under Executive Order S-3-05 continue its role in coordinating overall climate policy.”

⁵¹ See Global Warming Solutions Act of 2006, Part 2: mandatory GHG reporting, Section 38530(a) page 89 of bill.

policies, but also cost from climate change, risks of climate change, and opportunities for adaptation to climate) is required to be **reported on biannually by a group of agencies** led by the state’s EPA in a coordinated manner. The existence of this interagency group and its reports was mandated by Governor Schwarzenegger’s executive order in 2005 and then re-affirmed by the ETS-extending legislation passed in 2017.⁵² As for monitoring the progress toward achieving the emission targets, AB32 requires that the ARB’s scoping plan, which lays out how the state will achieve the required emission reductions, be **updated at least every five years** to ensure that the policies implemented are on track to achieving the target.⁵³

Analysis

California’s current long-term governance framework has been under development for more than ten years and seen changes and extensions. It represents a curious case of a *law that created a process to adopt instruments that in turn bred a law to extend them* – led by a political impulse from a celebrity politician who championed the climate change issue.

There are at least three key strengths to the Californian climate policy governance system:

- **Specific connection to policies:** the development of policies to implement the (first 2020, now 2030) milestone targets has been the essential purpose of the main act, AB32. Not only through the adoption of the cap-and-trade system (covering a majority of all emissions) has this feature proven its value.
- **Institutional arrangement to depoliticize policy development:** Via the adoption of AB32, the executive and the legislative branch ceded authority over the actual policies to “technical” public regulatory bodies rather than putting specific measures or ways to achieve targets into the law they enacted. Putting the ARB - a regulatory body whose powers consist of rulemaking based on public input – in charge of implementing policies implied an extensive stakeholder consultation process involving hearings, written comment sessions, and other public consultation processes which were by definition inclusive of all stakeholders. This explicit *depoliticisation* of the implementation, through a mandate made strong by having been enshrined in law, is a key aspect of this framework’s success.
- **Extensive stakeholder involvement to create buy-in and support to the policies:** the process of developing policy options through the stakeholder procedures employed by ARB (the starting pistol for which was just given in October 2017 for a two-year process to develop the 2030 implementation policies) has produced much stakeholder buy-in to the policies themselves, strengthening overall backing for the system as a whole.

⁵² The end of Section 1 of Assembly Bill 398 reads “(j) It is the intent of the Legislature that the Climate Action Team established by the Governor to coordinate the efforts set forth under Executive Order S-3-05 continue its role in coordinating overall climate policy.”

⁵³ Part 4 of AB32 (“Greenhouse gas emissions reductions”), Section 38561, reads “(h) The state board shall update its plan for achieving the maximum technologically feasible and cost-effective reductions of greenhouse gas emissions at least once every five years.”

- The new 2030 target, set at the same level as that of the EU, is arguably much harder to achieve since current levels and the 2020 target are significantly higher – making the reduction trajectory significantly steeper. The actions required to meet this target may thus have **more transformative power**. In addition, the built-in reporting and progress monitoring, coupled with an explicit mandate to oversee target achievement and regular updates to the measures should gaps occur, generates **high confidence in the system** delivering its objectives.

However, the existing system also comes with a number of weaknesses:

- **Failure to include the long-term target directly into the legal framework:** The 2050 target has been reiterated – but is so far only captured in Executive Orders. And the long-term ambition of 80% is at the lower end of the range cited in AR4 of the IPCC for industrialized countries, which is not directly in line with the long-term ambitions of the Paris Agreement.
- The internal political **controversy over the further extension of the cap-and-trade system** generates the most concerning signal from the current experience with the Californian system. While political support for the Democratic Party remains stable in the state, this is likely to last – but a strongly partisan political environment could make future adjustments difficult.

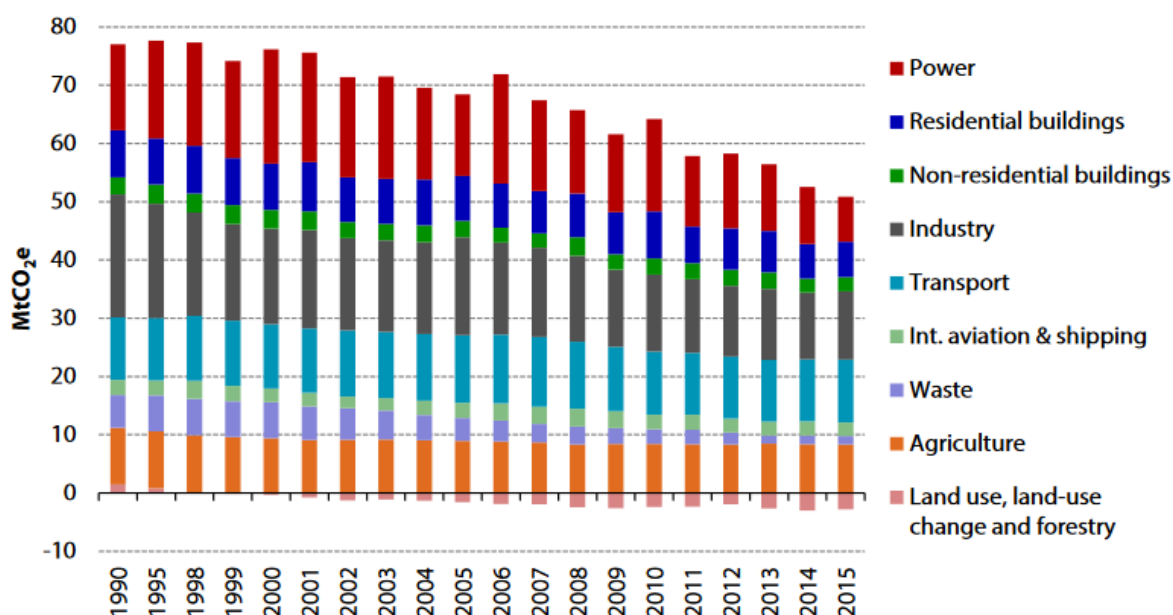
To sum up, AB32 cannot be disconnected from the measures – or their extension into the future, because they are an outcome of a process kick-started by the original law. Having this clear process established and depoliticising it by putting a regulatory body in charge, has produced policies with broad stakeholder buy-in and creates an overall rather effective framework. A key question for the future effectiveness of the system will be the strength of the political backing to important adjustments, e.g. for the time horizon 2040.

4.8 Sub-national government: Scotland

Essential background

With a population of some 5.3 million (National Records of Scotland, 2015), Scotland emits under 50 million tonnes CO₂ equivalent (MtCO₂e) per year (Official Statistics Publication for Scotland, 2017). Scotland's emissions have decreased significantly since 1990 (>38 %), which is a slightly stronger decline than in the UK as a whole (35 %) (UK Committee on Climate Change, 2017b). The vast majority of Scotland's emission reductions were driven by the decarbonisation of the power sector, particularly the shutdown of coal-fired power plants since 1990. The most recent such reduction happened following the closure of the last coal plant in Scotland (Longannet) in 2016.

Figure 11 Scottish GHG emissions 1990-2015.



Source: UK Committee on Climate Change, (2017), based on data from NAEI (2017).

Description of the long-term climate policy governance framework

Historical origin

The Climate Change (Scotland) Act of 2009 was first introduced in December 2008 by a member of Scottish parliament, John Swinney, into the lead committee (Transport, Infrastructure and Climate Change), where it was considered as per the regular parliamentary process for bills on their way to

becoming legislative acts.⁵⁴ The bill went through several rounds of amendments during the period January-June of 2009,⁵⁵ was passed by the Scottish parliament on 24 June 2009, and received royal assent in August 2009.⁵⁶ In terms of support for the law, the Scottish National Party (SNP) (currently the ruling party in the Scottish government) ran on a platform of greening Scotland and making the jurisdiction a leader in low carbon development. Since the SNP won an election in 2007 (coincidentally around the time when the UK Climate Change Act was being put in place and climate change mitigation was very much in the news), it has made good on the promise to put Scotland at the forefront of “green economic development” with not only a climate change act (discussed here) more ambitious than that of the UK as a whole, but also a Programme for Government that ties decarbonisation to economic growth (cf. Scottish Government, 2017a). In the preparatory phase, many of the same organizations that were influential to the creation of the UK Climate Change Act of 2008 also lobbied for stringent climate targets in Scotland – for instance Friends of the Earth UK/Scotland with its Big Ask campaign.

As Scotland is part of the United Kingdom as a “constituent country”, a highly devolved region within the UK, it is not a nation state in the traditional sense; thus, the Scottish climate law is often referred to as a ‘national’ law but is more accurately understood as a climate law adopted by a sub-national or regional jurisdiction. The devolved government for Scotland has a range of responsibilities including health, education, justice and housing. The environment is also a devolved responsibility, specifically including climate change (The Scottish Parliament, 2017a)⁵⁷. This stands in contrast to the powers reserved for the UK government, which include immigration, foreign policy and defence.⁵⁸

Main elements of the Act

Targets: The legislation prescribes both a near-term target (at least 42% below 1990 levels by 2020) and a long-term target (80% below 1990 levels by 2050).⁵⁹ It also applies a system of annual target

⁵⁴ Other committees that considered the bill were Rural Affairs and Environment; Economy, Energy and Tourism; and Finance – see history of the legislation online at <http://www.parliament.scot/parliamentarybusiness/Bills/16147.aspx>

⁵⁵ The bill’s history through parliament can be traced online at <http://www.legislation.gov.uk/asp/2009/12/notes/division/3>

⁵⁶ Once a bill has completed all the Scottish parliamentary stages, it must receive royal assent - the queen of the United Kingdom formally agrees to make the bill into an Act of Parliament (law). Royal assent is formally required for legislative acts of the Canadian and Australian parliaments as well.

⁵⁷ “Energy” is also considered a devolved power, to the extent that it covers “responsibility for the promotion of renewable energy generation, energy efficiency, and the consenting of electricity generation and transmission development.” However, the general list of “reserved powers” held by the UK includes “nuclear energy, oil, coal, gas and electricity” (The Scottish Parliament, 2017b). In 2016, “onshore oil and gas licensing” became a devolved power via Sections 47-49 of the Scotland Act of 2016, but the devolvement pertains to licensing only.

⁵⁸ Interestingly the other devolved countries of the UK – Northern Ireland and Wales – the former being the most devolved of the UK countries - opted instead to be bound by the UK Climate Change Act (which also binds Scotland) instead of developing separate climate laws. Scotland’s decision to adopt a ‘national’ framework was strongly linked to its desire to establish a distinct separate identity from the UK.

⁵⁹ For GHGs other than carbon dioxide, methane and nitrous oxide, the “base year” is not 1990 but 1995 levels (See the Act’s Section 11(2))

values, established in batches of five, which are set twelve years in advance. This is, in effect, an annualised version of the five-year carbon budgets used in the UK and also taken up in France. The long-term target is an 80% reduction below 1990 levels by 2050. Both interim and long-term **targets are explicitly enshrined in the legislative act**. The 2020 target has already been achieved (BBC News, 2017; Official Statistics Publication for Scotland, 2017). At the time of writing, the Scottish government is considering an amendment to the targets via a legislative change (the development of a new “Climate Change Bill”), to set stricter targets for 2020 and 2050⁶⁰ – the latter inspired also by the adoption of the Paris Agreement.⁶¹ Civil society organisations have demanded such changes, including for the interim targets (such as 2030) (SCIAF, 2017), and campaigned for them in public⁶². The government has also sought advice from the UK Committee on Climate Change (CCC) on, among other things⁶³, the appropriate level of future emissions, which it received in late March 2017 (Committee on Climate Change, 2017). The government has chosen to propose the more ambitious of the two options presented by the CCC (Scottish Government, 2017b)

Policies: The promulgation of concrete policies for achieving the targets, however, is not part of the law. The Act does not create actual regulatory limits or rulemaking procedures that would directly affect emitting activities or parties who emit greenhouse gases, nor does it delegate such implementation activities to a specific agency or government institution. Some parts of the Act come close to codifying implementing activities in some sectors, for instance by amending the Scottish Town and Country Planning Act of 1997 to require local development plans to contain greenhouse gas emissions policies that ensure new buildings install and operate “low and zero-carbon generating technologies,” (Section 72, Climate Change (Scotland) Act, 2009) or by directing ministers to come up with new regulations requiring building energy performance assessments (Section 63 covering non-domestic buildings, and Section 64, covering living accommodation, Climate Change (Scotland) Act, 2009).⁶⁴

Overall, the Act **confers powers upon relevant ministries to create secondary legislation** (actual regulations such as vehicle standards, waste management requirements, renewables quotas, etc.) that

⁶⁰ This would only specifically only amend those parts that relate to emissions reduction targets and associated reporting duties. The proposals are available online at <http://www.gov.scot/Resource/0052/00522395.pdf>

⁶¹ The document laying out the proposal for the new bill states this intention clearly: “Having made sustained progress towards the targets set out in the 2009 Act, the Scottish Government has committed to keeping Scotland at the forefront of global climate action by responding to the UNFCCC Paris Agreement with a Climate Change Bill setting new, evidence-based, statutory GHG emissions reduction targets” (Scottish Government, 2017b, p. 22).

⁶² Recent pressure from nongovernmental organizations includes a demonstration by Friends of the Earth in front of Scottish government headquarters in October 2017 urging greater climate action, see descriptions of the event in Friends of the Earth (2017)

⁶³ Other areas the CCC provided advice on were (2) the form of future emissions targets, (3) the future of Scotland’s emissions accounting framework, and (4) flexibility to update emissions targets. The advice on these matters included setting new interim targets for 2030 and 2040, increasing the transparency of emissions accounting, and setting all emissions reduction targets in the form of percentage reductions from baseline levels. See (Scottish Government, 2017b)

⁶⁴ Further provision to issue regulations in relation to this process is also made at Section 75(3) of the 2009 Act, pertaining to aspects of energy performance of buildings that are part of the Scottish civil estate.

is then **implemented and enforced by the relevant agency or technical body**. The body most relevant in Scotland is the Scottish Environment Protection Agency (SEPA), as it covers four regulatory areas relevant to climate change: water, waste, radioactive substances and pollution prevention and control (the last being mainly about air quality). Thus, SEPA is a main authority ministers can task with implementing and enforcing secondary legislation. Other institutions to which regulatory powers are intended to be delegated, where relevant, are local authorities such as municipal councils, local bodies of elected officials in charge of planning and regional by-laws.

Reporting: In terms of reporting, the Act requires in its Section 33 **an annual report by the government on progress toward the emissions targets**, and in its Section 38 a report on the electricity sector’s impact on Scottish emissions. If those reports indicate that the annual target or domestic effort target has not been met, Section 36(2) requires ministers to “lay a report before the Scottish Parliament, which sets out proposals and policies to compensate in future years for the excess emissions”.⁶⁵ The Scottish Ministry of Environment and Climate Change has published six reports that each covers both these requirements – the most recent one being published on 31 October 2017 and covering this information for the year 2015. These reports contain mainly statistical data on emissions and analysis on whether emissions levels are on track to reaching the interim and long-term targets on an annualised basis, not policies or measures to reduce them.

Planning: The latter **policies and measures are contained in *Climate Change Plans***, which are also required by the Act (Section 35), though not at any specific frequency. They fall under the responsibility of the Scottish cabinet’s subcommittee on climate change and are subject to review and public comment. They provide the strategic framework for a transition to a low-carbon Scotland by setting out how the government intends to meet the emission reduction targets along the long-term (2050) reduction trajectory. The first such plan⁶⁶ was published in March 2011, the second⁶⁷ in June 2013. The third, setting out proposals and policies for the period 2017-2032, is currently being finalised. Expected to be published in early 2018, its policies aim to drive emissions 66% below 1990 levels by 2032 (Scottish Government, 2016). **These plans involve stakeholders**, as they are open to public consultation: the 60-day public comment period for the plan currently being developed ended in September 2017.

⁶⁵ As far as punitive measures for not achieving the targets prescribed in the Act are concerned, the legislation is – like all comprehensive climate change efforts involving ‘pledges’ to meet certain emission reduction goals in a certain timeframe, including e.g. the Kyoto Protocol at the global level – not really able to enforce or ‘punish’ accountable entities. The responsibility lies with the Minister (in this case Roseanna Cunningham) and nobody can sue, punish, or fine her for not having achieved the target. However, not achieving targets that are under her Ministry’s purview is a breach of duty, for which in the UK any public official can be taken to “judicial review” or court. It is most likely that a judge would issue “declaratory relief” which declares a formal breach of the law (the Minister has behaved unlawfully in not achieving the reduction target) but this does not involve fines or punitive measures.

⁶⁶ Low Carbon Scotland: Meeting the Emission Reduction Targets 2010-2022, available online at <http://www.gov.scot/Publications/2011/03/21114235/0>

⁶⁷ Low Carbon Scotland: Meeting our Emissions Reduction Targets 2013-2027. Available online at <http://www.gov.scot/Publications/2013/06/6387>

Consultation: Stakeholder comments are taken seriously to the extent that responses are prepared and policy suggestions are modified accordingly. Similar to consultation processes at the EU level or in other Commonwealth nations such as Canada, the instruments used are generally white papers and green papers. Formal requests for input by groups with relevant expertise include think tanks, industry organisations and non-governmental organisations. The current process of preparing a change to the existing act has also undergone consultation⁶⁸.

Review and institutions: Review and refinement of the targets is explicitly foreseen by the Act. It requires that an outside body take on an advisory role in the assessment of target achievement and provide recommendations. The Act provides for the government to create such an advisory body beyond the existing (UK) CCC, but thus far the CCC has carried out this function. This process has been triggered by the government and consideration of an amendment is currently underway at the time of writing, with both a higher 2050 target as well as stronger and new interim targets included.

Unlike the UK Act, the **Scottish Climate Change Act itself does not specify one minister that is accountable**, but mentions all “ministries”, the use of the plural indicating that the government as a whole is to be held responsible. This writing of the law is intentional, as climate change policies could fall under the purview of several different ministries (transport, environment, energy, etc.) and leaving it open in the Act allows for flexibility as to which cabinet minister to imbue with accountable authority. The portfolio of Scotland’s current Minister for Environment, Climate Change and Land Reform (Roseanna Cunningham) is the one that currently falls in the relevant remit, making this Ministry practically most involved in implementation.

Analysis

The Scottish Climate Act represents a special case, due to the direct connection with the UK’s Climate Change Act (with Scotland as a constituent country to the UK, but with authority over environmental matters). It does borrow many of its provisions from the UK act, and there are shared resources in the form of the CCC, but the Scottish Act has its own innovative features that are being actively used.

- One of the strengths is the use of **quantitative annual targets** (similar to the system in place under the EU’s internal effort sharing), going a step beyond the five-year budgets established under the UK act, because progress measurement is more granular.
- An additional plus is the **explicit mechanism for reviewing the (interim) target**, which is currently being used to prepare an amendment to the 2009 Act. While the Act only explicitly references the 2020 target for such a review (the UK act allows review of the 2050 objective), it is now also being applied to the long-term target. Having the independent expert advice from the CCC as (publicly available) input to this process, as foreseen by the law, provides transparency and puts the review on solid footing.

⁶⁸ An overview of the consultation process for this new act is available online at <http://www.gov.scot/Topics/Environment/climatechange/Newclimatechangebill>

- Though the degree of stakeholder involvement is comparable to other framework laws covered in this report, one rather unique portion of the Scottish Act is Section 91, which includes among the obligations placed upon the relevant ministers that of “public engagement.” It essentially **requires the government to raise awareness** about climate change mitigation among Scottish citizens. The ministers must publish a public engagement strategy to be reviewed by parliament. This goes beyond involving the public in decision-making, as it also tasks the government with public education about the subject.

Other elements of the legislation could be perceived as weaknesses but are currently not preventing more proactive implementation by the government:

- Leaving open the **attribution of responsibility** is useful for policymaking in a government inclined to take action on climate change, as it allows all relevant departments and authorities to implement appropriate measures without having to formalize whose purview specific actions are under. However, in the case of a government opposed to action on climate change (an admittedly unlikely scenario in Scotland, given the electorate’s clear approval of “green economy” policies), this attribute of the law could work against strong mitigation action, as the attribution of responsibility and accountability within the government would be more difficult.
- Other points of weakness include technical accounting issues, such as those pointed out in the recent advice from the CCC in March 2017 (i.e. emissions are constantly being updated on the basis of data from the Emissions Trading System under the current rules).

Overall, the Scottish case shows that an Act with provisions on key elements (reporting, policy development via plans, target review, use of external advice, stakeholder input) can create a powerful tool for a government willing to act on climate change and implement the Paris Agreement in a credible manner.

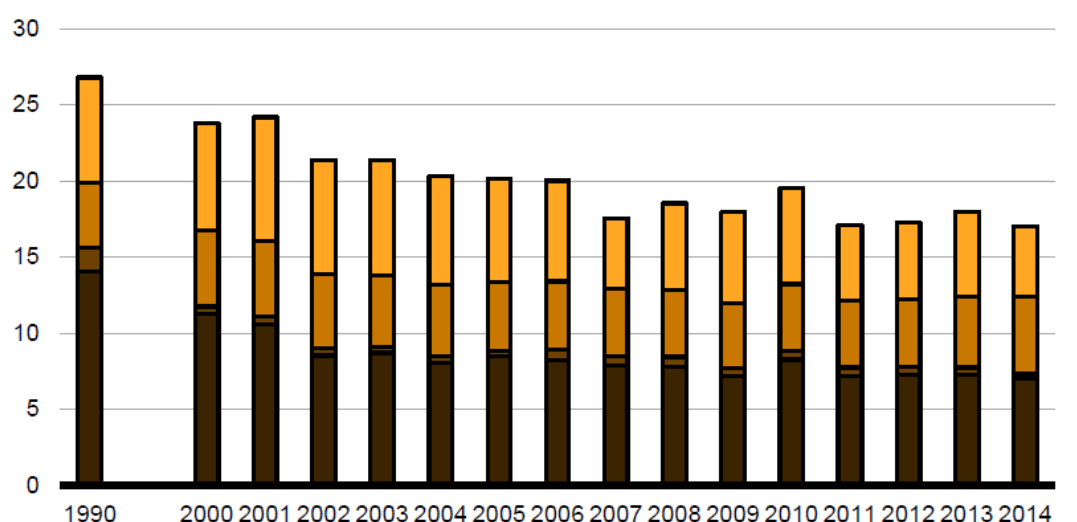
4.9 Sub-national government / city: Berlin, Germany

Essential background

With 3.5 million inhabitants, Berlin is the largest German city. The capital of the Federal Republic of Germany is also one of the most densely populated cities in Germany. In the last decade, Berlin has become increasingly attractive, judging by its population increase as well as its rising economic output (Amt für Statistik Berlin-Brandenburg, 2017a, 2017b). In spite of its recent growth, Berlin has managed to reduce its CO₂ emissions from 29.2m t in 1990 to 19.9m t in 2014 – a decrease of 31.8 percent (Amt für Statistik Berlin-Brandenburg, 2017c, p. 34). However, since 2005 the emissions have been decreasing at a slower rate than before. (cf also Amt für Statistik Berlin-Brandenburg, 2017c, p. 34; Senate Department for Urban Development and the Environment, 2014, p. 8). CO₂ emissions per capita were at 5.7t in 2014, which is 32.5 percent less than the 8.5t/capita in 1990 (Amt für Statistik Berlin-Brandenburg, 2017c).

Berlin is not only a city, but also a city-state, with the same rights and responsibilities as other German *Länder*. This includes major legislative competences, also in terms of climate policies. After the reunification in 1990, Berlin's debts started to increase heavily and today, the city is one of the most highly indebted German states (Berlin Online, 2017). This makes it difficult for the city to invest large sums of money in energy refurbishment or other funding programmes for climate-related measures.

Figure 12 Historical CO₂ emissions in Berlin (in m t) by sector (primary energy sources).



Source: (Amt für Statistik Berlin-Brandenburg, 2017c, p. 19). Note: From the bottom to the top: (1) transformation sector (electricity), (2) extractive and manufacturing industries, (3) transport, (4) households, trade, commerce, services and other consumers.

Description of the long-term climate policy governance framework

Historical origin

Berlin has a longstanding history of climate policy development. Already back in 1992, the city had an energy saving law. An early emissions reduction goal for Berlin (-25 percent compared to the 1990

base year until 2010) was already reached in 2005. The city’s first attempt at introducing an overarching legislative framework failed, when an internal draft for a climate protection law presented by the then Senate Department for Health, Environment and Consumer Protection in 2009 was not adopted. However, the “grand coalition” government of the previous legislative term (2011-2016) was successful in establishing targets and adopting a specific climate law, due to the changed political dynamics and the acute sense of awareness that cities have a responsibility to proactively engage in climate change mitigation (personal communication).

Among these targets is the long-term objective for Berlin to achieve climate neutrality by 2050. This means urban CO₂ emissions are to be reduced to around 4.4m t by the year 2050, i.e. by at least 85 percent compared with the 1990 base year. This aim was first stated in the coalition treaty of the grand coalition in 2011 (Abgeordnetenhaus Berlin, 2017, p. 12). Along the way, the city intends to achieve a reduction of at least 40 percent by 2020 and at least 60 percent by 2030 (Senate Department for the Environment Transport and Climate Protection. Special Division for Climate Protection, 2017). These interim targets fit into a trajectory of steadily declining emissions. The results of the “Feasibility Study for a Climate-Neutral Berlin 2050”, published in 2014, have shown that the 2050 goal can be achieved, if corresponding policies are adopted (cf. Senate Department for Urban Development and the Environment, 2014). However, it should be noted that an emission reduction of 85 percent compared to 1990 levels corresponds to an average annual emissions reduction of 2 percent, which is significantly above the levels Berlin has achieved in the past.

Main elements of Berlin’s *Energy Turnaround Act of 2016*

Targets: Berlin’s emission reduction targets are set out in the Berlin Energy Turnaround Act⁶⁹ (*Energiewendegesetz Berlin*) which was adopted by the Berlin House of Representatives on 17 March 2016. The Berlin Energy Turnaround Act creates a clear, binding mandate for the public administration and is structurally a framework law. It includes a chapter on the emission reduction targets, one on the exemplary role of the public sector, one on climate change adaptation, one on provisions regarding monitoring, one on climate change education, as well as one on energy production and supply, including the phase-out of fossil fuels (Senatsverwaltung für Umwelt Verkehr und Klimaschutz, 2017a).

Planning: The development and implementation of a Berlin Energy and Climate Protection Programme (BEK) is now a compulsory task. The Berlin Energy and Climate Protection Programme 2030 (BEK 2030), adopted in June 2017, implements this requirement. It describes strategies and measures for all relevant fields of action in the city which have to contribute to climate protection (but also the adaptation to climate change): energy supply, buildings and urban development, industry, traffic and private households (Senate Department for Urban Development and the Environment, 2016, p. 4). The BEK is based on scientific recommendations and the results of a large-scale public consultation. It contains the actual strategies and measures that need to be implemented in the short and medium

⁶⁹ This is the official term used by the respective administration in Berlin. The term “climate protection law” could not be used since the trial of introducing it had failed back in 2009 (personal communication). The more common English translation of the German phrase “Energiewende” is energy transition.

term (2021 and 2030 respectively) to deliver the climate goals, and represents a “roadmap” towards climate neutrality. The BEK will be updated on a regular basis: the most recent version stems from the red-red-green government that has updated the BEK in early 2017 (Abgeordnetenhaus Berlin, 2017). The BEK was adopted and is thus binding for politics and administration in Berlin.

The implementation of the BEK 2030 is being coordinated by the Senate Department for Environment, Transport and Climate Protection, more specifically the special unit on climate protection (*Sonderreferat Klimaschutz*), created in 2012.. This special unit is not part of the environmental unit but an overarching coordination unit directly subordinated to the state secretary and thus high in status.

Policies: In addition to the requirement to produce and implement an energy and climate protection programme, the Berlin Energy Turnaround Act requires the administration itself to become a role model for the whole city. Thus, the administration aims to achieve climate neutrality already by 2030. With an amendment at the beginning of the current legislative period (2016–2021), the phasing out of coal has been embedded in law as well. Energy production from lignite coal is to be phased out by 2017 and hard coal-based power shall be phased out by 2030 at the latest. To this end, a strategy is currently being developed in cooperation with the respective power plant operators. The new amendment also makes it easier to provide innovative and energy-efficient heating supply structures in specific areas (Senate Department for the Environment Transport and Climate Protection. Special Division for Climate Protection, 2017). The respective law was adopted on 19 October 2017.

Monitoring: The monitoring of the BEK’s implementation and the achievement of emission reductions is still to be developed. The monitoring of the BEK will allow in particular to verify the implementation of measures and to assess their effectiveness. It also serves as the basis for adjustments that might be necessary (Abgeordnetenhaus Berlin, 2017).

Political support: Climate policies are generally supported across parties in the House of Representatives, except for the new right-wing party ‘Alternative for Germany’ (Alternative für Deutschland – AfD). However, differences become apparent, if one compares the current red-red-green coalition with the previous “grand coalition”. The latter, or more specifically the Christian Democratic group in the parliament had blocked the adoption of the BEK in the last month of the previous legislative term. In contrast, the current red-red-green government has already strengthened the position of the public utilities, has included the phase out of coal production in the Berlin Energy Turnaround Act and is currently planning to adopt major legislation in terms of mobility and heat supply. Thus, in the new government, a strong and clear political will can be observed.

Stakeholders: Stakeholder involvement is seen as very important by the Berlin administration as well as many politicians. The process of developing the BEK was therefore designed in a very participatory fashion with different types of workshops, online and offline forums (Abgeordnetenhaus Berlin, 2017, p. 14). What is more, the feasibility study had been designed in a similar way, with experts, NGOs, scientists, business actors and citizens participating in the process. It is envisaged that the participatory approach continues with the implementation and further development of the BEK until 2050. For instance, §11 of the Energy Turnaround Act required for a Berlin Council for Climate Protection to be re-

introduced⁷⁰. This happened in September 2017 and the council is now composed of nine members (including experts from NGOs, academia and business) and is responsible for independently advising Berlin’s senate and parliament -- and thus ultimately safeguarding the BEK’s continuation and implementation (Senatsverwaltung für Umwelt Verkehr und Klimaschutz, 2017b).

Analysis

Berlin’s current long-term governance framework has been developed for more than ten years and has seen several changes and extensions recently. It is the only case among the cities that has a legally binding long-term reduction target, as Berlin is a city-state and therefore has legislative powers other municipalities do not have. Furthermore, Berlin is a frontrunner regarding the phasing out of coal.

The following **strengths** have been identified regarding the Berlin case in general and the Energy Turnaround Act in particular:

- **Berlin has a longstanding tradition of climate protection:** The first UN climate change conference discussing the global actions was held in Berlin, which can serve as a symbol of the city’s outstanding activities. It was not by accident that Berlin was chosen as the venue for COP1. The history of Berlin’s activity is long, going even further than the 1992 energy saving law. for instance, the Enquete Commission on Berlin’s energy policy was introduced as early as 1983.
- **Binding target at city level:** Berlin’s 2050 target is legally binding and the adoption of an energy and climate protection programme is required by the Berlin Energy Turnaround Act. It is thus unlikely that a change in leadership or governing parties would entail a change in the overall targets.
- **A fixed programme cycle ensures regular review and refinements:** Climate action planning and its monitoring are mandatory processes. Moreover, the BEK acknowledges the fact that adjustments of the programme will be necessary, which is why the programme is reviewed and refined regularly under a fixed programme cycle.
- **The cross-cutting nature of climate protection is acknowledged:** Regarding the institutional set-up, the special unit on climate protection was extrapolated from the environmental unit and made into an overarching coordination unit. Since it is directly subordinated to the state secretary, the unit’s overarching character is also reflected in its institutional set-up. Furthermore, current legislative processes, such as the planned mobility law, will strengthen the mainstreaming of climate policies into other policy areas.

Berlin’s existing framework displays certain **weaknesses**:

⁷⁰ An earlier version of this council was based on the energy saving law (then called Energy Council), then renamed into Berlin Council for Climate Protection. That council was (in different forms) active for three periods and ended in 2014 (personal communication).

- **Political support between parties varies**, so that the level of ambition of different coalition governments varies too. The last years have provided evidence for the fact that the political will and financial means allocated to climate measures can change, and thus the overall effectiveness of implementation and policy developments can be slowed down considerably. That is why emission reductions have not been in line with the envisaged trajectories in the last couple of years.

In conclusion, it is all the more significant that the Energy Turnaround Act ultimately came into force in April 2016, after an earlier attempt to introduce a climate protection law failed in 2009. Since then, the pace and the level of activity has increased. For instance, having adopted the Energy Turnaround Act, the senate and parliament started implementing it immediately, deciding to phase out coal and introducing the new Council for Climate Protection. While both the Energy Turnaround Act as well as the BEK are still too recent to be able to actually judge their effectiveness, Berlin’s outstanding commitment to combat climate change has been institutionalised step by step, which makes it more unlikely that the path adopted will be changed at a later stage.

.

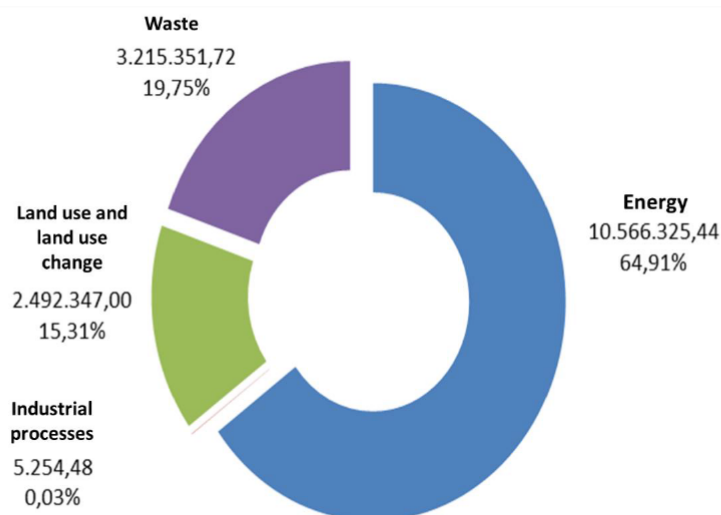
4.10 City: Bogotá, Colombia

Essential background

Bogotá is the capital and largest city of Colombia. It is a territorial entity of the first order with the same administrative status as the departments of Colombia. The capital district (Bogotá D.C.) has around eight million inhabitants, while more than ten million live in the broader metropolitan region.

In 2008, Bogotá released 16 million t of CO₂e, with each citizen producing on average 2.28t per capita of CO₂e. The energy sector was responsible for 65 percent of the city-wide GHG emissions, mainly due to the use of fossil fuels for energy purposes. The waste sector accounted for around 20 percent and the remaining emissions stemmed largely from emissions released due to agriculture, forestry and land use changes (15.31%) as well as industrial processes (0.03%) (Secretaría Distrital de Ambiente Bogotá, D.C - IDIGER, 2017, p. 85). According to current economic and technological trends (business as usual scenario), CO₂ emissions are projected to rise between 2008 and 2050 to around 60m t CO₂e per year (Secretaría Distrital de Ambiente Bogotá, D.C - IDIGER, 2017, p. 92).

Figure 13 GHG emissions by sector in Bogotá in 2008.



Source: (Carbonn, 2015, p. 1)

Description of the long-term climate policy governance framework

Historical origin

The former local government of Bogotá first officially addressed the problem of climate change in an overall strategy in its Development Plan "Bogotá Humana 2012–2016", with one of three axes focusing on "a territory facing climate change and organized around water", meaning that the former local government was already recognizing the challenge that climate change was posing for the city and was aiming to reduce GHG emissions, the ecological and water footprint, and limit its urban expansion. The central focus of "Bogotá Humana 2012–2016" was the adaptation to climate change and the reduction of vulnerabilities (Secretaría Distrital de Ambiente Bogotá, D.C - IDIGER, 2017, p. 79).

Prior to the Development Plan, the Acuerdo 391 of the Council of Bogotá D.C. already stated in 2009 that guidelines for a *Plan Distrital de Mitigación y Adaptación al cambio climático* (district plan for climate change mitigation and adaptation) should be developed (Secretaría Distrital de Ambiente Bogotá, D.C - IDIGER, 2017, p. 79).

Main elements of Bogotá’s climate governance framework

Bogotá’s first climate change response plan was adopted in December 2015 as *Plan Distrital de Gestión de Riesgo y Cambio Climático-PDGRCC*⁷¹, a roadmap to build a city organized around its water bodies and adapted culturally and environmentally to climate change impacts, keeping GHG emissions at a low level. Similar to the development plan, the general purpose of that mitigation and adaptation plan was to improve the city’s resilience, meaning its capacity to resist and recover quickly from climate change impacts, through strategies to reduce GHG emissions and strengthen adaptation.

However, since a change in the local government on the 1st of January 2016 from a left-wing to a right-wing mayor, the *Plan Distrital de Gestión de Riesgos y Cambio Climático – PDGRCC* is currently under revision. In fact, the 2015 plan was never implemented since the government changed before the implementation could be realised. Still, the broad aims of the plan will probably stay, while the quantitative objectives will probably be adjusted. The initial 2015 plan had five broad objectives, the first including emission reduction targets. The aim of Bogotá D.C. was to cut emissions by 31 percent until 2030, 40 percent until 2038 and 53 percent until 2050 against the business as usual scenario (Secretaría Distrital de Ambiente Bogotá, D.C - IDIGER, 2017, p. 247). An earlier version even stated a 56 percent reduction until 2038 and a 62 percent reduction until 2050. While the current opinion in the leading party is that these objectives are too ambitious and thus not realistic, it should still be acknowledged that Bogotá recognizes climate change as an important issue despite facing major political challenges such as the current peace process in Colombia.

Notwithstanding the current changes, the 2013 consolidation of the city’s institutional system with regard to climate change, based on *Acuerdo* 546 of the Council of Bogotá D.C., can be considered an important milestone. This agreement merged the areas of risk management, climate change, and environmental management in the new *Sistema Distrital de Gestión de Riesgos y Cambio Climático* (SDGR-CC), with the purpose of generating synergies and increasing the climate resilience of Bogotá. This overall system includes a Council (*Consejo del SDGR-CC*) which takes decisions on risk management and climate change, an Advisory Council (*Consejo Consultivo Distrital para la Gestión de Riesgos y Cambio Climático*), which is in charge of the strategic planning and an Intersectoral Commission on Risk Management and Climate Change (*Comisión Intersectorial de Gestión de Riesgos y Cambio Climático*), which is in charge of monitoring (Secretaría Distrital de Ambiente Bogotá, D.C - IDIGER, 2017, pp. 341–342). In terms of administrative organization, the previous Fund for Prevention and Emergency Care (FOPAE) became the District Institute of Management of Risks and Climate

⁷¹ There were other names for the same plan before, e.g. *Plan de Cambio Climático de Bogotá* or *Plan Distrital de Adaptación y Mitigación al Cambio Climático para Bogotá 2015-2038 con visión al 2050*.

Change – IDIGER, and a new District Fund for Management of Risks and Climate Change (FON-DIGER) was created. The District Secretariat of the Environment coordinates all activities and projects on climate change in the city and the subordinate institutions such as IDIGER (Secretaría Distrital de Ambiente Bogotá, D.C - IDIGER, 2017, pp. 54, 80).

The environmental authorities are also trying to include various stakeholders in strategic planning, and so far were mostly successful in engaging the organised civil society, business actors and scientists. For instance, the District Secretary of the Environment already works with universities to address the impacts of climate change associated with air pollution and risk management, among other issues (Krellenberg et al., 2014, p. 36). Participation of ordinary citizens is, however, still in the early stages, although measures are planned to encourage active citizenship (Secretaría Distrital de Ambiente Bogotá, D.C - IDIGER, 2017, pp. 339–341).

Bogotá D.C. is embedded in its regional context and the city framework directly refers to the Bogotá Comprehensive Regional Climate Change Plan (*Plan Regional Integral de Cambio Climático para la Región Capital Bogotá-Cundinamarca* – PRICC) which was adopted in 2014 at the metropolitan scale. The plan falls under the responsibility of the national Ministry of the Environment. Within the scope of the district plan, a partnership with the department of the Cundinamarca Region has been created, forming an inter-institutional platform for climate change, and thus strengthening an integrated perspective of the Metropolitan Region of Bogotá (Krellenberg et al., 2014, p. 37; Secretaría Distrital de Ambiente Bogotá, D.C - IDIGER, 2017, p. 78).

Analysis

Bogotá’s long-term governance framework has been mainly adopted to make the city more resilient in terms of climate change and to enhance its water management. Also, it represents a case of a city in a non-annex I country. While the city adopted an ambitious GHG reduction target in the 2015 plan, this likely too ambitious target is now being adapted to a more realistic one. It is reported that the new plan will be published around January 2018.

The case of Bogotá is characterised by the following **strengths**:

- **Mitigation and adaptation are addressed jointly:** Bogotá has a mitigation and adaptation plan which includes measures to reduce GHG emissions and to strengthen adaptation. The overall focus of the plan is to improve the city’s resilience, i.e. its capacity to resist and recover quickly from climate change impacts.
- **City policies are embedded in regional and national context:** The city’s framework directly refers to the aims of the regional climate change plan PRICC that falls under the responsibility of the national Ministry of the Environment. Thus, major changes in local policies are not likely as long as the national framework stays in place.
- **Comprehensive institutional set-up:** To effectively implement its climate policies, Bogotá changed the institutional set-up for responsibilities in risk management, climate change, and environmental management to be in the same hands. The new system highlights the city’s focus on resilience and the fact that mitigation and adaptation receive similar attention.

The adaptation and mitigation plan includes specific measures and project ideas to be implemented and it is envisaged to report progress towards the targets on an annual basis. Nevertheless, several **weaknesses** persist at the current stage of development:

- An actual **MRV system is not yet established**, even though it is planned (Secretaría Distrital de Ambiente Bogotá, D.C - IDIGER, 2017, p. 364). **Inter-agency cooperation seems to be still a challenge** which makes mainstreaming more complicated (Krellenberg et al., 2014, p. 40).
- The Intersectoral Commission on Risk Management and Climate Change, which is in charge of monitoring, is supposed to include other actors of relevance in the process. However, while organised stakeholders were and are contributing to a certain extent in the development and the implementation of the now existing framework, **elements of citizen participation are still to be implemented**.
- Most significant is, however, the **lack of political continuity**. The implementation of the 2015 plan has not even begun but it is already – due to a change of local government – undergoing a process of adjustment. While it can be expected that the broad goals will remain the same, the targets are likely to be adapted to a more realistic level. Furthermore, the political system in Colombia is not yet stable. In other words, with the next change of local government, there is a risk of the plan being changed again.

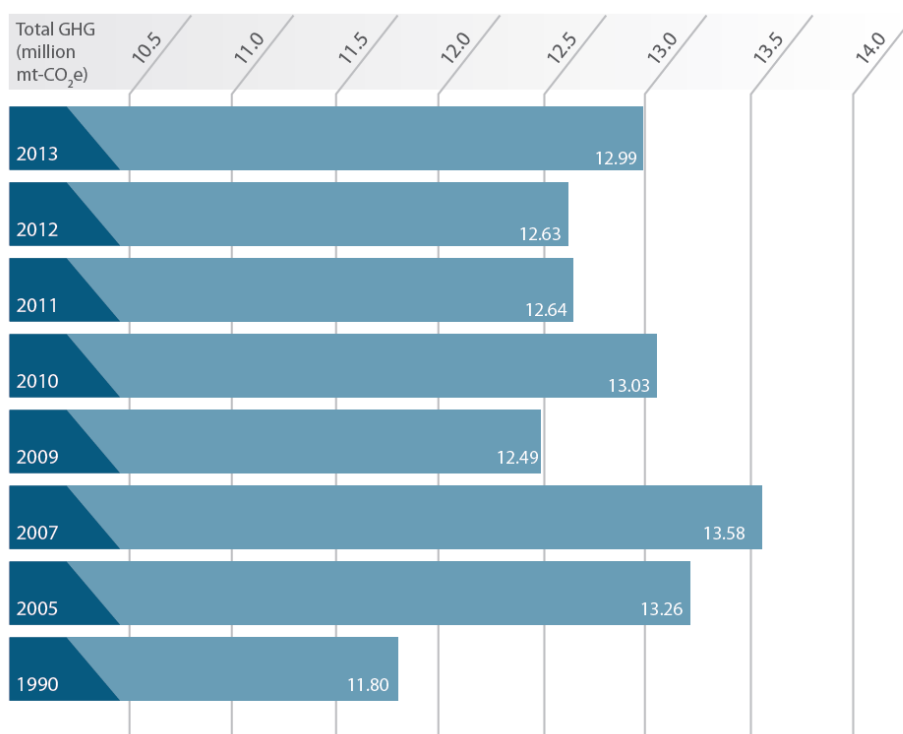
To conclude, although the city has, on paper, a comprehensive climate change response strategy, which takes into account the city’s institutional context and includes provisions to ensure mainstreaming of climate action across the municipality’s departments, the extent to which the strategy will be successfully implemented is unclear, and highly dependent on future political developments.

4.11 City: Denver, USA

Essential background

Denver is the capital and the municipality with the highest population in the US state of Colorado. It has around 700,000 inhabitants. In 2013, Denver’s total city-wide GHG emissions amounted to nearly 13m t CO₂e, translating into per capita emissions of 20t CO₂e. Thirty-five percent of emissions stemmed from commercial energy use, while residential energy use accounted for 16 percent, and gas and diesel vehicles for 19 percent (City and County of Denver, 2015, p. 8). Compared to the baseline years 1990 and 2005, this is an increase in community-wide GHG emissions from 11.8m t CO₂e in 1990 and 14.6m t CO₂e in 2005. However, per capita emissions decreased from about in 25.3m t CO₂e in both 1990 and 2005 due to an increase in Denver’s population (Greenprint Denver Advisory Council, 2007, p. 13).

Figure 14 Denver’s total GHG emissions.



Source: (City and County of Denver, 2015, p. 10). Note: 1990 emissions were estimated through backcasting based on more limited data than 2005–2013. Denver did not conduct a GHG inventory in 2006 or 2008.

Description of the long-term climate policy governance framework

Historical origin

Denver’s current emission reduction targets come with history on climate policy and participatory processes that date back more than ten years. Following the Mayor’s Climate Protection Agreement, a resolution by a number of US-American cities (US Conference of Mayors 2005), Denver set a relative GHG reduction goal in 2005, aiming for a 10 percent reduction of per capita emissions by 2012 from 1990 levels. The city later set its first climate action plan in 2007. This plan had been compiled by a

group of three dozen business, civil society and community leaders, the so-called Greenprint Denver Advisory Council. On behalf of the mayor at the time, the Council met over a 7-month period to:

- make an inventory of Denver’s GHG emissions;
- study the successes and failures of other similar cities’ efforts;
- evaluate proposed actions; and
- develop a set of recommendations to the Mayor (Greenprint Denver Advisory Council, 2007, p. 10).

The Council was working with city staff, faculty members and students from the University of Colorado, but also spent several months trying to engage the entire community of Denver. It particularly focused on residents, neighbourhood and community groups, business and industry and youth in the development process of the action plan. After a draft was published in May 2007, several public forums were hosted and members of the Advisory Council participated in other events, which over 300 people attended. In addition, comments on the Climate Action Plan were solicited via a weblog, as well as through regular e-mail and written correspondence. This feedback was incorporated in the final version of the 2007 plan.

The 2007 plan included mainly short-term targets to achieve the emission reduction goal set for 2012, focusing on different sectors (cf. for instance p. 34), but also recommended the now established goal for 2020. Very prominent in the 2007 plan was the public participation strategy, especially targeting businesses, neighbourhoods and youth (Greenprint Denver Advisory Council, 2007, p. 37).

Main elements of Denver’s climate governance framework

Currently, the city of Denver has two emission reduction targets. The first was introduced in 2013, when the city established the Denver 2020 Climate Goal as part of the “2020 Sustainability Goals” (Office of Sustainability, 2016a). This goal calls for an absolute reduction of GHG emissions to 1990 levels by 2020, which requires a 10 percent reduction of GHGs from 2005 levels (City and County of Denver, 2015, p. 3).

The second goal, in which the city commits itself to reduce GHG emissions by 80 percent by 2050 (branded as “80 by 50” or “80X50”), using the 2005 baseline, was introduced when Denver signed on to the Mayors’ National Climate Action Agenda in early 2015, and was included in the newly updated 2015 climate action plan (City and County of Denver, 2015, p. 16).

The new 2015 plan, which includes the 2050 goal, establishes only the first component of a long-term policy framework. Similar to the 2007 plan, the 2015 climate action plan includes very specific, quantified measures to reach the short-term 2020 goal (cf. for instance City and County of Denver, 2015, pp. 20, 25) but does not offer specific measures beyond that date yet. In the development process, however, strategies were also identified that could not deliver significant reductions until after 2020. Those long-term policy strategies were included in an appendix of the plan and are currently being further quantified and prioritized as part of the stakeholder engagement process mentioned above (City and County of Denver, 2015, p. 16).

The stakeholder engagement process was launched in 2016 and aims to “explore all the pathways” to meet the city’s goals (City and County of Denver, 2015, p. 32). The idea of the stakeholder engagement process is that Denver’s climate action plan “is a living document that will continually be updated with new climate science, strategies, policies, and programs” (City and County of Denver, 2015, p. 16).

The stakeholder process builds on the “80x50 Stakeholder Vision”, including the overall long-term aspirations for the city (City and County of Denver, 2017a). It also aims to set specific targets for energy efficiency and fuel switching, electric vehicles, freight and mobility as well as public transport and car-pooling (City and County of Denver, 2017b). Almost all of these specific targets include mid-term time goals (for 2025 or 2030). The measures for the post-2020 goals are currently undergoing a public consultation process and should be finalized in the first half of 2018 (personal communication). The implementation of the plans includes two distinct bodies: A Technical Advisory Committee to identify potential strategies for GHG reductions in four sectors (mobile supply and demand, stationary supply and demand), and a Task Force to integrate these strategies by looking into their opportunities and barriers.

For the 2015 climate action plan, a collaborative process by the Department of Environmental Health involving multiple city agencies, the Office of Sustainability, the Sustainability Advisory Council and in particular its sub-committee for Air, Climate & Energy, as well as external consultants allowed Denver to identify short-, medium-, and long-term strategies and to estimate potential GHG emissions reductions for each strategy. Denver also hosted two community meetings and a meeting for local NGOs (City and County of Denver, 2015, p. 17).

Denver has been evaluating GHG emissions levels and progress made in emissions reduction efforts by conducting annual GHG inventories since 2009 (City and County of Denver, 2015, pp. 8, 17). This inventory accounts for “core” or direct emissions as well as “upstream” or indirect emissions. Core emissions occur within the boundary of the city and include emissions from building energy use, transportation and fuels, street lights and waste management. Upstream emissions occur outside the boundary of the city but are demanded by people and businesses such as refining of fuel, airline jet fuel, cement production, food packaging, and transport (City and County of Denver, 2015, p. 8).

Moreover, Denver became certified by ISO 14001 Environmental Management System (EMS) in 2010 (and has been recertified in 2013 and 2016) and uses EMS to evaluate and ensure a continued commitment to reducing GHG emissions. The EMS is a tool used to incorporate environmental considerations into the city’s day-to-day operations. With the EMS, climate action strategies are integrated within agencies’ existing goals, processes, and plans and are analysed annually. This allows agencies to track implementation and measure the success of strategies, while increasing accountability (City and County of Denver, 2015, p. 32).

Apart from the GHG mitigation planning, there is also a 2014 adaptation plan, which focuses mainly on the city administration and less so on the city as a whole. That is why, stakeholders did not get extensive opportunities to participate and contribute to the plan. Similar to the mitigation activities, adaptation measures are embedded in the EMS and are subsequently monitored for successful implementation (City and County of Denver, 2014, p. 64).

Analysis

Denver is facing the challenge to increase sustainability in a booming economy and with a growing population. The city’s climate action framework combines regularly updated short-term planning with a strategic GHG reduction goal for the year 2050. In the last ten years, this goal has been changed from a per-capita goal to an absolute goal, which proves to be a major challenge.

The 2050 long-term emission reduction target was introduced in 2015 and the policies to achieve this goal are currently being developed. In the meantime, the 2020 target is still the big milestone for the municipality. It is broken down into sectoral targets with explicit measures and controlled by annual GHG inventory updates.

The analysis of Denver’s emission reduction strategy revealed the following strengths:

- **Backing by political leadership:** The first climate action plan in Denver came into being because of a specific request from the mayor during that time and second term mayor Michael Hancock (Democratic Party) has followed this example since being elected in 2011. His 2015 election win with over 80% of the vote and his ambition to run for a third consecutive time in 2019 (Murray, 2017) indicate a tendency towards a continuation of these policies beyond the current 2020 goal (personal communication). However, the position of mayor is limited to a maximum of three terms which makes it difficult to predict the long-term continuity of the (non-binding) plans.

On the city level, the strong institutional position of the mayor has resulted in a clear focus on initiatives by the executive branch: The plans on long-term emission reductions have been developed with political backing from the respective head of the city’s executive branch (personal communication). The political backing was particularly necessary since there is no legally binding climate law or other legislative act including Denver’s emission reduction targets. It should be noted, however, that the state of Colorado introduced a renewable energy standard in 2004 with a target of 30% renewable energy generation by 2020, which also affects the renewable electricity generation on the local level.

- **Interagency cooperation:** Departments and offices from different policy areas are in charge of implementing measures of the climate action plan together. This makes it easier to mainstream climate policy objectives across issue areas.
- **Stakeholder involvement:** Stakeholder involvement has been one of the strengths during the development of the first two climate action plans and continues to remain important for GHG mitigation efforts in general and for the development of interim targets and measures of implementation beyond 2020 in particular. Setting targets for specific indicators based on stakeholder consultations and identifying ways how to implement them into the city’s future planning shows openness for community input.

So far, however, the strategy has displayed the following **weakness**:

- The City of Denver **did not identify medium and long-term measures to effectively reduce emissions**. Thus, it is currently not on track to achieve its targets. In fact, a recent report on

the city’s progress on the 2020 Sustainability Goals that it set itself in 2013 shows that most indicators do not show a sufficiently positive development yet (Office of Sustainability, 2016b). While the developments are mostly on track for government operations, the reduction achievements in the overall community pose bigger challenges. The Denver Sustainability Office expects to close the gap at least partially with additional measures. Current plans include increasing the rate of energy efficient refurbishments of existing buildings or using the continuing increase of renewable energy generation by the local (investor-owned) utility to also accelerate the move to electric vehicles on the local level. Moreover, the medium and long-term strategies in the 2015 climate action plan are currently under development, including more specific measures.

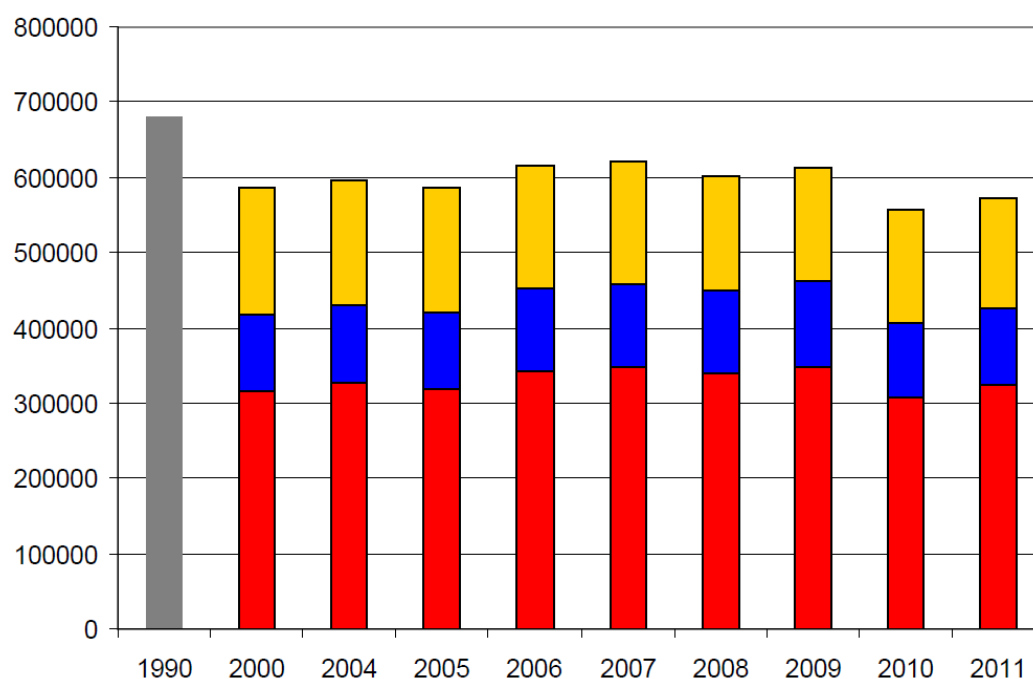
Overall, the continued political backing of climate (mitigation) action supports the active administration of Denver in its further planning of short- to mid-term measures as well as in the implementation of identified fields of action. The current level of ambition, however, risks falling short of the 2020 goal and, consequently, of the long-term target. Having said that, it stands to reason that Denver’s strong institutional setup and stakeholder involvement processes – given the continued political support on the local level – would allow the city to take its climate action even further in the future.

4.12 City: Kempten, Germany

Essential background

The municipality of Kempten is situated in the Allgäu region in Bavaria, Germany. Kempten is a small city with around 70,000 inhabitants. Its total CO₂ emissions amounted to 564,429 t in 2011, which translated into per capita emissions of 8.6 t CO₂, a value 6.5 percent lower than the German average in that year⁷². 54 percent of CO₂ emissions in 2011 stemmed from the economy, 27 percent from transport and 19 percent from households. Including agriculture and land usage, the GHG emissions in Kempten were at 607,000 t CO₂e in 2011 (Stadt Kempten, 2013, pp. 46–48).

Figure 15 CO₂ emissions (in tonnes of CO₂) in transport (yellow), households (blue) and the economy (red).



Source: (Stadt Kempten, 2013, p. 49). Note: The data quality for the years 1990 and 2000 is not comparable with the surveys since 2004.

Just as other municipalities in Germany, Kempten has the right to self-government, which includes municipalities' powers to regulate its finances, manage its staff and carry out its own spatial planning. However, these powers are exercised within a legal framework established by the constitution, federal parliament and especially the German states (*Länder*). Apart from this, municipalities provide public services such as gas, electricity and water supply, waste collection and disposal, public transport and social services.

⁷² In the baseline year 1990, the average annual CO₂-emissions in Kempten were still at 11 t per inhabitant (Eza! – Energie- und Umweltzentrum Allgäu, 2011, p. 28).

Description of the long-term climate policy governance framework

Historical origin

Kempton municipality started with energy-saving renovations of public buildings already back in 1999 and set up its own municipal energy management in 2000.

The first integrated climate protection concept with the target year 2020 was adopted by the city council in March 2011. The concept included the participation in the European Energy Award (eea, see below). Following an application initiated with a political backing of Kempton's mayor, in 2012 Kempton was chosen to become a so-called "master plan municipality" by the Federal Ministry of the Environment. For four years, the 19 German master plan municipalities received financial support from the Ministry to enable the local administrations to expand their activities on climate action (with emphasis on mitigation) and to set for themselves particularly ambitious climate protection goals. A distinctive climate and energy policy profile, the availability of the necessary know-how within the administration, scope, depth, and the feasibility of the implementation strategy, as well as the degree of participation that residents had in the development and implementation of the master plan process were all taken into account when selecting the master plan municipalities.

Main elements of Kempton's climate governance framework

Targets: With the support of its status as a master plan municipality, Kempton revised and developed its 2011 concept further and one year later, the "Master Plan for 100% Climate Change Mitigation in 2050" was adopted unanimously by the city council. This master plan includes an energy efficiency target of 50 percent by 2050 as well as a 95 percent emission reduction of greenhouse gases (GHG) (baseline year 2010).

Institutions: The master plan concept was primarily developed by the city's newly appointed Climate Protection Manager, the Climate Protection Advisory Board of Kempton (Klimaschutzbeirat) as well as the energy and environmental centre Allgäu (Energie-und Umweltzentrum Allgäu – eza!). The Climate Protection Manager is an element central to all master plan municipalities, which is why the position is financially supported by the environmental ministry during the first years. They have the task of creating structures in the municipal administration that ensure long-term and targeted cooperation on climate protection – within the administration as well as beyond. The Climate Protection Advisory Board of Kempton existed in a slightly different form and under the name of "Energy Team" since 2009 and was rebranded in 2014. The board has 17 members including politicians, administrative staff and representatives of municipal services' providers such as energy provision and waste treatment. The Climate Protection Advisory Board discusses and develops ideas and concepts, prepares climate protection measures and projects, and makes recommendations, which are then submitted to the relevant committees for decision (Stadt Kempton, 2017). In addition, one employee of eza! advises the city of Kempton regarding the certification procedure for the eea.

Policies: Project ideas for the master plan were collected from existing strategies by the Climate Protection Manager, eza!, the energy team, and the parliamentary groups of the Kempton City Council.

Citizens were able to provide input through citizens' fora. The ideas were initially included in different lead projects. Afterwards the environmental committee of the city selected 10 key projects (out of a larger catalogue of 24) comprising several measures each, the implementation of which was deemed crucial to achieving the ambitious targets of the city (Stadt Kempten, 2013, pp. 104–106). The city follows up on these projects with monitoring activities, including a qualitative assessment of the projects' milestones and collection of quantitative data on the projects' results. According to Kempten's 2050 scenario, the ambitious goals of 50% reduction of energy consumption and 85-95% GHG emission reductions are feasible to achieve (Stadt Kempten, 2013, p. 88).

Table 5 Key Projects of Kempten Master Plan 100% Climate Protection until 2050. Adapted from Stadt Kempten (2013, p. 105).

Field of Action	Key Project
Sustainable Planning	1. Urban land-use planning
	2. Residential areas with connected supply structures
	3. Energy-oriented city refurbishment: "neighborhood concept"
	4. Land usage reduction
Mobility	5. Improvement and future-oriented redesign of public transport (while taking into account existing framework conditions)
	6. Support and strengthening of bicycle traffic
	7. Support of sustainable mobility
Internal Organization	8. Interlinking relevant actors
External Communication and Cooperation	9. Public awareness, societal commitment and participation of citizens
	10. Incentives for businesses.

Stakeholders: The implementation of the master plan concept for Kempten started in 2014. Citizens' panels and other opportunities for participation are an integral part of the implementation, so that the municipality can create a sense of ownership over the master plan.

Monitoring: To ensure implementation, Kempten defines milestones for all projects and measures and assesses progress made annually. To do so, the energy team compiles a progress report each year, which is then presented to the environmental committee. Significant differences between the 2050 scenarios and the actual developments are analysed by the energy team in detail. The assessment includes a qualitative assessment as well as a quantitative assessment with indicators updated annually by the energy team. The citywide energy and CO₂ balance is updated every two years.

Review: The progress report also includes ideas for new projects and measures and signals the need for political adjustments (if significant discrepancies exist between the future scenarios and current progress levels).

Additional expertise and protocols: To ensure high quality progress monitoring, Kempten participates in the eea since 2011. As a quality management system and certification process, the eea enables the participating municipalities to systematically determine, assess, check, and coordinate all energy and climate protection activities of the local government to ensure their implementation. The eea is a process-oriented and long-term strategy. Its core element is a catalogue of around 100 measures which are divided into six areas of activity, namely development and spatial planning, municipal buildings and facilities, supply and disposal, mobility, internal organisation, and communication and cooperation.

The implementation of the eea involves an Energy Team audit (internal audit) and an audit performed by an external expert; the latter is in charge of the certification. A municipality is awarded the European Energy Award®, if it meets at least 50 percent of the maximum possible points – a goal that Kempten achieved already in 2012. The audit concluded that Kempten did best in the field of action called “municipal buildings and facilities” due to its great emphasis on the high-quality refurbishment of municipal buildings and the fact that it powers the municipal buildings with renewable energy. Moreover, Kempten decided to build all new municipal buildings in the passive house standard. Finally, the planning requirements of the city in the areas of construction planning, densification and infill of vacant lots were positively highlighted.

The European Energy Award® Gold was granted to Kempten in 2016 when it managed to reach more than 75 percent of the maximum possible points. In 2016, the weakest area of activity of the eea for Kempten was “mobility”. Thus, the city currently develops an ambitious mobility concept 2030 in cooperation with civil society and other local stakeholders. Among other measures, a 30 km/h speed limit zone is planned for the city centre. The adoption of the concept in the city council is supposed to take place by the end of 2017.

In late 2015, the city council adopted five strategic goals for 2030. The fifth goal is called “climate, environment, mobility – sustainable planning and action”. Here, the city council highlights the cross-cutting function of climate protection management. According to this decision, the eea quality management system is also used to determine whether the objectives of the strategic climate goal are reached (Stadtrat Kempten, 2015).

Analysis

Kempten is a small municipality and does not have the financial means or political power of large cities. Nevertheless, the city provides an example of a comprehensive approach to mitigate climate change at the local level and shows how bindingness of emission reduction targets can be achieved without a legislative act.

The following **strengths** of Kempten’s strategy have been identified:

- **Broad political support:** The "Master Plan for 100% Climate Change Mitigation in 2050" was adopted unanimously by the city council, which implies that changes in political leadership would not change the overall strategy. In fact, a change of the position of Kempten's mayor in 2014 (during the master plan project) did not change the underlying city goal or the ambition to implement the master plan's projects and measures.
- **Mitigation as a long-term strategic goal:** Climate mitigation is part of the five strategic goals of the city, which are set for 2030. This is to say, the whole city council reached an agreement on the importance and cross-cutting nature of climate policies. In political discussions, actors refer frequently to the strategic goals, creating high political commitment.
- **Broad citizen participation:** Citizens' panels and other opportunities for participation have been a central element of the development of the master plan and are now an integral part of the implementation of the master plan, which helps to create buy-in.
- **External auditing** ensures high quality progress monitoring.

What has also been critical to the success until today has been the financial support of the federal Ministry of Environment. This reveals a **weak point**:

- (Smaller) municipalities often lack financial capacity and strongly rely on the support of national initiatives to adopt ambitious targets.

Overall, the City of Kempten was able to adopt a GHG emission reduction target of 95 percent by 2050 because of a funding scheme at the national level and the support across political parties. An aspect central to the effective implementation is that climate objectives have to be considered in all parts of the administration due to their status as a strategic goal.

4.13 City: Sydney, Australia

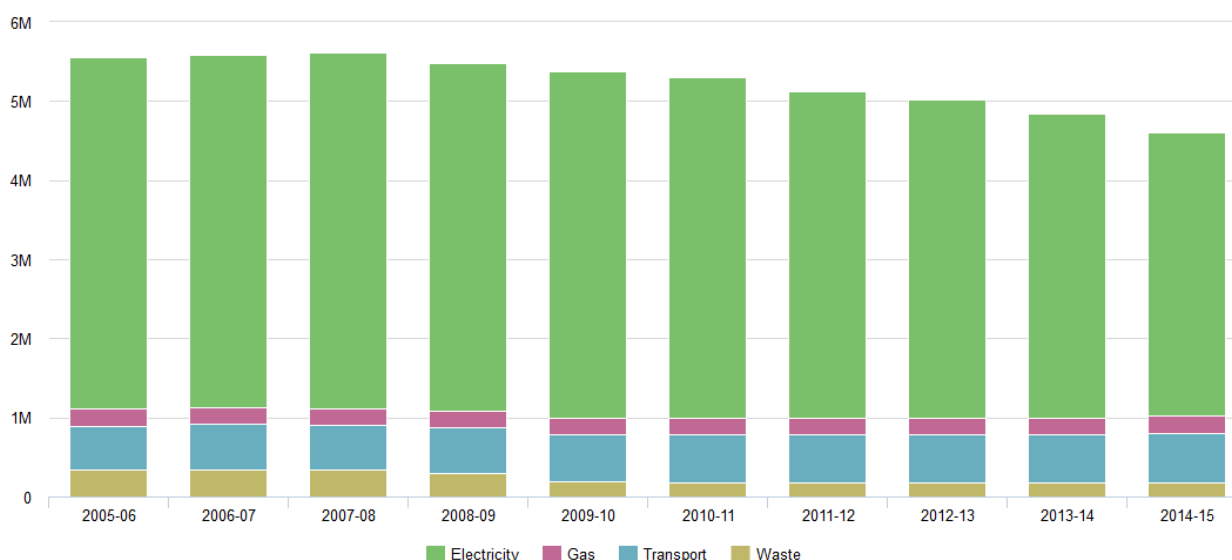
Essential background

The number of people who live, work and visit Sydney has grown and is likely to continue to grow according to population forecasts. The metropolitan Sydney population today is about 5 million inhabitants and is predicted to grow to 6.4 million by 2036 and more again in subsequent years. The actual City of Sydney is much smaller and only home to about 210,000 residents. Yet, the city supports 1.2 million residents, workers, visitors and students every day. Between 2006 and 2016, the population of the City of Sydney increased by 36.2 percent, or about 60,000 people and by 2031, the local population is projected to increase to more than 300,000 inhabitants.

The City of Sydney is located in New South Wales and operates within a legislative framework that is decided by the State Government. The local government's regulatory powers are low, compared to municipalities in other countries. Some parts of the local government's geographical area are directly managed by the State and Federal Government entities including the Darling Harbour Foreshore Authority, the Sydney Harbour Foreshore Authority, the Department of Defence, Roads and Maritime Services and others. As a result, the decisions made by the State and Federal Government have a significant impact on the policymaking at the local level (CDP, 2015, p. 17).

The local area's greenhouse gas emissions amounted to 4.81m t CO₂e in the financial year 2014/15 (City of Sydney, 2017a, p. 25).

Figure 16 GHG emissions by sector in t of CO₂e. Note: Data in the graph does not correspond exactly to the 4.81 m t mentioned above, as Sydney changed its way to calculate emission in 2017.



Source: (City of Sydney, 2016).

Description of the long-term climate policy governance framework

Historical origin

“Sustainable Sydney 2030”, a strategic plan for the City of Sydney, was developed and adopted following an initiative of the Lord Mayor, Clover Moore. Moore came into office in 2004 and identified a strategic gap regarding sustainable development to which she drew the attention of her administration. Upon her request the post of a Sustainability Manager (today Sustainability Director) was created shortly after she came into power (personal communication). The state law obligation for integrated planning and reporting at the municipal level was used to create a long-term plan that was presented to the city community for endorsement. A large-scale consultation process, including residents and businesses, government and statutory authorities, visitors, as well as educational and cultural institutions was initiated by the head of the administration, the Chief Executive Officer (CEO) of the City of Sydney. The result of the process, the “Sustainable Sydney 2030” strategic document, outlines environmental, economic, social and cultural goals of the city. It is described as “the cornerstone of everything we do” by the Lord Mayor (City of Sydney, 2017b, p. 8). The city’s entire work follows from this plan – strategies and action plans set out the commitments, projects, and services needed to achieve the targets established by the “Sustainable Sydney 2030”. Overall, progress is measured against ten targets set for 2030 (City of Sydney, 2017b, p. 13). These include, among others, the above-mentioned emission reduction target as well as targets for renewable energy (50 percent of electricity demand is to be met by renewable sources) and the modal share (at least 10 percent of total trips made in the city are to be done by bicycle and 50 percent by pedestrian movement; trips to work using public transport will increase to 80 percent) (City of Sydney, 2017b, p. 23). Currently, environmental indicators are included in the performance reviews of every Director of the administration to ensure the mainstreaming of climate (and other environmental) objectives (personal communication).

Main elements of Sydney’s climate governance framework

Across the area managed by the local government, the City of Sydney has set itself a target of a 70 percent reduction in 2006 GHG emissions levels by 2030 and net zero emissions by 2050. These targets are both included in the 2017 version of “Sustainable Sydney 2030”. The first version of the plan, adopted in 2008, included only the 70 percent reduction target by 2030, with year 2006 as a baseline. Following this trajectory would have meant an 80 percent reduction by 2050. However, the findings of the IPCC’s Fifth Assessment Report and, even more so, the Paris Agreement served as major turning points that have led the municipality to revise its environmental strategy and increase its ambition for 2050, in the light of a new target of limiting the global temperature rise to below 2°C above pre-industrial levels and pursuing efforts to limit it to 1.5°C (personal communication).

To implement “Sustainable Sydney 2030”, the city has not created new institutions, but relies on existing administrative structures as well as partnerships with local stakeholders, including businesses and, building owners (personal communication). Comprehensive implementation shall be ensured through a four-year delivery program and annual operational plans. The current delivery program covers the period from 2017–2021 and is supposed to translate the “Sustainable Sydney 2030”’s objectives into

action. The delivery program identifies priority projects and programs with key performance indicators and targets that contribute to the outcomes under each strategic direction mentioned in “Sustainable Sydney 2030”. The operational plan is prepared and adopted by end of June each year. It sets out the specific projects, programs and activities to be delivered in that year and incorporates relevant budgetary information (City of Sydney, 2017b, p. 13).

On top of the operational plan, the city also has a resourcing strategy for “Sustainable Sydney 2030”. The current version has five components, including a long-term financial plan, a workforce strategy, an asset management plan, as well as an information and communication technology strategic plan (City of Sydney, 2017b, p. 13).

Additionally, the resourcing strategy also outlines the approach to community engagement in the implementation of “Sustainable Sydney 2030”, which is a key aspect of the overall strategy. Engagement activities include, among others:

- a dedicated online consultation portal – sydneyyoursay.com.au which includes surveys, polls, mapping tool, and an online forum;
- workshops and community meetings;
- stakeholder meetings and roundtables; and
- deliberative processes including 21st Century Town Hall Meetings and Citizens’ Juries (cf. City of Sydney, 2017b, p. 137)

To guide the implementation of “Sustainable Sydney 2030”, the City developed a series of environmental master plans and strategies between 2008 and 2015. In 2017, these were combined in the strategy and action plan “Environmental Action 2016–2021”. During this five-year period, the action plan is reviewed and adjusted annually to take into account technology progress, regulatory reforms and stakeholder feedback (City of Sydney, 2017a, p. 3). The plan addresses six areas:

- Low-carbon city
- Water sensitive city
- Climate resilient city
- Zero waste city
- Active and connected city
- Green and cool city

In terms of the low-carbon city, the City of Sydney is planning to reduce emissions in its own operations by 44 percent from 2006 levels and move to 50 percent renewable energy by 2021. As the municipality has a strong record in emission reductions, it is not unlikely to succeed: the city’s operations became carbon neutral in 2007 and were certified as such in 2011 by the National Carbon Offset Standard in Australia. This means the city is using offsets where emissions cannot be avoided. Between 2006 and June 2015, GHG emissions of government operations were already reduced by 25 percent and emissions across the local government area have reduced by 17 percent despite a growth in population

and worker numbers — signifying a 37 percent reduction in ‘carbon intensity’ (City of Sydney, 2017a, p. 1, 2017b, p. 39). In 2017, the city updated the way it reports on local area emissions, in order to become compliant with the Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories (GPC) – the new international benchmark for reporting city emissions (City of Sydney, 2017a, p. 25).

Overall, monitoring of activities and transparency are central to the implementation of “Sustainable Sydney 2030” and its subordinate strategy and action plans: the city’s four-year delivery program and annual operational plan are monitored through six-monthly, annual, and four-yearly performance reports as well as quarterly financial reports. These reports are also available for the general public and set out the progress and results of the planned projects, programs and activities (City of Sydney, 2017b, p. 131). Moreover, the ten targets are monitored and progress is reported regularly. Activities and outcomes associated with environmental targets (such as emission reductions and the share of renewable energy) are reported in the green environmental sustainability progress report, published twice a year (City of Sydney, 2017b, p. 131).

Finally, the City of Sydney explicitly acknowledges that it is part of a broader metropolitan Sydney and that it exists in an even broader national and global context. The “Sustainable Sydney 2030” strategic plan thus states: “We can achieve more by defining major issues together, integrating our policy frameworks and taking collective and collaborative actions. The City is committed to collaborative action between all levels of government, at a policy level and when implementing our projects” (City of Sydney, 2017b, p. 16). This means, for instance, that the City of Sydney will update “Sustainable Sydney 2030” to reflect the intent of the 20-year central district plan for Metropolitan Sydney, which is currently developed to identify priorities and actions to improve the productivity, liveability and sustainability of the region in a coordinated way (City of Sydney, 2017b, p. 17).

Analysis

Sydney’s current long-term governance framework has been under development for more than ten years and has recently been updated. It represents a case in which climate policies and targets are embedded in a broader framework of urban sustainability. This allows for mainstreaming of climate considerations in other sectors.

The analysis has revealed several strengths of the Sydney case:

- **Backing of political leadership:** “Sustainable Sydney 2030” has been initiated by the Lord Mayor who is strongly committed to the environmental strategy and the city’s councillors are bound to actions they are directly responsible for. What is more, other capital cities in Australia (e.g. Canberra or Melbourne) pursue similar plans to Sydney, creating a competitive environment. Finally, the carbon-neutrality target is in line with the targets of the major opposition party at the national level. Thus, the climate targets are well established and are unlikely to be abandoned.
- **Strong public support by citizens and businesses:** In fact, citizens have even called for a further strengthening of the already ambitious targets in focus groups conducted by the city

administration as part of the community engagement strategy. Nonetheless, to ensure that public support remains high, citizens and other stakeholders are regularly involved in further developing the strategic plan, similar to the participation processes in the preparation phase of “Sustainable Sydney 2030”.

- **Short-term policies are directly connected to the long-term framework:** The “Sustainable Sydney 2030” strategic plan has all measures in place to allow for an effective implementation. It does include specific measures and projects to achieve its targets, progress is closely monitored through a wide range of metrics and the framework is regularly reviewed to address shortcomings.
- **Climate policies are mainstreamed in other policy sectors:** The strategic plan does not only focus on emission reductions, but includes targets regarding the modal split, renewable energy, and green areas in the city, which contribute to climate protection and/or adaptation in multiple sectors of local government.
- **Targets are adjusted in the light of new developments:** The long-term emission reduction target in “Sustainable Sydney 2030” (net zero emissions by 2050) has been adjusted recently with regard to the Paris goals, which the city is quite often referring to. Also the 70 percent reduction in 2006 GHG emissions levels by 2030 is more ambitious than emission reduction targets of countries considered to be frontrunners.

Similar to the situation in other cities, the 2050 target is not enshrined in any legislative act, but only in “Sustainable Sydney 2030”, the strategic plan of the city. The following constitutes the key **limitation** of Sydney’s climate governance framework:

- The **administration’s scope of action is rather limited**, if compared to other municipalities worldwide. This constitutes a weakness, as the city heavily relies on activities by other actors to achieve net carbon-neutrality. Engaging with stakeholders and citizens, advocacy coalitions and building of business cases, as well as the use of information and studies to trigger change are therefore core features of the city’s strategy.

All in all, adopting the 2050 net zero target has made a great difference in the public debate. While earlier discussions focused on energy efficiency, today the approach is more holistic. The 2050 target underlines the fact that there is no longer-term perspective for fossil energy sources and that capital flows need to be directed elsewhere. As there is no national target post-2030, Sydney hopes to influence national policies and businesses from the bottom-up.

5 References

- Abgeordnetenhaus Berlin, 2017. Berliner Energie und Klimaschutzprogramm 2030, Umsetzungszeitraum 2017 bis 2021. Vorlage – zur Beschlussfassung – Drucksache 18/0423 [WWW Document]. URL https://www.berlin.de/senuvk/klimaschutz/bek_berlin/download/BEK_2030_Drucksache_18-0423.pdf (accessed 9.11.17).
- Amt für Statistik Berlin-Brandenburg, 2017a. Bevölkerungsstand, Lange Reihen. [WWW Document]. URL <https://www.statistik-berlin-brandenburg.de/statistiken/langereihen.asp?Ptyp=450&Sageb=12015&creg=BBB&anzwer=6> (accessed 10.11.17).
- Amt für Statistik Berlin-Brandenburg, 2017b. Volkswirtschaftliche Gesamtrechnungen, Lange Reihen. [WWW Document]. URL <https://www.statistik-berlin-brandenburg.de/statistiken/langereihen1.asp?Ptyp=450&Sageb=82000&creg=BBB&anzwer=7> (accessed 10.11.17).
- Amt für Statistik Berlin-Brandenburg, 2017c. Statistischer Bericht E IV 4 – j / 14. Energie- und CO₂-Bilanz in Berlin 2014. [WWW Document]. URL https://www.statistik-berlin-brandenburg.de/publikationen/stat_berichte/2017/SB_E04-04-00_2014j01_BE.pdf (accessed 10.11.17).
- BBC News, 2017. Tough new climate targets proposed for Scotland [WWW Document]. URL <http://www.bbc.com/news/uk-scotland-scotland-politics-39346335> (accessed 11.3.17).
- Berlin Online, 2017. Schulden des Landes Berlin: Stetiger Abbau für eine solide Zukunft. [WWW Document]. URL <https://www.berlin.de/sen/finanzen/haushalt/haushaltsueberwachung/schuldentilgung/artikel.475316.php> (accessed 9.11.17).
- BMUB, 2017. Climate Action in Figures Facts, Trends and Incentives for German Climate Policy 2017 edition. Berlin.
- BMUB, 2016. Climate Action Plan 2050. Principles and goals of the German government's climate policy. Berlin.
- BMW, 2010. Das Energiekonzept - Beschluss des Bundeskabinetts vom 28. September 2010 32.
- Bollag, S., 2017. State Assembly GOP leader steps down over pressure on climate vote. Dly. J.
- CALCDA, 2015. Climate Action and Low Carbon Development Act 2015. Dublin.
- California Air Resources Board, 2017. Low Carbon Fuel Standard. Sacramento.
- California Air Resources Board, 2008. Climate Change Scoping Plan: a framework for change. Sacramento.
- California Air Resources Board, Gouvernement du Quebec, 2013. Agreement between the California Air Resource Board and the Gouvernement Du Quebec.
- Carbonn, 2015. Adaptation and Mitigation to Climate Change Plan for Bogotá (Bogota Climate Action Plan). [WWW Document]. URL [http://carbonn.org/uploads/tx_carbonndata/Brief \[Ingles\] - Plan Distrital de Adaptación y Mitigación al Cambio Climático 19.10.pdf](http://carbonn.org/uploads/tx_carbonndata/Brief%20Plan%20Distrital%20de%20Adaptaci3n%20y%20Mitigaci3n%20al%20Cambio%20Clim3tico%2019.10.pdf) (accessed 10.13.17).
- Carter, N., Childs, M., 2017. Friends of the Earth as a policy entrepreneur: 'The Big Ask' campaign for a UK Climate Change Act. Environ. Polit. 1–20. <https://doi.org/10.1080/09644016.2017.1368151>
- CCAC, 2017. Periodic Review Report 2017. Dublin.
- CDP, 2015. City of Sydney. Data provided for the CDP Cities 2015 Report.
- CGDD, 2011. Troisième rapport annuel au Parlement sur la mise en œuvre des engagements du Grenelle Environnement.
- City and County of Denver, 2017a. City and County of Denver 2017 80x50 Climate Goal – A Stakeholder Report, 80x50 Stakeholder Vision. [WWW Document]. URL [https://www.denvergov.org/content/dam/denvergov/Portals/771/images/EQ/80x50/80x50 Stakeholder Vision.jpg](https://www.denvergov.org/content/dam/denvergov/Portals/771/images/EQ/80x50/80x50%20Stakeholder%20Vision.jpg) (accessed 10.20.17).

- City and County of Denver, 2017b. City and County of Denver 2017 80x50 Climate Goal – A Stakeholder Report, Targets [WWW Document]. URL https://www.denvergov.org/content/dam/denvergov/Portals/771/images/EQ/80x50/80x50_Targets.jpg (accessed 10.20.17).
- City and County of Denver, 2015. City and County of Denver Climate Action Plan 2015. [WWW Document]. URL <https://www.denvergov.org/content/dam/denvergov/Portals/771/documents/EQ/Climate1/CAP - FINAL WEB.pdf> (accessed 9.14.17).
- City and County of Denver, 2014. City and County of Denver Climate Adaptation Plan [WWW Document]. URL https://www.denvergov.org/content/dam/denvergov/Portals/771/documents/EQ/Climate1/Climate_Adaptation_Final with letter.pdf (accessed 9.14.17).
- City of Sydney, 2017a. Environmental Action 2016–2021. Strategy and Action Plan. [WWW Document].
- City of Sydney, 2017b. Sustainable Sydney 2030. Community Strategic Plan. [WWW Document]. URL http://www.cityofsydney.nsw.gov.au/__data/assets/pdf_file/0011/288173/2017-362949-Adopted-Sustainable-Sydney-2030_Accessible-Version.pdf (accessed 9.11.17).
- City of Sydney, 2016. Total Greenhouse Gas emissions – City of Sydney. [WWW Document]. URL <http://data.cityofsydney.nsw.gov.au/dataset/cadfsasda> (accessed 10.11.17).
- Climate Change (Scotland) Act, 2009. Climate Change (Scotland) Act 2009.
- Clingendael, 2017. Reflection on Rutte III Coalition Agreement.
- Committee on Climate Change, 2017. CCC delivers advice to Scottish Government on new Climate Change Bill [WWW Document]. URL <https://www.theccc.org.uk/2017/03/22/ccc-delivers-advice-to-scottish-government-on-new-climate-change-bill/> (accessed 11.8.17).
- Curtin, J., Hanrahan, G., 2012. Why Legislate? Designing a Climate Law for Ireland. Institute of International and European Affairs, Dublin.
- DCCAE, 2017a. Minister Denis Naughten publishes Ireland’s first statutory National Mitigation Plan.
- DCCAE, 2017b. National Mitigation Plan. Dublin.
- DCCAE, 2014. Climate Action and Low Carbon Development National Policy Position Ireland.
- DCENR, 2015. Ireland’s Transition to a Low Carbon Energy Future 2015-2030, White Paper. Dublin.
- DCENR, 2014. Green Paper on Energy Policy in Ireland. Dublin.
- EESI, 2017. California vs. the EPA: A Potential Policy Standoff [WWW Document]. URL <http://www.eesi.org/articles/view/california-vs.-the-epa-a-potential-policy-standoff> (accessed 11.1.17).
- Energy Information Administration, 2017a. Rankings: Total Energy Consumed per Capita, 2015 [WWW Document]. URL <https://www.eia.gov/state/rankings/> (accessed 11.3.17).
- Energy Information Administration, 2017b. California - State Energy Profile Overview [WWW Document]. URL <https://www.eia.gov/state/?sid=CA> (accessed 11.3.17).
- EPA-Ireland, 2017a. Irelands Greenhouse Gas Emissions Data and Charts 2015. Johnstown Castle Estate, County Wexford, Ireland.
- EPA-Ireland, 2017b. Irelands Greenhouse Gas Emissions Data and Charts 2015. Johnstown Castle Estate, County Wexford, Ireland.
- Erica Gies, 2011. California Becoming World’s Second Largest Carbon Market. Forbes.
- European Union, 2009. Decision No 406/2009/EC of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community’s greenhouse gas emission reduction commitments up to 2020. Brussels.
- Eurostat, 2017a. Greenhouse gas emissions by source sector (source: EEA) (env_air_gge) [WWW Document]. URL http://ec.europa.eu/eurostat/cache/metadata/EN/env_air_gge_esms.htm (accessed 11.6.17).

- Eurostat, 2017b. Greenhouse gas emissions per capita. Tonnes of CO₂ equivalent per capita. Code: t2020_rd300.
- Eza! – Energie- und Umweltzentrum Allgäu, 2011. 2020. Integriertes Klimaschutzkonzept für die Stadt Kempten. [WWW Document].
- Faas, T., Huesmann, D.C., 2017. Bürgerbeteiligung zum Klimaschutzplan 2050. Ergebnisse der Evaluation. Bertelsmann Stiftung, Gütersloh.
- FoE-Ireland, 2007. Climate Protection Bill 2007. Dublin.
- Friends of the Earth, 2017. Scottish Government Urged To Act On Climate Emergency (Press release) [WWW Document]. Common Dreams. URL <https://www.commondreams.org/news-wire/2017/10/13/scottish-government-urged-act-climate-emergency> (accessed 11.3.17).
- Global Chance, 2003. Débat énergie une autre politique est possible (Les cahiers de Global Chance No. N°17).
- Government Offices of Sweden, 2017. Riksdag passes historic climate policy framework [WWW Document]. Regeringskansliet. URL <http://www.government.se/press-releases/2017/06/riksdag-passes-historic-climate-policy-framework/> (accessed 11.1.17).
- Greenprint Denver Advisory Council, 2007. City of Denver Climate Action Plan [WWW Document]. URL https://www.denvergov.org/content/dam/denvergov/Portals/771/documents/EQ/Climate1/DenverClimateActionPlan_2005_Original.pdf (accessed 9.14.17).
- Guillet, J.-J., de Rugy, F., 2016. Rapport d'information sur la mise en œuvre des conclusions du rapport d'information (n°1951) du 15 mai 2014 sur le paquet « énergie-climat ». Assemblée Nationale.
- HM Government, 2017. The Clean Growth Strategy. Leading the way to a low carbon future. [WWW Document]. URL https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/651916/BEIS_The_Clean_Growth_online_12.10.17.pdf (accessed 11.3.17).
- HM Government, 2011. The Carbon Plan: Delivering our low carbon future [WWW Document]. URL https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/47613/3702-the-carbon-plan-delivering-our-low-carbon-future.pdf (accessed 11.3.17).
- HM Government, 2009. The UK Low Carbon Transition Plan National strategy for climate and energy [WWW Document]. URL https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/228752/9780108508394.pdf (accessed 11.3.17).
- Horseman, 2017. How Assembly GOP Leader Chad Mayes became Benedict Arnold to many California conservatives. Press Enterp.
- Hsia-Kiung, K., Reyna, E., O'Connor, T., 2014. Carbon Market California: a Comprehensive Analysis of the Golden State's Cap and Trade Program. Year one: 2012–2013. Environment Defense Fund, New York.
- IEA, 2017. Energy Policies of IEA Countries: France 2016 Review.
- Jacob, K., Kannen, H., 2015. Integrated Strategies for Climate Policy Integration and Coherence: the Case of Germany. Berlin.
- Kemp-Benedict, E., Holz, C., Baer, P., Athanaisou, T., Kartha, S., 2017. The Climate Equity Reference Calculator. Climate Equity Reference Project (EcoEquity and Stockholm Environment Institute), Berkeley and Somerville.
- Krellenberg, K., Jordán, R., Rehner, J., Schwarz, A., Infante, B., Barth, K., Pérez, A., 2014. Adaptation to climate change in megacities of Latin America. Regional Learning Network of the research project ClimateAdaptationSantiago (CAS).
- Marx, J., 2017. Death spiral': Ousted GOP leader warns the Trump model won't work in liberal California.
- McGee, H., 2015. Long-delayed climate change Bill published to mixed reaction. Promises a low carbon economy by 2050 without binding targets for emissions. Ir. Times.

- Meyer-Ohlendorf, N., Bodle, R., Duwe, M., Görlach, B., 2017. EU Climate Policies after 2020: Robust Review and Ratcheting Up Targets.
- Murray, J., 2017. Michael Hancock quietly raises \$77,000 to run for 3rd term as Denver mayor. *Denver Post*.
- NAEI, 2017. Report: Greenhouse Gas Inventories for England, Scotland, Wales & Northern Ireland: 1990-2015. National Atmospheric Emissions Inventory (UK).
- National Records of Scotland, 2015. Scotland's Population at its Highest Ever [WWW Document]. URL <https://www.nrscotland.gov.uk/news/2015/scotlands-population-at-its-highest-ever>
- O'Faolain, A., 2017. Government's plan to combat climate change flawed, High Court told. *Ir. Times*.
- Office of Sustainability, 2016a. 2020 Sustainability Goals [WWW Document]. URL https://www.denvergov.org/content/dam/denvergov/Portals/779/documents/2020_Sustainability_Goals_Handout_02_2017_Final.pdf (accessed 9.14.17).
- Office of Sustainability, 2016b. 2020 Goal Progress.
- Official Statistics Publication for Scotland, 2017. Scottish Greenhouse Gas Emissions 2015 [WWW Document]. URL <http://www.gov.scot/Resource/0052/00520839.pdf> (accessed 11.3.17).
- Prognos, 2017. Evaluierung der Stakeholder-Beteiligung an der Erstellung des Klimaschutzplans 2050. Abschlussbericht. Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (BMUB).
- Rucht, P.D.D., 2016. Der Beteiligungsprozess am Klimaschutzplan 2050. Analyse und Bewertung (Greenpeace). Greenpeace, Hamburg.
- Rüdinger, A., 2015. The French Energy Transition Law for Green Growth: At the limits of governance by objectives. IDDRI.
- Sargent, N., 2017. Citizens' Assembly to start a 'new national dialogue' on climate change [WWW Document]. *Green News*. URL <https://greennews.ie/citizens-assembly-start-new-national-dialogue-climate-change/> (accessed 9.13.17).
- Sartor, O., Donat, L., Duwe, M., Umpfenbach, K., 2017. Developing 2050 decarbonization strategies in the EU: Insights on good practice from national experiences. IDDRI.
- Schreurs, M.A., 2008. From the Bottom Up: Local and Subnational Climate Change Politics. *J. Environ. Dev.* 17, 343–355. <https://doi.org/10.1177/1070496508326432>
- SCIAF, 2017. Scotland's New Climate Change Bill [WWW Document]. URL https://www.sciaf.org.uk/assets/000/000/207/SCIAF_-_Scotland%27s_New_Climate_Change_Bill_original.pdf?1503913328 (accessed 11.8.17).
- Scottish Government, 2017a. Scotland's Action on Climate Change [WWW Document]. URL <http://www.gov.scot/Topics/Environment/climatechange> (accessed 11.3.17).
- Scottish Government, 2017b. Proposals for a new Climate Change Bill. Strategic Environmental Assessment. Environmental Report. [WWW Document]. URL <http://www.gov.scot/Resource/0052/00522395.pdf> (accessed 11.3.17).
- Scottish Government, 2016. New Climate Change Plan [WWW Document]. URL <http://www.gov.scot/Topics/Environment/climatechange/climate-change-plan> (accessed 11.3.17).
- Secretaría Distrital de Ambiente Bogotá, D.C - IDIGER, 2017. Plan Distrital de Gestión de Riesgos y Cambio Climático para Bogotá D.C., 2015-2050, Documento Técnico de Soporte. Secretaría Distrital de Ambiente Bogotá, D.C./ Instituto Distrital de Gestión de Riesgos y Cambio Climático.
- SEMARNAT-INECC, 2016. Mexico's Climate Change Mid-Century Strategy. Ministry of Environment and Natural Resources (SEMARNAT) and National Institute of Ecology and Climate Change (INECC).

- Senate Department for the Environment Transport and Climate Protection. Special Division for Climate Protection, 2017. Climate protection in Berlin. [WWW Document]. URL https://www.berlin.de/senuvk/klimaschutz/publikationen/download/Flyer_Klimaschutz_2017_en.pdf (accessed 9.11.17).
- Senate Department for Urban Development and the Environment, 2016. Climate-Neutral Berlin 2050. Recommendations for a Berlin Energy and Climate Protection Programme (BEK) [WWW Document]. URL http://www.berlin.de/senuvk/klimaschutz/bek_berlin/download/Broschuere_BEK_EN.pdf (accessed 9.11.17).
- Senate Department for Urban Development and the Environment, 2014. Climate-Neutral Berlin 2050 Results of a Feasibility Study [WWW Document]. URL http://www.berlin.de/senuvk/klimaschutz/studie_%0Aklimateutrales_berlin/download/Machbarkeitsstudie_Berlin2050_EN.pdf%0A (accessed 9.11.17).
- Senatsverwaltung für Umwelt Verkehr und Klimaschutz, 2017a. Energiewendegesetz. Klimaneutral bis 2050. [WWW Document]. URL <https://www.berlin.de/senuvk/klimaschutz/energiewendegesetz/de/klimaneutral2050.shtml> (accessed 9.11.17).
- Senatsverwaltung für Umwelt Verkehr und Klimaschutz, 2017b. Klimaschutzrat Berlin [WWW Document]. URL <https://www.berlin.de/senuvk/klimaschutz/klimaschutzrat/index.shtml> (accessed 10.30.17).
- Stadt Kempten, 2017. Klimaschutzbeirat [WWW Document]. URL <http://www.kempten.de/de/klimaschutz-energieteam.php> (accessed 9.7.17).
- Stadt Kempten, 2013. Masterplan 100% Klimaschutz bis 2050. Masterplankonzept der Stadt Kempten (Allgäu). [WWW Document]. URL <http://www.kempten.de/de/media/masterplankonzept-klimaschutz2050-kempten1213.pdf> (accessed 9.7.17).
- Stadtrat Kempten, 2015. Beschluss: „Klima, Umwelt, Mobilität – nachhaltig planen und handeln. Die Stadt Kempten ist Vorzeigestadt im Klimaschutz. [WWW Document]. URL https://www.kempten.de/de/media/Beschluss_-_Klima_Umwelt_Mobilitaet.pdf (accessed 9.7.17).
- State of California, 2017. Assembly Bill No. 398.
- State of California, 2016. Senate Bill No. 32.
- State of California, 2015. Executive Order B-30-15.
- State of California, 2006. Assembly Bill No. 32, Global Warming Solutions Act of 2006.
- State of California, 2005. Executive Order S-3-05.
- Swedish Environmental Protection Agency, 2017. National Inventory Report Sweden 2017. Greenhouse Gas Emission Inventories 1990- 2015.
- Taylor, L., 2014. Carbon tax repealed: a short timeline of Australia's long debate about emissions trading. *The Guardian*.
- The Scottish Parliament, 2017a. Major Devolved Powers 1999-2012 [WWW Document]. URL <http://www.parliament.scot/PublicInformationdocuments/ListDevolvedPowers0817.pdf> (accessed 11.3.17).
- The Scottish Parliament, 2017b. What are the powers of the Scottish Parliament? [WWW Document]. URL <http://www.parliament.scot/visitandlearn/12506.aspx> (accessed 11.3.17).
- The World Bank, 2017. GDP ranking - World Development Indicators [WWW Document]. URL <https://data.worldbank.org/data-catalog/GDP-ranking-table> (accessed 11.6.17).
- Torney, D., 2017. If at first you don't succeed: the development of climate change legislation in Ireland. *Ir. Polit. Stud.* 32, 247–267. <https://doi.org/10.1080/07907184.2017.1299134>
- UK Committee on Climate Change, 2017a. Meeting Carbon Budgets: Closing the Policy Gap. 2017 Report to Parliament.
- UK Committee on Climate Change, 2017b. Reducing emissions in Scotland, 2017 Progress Report to Parliament.

- Virlouvet, G., 2015. Vingt ans de lutte contre le réchauffement climatique en France : bilan et perspectives des politiques publiques. Avis du Conseil Economique Social et Environnemental.
- Wettengel, J., 2016. Germany's trimmed-down Climate Action Plan [WWW Document]. Clean Energy Wire Factsheet. URL <https://www.cleanenergywire.org/factsheets/germanys-trimmed-down-climate-action-plan> (accessed 11.7.17).
- World Resources Institute, 2017. CAIT Climate Data Explorer [WWW Document]. URL <http://cait.wri.org> (accessed 11.3.17).
- World Resources Institute, 2014. Climate Analysis Indicators Tool (CAIT) Version 2.0 [WWW Document]. URL <http://cait2.wri.org/>
- WWF Norway, 2017. Oil producing Norway gets a climate law [WWW Document]. URL <https://www.wwf.no/?53785/Oil-producing-Norway-gets-a-climate-law> (accessed 11.6.17).