2012 Communication, the Commission criticized the member states as being 'slow in adjusting their national legislation' and often pursuing 'inward-looking or nationally inspired policies', both of which hampered the effectiveness of the adopted policy measures (European Commission 2012d). Nevertheless, the European Council decided to set 2014 as the deadline for the full completion of the internal gas and electricity markets (European Council 2011). In February 2014, the Commission announced an important milestone in that pursuit when electricity grid operators and power exchanges from 14 EU member states (Belgium, Denmark, Estonia, Finland, France, Germany, Austria, UK, Latvia, Lithuania, Luxembourg, the Netherlands, Poland, and Sweden) joined Norway in inaugurating a pilot project for one-day-ahead market coupling (European Commission 2014e) and, as of May 2014, the Commission was working on a regulation to make the practice of market coupling binding for all member states. Such efforts notwithstanding, the EU in mid-2014 still lacked the fully integrated electricity and gas markets that it deems vital to a functioning internal energy market; and it remains to be seen whether those markets will deliver the expected results when they ultimately come to fruition.

Chapter 6

Climate Change, Energy Efficiency, and the Quest to Expand the Use of Renewable Energy Sources

In recent years, the Commission increasingly emphasized the importance of finding 'cost-efficient ways to make the European economy more climate-friendly and less energy-consuming' (European Commission 2015a). To that end, responsibility for all climate-related topics previously held by the DG for Environment was assigned in February 2010 to a DG for Climate Action. In 2014, Connie Hedegaard, then Commissioner for Climate Action, noted that the ambition of the EU member states in realizing these targets should serve as a motivation for other countries to similarly aim for environment-friendly economic growth (Hedegaard 2014). Hedegaard's comments are indicative of how climate actions stand at the crossroads of internal and external policymaking. It is internal insofar as it relates to the regulation of energy efficiency standards and the promotion of renewable energy forms in the EU. The external dimension applies to the EU's international obligations and its claim to fame as a united political force on the world stage. The EU's external climate policy agenda was clearly driven by the entry into force of the United Nations Framework Convention on Climate Change (UNFCCC) in March 1994 (Oberthür and Pallemaerts 2010). The Convention 'sets an overall framework for intergovernmental efforts to tackle the challenge posed by climate change' (UNFCCC 1994) and has since been ratified by 195 countries (UNFCCC 2015). We identified climate change policies as multidimensional (see Chapter 1) precisely because the goals set within its context are unachievable without specific internal regulations, particularly increases in efficiency, reductions in the use of carbon-intensive fuels, and international reciprocity.

Although there existed a general consensus in the EU on the need for action to mitigate global warming during the early days of the EU's climate policy, the policy process was dominated by differences between the EU member states on the appropriate instruments. These differences resulted in the member states' inability to adopt binding targets for the participating countries: 'The lack of clear mitigation commitments in the UNFCCC resulted in the failure to establish effective GHG mitigation policies at the EU level [...]' (Oberthür and Pallemaerts 2010: 53). Today, the EU understands itself very much as an international agenda-setter in the area. According to the DG for Climate Action (European Commission 2014o), the EU has been a 'driving force in international negotiations on climate change' and has made a major contribution towards a new global climate agreement. It has since changed that description, now placing itself 'at the forefront of international negotiations for a new global climate agreement' (European Commission 2015b). Despite this slight change, opposing voices, especially among scientists, emphasize that the EU is losing its impact in global climate change negotiations. Indeed, there has been a notable lack of progress since the United Nations Climate Change Conference met in Bali in 2007 and adopted measures aimed at reaching a binding agreement to succeed the Kyoto Protocol by its Copenhagen Summit meeting in late 2009 (known as the Bali Roadmap; UNDP 2008, UNFCCC 2007). Progress has since been slow and convoluted. The Copenhagen Summit failed to deliver on its promise. The resulting Copenhagen Accord produced neither a legal treaty nor a target year for peaking emissions, illustrating 'a worrying trend' (Fernandez Martin 2012: 193) that the EU was losing its status as an environmental champion.

This chapter provides a state-of-the-art snapshot of current EU climate policies and future goals by examining the EU's measures to increase the share of its renewable energy sources, to strengthen energy efficiency, and to introduce new technologies and materials such as carbon capture and storage (CCS), nuclear fusion, large-scale wind, and concentrated solar power (CSP) plants.

Increasing the share of renewable energy sources

One of the first initiatives concerning the promotion of the share of renewable energy sources was the Commission's White Paper *Energy for the Future: Renewable Sources of Energy* issued in

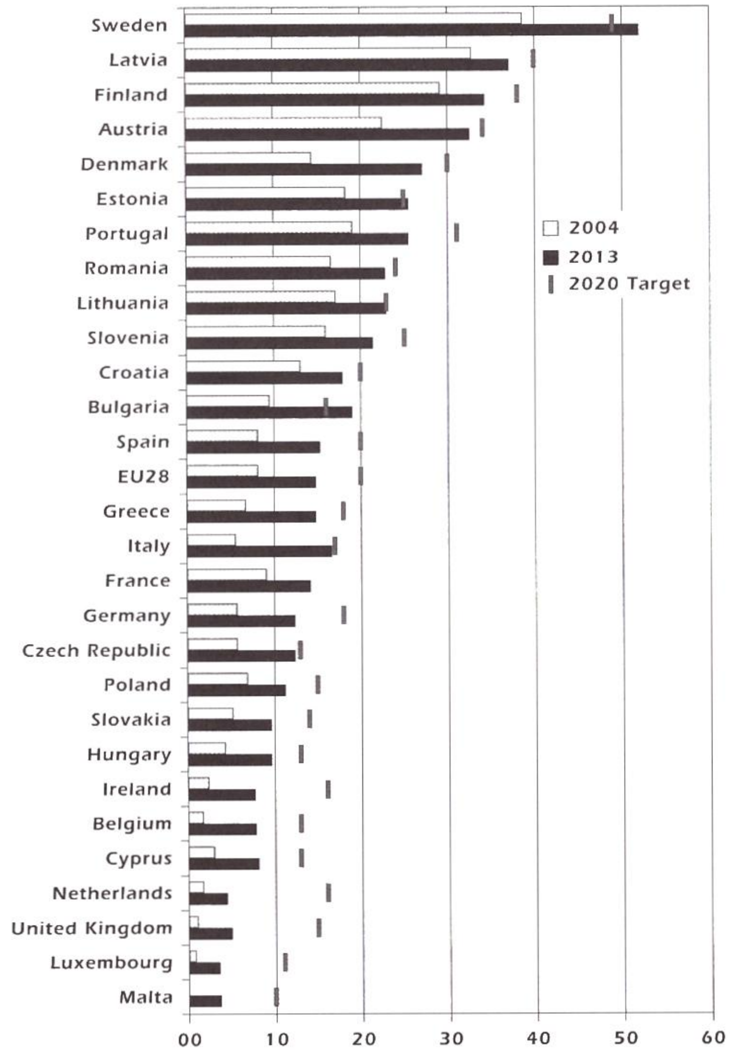
November 1997 (European Commission 1997). This initiative was based on three arguments. First, replacing fossil energy sources should contribute to reducing carbon dioxide emissions resulting from the use of oil, natural gas, and coal. Second, increasing the share of renewable energy was expected to reduce the Community's dependence on energy imports from other countries by utilizing domestically available sources of energy for electricity generation. Third, by promoting renewable energy sources, the demand for innovation should be increased, strengthening the regional economy and providing new employment opportunities (Howes 2010) (i.e. introduce a new industrial age commonly referred to either as a green or low-carbon economy). According to the Commission, renewable energy sources were 'unevenly and insufficiently exploited in the European Union' (European Commission 1997). Therefore, the White Paper set the goal of doubling the share of energy provided by renewable sources to 12% by 2010. In so doing, the Commission laid the groundwork for a cause–effect policy model (increased use renewables equates to reduced GHG output) that would serve as the basis for its future climate change policies and lead to multiple rounds of increasing renewable targets (European Commission 2008a, b, 2011a–c, 2013f).

In March 2006, the European Council pointed to the need of assigning the EU a leading role in combating climate change and asked the Commission to develop an action plan on how to promote renewable energies in the long term. In so doing, climate change was used as a political tool to centralize energy-related issues traditionally restricted to the sole authority of the individual member states. This is also reflected in the *Renewable Energy Road Map* (European Commission 2007m), which emphasized the value of renewable energy sources for a sustainable future: 'They [renewable energy sources] are largely indigenous, they do not rely on uncertain projections on the future availability of fuels, and their predominantly decentralised nature makes our societies less vulnerable' (European Commission 2007m).

Based on these assumptions, the Commission proposed in January 2008 its 20-20-20 targets (European Commission 2008a, b), which included: (a) increasing the share of renewable energy in total EU energy consumption to 20%, and the share of biofuels in transport to a binding minimum target of 10%; (b) cutting greenhouse gas emissions by at least 20% (below 1990 levels); and (c) reducing energy consumption by 20%. In order to achieve the overall 20% target in the renewables sector, Directive 2009/28/EC of 23 April 'on the promotion of the use of energy from renewable sources' (EP/Council 2009d) required the member states to adopt national action plans indicating the measures intended to realize the Commission's goals. However, in a clear indication of the perennial problem of harmonizing member-state interests, particularly in relation to their national energy, the individual targets each member state had to fulfil varied substantially, ranging from 10% in Malta to 49% in Sweden (EP/Council 2009d: Annex 1). Figure 6.1 lists the national overall targets for the share of energy from renewable sources in gross final consumption of energy for 2020, and compares these to the share of renewables in consumption in 2004 and 2013. As the data shows, substantial changes are still required in France, Germany, and the United Kingdom, three of Europe's most important industrial economies.

In order to increase the share of renewable energy in energy consumption, the Commission consistently draws special attention to the transport sector. The Renewable Energy Road Map (European Commission 2007m) called for not only a general increase in renewables but also an overall reduction in annual fossil fuel consumption, by over 250 Mtoe, by 2020. Touching upon all three dimensions of the energy policy typology, it described the advantages of replacing fossil fuels in terms of, for example, a reduced dependence on imports from non-EU countries (external), new investment opportunities in the renewable energy sector (internal), decreased CO_2 emissions, and improved air quality (multidimensional). However, especially with regard to the Commission's goal to increase the amount of biofuels in transport, conflicting interests between a wide range of actors, including scientists and politicians, prevented sustained success. The central scientific critique (e.g. IEA 2008, OFID 2009) emphasized that the production of biofuels negatively affects other industry sectors, such as agriculture, private consumption, and health. Another argument raised against biofuels is that they were not necessarily more environment-friendly than fossil fuels, because of the huge amount of energy necessary to produce them, which could, and probably does, potentially increase CO_2 emissions rather than reduce them (Howarth et al. 2009, Pimentel and Pimentel 2007: 269).

Figure 6.1 *National targets for the share of energy from renewable sources in gross final consumption of energy in 2004, 2013, and 2020*



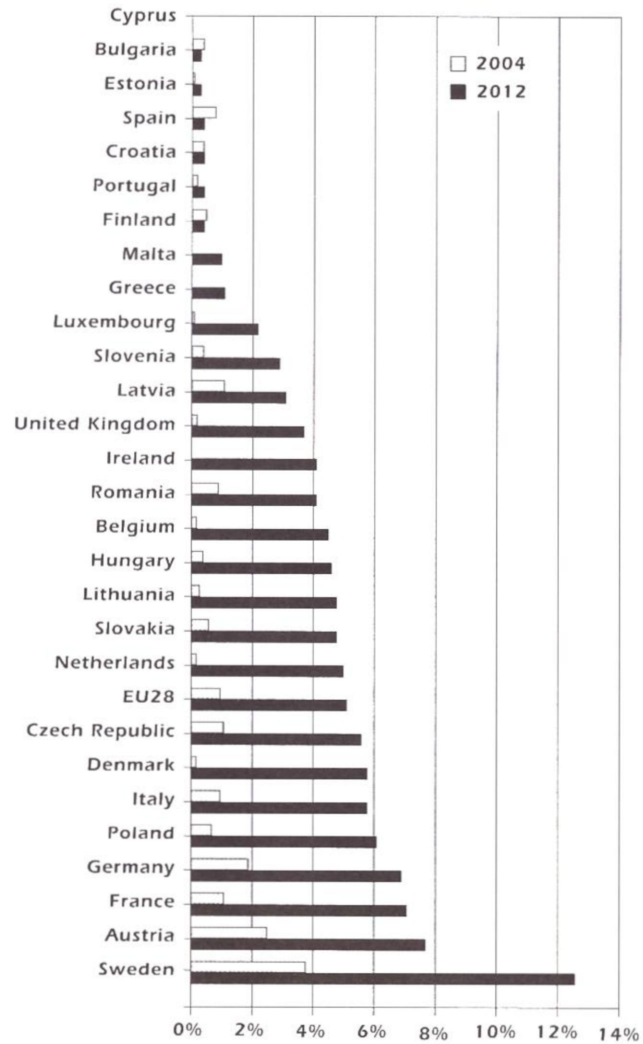
Sources: EP/Council (2009d: Annex I), Eurostat (2015g–h)

In response to these critiques, the EU passed Directive 2009/28/EC (EP/Council 2009d) 'to ensure [only] the use of sustainable biofuels' that 'generate a clear and net GHG saving without negative impact on biodiversity and land use' (Eurostat 2015e). Thus, it raised the target for the share of renewable energy in transport from 5.75% by 2010 (EP/Council 2003a) to a minimum of 10% in every member state by 2020. In contrast to the overall Union-wide target for the share of renewable energy sources, which led to individual targets in each member state, the share of biofuels in the transport sector was uniformly set for all member states. The Commission justified this by the fact that biofuels, although unevenly produced across the Union, could be acquired easily from those so endowed (EP/Council 2009d).

In 2011, the Commission went even further, calling for the elimination of conventionally fuelled cars in European cities by 2050 in its White Paper on Transport (European Commission 2011c). However, in order to limit land conversion for the production of biofuels, the Commission published a proposal in 2012 for a directive amending Directive 98/70/EC and 2009/28/EC, limiting the share of energy from food-based biofuels – meaning those produced from 'cereal and other starch rich crops, sugars and oil crops' – to 5% (European Commission 2012b). While unique in their use of land, targets in the biofuels sector thus exemplify one of the main complications in achieving climate change targets: that the practical fungibility of carbon-rich fossil fuel resources is questionable when one considers the full impact of their use on the environment.

An analysis of biofuel penetration in the EU's transportation sector reveals a mixed bag of uneven success (Figures 6.2 and 6.3). While the share of renewable energy in fuel consumption in the transport sector has risen (Eurostat 2014) since 2004, Europe's road to increased use of biofuels has been disproportionate among its members (Figure 6.2). In 2004, the average biofuels market share in the EU was only 1.0%, but rose to 2.8% in 2007, and then to 5.1% in 2012. While the percentages of market penetration are not high in absolute terms, the growth rates have been substantial where biofuels have found a reliable position in the market. Between 2004 and 2012, the share in Sweden rose from 3.8% to 12.6%, and in the UK it grew from 0.2% to 3.7%. This growth has not been the case everywhere, and there has even been a decline in some countries in recent years. In Cyprus, for example,

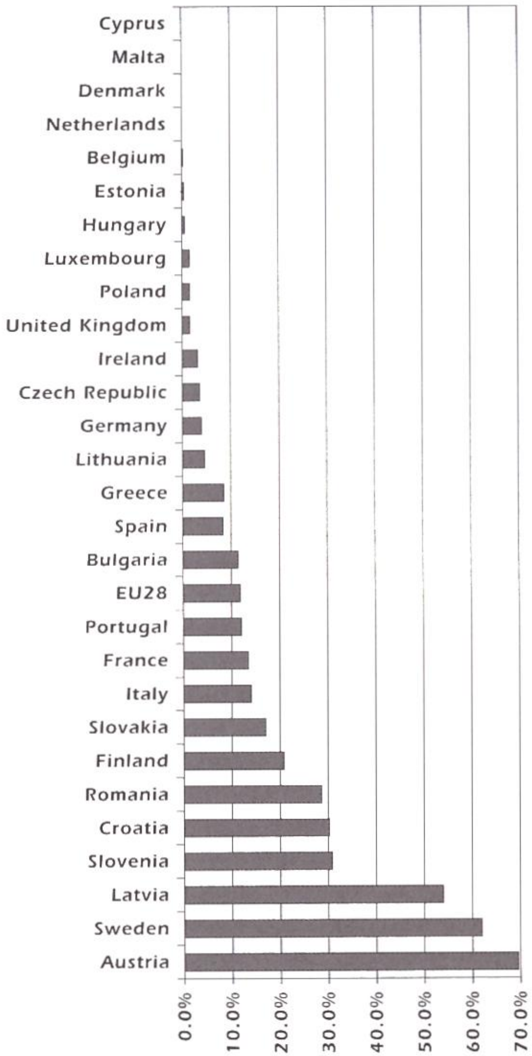
Figure 6.2 *EU28 renewable energy share in fuel consumption by transport (2004 and 2012)*



Source: Based on Eurostat (2014a) data

there were virtually no biofuels on the market in 2004. Their share peaked at 2.0% just five years later in 2009, but then dropped again to nil in 2011.

Figure 6.3 *Primary hydroelectricity production share of electrical energy available for final consumption in the EU (2012)*



Source: Based on Eurostat (2014b, c) data

In addition to biofuels, the Commission sees significant potential in hydropower (and particularly small hydropower systems) to optimize electricity production and react to fluctuations in

energy demand. Hydropower was the source of approximately 16% of global electricity generation in 2011, and the EU27 consumed approximately 9% of the world's hydroelectricity (European Commission 2014j: 16, IEA 2012: 7). In 2012, EU-based hydropower facilities constituted 15.6% of all EU-installed electricity capacity (almost 149 GW) and almost 46% of all of its renewable sources of electricity at 366 TWh, an output level that has held fairly steady since 1990 (European Commission 2014j: 88–90). Again, analysis of the data reveals a huge difference between the member states, with some producing no hydropower at all, while others such as Austria that in 2012 generated almost 70% of its electricity from hydroelectric sources (Figure 6.3).

Hydropower is a vital and reliable source for countries such as Austria, Latvia, and Sweden. However, it is of little use to a country in short supply of flowing water, such as Malta or Cyprus. Moreover, Europe's total hydroelectric capacity is relatively small when compared globally. The world's largest producer of hydroelectric power is China, which generated 699 TWh in 2011, or 19.6% of the world's total production that year, followed by Brazil's 428 TWh and Canada's 376 TWh. Together with the United States' 345 TWh, those four producers generated over 50% of the world's hydroelectric power (IEA 2013a: 19).

Beside its focus on biofuels and hydropower, the Commission considers wind power to be a highly promising renewable energy source. The wind power industry is a rapidly growing industry in the EU, making up 'around one third of all installed electricity generating capacity in the EU' since 2000 (European Commission 2014p). According to projections by the Commission, in cooperation with the European Wind Energy Association (EWEA), given sufficient support from all levels, 'onshore wind will be the largest contributor to meeting the 34% share of renewable electricity needed by 2020 in the EU, as envisaged by the 2009 Directive' (EWEA 2009: 6). Unsurprisingly, in order to realize this goal, EWEA logically calls for long-term EU investment in related technology and policy research, such as the North Seas Offshore Electricity Grid (NSOG) (see Chapter 5).

Similar to other renewable technologies, wind power technology is not free from questions. There are serious disadvantages and negative externalities as well. The most important ones include the unreliability of wind speeds, the high costs of related infrastructure, and the resulting environmental impacts, for example, from the removal of vegetation in places where plants are being built. Also relevant are the negative effects on the living conditions of populations located in the vicinity of wind farms, particularly noise and visual pollution, and reduced property values. The Commission recently emphasized that in order to continually increase the share of electricity generated from wind power in EU consumption, wind turbines have to move offshore. In early 2014 wind farms under construction were poised to add another 4,900 MW to the EU's overall installed wind power capacity. In the first six months of 2014 alone, more than 220 new offshore wind turbines were installed, with a combined capacity of 781 MW, and another 310 were awaiting connection to the grid (EWEA 2014). Despite these latest efforts, however, offshore wind farms have as yet contributed very little to meeting the EU's energy demands (Table 6.1), and given both the enormous investments required to build up wind energy resources and the long-term impact of forcing generators to overproduce electricity to ensure grid stability, there remains serious scepticism about their long-term economic viability. As Table 6.1 shows, wind energy generated only 205.8 TWh of gross electrical energy in the EU, or roughly a quarter of all renewable-based electricity, in 2012. Meanwhile, renewables accounted overall for only a quarter of the EU gross electricity generation, while nuclear power accounted for little more than another quarter. Just under half came from conventional thermal sources, including 18.7% from natural gas and another 27.4% from hard coal and lignite.

This continued concentration of carbon-rich fuels in the EU's energy mix reveals the limited progress made by the member states on the climate change front when it comes to power production. While the use of coal across the Union has certainly declined since 1990 (from 39%), as did the share of nuclear (down from 30.6%), and renewables have largely taken their place (up from just 12.6%), several member states, including some of the most adamantly pro-environment such as Germany, continue to rely heavily on coal. Indeed, the mix of energy resources used for electricity generation varies significantly across the Union (Figure 6.4). For example, in 2013, both Austria (60.5%) and Latvia (62.5%) generated more than half of their electricity production using hydropower. However, half of Slovakia's (55.3%) and Belgium's (51.3%) electricity came from nuclear power stations, which also accounted for 75.5% of France's electricity generation. Meanwhile, Malta (100%) and

Table 6.1 *EU28 gross electricity production, 2012 (in % and TWh)*

	Share	*TWh*
Renewables	24.2%	798.7
- Wind	6.2%	205.8
- Hydropower	11.1%	366.4
- Geothermal	0.2%	5.8
- Tidal/Wave	>0.1%	0.5
- Biomass	4.5%	149.4
- Solar	2.2%	71.0
Nuclear	26.8%	882.4
Conventional thermal	49.0%	1,614.1
- Solid Fuels	27.4%	901.8
- Gases	18.7%	614.7
- Petroleum	2.2%	72.5
- Non-RES Wastes + others	0.7%	25.1
Total	100.0%	3,295.2

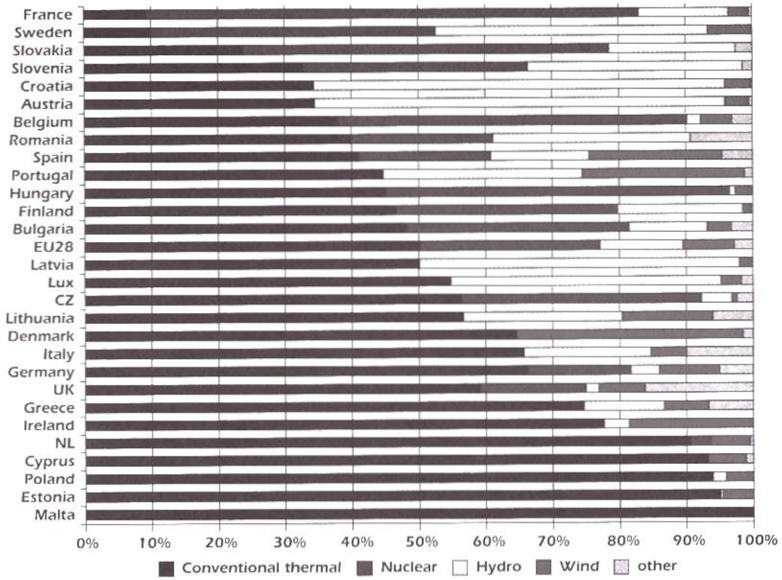
The total figure for renewables of 798.7 is that quoted in the EU report. However, the actual sum of the individual totals is actually 798.9.

Source: European Commission (2014j: 91)

Cyprus 95.8%) rely almost exclusively on oil-fired power stations for their electricity.

Part of the problem in achieving the ambitious targets adopted in Brussels stems from the fact that the Commission can neither mandate the actual energy mix of resources used in the production of electricity in its member states nor can it manage the exploration and development of its own energy resources. Unlike the world's other major energy producers and consumers, the EU has no centrally managed public lands upon which it can coordinate offshore drilling or mining – a fact that greatly complicates the

Figure 6.4 *Breakdown of electricity generation by source, 2013 (in %)*



Source: Based on Eurostat (2014b, d, e) data

coordination of policies, particularly with respect to increasing or reducing domestic fossil fuel production. Yet even if the EU could centrally control national energy mixes, mining, and exploration activities, there is no guarantee that it could overcome all the other obstacles associated with those activities, or prevail over the complex set of political and economic interests of the many actors (see Chapter 4) involved the EU's energy sector. Hence, despite the progress in some areas, the overall trends in the renewable sector have to be assessed cautiously.

Based on a conservative evaluation, the share of renewable energy sources is projected to decline in comparison to other energy sources because economic crises, administrative and infrastructural barriers, policy shifts, and support-scheme disruptions repeatedly hamper investment in the sector (ECOFYS et al. 2012). For example, production capacities in the biofuels market have been insufficiently exploited in recent years, reducing the impetus for further investment. As one related report notes, in 2012, biofuel production in the EU

was operating at 40% of capacity (bioethanol hovered between 50% and 60%), adding that the 'unused capacity' indicates 'that there is sufficient conversion capacity available for several years to come' (ECOFYS et al. 2012: iv). One reason for the failure to substantively increase the share of biofuels in the European transport market is that while the EU leadership sets targets for biofuels and legislates fuel-blend percentages in the consumer market, it simply cannot control how much the member states will invest in the requisite infrastructures. Despite all its achievements, the EU remains constrained by its own design.

So how does the EU plan to meet its ambitious goals? How will it ensure policy coherence across the member states? The Commission certainly is aware of the challenges responsible for the insufficient growth of the renewables sector and plans to compensate for them through increased investment in research and development and the distribution of revenues from the trade of emissions allowances (European Commission 2013d: 7). Some obstacles, however, will remain insurmountable without the full cooperation and commitment of the member states, which retain sole responsibility over key decisions about investments, licensing, and resource mixes. According to the Commission, progress in removing these barriers has been mediocre at best, and some member states have not even addressed the way in which they intend to make the necessary reforms.

In the event that EU law continues not be implemented correctly, the Commission can be expected to launch infringement proceedings against the respective member states, which it did in 2013 towards Belgium and Estonia (MEMO/13/470) and Italy and Spain (MEMO/13/820), each of which was requested to ensure full compliance with Directive 2009/28/EC. Likewise, the Commission referred Poland and Cyprus to the European Court of Justice for not correctly enacting the Renewable Energy Directive (IP/13/259).

The onus, however, cannot entirely be placed upon the member states. It would be remiss not to critically discuss the efforts initiated at the political level to increase the share of renewable energy sources in EU's overall energy mix. Renewables are expected to reduce import dependence and mitigate the risk of future oil price shocks. However, they simply are not predictable as an electricity source, at least in comparison to any fossil fuel. As one distinguished energy economist describes it, the costs resulting from this insecurity are immense (Helm 2012).

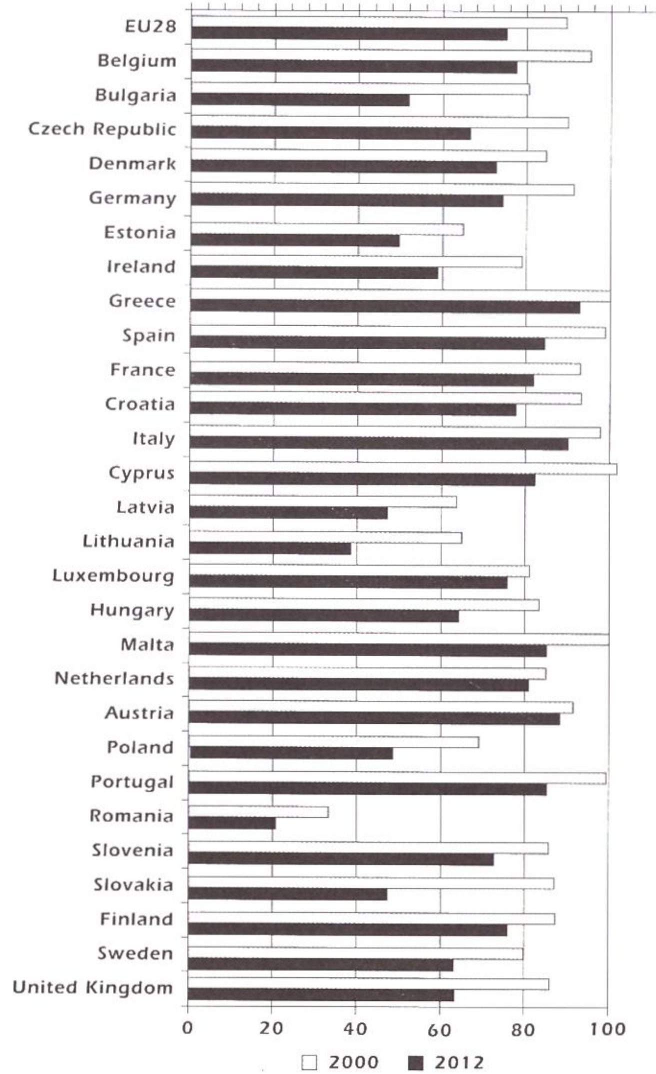
The EU's efforts to strengthen energy efficiency

Increasing energy efficiency as a means to reduce growth in consumption, particularly, but not exclusively, in terms of electricity, is a fundamental component of EU energy policy. At the macro scale, energy efficiency is measured as energy intensity, which measures the energy consumption of an economy by dividing the gross inland energy consumption (coal, electricity, oil, natural gas, and renewable energy sources) by gross domestic product (GDP). Energy intensity (EI) relates inversely to energy efficiency: the lower the intensity, the more efficient is an economy's consumption of energy.

Total energy intensity decreased in all EU28 countries between 1995 and 2012 (Figure 6.5). Yet, while the EU as a whole reduced the energy intensity of its economy by an average of 1.65% per year, individual member states' performances varied significantly. Energy intensity declined annually for most member states (Figure 6.6), on average between 1% and 4% (e.g. UK (–2.6%), Germany (–1.7%), and France (–1.1%)), but hardly declined at all in a few (e.g. Austria (–0.7%) and Italy (0.58%)), and two, Romania and Lithuania, saw substantial reductions. Averaging figures in this manner also conceals occasional annual increases in energy intensity. Such was the case for many member states that saw their EI increase in 2010 from the previous year, a phenomenon linked to the economic crisis of the preceding years and the subsequent recovery (Bosseboeuf et al. 2013).

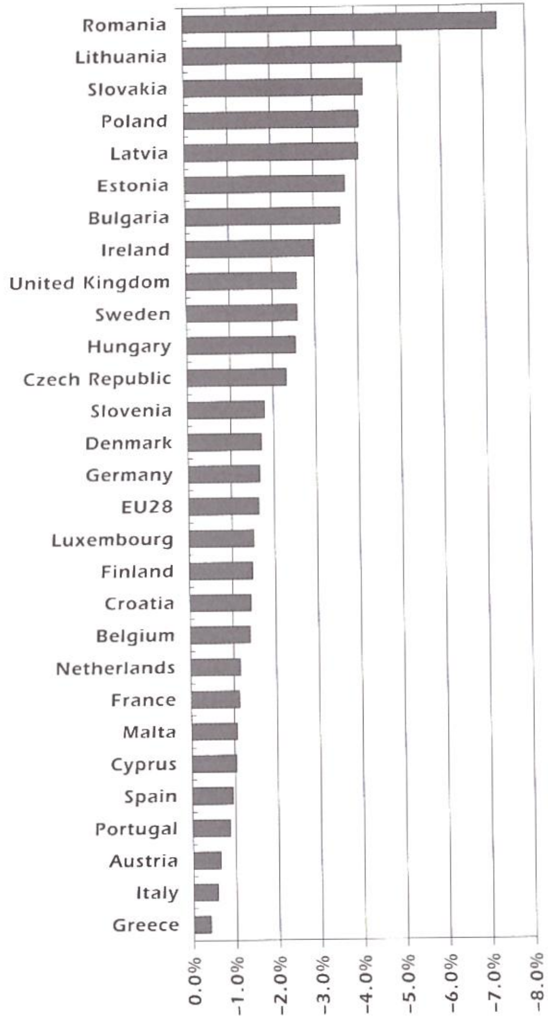
The Commission regards the increase of energy efficiency as a central mechanism to realize its overall energy policy goal of comprehensive energy security (sustainability, energy supply security, and competitiveness). This has been quite explicitly reflected in the Commission's proposals of the last decade. Already in 2000, the Commission had published an action plan to reduce the amount of energy consumed in the Community (European Commission 2000b) and in June 2005, the Commission published the *Green Paper on Energy Efficiency* (European Commission 2005). According to that plan, the EU could reduce energy consumption by 20%, reduce greenhouse gas emissions and dependence on energy imports, and create jobs in the renewable energy sector. The Commission then asked stakeholders interested in participating in the policy process to submit their positions in the course of an open consultation. In so doing, the Commission hoped to identify how it

Figure 6.5 *Energy intensity (EI) of the economy 2000 vs. 2012. (Base 1995 = 100; gross inland consumption of energy divided by GDP (kg of oil equivalent per 1,000 EUR))*



Source: Based on Eurostat (2014f, g) data

Figure 6.6 *Energy intensity, average annual change (1995–2012)*



Source: Based on Eurostat (2014f, g) data

could overcome existing obstacles in order to maximize savings, and sought recommendations on how efficiency improvements could be made in a cost-effective manner.

The Commission envisaged huge potential in the buildings sector, where it expected to save energy by introducing energy performance

certificates for all buildings exceeding 50 m^2 at their time of construction, sale, or rent, and even considered applying those measures to buildings under major renovation (European Commission 2005: 21ff). A second measure that concerned lighting worked on the premise that energy-saving light bulbs would use significantly less energy than standard ones (ibid: 22), a view that was supported in two meetings held by the Ecodesign Regulatory Committee in 2008. The latter resulted in calls for a draft regulation on how to improve energy efficiency in households and led the Commission to adopt two additional regulations requiring the eventual, total phase-out of the incandescent light bulb in Europe and replacing it with energy-saving alternatives by the end of 2012 (European Commission 2009b, c; see Chapter 4). The Commission also proposed certain requirements for heating, cooling, and electric motors in households. Finally, referring to the growth in the number of private cars and motorcycles on European roads (a by-product of Europe's economic success), it identified one of its most important goals moving ahead was to achieve substantial savings in the fuel consumption of vehicles, hence reducing overall energy consumption and CO_2 emissions in the transport sector (European Commission 2005: 23).

The action plan of 2006 (European Commission 2006b) identified further areas in which to save energy. In addition to reducing consumption in the construction and the transport sectors, the Commission proposed:

- to generally develop guidelines on improving energy end-use efficiency in all sectors;
- to better inform consumers on efficiency standards in order to transform the market;
- to offer economic incentives for energy efficiency investments, especially for small and medium enterprises;
- to review the modes of energy taxation currently applied;
- and to establish international partnerships in order to raise awareness of the issue worldwide and promote the use of energy-efficient technologies outside the EU.

These suggestions were reflected in the Commission's Communication on Energy *Energy 2020 – A Strategy for Competitive, Sustainable and Secure Energy* (European Commission 2010a), which detailed the ways in which the Commission planned to transition to a resource-efficient economy. The communication identified the need to streamline efforts to address inadequate progress in key energy policy areas such as the fragmentation of the internal energy market, insufficient security of internal energy supplies, and the disappointing nature of the member states' National Energy Efficiency Action Plans (NEEAPs). The Commission further highlighted four priority areas that, if managed and implemented correctly, could result in €1,000 of annual energy savings per European household (European Commission 2010a: 8). These included efficiency enhancements in the buildings and transport sector, industrial energy management, overall energy supplies, and an annual review mechanism for the aforementioned NEEAPs. The biggest energy-saving potential was foreseen in the buildings and transport sectors, while the main thrust of improvements in the industrial and services sector were to be made through the strict implementation of eco-design requirements for energy-intensive goods. Measures to improve transport sustainability and reduce the dependence on crude oil were described at length in an additional Commission White Paper entitled, *Roadmap to a Single European Transport Area – Towards a Competitive and Resource Efficient Transport System* (European Commission 2011c), which outlined 40 initiatives expected to lead to a 'reduction of at least 60% of GHGs by 2050 with respect to 1990' in the transport sector alone (European Commission 2011c: 3).

The Commission expected further progress on its *Energy Efficiency Plan 2011* (European Commission 2011d), which was formulated in line with the EU's target of a 20% improvement in energy efficiency and the 2020 Energy Strategy (European Commission 2010a). Therefore, it proposed a new directive on energy efficiency in June 2011 (European Commission 2011e). While the Commissioner for Climate Action, Connie Hedegaard, emphasized the directive's importance for tackling climate change (EurActiv 2011), a wave of criticism arose from environmentalists over the possibility for member states to opt out of the efficiency measures. Article 6(1) of the proposal dealt with the energy-efficiency obligation schemes and allowed the member states to set up their own schemes that should 'ensure that either all energy distributors or all retail energy sales companies operating' in the respective country's territory 'achieve annual energy savings equal to 1.5% of their energy sales, by volume' in relation to the previous year. Nevertheless, energy used in transport was excluded from the proposal

(European Commission 2011d: 20), and member states were allowed 'to take other measures to achieve energy savings among final customers' (ibid: 21).

Environmentalists were outraged. Organisations such as Friends of the Earth and the Climate Action Network argued that the directive was 'set up to fail' (EurActiv 2011) because the measures proposed were not designed to enable the EU to meet its 20% energy-efficiency target. Ultimately, the Energy Efficiency Directive, as it became known, was adopted and entered into force on 4 December 2012 (EP/Council 2012). The member states had to implement most of the provisions decided upon by 5 June 2014 and submit their National Energy Efficiency Action Plans (NEEAPs) by 30 April 2014. Despite the widespread criticism from environmentalists, the option to apply individual measures to realize energy-saving targets remained in the directive, but as consolation, the Commission expressed its intention to propose further legislation in the event that the EU failed to realize clear-cut reductions in energy consumption (EurActiv 2012).

In April 2011, the Commission proposed to overhaul existing legislation on the taxation of energy products (European Council 2003) in order to 'promote energy efficiency and consumption of more environmentally friendly products and to avoid distortions of competition in the Single Market' (European Commission 2011f, k: 1). The 2011 proposal included concrete minimum taxation levels (Table 6.2), which would have become applicable at the start of January 2013. When the proposal's text was adopted by the EP during its first reading in April 2012, and

Table 6.2 *Proposed minimum levels of energy taxation applicable from 1 January 2013*

For the purposes of motor fuels

	CO_2 related	General consumption (€/GJ)		
Applicable:	1 January 2013 (€/t CO_2)	1 January 2013	1 January 2015	1 January 2018
Petrol	20	9.6	9.6	9.6
Gas oil	20	8.2	8.8	9.6

Kerosene	20	8.6	9.2	9.6
LPG	20	1.5	5.5	9.6
Natural gas	20	1.5	5.5	9.6

For the purposes of: agricultural, horticultural, or piscicultural works, and in forestry; stationary motors; plant and machinery used in construction, civil engineering, and public works; and vehicles intended for use off the public roadway or which have not been granted authorization for use mainly on the public roadway

	CO_2 related (€/t CO_2)	General energy consumption (€/GJ)
Gas oil	20	0.15
Kerosene	20	0.15
LPG	20	0.15
Natural gas	20	0.15

Applicable to heating fuels

	CO_2 related (€/t CO_2)	General energy consumption (€/GJ)
Gas oil	20	0.15
Heavy fuel oil	20	0.15
Kerosene	20	0.15
LPG	20	0.15
Natural gas	20	0.15
Coal and coke	20	0.15

Applicable to electricity

		General energy consumption (€/GJ)
Electricity		0.15

Source: European Commission (2011f), European Council (2003)

before it came under debate in the Council, there was good reason for optimism that the rules could be reformed. When the Council began to debate the proposal in June 2012, though, it became clear that the road to any energy tax reform would be slow at best. Noting that further work was needed on a number of issues, including, among others, minimum tax rates on products and electricity (and those used in agriculture), ETS applicable installations, and how to tax biofuels, the Council merely invited the incoming Irish Presidency to continue the debate. The Council continued to debate the legislation (in June 2013 and again in June 2014), but because directives related to energy taxation require unanimity in the Council, the new measures did not survive. The Commission withdrew its proposal in March 2015 (European Parliament 2015), and it remains to be seen whether an overhaul of the energy taxation directive will ever be adopted.

In addition to the legislation on energy taxation, the Commission supports access to other means of financing energy efficiency. Both the European Investment Bank and the European Bank for Reconstruction and Development offer relevant financial schemes, as do the Cohesion Policy Funds (2014–2020), the EU Framework Programme for Research, Innovation Horizon 2020 (2014–2020), and the European Energy Efficiency Fund.

Despite the obvious advantages of reducing energy consumption for the environment, some critics claim that the introduction of energy-efficiency standards might, paradoxically, lead to an increase in industrial emissions. They argue that such measures ultimately lead to an increase in emissions (Breakthrough Institute 2011). The logic behind their reasoning is that the use of energy-efficient appliances increases consumers' disposable income by lowering the amount and cost of energy consumed. Consequently, consumers can and do use their additional disposable income to buy other goods and services, thus boosting rather than reducing demand. The subsequent increase in the production of goods needed to meet that higher demand then leads to an increase in emissions. All things being equal, this logic helps explain why automobile use increases as efficiency standards become stricter over time. To balance this argument (and its obvious negative implications for the environment), the Commission believes that it is necessary to change its citizens' (energy) consumption habits, which in turn explains why the EU puts so much effort into public awareness campaigns.

Case study: The EU emissions trading regime

Almost a decade before the Intergovernmental Panel on Climate Change (IPCC) presented irrefutable evidence that human economic activity was directly linked to increased concentrations of greenhouse gases in the atmosphere (IPCC 2007), the EU was aspiring to lead the fight against global warming. As early as 1998, the Commission outlined unilateral steps to fully implement its obligations under the 1997 Kyoto Protocol (European Commission 1999). In 2001, after consulting a broad range of stakeholders (European Commission 2000a), it proposed to establish an emissions trading scheme (European Commission 2001a), which sparked almost two years of contentious debate over whether to make the system mandatory or voluntary, which emissions to include, and whether and how to auction allowances, finally agreeing on a voluntary auction system with the optional inclusion of other sectors and greenhouse gases (EP/Council 2003d, 2004).

Under these new rules, the EU15 sought to decrease emissions by 8% from 1990 levels by the planned second trading period (2008–2012), and member states were also required to submit National Action Plans (NAPs) identifying the necessary quantity of free allocations to be granted to national energy and industrial sectors. Unfortunately, those NAPs proved to be substantially wide of the mark, resulting in a collapse of the market in 2007. The EU tweaked the system through a series of consultations and subsequent reforms, before and after the second trading period, including replacing national registries with a single Union Registry tracking verified emissions, ownership, and purchases and sales of allowances (European Commission 2013m; see also European Commission 2010). The single registry did not solve the problem of overestimating the number of annual national allocations required and, thus, by the beginning of the third trading period, the EU market was flooded with allowances that depressed prices and reduced the effectiveness of the trading scheme.

While overestimating emissions requirements proved to be a thorn in the side of the Commission's plans to establish an efficiently functioning carbon market, the original exclusion of the transportation sector, which according to the International Energy Agency produced circa 22% of worldwide emissions in

2010 (IEA 2012: 9), proved to be an open wound. It was not as though the EU wasn't already using its internal-market powers to reel in emissions from automobiles (circa 12% of total EU emissions in 2009). It did in fact establish mandatory automobile emissions targets in 2009 (EP/Council 2009e), and would later (2013) add rules to monitor emissions from new passenger cars (European Commission 2013a). However, the real challenge was tackling air travel, foremost because of the politically contentious nature of incorporating treasured national airlines into the EU-ETS.

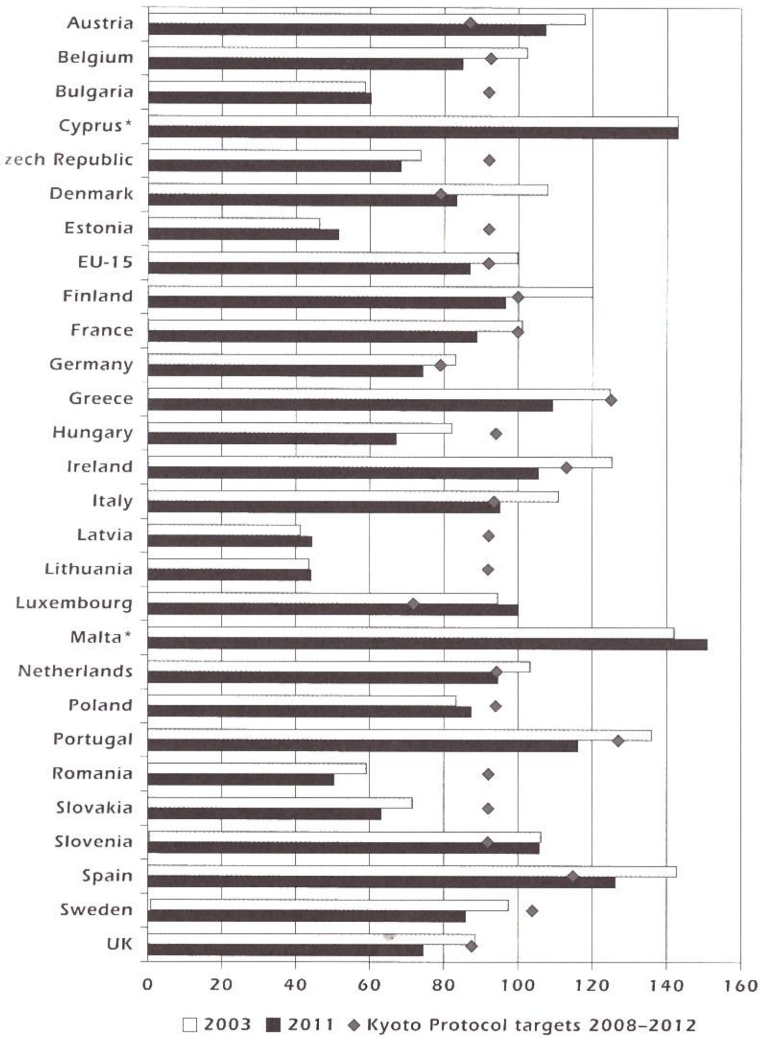
As far as the Commission was concerned, the aviation sector was insufficiently reducing emissions to offset increases in commercial air traffic (European Commission 2006c, IPCC 1999) and merited inclusion in the EU-ETS. Thus, beginning in 2005, the Commission initiated stakeholder consultations on when and how it could fit the aviation sector into its emissions trading scheme. The level of response, including inputs from 198 organizations and more than 5,000 individuals (European Commission 2005a), as well as the intensity of the debate that ensued, highlights the wide-ranging effect of the EU's internal-market mechanisms. Logically, European airline associations worried about their bottom line and strongly opposed the measure (AEA 2006), and member states could hardly ignore the industry's and their employees' interests. Some 3,000 enterprises operating in Europe's aviation industry employed circa 400,000 people and generated €30 billion of added value in 2006 (Eurostat 2009). By December 2006, the Commission had heard enough to formally bring aviation under the EU-ETS umbrella (European Commission 2006c). After two years of difficult negotiations, the EP and Council finally agreed to a directive (2008/101/EC) to include the sector, starting in 2012, and auction 15% of the permits (EP/Council 2008). European airlines criticized the move as unaffordable (EurActiv 2008), but they were not the only ones affected. The new rules also applied to non-European airlines flying to or from the EU. Once the CJEU subsequently rejected demands for exclusion by US airlines (Court of Justice of the European Union 2011, 2012a), on the grounds that inclusion of international aviation in the EU-ETS was compatible with international law, the EU-ETS crossed over from the internal to external energy policy dimension. This seemingly unintended turn of events resulted in the Commission temporarily deviating from the ETS Directive in November 2012 in order to seek a global agreement on the regulation of aviation emissions (European Commission 2012a).

Altogether, it took a little over a decade, but the EU developed a carbon market that covers a substantial proportion of the Union's GHG emissions, albeit a dysfunctional one that continues to be beset by oversupply. Allocated emissions' derivatives actively trade in London and Frankfurt. The glaring weakness of an oversupply of emissions allowances in the EU-ETS depressing prices and reducing some of the environmental impact hoped for by its most ardent proponents, must be balanced by the fact that the majority of EU member states successfully reduced their emissions between 2003 and 2011 (see Figure 6.7).

Finally, it must be noted that the emissions trading scheme is not the only game in town. The EU allows its industry to use a bundle of measures to reduce overall emissions, including national measures such as the Joint Implementation Mechanism (JIM) and the Clean Development Mechanism (CDM) (see, e.g. Freestone and Streck 2005). This multi-vector approach allows EU companies to avoid expensive short-term investments while concurrently strengthening the competitiveness of domestic branches, and thereby avoid negatively affecting the international competitiveness of its own emission-intensive sectors (Kreutler 2014).

The EU Emissions Trading Scheme (EU-ETS) is a demonstration of how the Commission has applied internal-market mechanisms to balance sustainability and security of supply. It directly affects the bottom line of power generators, the industrial sector, and the aviation sector. As a case, it has additional added value because its existence is central to EU plans to address climate change (the multidimensional realm) and enhance energy sustainability. By raising the cost of burning fossil fuels, the market serves a similar purpose as a carbon tax – a long sought after, but yet unfulfilled, goal of the Commission (see Chapter 3). Importantly, however, the EU-ETS is not a tax, but rather a market that provides a profit-based incentive for affected companies to reduce their carbon. In other words, heavy fossil-burning companies now pay for the right to pollute. A single allowance equals the right to emit one tonne of carbon dioxide (CO_2) or the equivalent amount of the two more dangerous GHGs, nitrous oxide (NO_2) and perfluorocarbons

Figure 6.7 *Total greenhouse gas emissions (in CO_2 equivalent) indexed to 1990*



Source: Based on Eurostat (2015f) data, Council of the European Union (2002a), and UNFCCC (1998).
*No targets under the Kyoto Protocol

(PFCs). If a company uses fewer allowances than it owns, it can either save the remainder for future use or sell them to others (via well-established markets). This allows for a supply–demand-driven reduction of emissions. It awards those who modernize and allows heavy polluters to buy their way out of refurbishing their facilities. However, it also provides an important item in the EU's supranational policy toolbox, whereby heavy fines can be imposed on those who do not surrender enough allowances to cover their emissions, the EU-ETS.

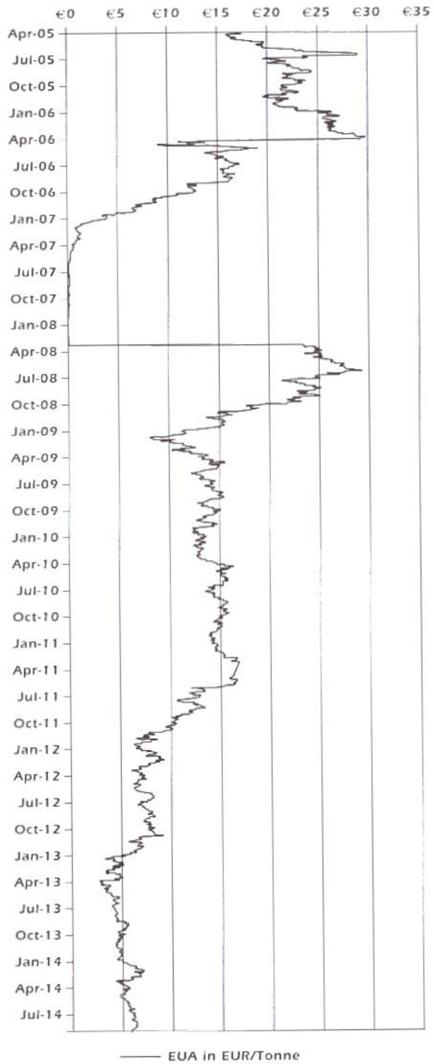
Now in its third permutation, the EU-ETS has faced serious obstacles since its inception, the most important of which was the lack of harmonized standards across the Union that led to miscalculations, price volatility, and a market collapse. Introduced in 2003 (and entering into force in 2005), with the objective to support the member states in meeting their obligations under the Kyoto Protocol, the EU-ETS began by allocating a set of free emissions allowances based on National Action Plans (NAPs) submitted by the member states. Ostensibly erring on the side of caution, those NAPs substantially overestimated the allowances required by their respective national energy and industrial sectors. As a result, between 2005 and 2007, the market collapsed, with the price per allocation falling from 30 Euros per tonne to almost zero (European Environment Agency 2008: 8). Despite demanding stricter rules for the second trading period (2008–2012), the Commission received widely variant NAPs by the member states in 2008. It responded in 2009 with some substantial changes to the system. It began requiring that: some of the allocations be auctioned rather than allocated, beginning 2012, (40% of all allowances in 2013, with the goal of completely phasing out free allocation by 2027), adding a reinvestment requirement of at least 50% of the proceeds into climate protection measures, such as renewables, energy efficiency, and carbon capture and storage technologies (European Commission 2008), and revising the ETS Directive to establish a single Union-wide registry of affected companies (European Commission 2013m). Despite the fixes, however, legal uncertainties continued to challenge the Commission's authority and its legitimacy to unilaterally allocate allowances. For example, the CJEU ruled in 2009 (and rejected a subsequent appeal) that the Commission exceeded its competences when it unilaterally reduced the amount of allowances for Estonia and Poland, arguing that past emissions data did not justify the requested amount (Court of Justice of the European Union 2012).

Notwithstanding its success in reforming the EU-ETS market, the project remains a work in progress. The first phase (2005–2007) was well understood as a trial phase designed to develop the necessary infrastructure for successful trading (Ellerman and Joskow 2008), and thus the market collapse may be understood as a necessary medicine. The second phase (2008–2012) introduced some important, yet incomplete corrections. The third phase (2013–2020), currently underway, appears to be a substantially more mature market, at least in terms of volume and trading. In 2013, the EU set its Union-wide emissions' cap (plus the three EEA-EFTA states, Iceland, Liechtenstein, and Norway) at just over two billion allowances. The EU plans to further reduce emissions by annually reducing the general allowances allocated by 1.74% (based on the average of allowances issued between 2008 and 2012), or 38,264,246 per annum, thus reducing overall EU GHG output by as much as 21% from the 2005 figure by the end of the third phase (2020). As of October 2013, it was limiting emissions from more than 11,000 power stations and manufacturing plants in 31 countries, as well as aviation within and between most of them, altogether covering approximately 45% of the EU's greenhouse gas emissions (European Commission 2013n). Simply stated, the EU-ETS constitutes the world's most ambitious emissions trading scheme, and a basis from which others can learn.

Still, the real impact of the EU-ETS in reducing EU GHG production is subject to debate. While it is clear that the EU has led the way in the fight against climate change, one cannot definitively claim that the EU's emission trading scheme played a substantial role in reducing its GHG output. Other factors, such as declining rates of economic growth and milder temperatures, reduce demand for energy and heat, both major sources of emissions. Indeed, market swings can severely depress prices, and this appears to be the case with the EU-ETS. Indeed, all three phases of trading experienced sharp declines in price; or in other words, it became cheaper to pollute in each period, reducing the market's carbon-reducing effectiveness (see Figure 6.8).

Because annual allocations are determined in advance and planned across an entire phase of trading, the gap between supply and demand grew rapidly as the economy underperformed. The

Figure 6.8 *ICE futures (1-month forward) EUA in €/tonne CO_2*



Source: Based on Bloomberg data

resulting surplus of allowances (more than 2 billion by the end of 2013; double the surplus in early 2012; and precisely the amount the Commission wanted to cut back in 2013) undermined the EU's carbon market. Recognizing its shortcomings, the Commission sought a public debate on structural reforms through a formal stakeholder consultation that ran from December 2012 through to February 2013 (European Commission 2013o). In January 2014, the Commission put forward a proposal for establishing a market-stability reserve with the start of phase four in 2021 (European Commission 2014g). Together with its initiative to postpone the auctioning of some 900 million phase-3 allowances until 2019–2020 (European Commission 2011, 2012e, 2014h), one can see how the EU was still trying to address this fundamental flaw more than a year into its carbon market's third phase of trading.

Despite its ups and downs, the evolution of the EU-ETS illustrates just how central liberal-market mechanisms are to the achievement of the other key pillars of the EU's strategy to achieve comprehensive energy security. Given the enormous effort already invested in creating its carbon market, the EU will need to implement serious structural reforms to account for the market's imbalances if it is to achieve its ambitious goal by 2030 of reducing GHG emissions by 40% from the 1990 levels.

Research and development of new technologies to mitigate climate change

Since energy was politicized in the industrial age, particularly as result of the economic and political impact of its key inventions – the coal-driven steam engine and the electric generator – government investment into new technologies and the infrastructures to support them have played a central role in driving technological change. In the last half-century, government-driven energy research and development (ERD) opened new means to producing energy (solar, wind, and tidal), extended the geographic reach of old means (offshore and deep- sea drilling), and led to ways in which fossil resources such as natural gas can be extracted from abundant shale deposits.

Europe has been a major driver of ERD for well over a century. It was the UK and Germany that moved the transport sector from coal to oil in the early twentieth century, a shift that transformed the world economy. After the 1973 oil crises, France led the way in implementing commercial nuclear technology (more than 70% of its electricity now comes from nuclear power) and today hosts the only multinational project to develop a functioning nuclear fusion generator (ITER). The US notwithstanding, Germany was among the first countries to open the market to bring small-scale, alternative producers, introducing feed-in tariffs in 2000 that required utilities to buy renewable-generated electricity (RES); and the Commission followed suit in September 2001, by adopting a directive on the promotion of electricity from renewables (EP/Council 2001).

Europe's success in driving technological change through ERD has been remarkable. However, it has also been inconsistent, ebbing and flowing over the past decades. While there was an enormous spike in such investments following the oil crises of the 1970s (almost doubling in value between 1974 and 1980 when measuring in 1974 currency values), there was an even greater decline between 1985 and 1992, and the relative level of Europe's overall ERD investments have remained below their 1975 levels ever since (Schubert 2010: 120). In the 1980s and 1990s, when energy supplies appeared abundant and Europe's economy was expanding, research into fossil fuels, nuclear energy, and even efficiency all declined sharply. Since 2003, priorities have shifted, and while investments into nuclear technologies have declined by as much as 22%, savings from other areas have led to a re-prioritization of research into hydrogen and fuel-cell technologies and renewables, including biofuels.

What all this reveals is that research and development is a core policy area in the energy domain. Recent initiatives to foster the research and development of low-carbon technologies are reflected in the European Strategic Energy Technology Plan (SET-Plan). The Communication issued by the Commission in 2007 (European Commission 2007a) identified six priority technologies: wind, solar, electricity grids, bioenergy, carbon capture and storage, and commercially viable and sustainable nuclear fusion. The EU is backing projects such as the *smart cities initiative*, targeting increased energy efficiency in Europe's cities (European Commission 2015c), and investing in the development of new large-scale turbines required to exploit offshore wind resources, as well as new materials that have the potential to substantially enhance the reliability of wind-energy technologies. This latter point is important because the bottleneck for grid integration of wind power is precisely its lack of consistency, directly resulting

from periods of low wind, a fundamental problem for energy supply security (European Commission 2015d). The SET-Plan also calls for the development of advanced network technologies to make existing networks more flexible and also secure the establishment of a pan-European electricity grid that integrates the Union's diverse national networks (European Commission 2010b).

EU Research into renewable technologies is advancing rapidly. In the solar energy sector, the focus lies on the mass deployment of advanced concentrating solar power (CSP) plants, a capital-intensive technology that involves the use of mirrors to concentrate the heat of solar energy to generate electricity through steam turbines. A single CSP plant could generate enough power for almost 70,000 homes. As the name suggests, they require intense direct solar radiation and, thus, will function only in Sun Belt regions, such as the Middle East, North Africa, southern Europe, and Turkey. The focal point of bioenergy research is on the conversion of biomass (forests, waste streams, wood, and agricultural industry by-products) into fuels, heat, or electricity. Currently, research activities focus on developing advanced conversion processes and bio-refineries, with the goal to increase the share of bioenergy in the EU energy mix to 14% by 2020. European scientists expect to realize GHG emission savings of up to 60% for biofuels and bioliquids (European Commission 2015e). Concern over emissions reductions is driving the development and deployment of carbon capture and storage (CCS) systems, technologies that prevent carbon dioxide from being released into the atmosphere and, hence, are expected to play a vital role in the EU's (as well as global) efforts to reduce climate change.

It is widely agreed that the most important technological shortcoming in the energy field, and perhaps the most important for real energy security, is the lack of capability to store large quantities of electricity. Energy storage is, thus, a very important issue on the Commission's agenda, and not only in the renewables sector (European Commission 2013l, Vouldis and Vallés 2009). Major progress is being made in this area. Theorized about for years, two scientists at the University of Manchester recently succeeded in extracting graphene from graphite (Novoselov et al. 2004). (Graphene is a thin, transparent, single layer of carbon atoms, stronger than steel and highly conductive.) Their success has since initiated a wave of research that stands to revolutionize energy storage. The EU is backing the development of graphene through a €1 billion flagship project at Chalmers University of Technology in Gothenburg, Sweden, via its Horizon 2020 Future and Emerging Technologies (FET) programme, with the expressed hope that it could be used for high-power energy storage (Graphene Flagship 2015).

Finally, researchers continue to focus on how the use of nuclear energy can help realize a low-carbon economy. Nuclear-related research remains generally controversial in Europe, and became more so following the Fukushima nuclear accident in March 2011. The member states continue to be divided over what role, if any, it should play in the EU's future energy mix. For example, while several member states plan to continue using nuclear power for the foreseeable future, the German government decided to shut down all of its nuclear reactors by 2022 almost immediately following Fukushima. The Commission continues to be particularly interested in aspects related to nuclear safety of existing reactors (see Chapter 1, Section 'The nuclear portfolio') and the development of nuclear fusion power, a technology, which many perceive as a long-term energy solution that could help meet EU climate goals because it can produce large-scale electricity without causing CO_2 emissions (European Commission 2013e). In addition to supporting research into nuclear fission and radiation protection research and training (European Commission 2012f), the EU was an early supporter of the Joint European Torus (JET) project to investigate the potential of fusion power. Under the Seventh Euratom Framework Programme for Nuclear Research and Training Activities (FP7 Euratom), it earmarked almost €2 billion for fusion research, over half of which was dedicated to constructing JET's successor, the International Thermonuclear Experimental Reactor (ITER), with circa €900 million reserved for activities that included the construction of a follow-up demonstration fusion plant (DEMO) and plasma research. As a key member of the European Fusion Development Agreement (EFDA), which coordinates the European scientific and technological contributions to ITER, the Commission continues to support efforts to bring nuclear fusion online as a commercial energy source by the middle of the twenty-first century.

Concluding remarks

Since the publication of several IPCC reports on climate change, global warming caused by human activity seems to have emerged as one of the biggest threats to our society. Leading scientists draw a dark picture of the effects of man-made global warming on biodiversity, extreme weather, rising sea levels, droughts, and poverty in the world. The EU has responded to these threats by introducing ambitious targets and strategies to reduce its greenhouse gas emissions. Yet while initiatives to increase the share of renewable energy sources and develop technologies and measures to improve efficiency are widely appreciated, the environmental impact of these measures on global warming has to be evaluated cautiously.

Glover and Economides (2010: 50) posit their criticism that 'it is the erroneous *blind* faith – very different from *reasoned* faith – in the viability of renewable energy as a future energy solution that is currently driving massive public investment in alternative energy projects'. They emphasize that, instead of focusing solely on renewables, people also have to be aware of supply security problems related to these often costly and immature technologies. Dieter Helm describes the Commission's renewables directive as having 'paradoxical side effects' and questions the environmental impact of electricity production from renewables, noting, 'As more renewables are forced onto the system, the carbon price in the EU-ETS is likely to fall' and this in turn 'increases the competitiveness of coal and gas, which consequently increase their share of electricity generation, so that the resulting emissions reductions are lower and at the limit completely offset' (2012: 96). Given the slow entry of renewables and, more recently, the increased use of cheap American coal for electricity generation in the EU, Helm's analysis seems prescient.

Taking some of these concerns into account, the Commission noted in a recent Green Paper that the 'framework for 2030 must be sufficiently ambitious to ensure that the EU is on track to meet longer-term climate objectives. But it must also reflect a number of important changes that have taken place since the original framework was agreed in 2008/9'. Among other issues, the Commission explicitly referred to the 'security of supply in the internal energy market' and the 'the consequences of the on-going economic crisis' as challenges that have to be considered when talking about how to mitigate climate change (European Commission 2013f: 2). For almost two decades the Commission has strived to rein in greenhouse gas emissions, an effort characterized by bold targets and the belief that greater efficiency and more renewables could be achieved through liberalization and the realization of an internal energy market. The concomitant compatibility of competition, security of supply, and sustainability – the three pillars of comprehensive energy security – were practically dogma. It now appears that the Commission is beginning to cautiously question that narrative.

Chapter 7

External Energy Politics

The establishment of the ECSC and Euratom in 1957 marked the first modern example of a collaborative 'external' energy policy in peacetime by any state, let alone six historically warring parties. Yet despite growing to include 28 countries in little over half a century and subsequently integrating energy matters between them, developing and sticking to a common position on energy relations with states outside the EU remains one of the most divisive issues in European politics. As two observers of European politics noted, energy is both 'an issue of integration and disintegration' and one that may 'turn out to be the ultimate litmus test of [the EU's] political and economic unity' (de Jong and van der Linde 2008).

This chapter examines Europe's external energy policy in a global context and explains how it is using diplomacy and specifically rule export to ensure security of supplies from abroad with marked, but mixed success. Most work on the EU's external energy policy places emphasis on EU–Russian energy relations, the Energy Community, the role of the EU in international organizations, the building of a southern energy corridor, or the increasing role of supranational institutions (see e.g. Beyli 2012 Konstatyan 2012, Youngs 2011). Our approach differs slightly, in that we look at the EU and its energy needs and relations as a subset of the global competition for energy resources. Although the EU is not a consolidated unitary actor in the area of external energy relations, its external energy goals should 'be pursued in a spirit of solidarity among Member States' (Art. 194 TFEU), and therefore, it is helpful to understand when, where, and how this solidarity either does or does not function, and how the EU approaches trying to mitigate the latter. In so doing, we close the loop between the three dimensions of energy policy identified in Chapter 1 and show how essential, and yet distracting, the external dimension is to achieving comprehensive energy security.

The time frames required for member states to reach a consensus and implement common external policies rarely keep pace with the