CHAPTER 10

A MORE SELF-HELP APPROACH TO ENERGY SECURITY

Policy-makers talk much about energy security, and academics spend much time and effort trying to define it. Its essence is continuity in energy supply, but as there are also price and environmental angles to energy security, most definitions boil down to something like 'uninterrupted access to sustainable energy at affordable prices'.

For the European Union, this involves the challenge of maintaining a reasonably-priced energy supply while carrying out the deep transformation of its electricity sector described in previous chapters, and also of minimizing the impact of any disruptions in the import of fossil fuels on which Europe still heavily relies and will for many years to come. The long-term goal is a low-carbon energy system that contributes to mitigating climate change, which is ultimately the greatest security threat—albeit one of a completely different nature to traditional energy security concerns.

The Energy Union plan is intimately associated with energy security. Although Polish politicians had come up with the concept of an EU energy community in quieter times, it took Europe's 2014 confrontation with Russia, its biggest outside gas supplier, over the fate of Ukraine, the main transit route for Russian gas to Europe, for the then Polish premier Donald Tusk to table a formal proposal for such a union. He announced his plan in a *Financial Times* article entitled 'A united Europe can end Russia's energy stranglehold' (FT 2014). It was intended to address two related issues: the frustration among Eastern Europe's EU members at the bloc's failure to provide the energy security that they had imagined their membership would bring them; and their particular complaint about being overcharged and discriminated against by their Russian gas supplier. So he called for EU member states to make their collective weight count

in negotiations and discussions with external energy suppliers, and he added the specific proposal for member states to make collective purchases of gas in order to get better or fairer terms from Russia, or indeed other suppliers. The incompatibility of collective purchasing with the past 20 years of pro-competition EU energy policy meant that this specific proposal has been quietly buried.

However, the Energy Union plan has now become a way of addressing a much wider array of problems in Europe's energy and climate policy, some of which affect energy security. It is therefore appropriate to tackle energy security in a way that puts Europe's Russia problem in a broader context. This chapter does this by arguing that the EU should pursue two principles:

- Engage partner countries and international organizations to promote, wherever possible, the development and orderly regulation of energy markets, but accept the limits of this approach in a sector still prone to disorderly geopolitics. Let Europe, in the words of the Energy Union plan, try to create 'an Energy Union that speaks with one voice in global affairs' (COM 2015a: 2). It already speaks with one voice on energy-related climate issues. But it should recognize that Europe, as the EU rather than its individual member states, cannot have a direct role in securing external energy resources, because it does not buy or sell energy as the EU.
- Focus on improving the EU's internal resilience to external energy shocks through integration of its 28 national energy markets and emergency energy-sharing arrangements among its member states. Internal resilience is something the EU can achieve on its own, and it has the advantage of being useful against all external energy shocks from whatever quarter. In other words, an approach to energy security that is more self-help and less dependence on the kindness of strangers. More cooperation between states on energy security would also reflect the Commission's vision of 'an Energy Union where Member States see that they depend on each other to deliver secure energy to their citizens, based on true solidarity and trust' (COM 2015a: 2).

In trying to maximize energy security, it is important not to exaggerate what external energy diplomacy can achieve, nor to minimize the contribution of internal energy market integration. External energy diplomacy has been Europe's 'Plan A' for energy security, indeed it always is for any energy-importing country or region. Forging ties with major energy exporters is considered the traditional recipe, or first priority, for energy security. But the Energy Union plan came about because Europe's Plan A of close ties with its predominant outside energy supplier—Russia—failed. The Tusk proposal for collective energy buying from Russia looked like a 'Plan B', but because of its continued focus on the external dimension it should really be considered a variant of Plan A. What the Energy Union plan brings to European energy security is the makings of a real Plan B in the emphasis on internal energy market resilience to external shocks. There has long been an internal dimension to EU energy security, but it has only come to the fore and acquired some credibility as the result of the past two decades of energy market integration.

Markets vs Geopolitics. EU countries are collectively the world's biggest importer of energy. This is both because their own production of oil, gas, and coal is in long-term decline and as their reserves of uranium for nuclear fuel were never large. Overall EU demand for fossil fuels is falling and will fall further. This is the result of general efficiency measures but especially tougher fuel standards for cars, of the squeeze on gas in power generation from competition by renewables and cheaper (imported) coal, and of increasing environmental restrictions on coal. However, domestic EU production of fossil fuels is dropping faster than this demand decline. Therefore, as a share of total consumption, the proportion of imports will continue to rise from today's levels of import dependence (see **Table 10.1**). So the notion of outright energy independence, which resonates with Americans because it is potentially realizable for them, can have no meaning for Europeans, at least in the foreseeable future.

To a large extent, the emergence in the early 1980s of a global oil market has meant that dependence on oil imports is no longer the security concern that it was when the supply and price

Table 10.1: Projection of Europe's fossil fuel demand and import dependence

	2010	*2020*	*2030*
Oil			
Total demand (Mtoe)	669	604	559
Import dependence (%)	84%	87%	90%
Gas			
Total demand (Mtoe)	444	404	347
Import dependence (%)	62%	65%	72%
Coal			
Total demand (Mtoe)	281	231	155
Import dependence (%)	40%	40%	48%

Note: Mtoe = million tonnes of oil equivalent

Source: European Commission, In-depth study of European energy security (2014)

of oil were heavily controlled—first by a set of international oil majors and then by the Organization of Petroleum Exporting Countries (OPEC). OPEC still does influence the price of oil, but since the mid-1980s it does so only indirectly by varying the level of its production, thus influencing the price. The price benchmarks for oil are set globally by the oil futures markets in New York and London, and the result is a fairly transparent market for consumers. Oil supply has rarely been used as a political or geopolitical weapon: once as a ban on oil supply, when OPEC's Arab members refused to supply the US and the Netherlands because of their support of Israel in the 1973 Arab–Israeli War; and a couple of times as a ban, under the authority of the United Nations, on oil purchases from Iraq and from Iran (where oil sanctions have been a bargaining chip in negotiations on Tehran's nuclear programme). There is still a risk in relying on the supply of oil from the Middle East and North Africa, though this now stems from the continuing political chaos in that region rather than any deliberate geopolitical threat aimed at oil consumers. EU countries insure against this oil supply risk by maintaining minimum levels of oil stocks in common with the US, Japan, and other members of the International Energy Agency (IEA).

In essence, it is the ease with which oil can be transported (by ship, road, or rail) and stored that makes oil a global market in which consumers can easily switch suppliers. The same factors of convenient transportability and storability also make coal a global market in which alternative supply is always available. Gas is different. It has to be transported either by pipeline or by ship, in refrigerated form as liquefied natural gas (LNG), and cannot be stored in very large quantities. Gas transport thus requires big investments and long-term contracts. Moreover, cross-border pipelines generally need to be accompanied by intergovernmental agreements, not least for political reasons; fixed gas pipelines create long-term mutual dependence of supplier and customer on each other, as for instance between Russia's Gazprom and the many European customers for its pipeline gas. This mutual dependence in the trading of piped gas locks supplier and customer into a kind of marriage, in contrast to the more promiscuous arrangements possible between partners in oil trading. Shipped LNG is inherently flexible; suppliers and customers are not locked together as they are by pipelines. The rising share of LNG is slowly globalizing the gas market and bringing gas prices in the world's regional gas markets closer together. However, there is not enough of a global gas market to enable one to say for gas, as one can for oil and coal, that in security of supply terms 'the market' has largely substituted for 'geopolitics' (though this can be said of the most liberalized gas markets with multiple gas sources, such as in north-west Europe).

Exporting energy policy. The counterpart to the EU's need to import energy is an attempt to 'export' policy in order to provide a rules-based international framework for the import of these commodities. The Commission's Energy Union plan states that:

> The EU has to improve its ability to project its weight on global energy markets. Together with its major partners, the EU will work towards an improved global governance system for energy, leading to more competitive and transparent global energy markets. (COM 2015a: 6)

However, there is no global governance system for energy to *improve* on. The World Trade Organization (WTO), like the GATT (General Agreement on Tariffs and Trade) before it, has never had any specific rules on energy. (Yet it might develop some rules as the result of Moscow's recent request for a WTO dispute panel to hear its complaint that EU energy rules have been used to discriminate against Russian companies.) There are producer organizations: OPEC, the pre-eminent producer group, which focuses on improving oil revenue and/or market share for its members; a grouping of a few gas producers called the Gas Exporting Countries Forum, which is, as its name suggests, just a forum for discussing gas issues; and the new fledgling body for research into renewable energy called the International Renewable Energy Agency (IRENA). Some major energy-consuming countries have their own club, the IEA. Its largely North American, European, and Japanese membership reflects that of its parent body, the Organization for Economic Cooperation and Development (OECD). Although it contains the net energy-exporting countries of Canada and Norway, the IEA was set up in 1974 as the consumers' counterweight to OPEC. As such, it organizes and monitors a system of minimum oil stocks required of its members, a system which is replicated in EU legislation for EU countries. The agency has developed into the major source of expert research and advice on global energy and energy-related climate issues. But its membership does not include those countries with the fastest-growing energy consumption rates, such as China and India (because they do not belong to the OECD and are not likely to in the near future). Moreover, apart from its binding rules on its members' oil stocks, it has no legal authority over its members' energy policies; the IEA's policy influence lies only in the expertness of its advice. Periodically, OPEC, the IEA, and some major oil and gas producing and consuming countries meet in something called the International Energy Forum (IEF). However, there is little concrete result to IEF dialogues because, except in the vaguest terms, the consumers refuse (notably at US insistence) to discuss price and the producers refuse to discuss their investment and output.

Just as there is slender global energy governance for the EU to build on, so the EU's past effort to export policy via the Energy Charter Treaty has not been encouraging. The ECT was

conceived by the EU in 1991 in order to create a legal framework for cross-border investment and trade in the energy sectors of the countries of the collapsing Soviet empire, though it was dressed up as a broader international agreement and now has a worldwide roster of governments as members and observers. Russia signed but never ratified the treaty, and eventually in 2009 Russian President Vladimir Putin rejected the ECT. Though it was a good idea, the ECT failed to convince the one country it was most designed to apply to. A fresh attempt to raise the global profile of the Energy Charter was made with the signing of the International Energy Charter in May 2015, but Russia was not among the signatories. In parallel with this multilateral approach to Russia, the EU also made energy issues a central part of its bilateral relationship with Moscow in the form of the 1997 EU–Russia Partnership and Cooperation Agreement. This ran for a term of 10 years but is now effectively defunct.

In terms of the multilateral export of its energy rules, the EU has had more success in involving its south-eastern neighbours in the Energy Community. This organization was set up in 2005 by the EU to extend the bloc's core energy market rules, initially to the former Yugoslav states and then to Ukraine and Moldova, while Georgia is still negotiating to join. The interest of the Balkan states committing themselves, at least formally, to all the latest EU internal energy market legislation, and even to renewable energy targets, is that if there is any further enlargement of the EU, they are likely to be the next to join. Ukraine's self-interest in Energy Community membership was less clear until 2014, when Russia's annexation of Crimea and the outbreak of war in eastern Ukraine effectively tipped the Kiev government into the EU camp. Kiev has expressed its desire to become a full member of the EU, and though Brussels has not formally acknowledged or accepted this, the EU is put under pressure to help Ukraine by the fact that its association agreement with Kiev was a catalyst of the present crisis with Moscow.

Elsewhere, however, the Energy Community has failed to gain Turkey as a full member; it only has observer status and is therefore under no obligation to take on EU energy market rules. Ankara is most unlikely to join the Energy Community

until the prospects for its protracted EU accession negotiations improve; these negotiations, on energy as on every other aspect, are currently deadlocked on the issue of Cyprus. In cancelling the South Stream pipeline project across the Black Sea to Bulgaria in favour of a similar Gazprom pipeline to Turkey, dubbed 'Turkish Stream' (both projects discussed later in this chapter), President Putin is probably banking on Turkey staying out of the Energy Community and its EU rules—and he is probably right. However, the EU should keep trying to tempt Turkey into the Energy Community, not least because Turkey is a logical route for any additional non-Russian gas for South-East Europe.

Towards its many other neighbours around the Mediterranean, the EU has also attempted multilateral forms of cooperation that include energy, but in a more diluted form than in the ECT or the Energy Community. It supported the creation in 2007 of the Association of Mediterranean Energy Regulators (MedReg), which groups some 21 national regulators from southern EU states, several Balkan states with a coastline, and a number of countries along the eastern and southern rim of the Mediterranean. For all that, they do not have much energy trade or infrastructure among themselves to regulate. Some modest political impetus for energy cooperation across the Mediterranean has come from the creation in 2008 of the Union for the Mediterranean, a 43-country 'Euro-Med' partnership designed to succeed the largely unsuccessful 'Barcelona Process' (itself modelled on the Helsinki Process in Europe during the Cold War). This 'Mediterranean Union' has a plan is to create 20 GW of solar power capacity in the region by 2020, but this vision took a major knock in 2014 with the collapse of Desertec.

This initiative had been set up by several dozen corporate backers, including some heavyweight German industrial and financial companies, with the long-term ambition of providing 15 per cent of Europe's electricity by 2050 with solar power from North Africa. Desertec may have made the wrong technology choice, opting for concentrated solar power (multiple mirrors focused on a single heat target), just as the cost of the alternative solar technology of photovoltaic power was falling rapidly. More

important was Desertec's failure to get commitments to export from North African governments, themselves struggling to meet their own energy needs, let alone other people's, and failure to get commitments to import from EU governments or utilities worried about political instability in North Africa. A further complication was Spain's anxiety about overtaxing its grid with surges of North African solar power at times of low demand in Spain, which has meagre power connections to the rest of Europe. Nonetheless, a Medgrid project to increase the underwater connection between Morocco and Spain is going ahead, though this will carry conventional as well as renewable power.

Energy cooperation efforts across the Mediterranean will continue. In 2015 the EU and its southern partners set up three 'Euro-Med Platforms', one for electricity, one for gas, and one for renewable energy and efficiency. An offshoot of this is a search for a Mediterranean gas trading hub in order to increase supply coming into Southern Europe; if such a hub materializes, it is likely to be in a Southern European gas-importing country interested in trading gas from all quarters, rather than in a North African gas exporter interested only in selling its own gas. Gas deposits that have been discovered in the eastern Mediterranean Sea itself might provide extra liquidity to such a hub. However, the unresolved tensions between Israel and its neighbours, and between Cyprus and Turkey, make exports from these deposits difficult, while most of Egypt's big new offshore gas find will be consumed in the Egyptian market.

In sum, the EU's efforts to spread its version of energy governance among its neighbours have had very limited success. Europe is fortunate in its geography to be semi-surrounded by an arc of nearby energy suppliers—stretching from Norway, Russia, the Caspian, the Middle East, to North Africa. Of these suppliers, however, EU energy governance only extends to Norway, which is a full (though non-voting) member of the EU single energy market through its membership of the European Economic Area. This matters, for Norway is currently the EU's second-largest supplier of oil and gas. But elsewhere in Europe's vicinity the geopolitics are increasingly unfortunate. Thus the EU contribution to energy governance even in its near-neighbourhood, let alone on the global level mentioned

in the Energy Union plan, has been minimal—either because it has been rebuffed as in the case of Russia, or eclipsed by the growing conflicts in the Middle East and North Africa.

Vulnerability vs dependence. Energy import dependence is an inescapable fact of life for the EU. So, for a long time to come, is Russia's dominance as a supplier of these imports, not only in gas but also in oil, coal, and uranium fuel. But the aggregate figures of EU import dependence are fairly meaningless for a group of 28 countries with widely varying energy mixes, sources, infrastructure, and geography. Heavy reliance on imports does not matter, in energy security terms, provided the imports come from a diversified set of suppliers *or* can be delivered flexibly via several means of transport. Dependence on imports is only serious if the imports come from a sole supplier through a fixed network, making the importer economically and politically vulnerable to pressure from that supplier. An illustration of this is Russia's Druzhba oil pipeline, which was built to serve Moscow's erstwhile communist allies in Poland, East Germany, Slovakia, the Czech Republic, and Hungary. Central Europe is quite dependent on this pipeline for its oil; however, if supply through the Druzhba pipeline were interrupted, the rest of the EU has access to crude oil from a wide variety of non-Russian suppliers and could get this oil to the region via barge, truck, or rail. The same means of transport could be used for alternatives to Russian coal. (However, alternatives to Russian supply of nuclear fuel for Russian-designed reactors in Eastern Europe and in Finland may be problematic—not because there are not alternatives from EU nuclear fuel fabricators, but because Russia's Rosatom reactor builder apparently does not disclose the fuel design specifications of its reactors or make it easy for fuel of another origin to be tested in them.)

Only six EU countries—the three Baltic states plus Finland, Slovakia, and Bulgaria—are seriously vulnerable to interruptions of Russian pipeline gas, because they rely, or have relied, on it for nearly 100 per cent of their gas. The northern group of these countries has taken precautionary measures. Finland and Estonia have developed the capacity to switch to other fuels for power generation; the latter can also get gas from Latvia, which

has gas storage larger than its annual demand. Lithuania has installed a floating terminal to store and regasify LNG from other sources, which it can then pipe to its Baltic neighbours. The Ukraine crisis causes concern for a larger number of countries in South-East Europe. Bulgaria and Slovakia get all their gas from Russia via Ukraine (although Slovakia can also obtain a reverse flow of gas from the Czech Republic and Austria, which can themselves draw on other sources of gas). However, although they have other gas sources, Hungary, Romania, and Greece also rely on the Ukraine route for most of the Russian gas they receive, while—outside the EU but in the Energy Community—Serbia, Bosnia-Herzegovina, and Macedonia rely on the Ukraine route for all their gas supply.

Diversification of gas sources and/or routes is the obvious solution. Ironically, in view of the fact that diversification is today the mantra of the EU, it was Russia which first embarked on diversification. Russia found itself, as one of the most landlocked of energy suppliers, inconvenienced by its inability to arrive at smooth post-Soviet commercial arrangements along its traditional energy transit routes through Ukraine, Belarus, and the Baltic states (all once part of the Soviet Union). So Gazprom started to plan new pipelines to supplement or substitute for its existing pipeline routes. In the 1990s it built a gas pipeline through Belarus and Poland to Germany. But partly because of some transit disagreements—ironically at the time more with Belarus than Poland—it decided to build a second pipeline system, Nord Stream, from St Petersburg across the Baltic Sea direct to Germany. This bypass line caused some irritation in Poland but was welcomed in Germany and accepted by the European Commission as adding some route diversity to EU energy security. (Russia also re-routed an oil export outlet away from Belarus and the Baltics to its St Petersburg region.)

Of far more controversy was Gazprom's project to build the South Stream gas pipeline across the Black Sea to Bulgaria as an alternative and eventual substitute for transit through Ukraine. Gazprom embarked on the project in the wake of gas pricing rows with Ukraine which led to an interruption of gas supplies to many of its EU customers in 2006 and 2009. The

Russian company therefore justified the project as enhancing security of gas supply to the EU. However, it was seen by the European Commission and most EU governments as Russia's way of weakening Ukraine's bargaining position as a transit route, and of pre-empting the simultaneous EU plan to open up a 'Southern Gas Corridor' to bring non-Russian gas from the Caspian and points east across Turkey to Europe.

The flagship project to realize this Southern Gas Corridor was to have been the Nabucco pipeline, run by a consortium of Central European and Turkish gas companies. The European Commission backed Nabucco with rhetoric and diplomacy, in particular to overcome the doubts that the Nabucco consortium would ever find enough gas to fill their big pipeline; for Azerbaijan was, and remains, the only Caspian region country able and willing to sell gas to Europe. In 2007, in order to woo and impress other suppliers, the European Commission appointed a former Dutch foreign minister, Jozias van Aartsen, as 'the EU Coordinator for the Caspian–Middle East Gas Route'. However, by the time of his appointment, Mr van Aartsen had also become mayor of The Hague. But even if he had had more time to devote to Caspian diplomacy, he would still have found it an uphill struggle. This became clear in 2011, when the EU Council of Ministers gave the Commission a mandate to negotiate an agreement for a legal framework for a trans-Caspian pipeline network with Turkmenistan as well as Azerbaijan. This was the first time the Commission had been authorized to negotiate an energy treaty on the EU's behalf—marking an increase in the EU executive's institutional power, but so far nothing else. By this time, Turkmenistan had agreed to sell quite enough gas to China as well as to Russia—and without having to build an expensive and legally problematic pipeline west across the Caspian—for it to succumb to the blandishments of officials from Brussels.

In the end, the Nabucco project foundered under its own weight: too big a pipeline with too little supply and demand at either end and hence no finance. Instead, the upstream gas companies in Azerbaijan decided in 2013 on a scaled down alternative to start in 2019 and carry 16 billion cubic metres (bcm) a year (6 bcm for Turkey and 10 bcm for Europe) of gas

across Turkey and across the Adriatic to Italy. The authors' gas programme colleagues at OIES have written:

> We see Azerbaijan as the only country which will substantially increase its exports of pipeline gas to Europe prior to 2030… No export of Central Asian gas to Turkey or the rest of Europe is likely in this time frame, and for this reason it would probably be more accurate to refer to a Caspian (and possibly Middle East) pipeline, rather than a corridor, to Europe. (OIES 2014b)

It is therefore with a certain degree of bravado that the European Commission states in its 2015 Energy Union plan that 'to ensure diversification in gas supplies, work on the Southern Gas Corridor must be intensified to enable Central Asian countries to export their gas to Europe' (COM 2015a: 4).

South Stream was evidently not responsible for torpedoing Nabucco. Nonetheless, the European Commission put up a barrage of legal obstacles to the onshore construction of South Stream through Bulgaria, Romania, and Hungary to Austria, to the dismay of the governments of these countries which had signed intergovernmental agreements with Moscow as well as preliminary contracts with Gazprom. The Commission argued that South Stream flouted various EU energy market and public procurement rules and that EU law took precedence over these intergovernmental agreements. In December 2014, President Putin abruptly announced that Gazprom was cancelling South Stream and replacing it with Turkish Stream. This would still take Russian gas across the Black Sea, but it would land not in Bulgaria but in Turkey, near its border with Greece, where EU customers could come and get it if they wanted to. That month, Alexei Miller, the head of Gazprom, explained the new approach thus: 'If the buyer doesn't want the purchase to be delivered home, well then perhaps he needs to get dressed and go to the store…In our case, the store is certainly the delivery point on the Turkish-Greek border' (Interfax: 2014).

It is too early to tell whether Gazprom will carry through with Turkish Stream, and if it does how this will affect future supplies of Russian gas into South-East Europe. Gazprom has said that it will not renew its gas transit agreement with Ukraine when that agreement expires in 2019, and from that date all its European customers that have been supplied via Ukraine will henceforth

be supplied via Turkish Stream. This would effectively land too much gas in the wrong place, and it is therefore unclear whether such a total geographical switch would really happen. Gazprom would still have a contractual obligation to its European customers to ensure that the gas actually reaches them, and does not just sit on the Turkish-Greek border for lack of adequate pipeline capacity to carry it up to Central Europe. (Evidently aware of this delivery obligation, Gazprom announced in June 2015 a parallel plan to expand Nord Stream in the Baltic so as to access more Central European customers from the north.) Nonetheless, the switched destination of Gazprom's Black Sea project to Turkey, though unexpected at the time, is in line with President Putin's general turning away from the EU in favour of forming his own Eurasian Union club with Belarus, Kazakhstan, Armenia, and Kyrgyzstan.

The limited success, so far, in bringing non-Russian gas to Europe has not been for want of trying, not only by the EU itself but also by successive US administrations. The US has long showed concern about its European allies exposing themselves to potential Kremlin political pressure through their energy dependence on Russia. Concern flared into an open US–European row in the early 1980s, when the Reagan administration tried to ban Western European companies selling US-origin technology to the Soviet Union in order to expand Soviet gas deliveries to Western Europe, and European leaders, led indeed by Margaret Thatcher, ordered their companies to defy the US ban. Since then, the US has pursued a quieter form of 'back-seat driving' diplomacy, not repeating its attempt to grab the steering wheel of European energy policy but rather giving advice from the back seat, usually from the mouth of a succession of senior State Department officials with the title of 'Special Envoy for Eurasian Energy'. Eastern Europe's incorporation into the EU gave this US role new relevance; enlargement not only increased Russia's role in the EU energy market but also provided Washington with a very receptive audience in Eastern European capitals. Indeed, some of the region's governments occasionally asked the US to convey their energy concerns about Russia to the European Commission, arguing that 'the Commission may not listen to us, but it will listen to you'.

In encouraging the development of non-Russian energy supplies in the Eurasian region, the US scored one signal success—the Baku–Tbilisi–Ceyhan (BTC) oil pipeline. US diplomacy was very instrumental in the development of this 1,000-mile pipeline which started to pump oil from Azerbaijan, through Georgia, to Turkey's Mediterranean coast in 2006. But this addition to world oil supply is less material to EU energy security than the potential of the Southern Gas Corridor, which the US has also backed. Vocal though US support has been for the gas corridor project, the fact is that US influence has waned in the past decade. US influence never did extend to countries like Turkmenistan; it once extended to Turkey, the key gas transit route nation, but US (and EU) influence in Ankara has also faded. This decline also reduces the chances of the US and EU persuading Turkey to sink its political differences with Cyprus and Israel to the extent of letting Turkey be a conduit for Cypriot and Israeli gas sales to Europe.

Successive Ukrainian gas crises have narrowed the gap between EU and US perceptions of Eurasian energy security. This convergence of views started in January 2009 with the interruption in Ukraine of Russian gas supplies destined for EU customers. Later that year, Washington and Brussels set up a high-level US–EU Energy Council. Though this council's annual meetings discuss a range of transatlantic energy trade, technology, and cooperation issues, their core agenda has been energy security. By 2014, with Russia's annexation of Ukraine's Crimea province and armed incursion into Ukraine's eastern regions, the EU had come around almost entirely to the US view that Europe needs to distance itself, and diversify away, from Russia. The EU's new coolness towards Russia was clear in the 2015 Energy Union plan. In it, the European Commission had only this to say about Europe's largest energy supplier: 'When the conditions are right, the EU will consider reframing the energy relationship with Russia based on a level playing field in terms of market opening, fair competition, environmental protection and safety, for the mutual benefit of both sides' (COM 2015a: 7). Until such a reframing—which is not in prospect—EU-Russian energy relations will be purely transactional, conducted deal by deal by companies or issue by issue by government officials.

Indeed, for the EU, the only current political framework for energy transactions with Russia is the restrictive one of Western sanctions on Russia related to Ukraine.

There are still national differences within the EU over dependence on Russian energy. Some south-east EU member states are anxious about Russia's announced decision to cut off their Ukrainian gas supply route in 2019, and they hope that Gazprom's Turkish Stream project can provide them with an alternative artery for Russian gas. However, more or less all 28 EU states agree not only on the need for diversification of energy sources and routes, but also on the contribution that greater integration of their internal energy market can make to energy security.

Internal resilience: Europe's energy security Plan B. There is a wide spectrum of risks to energy security. Some risks, such as shrinking margins of spare electricity capacity, are perfectly predictable and can be plotted year by year. Others, like changes in the behaviour of Russian suppliers, can be sudden but not unexpected. Still others, like natural disasters and accidents, are often totally unpredictable. The advantage of strengthening Europe's ability to withstand energy disruptions, internal and external, is that one does not have to predict these disruptions in order to mitigate them.

The EU's internal resilience is actually enhanced by the diversity of the energy mixes of its 28 member states. For instance, France, with its 58 nuclear power stations, is normally the biggest exporter of electricity to other member states. As a whole, the EU is moving towards a higher share of wind and solar power in its collective energy mix. Suppose the wind speed falls, or cloud cover extends over a wide stretch of the EU (a common weather pattern), then France's reliable base load of low-carbon nuclear power becomes even more valuable to its neighbours. Suppose, on the other hand, there is an accident in one of the French nuclear reactors and it is due to a generic fault that halts the operations of many or all of those reactors, then France's energy security could depend mightily on its neighbours, including its biggest one, Germany, which has renounced nuclear power. One could also suppose that in the case of a general decline in

nuclear power in Europe, and a temporary eclipse of renewable energy output, then Poland would argue—and it would be hard to gainsay—that there is security (though not long-term climate security) in its large coal reserves.

But these diverse national energy mixes contribute nothing to Europe's collective energy security unless joined up through cross-border interconnectors and trading arrangements and through collective contingency plans to share energy supplies in emergencies. The development of cross-border gas and electricity infrastructure and trade flows has been discussed at length in Chapter 4 and is not repeated here. However, the development of energy solidarity between EU member states, embodied in collective energy-sharing plans, must be mentioned, because it is a key part of the Commission's Energy Union plan, which states that 'solidarity among Member States, in particular in times of supply crisis, has to be strengthened' (COM 2015a: 6).

The notion of solidarity was at the root of Poland's initiation of the Energy Union plan, and not just as an echo of its democratic movement of the 1980s. In 2006, Poland first took a proposal for an 'energy solidarity' pact to NATO, where it knew it could count on US support. However, the response from NATO as a whole was negative, especially from Germany, which was wary of the reaction from Russia, and from France, which wanted NATO to stick to matters military. So Warsaw took its energy solidarity idea to the EU, and eventually it emerged in the Lisbon Treaty, which came into force in 2009. Up to then, and probably even up to the Ukraine crisis of 2014, it was generally the case that EU members in Western Europe regarded their counterparts in Eastern Europe as hysterical about energy dependence on Russia, while the East Europeans considered West Europeans as complacent about the Russian risk to energy security.

What was objectively true was that the EU was ill-prepared for the implications for energy security when eight East European countries joined the EU in 2004. Just before this enlargement, the EU had passed a gas security directive which, among other things, provided for gas-sharing in the event of a 'major supply disruption'. But it defined this as an interruption of 20 per cent of total EU gas imports for a period of eight weeks,

a level that took no account of the imminent enlargement. No fewer than nine smaller member states, mainly those in Central and Eastern Europe with small but Russian-dominated gas markets, could have had their gas imports cut off without any EU response. As a result of interruptions in gas flow through Ukraine, particularly in 2009, the EU passed the 2010 gas supply regulation with requirements for larger gas storage, more gas interconnections between member states, more realistic sharing arrangements, and for governments to ensure they could deliver gas to 'protected customers' (basically households) if their largest single gas provider cut off supply (Council Regulation 2010). However, checks made after the outbreak of the 2014 Ukraine crisis revealed loopholes and flaws in the 2010 legislation. One such flaw is that in drawing up national plans, some member states have counted the same molecule of gas twice. Partly to avoid this double-counting, the new Energy Union plan proposes emergency plans be drawn up at a regional and EU level. A common definition of so-called protected customers is also important: if some governments have a wider definition of protected customers, and therefore hoard more of their gas to help these customers, they will inevitably have less gas to share with other member states in a crisis.

Another feature of the planned Energy Union is to introduce more transparency into Europe's gas supply and specifically to shed more light on the various Intergovernmental Agreements (IGAs) that EU governments make with external gas suppliers. The transparency proposal applies to all energy IGAs, but most IGAs relate to gas because their special infrastructure aspects and security implications usually require government approval. These IGAs govern the building and use of fixed infrastructure, and they occasionally refer to commercial contracts or operators, but price and volume terms of energy trade are usually contained in separate commercial contracts. In 2012, EU member states agreed to pool information about their existing IGAs in an information exchange mechanism, run by the Commission (Council Decision 2012). The idea is to enable the Commission to check these agreements for compliance with provisions of EU energy law, such as allowing third-party access or two-way gas flows to prevent pipelines being monopolized, and to allow an

individual member state to find out whether it is getting equal treatment from suppliers as other states. This initiative is driven by the suspicion of many Eastern European member states that they have received significantly worse terms from Gazprom than those offered to Western Europe, or even to some of their immediate neighbours in the region.

In its Energy Union plan, the Commission wants to go further: it seeks to require member states to clear with Brussels in advance the terms of any new or revised IGA with a third country, preferably by letting Commission officials sit in on the negotiations for any new IGA. (This has occurred once in recent years, when Poland requested Commission help in re-negotiating the terms of the Yamal–Europe pipeline and got more satisfactory terms than it achieved in earlier solo talks with Gazprom.) The rationale for prior approval of IGAs is that, once agreements have been negotiated and signed, it is politically difficult to get the signatories to change the terms—as the Commission found with EU governments that signed IGAs with Russia on the South Stream project. But member states can point to their treaty-enshrined national right to determine their own energy sources and energy mix. One EU leader already has: in revising Hungary's gas agreement with Russia in spring 2015, Prime Minister Viktor Orban said it was unacceptable that he should have to get advance clearance of this from Brussels.

The Commission also wants to apply the same principles of transparency and prior EU approval to 'commercial gas supply contracts that may have an impact on EU energy security'. Its idea is that 'key features of the contracts should be aggregated and regularly published, in order to establish a transparent benchmark which could be referred to in future negotiations, ensuring at the same time the confidentiality of sensitive information' (COM 2015a: 7). The problem here is that commercial contracts contain price information, which IGAs rarely do. If 'a transparent benchmark' were to include a common purchase price, it would come very close to the Polish proposal for collective gas purchasing, which the Commission, for sound anti-trust reasons, has rejected except in crisis conditions. The Commission says it wants to ensure the EU speaks with *one voice* in negotiations with third countries, but, if decades of market

liberalization effort are to mean anything, this should not include speaking with *one price*.

Security of electricity supply has rarely figured in traditional assessments of energy security, and certainly not in those related to external policy. The reason for this has been that Europe imports very little electricity from outside the EU, except in the anomalous case of the Baltic states, which are still linked to the Russian grid. However, it is impossible today to assess Europe's internal resilience to external energy shocks without at the same time addressing its electricity system's capacity to absorb the internal shocks from ever-growing quantities of intermittent renewable power. In contrast to gas, no formal security of electricity supply standards exist at the EU level or indeed in many member states. The Commission says its Energy Union plan aims to remedy this by establishing 'an objective, EU-wide, fact-based security of supply assessment' for electricity (COM 2015a: 6). This is to take account of cross-border electricity flows, demand response and storage possibilities as ways of coping with variable renewable power output, and would be the basis for legislation in 2016 on a new electricity market template. Whatever the prospects for this (discussed at various points in Chapters 6, 7, and 8), it is important that internal instability in the electricity sector not undermine other efforts to improve energy security.

Conclusion

The external efforts to improve energy security can usefully be thought of as Plan A, and improvements to the EU's internal ability to absorb energy shocks as Plan B. There is a logic to this—if diplomacy (Plan A) fails to secure energy imports into the EU, then the focus (Plan B) has to be on absorbing the shock of any cut-off in supply. However, the Energy Union plan does not speak of Plans A or B, because it does not see external energy diplomacy and internal resilience measures as alternatives, but rather as parallel efforts. And for the moment, there is parallel progress.

The Energy Union's catch phrase is that Europe should

speak with one voice. It is already doing so towards Russia, its most important external energy partner. EU states have shown surprising unity in requiring Russia to accept the principles of its energy market and displayed growing solidarity in improving its resilience and contingency arrangements in the face of possible supply cut-offs. Yet, even in helping a non-EU neighbour like Ukraine, internal EU measures have been more useful than external ones. Because of reverse flow measures inside the EU, Ukraine could still get Russian-origin gas for its own needs from Poland, Slovakia, and Hungary.

The Energy Union plans for strengthening strategic relationships with various energy suppliers can have some meaning where these suppliers are already, like Algeria, linked to gas pipelines entering the EU or could be in the future, like Iran, linked through the Southern Gas Corridor. But the EU is not, as the European Union or the European Commission on its behalf, a trader in energy. Therefore, there is no point in Brussels rolling out the red carpet indiscriminately for every petro-power potentate.

In official dialogues with groups like OPEC, the EU delivers a general message to oil and gas producers that, despite its desire to accelerate decarbonization of its energy system, Europe will depend, for a long time to come, on fossil fuels for a significant part of its energy mix. Today this is a credible message, but in coming years it will become less so. Some oil and gas producing countries already complain that Europe treats them as an unsavoury insurance policy on which it does not even pay the premium—a European attitude of 'please continue to invest in your oil and gas which we don't really want but still might need'. To which complaint the Europeans retort 'blame climate change, not us'.

This will not be a propitious environment for external energy diplomacy, and therefore more emphasis should be put on internal measures to enhance energy security, and the sooner the better.

CHAPTER 11

ENERGY UNION: RHETORIC OR REALITY?

Step-change needed in EU policy. This book has demonstrated the many shortcomings and contradictions in Europe's energy policy. Chapter 10 underscored how Europe's political breach with its dominant foreign energy supplier, Russia, was the immediate catalyst for the Energy Union project. The underlying reason for change, however, is that the status quo has become unstable. This is not just because energy policy-making has arrived at a halfway stage between national policies, driven largely by national interests, and common EU policies, based on increasingly integrated energy markets and on a common goal of decarbonization. In many other sectors, there is a stable halfway house of policy-making competencies shared between member states and the EU. The need for change in EU policy stems from the risk that if it does not move forward towards more Europeanization, it will move backwards towards a re-nationalization of energy policy. The trend is already in the latter direction, with the entrenchment of national renewable schemes and the knock-on effect of these schemes in the shape of national capacity mechanisms as back-up for renewables.

The instability in the energy system is compounded by the widely differing levels of ambition and success with which individual member states have pursued renewables. The extreme case of high ambition and considerable success is Germany, which is going full-out for wind and solar power to replace nuclear and (in a less planned way) coal, and which has exported the resulting market volatility to its neighbours. There is perhaps a parallel, in a very different field, with the circumstances that led up to the monetary union of the Eurozone countries. After the EU decided in 1988 to remove all national restrictions on capital movements, it became clearly harder—with money freed to move at will across Europe—to maintain fixed currency rates between member states and to sustain national monetary

sovereignty. In a similar fashion, the (much slower) improvements in cross-border energy infrastructure and trading arrangements are enabling surges of nationally subsidized renewables to carry volatility into adjacent energy markets. This has reinforced member states' fears about the impact of their own renewables, and other countries' renewables, on their national energy security—fears which drive national capacity mechanisms.

The Energy Union plan. Therefore, the European Commission's proposed Energy Union is as much about preventing the bloc's 28 governments from sliding further backwards into national mechanisms and instruments, and from retreating from collective EU climate goals, as it is about forward leaps in the Europeanization of energy policy. The Commission's proposals are a series of reforms and improvements, on five broad fronts, to EU energy policy. What they signally lack is exactly that which you would expect any proposal for a union in energy to include, namely a plan for a new overarching institutional arrangement under which member states surrender some policy power or competence. This is in contrast to Europe's monetary union, in which governments give up the power to issue a currency; its customs union, in which governments give up the power to set external tariffs; and its banking union, under which governments surrender an element of supervision of their banking systems. As a reform process rather than an institutional blueprint, the Energy Union is akin to the current plan to improve integration of various financial sectors which the Commission also calls a union, as in its Capital Markets Union, or CMU plan.

The Energy Union is not defined, so we cannot know if and when it is achieved; it is even more open-ended than the internal energy market integration that is one of its key components. At recent summits, EU leaders had a habit of calling for the 'completion' of the internal energy market; at one point they even set 2014 as the deadline for it. Setting a deadline for the never-ending process of integration seemed slightly ridiculous, but in fact there has been a minimal definition of internal market completion: agreement on the electricity and gas target models to allow trading across all borders and across all time frames, and agreement on all the network codes to make this

happen. No such definition of Energy Union completion exists. However, the aims for the Energy Union set out in Chapter 1 are highly ambitious. If Energy Union requires the achievement of these objectives, or even just the establishment of a framework for achieving them, it is likely to be a long time coming.

The Commission's various proposals all point towards progressive Europeanization of energy policy. So they set a direction for policy to travel rather than a fixed destination for policy to arrive at. Even then, the journey may not be easy. The Energy Union plan does not involve any upfront surrender by member state governments of the right, enshrined in Article 194 of the Treaty of Lisbon, 'to determine the conditions for exploiting its energy resources, its choice between different energy sources and the general structure of its energy supply' (Treaty of Lisbon 2007). The Commission has repeatedly said its Energy Union does not necessitate any treaty change, so the Energy Union will have to proceed with the possibility that anywhere along the journey a government or governments may apply the emergency handbrake of Article 194.

'Governance lite'. The hole at the heart of the Energy Union, even as a reform process, is inadequate governance: the lack of clear control over the direction of travel in different parts of the EU and the inadequate coordination of the various policy instruments being used to achieve the objectives of clean and secure energy. Provided that the key challenges are being grasped and adequate solutions are being developed at EU level, the Europeanization of energy policy would make sense. It can provide continent-wide economies of scale, remove national distortions from the market, and prevent free-riding in combating climate change. It can also usefully embed enforceable clean energy targets into EU legislation in a way that would give investors confidence. It would thus provide benefits all round, but only if, as indicated, the right questions are being addressed, and there are reasons to doubt this in four key areas (discussed both in this chapter and previous chapters).

The governance issue goes back to the October 2014 summit at which EU leaders agreed the broad outlines of post-2020 energy and climate policy with targets set for 2030. This will be

Europe's contribution to the international climate talks in Paris in December 2015, and it is therefore also of considerable importance to Europe's international partners to know whether the EU has sufficient governance provisions to deliver on its promises.

As already mentioned in Chapter 3, EU leaders agreed on 2030 targets of a 40 per cent emissions reduction, a 27 per cent renewable share of total energy consumption, and a 27 per cent improvement in energy efficiency. It was also decided that the current system of individual renewable targets for member states would expire in 2020. Calls by Germany and Scandinavian countries for national renewable and efficiency targets post-2020 were successfully resisted by the UK and some East European countries, which said they wanted more national flexibility in how they cut emissions (including more resort to nuclear power and possible development of shale gas). At the same time, the October 2014 summit agreed that:

> A reliable and transparent governance system without any unnecessary administrative burden will be developed to help ensure that the EU meets its energy policy goals, with the necessary flexibility for Member States and fully respecting their energy mix. This governance system will … build on the existing building blocks, such as national climate programmes, national plans for renewable energy and energy efficiency. (European Council 2014)

However, the division over governance among member states continues. At one end of the spectrum is Germany, which sees the Energy Union project as a way of keeping the pressure on other member states to pursue the same renewable and efficiency goals after 2020 as before 2020. In an unofficial 'non-paper' which Germany circulated in early 2015, Berlin argued that in areas like renewables and energy efficiency, which will continue to have EU-level targets, 'a specific, robust and reliable governance structure' was needed. Pressing the point, the German paper stressed that, at the October 2014 EU summit that agreed the 2020 targets, 'a reliable governance [system] was the compromise for refraining from national binding targets for renewable energy and energy efficiency' (EU Observer 2015). (Not surprisingly, senior Commission officials also share this interpretation of the deal on the 2030 targets.) At the other end of the spectrum is the UK. In a joint non-paper with the Czech Republic, the UK called for the governance system to be 'light touch and non-legislative', based on national energy plans which should be technology neutral, with nuclear power and carbon capture being just as valid means of meeting decarbonization goals as renewables and energy efficiency. The paper, subsequently provided to a House of Lords committee by the UK government (Lords Committee 2015), also said that the Commission should review national plans 'with a view to informing [its] assessment of the EU's collective progress towards EU energy policy goals'). In other words, such reviews should be an opportunity for member states to tell Brussels what they are doing, rather than a chance for Brussels to tell them what to do.

For its part, the Commission takes the German line in private but is reticent in public on this sensitive matter of its role vis-à-vis national governments. In its Energy Union plan, the Commission did little more than call for 'an integrated governance and monitoring process, to make sure that energy-related actions at European, regional, national and local level all contribute to the Energy Union's objectives', and to promise it would 'launch a dynamic governance process' for the Energy Union (COM 2015a: 17–18). At the time of writing (the summer of 2015) it looks as though this process will revolve around:

- The 'building blocks' of the national energy and climate plans of the EU-28 governments.
- Vetting by the Commission of these national plans to see whether they collectively meet EU-level emission, renewable, and efficiency targets, and whether they need changing, in an iterative planning process between Brussels and national capitals.
- Possible naming and shaming of wayward governments in a 'State of the Energy Union' report that the Commission will make annually, the first of which will come by the end of 2015.

This form of governance is considerably softer than the hard tools of enforcement (the possibility of taking errant member states to court for breaching EU directives and EU-legislated targets) that the Commission has at present and that one would expect of the Energy Union.

In legal terms, it is clear that member states will insist on keeping Article 194 as a sword of Damocles hanging over the Commission to curb any excess of zeal by the EU executive. What this means in practice is that EU governments will proceed by unanimity on any major changes to energy and climate policy. This is already happening. The European Council, the formal name for summit meetings of EU heads of government, takes decisions by unanimity. It is the European Council which has taken all the main decisions on the energy and climate goals for 2020 and 2030. EU leaders have therefore set the framework for policy, leaving the Council of Ministers, which is composed of departmental ministers and which normally decides all non-tax energy and environment legislation by majority, to fill in the framework with decisions on second-order issues in conjunction with the European Parliament.

If progress towards the Energy Union is slow or impossible at the level of the EU-28, then movement may be faster or possible in smaller groups of member states. Regional cooperation is very much a theme of the Energy Union plan. There are several regional groups of countries cooperating on energy. Some are defined by specific infrastructure needs, such as the North Seas Countries Offshore Grid Initiative (NSCOGI) or the Baltic Energy Market Interconnection Plan (BEMIP), while the Visegrad 4 (Poland, Hungary, the Czech Republic, and Slovakia) tackles energy policy broadly, presenting a common front on climate policy as well as on energy infrastructure. The most influential is the Pentalateral Energy Forum, because of its membership (Germany, France, the three Benelux states plus, for some purposes, Austria and Switzerland) and because of its pioneering role. This group was the first to couple its electricity markets, and it has just become the first to produce a regional, as distinct from national, assessment of electricity generation adequacy as a possible building block for some regional capacity mechanism.

The difficulty with such regional cooperation is that it could not go very far towards meeting four key challenges identified in this volume as needing to be addressed if the EU is to meet the goals set for the Energy Union—of a fundamental transformation to a sustainable low-carbon economy. Further

action at European level is needed, and should in principle be achievable without the need for treaty change, to address these challenges. The four key challenges are:

- **Reform of wholesale electricity markets (Chapter 6)**. While the Commission seems to recognize the need for change (and indeed has published a staff paper by the Directorate-General for Economy and Finance analysing the problems [SWD 2015b]), its market redesign proposals duck the fundamental issues and instead put forward only marginal improvements to the current model. The Commission should be using the opportunity to open up the debate called for by the staff paper on long-term market arrangements for a low-carbon system. Since these arrangements would have to be implemented at European level to enable the single market in electricity to operate effectively, this calls for a Europe-wide debate.
- **Integrated demand-side strategy (Chapter 7)**. In this area too, a major shift of emphasis is needed, involving a move away both from the current emphasis on supply-side measures and, on the demand side, from the narrow focus on energy efficiency to a much wider examination of the role the demand side can play in the move to a low-carbon economy. The issues are wide-ranging—from demand response to pricing and taxation—and again a Europe-wide debate is needed. Action in this area needs to be consistent with wholesale electricity market reforms and would need to be taken in a coordinated fashion across Europe to avoid introducing market distortions.
- **New policy instruments (Chapters 5 and 8)**. The governance problem is in a sense insoluble as long as the current treaty arrangements remain in place, and it does not seem realistic to expect a change in the foreseeable future. However, the problems could be bypassed by a move towards new policy instruments—the technology-based approach has to a large extent run its course and is threatening increasing market and economic distortions. The time may have come to start considering new market-friendly approaches. If, as Chapter 8 suggests, the ETS will not on its own be able to deliver a

sustainable low-carbon economy, other approaches should be examined, like carbon intensity obligations. They offer the opportunity for introducing a Europe-wide approach, within existing treaty constraints, and would not threaten member states' ability to make their own energy choices; they would create fewer distortions and inefficiencies than the technology-based approaches; and they would prevent free-riding on the road to decarbonization while respecting different national starting points and circumstances.

- **A new approach to energy security (Chapter 10)**. Rather than wooing the goodwill of external energy producers, the EU should do more to take the solution to its energy insecurity into its own hands and to improve its internal energy market's resilience against external supply shocks. It should accelerate the building of gas and electricity interconnections, development of gas storage, and research into large-scale electricity storage. The immediate gas security problem is regional within the EU, but the solution could be more EU funding of infrastructure links to relatively poor Baltic and Balkan member states with a difficult geography they did not choose.

What would a real Energy Union look like? Progress towards the Energy Union may be slow, because of the decision to proceed at the level of the EU-28 by unanimity, or partial, because of the new encouragement being given to regional cooperation. But even so, the Commission's plan itself falls well short of what one would expect of a European Energy Union, as indicated in **Table 11.1**. The main point of the table is not to highlight the difference between the first and second columns—the comparison between current policy and the Energy Union plan has been the subject of most of this book. It is rather to point to the gap between the **second** and the **third** columns, which underlies the shortcomings of the Energy Union plan compared to what one would anticipate of such an entity, and compared to the ambitious goals set out for the Energy Union in the Commission strategy document. The third column is not presented as an immediate goal in itself—many would shrink from the degree of centralization it involves. Rather it is

Table 11.1: Milestones on the road to Energy Union

	Mini-change = current policy	*Midi-change = Energy Union plan*	*Maxi-change = a real Energy Union*
Electricity market	Complete Electricity Target Model (ETM) to establish cross-border short-term markets to allow renewables to participate	ETM + establish long-term markets to incentivize capital-intensive investment; regional assessment of generation adequacy and of need for capacity mechanisms	Fundamental market reform enabling renewables without subsidy and solving capacity issue
Renewables	Adapting renewable subsidies to the market	Regional/EU harmonization of the structure of national renewable subsidies; possible joint subsidy schemes	A common low-carbon support scheme across the EU
Demand management	Prime focus on energy efficiency	Measures to promote demand response	Full integration of policy towards the demand and supply sides
Gas market	Complete Gas Target Model (GTM)	GTM + EU strategy on LNG and storage	Use gas as a transition fuel but plan to phase it out long term
Research and Development	Focus on key low-carbon technologies	Focus on energy systems as well as technologies; better coordination of national R&D	Coordination at EU level of all R&D for decarbonization
Infrastructure planning and operation	Building Projects of Common Interest (PCIs); operation left to national TSOs	PCIs + Interconnection targets for isolated electricity markets; national TSOs grouped in regional operational centres to plan and manage cross-border flows	Central planning of infrastructure by the European networks of TSOs; pan-European coordination of system operation

Table 11.1: *Continued*

	Mini-change = current policy	*Midi-change = Energy Union plan*	*Maxi-change = a real Energy Union*
Regulation of networks	Cooperation of national regulators in ACER	EU-level and national regulation in parallel	Creation of a European energy regulator
External energy policy	Climate policy + EU role in import infrastructure	Climate policy + EU role in import infrastructure, intergovernmental agreements, and diversification of energy sources	Common EU external energy policy
Governance	Until 2020, legally binding targets at national as well as EU level	After 2020, this depends largely on the Commission vetting national energy plans, and naming and shaming governments with inadequate plans	Restoration of some central control to enforce policy; amend Article 194 of the EU treaty that maintains the energy sovereignty of member states

intended to indicate the gap between the reality and the aspirations. Clearly those aspirations cannot be achieved overnight; however, the gap between reality and aspiration is not necessarily unbridgeable, given time. Nevertheless, more determined efforts are needed at this stage, including addressing the challenges discussed here, if Europe wishes to ensure that there is genuine progress towards European Energy Union.

Many of the problems relate to a lack of coordination—not coordination for its own sake but in relation to the principle of subsidiarity according to which tasks should be performed at the lowest appropriate level of government. Given the risk of free-riding, and the natural political economies of scale afforded by a multi-state entity like the EU, the lowest appropriate level to deal with issues like energy and climate policy is often at the European level. The collective weight that the EU can bring to

bear in international climate talks has been stressed earlier in this book. Pan-European coordination also makes sense in much of energy policy.

Comparison with the US is a little unfair because the US is a single political entity. But, for instance, the US has a single regulator at the federal level with decision-making powers—the Federal Energy Regulatory Commission. Instead of ACER, which is a coordinating body for national regulators, a European Energy Union could have a single regulator—indeed the Commission's strategy document calls for 'effective regulation of energy markets at EU level where necessary' (COM 2015a: 2). In fact, the rationale for a single regulator is actually stronger in Europe than in the US: in electricity the EU has more of a standard market design than exists among individual American states, which are free to choose competitive or non-competitive market models. Similarly, rather than a single TSO, the US has Independent System Operators (ISOs) covering several states, and the EU could have ISOs too. Likewise, the EU could do a better job, like the US, of focusing its R&D programmes on low-carbon energy at the federal level, instead of dispersing its research money in national programmes that duplicate each other.

However, such an Energy Union could not conceivably come about unless the Commission, in its treaty role as policy proposer, were bold enough to push for it—which it clearly is not—and member states were prepared to accept it—which they are clearly unlikely to.

Is the Commission being inexcusably feeble at a time when proper energy governance is not only needed to underpin Europe's lofty pledges in international climate negotiations but could also pay political dividends? After all, a robust Energy Union project could offset the damage to the EU's political image from the multiple other challenges coming from Russia, migration, the question marks over Greece's membership of the Eurozone, and British membership of the EU.

Or is the Commission just being realistic, in view of the centrifugal, Eurosceptic forces at work in Europe and of the Commission's own declining political standing in recent years relative to that of the EU's national governments? It is certainly

true that naming and shaming—and increasingly governments may not be as ashamed at being named as they once were—is not the same as legal enforcement. But legal enforcement is not an option if there is no law to enforce.

Even if it does not conform to any standard template of such an entity, the EU's concept for Energy Union can still be useful in providing political impetus to reforms in the five energy policy dimensions that the Commission has laid out. However, the Commission's plan would be even more useful if it were to squarely address the challenges listed in this chapter, a move which, in the view of the authors of this volume, is within the realms of possibility. Without such a determined approach, there is a danger that the Energy Union will give the illusion of a solution to an ill-defined problem—which will turn out, at considerable cost and confusion, to be no solution at all.

ANNEX 1

WHY A MORE ACTIVE DEMAND SIDE IS NOW MORE NECESSARY AND PRACTICABLE

Worldwide interest in demand response, particularly in electricity, is growing because of changes in technology, economics, and policy. The underlying issue, central to the operation of electricity systems, is that electricity is difficult and expensive to store, especially on consumers' premises. Supply and demand generally have to be matched at all times to ensure the stability and safety of the system. Traditionally, the main burden of this matching has fallen on the supply side; demand has been treated as essentially passive. In practice, what has normally happened is that the level of demand over the relevant timescale (whether it is the next hour, the next day, or years into the future) is forecast and the electricity system operator then takes steps to ensure there is enough supply capacity to meet that demand. In a centralized system, most of the task is undertaken by a central operator. For instance, it will forecast demand over a number of years ahead and build or commission the supply capacity needed to meet that demand; for the day ahead, it will similarly forecast demand and ensure that there is enough capacity operating, available to operate or on standby, to meet that demand and cover any disruptions. In a market system, price signals provide the incentives for private concerns to build and operate supply capacity, but the same broad principle has traditionally applied: the primary task is to meet demand, and it is the supply side that is supposed to provide the flexibility to ensure that there is enough generation to meet it.

Rationale for supply-side approaches

Governments have tended to go along with this approach. This is partly because of the supply-side orientation of policy

described in the main text, but it is also because the system has worked well and has been based on what have traditionally been seen as basic characteristics of electricity supply, including:

- **Controllability and reliability**. For an electricity system operator it is much easier to influence supply than demand: in most systems, the operator controls the dispatch of supply and tells production facilities when to operate. In liberalized systems, it is the market which gives appropriate signals for plant construction and operation, but ultimate responsibility for balancing rests with the system operator and its interactions with suppliers. In the past, electricity systems have tended to consist of a relatively small number of large-scale generators supplying millions of customers whose usage cannot be directly controlled (or in many cases, even monitored in real time) by the system operator. To ensure a reliable and controllable system of matching supply and demand, operators have therefore tended to prefer to use the supply side.
- **Coordination and aggregation**. Even where the demand side is more directly controllable, it tends to consist of large numbers of independent users. Since supply and demand have to be matched in real time, system operators have to be confident of instant response in the quantities required. The transaction costs and uncertainties associated with the coordination and aggregation of large numbers of customers have been seen as major obstacles to the use of demand response.
- **The economics of flexibility**. Technically, there is little to choose between demand and supply in terms of flexibility. Indeed, reducing demand is often a simple matter of turning off an appliance or piece of equipment, while generation sources often take time to start up and ramp up to the required level of production. In economic terms, however, there has been much more flexibility on the supply side in the past. Start-up and ramp-up costs for power generation have been a relatively small part of the total. Operator instructions or price signals can be used to give suppliers an incentive to increase or decrease production; indeed, that is the suppliers' business and source of revenue. The demand side is different. Electricity is a complementary good—used in conjunction with a piece of equipment to provide a service to the consumer or input to the production process—and it is usually only a small part of a household's or business's total costs, so its price is not usually the critical factor in a decision whether to use the service or continue production. Electricity is therefore price inelastic—its value to the consumer is normally much higher than the price actually being paid, so demand is not very dependent on price. As a result, the so-called Value of Lost Load, or VOLL (the amount a consumer would have to be paid to forego a unit of electricity consumption), is normally seen as very high by comparison with the cost of electricity. For instance, when the UK Electricity Pool was introduced in the 1990s it included an element representing VOLL which, at £2/kWh, was roughly 100 times the then wholesale price of electricity. Recent estimates have put the figure even higher. A report for the UK government, as background for the establishment of a new capacity market, gave a value of £17/kWh (LE 2013: xvii). So in the past, the cost of energy not supplied has usually been thought to be much higher than the cost of energy supplied. In other words, it is better in economic terms to meet demand than reduce it.

Electricity systems are changing

So there are good reasons for the traditional orientation towards providing flexibility on the supply side. However, electricity systems are changing, and there is growing interest in considering the demand side as a flexible resource, just as much as the supply side. Behind this shift are some strong underlying trends:

- **Technological changes** are taking place on both supply and demand sides. Intermittent and distributed renewable sources, mainly intermittent, are changing the traditional pattern of electricity supply based on a small number of large power stations which can be dispatched by the operator. So the idea that the supply side is more controllable and requires less

aggregation than the demand side is becoming less valid. At the same time, major technical developments are under way on the demand side of electricity, including the introduction of smart meters and smart appliances. While flexibility on the supply side is decreasing, there is growing potential for flexibility on the demand side, if it can be harnessed effectively.

- As markets liberalize, operators are getting more used to the idea that **price signals**, rather than central control, can be used to help balance the system. In many liberalized markets, decisions on plant construction are now a matter for private operators; in some markets, private operators self-dispatch rather than being dispatched by the operator (though the operator still retains responsibility for short-term balancing). Before liberalization many observers worried that the 'lights would go out' if there was no single central body responsible for all aspects of system balancing, both short and long term. But, as liberalized markets have demonstrated a good security record, confidence in well-designed markets as a way of providing signals for plant construction and operation has grown. Against this background, operators are becoming more open to the idea of using the demand side as a resource despite the lesser degree of direct controllability.
- **The economics** are also changing. The costs of coordination and aggregation, and of remote monitoring and control of use on customers' premises, are coming down with the new smart technologies. In addition, the traditional assumptions about VOLL are becoming out of date. For instance, the figure of £17/kWh cited above conceals a huge range of different values for particular customers in particular situations; individual consumers' VOLLs are, in many circumstances, only a small fraction of this figure. In the past, a single figure was thought to be needed because it was not thought practical to identify separate consumer groups, given the network characteristics of electricity (it was not possible to cut off individual customers while supplying others in the vicinity). That single number generally represented a high marginal VOLL because it was used to help assess the amount of capacity needed to ensure that all demand was met at peak times. But changes in technology mean that it is now often practical to identify customers with the lowest VOLLs, or for those customers to identify themselves and make their own decisions about when it is worth their while to reduce demand. Meanwhile, the economics of the supply side are also changing. The growth of intermittent generation is requiring flexible generators to adjust their generation in response to the intermittency on a more frequent and often more short-term basis. At the same time, their hours of operation are often decreasing because the intermittent sources have priority when they are able to generate. The result is that costs like those of start-up and ramp-up are increasing as a proportion of total costs, while the lower load factors of flexible plants are, in many cases, undermining their economics, as discussed in Chapter 6. At any rate, the idea that the economics of flexibility favour the supply side is becoming less clear-cut, if not already out of date.
- **Government and EU policy** are also changing with the new focus on the Energy Union objective of a transition to a low-carbon system. The power station which remains unbuilt and the tonne of carbon not emitted are increasingly seen as desirable goals in themselves.

Taking all these changes together, traditional concepts of system balancing and security will need to undergo a complete change, and member state and EU policy needs to reflect this shift.

In the past, the task has been a relatively simple one of forecasting demand and ensuring that there is enough supply, coordinated from the centre, to meet that demand. In the future, there will be a vastly more complicated coordinating exercise which cannot all be done from the centre: a mix of central and decentralized generation, much of it largely inflexible; increasingly flexible demand; and centralized and decentralized storage, and indirect storage (for instance, via heat or via the conversion of electricity to a storable fuel like gas). The task is more analogous to the operation of the internet than to the traditional system based on central dispatch. The complexities are so great that much, at any rate, of the coordination will need to be undertaken by markets rather than planners (who will never have perfect information about all the market players).

The difficulty is that markets are essentially broken at present, as explained in Chapter 6. Partly as a result, we have no clear idea of the potential for consumer storage and demand response. There are no incentives in the present system for consumers to play a role in system operation, and there is only limited understanding of what will be acceptable and practical.

Overall, therefore, the potential economic and environmental benefits of a move to a more active demand side are huge. It can lower costs and reduce resource requirements at every stage:

- Flexibility in demand and long-term reductions in peak demand can reduce the requirement for new generating **capacity**.
- Reductions in overall demand mean less electricity **generation** is needed and emissions are lower.
- Flexible demand can be one effective means of **balancing** the system in real time.
- Demand response and local generation can reduce the need for new transmission and distribution **infrastructure**.
- Flexible demand supports **decarbonization** and facilitates the integration of intermittent renewables.

ANNEX 2

AN ALTERNATIVE MARKET-FRIENDLY APPROACH: TRADABLE CARBON INTENSITY TARGETS

Trading schemes and carbon taxes are well known as economic instruments to promote decarbonization. This annex looks at an alternative and less familiar 'market-friendly' approach based on the use of **tradable carbon intensity targets** to promote low-carbon generation.

The basic idea is that there would be a cap, expressed in terms of carbon intensity (g/kWh or kg/MWh), applying to all electricity generation within a given system. Individual caps would apply for each year (or other chosen period) and be set in advance over a long period of time to give guidance for investment. The obligation would be tradable. There are broad precedents for such a scheme, in particular in the US, where the idea of carbon intensity limits has some traction.[1] The approach seems to have potential to be applied within the EU in relation to electricity decarbonization.

In fact, many countries already have informal or implicit caps of this sort. In the UK, for instance, the carbon intensity target for electricity implied by the government's overall climate strategy is to get carbon intensity below 100g/kWh by 2030, from around 480g/kWh in 2012. This could be translated into a formal arrangement by setting a cap for each year up to 2030 on a declining trend. For the purposes of illustration, this could be a

1 See, for instance, the Energy Information Administration's *Analysis of the Impact of a Clean Energy Standard* (EIA, November 2011), which looks at the implications of an intensity-based approach for electricity, and *Taxes and Trading versus Intensity Standards*, Centre for the Study of Energy Markets University of California (CSEM WP 190). In practice, the measures introduced in the US via the EPA's Clean Power Plan do not take the form described here, but the flexibility given to states in meeting their clean energy obligations has some parallels.

steady reduction of about 20g/kWh per year, though in practice the trajectory would need to take account of the potential pace of investment. Further targets for the 2030s could perhaps then be set in 2020, for example, by which time more information should be available about the viability of CCS, new nuclear, and other sources; but the government could indicate at an earlier stage its expectation that the cap would fall to no higher than 50g/kWh, for example.

The idea would be that the obligation would give a clear signal to generators about the nature of the future capacity needed and that, because of its tradability, it would give flexibility in operation and strong incentives for cost minimization.

How it might work

The requirement would be imposed via an obligation on all generators, whether new or incumbent, to meet the carbon intensity cap (though there might be an exception for those under 50 MW, for example). They could comply with this obligation by one of the following methods:

- keeping the carbon intensity of their own generation within the cap
- buying carbon intensity reduction certificates (CIRCs) from other generators to bring their intensity down to within the cap
- paying a penalty (or buying reserve CIRCs from the government) to make up any shortfall

The obligation would apply across a generator's entire fleet (which could, of course, be an individual plant only) and would be calculated by taking total carbon emissions during the year (or other chosen period) divided by total electricity generation from that fleet or plant. Both figures are in principle easily obtainable and unambiguous.

The following example shows how the scheme might operate in a situation where the overall target is met. Say the target for 2020 is 300g/kWh and that there are three generators: generator A has a mainly coal fleet and an intensity of 600g/kWh; generator B has a mainly gas fleet and an intensity of 400g/kWh; and generator C has a fleet composed entirely of zero-carbon generation with no emissions. In total, as shown in the following table, they produce 1 TWh and 300,000 tonnes of CO_2:

	Output	*Carbon Intensity*	*Carbon Emissions*
Generator A	300 GWh	600g/kWh	180,000 tonnes
Generator B	300 GWh	400g/kWh	120,000 tonnes
Generator C	400 GWh	0g/kWh	0 tonnes
Total	1 TWh	300g/kWh	300,000 tonnes

To comply with the target, both generator A and generator B would buy credits from generator C until they were within the limit.

Various possible mechanisms for trading are possible and some of these are discussed here, but this does not fundamentally affect the basic structure of the scheme:

- **Virtual or actual?** Generator C could either sell a given quantity of electricity (in the example, 100 GWh to B and 300 GWh to A) or sell virtual electricity in the form of a CIRC. It is suggested that both options should be available, or any mix between them, to provide maximum flexibility and avoid market dominance by any particular generator.
- **Sales or swaps?** When it comes to virtual sales, the options would include sales (C would sell 100 GWh to B and 300 GWh to A and be left with nothing) or swaps (C would swap, say, 150 GWh with A and 75 GWh with B—each generator would then be left with the same amount of output but all would be at a system average intensity and so compliant). These options would need further examination, but for present purposes the latter is preferred: by keeping virtual and actual sales separate, it ought to simplify monitoring and compliance.
- **Units for trading?** In the given examples, the units are virtual electricity output at a given carbon intensity. In principle it would be possible to trade carbon instead (as has been proposed for one variant of the broadly comparable

US Clean Energy Standard). Indeed, in terms of trading within the year, the proposed scheme is effectively an emissions trading scheme. The key difference between it and a conventional trading scheme is that it gives certain, predictable and long-term signals for investment, which is the key to decarbonization.

- **Negawatts?** It is in principle quite possible and in practice highly desirable to include demand-side measures ('negawatts'). In the example, for instance, 100 GWh of generator C's zero-carbon production could be in the form of negawatts. Clearly a proper system of verification would be needed and relatively high set-up and transaction costs would be involved. But this sort of verification is needed (though not always provided) for any serious energy efficiency programme, and once the initial scheme had been set up, the transaction costs need not be excessive. Certainly, if energy efficiency is as cost-effective as its proponents claim, there should be ample incentives to develop monitorable schemes; under the arrangements discussed, they would effectively benefit from the sort of income currently going to renewable sources.
- **Supplier or generator obligation?** The obligation could in principle be placed on either suppliers or generators, but the option illustrated here is a generator obligation. By contrast, the proposal for a US Clean Energy Standard would have involved a retail supplier obligation (such as the renewables obligation in the UK). There are arguments for both approaches and the choice would depend on the nature of the system concerned and the specific objectives and orientation of government policy. It is arguable that a generator obligation would be simpler and easier to implement (see under 'Business friendly'), create greater certainty, and avoid the strong pressure to engage in long-term contracts which a supplier obligation would create (and which could in turn have the effect of limiting competition by creating barriers to entry). Generators, which have to invest in long-term assets, are arguably more likely to take a long-term approach and have a greater long-term commitment to a particular market than suppliers, whose investment is less and whose greatest asset (their customers) are always liable to move to another supplier. On the other hand, it could be argued that a supplier obligation is most likely to sharpen competition, by creating strong incentives for suppliers to negotiate effectively. It could increase the customer responsiveness of the system because of the suppliers' direct relationships with their customers and could lead to greater innovation (for instance, suppliers may be more likely than generators to consider demand-side options since they have less financial and psychological investment in generating plants as such). There is no clear answer and the choice would depend on circumstances.
- **Small generators?** The suggestion is that small generators could participate on a voluntary basis. This would give an incentive for distributed low-carbon generation (e.g. roof-top solar) while enabling other forms of small-scale distributed generation to avoid bureaucratic complications.
- **Autogenerators, Combined Heat and Power (CHP) etc.?** In principle, these generators could also participate in the scheme, but initially it might be better to leave this on a voluntary basis. In any event, special arrangements would be needed, for example to determine the carbon intensity of generation from CHP schemes.
- **Island generators (actual or metaphorical)?** In principle, these could be included in the scheme; their options for physical trading would be limited, but they could still engage in virtual trading. (Actual islands might, however, require special or transitional arrangements to reflect their particular circumstances.)

Another major issue, which is probably more than a design detail, is the nature of enforcement: what happens if targets are missed? (Monitoring should not be a problem, as already indicated.) There seem to be two main options, though they could overlap and merge:

- **Punitive**. The principle here would be to set a heavy penalty for any failure to meet the target so as to provide strong incentives for compliance. The advantage is that this is more likely to ensure that the targets are met; the disadvantage is that it may add to risk and push up costs in a distorting manner.

- **Cap on cost**. The principle would be to set something like a reserve price; the government would then issue as many extra CIRCs as needed at that price. The government would set the price at a level which was at the upper end of the range of the expected costs of low-carbon generation; this would provide an incentive to reduce costs but ensure that the ultimate burden on consumers was capped. On the other hand, it would not ensure that the target was met.

Although the two approaches are quite different in principle, they could be combined in practice: for example, a contingency reserve of CIRCs could be established of 5–10 per cent of total generation; anything in excess of that would bring the penalty system into operation. It could be applied at the level of the individual generator, so any emissions above the threshold for that generator would attract the penalty. Alternatively, it could take the form of a double threshold, with the penalty scheme only coming into operation when the system as a whole was above the threshold; penalties would then apply to each individual generator's excess above their threshold. Overall, the options in this area are very similar to those relating to the enforcement of the ETS.

Other wider issues include:

- **Interaction with other schemes**. The interaction with carbon trading is discussed shortly. But one of the advantages of the proposal is that, in principle, an EU-wide approach would reduce or remove the need for the technology-based approaches discussed in Chapter 5 (and for other national measures, like the various components of the UK government's Electricity Market Reform).
- **Feed-in Tariffs, renewable premia, and portfolio standards**. These would not be needed to drive low-carbon investment, as that would be driven by the intensity target, so central purchasing, government determined contracts, central price-setting, and all the other potential distortions would be removed. It might still be necessary, for political reasons, to provide special support for particular technologies, but (see under 'Technology neutral' heading) it is one of the advantages of the scheme that such support would need to be more transparent and clearly motivated. Whether, for instance, nuclear power would need or justify any special arrangements against this background is doubtful. It could simply compete on a level playing field with renewables, CCS, and other sources.
- The need for **capacity payments** might also be less as a result of the technology-neutral approach, though they would be compatible with the scheme if it were felt necessary to retain them.
- **Carbon trading**. The scheme could in principle run in parallel with the ETS or other trading schemes. It should be possible to make the two compatible by setting ETS allocations which take account of the carbon intensity targets and are based on the assumption that they will be achieved. The carbon price would then have two main functions in relation to electricity: it would affect day-to-day operation of the fleet in place (e.g. the choice between gas and coal); and it would provide a linkage with other sectors so that the operations of the electricity sector were not completely isolated from the wider economy. (Electricity does, of course, have a special position under the proposed intensity arrangements, but that is already a feature of national decarbonization policies as described in Chapters 5 and 6.) Furthermore, the new arrangements would be significantly less distorting than the present position—see the following 'Main benefits' section.
- **European integration**. In principle, the boundaries for trading could be set as widely as desired, and the scheme could operate at a European level. In practice, transitional arrangements would probably be needed under which different trajectories were set for different member states to ensure fair burden-sharing. It would not be possible to set a single carbon intensity target across Europe in the initial stages, given the present differences in carbon intensity between, say, Greece and Estonia on the one hand (both over 700g/kWh) and Sweden and France on the other (both less than 100g/kWh). But the difficulties of doing so are not different in principle from those which arise at present, for instance in relation to the ETS itself or in relation to renewables targets. The EU has an extensive and largely successful track record in

negotiating such transitional or burden-sharing arrangements. It should be possible to develop a scheme which required all countries to move, over a period of time, towards a common intensity target but meanwhile recognized different targets in different countries as a basis for trading.

Main benefits of the scheme

The scheme should provide the following benefits:

- **Policy simplification**. As noted earlier, both a carbon price and the ETS are unlikely to be able to generate the amount of low-carbon investment needed to meet the EU's targets, and the EU has no clear governance and delivery system beyond 2020. Delivering the required investment therefore falls almost entirely to member states, via their 'technology push' policies. An intensity target offers a market-friendly alternative that should avoid the distortions of such a technology push, simplify the overall policy framework, and create stronger pressures to reduce costs and improve efficiency.
- One major advantage of intensity targets is that they should provide more **credibility, certainty, and predictability for producers**. Generators would know a long time in advance what their targets would be and could plan their investment programmes around them. There is at present something of a cycle of uncertainty. The failure of the ETS to drive investment leads to a need, across Europe, for special support for renewables, energy efficiency, and so on. That support in turn undermines the ETS price, so making it an even less credible instrument. Meanwhile, many of the specific schemes of support for renewables, such as FiTs for solar, have been subject to fundamental changes in many countries, as have attitudes to nuclear. This makes the nature of future technology-specific schemes unpredictable. The carbon intensity target, by contrast, should provide credible, predictable, and reliable long-term signals for investment.
- **Business friendly**. This form of target is familiar to generators and easy to implement. Indeed, many generators have used such a target, for example: E.On had the aim of reducing carbon intensity by 10 per cent between 2005 and 2012; Vattenfall wants to reduce by 50 per cent by 2030; and RWE set a target of 50 per cent reduction between 1990 and 2015.[2] A statutory target would give an even clearer frame of reference for investment planning.
- **Transparency for investors**. Investors would be able to assess generators on the basis of both the carbon intensity of their existing fleet and their plans for reducing carbon intensity. This would create investment pressure for reductions by the integrated utilities and increase the attractiveness of low-carbon generation projects.
- **Efficiency and cost effectiveness**. The target would provide strong incentives for cost reduction, which most European renewables support mechanisms arguably fail to do. It would encourage entrepreneurs to find both the lowest cost forms of low-carbon investment and the most efficient trajectory for reduction.
- **Technology neutral**. A particular advantage of the proposal is that it is technology neutral, allowing markets to discover the best mix of technologies. Of course, this could be a problem for some existing renewables and CCS schemes, and they might require special or transitional arrangements. But this is also desirable in principle. Support for renewables in particular is presently based on a confusing range of motives, such as emissions reduction, industrial policy, technology development, energy security, and so on. If support schemes have to be made more transparent, governments will have to clarify their objectives if they wish to continue giving technology-specific support not based on emissions reduction benefits. State aid rules could be applied in a more straightforward and transparent manner.
- **Market neutral**. This is another significant benefit: the arrangements could, in principle, be combined with almost any market structure. They avoid the need to segregate certain sorts of investment and remunerate them via special support schemes like FiTs, with all the market distortions that entails. They may not entirely remove the need for market reform in

2 See E.On 2005; Vattenfall 2011; RWE 2013.

the longer term, for the reasons discussed in Chapter 6, but by providing non-distorting incentives for investment in renewable sources, they would provide breathing space for markets to operate effectively in the interim. In the longer term, when the objective of a low-carbon system (getting below 50g/kWh, for example) has been reached, an intensity target would be no more than part of the general background framework. In other words, there would be a clear exit strategy and the prospect that Europe can ultimately achieve the free-standing sustainable electricity markets the Energy Union is aiming at.

- **Flexible and market friendly**. The arrangements could be designed to accommodate all sorts of generation and integrate them into the new system over time. They would leave it up to individual generators to make their own decisions but create attractive new markets in the form of CIRCs which would be accessible even to relatively small-scale low-carbon generators. They would leave the shape of the future electricity system open for markets to determine. That system is likely to look very different from the present system, and it is important not to prejudice the path of development in the way that current 'technology push' approaches do.
- **Good for the demand side**. As noted, it should be relatively easy to accommodate the demand side in the new arrangements. They would be simpler to operate than the current approaches that tend to try to tie in demand response to capacity markets, something for which it is not very well suited. In an intensity scheme, provided they were verified, demand-side measures would instantly have a market value and tradability; long-term advance commitments and investments would not be needed, but nor would they be discouraged. The incentives for developing demand-side measures would be high.

In short, the intensity proposal seems to have many potential benefits. Against that must be set the key questions of credibility and uncertainty. The proposal would involve a major change in approach for most governments and would not directly guarantee investor revenues. Would it provide a strong enough basis for investment and be credible over the long term? Given the novelty of the approach, there can be no definitive answer to these questions at this stage. However, it is arguable that a commitment to an intensity target would be more credible than a commitment to a future carbon price or emissions cap. It is simpler in form, more closely related to the emissions objective, more likely to deliver a least-cost solution, and does not depend on (or constrain) assumptions about the growth in GDP or electricity demand, so there is less reason to expect the government to change the target.

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This book is one of the first to address the European Union's new plan for an Energy Union. It examines Europe's long and winding path to a common energy policy and discusses where it is, or should be, going. Despite the fancy name and the ambitious goal of a fundamental transition in energy, the Energy Union proposals consist mainly of modifications to current energy and climate policies and do not adequately address the underlying flaws and contradictions in Europe's approach. In practice, the proposals are as much about preventing back-sliding into national mechanisms and a retreat from collective EU goals as they are about making forward leaps in European energy policy. The hole at the Energy Union's heart is lack of governance and coordination at the EU level.

This book argues that the Energy Union will not realize its potential unless it addresses four key challenges: reform of Europe's broken electricity market; development of an integrated strategy for the demand side; moving low-carbon energy incentives away from narrow technology-specific support; and taking a more self-help approach to energy security.

The authors, based at the Oxford Institute for Energy Studies, have combined their specialized knowledge of energy markets and EU institutions to create a book for policy-makers, industry leaders, students, and anyone interested in whether Europe can fulfil its ambition to lead the international fight against climate change.

David Buchan, a former career journalist with The Economist and Financial Times, has been at OIES since 2007, specializing in EU energy policy. Malcolm Keay has had a wide-ranging career in the energy sector, including the UK government (as Director of Energy Policy) and the International Energy Agency. He has been at OIES since 2004, specializing in electricity and climate change.

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