

REPORT

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May 2012
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EUROPE'S NEXT ECONOMY

THE BENEFITS OF AND BARRIERS TO
THE LOW-CARBON TRANSITION



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ACKNOWLEDGMENTS

IPPR is grateful to the Foreign and Commonwealth Office for their generous support of this project. The views contained in this report are those of IPPR alone and do not constitute government policy. Similarly the recommendations are the views of the authors.

The authors would like to thank Phil Reed, Alesha de Freitas and Leah Gray at the Foreign and Commonwealth Office for their help and support with the project. Joss Garman of Greenpeace and Michael Jacobs from University College London and the London School of Economics read early drafts and gave excellent feedback which has greatly helped to strengthen the report. IPPR colleagues Nick Pearce and Tony Dolphin provided invaluable advice on policy and drafting.

In each of the European countries in which we conducted roundtables, we are grateful to everyone who attended the events and provided their expert advice and insights. In particular, we would like to thank Susanne Droege, Sybille Acosta and Philipp Richter at Stiftung Wissenschaft und Politik in Berlin; Olivier Ferrand, Romain Prudent and Alice Bonnet at Terra Nova in Paris; Carmen De Paz and Gustavo Nombela at Fundacion Ideas in Madrid; and Jacek Kucharczyk and Izabela Przybysz at Instytut Spraw Publicznych in Warsaw. Although this report draws heavily on the views heard at the roundtable discussions, the opinions expressed are solely those of the authors unless otherwise stated.

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EXECUTIVE SUMMARY

The UN talks in Durban last December signalled real progress by climate negotiators in agreeing a global deal to reduce carbon emissions. The European Union (EU) and its commissioner for climate action, Connie Hedegaard, were at the forefront of the negotiations as participating countries created the first timetable for agreeing to binding carbon targets. Europe's ambitious commitment – to reduce further its greenhouse gas (GHG) emissions from 20 to 30 per cent below 1990 levels by 2020 if other countries agree to their own targets – was fundamental to this leadership.

Through its Kyoto commitments, array of regulations and flagship cap-and-trade emissions trading scheme (ETS), Europe has long led the development of global climate policy. European businesses have, therefore, been among the first in the world to adapt and respond to these new requirements. Their reaction and the prospect of future regulations, however, has been mixed.

Some businesses, particularly those from energy-intensive industries, view low-carbon transition as a threat to their business models, which imposes costs with little payback and creates new competitive pressures. For other businesses, particularly innovators in the energy and transport sectors, the low-carbon transition and Europe's leadership creates new markets for their goods and services and allows them to develop comparative advantages. Yet others, for example suppliers to the green energy and transport sectors, see increases in both production costs and demand for their products.

This report examines the competing views of businesses across Europe. With partner thinktanks in France, Germany, Spain and Poland, the Institute for Public Policy Research (IPPR) brought together businesses and industry associations to discuss these issues. This process complemented four roundtable discussions and a series of one-on-one interviews with British businesses captured in the sister publication to this report, *Growing pains: British industry and the low-carbon transition* (Nash et al 2012).

The businesses in each country are, unsurprisingly, characterised by their own domestic concerns. In France, the presidential election and economic crisis have stimulated renewed debate about protecting domestic industries from global competition. Uncertainty around energy supply, particularly over the country's future reliance on nuclear power, which currently provides over 75 per cent of France's energy, is a growing concern. In Germany, the recent government decision to cease production of all nuclear power by 2050 in light of the Fukushima disaster has heightened concerns about rising energy costs. In Spain, the effects of the eurozone crisis and the resulting austerity measures have hampered climate change policy, not least by reducing feed-in tariff (FIT) levels, which has also occurred in France, Poland and the UK. In Poland, the dominance of coal, which is responsible for 90 per cent of the electricity supply, makes agreement on reducing emissions economically and politically difficult. Indeed, it was the only country at the March EU council of environment ministers meeting to veto the commission's 2050 'roadmap' proposals, which included stretching interim emissions targets. In the UK, concerns about rising energy prices, and a debate about the causes, have dominated policy debates.

However our research also shows that, even with these national differences in mind, the debates about climate change and the level of the EU's ambition are similar throughout the continent. Indeed, in every country there is a dichotomy between those businesses set to benefit from the low-carbon transition and those that believe they will lose out.

Many businesses, particularly those in energy-intensive industries such as steel and cement, complain that the high costs of European regulations will force them to move their facilities to countries that have less onerous regulations or face losing out to businesses from those regions. They believe that if this ‘carbon leakage’ takes place it will do little to reduce overall emissions, since production would simply take place somewhere else. Indeed, they point out that since the EU is only responsible for 11 per cent of emissions it can do little to address climate change by taking unilateral action. Other businesses are concerned that the ‘carbon price’ of EU ETS allowances, known as EUAs, has dropped too low to provide incentives for research and development (R&D) or investment in new technology and is failing to reduce emissions at a sufficient rate. These latter groups have called for measures to create a carbon floor price and to reduce volatility in the market.

While some issues, like the cost of carbon or climate regulations, spark a substantial debate, other issues unite businesses. Across Europe there is consensus that the EU and its member states could do more to provide regulatory certainty for businesses by avoiding the plethora of overlapping regulations and sudden policy changes like those in many countries on FITs. Businesses across the region noted that several supply-side constraints are thwarting the transition to a low-carbon economy, including a workforce that is unable to undertake the necessary tasks, inadequate financing (especially in the demonstration stage for new technologies) and a need for infrastructure improvements.

Businesses in certain sectors are keen to outline how their industry can create jobs and growth if these barriers can be overcome. Energy sector companies expressed optimism about investment opportunities in clean energy, a global market now worth £263 billion, of which Europe contributes 35 per cent. Offshore wind, biomass, and carbon capture and storage were all mentioned across Europe as technologies in which the continent could develop a comparative advantage, but there were concerns that member states’ innovation strategies were not properly coordinated and that funding was being reduced. Fast-growing countries, like China and India, are feared not just for placing competitive pressure on existing processes and production techniques, but also for winning the race to develop new technologies – last year for the first time, India invested more in clean energy than the UK, while China is second only to the US.

New jobs in energy efficiency are expected as demand for energy is reduced. That said, there was fierce debate, especially in Germany, about whether regulatory proposals from the EU were too complex. In the transport sector, demand for electric vehicles is increasing, and hydrogen fuel cell vehicles are being trialled although they are not yet commercially available. Europe is well placed to develop comparative advantages in both these sectors but there was concern that development of the necessary infrastructure, including charging points for electric vehicles, was not forthcoming.

Some of these issues are easier to address than others. For example, it is logical for the EU and its member states to provide greater regulatory certainty for businesses and to maximise the EU’s role as a standard setter, which has the potential to help create markets in new low-carbon goods and services.

Other issues, however, are more controversial. Although it is likely to be unpopular with other sectors and budget holders, the EU must move its resources away from the Common Agriculture Policy and structural funds and towards innovation in new low-carbon technologies as it negotiates the next seven-year budget. It should do what it can to ensure that revenues collected domestically from the EU ETS are used solely for

low-carbon projects. As well as helping the transition, this will help enhance the reputation of green policies as supporting efforts to reduce climate change, rather than as revenue raising devices.

Another contentious issue is how to resolve the demands of businesses in different sectors. At first glance there appears to be a polarisation between the views of energy-intensive and low-carbon businesses. Indeed, many policymakers are currently asking whether taking a lead on emissions reduction is compatible with a competitive economy. Although reducing emissions and promoting growth go hand in hand, there are certainly both winners and losers.

The starting point is that, at the aggregate level, Europe will benefit from taking the lead in the low-carbon transition. As long as a global emissions reduction agreement is reached in 2015, being ahead of the curve is good for Europe's economy. The International Energy Agency has shown that every delayed \$1 of investment in the energy sector will cost an additional \$4.3 after 2020. The European Commission's own analysis shows that the benefits of moving to a more ambitious emissions reduction target outweigh the costs. But uncertainty around the low cost of carbon is undermining investment decisions. In order to provide greater certainty for low-carbon innovators and investors, we advocate the creation of a central carbon bank in Europe that would have the sole remit of ensuring that emissions reduction targets are being met by intervening in the market to hold back ETS allowances if the price is too low, and issue allowances if prices rose too high.

In addition to helping potential winners, more should be done to mitigate the impact of the low-carbon transition on potential losers. The sister paper to this report, *Growing pains*, outlines how to achieve this in the UK, including a green deal for small energy-intensive manufacturers. Care must be taken, however, to distinguish between the Schumpeterian process of 'creative destruction' as new low-carbon technologies replace old polluting ones, and genuine grievances about competitive pressures caused by undercutting from other global regions that do not have the same regulations. There is scant evidence that carbon leakage is currently taking place, particularly since energy-intensive industries have had a significant number of free ETS allowances. Other cost pressures on businesses, including differing labour costs and a whole range of other administrative and regulatory compliance costs (of which environmental regulations are only a small part), are far more likely to explain existing offshoring decisions. Yet there is little doubt that widening the gap between Europe's carbon reduction ambitions and those of other regions could produce carbon leakage.

Therefore IPPR concludes that creating a level playing field for goods sold in the European market, regardless of origin, is preferable to a lower level of EU ambition, which could jeopardise global negotiations. As such, we endorse the investigation of how World Trade Organization (WTO)-compliant border levelling mechanisms for energy-intensive sectors could be introduced in the absence of a global deal. Such measures could include extending the EU ETS to compel importers of energy-intensive goods such as cement, aluminium, steel, paper and pulp, and chemicals to purchase ETS allowances equivalent to the best available technology. It would be important to make sure that this was perceived explicitly as a carbon reduction measure rather than as a protectionist measure.

Policymakers should see this process as providing a level playing field for European businesses in the event that a global emission reduction agreement or ambitious

global sectoral targets fail to materialise. It would also provide an incentive to reach these agreements, since the EU ETS extension would only take place in their absence. Policymakers should remain focused on the goal of agreeing binding emissions reduction targets to 2020 by 2015. This alone would do the most to ensure that the low-carbon transition maximises benefits and minimises costs for European businesses – something on which all businesses, and indeed citizens, around Europe can agree.

1. INTRODUCTION

The EU has, over the last two decades, sought to establish itself as a global leader on climate change, acknowledging the need to act quickly to reduce GHG emissions in order to avoid catastrophic rises in global temperatures. It supports the Intergovernmental Panel on Climate Change's objective of keeping any rise in the Earth's average temperature below 2°C. Higher temperature rises will jeopardise human life and many other animals and ecosystems (IPCC 2007, European Commission 2011a).

The EU's strategy on climate change has been a 'soft' leadership approach: to lead by example. It has continually pushed for a legally binding global climate agreement that would require all industrialised and major emerging economies to adhere to ambitious emission reduction commitments, and has adopted the highest emission reduction targets among the main industrialised nations.

During the 1997 Kyoto Protocol negotiations, the EU's leadership was evident in its commitment to reduce GHG emissions during 2008–2012 by 8 per cent relative to 1990 levels. As table 1.1 shows, by 2009, the total GHG emissions of the 15 member states that formed the EU at the time of Kyoto fell by 12.7 per cent relative to 1990 levels (the emissions of all 27 member states fell by 17.4 per cent), although emissions rose slightly in 2010 as Europe emerged out of the recession (EEA 2011). In contrast, other industrialised countries, such as Canada and Japan, only committed to a reduction of 6 per cent and have made far less progress towards reaching this target. Canada has since withdrawn from Kyoto to avoid fines, as it was apparent it would miss its target.¹ The US failed to ratify Kyoto but has since taken on a 'voluntary' target to cut emissions by 17 per cent in 2020 against 2005 levels pending ratification by Congress, which equates to a 7.2 per cent reduction against 1990 levels (UNFCCC 2011a).

Table 1.1
Kyoto emissions targets
by country

Nations	Kyoto target (%)	Emissions, '90–'09 (%)
EU-15*	-8	-12.7
EU-27**	None	-17.4
US***	-7	7.2
Japan	-6	-4.5
Canada	-6	17
Russia	0	-36.8
Ukraine	0	-59.9
Australia	8	30.4
New Zealand	0	19.4
Norway	1	3.1
Switzerland	-8	-2.2
Iceland	10	35.1
Croatia	-5	-8.2

Source: UNFCCC (2011b)

* EU-15 countries collectively agreed to a target of 8%.

** EU-27 includes countries with Kyoto targets and those without.

*** US failed to ratify Kyoto but was still assigned a target.

¹ <http://www.bbc.co.uk/news/world-us-canada-16165033>

Recent global emissions trends have been concerning. While global emissions decreased by 1 per cent in 2009 as a result of the global financial crisis, they increased by 5 per cent in 2010. This increase is primarily due to rising emissions produced in emerging and developing economies, which have increased from around one-third of global emissions to more than one-half over the last two decades. Emissions from China have doubled since 2003, and India has generated a 60 per cent increase over the same time period. Today, China is the world's biggest emitter of carbon dioxide in volume terms – responsible for 9 billion tonnes of CO₂ in 2010. Although per capita emissions are still less than one-half of US emissions, it is estimated that if current trends continue they could match or exceed US levels by 2017 (JRC 2011).

In this context, reaching an international agreement on emissions reduction that includes all major emitters is vital. The EU has challenged the international community, stating that if an 'ambitious and comprehensive agreement' can be signed in which 'other developed countries undertake to achieve comparable emission reductions and that the economically more advanced developing countries make a contribution commensurate with their respective responsibilities and capabilities', the EU would increase its 20 per cent emissions reduction target by 2020 to 30 per cent (European Commission 2010a). After years of prevarication, other major emitters – including China, the US and India – finally signalled a willingness during the Durban talks in December 2011 to commit to legally binding targets in 2015 and implement them from 2020 onwards.²

Europe's ambition on climate change has had a number of positive benefits. In 2011, European eco-industries employed approximately 3.4 million full-time equivalents with an annual turnover of €319 billion and growth rates of 5–8 per cent. Investors have been given the confidence to invest in low-carbon technologies, particularly in the energy and transport sectors. Increases in renewable energy use have reduced reliance on imported oil and gas, while cleaner air has generated a series of health benefits (CAN-Europe 2011).

Although there are costs associated with the transition, various official and independent estimates suggest that these have been falling since the financial crisis (Zorlu et al 2011). According to the European Commission (2010a), the annual estimated aggregate costs of meeting the EU's 20 per cent target have fallen from €70 billion to €48 billion per year, partly as a result of the recession. They estimate that the cost of increasing the rate of emissions reduction to 30 per cent by 2020 is just an additional €11 billion per year. Other estimates put the cost at an even lower figure of €3.5 billion on average per year (Bloomberg New Energy Finance 2012).

Every delayed \$1 of investment in the energy sector before 2020 will cost an additional \$4.30 after that time (IEA 2011). The European Commission's latest cost-benefit analysis shows that for the EU as a whole, moving to a 25 per cent domestic reduction in 2020³ would save an average of €20 billion in fuel costs each year over the period 2016–2020 and would require an additional investment in the energy system of €18 billion annually over the same period (European Commission 2012a). This reduction could also create two million direct and indirect jobs and result in numerous additional health benefits (CAN-Europe 2011). This data suggests that if the EU is to eventually increase its GHG reduction target to 30 per cent, doing so sooner rather than later would be beneficial.

2 See http://unfccc.int/files/press/press_releases_advisories/application/pdf/pr2011.11.12cop17final.pdf

3 Equivalent to a 30 per cent reduction, assuming that a 5 per cent reduction would be met through the use of international emission reduction credits.

Some businesses have joined this call in order to ‘spur innovation and investment thus creating millions of new jobs in a low-carbon economy’ (Climate Group 2010). For them, taking a lead on climate change will allow the EU to gain a competitive advantage in new and emerging markets for low-carbon goods and services.

In the absence of binding targets, however, other businesses are concerned that the cost of the EU’s climate change policies could damage their global competitiveness. Current estimates indicate that since the EU is responsible for just 11 per cent of the world’s total carbon emissions,⁴ any carbon reduction without cooperation from other countries and regions will fail to stop average global temperatures from rising more than 2°C. Binding emissions reduction commitments from the US (which was responsible for 18 per cent of global emissions in 2009) and China (25 per cent in 2009) are critical to preventing climate change. Without such agreements, some higher emitting businesses complain that the high costs of European regulations will simply force them to move their facilities to countries with less onerous regulations or lose out to businesses from those regions – so-called carbon leakage.

This report provides a snapshot of business sentiment towards the low-carbon transition across Europe. It assesses and verifies the disparate claims of these groups and recommends ways to maximise opportunities and deal with challenges in order to minimise the number of losers. Section 2 provides a brief history of EU climate policy, including its flagship ETS. Section 3 analyses the main barriers and benefits of the low-carbon transition that were identified in a series of roundtable discussions conducted with partner thinktanks and industry associations in France, Germany, Spain and Poland. These meetings examined, in particular, the challenges facing energy-intensive industries and the opportunities presented to other sectors, including (but not limited to) the energy and transport sectors. Section 4 sets out some conclusions and policy recommendations. The annex summarises the findings of the four roundtable discussions in more detail.

⁴ See http://ec.europa.eu/ireland/about_the_eu/eu_and_climate_change/index_en.htm

2. CLIMATE CHANGE POLICY IN THE EUROPEAN UNION: A BRIEF HISTORY

The 1997 Kyoto Protocol was a watershed moment for climate change policy. Prior to this, the EU-15 had managed their GHG emissions individually and were only bound to voluntary targets, which were agreed as part of the 1992 UN Convention at the Rio Earth Summit. The Kyoto Protocol marked a significant change by introducing mandatory targets that bound member states collectively to commit to reducing emissions by 8 per cent relative to 1990 levels.

Following Kyoto, the EU began to develop a number of initiatives to reduce GHG emissions. For example, the 1997 white paper *Energy for the future: renewable energy sources*⁵ set a target of doubling the amount of renewable energy consumed by the EU from 6 per cent to 12 per cent by 2010. Other directives sought to reduce vehicle emissions, increase the energy performance of buildings and provide energy efficiencies from the combined use of heat and power generation. The centrepiece of the EU's efforts was the ETS.

Phase 1 of the ETS, launched in 2005, placed a cap on the total amount of GHGs that factories, power plants and other types of installations could emit over a specified period of time. The scheme allowed companies to trade a limited number of allowances to create a market that sets the carbon price. The European Commission argue that the cap on emissions encourages industries to find innovative, low-carbon methods of production.⁶ It is the first and most comprehensive international scheme of its kind. Phase 2, which began in 2008, expanded the scope of the scheme significantly and reduced the number of free permits. It now covers 11,000 industrial plants and power stations in 30 countries.⁷ The scheme covers roughly half of all EU GHG emissions including, since the beginning of 2012, the aviation industry.⁸

The performance of the EU ETS is controversial. Some reports indicate that it has managed to reduce the overall emissions of the companies it covers by around 8 per cent (Carbon Trust 2008a, European Commission 2010b). Others claim that the over allocation of allowances in phase I actually resulted in an emissions growth since 2005 of 1 per cent (Sandbag Climate Campaign 2010). The European Commission has sought to simplify the process and improve its transparency.⁹ Industry stakeholders in all four countries in which IPPR held roundtables addressed their concerns and ideas about the ETS. Section 4 of this report recommends ways to improve the legitimacy and efficacy of the scheme.

In 2008, the European Commission announced a new set of proposals to make Europe's economy more climate friendly and less energy intensive. The proposals sought to integrate both new and existing policies (such as the EU ETS) into its efforts to fight climate change. Known as the 20-20-20 climate change and energy package,¹⁰ the EU identified aims, by 2020, to:

- cut overall emissions by 20 per cent relative to 1990 levels
- expand the share of renewable energy in gross final consumption
- increase energy efficiency in order to reduce energy consumption by 20 per cent.

5 See http://europa.eu/legislation_summaries/energy/renewable_energy/l27035_en.htm

6 See http://ec.europa.eu/clima/policies/ets/cap/index_en.htm

7 See http://ec.europa.eu/clima/policies/ets/index_en.htm

8 This measure has proved controversial: airlines claim it will negatively affect their competitiveness, but a recent study found that the impact of the EU ETS on US airlines looked set to increase profits rather than damage them (Malina et al 2012).

9 See http://ec.europa.eu/clima/policies/ets/allocation/2008/index_en.htm

10 See http://ec.europa.eu/clima/policies/package/index_en.htm

The first of these targets has been more successful than the others. The EU-27 countries are on course to meet the 20 per cent emissions reduction target; emissions decreased by an estimated 15.5 per cent between 1990 and 2010 (EEA 2011). In addition, the EU has recently implemented the 'Effort Sharing Decision', which establishes binding GHG emission reduction targets of 10 per cent for sectors that were not included in the EU ETS for the period 2013–2020 (European Parliament and Council 2009). Member states have deployed a variety of measures to meet these targets, such as improving the energy performance of buildings, creating strategies to develop renewable heating technology, employing efficient farming practices and promoting public transport.¹¹ The level of reduction varies across member states; wealthier nations have set larger reduction targets. Some emission increases have been permitted for poorer nations.¹²

The renewables target is unlikely to be met. Eurostat estimates that in 2009, the share of EU renewable energy in gross final consumption amounted to 11.7 per cent,¹³ up from just 8.5 per cent¹⁴ in 2005. Progress in renewable energy consumption varies considerably across individual EU member states. Countries such as Austria and Portugal, which have relatively ambitious renewables targets of 34 and 31 per cent, respectively, look set to meet their targets. In 2009, they reported a share of renewables of around 29.2 per cent and 25.7 per cent, respectively. In the same year, Sweden reported a renewables share of 50.2 per cent and looks set to outperform its 49 per cent target. Other countries are not performing as well. The UK and the Netherlands, for example, reported shares of renewables of 2.9 per cent¹⁵ and 4.2 per cent, respectively, in 2009, and may struggle to meet their respective targets of 15 and 14 per cent.¹⁶

Progress is even more limited in relation to energy efficiency. The European Commission is currently delivering only half its target.¹⁷ To address this, the *Energy Efficiency Plan 2011* proposed a new energy efficiency directive that sets legally binding obligations on member states to establish energy-saving schemes (European Commission 2011b).

In early 2011, the commission published *A roadmap for moving to a competitive low-carbon economy in 2050*, which identified medium- and long-term emission reductions targets that, if legislated, could see the EU reduce emissions by 40 per cent in 2030, 60 per cent in 2040 and 80–95 per cent in 2050, relative to 1990 levels (European Commission 2011a). The roadmap envisages rapid progress in decarbonising the energy and transport sectors and improving energy efficiency. It stressed the need to increase capital investment in the low-carbon transition from both the public and private sector by €270 million annually (1.5 per cent of EU GDP) (ibid).

To probe business views of these policies and to understand other concerns facing industry across Europe relating to the low-carbon transition, IPPR convened four roundtable discussions. The next section analyses the concerns raised in these sessions.

11 See http://ec.europa.eu/clima/policies/effort/index_en.htm

12 See http://ec.europa.eu/clima/policies/effort/docs/targets2020_en.pdf

13 See http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=t2020_31

14 See http://ec.europa.eu/energy/renewables/targets_en.htm

15 Although 2010 data is not available for all countries, the UK's share of renewables rose to 3.3 per cent in 2010.

16 See http://ec.europa.eu/energy/renewables/targets_en.htm

17 A business-as-usual approach in this context would mean that member states would continue to carry out the same behaviour under current policies, as opposed to changing their behaviour under new or changed policies.

3. BARRIERS TO AND BENEFITS OF THE LOW-CARBON TRANSITION

The EU's climate change policies – outlined above – have had a profound impact on businesses in Europe. For some businesses, for example those engaged in bringing technologies to market that reduce the carbon intensity of the energy or transport sectors, the EU's targets increase demand for their goods and services. For others, particularly those from energy-intensive manufacturing sectors, the ambition is seen as a burdensome cost. To examine these views in more detail, IPPR convened roundtable discussions in four European capitals with different businesses and industry associations. We partnered:

- in France, with Terra Nova, a social democratic thinktank that produces and disseminates innovative policy proposals across France and Europe
- in Germany, with the German Institute for International and Security Affairs (Stiftung Wissenschaft und Politik), an independent thinktank that conducts scholarly research in the fields of international politics and foreign and security policy
- in Spain, with Ideas Foundation (Fundacion Ideas), a progressive thinktank affiliated with the Spanish Socialist Workers' Party that brings progressive ideas to the arena of political and social debate
- in Poland, with the Institute of Public Affairs (Instytut Spraw Publicznych), an independent thinktank that contributes to informed public debate on key Polish, European and global policy issues.

These thinktanks helped IPPR bring together participants from a range of different industries as well as politicians and academic experts. Each session gave participants the opportunity to discuss some of the challenges presented by the 20-20-20 climate change and energy package and other specific laws, the barriers to low-carbon growth that went beyond EU policies and regulation and other challenges facing their sector. Additional challenges included carbon leakage; the current low price of carbon; regulatory uncertainty; and supply-side constraints such as those relating to innovation, skills, access to finance and infrastructure. Each roundtable also examined commercial and wider economic opportunities, particularly in the energy sectors, and whether additional policies from Brussels or domestic governments were needed to help maximise the opportunities or ameliorate the costs associated with the low-carbon transition. This approach mirrored a related series of roundtable discussions conducted in the UK with support from the Engineering Employers Federation, which were summarised in *Growing pains*.

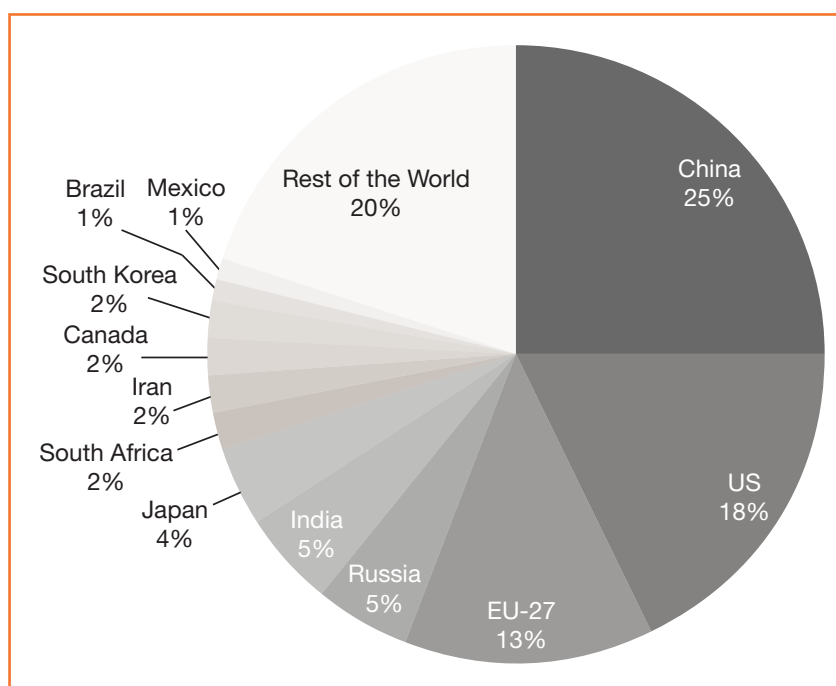
A full synopsis of each of these discussions can be found in the annex. This section summarises the barriers to, and benefits of, the low-carbon transition as outlined by the industrial stakeholders at the four roundtables. It also draws on the views of British industry representatives in the report mentioned above.

Barriers to the low-carbon transition

Underpinning discussions in every country were concerns about global competitiveness and the cost of the low-carbon transition. As figure 3.1 (over) shows, in 2009 the EU contributed just 13 per cent of global emissions.¹⁸ Many businesses felt that further ambition from the EU would do little to stop catastrophic climate change without greater contributions from other regions, notably the US and China. This view was reinforced by public consultation during the preliminary stages of the *EU energy roadmap 2050* (European Commission 2011c).

¹⁸ It fell to 11 per cent in 2010, although comprehensive figures are not yet available for other regions.

Figure 3.1
Major world emitters



Source: US Energy Information Administration 2011

The agreement at the 2011 Durban Climate Change Conference for governments to adopt a comprehensive legal agreement on emissions reductions targets by no later than 2015 has raised hopes that a global agreement may be reached.¹⁹ In the meantime, the absence of binding reduction agreements means that the world is still on course for catastrophic climate change. It also places competitive pressures on European businesses and could potentially result in carbon leakage (IEA 2008).

Carbon leakage

Many businesses consulted by IPPR mentioned that they were concerned by carbon leakage. Energy-intensive firms – such as those in the cement, aluminium, steel, pulp and paper, and chemicals sectors – believe they are most at risk from competitive pressures relating to the low-carbon transition (ibid). The EU anticipates that chemical companies will face production losses of 0.5–2.4 per cent as a result of the existing 20 per cent target and could rise to 0.9–3.5 per cent if the target increases to 30 per cent (European Commission 2010a). The steel and cement industries are also particularly vulnerable to the high costs of climate regulations (Carbon Trust 2008a, 2008b). These firms are often part of the supply chain for green technologies that produce, for example, steel or lubricants for wind turbines (CBI 2011). Therefore, the loss of these companies to jurisdictions outside the EU would harm Europe’s low-carbon transition and cost jobs and economic output.

Nonetheless, it is hard to determine whether the EU ETS and other climate policies are actually causing carbon leakage. Calculating the impact and severity of particular regional policies on carbon leakage is difficult. There are many reasons why a company may choose to move its production offshore or see its market share eroded by foreign competitors. Labour costs, profit margins, transport costs, trade intensities, demand

¹⁹ See http://unfccc.int/files/press/press_releases_advisories/application/pdf/pr2011.11.12.cop17final.pdf

growth, geographical location of plants, the type of products produced and the homogeneity of products are all important factors that may affect location decisions (Summerton 2010). Climate policies are therefore likely to be only a small component of the overall cost pressures facing European businesses.

Indeed, even when industry representatives cite the cost of the low-carbon transition as a competitive pressure, they may be using this as a proxy for high energy costs, an issue that was raised in all of the roundtable discussions. Combined gas and electricity prices in the UK have risen by 75 per cent since 2004. However the cost of renewables accounts for only 7 per cent of this increase; the bulk of the rise is due to wholesale gas prices, which have increased in line with demand, particularly from rapidly growing economies (CCC 2011).

In any case, moving production may not actually result in higher carbon emissions. Production in the EU, for example, may not always be more energy efficient than production in another region – particularly if the area's energy mix is less reliant on fossil fuels (Bosch and Kuenen 2009).

Indeed, the ETS has produced lower leakage rates than first predicted for the major energy-intensive industries (IEA 2008). The free allocation of allowances under phases I and II of the scheme, and the booming demand for commodities, has kept the risks of carbon leakage in check. One report suggests that the ETS actually benefited energy-intensive industries, since many companies still have a number of leftover allowances that they can roll over into phase III (CEO 2010).

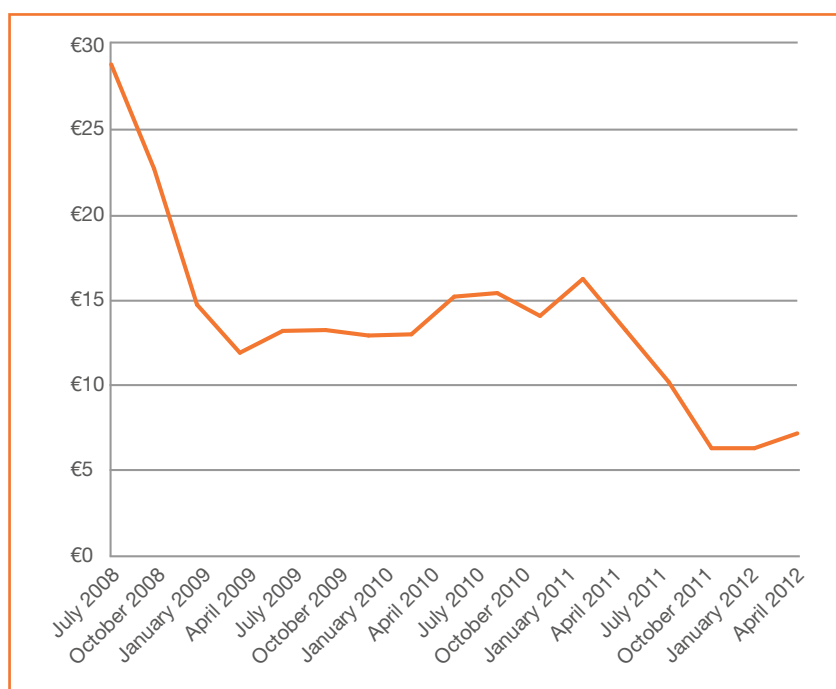
Nonetheless, technological breakthroughs in some sectors suggest that innovation can help energy-intensive firms reduce their energy intake. For example, as outlined in *Growing pains*, Novacem have created a carbon-negative form of cement (Velandia et al 2011). Should this product reach the commercial production stage, it would significantly help the cement industry curb its emissions. The technology could become a source of comparative advantage for the EU.

Given these complexities, compensating the energy-intensive sectors and using diplomatic channels to ensure that other jurisdictions commit to binding emissions reduction targets is a better approach than reducing the EU's own ambition, which could make a global agreement less likely and reduce current incentives for technological innovation. Indeed, as outlined earlier, the cost of the energy transformation is likely to be higher the longer it is delayed.

The low price of carbon

At the other end of the spectrum, several businesses that use low-carbon technologies have complained about the low price of carbon. Industry representatives in France, Germany, Spain and the UK all expressed concerns about this issue. Since July 2008, the carbon price has dropped dramatically (figure 3.2 over). The first of these falls was due to an over allocation of allowances, exacerbated by the effects of the recession, which reduced demand. The second fall may be due to the eurozone crisis, which is again reducing demand. The price of carbon as this report went to press was €6.63.

Figure 3.2
Price of carbon



Source: EcoTrade 2012

A higher price signal would increase the incentive for low-carbon innovation among businesses covered by the EU ETS, and would encourage them to look for lower carbon methods of production. In addition, more certainty in the price of carbon would provide investors with greater confidence that there will be a market for their low-carbon products. The EU recognises this issue: in December 2011 the European parliament supported plans to withdraw 1.4 billion allowances from phase III of the ETS. This change would increase the annual reduction in the supply of permits during 2013–2020 from 1.74 per cent to 2.25 per cent, and is expected to raise the price by 20 per cent. Some businesses around Europe support this move, given the response at the roundtable discussions.

It should be noted, however, that a higher carbon price is a necessary, but not sufficient, condition for greater investment in low-carbon technologies. Regulation, standards, industrial policy and subsidies to support R&D are also necessary (Acemoglu et al 2009).

Regulatory uncertainty

Representatives from businesses in most countries expressed general concerns about the overlapping, fragmented and complex array of European regulations that are often overlaid by additional domestic policies. Reductions to feed-in tariffs were discussed in France and Spain, where they have been as controversial as in the UK. In Germany, participants thought that the 20-20-20 strategy was flawed since it dictates targets on renewables and energy efficiency in addition to its overarching emissions reduction targets. The climate change levy and carbon reduction commitment were raised as examples of overlapping regulations in the UK. Ensuring that the purposes of regulations are clear and that they do not overlap is a critical part of retaining support for the low-carbon transition from businesses set to win as well as those threatened by the changes.

Supply-side constraints

Participants from every country except Poland expressed concerns about access to finance and skills. In Poland, a lack of funds for infrastructure upgrades was seen as a greater constraint. These concerns tend to be voiced by all companies, regardless of the sector; their solution requires an enabling role from government. Some businesses, particularly in Germany and France, believe that government can encourage lending or use the lower cost of capital to which it has access to leverage greater lending by banks. Some countries, including Germany, have state banks that have made a number of investments in low-carbon projects. The UK's new Green Investment Bank will start investing in 2012, and have the power to borrow from 2015–2016. A strategic investment fund was also established in France in 2009 with an initial endowment of €20 billion. Nonetheless, industry representatives suggested that these initiatives are insufficient.

Participants from each country (aside from Poland, where the issue was not raised but may still be relevant) felt that there was an inadequate supply of skilled employees. These findings are a concern and suggest problems with the education, training and immigration systems in each country. In the UK, immigration rules were cited as an impediment to attracting foreign talent. This finding is particularly troubling in the context of the changing global economy and the increasing importance that is attached to innovation from high-growth countries like China, Brazil and India (OECD 2011). However, businesses may be under-utilising the existing stock of skills in the labour market and might be able to do more to train those who are currently looking for work (Lanning and Lawton 2012). Government and industry together should identify skills gaps and future skills needs in emerging industries, such as the low-carbon sector, in which individual countries seek to develop a competitive advantage (Lent and Nash 2011).

Benefits of the low-carbon transition: innovation and comparative advantage

All but one²⁰ of the roundtables included a discussion about the potential role of the low-carbon transition in creating jobs and growth and the importance of innovation. The low-carbon and environmental goods and services sector was estimated to be worth approximately £3.2 trillion worldwide in 2009–2010, up 1.8 per cent from 2009–2010.²¹ Some sectors, including energy and transport, could significantly benefit from the transition by developing new technologies and potential comparative advantages within the EU. Examples are discussed below.

Energy

As many participants outlined, it is vital for the EU's economic recovery and future sustainability that it develops and harnesses comparative advantages in a range of technologies. Global investment in clean energy amounted to an estimated \$263 billion in 2011, a record high and a 6.5 per cent increase over 2010 – with a 44 per cent rise in investment in solar power. The EU-27 had the single largest component of this total, with \$92.6 billion in new investment, but 63 per cent came from just two countries: Germany and Italy. Meanwhile, US spending soared by 42 per cent to \$48.1 billion, while China invested a similar \$45.5 billion. India had the fastest-growing investment rate in this area – up more than half from 2010–2011 to \$10.2 billion – while Brazilian investment rose 15 per cent to \$8 billion (Pew Charitable Trusts 2012). Although these efforts are more closely related to meeting domestic energy needs and capturing export markets than reducing

20 In Poland, it was felt that most of the benefits would be accrued by rich member states.

21 See <http://www.bis.gov.uk/policies/business-sectors/low-carbon-business-opportunities/market-intelligence>.

GHG emissions, EU member states may see themselves overtaken and less able to compete in clean technology if they fail to increase their investment levels. Nonetheless, there are several areas in which Europe can flourish.

Given the EU's own renewables target, it was little surprise that renewables were a particular focus in each of the roundtables. Renewable energy is estimated to generate more jobs per dollar and more jobs per megawatt of installed power than plants that run on fossil fuels (GCN 2010). By 2030, 2.1 million people are expected to be employed in wind energy, 6.3 million in solar energy and 12 million in biofuel-related industries (UNEP 2008). Of these, offshore wind is perhaps the technology in which Europe, and particularly the UK, has a natural comparative advantage. In 2009, the European Commission proposed nine offshore wind projects with a fund of €565 million to develop them. Progress has been slow, and global investment in wind power dropped significantly (15 per cent) to \$72 billion last year (Pew Charitable Trusts 2012).

Biomass, which was raised in both the German and Polish roundtables, could provide an essential source of fuel for heating. Several member states have developed biomass national action plans, which has prompted the commission to look at ways to encourage further development.²²

Carbon capture and storage (CCS), which involves capturing CO₂ emissions and storing them underground, was mentioned at the roundtables in Germany, Poland and the UK. In 2010, the EU announced a €1 billion fund to develop six projects in Poland, Spain, Germany, Italy, the Netherlands and the UK. The projects require the participating countries to share and disseminate effective processes and technological advances in CCS (European Commission 2010c).

Progress in the development of CCS has been slow and, at times, uncertain. For example, the UK government cut the budget for demonstration projects from £3 billion to £1 billion as part of its austerity drive. More positively, the EU recently announced that €1.37 billion would be allocated from its energy infrastructure package in a bid to reconcile the under-development of CCS projects.

In addition to these supply-side opportunities, demand-side reforms can also be used to reduce energy consumption. A key example is that dramatically improving the energy efficiency of the EU's building stock would save energy, reduce costs and create jobs. Unfortunately, many member states have failed to take these opportunities seriously (European Commission 2011a). Smart metering, which provides consumers with an easy way to monitor their energy use and consumption, and the insulation of buildings has yet to be taken up adequately. There are, however, other more innovative examples available, such as the installation of special 'superwindows', which are projected to yield savings of over 40 per cent in the future (Lovins 2012).

Transport

Aside from France and the UK, transport was discussed somewhat less than expected at the European roundtables. Nonetheless, the low-carbon transition presents huge opportunities.

Electric vehicles are cheaper to fuel than fossil fuel cars, and will soon cost around the same as regular combustion engine vehicles (Lovins 2012). Hydrogen vehicles are expected to reach sales of 100,000 by 2015 and 1 million by 2020, gaining a 25 per cent

²² See http://ec.europa.eu/energy/renewables/bioenergy/bioenergy_en.htm

share of the total EU passenger car market by 2050 (McKinsey 2010). As a result of these positive trends, the EU has allocated hundreds of millions of euros to research projects.

That said, uptake of these vehicles has been very low. For example, London mayor Boris Johnson stated in 2009 that he hoped to have 100,000 electric vehicles on the roads in London as soon as possible, but only 2,313 are currently being used. A lack of electric vehicle infrastructure, including charging points, is the main reason behind the low uptake (Environment Committee 2012). Manufacturers have appealed to the EU for help in addressing this issue (Spence 2012). UK participants asserted that the private sector should be encouraged to co-invest in electric vehicle infrastructure, specifically to provide charging facilities in public places such as airport and supermarket car parks.

Biomass for transport was raised in the roundtables. Second- and third-generation biofuels, for example algae-powered aircraft, are seen as particularly exciting opportunities but are not yet commercially viable. To encourage this investment, the 2009 renewable energy directive set a 10 per cent target for the share of transport energy that should be sourced from renewables by 2020, the majority of which is expected to come from biofuels. The commission has, however, come under immense pressure to remove this target, since it has encouraged unsustainable biofuel cultivation and displacement of communities in Africa and Latin America. The sustainability of organic matter needed to deploy them on a mass scale is another issue.

Other sectors

The low-carbon transition presents opportunities for businesses in other sectors as well. In 2009–2010, sales from Britain made up nearly 17 per cent of the global carbon finance sector. Although not nearly as dominant, Britain also has over 3 per cent of the environmental consultancy and related services market, and the building technologies sector, which is roughly on par with its share of world trade. *Growing pains* shows how firms in other sectors are adapting their business models. For example, David Brown, an engineering firm specialising in gearboxes, has shifted its focus from the declining defence market to the wind sector. UK orders for the firm's products and services have grown substantially, from £2 million in 2010 to over £12 million in 2011. Another case study, mentioned above, is Novacem, which have created a technology to develop negative-carbon cement production. If this were to become commercially viable it could be a significant export for the UK and could fundamentally change the emissions profile of the cement industry globally.

4. CONCLUSIONS AND PATH AHEAD

Europe has successfully become a global leader on climate change and environmental policy. The EU has put in place a suite of policies and regulations that has succeeded in reducing GHG emissions faster than any other region in the world. This leadership has included the creation of the world's first cap-and-trade emissions reduction system and ambitious targets to reduce carbon emissions, increase renewables and improve energy efficiency across the EU.

These policies have not been without their critics. On the one hand there have been calls for greater ambition and action. The ETS has been criticised for being too generous with its allowances and for failing to reduce emissions to the extent expected. The 20-20-20 package of existing targets has been criticised for failing to show significant progress against either the renewable or energy efficiency targets. A number of businesses and campaign groups have called for the EU to push for more ambitious reductions in GHG emissions of 30 per cent by 2020.

On the other hand, the ETS and other European regulations have been criticised for their bureaucratic processes and the high costs they impose on businesses. In some countries, additional domestic regulations overlap with European regulations, creating confusion for business. Domestic decisions, for example to reduce FITs in France, Spain and the UK or to reduce nuclear capacity in Germany, have been met with concerns about removing regulatory certainty.

From the four roundtables that IPPR convened in France, Germany, Spain and Poland, as well as the four sectoral roundtables in Britain – discussed in the accompanying paper *Growing pains* – it is clear that there is no single business view of the low-carbon transition. A business' perspective on these issues depends almost entirely on whether it regards itself as a winner or a loser in the low-carbon transition. For some sectors – notably those in energy-intensive industries such as cement, aluminium, steel, pulp and paper, and chemicals – there are genuine concerns about increasing energy costs unless innovative processes can be developed to reduce the energy intensity of production. These concerns are likely to worsen if energy costs or regulatory burdens increase dramatically. Nonetheless, although these costs and concerns are often equated with the low-carbon transition through the process known as carbon leakage, there is little evidence to show that this is currently taking place.

For other businesses, notably in the energy and transport sectors, the low-carbon transition presents huge opportunities. As countries in Europe and beyond have reduced their reliance on fossil fuels, demand for new sources of energy, such as wind and solar power, has increased. Innovation in the transport sector – such as highly fuel-efficient combustion engines, electric cars and hydrogen fuel cells – is creating new jobs and reducing transaction costs for businesses. Supply chains within these industries benefit from this increased demand. In other sectors, innovations to reduce the cost of fossil fuels, for example the development of carbon neutral cement production, are rapidly reducing costs. These innovations hold huge export potential as other countries seek to lower their energy intensity and GHG emissions.

The European experience indicates that policymakers are undertaking a balancing act to make sure that the pace of the transition maximises the benefits to those sectors and innovators that are set to win from the process while minimising the costs to businesses that are unable to adapt. Critical to this balance is ensuring that a deal on global emissions reduction targets is agreed according to the timetable set out at the 2011 Durban conference.

Since European ambition is crucial to achieving a global deal, there is little to be gained from going back on the EU's commitment to set a 30 per cent emissions reduction target for 2020 in 2015. Indeed, doing so would make it less likely that other countries such as China and the US will honour their pledges at Durban to assume binding commitments in 2015. Likewise, it is regrettable that Poland has, for the second time, vetoed mid-term targets set out in the EU roadmap.²³ This is particularly worrying, since every delayed \$1 of investment in the energy sector will cost an additional \$4.30 after 2020 for the EU as a whole (IEA 2011). Every effort should now be made to ensure that an agreement is reached in 2015, that sufficient incentives are in place for low-carbon innovation within the EU and that regulations are streamlined to achieve the desired emissions reductions and other outcomes at the lowest administrative cost. In relation to these goals, IPPR make the following six recommendations.

- **Expand the EU ETS to include imported energy-intensive goods.** Serious consideration should be given to extending the ETS into imported goods from energy-intensive sectors if binding emissions commitments for 2020 are not agreed by 2015. ETS allowance set asides will become increasingly common as the EU works towards its own emissions reduction targets. This trend is likely to hit energy-intensive industries particularly hard. As the carbon price increases, carbon leakage could become a reality. Pressure on domestic manufacturers could become so intense that European leaders will feel obliged either to reduce the EU's overall ambition or to exclude energy-intensive firms from the next phase of the EU ETS. Given that cement and steel production each account for about 6 per cent of global emissions, this would do little to help decarbonise the economy.

Instead, the EU should work to ensure that there is a level playing field for goods competing in the European marketplace. An extension of the ETS to imported goods such as cement, aluminium, steel, paper and pulp, and chemicals would be one way to achieve this objective. Broadening the ETS to include aircraft flying into EU airspace set a notable precedent. Nonetheless, the diplomatic fallout from the decision – which has provoked threats of reprisals from a number of jurisdictions, including China's warning that it will withdraw its orders for Airbus aircrafts – presents a warning to any additional extension of the ETS to cover imports. Two provisos are therefore critical.

First, any extension of the ETS must guard against accusations of protectionism. 'Border carbon cost levelling' of this nature has been shown to be WTO-compatible if there is a fixed requirement for importers to purchase ETS allowances equivalent to the best available technology (Grubb 2011). Marginally different schemes may be needed for different sectors, depending on the trade intensiveness and level of electricity needed in the production process, but these can all avoid falling foul of the General Agreement on Tariffs and Trade (Grubb and Counsell 2010).

Second, it should be clear that the policy would go ahead only if binding emissions reduction targets through the UN process were not agreed by 2015. Designing the policy between now and 2015 could act as an incentive for countries exporting to the EU to sign up to emissions reduction targets. In the absence of an agreement on emissions reductions, the policy would create a level playing field for energy-intensive industries competing in the EU and guarantee that all goods from these sectors have an associated carbon price. The proposal could also build on the clean development

²³ Although it should be remembered that the costs of transition for Poland are particularly high, and that every effort should be made to support the country in its decarbonisation.

mechanism, which has been used to incentivise reductions in industrial process emissions in developing countries, albeit on a relatively small, project-by-project basis (UNFCCC 2010).

- **Raise the carbon price.** The EU should act to raise the carbon price, which is at worryingly low levels. Industry groups in Germany, France, Spain and the UK all raised concerns that the volatile carbon price has made business planning problematic. It is also reducing incentives for low-carbon innovation. Following a Coalition programme commitment, a carbon floor price will be introduced in the UK from April 2013. The policy has come under some criticism. IPPR analysis demonstrated that the policy would do little to reduce emissions, is unlikely to enhance investor certainty given its flawed design (which provides contradictory signals to investors since there are two separate carbon prices) and would harm UK industry relative to its European counterparts (Maxwell 2011). Nonetheless, the IPPR report concluded that action at the EU level to raise the carbon price would be beneficial since it would strengthen investor certainty across the continent. Indeed, while carbon leakage between the UK and EU is a significant reason to oppose a unilateral British carbon floor price, carbon leakage between the EU and other jurisdictions is far less likely at present, suggesting that the EU has some room to raise the carbon price (if not to put a firm floor in place).

The most efficient way to raise the carbon price in the absence of an EU-wide increase in the emissions reduction target to 30 per cent would be a large-scale set aside of emission reduction allowances. Proposals to withdraw 1.4 billion of allowances from phase III of the ETS (which would effectively increase the carbon price by 20 per cent) should be supported.²⁴ But this is only a start. Given the volatility in demand for ETS allowances, a more interventionist role may be needed to ensure that the EU delivers its emissions reduction targets and provides greater certainty for investors concerned by the low price. A central carbon bank could guarantee that emissions reduction targets are met by auctioning allowances. If prices were seen as too low to achieve the goal, the carbon bank could hold back allowances. By contrast, it could issue allowances if prices rose too high.²⁵

- **Focus the EU's multiannual financial framework on innovation.** In addition to the demand-side measures described above, the EU should develop a set of supply-side policies. As part of this, the EU's forthcoming seven-year budget, known as the multiannual financial framework 2014–2020, should focus greater resources on innovation. The European Commission is currently planning to bring together the three main sources of funding for research and innovation and technological development²⁶ within a single common strategic framework for research and innovation in the horizon 2020 framework programme (European Commission 2012b). The new budget for research and innovation is expected to total €80 billion, an increase of €25.5 billion on the 2007–2013 budget. It aims to strengthen the EU's scientific research, support industry leadership in innovation, improve access to finance for small and medium sized enterprises (SMEs), and advance issues such as climate change, sustainable transport, renewable energy, food security and the challenges of an ageing population.²⁷

24 See 'A Baseline Correction for the EU ETS', <http://blogs.shell.com/climatechange>

25 See <http://www.ideacarbon.com/ideas-and-resources/recent-features.htm/jdwjkbbdbj>

26 These are the 7th framework programme for research, the innovation part of the current competitiveness and innovation programme, and the European Institute of Innovation and Technology.

27 See http://ec.europa.eu/research/horizon2020/index_en.cfm?pg=h2020

While these efforts should be supported, more could be done. The commission's draft budget included €386.9 billion for inefficient agriculture subsidies and €376 billion for structural and cohesion funds, which have been blighted by misspending and suspected fraud (Peet and Tindale 2012). Priority should be given to shifting funds from these two budget headings into innovation. All remaining structural and cohesion funds should be used in a way that is entirely consistent with the low-carbon transition, including targeting resources for renewable energy and sustainable transport in poorer countries, which will potentially incur greater costs during the low-carbon transition. Meanwhile, member states should do more to coordinate big demonstration projects and pool funds for collaborative working, for example on clean coal and industrial CCS. The climate of austerity provides a greater impetus for such collaboration.

As set out in *Growing pains*, member states should also develop national supply-side policies to address many of the concerns set out in the roundtable discussions. These issues include a lack of financing for demonstration and development, low skills (especially in engineering) and poor infrastructure, especially in countries like Poland. Progress in each of these areas will be crucial to fostering low-carbon growth across a range of sectors in each member state. The EU has various roles in supporting these national efforts. Completing the single market, for example, by extending and introducing more ambitious low-carbon standards for products and services, could generate greater inward investment within Europe and stimulate growth in key low-carbon sectors. Meanwhile, state aid rules should be reviewed to ensure they are consistent with legitimate WTO-compliant approaches to supporting new industries and technologies.

- **Protect ETS revenues for low-carbon projects.** The ETS is partly undermined by concerns that it has become a fiscal policy to raise revenue rather than a climate policy to reduce emissions. This perception is not helped by the fact that revenue collected by national governments from the sale of permits at the start of each new phase generally go into member states' central government pots. While member states would almost certainly reject the central collection of ETS permit revenues by the EU, there is a strong case for strengthening reporting requirements to make sure that national governments spend these funds on low-carbon projects. There is a precedent for this in the UK: a small portion of the funds raised by the climate change levy is invested in energy-efficient and low-carbon technologies. The rest is directed to businesses, which receive a 0.3 percentage point cut in employers' national insurance contributions. Similarly, the EU's 'NER 300'²⁸ programme contains a provision to invest the proceeds from selling 300 million allowances currently held in the ETS' new entrants reserve – an estimated €4.5 billion based on the market price in November 2011 – in CCS deployment, smart grids and a range of renewable technologies.

Although the fungibility of funds mean that governments could use money from other sources to claim that new resources had been found for the low-carbon transition, this more transparent approach would have two beneficial effects. First, countries that currently spend less on low-carbon projects than they bring in from ETS revenues would be forced to increase their low-carbon expenditure. Second, this method would enhance the legitimacy of the ETS and reassure industry that the revenues were being put to good use.

28 See <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/10/549&format=HTML&aged=0&language>

- **Provide industry with greater regulatory certainty.** Industry participants from France, Germany and the UK called for more stability in the EU's regulatory setting process. Ideas included early agreement of phase IV of the ETS, which will be rolled out in 2021. UK industry participants wanted a clear post-2020 policy regime to be established sooner rather than later, since current EU policies effectively come to an end in 2020. Predictable policies are critical for businesses in many sectors, for example aviation, which have investment lead times of 10 to 15 years.
- **Maximise the EU's role as a standard setter.** Vehicle emissions standards are a successful example of the EU generating a new market through standard setting. In 2009, new carbon emissions targets were adopted for new passenger cars and light commercial vehicles. For the former, a fleet-average target of 130g/km was set for 2015 and a long-term target of 95g CO₂/km from 2020. The US and Japan have since followed suit. EU fuel efficiency standards might be effective in the aviation sector.

These measures, taken together, would help reassure European businesses about the low-carbon transition while ensuring that the EU's ambition to reduce carbon emissions are not dulled. Recognising that businesses do not speak with a single voice on climate change is critical to the policy response. Therefore policies intended to help businesses that are vulnerable to carbon leakage should not create unnecessary barriers or reduce incentives for companies trying to create low-carbon goods and services. Commercial innovation is needed to find ways to reduce the energy intensity of production., Policy innovation is required to ensure that growth in new sectors and technologies is maximised while losses to energy-intensive firms are minimised. Ultimately, however, a binding global emissions reduction deal is the best way to make this happen; it must remain the primary goal of EU policy.

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ANNEX

THE VIEW FROM THE CONTINENT

To examine how different businesses and industry associations across Europe view the challenges and opportunities presented by the EU's climate change policies and regulations, IPPR convened roundtable discussion events in four European capitals. To convene these events we partnered:

- in France, with Terra Nova, a social democratic thinktank that seeks to foster the intellectual revival of social democracy and produce operational expertise for policy solutions and practices across France and Europe
- in Germany, with the German Institute for International and Security Affairs (Stiftung Wissenschaft und Politik), an independent thinktank that conducts scholarly research in the fields of international politics and foreign and security policy
- in Spain, with Ideas Foundation (Fundacion Ideas), a progressive thinktank affiliated with the Spanish Socialist Workers' Party that brings progressive ideas to the arena of political and social debate
- in Poland, with the Institute of Public Affairs (Instytut Spraw Publicznych), an independent thinktank that contributes to informed public debate on key Polish, European and global policy issues.

These thinktanks helped us bring together participants from a range of different industries as well as politicians and experts. This approach mirrored a related series of roundtable discussions conducted in the UK with support from the Engineering Employers Federation, which were summarised in *Growing pains*.

France

France is committed to an 80–95 per cent reduction in its GHG emissions by 2050, along with other European countries such as Germany and the UK. This ambition was cemented in the 2005 *Grenelle* bill, which called for average emissions reductions of 3 per cent per year. Under the EU's 2020 climate and energy package, France has also pledged a 23 per cent cut in its emissions by 2020 relative to 1990 levels.²⁹

France has already outperformed its target of stabilising emissions under the first phase of the Kyoto Protocol, having cut emissions by 6.4 per cent in 2008 relative to 1990 levels. One of the main reasons for this success is France's heavy reliance on nuclear power, which has increased over time and generated 80 per cent of the country's electricity in 2009.³⁰ More recently, it has introduced additional policy levers to foster the transition. *Grenelle 2*, which was introduced in 2011, sets out plans to increase the energy efficiency of France's building stock and reduce transport emissions. It also transposes the EU's 2020 targets into French law – including a commitment for renewables to account for 23 per cent of final energy use.

The current fiscal and economic crises in France and across the eurozone pose significant challenges for the low-carbon agenda in France. With limited public funds, new ways of financing low-carbon investments will be necessary, while the impact of rising electricity prices is rapidly becoming a political issue.³¹ But there are clear opportunities as well. A recent report, *Trajectoires 2020–2050* (Perthuis 2011), argues that climate change policies can assist the economic recovery in France and elsewhere in Europe, and will create new poles of growth and competitive advantage.

29 See <http://www.strategie.gouv.fr/en/content/trajectories-2020-2050-low-carbon-economy-report#les-ressources>

30 See http://www.eea.europa.eu/soer/countries/fr/soertopic_view?topic=climate%20change

31 <http://www.latribune.fr/entreprises-finance/industrie/energie-environnement/20120117trib000678629/le-prix-de-l-electricite-en-france-pourrait-augmenter-de-30-d-ici-a-2016.html>

IPPR and Terra Nova hosted a roundtable discussion in Paris on 7 March 2012. Participants included representatives from the transport, environmental, political, financial and professional services sectors. The discussion included presentations on the *Grenelle 2* bill, renewable energy and low-carbon investment. Most participants were encouraged by the level of EU ambition and felt that the 2050 roadmap provided an important long-term vision for decarbonisation. There were, however, concerns about the impact of the financial crisis on climate change action, and the lack of progress at the global level due to perceived inaction in China and the US.

Challenges and barriers to decarbonisation

Roundtable participants identified cost as a significant impediment to realising France's low-carbon ambitions. Concerns about the financial burdens placed on public finances (through schemes like solar FITs, which nevertheless were deemed critical) and the impact of rising energy prices on society left many unsure of where the money was going to come from to fund the transition. Participants were very keen to reduce the financial pressures on the taxpayer when and where possible, with some suggesting that government take special measures, such as progressively pricing electricity to charge higher rates to those who can afford to pay more. Others alluded to the damaging effect of cumulative costs, which include the regulatory costs of climate change policies on business competitiveness and the EU's failure to protect European businesses from outside competitors.

The main concerns were the lack of agreement at the international level on sharing the burden of reducing emissions and the high costs associated with low-carbon technologies. Representatives from both the environmental and professional services sectors felt that these factors, combined with the low price of carbon – which may not rise for some time – made the concept of the low-carbon transition rather abstract and discouraged business investment in low-carbon and energy-saving technologies.

Policymakers were accused of sending contradictory signals to French companies. Much of the debate focused on recent changes to French solar FITs. Although some participants felt that tariffs had been set too high, the *volte face* in policy was criticised for undermining business confidence and certainty in France's energy policy. Several participants described the FIT scheme as 'ill thought-out' and 'ill managed'. Several participants stressed the importance of a visible, secure and stable policy environment to provide businesses with the confidence to invest.

Many felt that the French financial and banking sectors must do more to channel capital into low-carbon projects and technologies. Since banks are not currently interested in the long-term investments typical of the green agenda (mainly preferring quick returns), many clean-tech companies are struggling to access finance. In contrast, participants expressed concerns about the impact of long-term investments from rapidly growing economies such as China – both in clean technologies and other products – on French and European competitiveness.

The economic downturn and subsequent dearth in lending was seen as particularly problematic for SMEs. Many participants felt that France had 'lost its industrial culture' and that the government only supported major businesses that were already successful and had sufficient capital (and capital-raising powers). Although some expressed doubts about whether picking winners was the right approach, participants felt that government should be doing more to assist SMEs and encourage them to innovate and decarbonise their supply chains. Participants from the political arena were particularly impressed

with US policy initiatives – such as the 2009 American Recovery and Reinvestment Act – that provide loan guarantees and grants to support low-carbon innovation and R&D. Furthermore, larger companies should be encouraged to support SMEs in their supply chain to innovate and cut carbon. Airbus was cited as a good example of a company that supports its suppliers in this way.

Innovation was seen as critically important to overcome the technological challenges facing the low-carbon transition. One participant from the aviation sector suggested that the main barriers to low-carbon aviation – and other forms of transport – were technological. Rising fuel costs provide an incentive for aviation and aerospace engineers to develop ways to increase aircraft fuel efficiency, but the rise in demand for air travel increases aggregate emissions from the aviation sector. As a result, an international sectoral agreement – building on the EU ETS framework – was seen as important in providing long-term goals for emissions reductions in aviation.

Gaps in human capital and skills were identified as a key challenge inhibiting the low-carbon agenda in France. Participants observed that too few university graduates and young people are currently trained in key subjects such as engineering, and that this would affect France's ability to gain a foothold in high-value-added low-carbon technologies and sectors. At the same time, the lack of vocational training in schools impedes business innovation and makes potential employees less attractive to companies.

Finally, participants questioned the political will of French politicians and policymakers. Some felt that politicians had become more regressive in their approach to climate change, claiming that France lacked any real medium- to long-term vision of the type of low-carbon economy it wanted. Participants were concerned about the increasingly short-term focus of politicians and businesses due to the eurozone crisis and its negative effect on France's low-carbon transition.

Surprisingly, there was a lack of discussion about nuclear energy. After the Fukushima nuclear disaster in Japan, some in France are starting to question whether new nuclear build is desirable. Socialist presidential candidate François Hollande has, for example, proposed reducing France's reliance on nuclear energy from 75 per cent to 50 per cent. Nonetheless, the current government is pressing ahead with plans to develop its 60th nuclear plant and the country still seeks to export its expertise in this sector (Maitre 2011). For example, EDF energy – the partly state-owned French utility – is currently negotiating new nuclear contracts with the UK government. France's clear competitive edge in the nuclear energy sector is another factor that may explain why the current French government has continued to show a strong commitment to nuclear power when other governments, notably Germany, are going in the opposite direction.

Opportunities presented by the low-carbon transition

Despite the many challenges outlined above, participants maintained that the low-carbon transition offered significant opportunities for French business, industry and consumers, particularly in high-value-added sectors. They held policymakers and businesses responsible for harnessing these opportunities in areas such as R&D, intellectual property and advanced manufacturing. One political representative noted that China is increasingly moving away from 'imitation to innovation' and stands to reap the benefits of low-carbon innovation, increasing the pressure on Europe to take action. However, participants concluded that it was time for Europe to develop a low-carbon 'supply policy' that supported domestic manufacturing in addition to its well-developed 'demand policy' for low-carbon goods.

Some participants felt that there were more opportunities to spur low-carbon innovation through setting standards. They pointed to the success of European fuel economy standards in the automotive sector and energy efficiency standards for electrical appliances. Using standards as a way to encourage the 'right' sort of behaviour was deemed particularly useful since it comes at almost no extra cost to government. In addition to standard setting, environmental labelling of products was seen as a way to engage consumers in the green agenda and increase the demand for green products, and encourage the state to lead by example in using, supporting and procuring low-carbon products. One person from the professional services sector felt that the current labelling regime was too complex and needed to be simplified.

Participants asserted that Europe also had an important role to play in 'exporting' environmental standards. One participant, who headed an organisation specialising in climate change-related investment, was particularly passionate about the opportunities the EU ETS offered Europe and the rest of the world. They argued that businesses should look more at the positives of the EU ETS, which had managed to secure a cap-and-trade system between 30 different nations, rather than focus on its defects. They went on to claim that the EU ETS was the world's biggest hope of achieving a global cap-and-trade system and should be supported at all costs. However, participants were concerned about the low price of carbon and advocated an EU-wide reserve price. Many also felt that national governments should use the revenue from the ETS to support low-carbon investments.

Participants highlighted potential opportunities from energy efficiency. Despite some policy progress in this area, in particular provisions in the recent Grenelle 2 bill, they argued that more could be done to retrofit the existing building stock and set energy efficiency requirements for new homes, schools and hospitals. Such measures would help reduce the proportion of France's fuel imports and create important job opportunities in the labour market.

Wider environmental issues featured frequently throughout the discussion. Some participants from environmental organisations argued that there tends to be too much focus on carbon and climate change, and not enough on other environmental issues such as waste, water, recycling and biodiversity. Some participants pointed to economic opportunities available to France in these sectors. Recycling, for example, is a growing domestic industry and could be further promoted by the government. Other participants suggested that 'resource efficiency' was one area in which Europe could develop competitiveness, since 'we do not have our own resources' and are therefore more prone to commodity shocks.

Policy ideas from industry stakeholders

A number of potential policy requirements and solutions were discussed. Several participants thought that policymakers were failing to take advantage of a general acceptance within some parts of industry and the French public that environmental taxation is necessary. They were critical of the current tax system in France that, in many cases, encourages rather than disincentivises carbon pollution. Participants suggested that the transport sector would benefit from carbon taxation, which is particularly significant as French transport emissions have continued to rise over the last couple of decades (when other sectors' emissions have fallen); the sector now accounts for approximately 27 per cent of emissions.³²

³² See http://www.eea.europa.eu/soer/countries/fr/soertopic_view?topic=climate%20change

Another participant from the professional services sector suggested that it was critically important to encourage the finance and banking sectors to invest in low-carbon projects and technologies. One potential solution was to create a sub-set of the binding technical standards that are being introduced under the Basel II reforms (which require banks to hold a certain proportion of high-quality capital in reserve and to be more selective about the loans they make) that would require banking institutions to invest in low-carbon, environmentally sustainable and other socially responsible investments. This measure would cost governments little and could fundamentally change the dynamic of the banking sector.

Finally, there was a strong emphasis throughout the discussion on the importance of the EU single market and the need to protect it. The EU has an open and competitive market, with solid procurement rules that prevent governments from favouring specific domestic industries and businesses. This system allows countries from all over the world to sell into the European market with ease. In contrast, many other countries fail to show the same reciprocity and appear reluctant to open up their markets to international competition. Some participants felt that the EU was locked out of China's market altogether. Furthermore, public procurement represents a significant amount of the EU economy, an estimated 17 per cent of gross domestic product (GDP) in 2011 or €312 billion.³³ By contrast, procurement opportunities available to foreign investors in the US were valued at just €34 billion and €22 billion in Japan (Simon 2012). This issue has been repeatedly raised by French politicians, including President Sarkozy, in the past.³⁴

Several participants expressed a desire for a level playing field and suggested that the EU should explore the possibility of imposing border restrictions or other trade barriers on importing countries that do not practice open markets or do not have sufficiently stringent environmental regulations (in order to counteract carbon leakage). This issue is being explored by the European Commission, which is considering allowing EU member states to implement measures to protect their markets whilst at the same time pursuing negotiations to persuade other countries to open up their markets.³⁵ One political participant suggested that the low-carbon transition should be seen as an opportunity for the EU and its member states to do what they can to support European businesses over outside competitors.

Germany

Germany is committed to an 80–95 per cent reduction in its GHG emissions by 2050, along with other European countries such as the UK and France. The Germans have set themselves an ambitious 40 per cent emissions reduction target by 2020, relative to 1990 levels, under the Federal Environment Ministry's climate initiative and the EU's 2020 climate and energy package.³⁶

Under the Kyoto Protocol, Germany agreed to a 21 per cent emissions reduction target, the largest of all EU countries. In part, this commitment was because Germany is the largest contributor to European emissions – responsible for 25 per cent of total EU-15 emissions. By 2008, Germany had already reduced its emissions by 22.2 per cent relative to 1990 levels.³⁷

33 See <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/11/682&format=HTML&aged=0&language=EN&guiLanguage=en>

34 See <http://www.euractiv.com/trade/sarkozy-see-reciprocity-trade-talks/article-163984>

35 See http://trade.ec.europa.eu/consultations/?consul_id=154

36 See http://www.bmu.de/english/climate_initiative/general_information/doc/42000.php

37 See http://www.eea.europa.eu/soer/countries/de/soertopic_view?topic=climate%20change

In addition to reducing emissions, Germany is undergoing a transformation of its energy system, known as the ‘Energiewende’, which includes ceasing all nuclear power generation by 2050 and moving towards renewable sources of energy and energy efficiency savings to meet energy demands.

The transformation presents Germany with a massive challenge to replace the secure energy sourced from nuclear power with other forms of low-carbon technologies. But in light of the Fukushima disaster in 2011, the German public feel very strongly about reducing their dependency on nuclear power.³⁸ The EU’s renewable energy directive set Germany a target of 30 per cent renewable power by 2020, under which the German government has identified several different renewable technologies to help meet demand, including wind, hydro, biomass, solar and geothermal energy.³⁹

A roundtable discussion, held in Berlin on 8 March 2012, was hosted by IPPR and the German Institute for International and Security Affairs, a German thinktank that conducts scholarly research in the fields of international politics and foreign and security policy with the objective of providing independent research-based policy advice. Participants included representatives from a number of sectors that are preoccupied by the perceived costs of the low-carbon transition, including the energy, metal, manufacturing and some other energy-intensive sectors. Only two participants represented sectors that are overt ‘winners’ from the low-carbon transition: one each from the high-tech and energy efficiency sectors. The discussion included presentations on the ‘Energiewende’ and energy efficiency. Underpinning the discussions was the view that although industry did not question the need for the low-carbon transition, they were increasingly concerned about how to get there. The discussion focused primarily on the difficulties presented by the overlapping nature of EU regulations and the costs of the ‘Energiewende’.

Challenges and barriers to decarbonisation

A number of participants criticised the EU roadmap as an overly simplistic approach that does not take the complicated transition costs into account. Representatives of several industry bodies suggested that the roadmap should limit itself to emissions reductions targets and not complicate the regulatory environment by also dictating a desired increase in renewables or energy efficiency. Decarbonising the energy systems was seen as ‘core’ to reducing GHGs and was said to be the priority.

The idea of going faster than other regions was questioned; participants expressed a clear desire for emissions reduction targets to be negotiated at the international level. One leading energy firm said that EU thinking was now divorced from reality and did not reflect the economic reality that the global economy extended beyond the EU-27. There was concern that the rhetoric about the ‘win-win’ from leading on emissions reduction was dishonest. Industry representatives felt it was better to admit that the transition would be expensive.

The notion of first-mover advantage from the low-carbon transition was questioned by one representative of the energy sector, who described it as ‘first-mover disadvantage’ since China and other countries learned from the first movers’ example without incurring the significant research and innovation costs. Indeed, participants thought the European discussion should be viewed in the context of China to a far greater extent. For example, China educated more engineers every year than Germany had in total.

³⁸ See http://www.bmu.de/english/transformation_of_the_energy_system/general_information/doc/48050.php.

³⁹ See http://www.bmu.de/english/renewable_energy/general_information/doc/4306.php.

The EU's energy efficiency directive, which was first proposed last June, was the subject of significant debate, with one participant describing it as an instrument of a 'planned economy'. Participants asserted it was out of line with existing German regulations and criticised the lack of an impact assessment. A number argued that it was unclear whether the directive was intended to reduce energy consumption or to lead to higher productivity per unit of energy. One representative from the energy sector questioned whether its real target was saving energy rather than enhancing overall efficiency. A representative of the metal industry conceded that it could never be the goal of industry to reduce its electricity, but that reducing costs was a legitimate aim. He outlined the tension inherent in his industry, which has little scope for energy savings within its production processes, but concluded that the sector would benefit from the overall low-carbon transition since metal is a key intermediate product for downstream sectors like wind turbines. Another participant from the steel sector maintained that there was little scope for energy reduction, and that the only way to reduce emissions was by shifting to renewables.

Participants were also concerned that the new directive was unnecessary, since the ETS provides incentives for efficiency. Others contended that energy efficiency was more readily driven by market forces than regulation. For example, the high cost of oil drives innovation in electric cars. Therefore efficiency savings of 30–50 per cent in heating could be generated through higher energy prices. However a representative of the energy efficiency industry defended the directive and said there was a lot of misunderstanding about its objectives. In particular, he outlined that article 6 was not geared at end users and was instead calling for energy suppliers and distributors to meet an annual energy-saving target of 1.5 per cent. Another participant, speaking in a personal capacity (and at odds with the views of his own industry association), felt that the benefits of the new directive outweighed the costs, given the complexity of the existing domestic energy efficiency arrangements. He felt that another benefit of the legislation would be that it helps create a standardised accounting system to measure energy efficiency.

There was not a lengthy discussion about the ETS, although it was felt that the objective needed to be clarified to determine whether it was meant to drive efficiency, increase investment in renewables or generate revenue. One representative from an energy firm said that the ETS had become a fiscal instrument rather than a climate instrument.

One participant noted that the current carbon price of €8–9 per tonne was far below the €17 level last year. Some participants thought a carbon floor price of around €15 would be desirable and could be generated by setting aside a certain number of permits. Some industries wanted a 30 per cent cap for phase IV.

Representatives of the metal and energy industries, among others, identified increases in energy prices as a critical brake on international competitiveness. One participant made the point that innovation would still occur, but would take place in other regions. Others suggested that rising energy costs were increasing fuel poverty. There was specific concern about the loss of 8 GW of capacity following the post-Fukushima decision to decommission most nuclear power stations. A high-tech company was concerned about security of supply after 2020. Meanwhile, a representative of the energy industry contrasted the opaque decision-making process in 2011 to the transparent discussion about the first nuclear phase-out in 2000.

Several concerns were raised about the European Commission's PRIMES model,⁴⁰ which is used for forecasting, scenario construction and policy impact analysis up to 2030. Specifically, it was felt that the model's methods and processes were not transparent enough.

Opportunities presented by the low-carbon transition

Given Germany's lead on emissions reduction, there was fairly little optimism about the low-carbon transition. However, with the exception of one representative of the energy efficiency sector, most of the participants were from industries that perceived themselves as losers or partial losers from the transition. Nonetheless, a representative of a high-tech company saw clear opportunities from the low-carbon transition so long as German competitiveness could be maintained. Another industry representative thought that despite all the concerns, firms would continue to adapt and innovate and find ways to maximise the opportunities.

A representative of the energy efficiency industry was, unsurprisingly, upbeat about the role his sector could play and felt that it would continue to create jobs. The focus on demand for energy in Germany was relatively new, whereas previous discussions had focused purely on supply questions. Energy efficiency could be a solution not just to climate change but also to securing energy supplies, tackling fuel poverty and creating new jobs. He claimed that Germany could develop a comparative advantage for energy efficiency since it already had a lead in energy-saving products.

Participants thought the German government displays inadequate interest in carbon capture and storage, and that this could become an important technology both for reducing European emissions and for exporting to other regions of the world, notably China, that rely heavily on polluting fossil fuels such as coal.

Policy ideas from industry stakeholders

Several participants felt that greater clarity was needed on how revenues from the EU ETS are spent. They suggested that all proceeds should be put into energy and climate funds to pay for innovation and R&D. In addition to existing EU expenditure on developing renewables and carbon capture and storage, participants proposed that funds should be made available to develop electric vehicles, improve building energy efficiency and compensate energy-intensive industries.

Participants suggested that the renewables framework should be harmonised across the 27 member states to simplify the existing (complicated) arrangements. They criticised the current array of wind subsidies as targeting investment where subsidies were highest rather than where there was the most wind. Another participant from an energy-intensive sector thought fixed FITs were critical. In relation to other energy sources, a representative from a high-tech company asserted that there were insufficient incentives for gas-fired power plants as part of the low-carbon mix. Meanwhile, participants viewed grid expansion as critical to the low-carbon transition.

Enhancing the energy efficiency sector would require additional policies and regulations to reach the 20 per cent target. Participants observed that the EU directive should have been binding, since many countries are now taking their own disparate paths. But even with greater regulatory incentives, other issues need to be addressed. Upfront financing,

40 PRIMES is a partial equilibrium model for EU energy markets that is used to analyse the impact of environment policies within each of the 27 member states.

especially for building retrofits, was described as critical. Participants proposed bond issuance or the development of payback systems in the corporate sector as potential solutions. Other issues included skills shortages and the need to accredit companies in order to ensure greater consumer uptake. The California Energy Efficiency Industry Council was cited as a successful example.

Spain

Over the past 20 years, Spain has experienced significant growth from a low economic base. Therefore Spain's Kyoto target was to increase emissions no more than 15 per cent relative to 1990 levels. After continuing to rise rapidly in the first decade and then stabilising in the second, Spain failed to meet this target and its 2009 emissions were 30.5 per cent above its 1990 baseline.⁴¹

Spain has for some years been strongly committed to a policy of investing in renewable energy. In 2010 its share of renewables represented an estimated 12 per cent of total final energy consumption. In 2011, the Spanish government published its 2011–2020 renewable energy action plan, which decreased its renewable target from 22.7 per cent of final energy consumption to 20.8 per cent by 2020, in a move to control subsidy costs while still encouraging growth.

Spain was significantly affected by the 2008 economic crisis and the current fiscal and economic crisis across the eurozone. A sustainable economy law was introduced in March 2011 to implement austerity measures to tackle the country's budget deficit. This law followed austerity measures and economic stimuli introduced the previous year to avoid a bailout from the EU and International Monetary Fund, with the aim of reducing the government deficit to 6 per cent of GDP by 2011.

Spain's low-carbon agenda not escaped the impact of the financial crisis. Royal decrees have reduced FITs for wind and solar power installations in a retroactive manner, according to the EU Commission. Tariffs on ground-based solar photovoltaic (PV) plants have been cut by up to 45 per cent, depending on size and technology. In addition, the premium for wind power producers will be cut by 35 per cent until 2013.

A roundtable discussion was held in Madrid on 9 March 2012 that was hosted by IPPR and Fundacion Ideas, a Spanish thinktank that brings progressive ideas to the arena of political and social debate. Participants included representatives from five energy companies, including renewable technology developers, the Spanish National Grid company, one construction company focused on energy efficiency, one transport academic, one consultant, an oil industry association representative and a former government minister. The majority were therefore from sectors that stand to benefit from the low-carbon transition. The discussion began with a presentation from Factor CO₂, an environmental consultancy based in Bilbao, on CO₂ markets in Spain.

Challenges and barriers to decarbonisation

Participants demonstrated a significant degree of consensus on the main concerns about the low-carbon transition. One of the strongest objections was the absence of robust carbon price signals. The EU currently uses a floating price in its ETS with no floor price, unlike similar cap-and-trade systems in the US east coast, California and Australia. Several participants argued that the low carbon price was holding back progress, particularly in terms of achieving cost convergence between renewable technologies and

41 See http://unfccc.int/files/ghg_emissions_data/application/pdf/esp_ghg_profile.pdf

conventional energy. Participants from other sectors, such as construction, supported this point. One company, which seeks to carry out large-scale projects for retrofitting buildings, called for a positive and strong carbon price signal, arguing, 'With a carbon price at 13 euros per tonne we have no chance of the market investing in huge energy efficiency projects, but with a high carbon price of around 50 euros, we could get a lot more investment and opportunities'.

Participants warned, however, that policymakers tend to overreact. For example, one experienced policy expert cautioned that removing hundreds of millions of carbon allowances from phase III of the EU ETS could be seen by many businesses as a step too far, despite the good intention of rising carbon prices. By contrast, increased certainty about post-2020 EU ETS policy could raise the price of carbon without disrupting the market by withdrawing allowances. Participants maintained that there are only vague signals about what will happen from 2020–2050, yet this period is important for investment cycles.

Participants disagreed about the effectiveness of the EU ETS. One presentation showed that Spanish industries were actively participating in the ETS market and that, overall, Spanish industry thought the carbon market was functioning positively in Spain (Factor CO₂ 2012). However, some participants argued that the low carbon price proves that the scheme is not functioning effectively. Companies surveyed for the presentation had revised their carbon price estimates downwards, and most were working with spot price estimates in the range of €10–15. Some participants suggested that energy taxation on carbon would more effectively reduce emissions than the cap-and-trade system, which is complicated and has not produced the right price signals.

Participants explained that the need for significant levels of investment and access to finance is a barrier to low-carbon growth. Representatives of renewable energy companies, in particular, stressed the need for investment in infrastructure, but suggested that profitability and access to finance was needed first. This point was related to a discussion on the need for policy stability and consistent messages from government, as access to finance has in many cases become more expensive due to recent policy changes made by the government, for example on renewable targets and incentives. Some participants thought that the downward revision of the renewables targets, as well as cuts to the FITs for wind and solar energy, have contributed to a general sense that the economic and regulatory signals are going backwards. Participants expressed concerns that many other countries were planning to revise the 20-20-20 EU climate and energy package objectives.

The best available tools for the government to promote the transition to a low-carbon economy – standard setting, tax policy and improving access to finance – were not felt to have been handled in a consistent manner, which has decreased support because the goals appear inconsistent and unclear. A key concern of the renewable industry was that time, money and resources invested in preparing for the targets were at risk unless adjustments were made. Domestic political pressures in Spain had increased because of the economic crisis and an increase in criticism of low-carbon policies.

Some participants expressed concerns that the myriad policies and approaches to taxation across the EU had created high transaction and compliance costs for investors, and that simplification and harmonisation across the EU was needed. In relation to the energy taxation directive, which sets out common rules on what can be taxed (which is

currently under review by the EU), one energy sector participant argued that setting a minimum level was not sufficient and that a cap or margin should be established within which countries should operate.

Despite support for more ambitious low-carbon policies, particularly from renewable energy companies, some participants were apprehensive about the impact on business competitiveness compared to countries operating outside the EU. This concern was particularly for regulated sectors that are unable to pass the extra costs onto the consumer. An oil industry representative underlined the fact that for energy-intensive industries, the carbon price was an operation cost not faced by companies outside the EU such as the US and China. He pointed to recent announcements by several large EU oil refineries that were planning to move their bases outside Europe as evidence of 'carbon leakage'. The position of his members was that the absence of a global agreement rendered EU policies to tackle climate change futile. Other participants disagreed with this perspective and felt that moving towards a low-carbon economy will secure a vital competitive advantage for the EU and is not simply a question of tackling climate change. Participants agreed, however, on the need for steps to support energy-intensive industries before a global agreement is in place.

Opportunities presented by the low-carbon transition

Participants highlighted regulation, taxation and standards as the key policy measures needed to support the transition. They discussed the need for regulation of energy efficiency, in particular, and supported the energy efficiency directive that is currently under consultation in the EU. Participants also pointed out the need for policy tools to achieve change rather than relying primarily on targets. They highlighted policy instruments such as the UK's green deal as a means to achieve market development. Participants thought that keeping track of progress and adapting and introducing measures to react to a lack of progress, if needed, was just as important as regulation and setting targets.

On standards, participants cited the labelling of electrical goods as an example of how consumer choice can be harnessed to positive effect. Promoting carbon labelling on electrical goods was suggested as one way that newer, cleaner technologies could be supported in markets over older technologies.

Several participants spoke in favour of a progressive approach to taxation on carbon to replace the current market-led cap-and-trade system. Some advocated a progressive taxation plan that allows businesses time to adjust and gives strong signals to industry for the medium to long term. Some also felt that this approach would provide more certainty to help promote technological innovation.

At the domestic political level, several participants stressed the importance of maintaining a strong narrative on the opportunities presented by the low-carbon transition in terms of aiding economic recovery, prosperity and growth – and highlighting how this links up to a global agenda, with measures being taken in countries such as China and the US.

Participants highlighted the need for a more persuasive approach towards companies to engage them in tackling climate change, particularly including carbon emissions as part of the strategic decision-making process of any investment. Highlighting issues such as resource sustainability, higher energy costs and population growth – as well as brand value – could shift the focus from climate change alone, to include reputational risk and competitiveness.

Many participants considered the EU to be the best level to drive forward policy for a low-carbon transition. At a time when national governments are subject to difficult domestic economic pressures, several participants argued that the EU is better able to maintain the momentum on policy. There was broad support for a clear 2030 objective for renewables, which some participants expected to feature as part of the 2050 energy roadmap.

Policy ideas from industry stakeholders

Overall, participants supported clear, consistent and stable policies on regulation, standards and taxation to promote the transition to a low-carbon economy. That said, it should be pointed out that the majority of the roundtable participants were involved in developing renewable energy technology or energy efficiency and thus stand to benefit from such reforms. Significant concerns were expressed about whether there is sufficient political will to maintain policies already in place in the face of growing economic pressures and high unemployment. Many participants believed that recent changes in government policy had already created uncertainty that was damaging industry prospects. Participants generally agreed that despite the difficult economic circumstances, national energy and climate policy could be better managed.

Participants put forward specific ideas for re-defining the EU ETS – for example improving price signals through an EU bank for emission permits or price mechanisms such as a carbon floor price for Europe. Participants also suggested that industry should be treated more fairly inside and outside the EU to better handle the risks of carbon leakage. Several participants spoke in favour of a progressive approach to carbon taxation to replace the current market-led cap-and-trade system, which would allow businesses time to adjust and give strong signals to industry for the medium to long term.

Poland

Poland joined the EU in 2004 and signed up to national emissions targets under the first phase of the Kyoto Protocol. From 1988–2007, GHG emissions decreased by 29.3 per cent below 1988 levels – primarily as a result of wholesale economic restructuring and market liberalisation that took place in the country during the 1990s. In general, however, the policy framework to support emissions reductions and low-carbon development in Poland is relatively immature.

Although the Polish economy is performing strongly compared to other European countries – and Poland was one of the few countries to avoid recession in 2008 – there is a general fear within the country of the potential impact of decarbonisation on the economy. As such, industry, the media and large parts of government are highly antagonistic towards climate change policy and the low-carbon agenda. The Polish government has been lukewarm in its approach towards the EU's 2020 climate package (despite signing up to it⁴²) and is vehemently opposed to raising the EU carbon reduction target for 2020. In a significant move, Poland's environment minister recently vetoed commission proposals to introduce interim milestones for EU emissions reductions through to 2050.⁴³

42 It is also worth noting that the ruling Civic Platform party is generally seen as pro-European and integrationist.

43 <http://www.reuters.com/article/2012/03/09/us-eu-environment-idUSBRE8281DV20120309>. Poland was the only member state to veto the conclusions of the March 2012 meeting of EU environment ministers on the grounds that the text mentioned commission proposals to reduce EU emissions by 40% by 2030, 60% by 2040 and 80% by 2050. In a previous council meeting, Poland also vetoed commission plans to raise the EU's 2020 carbon reductions target from 20–25%.

There are understandable reasons for this stance: coal is responsible for over 90 per cent of Poland's electricity supply, and the country has large mining, steel, iron and other energy-intensive industries. As a result, many in Poland increasingly view the transition to a low-carbon economy as a largely European initiative that at best fails to appreciate the nature and challenges facing Poland's coal-based economy and at worst, seeks to actively undermine Polish economic competitiveness.

A roundtable discussion was held in Warsaw on 1 March 2012, hosted by IPPR and the Institute of Public Affairs, a Polish thinktank that contributes to informed public debate on key Polish, European and global policy issues.

There are a number of seemingly intractable challenges facing the low-carbon agenda in Poland, with dependence on fossil fuels chief among them. The current debate in Poland is focused on the cost of decarbonising for the economy and, by extension, the energy and industrial sectors. According to recent modelling by the World Bank, reducing carbon emissions by 30 per cent by 2030 (against a 2005 baseline) using existing technologies would cost the Polish economy 1 per cent of its GDP per annum (around €3 billion), at a price of €10-15 for every tonne of carbon-equivalent reduced.⁴⁴ Although the economic cost in output and employment of Poland achieving its 2020 emissions targets is estimated as higher than for the average EU country, this is deemed affordable by the report's authors. While the cost to the economy is expected to peak in 2020, from 2030 emissions reductions are expected to increase GDP. In time, the transition will bring tangible benefits in terms of growth and jobs. Nevertheless, the transition is seen as incredibly challenging for Poland and there is general uncertainty regarding the specific impact of climate policies on its industry, businesses and consumers.

Challenges and barriers to decarbonisation

Far and away the largest immediate challenge is the state of Poland's energy infrastructure, much of which is outdated and inefficient: 40 per cent of its power plants are over 40 years old, while 15 per cent were built 50 years ago. Poland's grid – which is mainly powered by large plants owned by state-owned utilities – caters heavily for fossil energy (principally hard coal and lignite) and is less suited to decentralised electricity generation such as renewables. While the Polish government recognises the need to upgrade its energy generating stock and diversify its energy mix, the cost of investment is a significant barrier. Planned investments in 8,000 MW of new, more efficient coal plants were due to come on-stream by 2017, but are now expected to be delayed due to cost and administrative barriers. The high upfront capital cost of renewables – compared to conventional sources of energy – is a barrier to their deployment. At the same time, officials are reluctant to close inefficient plants because of concerns over security of supply and projected increases in demand for energy in Poland.

Polish policymakers also perceive carbon leakage as a major challenge and threat. A recent paper by Krzysztof Zmijewski (2011) suggested that Polish industries would relocate abroad if Europe raised its ambition on carbon reduction. However, many roundtable participants thought that the risk of carbon leakage is being overplayed in Poland and questioned whether it was really happening. Indeed, the Polish energy sector has largely been sheltered from the EU ETS after the Polish government managed to secure up to 70 per cent free allowances for the sector until 2013 (although this will decline to zero in 2020). For some industry participants, this 'derogation' was distorting

44 http://siteresources.worldbank.org/ECAEXT/Resources/258598-1256842123621/6525333-1298409457335/report_2011.pdf

the ETS and ‘postponing the moment at which [Poland would]... have to face the reality of the market’, which would potentially lead to higher adjustment costs in the longer term.⁴⁵ Other participants felt that other industries – such as paper and cement – should be entitled to similar treatment with regard to free allocation of ETS allowances as the energy industry, as they are also at risk.

In general, many participants regarded the lack of a sufficiently developed or consistent policy framework for energy and climate change as a barrier to the transition. Policy is piecemeal and tends to be formulated in response to EU directives. Although Poland has a 2030 energy strategy, many asserted it is out of date and includes some unrealistic projections, particularly regarding the potential for installed nuclear capacity. Stable and secure policy is critical to attract businesses and investors to low-carbon projects and encourage utilities to decarbonise Poland’s power grid. Participants maintained that a related issue is that the Polish banking sector does not seek out opportunities to invest in either the low-carbon or conventional energy sector. The available funding is typically small scale.

One area that boasts more developed policy is renewables. In 2011, renewable energy accounted for approximately 7.8 per cent of total energy production in Poland, with hydro, biomass, biogas and (more recently) wind making the largest contributions. Deployment has been boosted by Poland’s ‘green certificates’ scheme – which guarantees producers of renewable electricity a premium price – coupled with quota obligations on energy utilities to source a certain proportion of electricity from renewables. However, a new draft renewables act proposes a new index scheme that will effectively reduce the subsidy for certain renewables, including biomass combustion and onshore wind, and introduces the possibility of changing the levels of support every three years.⁴⁶ Many participants viewed this as a retrograde, if inevitable, move after similar steps have been taken to reduce FITs in Germany, France and other European countries. Although some participants thought subsidies were initially set too high – which had led to increased energy prices – all felt it was important to provide policy certainty and clarity to investors. Some participants criticised the fact that subsidies were primarily accrued by the larger energy companies.

Political intransigence is a substantial barrier to progress. Participants speculated that politicians from each of the main parties avoid talking about climate change policy in part due to the highly sceptical media and public discourse on the subject. As one non-governmental organisation participant said, ‘climate change in Poland [has become] more a discussion of how to fight the [EU’s 2020] climate and energy package’⁴⁷ than fighting climate change itself. Since government ministers and officials have formulated policy in response to European directives, rather than setting out a proactive agenda, the wider debate in Poland revolves around the notion of the ‘Europeanisation’ of Polish energy policy (Grosse 2011). Participants described the government as trying to ‘dance two dances to satisfy two different constituencies... a waltz for the EU and a Polish folk dance for local public opinion’.

That said, energy is seen as an increasingly important political issue and is ‘starting to be taken seriously’. The energy portfolio is currently housed in the Ministry of the Economy –

45 It has also been noted that the economic impact of a 7-year derogation on a coal plant with an operating timeframe of 40 years would be minimal (see Scott and Hinc 2011).

46 <http://businesslawblog.eu/2012/01/27/new-energy-law-to-be-adopted-in-poland%E2%80%93act-on-renewable-energy-sources-comments/>

47 Solidarna Polska – a splinter group from one of the mainstream right parties – has launched a petition for the government to withdraw from the EU 20-20-20 package.

run by the deputy prime minister – but there have been talks to create a separate ministry. This change has met resistance due to political tensions within the ruling coalition (the deputy prime minister is the leader of the junior party in the coalition). One participant also suggested that there was limited political appetite for renewables and other dispersed forms of energy because they are seen as an attempt to break up the big state-run energy utilities that harbour ambitions to compete against other big energy companies in the European market.

Decarbonisation of the transport sector faces several obstacles. One participant noted a contradiction between the EU's climate goals and the use of EU funds to invest in high-carbon transport infrastructure. The government plans to set up a new investment programme for road projects, which will be partly financed by reallocating €1.2 billion of European cohesion funds originally earmarked for rail investment. This programme will encourage road transport use, which is still relatively low in Poland compared to other countries (World Bank 2011: 19).

Opportunities presented by the low-carbon transition

Despite the substantial economic, policy and political challenges, there are clear opportunities for reducing emissions in Poland. In the short term, replacing Poland's most inefficient power plants – some of which have a gross production capacity of less than 32 per cent – with more modern, cleaner coal units fitted with the best available technology would be a cost-effective option for utilities and help reduce their environmental impact. In the longer term, CCS is likely to be an important technology for Poland, as and when it becomes commercially viable. Poland is reportedly interested in taking a lead on CCS and is seeking EU funding for a planned demonstration plant at Bełchatów.⁴⁸

Other participants argued that coal may not be the best energy option for Poland, since domestic supplies are increasingly difficult to reach and therefore costly to excavate. Indeed, Poland is currently a net importer of coal. Local communities are also protesting against new lignite mining, which is adding to the perceived investment risk. Hence alternative sources of energy will increasingly be sought.

Increasing the proportion of natural gas in the mix is a potential low-cost option for Poland, although there are fears that this would leave the country open to Russian imports – hence gas is a relatively tightly regulated market.⁴⁹ The first nuclear plants are not expected to come on-stream until 2020, although many of the experts we consulted felt this was optimistic. There are concerns over how nuclear build can be financed and doubts over whether the state-run power company, Polska Grupa Energetyczna, could afford a majority stake in addition to the high generating subsidies that will be required. Participants predicted that a shale gas boom could fundamentally change the energy mix in Poland in favour of lower carbon sources, although some raised concerns about the safety and environmental effects of fracking.

Despite concerns about changes to the subsidy regime, some participants were still optimistic about the prospects for renewables and other decentralised forms of low-carbon energy. They identified solar thermal, renewable heat, co-combustion (coal and biomass) and electrification of the transport sector as areas that are experiencing some progress – albeit slowly and with limited investment. Participants also observed that there are huge opportunities in energy efficiency for new residential buildings and retrofitting

48 <http://sequestration.mit.edu/tools/projects/belchatow.html>

49 Interestingly, however, Poland imports a substantial proportion of cheap brown coal from Russia.

existing commercial buildings, but that there is limited policy in this area. In April 2011, a new law was introduced that mandated power companies to buy (and allows them to trade) certificates in energy efficiency. A new national action plan for energy efficiency is due to be introduced soon, although some felt it was not ambitious enough. On the positive side, participants noted that Poland's business community is becoming aware of the opportunities of investing in low-carbon energy and energy efficiency and that there is already 'a long list of companies that are making money on CO₂ reduction'.

In general, many participants thought that the debate in Poland is skewed towards the costs of reducing emissions and that there is not enough discussion of the benefits. They suggested that more awareness was needed about the health benefits of curbing carbon and the resulting reductions in healthcare costs. According to the European Agency of Environmental Protection, the cost of polluted air in Poland is €12–18 billion annually. Greater public awareness of the potential cost of climate change impacts on Poland – such as flooding and forced migration – was also believed to be important.

Creating jobs in low-carbon sectors is a key opportunity for Poland, but receives little attention in the debate. Although precise job estimates are difficult to come by and heavily influenced by modelling assumptions, several studies predict positive trends. The Polish Institute for Eco-development, for instance, has suggested 330,000 new jobs could be created by 2020 as a result of thermal modernisation in Poland. Participants concluded that government needed to take these and other benefits into account in their analyses, as well as the social and economic costs of not reducing emissions.

However, there is a prevailing sense in Poland that the EU 20-20-20 climate and energy package will primarily provide opportunities for richer member states, while poorer ones such as Poland will lose out – not least because of its industrial and energy structure. There was little discussion of the types of low-carbon technologies or sectors in which Poland might develop or gain comparative advantage. Participants generally believed that these types of opportunities would mainly come to richer EU member states.

Policy ideas from industry stakeholders

Poland faces a particularly challenging outlook in terms of placing its economy on a low-carbon trajectory. Nevertheless, the majority of participants thought that a low-emissions economy is achievable in the long run, provided that political will and suitable transition policies are in place. However, far more needs to be done to engage civil society in a serious public debate about the costs and benefits of the transition, and about what kind of economy Poland ultimately wants.

Many participants agreed that a clear long-term domestic policy framework covering all of Poland's key sectors was long overdue. A low-emissions roadmap is being drawn up by the Economics Ministry and is expected to be published in 2013, although it was unclear whether this document would contain a sufficiently robust cost-benefit analysis or prescribe specific policy options. Without a clear and costed proposal, many participants asserted that any analytical document or roadmap would have a limited impact on political and public debate.

In addition, any current and future policies to stimulate low-carbon growth and reduce emissions should provide clarity and certainty to businesses, investors and consumers. The private sector in Poland want 'clear and predictable regulations so that they can draw up sensible business plans'. The proposed changes to the existing support framework for renewables were described as unhelpful in this regard. Given that the 2020 targets are

out of sync with planned energy investment timeframes, one business sector participant called for an updated energy policy framework or ‘energy security doctrine’ that sets out a vision for a diversified energy sector mix through 2030.

Others favoured a less prescriptive approach to decarbonisation and suggested that a sufficiently robust carbon price – delivered by the ETS – would enable Polish industry and businesses to identify and pursue the most cost-effective routes to abatement. One participant suggested that a low-emission economy should be viewed as ‘an organic phenomenon’ and that EU directives and targets, particularly for renewables, have inadvertently distorted the cap-and-trade system and increased economic costs.⁵⁰ The same participant felt that as the Polish economy slows (1–2 per cent annual GDP growth is expected by the end of the decade, compared to 4–5 per cent growth today), this would reduce energy consumption and therefore emissions. Others, however, thought this was an insufficient and unsustainable strategy to achieving decarbonisation.

Poland is not the only country facing difficulties. Many member states are expected struggle to implement the EU’s 2020 package in its entirety, not least because of the economic and debt crises afflicting the eurozone. Pressure is also mounting from outside, as recent wrangling with China, Russia and the US over EU plans to extend ETS costs to international aircraft carriers suggests. These difficulties notwithstanding, many participants felt that EU policymakers need to develop a clear picture of the challenges facing Poland, become more sensitive to its concerns and help the government break down the barriers that are inhibiting decarbonisation. Several participants thought the EU’s upcoming budget for 2014–2020, known as the multiannual financial perspective, would be important and that it was important to safeguard financing for low-carbon investment projects. Others suggested that auction revenues from the ETS should be invested in new low-carbon infrastructure and used to incentivise energy efficiency (for example, tax incentives for households that consume less electricity).

Some participants expressed optimism, however. Whereas Poland had previously merely accepted and implemented policy directives from Brussels, participants pointed to increasing Polish engagement at the EU level on climate matters, which – despite being largely negative – was deemed to be better than a policy of disengagement and isolation. Poland now needs to set out a constructive proposal for how best to achieve its domestic transition, including what policy instruments it might use and the barriers and challenges it faces.

⁵⁰ According to this participant, the EU renewables directive is incompatible with the EU ETS cap-and-trade mechanism because the more renewable energy that is in the mix, the less demand there is for emissions allowances (from energy sector participants in the ETS), which in turn will reduce the price of carbon and discourage investment in low-carbon alternatives.