Climate change and energy security in Europe: policy integration and its limits

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PREFACE

Climate change and energy will be high on the agenda for the Swedish Presidency 2009, with the common theme of the two policy areas being "an eco-efficient economy". Moreover, at the UN Climate Change Conference in Copenhagen in December 2009 an attempt will be made to reach a new global climate agreement that will replace the Kyoto Protocol.

The present report, *Climate Change and Energy Security in Europe: Policy Integration and its Limits*, analyses how far the EU is integrating its energy and climate change policies. As an international leader in climate change policy, it is necessary for the EU not only to make sufficient progress in the respective two areas but also to take steps towards better integrating them in the future. Therefore the report focuses on identifying possible synergies and trade-offs between the EU's most recent package of legislative measures to combat climate change and its energy security objectives.

The authors conclude, among other things, that energy efficiency should be made a priority to reach both energy security and climate change objectives; that greater effort is needed from EU Member States to ensure that their renewable energy targets are met; and that much more investment in research and development is a necessity, in particular to fund research in non-nuclear energy and energy efficiency projects.

Anna Stellinger
Director, SIEPS

ABOUT THE AUTHORS

Camilla Adelle is a Policy Analyst at IEEP focusing in particular on EU sustainable development and policy integration. She has contributed to projects on the global dimensions of EU sustainable development as well as various aspects of policy integration and coordination. Her PhD thesis, completed at the University of East Anglia, tackled the issue of policy coherence in the EU's pursuit of sustainable development. In particular, it focused on the global social and environmental implications of EU policies, both external and internal. Her work has also covered numerous projects on evaluating and contributing to policy impact assessments in both an EU context and at the Member State level. Her work at IEEP includes other horizontal issues of environmental governance such as the implications of the EU's budget and treaty and other institutional developments.

Marc Pallemaerts is an international environmental lawyer and political scientist, who specialises in legal and governance issues of environmental policy, sustainable development and climate change. He is a Senior Fellow at IEEP and head of its Environmental Governance Research Programme. Marc is also Professor of European environmental law at the University of Amsterdam and at the Université Libre de Bruxelles on a part time basis. He has held several positions as a senior policy advisor to successive Ministers of Environment in Belgium, most recently as Deputy Chief of Staff to the Federal State Secretary for Energy and Sustainable Development, Olivier Deleuze, from 1999 to 2003. Before joining IEEP, he worked as a Senior Research Fellow at the Institute for European Studies of the Vrije Universiteit Brussel (VUB), where he was responsible for research projects on the EU's environmental and sustainable development policy.

Joana Chiavari is a Policy Analyst at IEEP, analysing the impact of policies related to climate change and energy issues at EU and international level, with a focus on new mitigation technologies. Her experience includes work on CO_2 capture and storage, from the standpoint of environmental impacts, risk assessment, regulatory requirements and public perception of the technology. Joana has also been involved in numerous research projects involving biomass for energy and transport fuels, and provided input into the Gallagher Report for the UK's Renewable Fuels Agency. Before joining IEEP, Joana worked for Fondazione Eni Enrico Mattei (FEEM) as part of the climate change policy unit, researching in the economics and policy of climate change. Joana took part in cooperation activities on climate change undertaken in the Black Sea Region, China and Brazil, focussing on the Kyoto Protocol's Clean Development

Mechanism (CDM). She was also a professor at the LLM Program in Environmental Law at the Catholic University of Rio de Janeiro. Joana has a Law degree, holds a Master's Degree in Environmental Management and a PhD in Analysis and Governance of Sustainable Development.

IEEP is a leading centre for the analysis and development of environmental policy in Europe and brings an independent analytical perspective to policy questions. The Institute's work focuses on EU environment policy, with programmes on climate change and energy, transport, industrial pollution and waste, agriculture, biodiversity, fisheries, and EU environmental governance. IEEP seeks to raise awareness of European environmental policy and to advance policy-making along sustainable paths. IEEP undertakes research and analysis and provides consultancy and information services, working both independently and on commissioned projects. Partners and audiences range from international and European institutions to local government, non-governmental organisations, industry and others who contribute to the policy debate.

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LIST OF ABBREVIATIONS

CO_2	Carbon Dioxide
CCS	Carbon Capture and Storage
CDM	Clean Development Mechanism
CHP	Combined Heat and Power
CIP	Competitiveness and Innovation Programme
DG	Directorate General
EC	European Community
EEC	European Economic Community
ECCP	European Climate Change Programme
EMAS	Eco-Management and Audit Scheme
EPI	Environmental Policy Integration
ETS	Emissions Trading Scheme
EU	European Union
FP7	7th Framework Programme for Research and Technological Development
GDP	Gross Domestic Product
GHGs	Greenhouse Gases
IA	Impact Assessment
IEE	Intelligent Energy Europe
IEA	International Energy Agency
IPPC	International Panel on Climate Change
JI	Joint Implementation
NAP	National Allocation Plan
NGO	Non-Governmental Organisation
OPEC	Organisation of Petroleum Exporting Countries
OECD	Organisation for Economic Cooperation and Development
RTD	Research and Technological Development
TFEU	Treaty on the Functioning of the European Union
UK	United Kingdom
UNFCCC	United Nations Framework Convention on Climate Change
US	United States
WTO	World Trade Organisation

EXECUTIVE SUMMARY

Energy production and consumption on the scale practised by Europeans has enormous environmental impacts. In the European Union (EU) roughly 80 per cent of energy consumed comes from burning fossil fuels which is the main source of greenhouse gases (GHGs) and so climate change. At the same time fossil fuels are largely externally sourced thus increasing European dependency upon a handful of suppliers, many of which are volatile politically or economically. Therefore, GHG emissions reduction and energy security have become two of the main energy-related policy drivers in the EU today necessitating fundamental changes in the way we produce and consume energy.

Despite the recent new era in EU energy and climate policy, few in depth analyses have examined the relationship between these two policies. This report analyses how far the EU is integrating its energy and climate change policies. As an international leader in climate change policy, it is necessary for the EU not only to make sufficient progress in both these areas but also to take steps towards better integration of these two policy areas in future. Therefore this report also focuses on identifying possible synergies and trade-offs between the EU's most recent package of legislative measures to combat climate change and its energy security objectives. Better understanding of these interactions will allow potential win-win situations between these two policies to be maximised while also identifying inevitable trade-offs.

Progress on Integration Commitments

The issue of energy and the environment has been on the European political agenda since the 1980s and has gone hand in hand with the EU's desire to act as a global leader in international cooperation to combat climate change. While progress was initially rather slow, a number of policy initiatives have now been developed in the field of energy efficiency, renewables, research and development as well as the completion of the first trial run phase of the EU Emission Trading Scheme (ETS).

Energy Efficiency

Energy efficiency is a core component of both energy security and climate change objectives. However, despite a number of initiatives aimed at energy efficiency and savings, progress made within Member States has been particularly disappointing. The Energy Efficiency Package presented by the Commission in November 2008 will give new impetus to this policy area but it is notable that a legally binding target on energy efficiency was not explicitly part of the 20-20-20 agreement.

Energy efficiency, and specifically the effective implementation of EU legislation in this area, should be made a priority to reach both energy security and climate change objectives. There is considerable scope to improve performance, especially in the residential sector.

Renewables

In the field of renewables – the other obvious component of a truly integrated energy and climate policy – progress has also been slow. The Commission anticipates that the EU will fall short of its initial "indicative" target of 12 per cent renewables in energy supply by 2010, as set out in the 2001 renewables Directive. Rather than too difficult, the Commission claimed that the 12 per cent target was insufficiently ambitious to drive change and proposed a *binding* 20 per cent target by 2020 which was adopted as part of the recently agreed 'Climate and Energy Package'.

Much greater effort will be needed from Member States to ensure that their renewable energy targets are met. It is important not to place too much confidence in the legal nature of new commitments and to gain a better understanding of why the original 2010 targets are likely to be missed.

Research and Development

The EU has made efforts to increase funding for research in recent years but it is still lagging behind countries such as the United States and Japan. Funding currently received by 'alternative' forms of energy is dwarfed by that received by nuclear fission and fusion and fossil fuel related energy technologies. A positive outcome of the recent Climate and Energy Package, however, has been the allocation of a proportion of the ETS emission allowances (with an estimated value of between €6-9 billion) towards the funding of large scale Carbon Capture and Storage (CCS) projects in the EU.

A great deal more investment will be needed in research and development, in particular to fund research in non-nuclear energy and energy efficiency projects. Member States should ensure that their 'willingness' to allocate up to 50 per cent of their revenues from ETS allowance auctioning to mitigating climate change is translated into a significant new investment in cleaner technology such as CCS rather than simply a repackaging of existing spending.

Emission Trading Scheme

The ETS is the EU's flagship policy initiative and has gone some way to fill the gap left by the earlier failure of the Commission's carbon/energy tax proposal and internalise some of the environmental costs of energy in-

tensive industries. This scheme therefore has the potential to reduce the amount of fossil fuels used in the EU and so contribute to both climate change and energy security objectives. In its initial trading period, a number of lessons were learnt but it remains to be seen whether the second trading period will spur innovation and emission reduction effort.

The amended ETS Directive has extended the scope of the scheme but many loopholes have been added for new Member States as well as exceptions for industrial sectors at risk of carbon leakage. The admittedly considerable increased pressures on EU industry in the current economic climate should not be used as an excuse to further weaken the implementation of the scheme in the post 2013 period.

Synergies between the 'Climate and Energy Package' and Energy Security

Further integrating climate and energy policy will bring both win-win situations (that is to say synergies) as well as trade-offs to different sectors and actors. Maximising the former and minimising the latter is vital if sufficient and timely progress is to be made towards a secure low carbon economy.

The main synergy between the goal of energy security and the four legislative instruments resulting from the 2008 'Climate and Energy Package', in particular the Decision on effort sharing, the new renewable energy Directive and the revision of the ETS Directive, is the likely reduction in fossil fuel consumption and imports. A further synergy is the potential role of the revenue raised from the auctioning of ETS allowances, which could be used to bolster the development and deployment of clean technologies. This would have knock-on impacts on energy security by promoting energy diversification and energy efficiency. In addition, renewable energy, and biofuels in particular, are seen by the Commission as a major opportunity to wean the European transport sector off its overwhelming dependence on imported oil. This would reduce national and European dependence upon imported oil. Renewables also offer a possible way in which the EU's climate change agenda can be promoted in the Union's bilateral relationships with other key actors and major oil importers, encouraging them to diversify their own energy supply whilst retaining their partnership in cooperating on a green agenda. The CCS Directive offers a number of possible synergies with energy security objectives. Mainly it puts Europe in a strong position to deal with its CO_2 emissions while also continuing to use its indigenous coal supplies and in addition to maintain coal as a possible external energy source.

Conclusions

This report discusses the progress made by the EU so far in integrating its climate and energy policies as well as pointing to areas where extra efforts will be needed in future. A greater focus on the possible synergies and, where necessary, trade-offs between EU climate and energy policies is one area deserving greater attention in future. The European Commission already has Impact Assessment as an instrument which it can use to clarify the relationship between these two high level EU objectives in specific policy proposals but much more thorough use could be made of this tool for this purpose. Win-win situations will not always be evident and complete coordination of competing objectives may not always to possible or even desirable. However, as we enter a 'new energy era' with the rise of both energy security and climate change policy issues up the political agenda, there appears to be a better chance at greater integration than any time in the past. Better understanding of potential synergies and trade-offs in these two policy areas will facilitate this further integration. Somewhat counter-intuitively, creating a new 'super-DG' for energy and climate change, possibly under the authority of a single Commissioner, as has been proposed by an internal task force of senior officials acting under a mandate from the outgoing Commission, may well turn out to be detrimental to further integration aimed at promoting sustainable development in Europe and beyond.

1 INTRODUCTION

Energy production and consumption on the scale practised by Europeans has enormous environmental impacts. Energy related emissions contribute to pollution of air, water and soil while also posing risks to human health, nature and biodiversity. In the European Union (EU) roughly 80 per cent of energy consumed comes from fossil fuels which are not only the main source of greenhouse gases (GHGs), and so climate change, but also largely externally sourced. The use of fossil fuels not only contributes to climate change but also increases European dependency upon a handful of suppliers, many of which are volatile politically or economically. However, at the same time that the EU has committed itself to cutting its GHG emissions by 20 per cent by 2020, or 30 per cent if other developed nations commit to comparable efforts, its dependency on imported fossil fuels is set to grow from 50 per cent today to 70 per cent in 2030 under a business as usual scenario (CEC 2006a). Therefore, addressing GHG reduction and energy security have become two of the main energy-related policy drivers in the EU necessitating fundamental changes in the way we produce and consume energy.

The integration of environmental and energy issues in Europe has been on the political agenda since the beginning of the 1980s and became a central strand in the sustainable development debate. New Member States in 1995, Sweden, Finland and Austria, gave a boost to the general concept of Environmental Policy Integration[1] (EPI) as a way of 'operationalising' the somewhat ambiguous concept of sustainable development. These countries pressed for an integration clause in the Amsterdam Treaty[2] strengthening the legal status of the principle of EPI and also brought pressure on heads of state and government to put this clause into practice (Lenschow 2002). As a result, during the UK Presidency in 1998, the Council of Ministers (including the Energy Council) was requested to develop strategies to give effect to "environmental integration and sustainable development" in their sector in the so-called Cardiff process (European Council 1998, 13).

Unfortunately, although the Cardiff process helped to put EPI on the agenda, the actual progress towards integration was weak and by 2001 the process

[1] Environmental Policy Integration refers to the integration of environmental aspects and policy objectives into sector policies, such as energy and agricultural policy.

[2] A new article, article 6, was inserted into the Amsterdam Treaty which charged that 'environmental protection requirements must be integrated into the definition and implementation of all the community policies and activities… in particular with a view to promoting sustainable development'. A weaker version of the principle of integration had earlier been included in article 130r(2) by the Single European Act in 1987.

was seen to be faltering. Partly as a consequence of the disappointing progress of the Cardiff process, little further headway with the 'greening' of EU energy policy was made in the late 1990s and early millennium. Early measures on renewable energy and energy efficiency had little impact, while more significant decisions in terms of energy policy were made in relation to liberalising the EU energy market with little consideration to the environment (Collier 2002).

Meanwhile, the integration imperative in the energy sector was given an increasing sense of urgency with the rise of climate change on the political agenda. In particular, the international climate change negotiations within the framework of the United Nations focused attention on the need for changes in energy policy. The EU's policy on climate change developed in parallel and in close interaction with this multilateral regime-building process. In particular, in October 1990 a joint meeting of the energy and environment ministers agreed for the first time to take action to stabilise CO_2 emissions in the Community *as a whole.* This allowed the EU to position itself as a key player in the international negotiations on climate change. The EU has made increasing efforts to underpin its international leadership role with domestic measures and, while these climate policy measures only weakly supported the EU position throughout most of the 1990s, the EU and its Member States have increasingly taken action since then (Oberthür 2008). In particular, the EU has implemented the Emissions Trading Scheme (ETS) as its flagship climate change policy and in March 2007 EU leaders agreed an ambitious set of climate change targets designed to influence the negotiations on a post-Kyoto global climate agreement. This has been backed up by the 'Climate and Energy Package' of implementation measures agreed by the European Parliament and European Council in December 2008.

In addition to the boost given to the integration imperative by the rise of climate change as a political issue, EU energy policy itself has recently been given renewed prominence due to concerns over energy security, volatile international oil and gas prices and their potential impacts on the competitiveness of EU business. Although the EU currently has no explicit competence in the area of energy policy, limited EU legislation on particular aspects of energy policy has been justified under other provisions of the EC Treaty, especially those relating to the internal market and environmental protection. In particular, the cut-off of Russian gas supplies to the Ukraine in January 2006, with incidental effects in a number of EU Member States, was seized upon as an opportunity to re-legitimise the objective of a common energy policy as a response to the challenge of security of supply.

According to the Commission, we have entered "a new energy era" (CEC 2006a).

Climate change and energy security are now at the heart of future European energy policies and greater attention is being given to their integration and interaction. Therefore, European policy makers are under increasing pressure to reduce GHG emissions while also ensuring energy security for Europe. Accordingly, energy security and climate change linkages are emphasised extensively in the European Commission's 2006 Green Paper *A European Strategy for Sustainable, Competitive and Secure Energy* (CEC 2006a) as well as its Communication *An Energy Policy for Europe* (CEC 2007a). It appears that climate and energy policy are at last being considered together, at least in part.

Integrating climate change and energy security will, however, not be an easy task. While tackling air pollution issues, specifically acid rain arising from power plants, produced some positive results, mitigating climate change is a far more complex task. Initially, during the 1980s and 90s the integration of energy and environmental issues in the EU had mainly been about reducing emissions of sulphur dioxide and nitrogen oxides from power plants (Collier 2002). In the end this was relatively successfully achieved through (admittedly costly) end-of-pipe technologies which 'scrubbed' these pollutants from the plant smoke stacks. Thus, relatively little integration of energy and environmental policy was necessitated as these activities had only limited impact on upstream energy activities (IEA 2007). However, mitigating climate change involves changes in almost every economic activity and every sector of society. It requires a complex combination of improving energy efficiency, switching to less carbon-intensive fossil fuels and carbon-free energy sources, and carbon capture and storage (CCS) (at least in the medium term). Therefore, fundamental changes in energy policy, that is to say EPI, rather than end-of-pipe solutions are needed if the EU is to meet its climate change objectives.

According to the European Environment Agency (EEA) (2005, 12) EPI means "moving environmental issues from the periphery to the centre of decision-making, whereby environmental issues are reflected in the very design and substance of sectoral policies". However, the EEA goes on to argue that the lack of agreement over the meaning of EPI (which can be seen as a concept, principle, strategy, duty and process) makes it difficult to put into practice and to evaluate its progress. For example, Lafferty and Hovden (2003) define EPI as giving "principled priority" to environmental objectives in sectoral policies. However, in practice environmental objectives sit alongside other policy objectives of the EU which on the other

hand also seek to promote the integration of economic and social goals into other policy areas (EEA 2005). Indeed, the balancing of the three pillars of sustainable development, economic, social and environmental, forms the basis of the EU's Sustainable Development Strategy (SDS). This therefore leads to a more complex form of integration than EPI alone. A two-way form of integration is required from environment into other sectors and vice versa which may entail intricate trade-offs between different policy objectives such as costs of environmental protection and social equity issues (Persson 2004).

Since 2003 the European Commission has put into place a policy tool – Impact Assessment (IA) – to identify such trade-offs and synergies arising from its policy proposals. The Commission intended IA to be a tool to improve the quality and coherence of the policy development process by identifying "the likely positive and negative impacts of proposed policy actions, enabling informed political judgements to be made about the proposal and identify trade-offs in achieving competing objectives" (CEC 2002, 2). However, only two assessments were conducted for the *four* legislative proposals contained in the recently agreed 'Climate and Energy Package' and these were relatively short and paid more attention to the potentially negative trade-offs between the competitiveness and environmental objectives of EU energy policy than to the potential positive synergies with energy security.

There is a need, therefore, to more widely examine the possible synergies and trade-offs between climate and energy policy both to increase our understanding of the potential barriers as well as help inform policy co-ordination mechanisms such as Impact Assessment in order to further integration. Despite the recent 'new era' in EU energy and climate policy, few in depth analyses have examined the relationship between these two policies, nor have they examined the EU's progress on their better integration. Therefore many questions remain which this report seeks to address: How far are these two policies now integrated? What potential is there for greater integration in the future? What are the opportunities and risks in terms of synergies and trade-offs ahead if greater integration is sought? If climate change and energy policies are to be better integrated it is necessary to be aware of these possible synergies and trade-offs in order to maximise the former and minimise the latter or at least to identify where appropriate flanking measures are to be taken to lessen any unavoidable negative impacts.

This report, therefore, examines the EU's attempts to integrate climate change and energy policies with specific interest to possible synergies be-

tween GHG reductions and energy security objectives. To do this the next section will outline the EU's energy policies with particular emphasis on the EU's energy security objectives and the potential synergies with climate change policies. Section 3 sets out a brief history of the EU's attempts to integrate climate change and energy policy up to now starting with early activities in the late 1980s, through the disappointing progress of the Cardiff process and ending with the 2007 energy package and the headline 20-20-20 climate change targets leading to the recently agreed 'Climate and Energy Package'. Section 4 then sets out the four legislative instruments proposed in this package and examines each of them in turn for potential synergies and trade offs between EU climate change and energy security objectives. The final section of this report, section 5, forms some conclusions on how far climate change and energy policy is currently integrated and puts forward some recommendations for better integration in future.

2 EU ENERGY POLICY

2.1 Provision for Energy Policy in the Treaties

When considering the integration of climate change and energy policy, it should be recognised that formally speaking the EU lacks a common energy policy. As the EU Treaties stand, the EU has no explicit competence in the area of energy policy, except for certain aspects of nuclear energy (including common radiation protection standards) under the antiquated Euratom Treaty. The original European Economic Community (EEC) Treaty did not address energy policy at all and the legal situation in primary Community law has remained essentially unchanged to this day. The European Community (EC) Treaty, as last amended by the Treaty of Nice, now includes, in the list of Community activities set out in its Article 3, "measures in the sphere of energy". However, it does not provide the institutions with specific powers in this field, other than for the limited purpose of contributing to "the establishment and development of trans-European networks in the areas of transport, telecommunications and energy infrastructures".[3]

Member States have been reluctant to formally delegate part of their sovereign powers over energy policy to the EU institutions, even though they have accepted limited EU legislation on particular aspects of energy policy which can be justified under other provisions of the EC Treaty. Thus, legislation to liberalise the market for electricity and natural gas was passed in the mid-1990s using the EU's powers to establish a single market. Likewise, legislation to promote energy efficiency and renewables was adopted under the internal market and environmental provisions of the Treaty. These are the "measures in the sphere of energy" referred to in Article 3 of the Treaty.

While the EU institutions can adopt environmental legislation binding on all Member States without their unanimous consent – a 'qualified majority' of Member State votes is sufficient – there are two important exceptions which constrain the EU's activities in the field of energy. Under Article 175(2) EC unanimity is still required for any "provisions primarily of a fiscal nature" as well as for "measures significantly affecting a Member State's choice between different energy sources and the general structure of its energy supply". The first exception was invoked in the 1990s to block a Commission proposal for a harmonised carbon/energy tax to be introduced throughout the EU as a climate policy measure (IEEP and NRDC 2008). The second has never explicitly been invoked so far but is looming in the

[3] Article 154(1) TEC.

background in all political decision-making on climate change, especially as the impact of climate measures on energy policy is increasing (*ibid*). Essentially, this gives Member States the power of veto over environmental measures which they perceive as encroaching upon their national energy policies.

However, the circumstances governing energy policy decisions have changed considerably in the last two decades. Oil prices have risen and become volatile, the EU dependence on imported energy supplies has increased and disruptions of supplies for political reasons (such as between Russia and the Ukraine) have become evident if still rare. Therefore, as a result of growing concerns about energy security and climate change, Member States have begun to overcome their long standing reluctance to delegate powers over energy matters to the EU and a political consensus has started to emerge in the last few years to establish a stronger role for the EU in energy policy (Pallemaerts 2008).

The Treaty establishing a Constitution for Europe, which was signed in 2004 but failed to enter into force due to its rejection in referenda in France and the Netherlands in 2005, already contained a new legal provision to grant specific competences to the EU in energy matters (Article III-256). This provision was subsequently included, in essentially the same form, in the Lisbon Treaty.[4]

Article 4 (2) of the new Treaty on the Functioning of the European Union (TFEU – the former EC Treaty, as modified by the Lisbon Treaty) includes energy as one of the areas of shared competence between the Union and the Member States (that is to say, it puts the area on a par with environment and the internal market). The objectives which should be pursued through EU energy policy are set out in a new Article 176a (1):

(a) ensure the functioning of the energy market;
(b) ensure security of energy supply in the Union;
(c) promote energy efficiency and energy saving and the development of new and renewable forms of energy; and
(d) promote the interconnection of energy networks.

Therefore, though mitigating climate change is not explicitly mentioned as one of the objectives of future EU energy policy (but would be explicitly mentioned as one of the objectives of EU environmental policy in the

[4] The Lisbon Treaty, if ratified by all 27 Member States, will replace the current EC and EU Treaties and their successive amendments. However, after the citizens of Ireland voted no to ratifying the Treaty in June 2008 the future of this treaty is far from certain. Though at the time of writing (May 2009), it looks likely that another referendum will take place in Ireland in October 2009.

TFEU), the activities necessary to pursue it are (that is to say, energy efficiency and the development of renewable forms of energy). However, Article 176a (3) goes on to state that the measures taken by the EU to pursue these objectives "shall not affect a Member State's right to determine the conditions for exploiting its energy resources, its choice between different energy sources and the general structure of its energy supply". Thus, the "energy sovereignty" of the Member States is preserved even more strongly than it currently is under Article 175(2) with respect to environmental measures, since measures affecting these matters could not be adopted under the new Article 176a even with unanimous support. While this safeguard may be politically necessary, in practice it could potentially act as a barrier to the effective integration of climate change policy and EU energy policy because it is precisely this "choice between different energy sources" that will need to change if the EU is to reach its climate change targets and objectives.

2.2 A New Energy Era

Closely linked to these developments in EU primary law, a significant evolution has also taken place in the arguments and strategies put forward in the 'softer' policy framework of European energy policy. In a landmark Green Paper on Energy published in 2000, *Towards a European Strategy for the Security of Energy Supply* (CEC 2000a), the Commission raised the argument for a deeper debate on EU energy matters. Specifically, it raised the question of whether it was "worthwhile conceiving a European energy policy from an angle other than that of the internal market, harmonisation, the environment or taxation" (CEC 2000a, 3). The Commission argued that energy policy had "assumed a new Community dimension without that fact being reflected in new Community powers" (CEC 2000a, 3). A number of policy documents discussing the possibilities of greater cooperation in the field of energy ensued but a renewed political interest in energy matters, and specifically energy security issues, was sparked off by the Russia/Ukraine gas crisis at the beginning of 2006, as mentioned above.

In March 2006, the Commission published a further Green Paper, *A European Strategy for Sustainable, Competitive and Secure Energy* (CEC 2006a), which describes a "new energy landscape of the 21st century". This new EU energy landscape is characterised by a high level of interdependence between Member States both in terms of supply and demand as well as environmental impacts (CEC 2006a). The Commission argued that this landscape necessitated a common European response. More specifically, the Green Paper put forward energy security and sustainability as two of the three priorities for a potential EU energy policy (the third

was competiveness and will only be briefly mentioned in this paper). The Commission observed that "Europe has entered into a new energy era" and that "increasing dependence on imports from unstable regions and suppliers presents a serious risk... [with] some major producers and consumers... using energy policy as a political lever". As will be discussed in section 3.4, the Green Paper illustrates the beginning of a more integrated energy and climate policy.

More recently, on 13 November 2008, the Commission published a five point *EU Energy Security and Solidarity Action Plan* to address the growing concerns over security of energy supply. Energy efficiency was at the forefront of this initiative but other measures included the diversification of energy supply, a greater focus on energy in the EU's international relations, and making better use of the EU's indigenous energy resources. The action plan was presented as part of the 'Second Strategic Energy Review' along with a number of energy efficiency proposals. Presenting the package, President José Manuel Barroso said that the proposals represented "an unequivocal statement of the Commission's desire to guarantee secure and sustainable energy supplies, and should help us deliver on the crucial 20-20-20 climate change targets" (CEC 2008a). Thus the interlinkages between the EU's energy security and climate change objectives have been recognised and are now being addressed alongside each other, at least in part.

2.3 Energy Security

As discussed in section 1 energy security is a complex concept that has been described as "one of the most overused and misunderstood concepts in the energy debate" (Helm 2002, 175). Its converse, energy insecurity, is defined as "the loss of welfare that may occur as a result of a change in the price or availability of energy" (Bohi and Toman 1996 in IEA 2007, 32). The energy security policy debate in Europe encompasses a wide range of issues including energy efficiency, diversification of energy supply, increased transparency of energy demand and supply offers, solidarity among Member States, infrastructure and external relations (EEA 2008).

The uneven distribution of fossil fuel resources around the world is the most long-lasting cause of energy insecurity (IEA 2007). For example, 62 per cent of global proved oil reserves are found in the Middle East. In addition, in many cases fossil fuel resources are concentrated in politically sensitive regions. In the case of the transport of fuels to the market, this is further exacerbated by local geographic constraints. In general, the policy response to this cause of energy security problems is to diversify energy

sources both by type and origin and so reduce the exposure to the resource concentration risk. This is usually best achieved by a mix of fuel sources and by a preference for domestic over imported energy supplies.

Europe's traditional reliance on its indigenous fossil fuels of oil, natural gas and coal has translated into dwindling reserves of domestic supplies, as well as into a serious dependence upon imports, many of which are affected by both price uncertainty/volatility and physical disruption. According to the Commission's figures in its 2000 Green Paper, dependence on imported oil could rise to 93 per cent, and on imported gas to 84 per cent by 2030. While oil suppliers are generally numerous, imported gas supplies (on which it is already 50 per cent dependent) are currently largely sourced from Russia, Norway and Algeria. In addition, the EU's Member States have a range of import dependencies. Denmark is now the only net exporter of energy, but a number of other countries such as Cyprus, Latvia, Luxembourg, Malta and Portugal import over 90 per cent of their needs.

The EU's incomplete internal energy market has not resolved energy security issues, and indeed has contributed periodically to energy distribution problems. Despite a host of Directives and proposals, EU-27 attempts at diversification and energy efficiency have been largely insufficient, and have not weaned it away from continued use of fossil fuels or their damaging effects on the environment. According to the 2006 Green Paper, the EU's dependency on imports will rise from around 50 per cent of its energy needs to around 70 per cent by 2030 if a business as usual approach is taken (CEC 2006a). Many supplier regions are threatened by political instability. At the same time Europe faces these challenges, global energy consumption is, under the International Energy Agency's (IEA) business as usual scenario, expected to increase by around 50 per cent by 2030 from current levels. Meeting this level of energy demand will potentially be difficult.

2.4 Synergies and Trade-offs between Climate and Energy Security Policy

Integrating climate and energy policy can bring win-win situations (that is to say synergies) as well as trade-offs. In particular, resource concentration issues have the most significant implications for climate change mitigation and vice versa as in both cases policies are most likely to directly affect fuel choices. Both energy efficiency and an emphasis on renewables are the key components of EU climate change policy that will have a significant impact on energy security by lessening external dependence on fossil fuels

regionally and internationally. The nature of synergies and trade-offs between security of supply and climate change policies depend, in part, on the strength of the GHG abatement policy pursued (Turton and Barreto 2006). From the fuel security point of view, only serious energy efficiency and renewables-focused diversification would seem able to resolve Europe's growing dependence on externally-sourced, climate-damaging fossil fuels, contributing to both climate change *and* energy security objectives, that is to say produce win-win solutions.

Despite these possible synergies, however, the underlying policy goals of addressing these two issues are still different. In the case of energy security the goal is to move away from the risk-prone fuels; while in the case of climate change mitigation, it is to reduce the carbon intensity of the fuel mix. As Turton and Barreto (2006, 2248) argue "where sustainability and supply security diverge, is that the latter considers only the impact of resource availability and not the impact of consumption or competing demands either natural of intra-generational or intergenerational". Therefore while the policy overlap may be significant, differences in approach and conflicts can still arise and policies or targets on climate change may have a detrimental impact on energy security. For example, coal reserves in the EU and around the world offer greater fuel diversity, potentially at a lower cost than the other, cleaner fossil fuels such as gas supplies from Russia. Increasing coal imports from South Africa may therefore be a low cost option for the EU to increase its energy security. However, burning coal undermines attempts to reduce CO_2 emissions and may ultimately have to be prohibited without CCS or, with a sufficiently high carbon price, will become too expensive under increasing climate change policy constraints. The eventual retrofitting of CCS to existing coal fired power plants further complicates this picture.

The rising prospect of low CO_2 fossil fuels through CCS causes some re-evaluation of the general notion that climate and security considerations tend to run parallel – CCS muddies the water by being a potential climate solution while permitting the use of coal, much of which is imported. This could have both positive and negative impacts on energy security. Positive impacts may arise if CCS allows the diversification of fuels by facilitating the continued use of coal in the short to medium term. Negative impacts could arise from the fact that CCS could facilitate the continued reliance on fossil fuel which, as will be discussed below, is ultimately not a secure energy resource due to its finite nature. In addition, capturing CO_2 may have a significant impact (around a 20 per cent reduction) on the overall efficiency of the power station and thus impact upon the security of supply

– as a great volume of primary energy is required. However, any portfolio of mitigation options that includes CCS is likely to use coal and gas at a far lower rate than under non-mitigation scenarios, and CCS may be important to earning the political agreement on tougher abatement targets over time.

The divergent policy goals of energy security and climate change mitigation can also lead to some trade-offs and contradictions even within areas of apparent synergy such as renewable energy. While developing domestic renewable sources of energy can contribute to both climate change and resource diversification objectives, the increasing reliance on *imported* renewable energy sources such as bioenergy may not necessarily have such a positive impact on energy security objectives. On the one hand, even with imports, renewables will diversify energy supplies, and therefore improve energy security, by shifting away from the traditional concentrated fossil fuels supplies. On the other hand, renewable energy resources are also unevenly distributed (IEA 2007). Solar insolation, for example, is much higher in the tropics than in northern countries in Europe. Similarly, wind or geothermal resources vary from country to country and within countries from region to region.

Up to now these renewable resources have mainly been developed domestically and have therefore not been the object of energy security concerns related to the uneven distribution of resources (*ibid*). However, as the EU increasingly turns towards biofuels in its transport energy mix, many developing countries may exploit this opportunity to become important suppliers to EU markets. Depending on how the market develops this may cause new energy security concerns linked to resource concentration (*ibid*).

Interactions between other causes of energy insecurity and climate change, such as regulatory failure are likely to be less important. Of particular interest here in terms of regulatory failure is that a fully functioning internal energy market within the EU should facilitate the choice of energy sources and companies by the consumers enabling the EU citizens to exercise green consumer choice. On the other hand, the competition introduced by an internal market may help to keep the price of energy low and thereby reduce the economic incentives to increase energy efficiency. Climate change mitigation efforts are unlikely to directly affect the ability of system operators to balance supply and demand on the market. However, some have argued that climate change mitigation may lead to an increase in the role of intermittent renewable sources of electricity, such as wind, and that this may render the system less secure. Better network integration across Europe can help significantly by smoothing out the impacts of

intermittency at any one point in the system. Smarter grids – with the ability to match load to generation more precisely and shift loads quickly – can further reduce adverse impacts. However, if system operators have the necessary means, and in particular the ability to charge for the additional back-up capacity needs, then system security should be unaffected (IEA 2007).

In the very long-term the main synergy between energy security and climate change is that the indefinite maintenance of supply security must ultimately lead to sustainable resource consumption (Turton and Barreto 2006). This eventually necessitates a shift to renewable resources over the very long term. Therefore, a shift from oil and natural gas to a combination of renewables and increased energy efficiency should be seen as the first step in a transition lasting a number of decades and perhaps up to 2050. Taken from the opposite perspective (that is to say giving the climate change objective priority), the imperative to reduce GHGs renders much of the existing energy capacity inappropriate (Helm 2002). In these circumstances, shifting to renewables and energy efficiency becomes a matter of urgent energy security.

3 PROGRESS ON INTEGRATION COMMITMENTS

3.1 The Early Days: 1980s and 1990s

The issue of energy and the environment has been on the European political agenda since the 1980s.[5] In 1992 during the negotiations on the United Nations Framework Convention on Climate Change (UNFCCC) in Rio, the EU argued (unsuccessfully) that all industrialised countries should sign up to a commitment to stabilise CO_2 emissions at 1990s levels by 2000. The EU's Environment and Energy Councils had agreed to this target itself in October 1990 in response to the International Panel on Climate Change's (IPCC) First Assessment report. Shortly afterwards a Commission Communication, *A Community Strategy to Limit Carbon Dioxide Emissions and Improve Energy Efficiency* (CEC 1992) proposed an EC level carbon/energy tax as the main policy instrument to implement this commitment to stabilisation. A range of legislative and incentive measures to reduce energy consumption (namely the SAVE and ALTENER programmes), and complementary legislation to monitor the national CO_2 reduction programmes of the Member States were also tabled. These proposals were issued jointly by the Commissioners responsible for energy and environment and potentially offered some real progress towards climate change and energy policy integration (IEEP 2008).

The carbon/energy tax proposal, the most contentious of the measures, was opposed by the British government on the grounds that taxation is a matter that should be the exclusive responsibility of the Member States (IEEP 2008). While some Member States (Denmark, Finland, the Netherlands and Sweden) introduced their own carbon taxes and remained keen on pushing for a common tax (Collier 2002), no progress was made on the original proposal, which was eventually withdrawn in early 2002. A subsequent proposal for a Directive to harmonise fuel tax rates (CEC 1997a) was put forward as an attempt to avoid the same problems: it was designed to raise the minimum duty rates for petrol and diesel, as set in the Mineral Oils Directive 92/82/EEC, and expand the coverage of the latter to other energy products. The Directive was finally agreed, in a much-weakened form, in mid 2003. The inability to reach agreement on a meaningful carbon/energy tax continues to be a major weakness in the integration of energy and climate change issues. In addition, its failure has been one of the major

[5] In Resolution of 1986 (86/C241/01) the Council adopted the Community target of improving the efficiency of final energy demand by at least 20 per cent by 1995. Integrating environmental considerations within energy policy was the theme of a subsequent Commission document entitled *Energy and the Environment* (COM (89)369) which, according to the Commission, was the first time that Community energy policy addressed environmental problems in a global way.

triggers of the emergence of an alternative economic instrument in this field, namely, the EU ETS.

The outcomes of the SAVE and ALTENER programmes were similarly disappointing. Ultimately these programmes were turned into funding for 'demonstration' projects (Henningsen 2008). The SAVE Directive 93/76/EEC (resulting from the Commission proposals made in the strategy in 1992) required the Member States to establish 'programmes' to limit CO_2 emissions through improvements in energy efficiency, particularly in areas such as energy certification and thermal insulation of buildings and energy audits (IEEP 2008). Limited financial assistance of around 40 million ECUs was originally provided for the first phase of the programme, SAVE I (1992-1996). However, no qualitative objective was set and the content of the programmes was left to the Member States' discretion. So much so, in fact, that the Commission itself commented early on that the effects of SAVE were highly uncertain (CEC 1994 in Collier 2002). ALTENER, a financial instrument for the promotion of renewable energy sources, was also considered to be a weak programme (Collier 2002). Targets, including those aiming to increase the contribution of renewable energy from 4 per cent in 1991 to 8 per cent in 2005, proved unrealistic. The relatively moderate amount of EU funding allocated to this programme (40 million ECUs for the first five years) helps explain its subsequent limitations.

In the early 1990s, some legislative measures were also adopted in the area of energy efficiency. Directive 92/75/EEC introduced a system of mandatory labelling and product information on the energy consumption of household appliances, designed to encourage consumers to choose more energy-efficient products. In parallel, minimum energy efficiency standards were adopted for a small number of consumer products such as hot-water boilers (Directive 92/42/EEC), household refrigerators and freezers (Directive 96/57/EC). However, these standards were not revised to keep up with technological progress, as EU energy efficiency policy essentially opted to rely on the energy labelling system and consumer pressure to move the market towards greater energy efficiency. This, however, did not prove very effective, and the EU's rate of progress in energy efficiency significantly slowed down in the 1990s.

Another relevant initiative was the Community Strategy on Renewable Energy (CEC 1997b) which aimed to encourage the doubling of the use of renewable energy from 6 per cent of total consumption in 1996 to 12 per cent by 2010. The target was subsequently endorsed by a Council Resolution (98/C198/01) and eventually led to the 2001 Renewable Energy Direc-

tive (2001/77/EC) (see section 3.3). An energy efficiency strategy was also adopted by the Commission in 1998 (CEC 1998a).

Therefore, quite a number of policies and initiatives had been proposed early on in the EU to integrate climate and energy policy but in the end many of these lacked the necessary support from Member States. The failure of the energy/carbon tax was a particularly significant example of hesitant Member State backing. Meanwhile, the EU had taken a leading role in the 1997 Kyoto UNFCCC Conference pushing for GHG reductions beyond 2000. In March 1997, the Environment Council adopted conclusions calling for a 15 per cent reduction by the year 2010 relative to 1990 levels. International negotiations were tough and while the EU was asserting its leading role in international climate change negotiations, it still lacked a credible internal integrated energy and climate change policy (Oberthür 2008). In fact the stabilisation target set by the EU in 1990 might well have been missed had it not been for a number of coincidental developments such as the 'dash for gas' in the United Kingdom (UK) and the industrial collapse in eastern Germany following the demise of the former German Democratic Republic (Henningsen 2008). Collier (2002) maintains that the most significant development for the energy sector during this period was the decision to liberalise energy markets.[6]

In the event, the EU collectively committed itself to the toughest Kyoto Protocol target of an 8 per cent reduction by 2012. The Council subsequently agreed a corresponding 'burden-sharing' agreement as to how the Community was to achieve its collective Kyoto target in June 1998, with a number of Member States committing themselves to very substantial reductions. It was clear that when the Kyoto Protocol was eventually ratified by the EU,[7] meeting these targets would require additional measures at the Community level.

[6] Market liberalization to create an internal energy market had been on the EU agenda since the 1980s and the Council finally agreed on market liberalisation in the electricity sector in 1996 and in the gas sector in 1998. The ultimate aim of this process was to achieve lower energy prices as a means of improving industrial competitiveness. However, low energy prices are not necessarily desirable environmentally since they provide a disincentive for energy efficiency as well as make it harder for renewables to compete (Collier 2002).

[7] The Community did in the event adopt a Decision to ratify the Kyoto Protocol in April 2002, and the EU and its 15 Member States ratified simultaneously the following month (2002/358/EC). The ratification Decision included the burden sharing agreement, which was formally notified to the UNFCCC Secretariat and became binding on Member States once the Protocol entered into force.

3.2 The Cardiff Process: 1998-2000

The integration of energy and climate policy was given a fresh impetus through the Cardiff process. This process was launched in 1998 when the sectoral formations of the EU Council of Ministers were asked by the Cardiff European Council to establish a series of strategies to integrate the environment and sustainable development into their respective policy areas (European Council 1998). The Energy Council was in the first wave of three Council formations requested to prepare a strategy.

In response to this request, a Commission Communication on *Strengthening Environmental Integration within Community Energy Policy* was presented in October 1998 (CEC 1998b). This document was followed by a Council integration strategy submitted to the Helsinki European Council in December 1999 (EU Council 1999). The strategy identified a number of priority areas for further action, including: renewable energy sources; energy efficiency; internalising the external costs; research and development; contributing to developing flexible mechanisms of the Kyoto Protocol; and increasing cooperation between Member States in regard to their Kyoto commitments (EU Council 1999, 7). However, the strategy failed to move the integration process along in any significant way. Although, it set out three action periods the strategy did not contain any concrete supplementary plans beyond what was already in progress under initiatives such as SAVE and ALTENER (IEEP 2008). No concrete goals or targets were set either and even existing targets (on renewables) were not explicitly reiterated (*ibid*).

This missed opportunity for integration was not particular to the energy sector and the Cardiff process was widely criticised (Kraemer 2001; IEEP 2001; Gorlach *et al* 1999). The Commission's own assessment of the strategies in 1999 found that they should have contained more detailed analysis of the causes of environmental changes and measures to address them rather than simply describe existing trends and listing "end-of-pipe" solutions that the EU had already adopted (CEC 1999, 6). In addition, rather than a *process* the Cardiff strategies were regarded as *ad hoc* policy statements by the Council formations concerned with little follow up activities taking place. In light of these criticisms, as well as the static nature of the initiative, the Cardiff process soon lost credibility and momentum and by 2001 the process was faltering (Jordan *et al* 2006). During 2005 and 2006 official reference to the process had all but ceased and it can now be considered as effectively defunct.

Meanwhile, in November 2000 the Commission published a long-awaited Green Paper *Towards a European Strategy for the Security of Energy*

Supply (CEC 2000a). This document had no explicit links to the Cardiff process but it does illustrate an interesting corresponding shift in scope of EU energy policy towards environmental considerations. Although based firmly in the field of security of supply, the document also paid some attention to the environment, which was by now gradually becoming recognised as the third core objective of the policy – the others being security of supply and competitiveness. In particular, the Green Paper stressed the importance of climate change as a driving factor in energy policy, signalled a need for a long term rebalancing towards demand-side policies, and once more highlighted the advantages of energy taxation. This was in contrast to the previous Green Paper published in 1995 *An Energy Policy for the European Union* which included 'environmental protection' as one of the three objectives of EU energy policy but only briefly mentioned the impacts of rising energy consumption in the EU on climate change (CEC 1995b). Therefore, while limited progress had been made in integration on the ground in the 1990s and the Cardiff process had mainly been a missed opportunity for integration, there was a gradual shift around that time in the formulation and perception of energy policy to one which included consideration of climate change objectives.

3.3 Progress Post Cardiff: 2001-2007

Two important publications set out the Commission's bid to step up efforts to address climate change in the new millennium: a Communication on policies and measures to reduce GHG emissions (CEC 2000b), which launched the 'European Climate Change Programme' (ECCP) and a Green Paper on an EU ETS (CEC 2000c). The first phase of the ECCP was completed in 2001 and along with the two subsequent rounds of the ECCP, catalysed a broader range of energy-related measures, putting forward many proposed measures that have subsequently become legislation. Progress made in the fields of energy efficiency, renewable energy, research and development will be discussed below along with the EU ETS.

Energy Efficiency

The first ECCP report in 2001 identified a number of measures in the field of energy efficiency including some that were already under development, for example a Directive on energy performance in buildings and a Directive on combined heat and power which was part of the Action Plan to Improve Energy Efficiency in the European Community (CEC 2000d). The energy performance of buildings Directive (2002/91/EC) demands Member States set minimum standards for the energy performance of

new buildings while the Directive on the promotion of cogeneration (2004/8/EC) provides harmonisation of definitions of efficient Combined Heat and Power (CHP), establishes a framework for a scheme for a guarantee of origin of CHP electricity, and sets the general target of having electricity production from cogeneration increased to 18 per cent. The first ECCP also called for new measures, for example a Directive on energy efficient public procurement. Further EU measures in the energy efficiency field soon followed including Directive 2005/32/EC establishing a framework for the setting of eco-design requirements for energy-using products and Directive 2006/32/EC on national programmes for energy end-use efficiency and energy services.

More recently, the Commission identified energy efficiency as a priority in the publication of the Green Paper on Energy Efficiency, *Doing More with Less* (CEC 2005a). This highlighted potential energy savings of over 20 per cent by 2020 recognizing energy efficiency and demand side management as one the priority means to comply with the energy security of supply *and* climate change agendas. However, according to Henningsen (2008, 24), "the current Commission has not performed well on energy efficiency" and it no longer seems to be the priority it was. In particular, he claims that the following 2006 *Energy Efficiency Action Plan* (CEC 2006b) did not deliver a convincing follow-up to the Green Paper. The Commission itself has admitted that, although the EU had adopted some useful legislation and targets in this field, the expected impact of the most relevant efficiency measures when fully implemented "reveals that the EU and Member States are not doing well enough" (CEC 2008a). Indeed, although the Energy Efficiency Action Plan contains over 70 proposed measures targeting buildings, transport and manufacturing, many of these are unlikely to make a significant impact on emissions. For example, while it is commendable for a review and expansion of the Directive on energy efficiency in buildings to be undertaken, there is evidence that the implementation of the current Directive is limiting its effectiveness (IEEP 2008). In addition, the proposed legislation with regard to fuel efficient cars has been significantly watered down in its passage through the Council and Parliament. In response to these many and severe criticisms, the Commission published a bundle of proposals designed to better implement EU energy efficiency commitments in November 2008.

Renewables

Apart from small sums available through ALTENER and other EU funds, renewable energy support had mostly been a Member State matter. The Renewable Energy Directive adopted in 2001 (2001/77/EC) as a result of

the Community Strategy on Renewable Energy published in 1997 (see above) had been the most concrete EU level action in this field. However, the individual targets set for the future share of renewables in each Member State's electricity supply mix were non-binding, as was the ultimate target to increase the share of renewables in the total energy consumption across the Community from 6 per cent to 12 per cent by 2010 (IEEP 2008). The fact that these targets were not mandatory left considerable flexibility for Member States to set their own targets and to choose their support mechanisms. According to Henningsen (2008) "the fact that 12 per cent happened to be twice as much as 6 per cent led some Member States with low shares of renewable energy sources to be satisfied with doubling their low share and Member States which already had renewable share above 12 per cent felt they were off the hook".

By 2004 it was becoming apparent that not enough progress was being made on these indicative targets. Although the contribution of renewables has increased by 55 per cent since 1997, the Commission anticipates that the EU will fall short of its original 2010 target. The achievement of 10 per cent of energy supply may be more likely. Therefore when the Commission published a communication on EU renewable targets (CEC 2004) in May 2004, there was hope from some quarters for more concrete action. However, in the end the Commission said any long-term EU renewable targets would not be proposed until 2007. Obstacles including technical and practical limits and cost-effective availability were given for this approach. Eventually, after prodding by both the Council and the Parliament,[8] on 10 January 2007, the European Commission published the *Renewable Energy Roadmap* (CEC 2006c) as part of its package of climate and energy communications. It proposed a target of 20 per cent of renewable energy by 2020, which was affirmed by the European Council in March 2007 (see Section 3.4 below). Flexibility is introduced in two ways – differentiated national targets based in part on a Member State's GDP, and secondly the opportunity to trade 'guarantees of origin', allowing those over-complying to sell certificates to those needing them. Secondary targets for specific uses of renewable energy would be left to Member States to decide (IEEP 2008).

[8] At their Spring 2006 Summit, EU heads of State and Government responded to the Commission's Green Paper on Energy Policy by proposing that the Commission should 'consider' an overall renewable target for 2015 of 15 per cent and an 8 per cent target for bio-fuels in transport. In July 2005 the European Parliament's Industry, Trade and Energy Committee reacted to a Commission Communication on the renewable targets published in May 2004 (COM (2004) 366) by calling for a 25 per cent renewable target by 2020.

In addition to its policy for promoting the use of renewables in its general energy supply, the EU has developed some policy initiatives to promote the use of biofuels in transport. In the transport White Paper in September 2001 (CEC 2001a) two proposed measures to promote liquid biofuels were discussed. A Communication on alternative fuels for road transportation and a set of measures to promote biofuels followed later that year (CEC 2001b). This led to a Directive on the promotion of the use of biofuels or other renewable fuels for transport (2003/30/EC) which set indicative targets for their market penetration in each Member State rising from 2 per cent at the end of 2005 to 5.75 per cent in 2010. However, since then a much broader debate on biofuels has taken place in Europe and in particular focusing on the sustainability of biofuel production and the potential contention for feedstocks with the food industry. This debate was reflected in the *Biofuels Progress Report* (CEC 2006e) which also concluded that the indicative targets set were unlikely to be met in 2010. Accordingly, the Commission argued for the mandatory targets of 10 per cent biofuels in 2020. Thus, new and more stringent biofuels targets have been proposed by the Commission and adopted by heads of state and government in the Spring European Council in March 2007 (see section 3.4 below). These new targets have been accompanied by 'sustainability criteria' which attempt to take into account some of these concerns raised in the broader debate on biofuels.

Emission Trading Scheme (ETS)

The failure of the energy/carbon tax in the 1990s as the main implementing mechanism for the emissions cuts agreed at an EU and international level, left the Commission searching for other instruments to intervene in the energy sector. Economic instruments are thought to be better suited (ie more easy to implement and cost-effective) at controlling energy markets than traditional command-and-control regulation. Flexible mechanisms were also promoted by the Kyoto Protocol. The first reference to an ETS appeared in a Commission Communication after the signature of the Kyoto Protocol by the EC in December 1997 (CEC 1998c) and the Green Paper presenting the scheme was published in March 2000 (CEC 2000c). However, Henningsen (2008) argues that claims that the EU ETS was derived from the emission trading provision in the Kyoto Protocol are wrong.

The ETS proposal was eventually published in October 2001 following a Green Paper and alongside a proposal for a Council Decision to ratify the Kyoto Protocol. The proposal was originally due to be published earlier but it was held up at the time as a result of various concerns from both stakeholders and internal divergences within the Commission, in particular

The ETS requires major energy intensive installations such as power plants, oil refineries and iron and steel plants, to obtain a GHG emissions permit issued by a competent national authority and to monitor and report their CO_2 emissions. Each installation is allocated an emission cap determined by national authorities in accordance with a pre-established National Allocation Plan, which each Member State submits to the European Commission for approval based on a set of criteria laid down in the Directive. The first set of NAPs covered the period 2005-2007; the second the period 2008-2012.

Each year, the permit holder must surrender a number of allowances corresponding to actual emissions. If these exceed his emission cap, he will have to acquire additional allowances on the market, originating from operators anywhere in the EU who have reduced their emissions below their assigned caps. Subject to certain conditions, emission credits acquired under the Kyoto mechanisms (JI and CDM) can also be used to discharge obligations under the EU ETS. Permit holders who do not comply with their obligations will be liable to pay a fine per tonne of unlawfully emitted CO_2 (€100/tonne in the current period). From 2013 a proportion of the allowances will be auctioned.

between the Directorate General (DG) Environment (from which the proposal originated) and DG Enterprise (Henningsen 2008). Many of these issues of concern have become the basis for continued discussion and negotiation, namely the impact on energy intensive industries, the mode of allocation of emission allowances, the link to other flexible mechanisms such as Joint Implementation (JI) and the Clean Development Mechanism (CDM) of the Kyoto Protocol. In the end the EU ETS was adopted in October 2003 by Directive 2003/87/EC with the first trading period of 2005-2007 seen as something of a trial run.

The ETS has quickly become the EU's flagship policy but has also had its share of controversy. Progress to date has been a story of ups and downs (IEEP and NRDC 2008). The system got up and running quite quickly, overcoming a number of obstacles both political and practical. It is the first of its kind in the world, and there was always recognition that there would be difficulties – particularly in the 2005-2007 trading period. But it was more than just birth pains – the process of setting allocations at national level, and the subsequent results of that process, highlight the flipside of the image of emission trading as being friendly to both environment and industry (IEEP and NRDC 2008). In fact, allocation setting is a process fraught with technical difficulty and tough political choices, where industry holds an information asymmetry over regulators, and national governments can produce projections of emissions needs using opaque methodologies, designed to protect their industries.

While warnings had long been issued that allocations were too high in the first period, when verified 2005 emissions data were published in 2006,

the over-allocation was made plain and shocked the market – carbon permit prices plummeted from over €15/tonne to less than €5/tonne, and by the end of the period sank to less than €1. Permit prices for the 2008-2012 period had already been trading in the previous period above €12, and through the first months of the new period rose quickly to stand in the mid €20's.

The strong price for the new period reflects the way lessons were taken from the over-allocation in the first period. To start with, having verified data in hand, it was no longer necessary to speculate about historic emissions of covered facilities. Nevertheless, in their 2008-2012 National Allocation Plans (NAPs), many Member States still gave generous allocations, often claiming the need to allow for strong activity growth. The Commission, however, approved all but four NAPs subject to the condition that total allocation levels were cut – the total cuts demanded by the Commission amounted to 10.5 per cent below what was requested. Perhaps most remarkable is the position of new Member States: for example, Latvia, Lithuania, Malta, and Slovakia collectively proposed caps that were fully 87 per cent above 2005 verified emissions. The Commission cut these proposals back to a rise of 23 per cent.

Reaction to the cuts imposed by the Commission has by and large been positive, particularly by carbon traders and environmentalists. Some governments, however, fought with their own industry and with the Commission over the figures. Germany's Economy Minister Michael Glos initially called the cuts "totally unacceptable", but Germany ultimately published a revised plan as demanded by the Commission. Some of the governments and industries concerned even challenged the Commission decisions before the European Court of Justice, but so far largely unsuccessfully.

Further developments of the ETS have been agreed as part of the Energy and Climate Change Package which will be discussed below.

Research and Development and Energy Technologies

Europe has approached the role of technology in climate policy with some caution, choosing instead to emphasize international target setting and economic instruments. But technology clearly has to play a major role in helping it reach its climate change goals. At the EU level there are a range of policies and programmes to promote clean technology, ranging from facilitating projects and programmes which promote take-up (Intelligent Energy Europe), to funding for scientific research (the multi-year RTD framework programmes, of which the current seventh one is an example).

Intelligent Energy Europe (IEE) was established through a Commission Decision (1230/2003) in 2003 as a more ambitious follow-on of the earlier ALTENER and SAVE programmes. It had an initial budget of €200 over four years (IEEP 2008). However, in 2005 the Commission proposed to subsume IEE under a much larger initiative headed by DG Enterprise entitled the *Competitiveness and Innovation Programme* (CIP) (CEC 2005b). This Programme was part of a Lisbon-inspired effort to join together environmental and competitiveness issues under the banner of eco-innovation. A budget of €727.3 million was made available to fund projects from 2007-2013 covering three main areas – energy efficiency (SAVE), renewable energy sources (ALTENER) and transport (STEER) – as well as some integrated activities.

In addition to these specific research and technological development (RTD) funds, the Commission has developed a series of multi-annual frameworks for funding general research within the EU. While the majority of research funding still originates at a Member State level, there are some obvious advantages to funding at an EU level, for instance in the reduction of duplication of research and the pooling of funding for larger projects. In response to criticism that the EU underfunds research in comparison to other countries such as the US, the current 7th Framework Programme (FP7) which runs from 2007-2013, provides considerably more funding for research in general than the previous FP6, as well as for climate change related research in particular. These funds include the thematic area of "energy" (€2.3 billion), and "environment and climate change" (€1.8 billion). It is worthy of note that the funding for sustainable energy research and development under the FP7 is less than the funding (€2.75 billion) for research into nuclear power under the Euratom Research and Technology Development Programme (EU Council 2006b).

The EU has also attempted to build cooperation on some specific technologies which are of particular importance to its climate and energy policies. Over the last few years CCS has become a much talked-about mitigation option, pressing the EU to consider how it would be regulated and commercialised. The Second European Climate Change Programme (ECCP II), established by the Commission Communication *Winning the Battle Against Global Climate Change* of 9 February 2005 (CEC 2005c) set up a Working Group on CCS. This Working Group published a report in June 2006 stressing the need for developing the policy and regulatory framework for CCS. The Communication from the Commission *Sustainable power generation from fossil fuels: aiming for near-zero emissions from coal after 2020* (CEC 2006d), adopted in January 2007, set out the

EU strategy with respect to CCS. Two major tasks for deployment of CCS were identified by the Commission: developing an enabling legal framework and economic incentives for CCS within the EU; and encouraging a network of demonstration plants across Europe and in key third countries. The legal framework was established by a recently adopted Directive, which was proposed as part of the climate and energy package to be discussed below (section 3.4).

3.4 The Energy Package and the Climate and Energy Package: 2007-2008

In March 2006 the Commission opened a wide-ranging debate on a future European energy policy with the publication of a Green Paper *A European Strategy for Sustainable, Competitive and Secure Energy*, (CEC 2006a). As discussed above, the paper had been prompted by the changing context of European energy policy and specifically mounting concerns regarding high oil and gas prices and worries about Europe's increasing dependency on a few external suppliers, as well as climate change. As a follow up to this Green Paper, the Commission unveiled a 'package' of energy and climate change policy proposals on 10 January 2007 thereby formally underlining the link between these two policy fields. In a statement made at the launch of the package, Commission President José Manuel Barroso claimed that "the proposals put forward by the Commission today demonstrate our commitment to leadership and a long-term vision for a new Energy Policy for Europe that responds to climate change". (CEC 2007c)

This package included a climate change policy vision entitled *Limiting Global Climate Change to 2 degrees Celsius: The way ahead for 2020 and beyond*, (CEC 2007b). The proposal called for a range of actions to strengthen climate policy, headed by the proposal that the EU commit to a 20 per cent reduction in emissions by 2020, which would rise to 30 per cent if an international agreement under which other countries take comparable action is reached at the Copenhagen UNFCCC conference in December 2009. At the same time, the package contained the Communication *An Energy Policy for Europe* (CEC 2007a) outlining an action plan to advance energy policy in Europe between 2007-2009. The action plan included: a binding target to raise the EU's share of renewables to 20 per cent by 2020; an obligation for each Member State to have 10 per cent biofuels in their transport fuel mix by 2020, and a reaffirmation of the energy efficiency target to save 20 per cent of the EU's total primary energy consumption by 2020.

These targets were endorsed by the EU leaders in March 2007 at the European Council and became known as the headline '20-20-20' climate

and energy targets. The importance of the package has been repeatedly reiterated, especially in terms of adopting measures that bolster Europe's international leadership on this issue. The importance of Europe having a clear, unified position in the lead up to negotiations on a post 2012 international agreement is clearly recognised.

The endorsement of the package and accompanying commitments by the EU heads of state and government led to official Commission proposals published on 23 January 2008, under the collective title *The Climate Action and Renewable Energy Package*. These have commonly become known as the 'Climate and Energy Package' and include: a proposal to revise the ETS; another to tighten national reduction targets for GHG emissions not covered by the ETS; a new Directive on renewables with differentiated national targets for the uptake of renewable energy; a legislative framework for CCS; and amended guidelines on state aid for environmental measures.

The package was the topic of heated discussion between Member States throughout 2008 but was eventually agreed at the European Council on 11-12 December and formalised through a first reading agreement adopted by the European Parliament on 17 December. The Council formally adopted the package on 9 April 2009. Green commentators complained that the package had been watered down in this compromise agreement. In particular, that plans for auctioning emission allowances in the revision of the ETS from 2013 were pared back giving concessions to certain industrial plants deemed to be at risk from 'carbon leakage' (ENDS Report 2008a). However, the speed at which the package progressed through the legislative procedure (only eleven months from proposal by the Commission to agreement in the Council) shows to some extent a high level of political will and also reflects the increased profile of the interaction between the energy and climate policy fields. The EU 20-20-20 energy and climate package had been a key priority for the French Presidency and despite the disappointment in the loopholes provided for some sectors in the eventual compromise is still the most ambitious package globally and will help preserve European leadership ahead of Copenhagen (ENDS Report 2008a)

4 SYNERGIES BETWEEN THE 'CLIMATE AND ENERGY PACKAGE' AND ENERGY SECURITY

As discussed in section 2.4 there are a number of potential synergies between climate change and energy security objectives. As an international leader in the field of climate change policy the EU should improve its capacity to fully understand and cope with the synergies and trade-offs associated with the major shifts in economic patterns that integrating climate and energy policy will entail. This understanding should be reflected in policy proposals so that it can help inform political decision making. However, such understanding and clear articulation of trade-offs was not entirely evident in the communications, explanatory memoranda, and Impact Assessments accompanying the Commission's proposals which together formed the Climate and Energy Package. In general, the Impact Assessments paid substantially more attention to the potential negative trade-offs between these proposals and the third, competitiveness objective of EU energy policy, especially the issue of 'carbon leakage'.

The main synergy between the new climate and energy legislation (or at least the burden sharing Decision, new renewables Directive and revision of the ETS Directive) and the EU's policy objective of energy security highlighted by the Commission is the likely reduction in fossil fuel consumption and imports. The energy security implications of the CCS Directive are actually far more complex. The Commission stated in its communication accompanying the package (CEC 2008b, 16):

> reducing greenhouse gas emissions and increasing renewable energy according to the targets agreed to by the heads of state makes the EU considerably less dependent on imports of oil and gas. Next to positive trade balance effects, this reduces the exposure of the EU economy to rising and volatile energy prices, inflation, geopolitical risks and risks related to inadequate supply chains that are not matching the global demand growth.

The four legislative instruments which are the outcome of the package[9] are each examined below to assess how well the Commission, Council and Parliament have explicitated their joint consideration of synergies and trade-offs between climate and energy security objectives.

4.1 The Effort Sharing Decision

This Decision reveals obvious synergies between climate change and energy security objectives. While the link between GHG reduction and energy

[9] The fifth element of the climate and energy package, the amended guidelines on state aid for environmental measures, was not a legislative proposal.

The Effort Sharing Decision (406/2009/EC)

This Decision contains individual GHG reduction targets for Member States, which together with the targets to reduce industrial emissions through the EU ETS will enable the EU to reach its overall target of reducing GHG emissions by 20 per cent by 2020. The individual targets have been allocated among Member States on the basis of their GDP. Newer, less-developed Member States have, in general, been allowed to increase their emissions (for example Bulgaria can increase its emissions by 20 per cent) while older, wealthier Member States are required to make more significant cuts (for example Denmark and Luxembourg have to reduce emissions by 20 per cent). Should international negotiations result in an agreement among industrialised countries on comparable efforts by all such countries, these individual targets will be revised upward so as to reach an overall EU emissions reduction target of 30 per cent. The compromise text allows Member States to transfer part of their allowed GHG emissions allocation to subsequent years and to other Member States. Member States can also purchase credits resulting from projects in third countries under the Kyoto Protocol's Clean Development (CDM) and Joint Implementation (JI) mechanisms. However, the annual use of CDM and JI credits may not exceed 3 per cent of the GHG emissions of any Member State in 2005.

security is not explicitly stated in the proposal,[10] connections can be made between transforming "Europe into a highly energy-efficient and low greenhouse-gas-emitting economy" (CEC 2008c, 2). This transition implicitly depends on a substantial reduction in the use of traditional fossil fuels with beneficial effects on EU import dependency, which lies at the heart of security of supply issues. Therefore, along with the revised ETS and renewables Directives, this Decision should lead to absolute emission reductions as well as reduce the EU's reliance on imported fossil fuels. According to the results of models presented in the Commission's own IA the impact of its proposals[11] on the value of the oil and gas imports saved will equal 0.3 per cent of GDP or import savings of €47 billion without the use of the CDM (CEC 2008b) Hence, the Commission argues that the "EU economy would be less exposed to supply disruption and price shocks that might result from the concentration of supply in a limited number of countries" (CEC 2008b, 16).

In addition, GHG reductions need to be tackled in an innovative way that visibly demonstrates the cost-effectiveness of turning to new forms of energy altogether, or reducing reliance upon current stalwarts, both of which will reduce import (though not necessarily domestic) reliance. However, although complementarity exists between technologies which reduce

[10] Energy security is, however, defined as a Community objective in both the explanatory memorandum and the preamble of this proposed decision.

[11] The Commission has conducted only one Impact Assessment for three of the four proposals: the revision of the ETS; the proposal on effort sharing; and the proposal for a renewables Directive. This Impact Assessment examines the impacts of these three policies together and not separately.

GHG emissions and also contribute to energy security, such as renewables or increased energy efficiency, some authors argue that the most cost-effective solution may sometimes point towards the use of less costly conventional technologies which only provide benefits to one policy objective at a time (Brown and Huntington 2008).

An obvious trade-off between energy security and climate change objectives (or at least a factor which reduces the extent of potential synergies) is the relationship between the amount of oil and gas imports saved and the use of CDM credits. The models presented in the IA show that achieving GHG reductions outside of the EU through investments in the CDM implies that these energy security benefits would be reduced since some mitigation effort is done abroad, and less is invested for the purpose of using less energy in Europe. The value of the oil and gas imports saved when partially meeting reduction targets with CDM is estimated to be only €41 billion compared to €47 billion without the use of CDM (CEC 2008b). The flexibility that the use of CDM credits brings to the Decision should help to reduce the negative impacts on EU competitiveness, the third objective of EU climate policy, by facilitating GHG reductions at the lowest cost possible. Therefore, this measure could be viewed as a trade-off between competitiveness and energy security objectives. However, the European Parliament has raised the concern that it is important that the emission savings made through these credits are real, permanent and verifiable – which many argue has often not been the case to date. If not, climate change objectives will also be compromised.

The use of international GHG credits, such as those originating from CDM and JI-projects, may, however, have some indirect benefits for energy security. For example, their use may allow both environmental and market incentives to stimulate investment in emission reduction projects in third countries, which may strengthen the EU's foreign energy policy relations with these regions. In addition, foreign policy effectiveness will more practically come from the EU being able to demonstrate the innovative and competitive edge that credits, the CDM, and even GHG targets hold for third countries. On the other hand, the projected increase in renewables and energy efficiency will radically alter the composition of the European energy market, suggesting that it could ultimately become an unattractive place for traditional energy sales, perhaps causing current exporters to rethink their energy trade relations with the EU. Although this may seem a long-term proposition, OPEC countries have traditionally shown high sensitivity to the impact of climate policies on their export and overall economic prospects.

4.2 Extending the ETS Directive

Although no explicit link is made between the ETS and energy security in this amended Directive, there are still some obvious synergies to be found. The most important one is the substantial reduction in the use of traditional fossil fuels with beneficial effects on EU import dependency that could be expected to result from the implementation of this proposal. After some significant corrections the EU ETS may indeed produce absolute emission reductions which, along with GHG reduction targets in other, non-ETS sectors, may be sufficient to reach the 20 per cent reductions in GHG emissions by 2020. This in turn will reduce the EU's reliance on imported fossil fuels. These savings are estimated in the Commission's IA (CEC 2008b) to be around 0.3 per cent of the EU's GDP as discussed above.

Extending the ETS Directive (Directive 2009/29/EC)

The amendments to the original ETS Directive (2003/87/EC) aim to strengthen the EU-wide carbon market for its third phase from 2013 to 2020 and include provisions to:

- Extend the scope of the ETS to all major industrial emitters;
- Include other GHGs beside CO_2;
- Centrally allocate allowances by the Commission (rather than through 27 national allocation plans); and
- Increase auctioning of allowances: from 2013 power plants (with the exception of certain power plants in new Member States) will be subject to full auctioning of allowances and auctioning in the manufacturing sector will be phased in gradually from 2013.

However, broad exceptions and derogations have been inserted for industrial sectors at risk of carbon leakage. These may be eligible to receive up to 100 per cent of their allowances for free from 2013. The Commission is to identify these sectors by December 2009, and by June 2010 it shall report on the carbon leakage implications of any new international agreement and put forward proposals accordingly. Smaller installations that emit less than 25,000 tonnes of CO_2 per year will also be allowed to opt out from the ETS, provided that alternative reduction measures are put in place at the national level.

Governments agreed to the principle that 'at least 50 per cent' of the proceeds from auctioning 'should' be used for climate related adaptation and mitigation purposes.

A further synergy could result from the significant revenues that may ultimately result from auctioning emission allowances. Auctioning allowances, if carried out without distorting internal and external competition, should bolster the technological and innovative edge needed to transform Europe into a low-carbon economy. This could have knock-on impacts on energy security by promoting energy diversification and energy efficiency. The Commission estimated in its IA that the increase of auctioning introduced through the package could represent as much as 0.5 per cent of GDP or

€75 billion in 2020 with a carbon value of €40 per allowance (CEC 2008b, 10). However, this was for the maximum "cost effective reference option". In the case of partial auctioning the revenue would necessarily be less. It is important to note, therefore, that it has been estimated that the compromise agreement reached in December within and between the Council and Parliament on the final, adopted version of the revised ETS Directive is likely to see revenues fall from an original forecast of €50 billion per year by 2020 to nearer €30 billion (ENDs Report 2008a).

Despite a reduction in auctioning from the Commission's original proposal (CEC 2008d), the ultimate revenue is still likely to be a substantial amount. The agreement as adopted provides that it shall be for the Member States to determine how this revenue is to be spent. However, in the final compromise with the European Parliament a clause was inserted under which Member States "should" use at least half of this towards actions to mitigate and adapt to climate change including measures to support such actions in developing countries. However, this is a non-binding recommendation and it remains to be seen if it will actually be followed. If so, this proportion of the revenue would also represent a significant amount of public investment in energy infrastructure and clean technologies which would have a number of positive impacts on the supply, demand and infrastructure aspects of energy security.

There are a number of risks with the implementation of the ETS which may reduce its ability to deliver climate change and energy security objectives. For example, the over-allocation of allowances and lack of verified emissions data in the first phase of the EU ETS, as well as reliance on CDM project offsets that will continue into the second phase, may undermine the future viability of the ETS. From the perspective of the European energy market these inadequacies may distort Member States' energy choices, and their related trade and energy relations with third countries. With the carbon price so clearly affected by politically-decided system design and external crediting options, a clear signal to the energy market is difficult to maintain.

The main trade-off between this amended Directive and other EU energy objectives is not with energy security but with the competitiveness of energy intensive industries in the EU. This has been the main area of controversy surrounding these proposals and the area in the final agreement between the Council and the Parliament, along with reduced allowance auctioning, that received most criticism from green Non-Governmental Organisations (NGOs). Carbon leakage has few direct implications for energy security in the EU, except for those cases in Eastern Member States where the power

sector may face competition from imports of electricity from sources of potentially dubious environmental sustainability.

There are, however, some trade-offs which could be anticipated, such as the fact that the EU ETS could discourage the use of high emission fossil fuels and increase the EU's reliance on cleaner fossil fuels such as gas.

4.3 The Renewable Energy Directive

The Renewable Energy Directive (2009/28/EC)

The new Renewable Energy Directive aims to ensure that renewable energy makes up at least 20 per cent of the EU's total energy consumption by 2020. In order to achieve this target, the new Directive lays down mandatory national targets to be achieved by Member States through promoting the use of renewable energy in the electricity, heating and cooling, and transport sectors. These national targets are differentiated according to national circumstances and GDP and Member States will be required to submit national renewables action plans to the Commission by 2010 detailing how they will achieve their targets. A series of interim targets have also been set in the lead up to 2020; Member States meeting these targets are allowed to sell tradable renewables certificates (guarantees of origin) to those falling behind on their interim targets.

One of the most controversial measures included in the Directive is the binding target requiring 10 per cent of the final energy consumed in all forms of transport to be from renewable sources by 2020. The vast majority of this is expected to be met through increased use of biofuels. However, for biofuels to count towards this target, they need to demonstrate a minimum level of GHG savings of at least 35 per cent initially, rising to 50 per cent from 2017, and meet a set of sustainability criteria. The Directive also excludes those biofuels made from raw material cultivated on land with high biodiversity value or a high carbon stock.

There is a strong synergy between climate change and energy security objectives in this new Directive. Accordingly, there is a clear opening statement in the Commission's original proposal that renewable energy sources contribute directly to both "climate change mitigation through the reduction of greenhouse gas emissions, sustainable development, [and] security of supply" (CEC 2008e, 2). Specifically, renewables help address the EU's "increasing dependence on energy imports which threatens its security of supply" by "boosting investment in energy efficiency, renewable energy and new technologies" and realising Lisbon Strategy goals (CEC 2008e). In addition, the explanatory memorandum accompanying the renewables proposal recognises that renewables can be a "stepping stone to reaching the dual objective of increased security of supply and reduced greenhouse gas emissions" (CEC 2008e). Therefore, opportunities exist for both domestic supply and imports if renewables can be added to Europe's energy mix, reducing both domestic and imported energy dependence on traditional fossil fuels.

The explanatory memorandum accompanying the renewables proposal also highlights the use of biofuels for transport as "one of the most effective tools by which the Community can reduce its dependence on imported oil – where the security of supply problem is most acute – and influence the market for transport" (CEC 2008e). The 10 per cent target for renewables in transport is said to be a major opportunity to wean the European transport sector off its overwhelming dependence on imported oil. This would presumably reduce national and European dependence upon imported oil currently obtained from the Middle East, Russia and the Caspian region and North Africa. Reducing energy dependence on these three regions would permit the EU to further diversify its (diminishing) oil portfolio, and possibly give it more independence in its foreign policy dealings with these three regions.

It is necessary when discussing the future role of biofuels to acknowledge that the increased demand for biofuels is a contentious choice, in particular regarding links to food shortages and other undesirable environmental and social impacts. While the EU agreed upon a set of sustainability criteria for the import of biofuels in order to address some of these concerns, the EU's increased demand for biofuels has potential to strengthen or harm its relations with other countries particularly in the developing world, depending on how the market develops.

Further security of supply links are found in the original proposal's suggestion that the "Community's external energy policy should ensure the common voice of the EU in support of intensifying its relationship with its energy partners with a view to further diversifying sources and routes, strengthening partnership and cooperation and focusing on the reduction of greenhouse gas emissions, renewables and increasing energy efficiency" (CEC 2008e). Renewables, therefore, appear to be a possible way in which the EU's own climate change agenda can be translated into its foreign policy relationship with key importers; encouraging other actors to diversify their own energy whilst retaining their partnership in cooperating on a green agenda.

In particular, the proposal suggests that renewables are both indigenous and an energy source that can be cultivated or invested in outside the EU, as part of a global energy strategy. Thus the Commission argues that "third countries should be able to benefit from the promotion of renewables in the EU through the supply of biofuels… or the supply of renewable electricity in neighbouring countries" (CEC 2008e). It is anticipated, therefore, that third countries may contribute renewables to the European energy mix.

However, while boosting the EU's position to encourage energy exporters to diversify their supply, increasing its imports of renewable energy may limit the energy security benefits of switching from fossil fuels. As described in section 2.4, imported renewables carry the risk of substituting one form of dependency for another. However, in the short to medium term, imports of renewable energy will mainly be in the form of biofuels. In this case, even substituting one energy dependency for another will still lead to the diversification of supply away from traditional oil imports as these biofuels are likely to come from a different set of agriculturally productive countries such as Brazil and Indonesia.

In contrast, reducing dependence on imported oil runs the risk of triggering security of demand concerns in oil exporting regions. As the EU market becomes a less attractive place for oil sales, the revenue of oil-exporting countries is reduced; this could trigger a foreign policy fallout between the EU and these countries, which may have separate arrangements with the EU regarding gas imports. In addition, reducing oil imports could seriously weaken the EU's perceived leverage in North Africa and the Middle East, an area already targeted by the EU to improve indigenous sustainable development, economic growth, competitiveness, and rural development. Thus the goal of diversification in renewables which will complement, and eventually substitute for traditional energy sources sparks numerous security of demand issues, which may be difficult to reconcile with ambitions to strengthen partnership and cooperation with some other countries and regions.

4.4 The Carbon Capture and Storage Directive

While in general the climate and energy package places emphasis on energy efficiency and renewables as solutions both for security of supply and climate change, tackling climate change will require the use of CCS to feasibly reduce CO_2 emissions in the short and medium term. In the original CCS proposal the Commission argues that deployments of this technology "reconciles security of supply with climate change objectives" (CEC 2008f). However, this 'reconciliation' is not elaborated upon.

As discussed in section 2.4, CCS could have both positive and negative impacts on energy security. Positive impacts may arise if CCS allows the diversification of fuels by facilitating the continued use of coal in the short to medium term. Negative impacts could arise from the fact that CCS could facilitate the continued reliance on fossil fuel, which is not a long-term sustainable energy source. It also decreases the energy efficiency of the coal used. Developing both the technology and the regulatory frame-

The Carbon Capture and Storage Directive (2009/31/EC)

The Directive on the geological storage of carbon dioxide, also known as the CCS Directive, establishes a legal framework for the permanent containment of CO_2, designed to ensure that CO_2 capture and storage is an available mitigation option to fight climate change, and that it is done safely and responsibly. The bulk of the Directive, therefore, concerns the regulation of CO_2 storage and the removal of unintended barriers to CO_2 storage in existing legislation.

The Directive requires operators of new power plants with an output of more than 300 MW to assess whether suitable storage sites and transport facilities are available and if it is technically and economically feasible to retrofit the power station for the capture of CO_2. If these conditions are met, authorities in Member States are required to guarantee that "suitable space on the installation site for the equipment necessary to capture and compress CO_2 is set aside".

The EU ETS should provide the main incentive for the deployment of CCS technology. CO_2 captured and safely stored according to the new EU legal framework will be considered as not emitted under the ETS. In Phase II of the ETS (2008-12) CCS installations can be opted in. For Phase III (2013 onwards), under the amended ETS Directive, capture, transport and storage installations will be explicitly included in the ETS. Furthermore, up to 300 million allowances in the new entrants reserve will be made available to stimulate the construction and operation of up to 12 commercial demonstration projects to capture and store CO_2, and for innovative renewable energy demonstration technologies in the EU.

work by which CCS becomes a market reality therefore puts Europe in a strong position to deal with its CO_2 emissions while also continuing to use its indigenous coal supplies and in addition to maintain coal as a possible external energy source. The development of CCS also has a clear potential to drive technological and policy innovation forward. This has indirect security of supply benefits in that a more robust, innovative European energy market may be better placed to move away from traditional forms of fossil fuel reliance.

Conversely, one of the main trade-offs between this Directive and energy security objectives, is that CCS may have an implicit 'business as usual' ethos attached to it and may run counter to the objectives of energy efficiency and renewables. Indeed, the possibility of capturing and storing CO_2 emissions produced by traditional fossil fuels may not provide an incentive to stop using these fuels, which in turn may perpetuate, rather than solve, Europe's present security of supply issues. Stakeholder feedback to the Commission indicates similar concerns that CCS technology will divert efforts away from energy efficiency and renewables.

While CCS may be a necessary phase in transforming Europe into a low-carbon economy, it needs to work alongside a general reduction of fossil fuel reliance, as this reduction is the only way of solving long term climate change and energy security issues. As security of supply is directly

premised on a wide energy mix and diverse portfolio of suppliers, it is crucial that the role of CCS in contributing to the continued, reduced or substituted use of carbon within European energy mixes is understood prior to fully deploying it as an energy strategy.

5 CONCLUSIONS

5.1 Reflections on Policy Integration

Energy policy in the EU is entering a new era in which energy security and climate change mitigation are both fundamental objectives. The EU must ensure that it has a reliable and sufficient supply of energy into the future while also cutting GHG emissions sufficiently to limit the rise in global temperatures to two degrees Celsius. Achieving these two objectives requires fundamental changes in the way we source, produce and use energy. Not only does this require the EU to step up its efforts to integrate climate change *into* its energy policy but it also requires careful consideration of how these two policy objectives interact. In this way, a more complex form of policy coordination is called for because, as argued by Greening and Bernow (2004, 721):

> with uncoordinated and sporadic attempts at policy formulation, the benefits of an energy policy could be offset by an environmental policy and vice versa. As a result, the costs for both sets of policies may be higher than originally anticipated, particularly if only one aspect of the problem…is addressed at a time, resulting in a suboptimal solution that does not contribute towards the realization of long-term goals.

Therefore a *two way* integration process is called for which maximises the synergies between these two policy objectives. Inevitably, however, it will also be necessary to identify where win-win solutions cannot be reached and trade-offs will still need to be made.

Identifying the synergies and trade-offs, however, between energy security and climate change objectives and formulating an integrated policy framework to address both issues presents a number of challenges. Some of these challenges are institutional and cultural and involve the separate way in which these policies have developed in the past. The formulation of energy and climate change policies involves many decision makers and can affect numerous stakeholders from many different backgrounds and value systems (Greening and Bernow 2004). Overcoming attitudinal and bureaucratic barriers to policy coordination and integration should not be underestimated, even when there is adequate political will. Achieving policy coordination is after all the perennial quest of all political systems (Perri 6 *et al* 2002).

Other challenges in developing an integrated energy and climate change policy arise because of fundamental and underlying differences in the way the policy goals are framed and perceived. For example, energy security issues are usually viewed in the short to medium time frame with concerns over securing energy supplies and returns on investments in the next

decade or even three. In this time frame diversifying supplies of fossil fuels to include for instance more coal imports from South Africa to the EU may be a wise solution to the increasing concentration of fossil fuel imports from politically sensitive countries in the Middle East. This scenario will undermine climate change objectives which are concerned about the impacts of policies in much more distant time frames of several decades. However, given a long enough time frame, energy security and climate change objectives are compatible as energy security can only be achieved in the long-term through sustainable resource use, that is to say renewable forms of energy.

Further differences in the way these two policy problems are perceived include geographical scale; the geographical scale of an environmental impact can be substantially larger than that of an energy policy. In addition, many of the key attributes of climate policies are public goods which are not market-valued and so are often excluded from the analysis. This may make some energy security policies economically attractive because the calculation excludes the cost of the extra GHG emissions or alternatively the cost of mitigating these emissions by a separate climate change policy.

5.2 How Well are Energy and Climate Policies Integrated?

Although the integration of climate change and energy policy has been an issue in the EU since the 1980s, action in terms of significant policy measures was initially rather slow. The failure to get the carbon/energy tax off the ground in the 1990s was a key factor in this, as was a lack of political commitment and funding for other policy initiatives such as SAVE and ALTENER. Therefore, while the EU was attempting to play a leadership role in the international climate negotiations under the UNFCCC process, it was undermining its own credibility through its lack of adequately coordinated energy and climate change policy at home. Instead it appeared that during the 1990s the most significant development in the energy sector in Europe was the liberalisation of electricity and gas markets in order to create an internal energy market (Collier 2002). Critically, the Cardiff process which was specifically designed to promote EPI in a number of key policy sectors in the EU, including energy, did not have any significant influence on the way in which the liberalisation process was conducted.

Efforts were increased in the new millennium, however, as the issue of climate change moved higher up the political agenda. The Green Paper on Energy in 2006 in particular marked the beginning of a more integrated

energy and climate change policy as part of a "new energy era" (CEC 2006a). Eventually, this has led to headline '20-20-20' climate change targets agreed by EU political leaders in 2007 and the recently agreed Climate and Energy Package in 2008. However, the progress achieved so far in specific policy areas which impact on both climate change and energy security, such as renewables, energy efficiency, the ETS and research and development of energy technologies, reveals that much greater integration efforts will be needed in future.

Energy efficiency is a core component of both energy security and climate change objectives. However, despite a number of initiatives aimed at energy efficiency and savings, progress made in this area has been particularly disappointing and the Commission has received severe criticism in this regard (ENDS Report 2008b). Henningsen (2008) argues that it would be unfair to blame the Commission for missed energy efficiency opportunities because the Commission has been more progressive than most Member States, as evidenced in their recent reports on their energy efficiency policies (required under the energy services directive). However, he goes on to claim that the Commission can "justifiably be criticised for failing to maintain the momentum, without which any expectation of a radical – and necessary – shift in overall EU energy efficiency policy can be written off, at least for a good number of years" (Henningsen 2008, 24). The Commission's response to these types of criticism came in the form of the Energy Efficiency Package presented in November 2008.

This package will no doubt give new impetus to the Member States' progress towards more efficient energy use. However, it remains to be seen if the new legislative measures proposed, which are currently under consideration by the Council and European Parliament under the codecision procedure, will provide the desired increase in energy savings given that even the Commission recognises that for much of the existing legislation in the field Member States' transposition "is slow, financial encouragement is not yet practised widely enough and administrative procedures are too complicated" (CEC 2008 in ENDS Report 2008b). In addition, the effort sharing GHG emissions targets for Member States agreed under the Climate and Energy Package could potentially lead to greater efforts by Member States in this area (as well as renewables) but this has not been explicitly stated and GHG savings could in practice also be made in some Member States through other measures such as the deployment of CCS or further switching to cleaner fossil fuels. In general the EU's ambitions for energy security appear rather more tentative than other climate change objectives. The EU has a goal of increasing energy efficiency to save 20

per cent of its energy consumption by 2020 but, although this was confirmed by the EU leaders in March 2007, it is not a legally binding target and so is not comparable to the GHG and renewables targets. It is not clear at this stage that the recently proposed Energy Efficiency Package, which has yet to be adopted by the Council and Parliament, will eventually result in sufficient action to deliver this objective.

In the field of renewables – the other obvious component of a truly integrated energy and climate policy – progress has also been slow. The Commission anticipates that the EU will fall short of its initial "indicative" target of 12 per cent renewables in energy supply by 2010, although the contribution of renewables has increased by 55 per cent since 1997. A 10 per cent increase is more likely. Uptake of biofuels in particular has been uneven and lately controversial due to wider sustainability considerations. The target of 5.75 per cent biofuels of all fuels in 2010 is also unlikely to be met. The mandatory target of 20 per cent for renewable energy's share of energy consumption in the EU by 2020 – covering electricity, heating and cooling, and transport – which was adopted in December 2008 is even more ambitious. What distinguishes this new target from the previous 12 per cent effort is that it is *binding* rather than indicative, although some level of flexibility has been introduced to the proposal. However, it is still unclear how some of the Member States with currently very low levels of renewables, such as the UK, will be able to implement these targets on time.

The EU has made efforts to increase its funding for research in recent years but it is still lagging behind countries such as the US and Japan. However, more resources have been allocated to climate change and energy research, technological development and deployment in the present FP7 as well as under the CIP programme. On the other hand the amount of funding, both private and public, currently received by 'alternative' forms of energy is dwarfed by that received by nuclear (fission and fusion) or fossil fuel related energy (and radioactive waste management) technologies. It is difficult to calculate exactly what is being spent on this area of research in the EU because the scope of the funds is usually broader than just climate change (for example 'environment including climate change' is allocated €1.8 bn and 'energy and climate change' is allocated €2.3 billion in the current FP7). A positive outcome of the recent Climate and Energy Package, however, has been the allocation of 300 ETS emission allowances to be awarded to large scale CCS projects in the EU. The value of this support depends on the price of CO_2 at the time, but could approximately amount to between €6-9 billion. This is less than previously requested by

the European Parliament but in theory this could be boosted by funds from the Member States' share of the auctioning revenue which they have professed their willingness to use at least partly towards actions to mitigate and adapt to climate change.

The ETS has been the EU's most high profile policy initiative to internalise some of the environmental costs of many energy intensive industries in Europe. In its initial trading period, a number of lessons were learnt including the need for the Commission to centrally steer the national allocation of allowances. It remains to be seen whether second period allocations will be low enough to spur a large-scale innovation and emission reduction effort, which most people agree has not been the case in the first period. Given the global economic downturn, emissions may fall due to decreasing activity. The ETS revision agreed under the climate and energy package will improve the functioning of this instrument, though the number of derogations obtained by some Member States and energy intensive industries is seen by some as a substantial weakening of the level of ambition.

5.3 What Potential is there for Further Integration?

There is a strong economic case for using carbon taxes to better integrate climate objectives into EU energy policy (Helm 2002). Current energy prices vary significantly between Member States due to differences in tax levels and structures, subsidies for different forms of energy generation and different market structures. Including all relevant externalities to establish the true cost of energy use will help provide the correct price signals for future investment decisions in energy supply and demand (EEA 2008). Energy policy in the context of a privatised and liberalised market needs to place much more emphasis on economic instruments, since old style command and control policy instruments cannot be enforced if customers can switch. The ETS is an innovative attempt to internalise the cost of carbon for some energy intensive industries in the EU, but it will only gradually achieve this aim. However, it is currently unclear how the Member States will reach their reduction targets outside the ETS sector. Past experience in both energy efficiency initiatives and indicative targets for renewables illustrate the lack of commitment and innovative approaches in many Member States.

More pro-active use of taxation as an instrument of energy and climate policy remains a contentious issue due to reluctance by some Member States to grant powers over tax matters to the EU. However, the potential of this mechanism should not be forgotten, and the forthcoming review of

the energy products taxation Directive should be seized as an opportunity to promote a further 'greening' of energy taxation in the EU. If unanimity once again proves elusive, the possibility of applying the enhanced co-operation procedure should be explored by interested Member States.

In view of the EU's past disappointing record on energy efficiency, it should make demand side measures such as energy efficiency a priority to reach both energy security and climate change objectives. There is considerable scope to improve this, especially in the residential sector, which in Europe accounts for 26.6 per cent of the final energy consumption. According to the European Environment Agency it is one of the sectors with the highest potential for energy efficiency (EEA 2008, 9). Measures to reduce the heating and cooling demand in buildings represent a significant part of this potential. Between 1990 and 2005, the absolute level of final household energy consumption in the EU-27 rose by an average of 1.0 per cent a year.

While the Commission has proposed a number of new pieces of legislation on energy efficiency, adequate attention must be paid to the implementation of EU legislation in this area. For example, several Member States have not made significant progress so far in the implementation of the existing energy performance in buildings Directive, and have chosen to delay its implementation until 2009 (IEEP 2008). If Member States continue to be less than active in transposing and implementing this type of legislation it may be worth considering the use of EU funding to act as an added 'carrot' to the 'stick' of legislation.

Much greater effort will be needed in future from Member States to ensure that their renewables targets are met, in particular the target of 20 per cent by 2020. In the past this commitment was not demonstrated but there is room for more optimism at least thanks to the fact that the new targets agreed are binding. However, it is important that in order not to place too much confidence in the new legal nature of these commitments we gain a better understanding of why the original 2010 targets are likely to be missed. To overcome the possible barriers to the uptake of renewables it would be wise first to learn from our collective mistakes. Thus research into the economic and non-economic barriers which caused the failure to attain the 2010 indicative targets is recommended by the recent International Energy Agency (IEA) report on EU energy policy (IEA 2008). This report also recommends that the Commission should outline what action it will consider taking throughout the period leading from now to 2020 should Member States miss interim targets.

Increased efforts in energy RTD will be needed to achieve the EU's climate change objectives. The increased funding allocated to this area in the latest FP7 is a positive step but not enough relative to the enormous and urgent task at hand. A great deal more investment is needed in RTD in order to decarbonise the European economy. The Green Alliance suggests a rough figure of around €7.5-8.5 billion per year although this does not necessarily have to come from EU funds or even the public purse (Green Alliance 2007). In particular, investment is needed in non-nuclear energy projects and especially in energy efficiency. This is all the more evident in light of the very significant funds invested in nuclear fusion technologies which everyone acknowledges cannot possibly contribute to climate and energy security objectives within a meaningful timeframe given the IPCC's projections. In addition, Member States should ensure that their 'willingness' to allocate up to 50 per cent of their revenues from ETS allowance auctioning to mitigating climate change is translated into a significant new investment in clean technology RTD. Momentum behind securing funds for CCS and other very important technologies must be maintained.

The question of what role nuclear energy is going to play in the EU's mitigation of climate change is still relatively unclear. The IEA (2008) conclude that continued use of nuclear energy in the EU is "almost certainly" going to be necessary to attain the policy goals in the areas of climate change and security of supply. However, the Commission's policy position about nuclear energy is generally cautious given the sensitivity of the issue in the Member States.[12] In view of the divergent national policies and public sensibilities in this area, it is not realistic to anticipate that a spectacular further development of the nuclear sector will play a significant role in climate or energy security policy at an EU-wide level in the near future (i.e. within the 2020 timeframe), whether or not one believes it should.

This report has started to highlight some of the possible synergies and trade-offs that are likely to emerge in the increasing integration of the climate change and energy policy areas. However, the relationship between these two policy areas is as yet not fully understood – especially the extent of the positive synergies which could be achieved. Much more research,

[12] A Communication which addresses nuclear issues was published as part of the energy package in 2006 (CEC 2006f) but focuses only on those areas which are unlikely to ruffle many feathers: safety and security. However, it also makes it clear that "nuclear energy generation has a role to play in security of supply, competitiveness and sustainability" and attempts to raise the urgency for action on maintaining nuclear capacity, noting that the average age of most plants in Europe is in the 20-30 years.

including quantitative research, is needed in this area to facilitate future progress in integration. In addition, Greening and Bernow (2004) suggest that multiple objectives, such as those required by an integrated energy and climate policy, demand analytical tools to adequately consider the issues.

While they suggest multi-criteria analysis, the Commission already has an analytical tool in place – Impact Assessment – which was designed to facilitate the understanding of the positive and negative impacts of its policy choices. Although the four legislative proposals in the Energy and Climate Package were accompanied by two IAs, the possible synergies and trade-offs between climate change and energy security objectives were not given much attention. Much more rigorous use of this analytical tool could be made by the Commission to assist in identifying and communicating possible synergies between these two policy areas. As we enter a 'new energy era' with the rise of both energy security and climate change policy issues up the political agenda, there appears to be a better chance to achieve greater integration than at any time in the past. However, clearly identifying the synergies which can potentially be harnessed between these two policy areas is essential. So too is recognising where trade-offs will have to be made and providing political decision makers and citizens with the best information possible with which to make these inevitably difficult choices.

5.4 Political Discourse, Institutional Reform and the Limits of Policy Integration

As this study has shown, the political context of EU energy policy changed significantly in recent years as a result of the growing importance of climate change and energy security as issues at the top of the Union's political agenda – a 'new energy era' as the Commission has termed it. This has not only led to significant progress towards the integration of climate and energy policy, but also has wider-ranging consequences on the political and institutional front, which will be discussed in this concluding section.

Ever since the demise of the Constitutional Treaty in 2005, political leaders and EU institutions have been searching for a narrative that would convince public opinion of the need to continue the process of European integration as the most adequate response to globalisation. The European Commission and many national leaders responded to this political crisis by highlighting the role of the EU in leading the struggle against climate change as evidence of the added value of a united Europe. The cut-off of Russian gas supplies to Ukraine in January 2006, with incidental effects in

a number of EU Member States, was seized upon as an opportunity to add an economic and security dimension to the environmental discourse and re-legitimate the objective of a common energy policy as a response to the challenge of security of supply, which had been put on the agenda by a Commission Green Paper issued in 2000 (CEC 2000a). But it is only in the political crisis following the rejection of the Constitutional Treaty in the referenda in France and the Netherlands in 2005 that energy policy again became an issue for high-level political debate, together with climate change, as the EU prepared for the first UNFCCC Conference of the Parties following the entry into force of the Kyoto Protocol.

The events in 2005-2006 provided an opportunity for the Commission to further advance its energy policy agenda, riding the growing wave of public concern about climate change. The EU's role in the global struggle against climate change was frequently put forward as an example of how a united Europe can make a difference. Only through further integration and cooperation would European countries be able to face up to the challenges of globalisation. In October 2005, the British Presidency convened an informal summit meeting of EU leaders at Hampton Court to discuss how Europe should respond to those challenges. One of the questions debated was the development of a "long-term and coherent energy policy" (CEC 2005d), and the meeting provided fresh political impetus for a Commission initiative in this field. Building on the momentum of Hampton Court, the conclusions of the regular European Council meeting in December 2005 first stressed the importance of "an integrated approach to climate change, energy and competitiveness objectives". A few weeks later, events in Ukraine highlighting the vulnerability of the EU's energy supplies would prove more effective in bringing home the case for a common energy policy than the Commission's Green Paper on security of supply (CEC 2000a) published a few years earlier.

The European Council's intention to develop an integrated climate change and energy strategy, announced in December 2005, materialised under the German Presidency in 2007, when the Spring European Council took a number of highly publicised political decisions on the EU's future policy in this area. Under the forceful leadership of Chancellor Angela Merkel, these decisions demonstrated Europe's determination to act and helped create a favourable political climate for the EU leaders' subsequent decision, a few months later, to break the institutional deadlock which had resulted from the rejection of the Constitutional Treaty and agree on a mandate for a new Intergovernmental Conference to prepare a "Reform Treaty". A full section of the Presidency Conclusions of the March 2007 European Council is en-

titled “An integrated climate and energy policy”. It contains detailed policy guidance on climate change, positioning the EU in a leadership position for the multilateral negotiations on a post-2012 global climate regime, and also endorses an action plan in the field of energy for the period 2007-2009, based on the first Strategic Energy Review presented by the Commission pursuant to the mandate given to it by the March 2006 European Council (CEC 2007a). Energy policy successfully “piggybacked” on the more popular climate policy, which was deliberately highlighted in the German Presidency’s and Commission’s communication strategy.

The success of the March 2007 European Council in setting ambitious targets for climate and energy policy apparently inspired the Presidency’s drafting of the Berlin Declaration, a solemn statement by EU leaders issued at an informal summit meeting convened in the German capital to mark the 50th anniversary of the signing of the Treaties of Rome on 25 March 2007. This declaration stressing the achievements of half a century of European integration was the first step in the process leading to the new Intergovernmental Conference on institutional reform and the signing of the Treaty of Lisbon later the same year. Again the EU is presented as the appropriate response to the challenges of globalization: “We are facing major challenges which do not stop at national borders. The European Union is our response to these challenges.” The example of energy and climate policy is adduced in support of this political discourse of re-legitimation of the European project: “We intend jointly to lead the way in energy policy and climate protection and make our contribution to averting the global threat of climate change.”

It is in this political context that the European Council at the end of the German Presidency in June 2007 reached agreement on an institutional package labelled as the “Reform Treaty”, which would be formalized as the Treaty of Lisbon a few months later under the Portuguese Presidency. Not surprisingly, one of the treaty amendments agreed upon – albeit one of largely symbolic nature – was to add an explicit reference to combating climate change to the objectives of EU environmental policy in Article 174(1) of the EC Treaty. More importantly, as has been discussed above, the package also included the new treaty provision on EU energy policy which had originally been drafted by the Convention on the Future of Europe several years earlier and subsequently incorporated, in slightly modified form, in the unsuccessful Treaty establishing a Constitution for Europe.

In January 2008, when it presented its “Climate and Energy Package” of proposals to the Council and European Parliament, the Commission high-

lighted the political dimension of these policy initiatives, which it depicted as a political and economic opportunity for Europe, as a "stepping stone to modernise the European economy". (CEC 2008g) According to the Commission, which refers to 2007 as a "turning point", "[a] political consensus has crystallised to put this issue at the heart of the European Union's political programme" (CEC 2008g). In his speech to the European Parliament on 23 January 2008, Commission President Barroso went out of his way to present the package as a policy initiative of direct relevance to the concerns of EU citizens (Barroso 2008):

> The work of the European Union is sometimes seen as rather technical. As cut off from daily concerns. Interesting to specialists, but not relevant to people's daily lives. The action we are discussing today proves this theory wrong. The struggle against climate change and the quest for secure, sustainable and competitive energy touches on every European, every day. That is why we can all sense a real shift in attitudes. Europeans want a vision, and a plan of action.

These statements clearly illustrate the extent to which climate and energy policy have quite suddenly become a crucial element of the new legitimating discourse of European integration. In fact, climate change has so firmly taken centre stage that it has eclipsed the broader policy objectives of environmental protection and sustainable development. The emphasis put on climate policy, and, together with it, a new energy policy "for Europe" – though it is to be welcomed from the perspective of policy integration – all but tends to displace other key environmental and sustainability objectives from the EU political agenda. It is quite significant, in this context, that the 6th Environmental Action Programme (EU Council 2002) and the EU Sustainable Development Strategy (EU Council 2006a) have hardly been mentioned at all in high-level policy discourse since 2006. In many policymakers' minds "climate change" has become the alpha and omega of current EU environmental policy. Such a one-sided and reductionist approach to policy integration, which is far removed from the original principle of environmental policy integration that lay at the root of earlier efforts to integrate energy and environmental policies, has obvious limitations and also carries serious risks.

It is interesting to note that there has been a gradual shift in the debate on coherence and integration between energy and environment policy to a vaguer concept of "policy integration" which is more closely linked with the better regulation and good governance agendas than with integration of environmental requirements into other areas of EU policy per se. This conceptual shift started with the rise of the "triple bottom line" approach to sustainable development on the EU policy agenda. In the 'Guiding Principles' that are part of the renewed EU SDS adopted by the European

Council in June 2006 (EU Council 2006a), "policy coherence and governance" and "policy integration" feature prominently. The Strategy seeks to "[p]romote coherence between all European Union policies and coherence between local, regional, national and global actions in order to enhance their contribution to sustainable development." This is in line with the principle of consistency of EU policies and activities set out in Article 3 of the EU Treaty. The SDS principle of "policy integration" however, is strongly linked to the better regulation agenda and in that respect differs quite significantly from the principle of environmental integration as laid down in Article 6 of the EC Treaty. It aims to "[p]romote *integration of economic, social and environmental considerations* so that they are coherent and mutually reinforce each other *by making full use of instruments for better regulation, such as balanced impact assessment* and stakeholder consultations." (emphasis added)

While achieving the EU's overarching objective of sustainable development requires better integration of economic, social and environmental policies, the policy developments analysed in this report raise interesting questions as to the way in which integration is pursued in the policy fields of climate change and energy security, which are only two aspects of the broader sustainable development agenda. Indeed, as has been shown, the evidence that IA, as it was practiced for the Climate and Energy Package, was sufficient to achieve an optimal balance between climate change mitigation and energy security objectives, is not very convincing. Moreover, the debate on biofuels in the context of the new renewables Directive has shown that a one-sided pursuit of GHG emissions reduction and energy security objectives could lead to perverse effects in other areas of environmental policy, such as the conservation and sustainable use of biodiversity, and also have unintended negative consequences for other aspects of global sustainable development, such as food security in developing countries.

But beyond such issues of substantive policy coherence and effectiveness, the fact that climate and energy have become a matter of high politics has also raised new institutional and political stakes. Where do these policies belong and who should be in charge of them? Speculation on the appointment of a Commissioner for Climate Change in the next Commission and associated reorganisation of the Commission services currently responsible for energy and climate change issues started in earnest when it was announced that a new Directorate General for Energy will be created by the start of the next Commission's mandate. This would imply splitting the current DG TREN into separate DGs for Transport and Energy. A task force, chaired by the Director General of DG Personnel and Administra-

tion, was set up to present proposals on the scope and structure of the new Energy DG to the outgoing Commission by 1 May 2009 (CEC 2008h).

The proposed creation of a separate Directorate is consistent with the Barroso Commission's activism on energy policy and with the formalisation of EU competence for energy policy in the Lisbon Treaty. But it immediately begs the question whether this new DG should also be responsible for climate change policy, which has traditionally been within the remit of DG Environment and the Commissioner responsible for Environment. Such a reshuffle of institutional boundaries within the Commission services would seem to be in line with the recent movement towards integration of climate and energy policy analysed in this report.

When the Commission's decision to establish a new Directorate for energy was announced on 3 December 2008, the institution's spokesman, Johannes Laitenberger, stated that there were no plans for reallocating responsibility for climate change away from DG Environment (Pop 2008). However, this denial sounded too adamant to be fully credible and speculations that the new DG may also be put in charge of climate change continued, since the combination of Climate Change and Energy in a single portfolio would make a very attractive high-profile post for a member of the new Commission. Despite objections from the Director-General of Environment, Karl Falkenberg, who is understandably keen to keep this prominent dossier within his DG's remit, the administrative task force on the mandate of the new DG for Energy has now reportedly proposed to Commission Vice-President Siim Kallas that responsibility for the EU ETS as well as international climate strategy be shifted from DG Environment to the new DG that will formally be established after the incoming Commission takes office (ENDS 2009a, 2009b). This proposal makes it very likely that the issue of competence for climate change will be part of the high-level negotiations between Member States and their nominee for Commission President on the new Commissioners' portfolios.

Would the creation of a new DG for Energy and Climate Change under a single Commissioner be a positive move towards further integration of climate change and environmental concerns in EU energy policy? Theoretically, one might expect this to be the case, but on closer analysis the answer to this question is not as straightforward as it may seem. The literature on environmental policy integration (EPI) has identified many factors that may be conducive or, conversely, detrimental to the achievement of this objective, among which institutional design features prominently, but far from exclusively. Issues of political leadership, strategic vision and target-setting, procedures for planning, assessment, consultation and cross-

sectoral coordination, indicators, monitoring and review have also been found to be of crucial importance. In an important study on EPI in Europe, the EEA (2005) noted that 'compartmentalised' government both within Member States and at the EU level constitutes one obstacle to the achievement of sustainable development objectives, which can be addressed in many different ways, including "restructuring and better coordination within organisations", but also capacity-building, interdepartmental coordination mechanisms and cross-sectoral decision-support and learning.

The suggested integration of energy and climate change within a single administrative department under the responsibility of a single portfolio holder might be seen as a way of improving policy coherence and coordination through unity of decision-making, but this result may well be achieved at the expense of wider cross-sectoral coordination with climate-relevant policy areas outside the energy sector and environmental and sustainable development objectives other than the reduction of GHG emissions. In the strongly hierarchical bureaucratic culture of the Commission services, bringing units concerned with the delivery of climate change, security of supply and competitiveness of different sub-sectors of the energy industry under the authority of a single Director General may well eliminate important internal checks and balances existing in the current administrative structure, in which DG Environment is free to challenge policy proposals emanating from DG TREN and other sectoral DGs in inter-service consultations.

The proposed new DG for energy that would result from the split of DG TREN along sectoral lines would number between 400 and 500 officials (Pop 2008) mostly originating from four of the current twelve Directorates of DG TREN (C, D, H and I), two of which (H and I), based in Luxembourg, are responsible for nuclear policy. The units of DG Environment (ENV.C.1, C.2 and C.5) which would be merged into this new DG if it is also given responsibility for climate change currently number little more than sixty officials (including support staff) who are very likely to be outnumbered and marginalised within the prevailing, still essentially supply- and industry-oriented administrative culture of the majority of their colleagues coming from DG TREN. In view of these simple arithmetics, which of the three objectives of EU energy policy – security of supply, competitiveness and sustainability – would prevail in the event of inevitable conflicts and trade-offs between them, despite all the political rhetoric about policy integration and sustainable development? To what extent would the Commissioner in charge of the new portfolio be able to counter a possible trend towards 'reverse integration' in the pursuit of

short-term economic interests, assuming that he or she would be inclined to do so and willing to exercise the necessary political leadership? These questions have not been explicitly addressed, let alone answered by the outgoing Commission and will legitimately be raised in the forthcoming debates and hearings on the composition, organisation and policy priorities of the incoming Commission during the Swedish Presidency.

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SAMMANFATTNING PÅ SVENSKA

Den mängd energi som produceras och konsumeras av européer har en enorm påverkan på miljön. Inom den Europeiska unionen (EU) kommer ungefär 80 procent av den konsumerade energin från fossila bränslen, som är den huvudsakliga källan till växthusgaser och därmed också till klimatförändringarna. Samtidigt kommer de fossila bränslena till stor del från källor utanför unionen, vilket i sin tur har lett till att Europa har blivit beroende av en handfull leverantörer som i flera fall är både politiskt och ekonomiskt instabila. Därför har minskningen av växthusgaser och sörjandet för energisäkerhet blivit två av de främsta drivkrafterna för energipolitiken, för att framtvinga djupgående förändringar i hur vi producerar och konsumerar energi.

Trots att EU:s politik för energi- respektive klimatfrågorna nyligen har gått in i en ny era finns det få studier som på djupet har undersökt förhållandet mellan dessa två politikområden. Den här rapporten analyserar i hur hög grad EU integrerar sin energi- och klimatpolitik. Med tanke på att EU är klimatpolitiskt världsledande är det viktigt att inte bara fortsätta den framgångsrika politiken på båda dessa områden, utan även att ta ytterligare steg för att bättre integrera dem. Rapporten fokuserar därför också på att identifiera möjliga synergier och målkonflikter mellan de lagstiftningspaket som syftar till att både motverka klimatförändringarna och förbättra energisäkerheten. Genom att bättre förstå detta samspel kan man både nå synergier mellan de två områdena och identifiera oundvikliga målkonflikter.

Framsteg för ökad koordinering

Energi och miljö har funnits på EU:s politiska agenda sedan 80-talet och har gått hand i hand med EU:s önskan att agera som en ledande global aktör i det internationella samarbetet i klimatförändringsfrågan. Även om de framsteg som gjordes i början av denna process var ganska blygsamma, har nu ett antal politiska initiativ utvecklats inom ramen för energieffektivitet, förnybara resurser, forskning och utveckling, liksom slutförandet av den första fasen för EU:s system för handel med utsläppsrätter (European Union Emissions Trading System; EU ETS).

Energieffektivitet

Energieffektivitet är utgångspunkten för både energisäkerhets- och klimatmålen, men trots att det har funnits flera initiativ för ökad energieffektivitet och energisparande har utvecklingen i medlemsstaterna hittills varit begränsad. Det energieffektivitetspaket som kommissionen presenterade i november 2008 kommer att sätta bättre fart på processen, men det ska

samtidigt sägas att det inte fanns några uttryckligt bindande mål för energieffektivitet i 20-20-20-paketet.

Energieffektivitet, i synnerhet ett kraftfullt genomförande av EU:s lagstiftning, bör prioriteras för att både energisäkerhets- och klimatförändringsmålen ska uppnås. Det finns stort utrymme för förbättringar, särskilt i bostadssektorn.

Förnybar energi

När det gäller förnybar energi, den andra komponenten i en helt integrerad energi- och klimatpolitik, har utvecklingen varit långsam. Europeiska kommissionen förväntar sig inte att EU kommer att nå det ”vägledande” mål som sattes i 2001 års direktiv, det vill säga att 12 procent av energiutbudet år 2010 ska bestå av förnybar energi. Kommissionen ansåg inte att målet var för svårt att uppnå, utan hävdade snarare att det inte var ambitiöst nog. I det nyligen antagna ”klimat- och energipaketet” föreslog kommissionen därför ett *bindande* mål på tjugo procent till år 2020.

EU:s medlemsstater måste i långt högre grad anstränga sig för att säkerställa att de möter målen för förnybar energi. Det är viktigt att inte lägga för stor vikt vid de rättsliga aspekterna av de åtaganden som har gjorts. Man behöver också få en bättre insikt om varför de ursprungliga målen för 2010 sannolikt inte nås.

Forskning och utveckling

Även om EU de senaste åren har ökat forskningssatsningarna ligger unionen fortfarande efter länder som USA och Japan. Den finansiering som ges till ”alternativa” energikällor är obetydlig i jämförelse med satsningarna på energiteknologier som exempelvis kärnkraft och fossila bränslen. En positiv följd av klimat- och energipaketet är dock att en del av handeln med utsläppsrätter i ETS (med ett uppskattat värde av 6-9 miljarder euro) vigs till att finansiera storskaliga EU-projekt för avskiljning och lagring av koldioxid (Carbon Capture and Storage; CCS).

Det krävs större satsningar på forskning och utveckling, i synnerhet forskning i icke-nukleära energier och energieffektivitetsprojekt. EU:s medlemsstater bör försäkra sig om att avsätta upp till 50 procent av deras respektive intäkter från handeln med utsläppsrätter och se till att dessa intäkter leder till betydande nya investeringar i ren teknologi – som till exempel avskiljning och lagring av koldioxid – snarare än att endast ompaketera nuvarande utgifter.

Handel med utsläppsrätter

Handeln med utsläppsrätter, som är EU:s miljöpolitiska flaggskepp, har delvis mildrat kommissionens bakslag med förslag om koldioxid/energiskatt och har även till viss del inneburit att miljökostnaderna från energiintensiva industrier har internaliserats. Systemet skulle kunna minska mängden fossila bränslen i EU och därmed bidra till att nå både klimat- och energisäkerhetsmålen. Ett antal lärdomar kunde dras under initieringsfasen, men det återstår att se om den andra handelsperioden kommer att stimulera innovation och utsläppsminskningar.

Det utökade ETS-direktivet har inneburit att handeln med utsläppsrätter har blivit mer omfattande, men samtidigt har det lagts till både kryphål för de nya medlemsstaterna och potentiella undantag för industrisektorer där risker finns för koldioxidläckage. EU:s industrisektor upplever onekligen ett ökat tryck i och med den ekonomiska krisen, men detta får inte användas som en ursäkt för att ytterligare försvaga genomförandet av systemet under perioden efter 2013.

Synergier mellan klimat- och energipaketet och energisäkerhet

En fördjupad integrering i klimat- och energipolitiken leder till både synergier och målkonflikter mellan olika sektorer och aktörer. Att maximera det förra och minimera det senare är avgörande om tillräckliga framsteg ska göras för att nå ett energieffektivt samhälle med låga koldioxidutsläpp.

Den huvudsakliga synergin mellan å ena sidan energisäkerhetsmålet och å andra sidan de fyra lagstiftningsinstrumenten i klimat- och energipaketet från 2008 – i synnerhet beslutet om insatsfördelning, det nya direktivet om förnybar energi och det reviderade ETS-direktivet – är att konsumtion och import av fossila bränslen sannolikt minskar. En annan möjlig synergi kommer från intäkterna från systemet för handel med utsläppsrätter, som kan användas till att stärka utveckling och spridning av ren teknologi. Detta skulle även kunna ge dominoeffekter för energisäkerheten via ökad energidifferentiering och energieffektivitet. Dessutom ser kommissionen förnybar energi och biobränslen som ett betydande och gynnsamt tillfälle att avvänja den europeiska transportsektorn från sitt överväldigande beroende av importerad olja. Förnybar energi erbjuder också en möjlighet för EU att främja sin klimatpolitiska agenda i de bilaterala relationerna med andra nyckelaktörer och stora oljeimportörer genom att uppmuntra dem att diversifiera deras energiutbud, samtidigt som partnerskapet med dem bibehålls i samarbetet för en grön agenda. Direktivet för avskiljning och lagring av koldioxid erbjuder ett antal möjliga synergier med energisäkerhetsmålen.

Framför allt placerar det Europa i en stark position när det gäller att ta itu med sina koldioxidutsläpp, samtidigt som man även fortsättningsvis använder sitt inhemska utbud av kol.

Slutsatser

Den här rapporten diskuterar de framsteg som EU hittills har gjort i integrerandet av klimat- och energipolitiken och pekar på områden där extra insatser kommer att behövas i framtiden. Större fokus bör riktas på möjliga synergier – och, när det är nödvändigt, målkonflikter – mellan EU:s klimat- och energipolitik. Europeiska kommissionen har redan ett instrument, den så kallade ”konsekvensbedömningen”, som används för att klargöra förhållandet mellan energi- och klimatmål inom ramen för specifika politiska förslag. Konsekvensbedömningen bör användas i ännu högre grad än vad som är fallet idag. Synergierna kommer inte alltid att vara självklara och det kommer kanske inte att vara möjligt, eller ens önskvärt, att se en fullständig samordning av konkurrerande mål. När vi nu går in i en ”ny era i energipolitiken” och både energisäkerhets- och klimatpolitiska frågor klättrar uppåt på den politiska agendan finns det förmodligen större möjligheter för integrering av de två områdena än någonsin tidigare. En bättre förståelse av möjliga synergier och målkonflikter kommer att möjliggöra detta. Däremot vore det troligtvis ett misstag att skapa ett nytt ”super-DG” för energi- och klimat och ge detta generaldirektorat en egen kommissionär, något en intern arbetsgrupp av högre tjänstemän i den avgående kommissionen föreslagit. Förslaget kan mycket väl visa sig vara skadligt för den integrering som syftar till att främja hållbar utveckling inom och bortom Europa.

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