



Chapter 8

Environment

The summary

- Environmental policy has become one of the most significant and wide-ranging policy areas of EU legislation. An estimated 80% of UK legislation on environmental affairs emanates from Brussels, touching on almost all areas of industry and the public sector.
- Supporters argue that threats to the environment naturally cut across nation-state borders and should be tackled on an international scale. Many Europeans and members of the international community argue that the EU's commitment to environmental protection shows leadership and encourages other countries to adopt similar measures.
- Critics of EU environmental policy question the efficiency of some measures, arguing that the cost of complying with these regulations leaves European business uncompetitive, especially in the face of increased economic competition from countries such as China and India, where environmental standards and legislation fall far behind European requirements. Other critics point to the EU's involvement in environmental issues that are not trans-national, and could be dealt with by Member States, for example waste management.
- The EU Regulation on chemicals and their safe use (REACH) is another such example. Whilst the social and environmental benefits of regulating dangerous substances are self-evident, REACH has acted as a blunt and disproportionate device which has unleashed a stream of costs, both intended and increasingly unintended:
 - The 'command and control' approach to substitution of substances has, in some instances, been judged to be dangerous where suitable replacements have not been found
 - The obligation to publish toxicity data has forced some companies to reveal confidential information on R&D methods which has given non-EU companies a competitive advantage
 - Compliance costs have filtered to downstream users, not just in the chemicals but across virtually all manufacturing industries, especially SMEs.
- The Emissions Trading Scheme (ETS) is a third example. This aims to encourage companies to invest in low-polluting technologies by requiring EU companies to buy licences for their emissions above a certain quota. Non-EU polluters have no such schemes which can put their companies at a competitive advantage.
 - The EU's plan to unilaterally extend the ETS to the aviation industry has lined the EU up against the US, Canada and the BRIC countries. And while projected costs will vary from operator to operator, EU airlines are expected to foot the largest bill, and these costs will inevitably be passed on to the consumer.
- On carbon reduction and renewables, the EU has three agreements, which contain the conflicting priorities of emissions reduction on the one hand and prescriptive, technology specific targets for the energy mix of Member States on the other.
- At the March 2007 European Council summit, EU leaders committed to a set of legally-binding targets to reduce the EU's greenhouse-gas emissions by 20% by 2020 compared to 1990 levels. This also included provision for an EU Renewable Energy Directive, which requires 20% of the EU's total energy consumption to come from renewable sources by 2020. Furthermore, Member States agreed to introduce a binding target that renewable fuels—the majority of which, in practice, will be biofuels—should constitute at least 10% of their transport fuel needs by 2020.
 - In the UK, the Renewable Energy Directive requires 15% of energy consumption to be from renewable sources by 2020. The UK was starting from a rather low base, with renewables constituting only 1.5% of its energy mix in 2005. To achieve this ambitious

target, the last Government developed a national renewable action plan, which placed investment in energy sourced from onshore wind at the forefront of the UK's strategy.

- These targets are due to expire in 2020, and the UK Government has stated that it now “envisages multiple low-carbon technologies: renewables, nuclear and carbon capture and storage, all competing freely against each other in the years to come...For this reason, we cannot support a 2030 renewables target.”
- Such a shift in position could be a game-changer in the move towards low-carbon economies across the EU. The failure to demonstrate adequate returns on vast public investments have led to governments in Italy and Germany slashing subsidies for solar companies, while in Spain, one of the first acts of the new centre-right government was to axe subsidies for wind and solar power.
- As part of a broader energy mix, gas in general, and shale gas in particular, could also play a major role as a transitional low-carbon fuel, consistent with Britain's emission reduction objectives. The UK Government is supportive of shale gas production, but is cautious regarding concerns over its extraction process, and is eager to establish a strong national regulatory framework.

The options for change:

- ➔ In order to reduce the bureaucratic burden of environmental legislation, and help curb carbon leakage, the UK could take a more holistic, coordinated approach towards developing a less prescriptive, more business-friendly, regulatory framework that provides consumers and tax-payers with value for money. The UK could develop a much more active negotiating position within the Commission and other EU institutions; particularly in the context of our next EU Presidency term in 2017.
- ➔ The UK could renegotiate our compliance with the European Chemicals Agency (ECHA) regime ahead of this year's review of the REACH framework.
- ➔ The UK could work within current structures to present alternative proposals for the scope and ambition of the EU ETS fourth trading period (set to begin in 2020).
- ➔ The EU's renewables targets will expire in 2020, and this offers a window of opportunity for the UK Government. Negotiations on future targets are due to begin, and the UK could announce that whilst continuing to respect its current commitments, it would refuse to abide by any future renewables targets post-2020. This would then permit the UK to concentrate on developing its own approach to building a low-carbon economy, concentrating further resources on nuclear, gas and carbon capture and storage.
- ➔ The UK could negotiate fundamental reform of the REACH regime, or an opt-out for the UK, as part of wider renegotiation of its relationship with the EU.
- ➔ On EU ETS, the UK could negotiate through appropriate international bodies, such as through the International Civil Aviation Organization (ICAO) in the case of aviation, in order to obtain a global agreement, and ensure a level playing field.
- ➔ The UK could unilaterally refuse future compliance with existing provisions on REACH, 2020 renewables targets, and/or the EU ETS.

The introduction

Although there was no mention of it in the Treaty of Rome, environmental policy has become one of the most significant and wide-ranging policy areas of EU legislation. The pace of regulatory activity on environmental matters has accelerated over the last four decades, particularly since 2006 with the completion of major legislation on chemicals regulation, directives on waste and hazardous substances, and a raft of measures addressing air pollution. The energy and climate change package, unveiled by the Commission in 2008 with much pomp and fervour, includes regulations and directives on emissions and sustainable energy that will – and in many cases does already – have a major influence on the way Member States power their buildings, electricity grids and transport networks. Today, an estimated 80% of UK legislation on environmental affairs emanates from Brussels, touching on almost all areas of industry and the public sector.

In this paper we have deliberately not challenged the science of anthropomorphic climate change, preferring to focus on the tools used to reduce carbon emissions. The current EU energy and climate change package contains two principal elements: carbon reduction targets which set legally-binding targets to reduce the EU's greenhouse-gas emissions by 20% by 2020 compared to 1990 levels; and renewables targets which requires 20% of the EU's total energy consumption to come from renewable sources by 2020. These have presented conflicting priorities in implementation, with renewable energy sources being prioritised over other methods of carbon reduction, which may be more cost-effective.

Furthermore, analysis indicates that, in order to reduce carbon emissions by sufficient amounts to reduce the estimated increase in global temperatures by 0.1 degree Celsius would cost the equivalent of global GDP under current policies.

The detail

A brief history of European environmental policy

Environment Action Programme: The European Economic Community adopted its first environmental directive on the classification, packaging and labelling of dangerous substances in 1967. However, the advent of European environmental policy is widely understood to have started with the introduction of the Environmental Action Programme (EAP) in 1973, the first six-year plan in what would become a series of seven successive EAPs (the latest of which is currently under negotiation) that act as a framework for overall European efforts on the environment.

1973 also saw the European Parliament establish an Environment Committee. Momentum in European environmental policy was maintained with the establishment of both the European Commission's Directorate-General for Environment, Nuclear Safety and Civil Protection, in 1981, and with the 1985 Vienna Convention for the protection of the ozone layer, signed by the Community on behalf of the EU Member States.

The Single European Act (SEA) of 1986 launched a more prominent role for environmental protection in EU policy-making, introducing the idea of environmental mainstreaming in all new Community legislation. In addition, the SEA extended the competences of the Union to single market legislation, and the European Parliament's Environment Committee took on responsibility under co-operation procedure for a series of legislative proposals on consumer protection and food safety. Under the 1993 Maastricht Treaty, many of these responsibilities fell under co-decision; in 1999 this was extended to most areas of environmental, food safety and public health with the entering into force of the Amsterdam Treaty.

Air pollution: Reducing air pollution became increasingly important with the acid rain scares of the late 1980s, and amid concerns over ozone depletion; the Community was swift in ratifying the 1988 Montreal Protocol, which committed signatories to a 50% reduction in chlorofluorocarbon gases (CFCs) by 2000. Air quality legislation has developed along several parallel tracks since 1980, with the approval of the first Council directive on air quality limit values³⁴¹. In addition to setting air quality objectives, the EU has also undertaken action to reduce pollutant emissions. This has led primarily to directives on, among others, fuel quality standards, automotive emission standards, and pollution from industrial plants.

REACH: Now considered as landmark legislation, in 2003 a proposal was put forward for a Regulation on REACH, or Registration, Evaluation, Authorisation and Restriction of Chemicals. Replacing various European directives and regulations with a common system, its principal objective was to introduce a single and coherent regulatory framework for both “new” and “existing” chemical substances. In 2006, REACH was adopted, and came into force in April 2007.

Climate change: The EU has also played a role in global environmental negotiations, most notably the signing of the Kyoto Protocol under which the EU committed its members to reducing greenhouse gas emissions by 8% by 2012, compared to levels in 1990. In order to structure Member States’ commitments to limit or reduce greenhouse gas emissions, the EU Emissions Trading System (ETS) was launched in early 2005. The EU ETS is a cap-and-trade system, which means that it caps the overall level of emissions but within that limit allows participants in the system to trade emissions allowances as they require. These allowances are the common trading currency at the heart of the system. One allowance gives the holder the right to emit one tonne of CO₂.

In 2009, the Parliament and Council adopted an Energy and Climate Change package, comprising measures and directives aimed at mitigating the effects of anthropogenic climate change through emissions reductions, renewables and energy efficiency. The package includes the EU Renewable Energy Directive which mandates renewable energy use, and sets out the Commission’s 20:20:20 strategic objectives for the remainder of the decade: 20% of energy to come from renewable sources and the commitment to reduce greenhouse gas emissions by 20% by 2020.

Criticism

Critics of EU environmental policy question the efficiency of some measures, arguing that the cost of complying with these regulations leaves European business uncompetitive, especially in the face of increased economic competition from countries such as China and India, where environmental standards and legislation fall far behind European requirements. Is environmental legislation at the EU level necessary, or has current legislation gone beyond its original purpose and intent?

Threats to the environment are global and should be tackled on an international scale. The EU plays an important role in setting this agenda, and many Europeans and members of the international community argue that the EU’s commitment to environmental protection shows leadership and encourages other countries to adopt similar measures.

However, critics point to the costs of complying with much of the legislation, and how these costs are often passed on to consumers and undermine competitiveness. For example the Industrial Emissions Directive (IED), which is examined in more detail later in this chapter, forces large combustion plants with a thermal output of 50MW to adhere to unworkable and

³⁴¹ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31980L0779:EN:HTML>.

impractical emission limit values that will reduce the operating time of many industrial installations to a mere two years (17,500 hours) between 2016 and 2023.

Today, the debate on climate change seems to cloud all environmental debate; but environmental policy should be much more than just climate change policy. Many questions still remain over the causes of climate change and its potential future effects. Moreover, if we are to assume that climate change is man-made, are EU efforts alone enough to force a change? Surely a global approach should be sought, instead of the EU taking unilateral action that mostly serves to export industry and its emissions out of the EU, but with negligible impact on the global level.

To address these questions further, the following pages assess some of the key issues raised by EU environmental legislation, namely through the REACH regulatory framework for chemicals, the EU Emission Trading Scheme, and moves towards a low carbon and diversified energy mix in the context of the energy and climate change package.

The case of REACH - towards a pan-EU regime for chemicals

REACH is the EU Regulation on chemicals and their safe use, dealing with the Registration, Evaluation, Authorisation and Restriction of Chemical substances. The regulation entered into force in the UK on 1 June 2007. In the view of the European Commission, the aim of REACH is to “improve the protection of human health and the environment through the better and earlier identification of the intrinsic properties of chemical substances” whilst simultaneously “enhancing the innovation and competitiveness of the EU chemicals industry”. The chemicals industry is the third largest manufacturing industry in the EU, generating 1.7 million jobs and indirect employment for more than 3 million people. In total, the EU produces 31% of the world's chemicals, with the UK holding the largest European share of this industry. By means of comparison, the US produces 28% of the world's chemicals.³⁴²

Prior to REACH's implementation, a body of EC Directives and Regulations on chemical substances were developed during the 1970s and 1980s. A marked difference to the current framework was the different rules for “existing” and “new” chemicals. This distinction, introduced under regulation (EC) 793/93, was based on a cut-off date of 1981 - all chemicals that were reported as being on the European Community market between 1 January 1971 and 18 September 1981 were called “existing” chemicals. “New” chemicals had to be tested before they were placed on the market, whereas there was no such provision for “existing” chemicals. Under the previous system, the burden was on the authorities to prove that a substance posed a threat before it could be withdrawn.

Regime post-REACH

REACH removed the distinction between “new” and “existing” chemicals, and imposed a reversal of the burden of proof on industry, which has had to collect sufficient data in order to demonstrate the safe use of the particular chemical before it can be placed on the EU market. Under the uniform system, both “existing” and “new” chemicals are examined for health and safety over an 11-year period, beginning in 2007. This data is publicly available via a central database held at the specially established European Chemicals Agency (ECHA) in Helsinki. The ECHA is responsible for authorising or rejecting applications from manufacturers, and failure to register means that a substance cannot be manufactured or imported into the EU. Moreover, REACH prescribes pan-European rules for the phasing out and substitution of dangerous chemicals.

³⁴² Information from European Commission's website:
<http://ec.europa.eu/environment/chemicals/index.htm>.

Highly hazardous substances are divided into three categories: CMRs (carcinogenic, mutagenic or toxic to reproduction), PBTs (persistent, bio-accumulative and toxic), vPvBs (very persistent and very bio-accumulative) and other substances "of equivalent concern". Under the terms of REACH, PBTs and vPvBs are to be replaced whenever safer alternatives are available at an 'acceptable socio-economic cost'. This means that the health and environmental benefits of withdrawing the substance must outweigh those of keeping it on the market. For carcinogens and mutagenic chemicals (CMRs), producers must show that the risk they pose can be "adequately controlled". If a safer alternative exists, they will need to submit a substitution plan so that they are eventually replaced, or if not readily available, companies will need to produce an R&D plan for substitution at a later stage.

The regulation is due for review in the coming months, but major changes to REACH are considered unlikely. As a Commission official recently revealed,³⁴³ the forthcoming review is more likely to focus on better implementation of the existing rules rather than a major overhaul of the legislation, which was fiercely negotiated between Council and Parliament after years of lobbying battles by industry and NGOs. However, it is believed there will be scope for reviewing the costs and administrative burdens which REACH has imposed on the industry, in addition to its adverse impacts on innovation in this field.

Problems with REACH

First and foremost, REACH's framework attempts to set up a 'command and control' approach to substitution of substances judged to be dangerous. The illusion that in the case of a substance withdrawn from the market, that a safer substitute will automatically appear, has proven to be just that – an illusion. Companies using chemicals subject to the REACH regime in the manufacture of consumer goods have found that REACH has disrupted their supply chains. Post-REACH, many companies have faced extremely onerous tasks to find equally reliable and high-quality new suppliers, to the extent that in one instance, the European Aerospace Defence and Security industry declared in 2010 that their supply chain had "completely dried up".

With regard to innovation, REACH imposes the obligation on European firms to publish a large part of their toxicity data. Hailed by environmental NGOs, this requirement has in reality forced some companies to reveal confidential data, which reveals their R&D methods. The obvious consequence has been that non-European rivals have been placed at a competitive advantage, as they have been permitted a free insight into their European rivals' innovation strategies.

Another major concern regards so-called "downstream users" - REACH's costs have fallen not just on the chemicals industry but also across virtually all manufacturing industries, especially small-to-medium firms which represent 96% of all the EU's chemical concerns. In the view of UEAPME, the pan-EU group representing SMEs, these smaller businesses simply cannot cope with hundreds of pages of paperwork in order to complete the obligatory registration dossiers. In some cases, firms have been forced to invest thousands of pounds in IT systems and consultancies in order to examine substances so as to provide ECHA with accurate data.

REACH furthermore falls victim to the law of unintended consequences – in the view of many, while designed to protect consumers from exposure to hazardous chemicals, the vast bureaucracy entailed in the REACH regime also extends to metals such as Cobalt which hardly comes into contact with consumers at all. As a recent report by the House of

³⁴³ <http://www.euractiv.com/climate-environment/chemicals-policy-review-reach-links-dossier-188209>.

Commons' Science and Technology committee states, policymakers "should adopt different approaches to substances that aren't dangerous and those that are known to be harmful to human health", stressing the need for a more flexible and less bureaucratic regime.

Ultimately, all these factors have created a legacy of what have been described as "de facto import tariffs" which are depressing this vital European industry at a time of grave economic uncertainty. REACH requires European firms not only to submit highly prescriptive dossiers on each substance but also to pay registration fees to ECHA, which, according to the UK government, can cost up to €30,000, not including the sums invested in producing the dossier in the first instance. REACH adds effective tariffs therefore to every strategically important metal produced or imported into the EU in quantities of over one tonne per year, heightening trade barriers and depressing economic growth and competitiveness.

In summary, whilst the social and environmental benefits of regulating dangerous substances are self-evident, the EU's weapon of choice has acted as a particularly blunt and disproportionate device which has unleashed a stream of costs, both intended and increasingly unintended. Emerging economies such as China and the rest of the Asia-Pacific region have attracted three times as much chemicals industry-related investment as in the EU and the USA in 2010. Once again, the dangers of EU unilateral action are clear, as the single market risks de-industrialisation unless the REACH regime can be overhauled. With environmental groups actively campaigning for an even more restrictive regime, the time has never been more pertinent to clarify the real bureaucratic and financial costs of REACH to business and consumers.

The case of the ETS – the cost of EU unilateralism in aviation

The EU's Emissions Trading Scheme (ETS) is the world's largest carbon market, with a turnover of over €90 billion in 2010. It aims to encourage companies to invest in low-polluting technologies by allocating or selling them allowances to cover their annual emissions. Companies also have the right to sell unused allowances or to hold them in reserve. This 'cap and trade' approach requires EU companies to obtain licences for their emissions, which exceed their allocated quotas, but other great international polluters such as China and the USA have not accepted it. Whilst the Obama administration proposed a similar 'emissions exchange' programme as part of its early environmental agenda, this has been subsequently shelved in the teeth of bitter opposition from Congress.

From 1 January 2012, the EU has sought to extend the ETS' application to the aviation industry. Whilst the original Directive was enacted in 2008, the EU waited three years to implement the provisions on aviation, whilst it engaged with talks at the international level with other International Civil Aviation Organisation (ICAO) member countries. Once it became clear that consensus on aviation emissions was not possible, the EU chose the unilateralist path. Increasingly isolated internationally over 'cap and trade', such a further unilateral demarche has provoked an enormous backlash against the EU, with China, Russia, Brazil, India, Canada and others lining up with the US against the EU's push for further unilateralist action which severely impacts the rest of the world's aviation.

The EU is seeking to force airline operators on flights to and from the EU to surrender their emission allowances for emissions released during these flights. In the example of a flight from San Francisco to London, the EU's plans would count 100% of the emissions released, even though the aircraft would spend a tenth of its time in EU airspace. The Air Transport Association of America has already tried to challenge this move at the European Court of Justice (ECJ) in Luxembourg, but its core argument that such a unilateral and extraterritorial attempt to impose the EU's climate change policies on others violated a number of international treaties and principles of customary international law, was dismissed by the Court.

The projected costs for airlines will vary from operator to operator, but European companies are expected to foot the largest bill, estimated at around \$4.5bn a year. The cost to U.S. carriers is forecasted to reach \$2bn a year by 2020, based on the European Commission's own figures. Naturally, such costs will be passed onto consumers, with passengers' ticket prices set to rise between €10-€60, depending on the length of the flight.

As outlined, this ETS extension has set the EU in conflict not just with the US and the developed world but also with a vast swathe of developing countries. China, India and Russia have threatened not to let the matter rest, and despite the US' failed challenge to the ECJ, further legal challenges are anticipated, possibly triggering some form of trade war which the UK's British Air Transport Association described as "being in no one's interests". Recognising the severity of the situation, CEOs from Europe's top airlines came together on the 24 May 2012 to angrily dismiss the ETS as 'crazy' at a time when economic growth is stagnant, with Willie Walsh, CEO for the International Airlines Group calling on the European Commission to move quickly to defuse tensions and reverse the EU's "arrogant approach". In response, the EU has threatened sanctions against airlines that fail to comply with the ETS by mid-June, while in its sole olive branch offering, it has promised to amend the ETS legislation if a global deal can be agreed in ICAO talks, scheduled for June 2012.

The case of the current EU energy mix and the need for reform

At the March 2007 European Council summit, EU leaders committed to a set of legally-binding targets to reduce the EU's greenhouse-gas emissions by 20% by 2020 compared to 1990 levels. The EU has also pledged to raise this target to 30% if other major polluters make comparable unilateral commitments. This included provision for an EU Renewable Energy Directive, which was signed in December 2008 and which provides for an increase of the share of renewable energies to 20% of the EU's total energy consumption by 2020. Furthermore, the UK and the 26 other Member States agreed to introduce a binding target that renewable fuels—the majority of which, in practice, will be biofuels—should constitute at least 10% of their transport fuel needs by 2020.

In order to track progress towards reaching these goals, each Member State agreed to produce national action plans in the fields of electricity, heating and cooling, and transport to the European Commission, with progress reports on the plans' implementation to follow every two years. The Commission reserves the right to bring forward infringement proceedings to the ECJ against Member States in cases where Member States do not take 'appropriate action' towards achievement of the binding targets. The loose wording is rather revealing, demonstrating that the decision to take legal action is at the discretion of the Commission, given the absence of strict criteria, which could form such a judgment to force Member States before the Court.

The Renewable Energy Directive obliges the UK to achieve 15% of its energy consumption from renewables by 2020. The UK was starting from a rather low base, with renewables constituting only 1.5% of its energy mix in 2005. To achieve this ambitious target, the last Government developed a national renewable action plan, which placed investment in energy sourced from onshore wind at the forefront of the UK's strategy.

These targets are due to expire in 2020, and attention in Brussels has already turned towards what provisions will be made for the coming decade. The UK Government has taken advantage of this vacuum to press for nuclear power, carbon capture and storage (CCS) to be given parity with renewables in the EU. In a leaked policy paper, the UK government stated its position as follows:

“The UK envisages multiple low-carbon technologies: renewables, nuclear and carbon capture and storage, all competing freely against each other in the years to come...For this reason, we cannot support a 2030 renewables target.”

Such a shift in position opens up the potential for a game-changer in the move towards low-carbon economies across the EU. This is all the more so as it comes at a crucial time when the renewables industry has suffered a series of blows over the past number of years, largely due to the impact of the sovereign debt crisis across Europe, as governments seek to reduce their overheads. The failure to demonstrate adequate returns on vast public investments have led to governments in Italy and Germany slashing vital subsidies for solar companies, while in Spain, one of the first acts of the new centre-right government was to axe subsidies for wind and solar power.

In terms of Europe's future energy mix, this could have far-reaching repercussions. Governments such as the UK are already putting forward proposals to move towards outcome targets such as a new goal on carbon reduction, which embrace all low-carbon technologies, rather than just setting a new target for renewables. Europe's major business lobby, BusinessEurope believes that a renewed focus on nuclear energy could stimulate growth and competitiveness through lower electricity prices.

It is not just economic competitiveness that is affected by higher energy prices caused by the implementation of the Renewable Energy Directive. A recent research paper by Policy Exchange estimated the full cost of UK subsidies for renewable energy at £400 per average household. Department of Energy and Climate Change figures suggest that, in 2009, 40,000 - 50,000 households were pushed into fuel poverty because of the "wind element" of renewables.

This concentration on renewables ignores the fact that beyond the concerns raised by the construction of vast onshore wind farms which scar the landscape, nuclear energy will remain the most cost-effective of the low-carbon technologies currently on offer. This view was confirmed by the Committee on Climate Change, the statutory body set up to advise the Government on climate change policy. According to its recent findings, applying a 10% discount rate, nuclear power should cost between 5-10p/kWh to produce, even after taking into account the costs of decommissioning and waste disposal. Onshore wind, on the other hand will cost a minimum of 7p/kWh, even allowing for a best-case scenario. Consider that France was able to add 48GW of nuclear capacity - half the UK's entire electricity capacity - in less than 10 years, and it would seem that the UK is in danger of neglecting a viable and affordable way to tackle climate change whilst reducing the pain for households and business.

In summary, in order to tackle the risk of increased fuel poverty, while simultaneously tackling the challenge of building a low-carbon economy for the 21st Century, the UK should explore any possible short-term scope for re-negotiation of the 2020 renewable energy targets. If such moves prove unfruitful, the key battle will centre on what targets will be set post-2020. EU policy should focus on overall emissions and embrace all low-carbon technologies, rather than picking winners. Whilst the business case for government support for learning and innovation in a range of promising low carbon energy technologies is clear, the need to meet the EU2020 renewable targets constitutes a burdensome and most unnecessarily expensive policy.

The case study—Shale Gas

As part of a broader energy mix, gas in general, and shale gas in particular, could also play a major role as a transitional low-carbon fuel, consistent with Britain's reduction objectives. The UK Government is supportive of shale gas production, amid concerns over its extraction process, and is eager to establish a strong national regulatory framework.

Shale Gas: An Introduction

Shale gas is the natural gas trapped within shale rock formation, most commonly extracted by hydraulic fracturing, known as "fracking." Estimates indicate that using shale gas in electricity generation produces between one third and one half the carbon emission of coal,³⁴⁴ making it an attractive solution to the EU's 2020 emission reduction goals. It has the advantage over popular renewable resources like wind in that it can produce a baseload supply of energy, whereas wind farms will only generate if conditions are suitable. Additionally, the often unsightly structures used for hydraulic fracturing are more temporary than wind farms, making fracking often more popular locally than wind.

Nonetheless, shale gas is not a perfect solution. Many take issue with perceived environmental consequences of the fracking process, including possible earth tremors and potential harm to the water supply. Most of these complaints are disputed, and supporters argue that shale gas is among the most cost-effective and the least invasive plans for alternative energy for the UK, especially given that shale gas has already been found on- and offshore in the UK.

Shale in the UK

Cuadrilla Resources, a UK based energy company, began testing the Lancashire area for shale reserves in 2010. Due to minor earth tremors less powerful than those caused by city traffic, their tests were paused indefinitely. However, by that point, they had already found over 200 TCF (trillion cubic feet) of shale gas on site in Lancashire, and preliminary tests indicated that it would have commercial potential. According to conservative estimates, this quantity could correspond to the entire supply of gas used in the United Kingdom for several years. A domestic shale supply in the UK would be likely to cut costs, reduce emissions, and create jobs.

What's hindering UK fracking?

Despite significant evidence about the existence and the possible benefits of fracking in the UK, several factors have hindered this alternative energy project from progressing. The first is a moratorium on fracking in the UK passed in autumn 2011, effective until more information on environmental and health risks is assessed. A round of bidding for onshore exploration licenses has been delayed. Twenty-seven rounds of bidding for offshore licenses and thirteen for onshore licenses have already taken place, but an effective freeze on this fourteenth onshore license is preventing any progress in UK shale from taking place.

Shale in the US

The United States has seen increased focus in research and production of shale gas in the last five years. An early release edition of the Annual Energy Outlook 2012 report produced

³⁴⁴ Burnham, Andrew, et al. "Life-Cycle Greenhouse Gas Emissions of Shale Gas, Natural Gas, Coal and Petroleum" *Environmental Science and Technology*. 2012, Vol. 46, (2).
<http://pubs.acs.org/doi/abs/10.1021/es201942m?prevSearch=Life-cycle%2Bemissions%2Bshale%2Bgas&searchHistoryKey=#citing>.

by the US Energy Information Administration (EIA) estimates that as of January 2010, the US possessed roughly 2,214 TCF in shale gas reserves.³⁴⁵ Over the past five years, the US, which did not sign the Kyoto protocol and does not have binding carbon reduction targets, has cut carbon dioxide emissions by 450m tonnes, a feat the chief economist at the International Energy Agency accredits to this shale boom.³⁴⁶

From an economic standpoint, the impact of the shale boom has also been visible. In January 2012, the Financial Times reported that US natural gas prices were the lowest they had been in a decade, down 85% since 2005 to a low of \$2.32 per million BTU.³⁴⁷ And according to research from Pennsylvania State University, the Marcellus Shale reserves in Pennsylvania have already contributed to massive surges in local employment and relief to the government deficit.³⁴⁸

Yet despite this success, it remains unclear how likely the United States is to export its shale in liquid form to other countries. A report produced by the Brookings Institution, a Washington, DC-based public policy think tank, offers a thorough analysis of some of the factors hindering the US from engaging in significant LNG (liquid natural gas) exports, despite numerous offers. As this report notes, factors including the logistical transport difficulties associated with facilitating such an export market, the effect of exporting on domestic prices, and the demand for LNG both at home and abroad make the US' next step unclear.³⁴⁹

Shale in the EU

While several Member States, including France, oppose fracking on environmental grounds, countries like Poland that were preliminarily shown to be rich in shale, support fracking as a means to decreased dependence on imported energy resources from Russia. Exxon recently pulled out of its major shale venture in Poland, in light of further research suggesting projections of shale reserves in Poland might have been overestimated by a factor of ten. The long-term impact of this initial setback remains to be seen, and it is still unclear how viable an option for alternative energy in Europe shale really is.

Critics will note that shale gas does not contribute to fulfilling the renewables directive outlined in the European Commission's Europe 2020 climate change target. Although shale gas will clearly contribute to carbon emission reductions, it is not a renewable energy source. Nonetheless, an energy source that could reduce energy costs, contribute to lower carbon emissions, and improve UK energy security deserves further exploration.

³⁴⁵ "What Is Shale Gas and Why Is It Important?" *Energy In Brief*. U.S. Energy Information Administration. 11 Apr 2012. http://205.254.135.7/energy_in_brief/about_shale_gas.cfm.

³⁴⁶ Chazan, Guy. "Shale Gas Boom Helps Slash US Emissions". *Financial Times*. 23 May 2012 <http://www.ft.com/cms/s/0/3aa19200-a4eb-11e1-b421-00144feabdc0.html#axzz1yR6Stfa7>.

³⁴⁷ Meyer, Gregory and Guy Chazan. "US natural gas prices fall to decade low". *Financial Times*. 19 Jan 2012 <http://www.ft.com/cms/s/0/1199fc56-426e-11e1-97b1-00144feab49a.html#axzz1yR6Stfa7>.

³⁴⁸ Considine, Timothy, et al. "The Pennsylvania Marcellus Natural Gas Industry: Status, Economic Impacts, and Future Potential". 20 July 2011 <http://marcelluscoalition.org/wp-content/uploads/2011/07/Final-2011-PA-Marcellus-Economic-Impacts.pdf>.

³⁴⁹ Ebinger, Charles, et al. *Evaluating the Prospects for Increased Exports of Liquefied Natural Gas from the United States: An Interim Report*. Prod. By Energy Security Initiative at Brookings Institution. January 2012. http://www.brookings.edu/~media/research/files/papers/2012/1/natural%20gas%20ebinger/natural_gas_ebinger_2.pdf.

The Industrial Emissions Directive / Large Combustion Plant Directive

The Industrial Emissions Directive incorporated the EU's 2001 Large Combustion Plant Directive (LCPD). The LCPD is designed to reduce the amount of sulphur dioxide, nitrogen oxides and dust emitted from large conventional power stations. Existing plants had the choice to either comply with the new targets by installing new technology to remove emissions or remain open for a limited period only. In the UK, 11GW of capacity opted out of the Directive and will consequently have to close in 2015.

The short timeframe for the retirement of this capacity could have a serious impact on the UK's ability to cope with peak demand, when taken together with the slow pace of building new generation capacity, and the fact that it is impossible to rely on just renewables, such as wind, for peak demand, due to intermittency.

The UK currently has around 97 GW of generation capacity covering an estimated peak demand of 57.1 GW. However, of this only 64.1 GW of generation capacity is 'base load' or reliable for peak periods, this currently gives the UK a spare peak time capacity of 13%. However, as a result of the removal of large plants from production the base load is predicted to fall to 46.8 GW. Unless measures are taken, this could leave the UK with very little or no peak time generation cover, potentially leading to blackouts.

The options for change

The colour-coding used below for possible UK action follows the categorisation for all the Fresh Start Project's Green Paper chapters. Green are those measures that can be achieved within the current EU legal framework; Amber are those measures that require negotiated EU treaty change; Red are those steps that the UK could take unilaterally that would involve breaking its treaty obligations.

Environmental legislation cannot work completely independently, and can require a transnational approach; it is also inextricably linked to a number of other policy areas such as energy, trade, competition, consumer protection, transport and scientific research, and therefore has a considerable impact on the EU single market. Therefore, in order to reduce the bureaucratic burden of environmental legislation, and help curb carbon leakage, the UK could take a more holistic, coordinated approach towards developing a less prescriptive, more business-friendly, regulatory framework that provides consumers and tax-payers with value for money. The UK could develop a much more active negotiating position within all relevant Commission DGs and bodies of the European institutions; particularly in the context of our next EU Presidency term in 2017.

The UK could renegotiate our compliance with the ECHA regime ahead of this year's review of the REACH framework.

The UK could present alternative proposals for the scope and ambition of the EU ETS fourth trading period (set to begin in 2020).

Similarly, the UK could also take hard-line positions on any successor agreement on renewables after the existing 2020 targets expire. Negotiations on the Commission's Third Strategic Energy Review, expected in the next two years, will provide a good opportunity for the UK to set out its strategic goals, and press the case for investment in a pragmatic diversified energy portfolio that includes low carbon energy sources such as nuclear and

shale gas, instead of focusing almost entirely on costly renewables targets.

The UK could announce that whilst continuing to respect its current commitments, it would refuse to abide by any future renewables targets post-2020. This would then permit the UK to concentrate on developing its own approach to building a low-carbon economy, concentrating further resources on nuclear, gas and CCS.

Hypothetically, if the European Commission was also to introduce legislative proposals on shale gas which would greatly restrict its future development, the UK Government in the Council could seek to build allies such as Poland who would seek to block such moves.

The UK could negotiate a derogation from the Industrial Emissions Directive / Large Combustion Plant Directive.

Moreover, the review of the REACH framework, due to begin later this year, would further provide a negotiating opportunity for the UK. The remit of the review beginning this year, is aimed at ironing out the current problems with the current regime, rather than replacing it altogether. The scope for UK repatriation from REACH is rather narrow, and would require being part of a much wider package of reform of other areas of the UK's relationship with the EU.

On EU ETS, the solution lies more realistically in negotiation through appropriate international discussions, such as through the ICAO in the case of aviation, in order to obtain a global agreement, rather than demanding repatriation.

It is possible that the UK's ambitions to radically alter the existing policy at European level would be thwarted under the existing EU procedures and commitments to which the UK is legally bound. If, however, the UK is determined to take unilateral action and withdraw either partially or entirely from the EU's environmental *acquis*, there would be various consequences.

This scenario could arise in a number of circumstances. For instance, the UK could unilaterally announce its intention to refuse future compliance with existing provisions on 2020 Renewables targets, REACH or the EU ETS. This would lead to the UK being in clear breach of its existing legally binding commitments. Moreover, if the UK, as a large and powerful Member State, unilaterally announced its refusal to comply with EU environmental legislation, and did not receive appropriate sanction, other smaller Member States could possibly be emboldened to no longer feel obliged to respect other EU Treaty obligations, possibly in areas linked to the Single Market.

Such a move would however surely prompt swift reaction from the Commission which would pursue and almost certainly succeed in bringing infringement proceedings against the UK to the European Court of Justice, leading to heavy financial penalties and an order to implement and abide by existing Treaty obligations.

If the UK was unable to negotiate an opt-out from the Industrial Emissions Directive / Large Combustion Plant Directive, and implementation threatened the UK energy supply, the UK could simply ignore it and allow the affected power stations to go on producing. This would involve breaking treaty commitments and may result in sanctions from other countries. However, if the choice was between implementing the Directive, and the lights going out, Government would face little choice.