Energy for Climate in Europe

An assessment of energy policies with climate-relevance

The LinkS Project

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The LinkS project aims at providing a better linkage between perspectives and projections for global climate policy development and regional energy systems, by linking relevant modelling tools. The present report provides a specific focus on energy policy measures within the EU with climate relevance.

The EU has in recent years aimed at reinforcing the linkage between the climate and energy policies, both at strategic and operational levels. The EU has pledged itself to reduce its greenhouse gas (GHG) emissions with 8 percent by 2008-12 as compared to the 1990 level, and by 20 percent by 2020 as compared to the 2005 level. The EU-27 reduced its GHG emissions with 11.3 percent in 1990-2008. The 2020-target, however, will require stronger efforts and energy is a key sector: The EU has decided that 20 percent of the energy used in 2020 must be renewable, and that the energy usage in 2020 is to be 20 percent more efficient than in 2005. A number of policy strategies, measures and legislation are formulated to fulfil these targets.

In order to highlight the potential of these measures, this report specifically addresses the drivers and limitations given the existing decision-making structures in the EU. The methodology employed is mainly qualitative, based on document analysis and a review of secondary literature.

Climate-change mitigation is in principle based on supra-national decision-making, but unanimity among all EU Member States is still required in critical issues related to the energy sector. In addition, the national follow-up of the targets constitutes a particular challenge. This is here illustrated by the cases of Denmark and Norway. Energy policy is also substantially characterised by several conflicting interests between the Member States, resulting in diverging policy priorities. It is, therefore, an open question whether the EU will succeed in fulfilling its 20/20/20 percent targets by 2020, and what will be the actual role of energy within the climate-change strategy.

**KEYWORDS**

<table>
<thead>
<tr>
<th>SELECTED BY AUTHOR(S)</th>
<th>EU, EEA</th>
<th>Energy policy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Climate policy</td>
<td>Greenhouse emissions</td>
</tr>
</tbody>
</table>
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>INTRODUCTION</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>BACKGROUND: STATUS, DECISION-MAKING SYSTEM AND HISTORICAL BACKDROP</td>
<td>6</td>
</tr>
<tr>
<td>2.1</td>
<td>CURRENT STATUS: GREENHOUSE GAS (GHG) EMISSIONS AND RELATED TARGETS IN THE EU</td>
<td>6</td>
</tr>
<tr>
<td>2.2</td>
<td>DECISION-MAKING RULES FOR ENERGY AND CLIMATE IN THE EU</td>
<td>9</td>
</tr>
<tr>
<td>2.3</td>
<td>THE EMERGENCE OF AN EU CLIMATE AND ENERGY STRATEGY</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>THE EU CLIMATE AND ENERGY PACKAGE, AND IMPLEMENTATION CHALLENGES</td>
<td>15</td>
</tr>
<tr>
<td>3.1</td>
<td>THE EU EMISSION TRADING SYSTEM (ETS)</td>
<td>16</td>
</tr>
<tr>
<td>3.1.1</td>
<td>Experiences from the follow-up of the ETS</td>
<td>18</td>
</tr>
<tr>
<td>3.2</td>
<td>RENEWABLE ENERGY (RES)</td>
<td>19</td>
</tr>
<tr>
<td>3.2.1</td>
<td>Renewable stationary energy</td>
<td>19</td>
</tr>
<tr>
<td>3.2.2</td>
<td>Renewable fuels for transport</td>
<td>21</td>
</tr>
<tr>
<td>3.2.3</td>
<td>Experiences from the RES-E Directive</td>
<td>22</td>
</tr>
<tr>
<td>3.3</td>
<td>CARBON CAPTURE AND STORAGE (CCS)</td>
<td>24</td>
</tr>
<tr>
<td>3.3.1</td>
<td>Further implementation of CCS: From demonstration to deployment</td>
<td>25</td>
</tr>
<tr>
<td>3.4</td>
<td>ENERGY EFFICIENCY</td>
<td>26</td>
</tr>
<tr>
<td>3.4.1</td>
<td>Information-related measures</td>
<td>27</td>
</tr>
<tr>
<td>3.4.2</td>
<td>Harmonization of minimum standards</td>
<td>28</td>
</tr>
<tr>
<td>3.4.3</td>
<td>Experiences from the national implementation of energy efficiency</td>
<td>29</td>
</tr>
<tr>
<td>3.5</td>
<td>STATE AID RULES</td>
<td>30</td>
</tr>
<tr>
<td>3.6</td>
<td>SUMMARY</td>
<td>31</td>
</tr>
<tr>
<td>4</td>
<td>THE VERTICAL DIMENSION OF EU POLICIES: THE CHALLENGE OF NATIONAL FOLLOW-UP</td>
<td>33</td>
</tr>
<tr>
<td>4.1</td>
<td>DENMARK</td>
<td>33</td>
</tr>
<tr>
<td>4.1.1</td>
<td>Background</td>
<td>34</td>
</tr>
<tr>
<td>4.1.2</td>
<td>Status</td>
<td>35</td>
</tr>
<tr>
<td>4.2</td>
<td>NORWAY</td>
<td>36</td>
</tr>
<tr>
<td>4.2.1</td>
<td>Background</td>
<td>36</td>
</tr>
<tr>
<td>4.2.2</td>
<td>Status</td>
<td>37</td>
</tr>
<tr>
<td>4.3</td>
<td>SUMMARY</td>
<td>38</td>
</tr>
<tr>
<td>5</td>
<td>THE HORIZONTAL DIMENSION: THE CHALLENGE OF INTEGRATING POLICY EFFORTS ACROSS DIFFERENT DOMAINS</td>
<td>39</td>
</tr>
<tr>
<td>5.1</td>
<td>CLIMATE VS. OTHER ENVIRONMENTAL CONCERNS</td>
<td>39</td>
</tr>
<tr>
<td>5.2</td>
<td>SECURITY OF SUPPLY</td>
<td>40</td>
</tr>
<tr>
<td>5.2.1</td>
<td>Nuclear energy</td>
<td>42</td>
</tr>
<tr>
<td>5.3</td>
<td>THE INTERNAL ENERGY MARKET AND COMPETITIVENESS</td>
<td>43</td>
</tr>
<tr>
<td>5.3.1</td>
<td>Innovation and energy technology development</td>
<td>45</td>
</tr>
<tr>
<td>5.4</td>
<td>SUMMARY</td>
<td>47</td>
</tr>
<tr>
<td>6</td>
<td>CONCLUSION</td>
<td>49</td>
</tr>
<tr>
<td>7</td>
<td>REFERENCES</td>
<td>50</td>
</tr>
</tbody>
</table>
8 ANNEX 1: OVERVIEW OVER CLIMATE-RELEVANT ENERGY POLICY
STRATEGY DOCUMENTS AND LEGISLATION ...........................................................57
8.1 OVERVIEW STRATEGIES AND DIRECTIVES FOR CLIMATE CHANGE
MITIGATION ............................................................................................................57
8.2 OVERVIEW STRATEGIES AND DIRECTIVES FOR RENEWABLE
ENERGY ....................................................................................................................57
8.3 OVERVIEW STRATEGIES AND DIRECTIVES FOR ENERGY
EFFICIENCY .............................................................................................................57
8.4 OVERVIEW STRATEGIES AND DIRECTIVES FOR TRANSPORT ........... 58
1 INTRODUCTION

The European Union (EU) has, under the Kyoto Protocol, pledged to reduce its greenhouse gas emissions by 8 percent of the 1990 reference level by 2008-12; and by 20 percent of the 2005 level by 2020. But while the available data indicate a very positive trend in terms of achieving the Kyoto goals, the target of a 20 percent reduction by 2020 clearly requires stronger efforts from the EU and its Member States. In this context, energy stands out as a key sector if the EU is to achieve its ambitious targets.

The EU has in recent years worked to reinforce the linkage between climate and energy policies, at both the strategic and more operational levels. The LinkS Project aims at providing knowledge for a better interaction between perspectives and projections for global climate policy and regional energy systems by linking relevant modelling tools. Given the EU’s role within a globally anchored climate-change mitigation regime, and its role vis-à-vis energy policy, the present report provides a focus on EU energy policy measures with climate relevance. It is, however, a major methodological challenge to develop parameters which capture the nature of the contextual governance challenge in Europe. The methodology employed here is primarily qualitative; based on documentary analysis and a review of secondary literature. Such an approach is essential to capture the ‘contextual’ channeling of technological and economic variables. Together with similar analyses of US and Chinese energy policies, the report provides important input on the factors that condition the overall validity of the quantitative modelling parameters. The report thus contributes a policy ‘reality check’ for further methodological development, as well as a framework for assessing the broader political implications and feasibility of future model outputs.

Within this context, the present report outlines relevant policy measures for the energy sector as formulated by the EU thus far (up to 2010), and discusses the extent to which these measures are assumed to contribute to reductions in the total emissions of greenhouse gases (GHG) in the EU and the European Economic Area (EEA). The main empirical references are the regulatory measures introduced by the ‘Climate-energy package’ (adopted by the EU in December 2008); a policy initiative that builds partly on existing legislation, but also outlines significant new policy approaches.

With respect to a stronger integration between climate and energy policies in the EU, several analytical challenges stand out. First, there are certain differences in the formal framework and the driving-forces behind the broader, sector-encompassing climate-change policy agenda, as compared to more specific energy-related initiatives.

Secondly, the relevant policy measures must be adopted by the Member States and implemented at the national level. The EU-27 constitutes, however, a multitude of different national contexts, which represent very diverse circumstances for the actual follow-up.

Thirdly, it is difficult to establish a direct link between specific energy-policy decisions and their exact effects on emissions. This is mainly due to a lack of statistical material that specifies current
and projected sectoral contributions of energy for the EUs climate-change policy targets. In section 2.1 we nonetheless present a brief overview reflecting the available material.

Finally, in order to assess the effects of existing policy measures at the EU level, the report also addresses the drivers and limitations represented by the existing decision-making structures. This involves a focus on the nature and eventual coordination of the relevant EU policy measures.

The report begins by briefly analyzing the main features of the decision-making principles that apply to climate-relevant energy policies. It is here important to stress the vertical and horizontal dynamics of EU policy-making and implementation. This can preliminary be outlined as follows:

1) EU policies must be followed up and implemented at the national level and beyond. This represents an important vertical dimension of the EU multi-level governance system, where decision-making at the EU level both directs and supplements decisions at the national and sub-national levels. This fact raises substantial challenges as to the actual follow-up of common policy decisions and legislation. These challenges are here illustrated through concise assessments of Denmark’s and Norway’s follow-up of EU policies.

2) Further, there is a horizontal dimension related to the interaction between the different energy policy concerns; that is, environment, security of supply and competitiveness. In addition, various other sectoral policy processes and programmes also affect energy performance and climate-change consequences. Along this dimension it is important to stress that energy-relevant policy decisions in the EU primarily are part of the environmental policy and market development policy domains. In parallel, climate change mitigation as a policy field has in many ways emerged on the basis of these areas, but at the same time represents other challenges for a more sector-encompassing and integrated policy strategy.

The report presents the relevant background information in section 2, including an overview over the current status of GHG emissions and related targets, an outline of the main features of the relevant decision-making system, and a brief historical overview of current climate-relevant energy policies. Thereafter, in section 3, we outline and assess the main features of the 2008 climate-energy package and related legal acts; as part of the vertical dimension described above. In section 4, we illustrate the status and challenges related to national follow-up, as exemplified by Denmark and Norway; two most similar countries in terms of population size, political structures and culture – but substantially differing as far as the energy sector is concerned. In section 5, we discuss the horizontal dimension of the EU policies, focusing on the eventual coordination and integration between relevant policy domains. Section 6 provides the general conclusions, followed by an annex listing the major policy strategies and related legal acts covered by the report.
2 BACKGROUND: STATUS, DECISION-MAKING SYSTEM AND HISTORICAL BACKDROP

2.1 Current status: Greenhouse gas (GHG) emissions and related targets in the EU

In the negotiations on the Kyoto Protocol the then fifteen Member States\(^1\) of the EU agreed to reduce their GHG emissions with eight percent by 2008-2012 below the level of 1990. After the ratification of the Kyoto Protocol twelve additional countries have joined the Union.\(^2\) These countries are committed by individual GHG reduction targets; between 6 and 8 percentages as compared to the base year emissions.\(^3\) The latest inventory data indicates that the GHG emissions of the EU-15 decreased with about 6.9 percent compared to the 1990 level (1990-2008) (EEA 2010a). Currently, only Austria seems to have difficulties achieving its Kyoto commitment. The rest of the countries are expected to meet their targets or even over-achieve them with existing measures. Projections from 2009 based on data submitted from the Member States indicate that the EU 15 is on the track to over-fulfil its Kyoto target by 5.1 percent in 2008-12, provided that all existing and projected measures are fully implemented (EEA 2009). Forthcoming projections in 2010 are likely to indicate the same positive trend in the EU 15 given the high reductions last year.

In addition to the Kyoto commitment, the current twenty-seven EU Member States (EU-27) have agreed among themselves to reduce their GHG emissions with 20 percent by 2020, independent of the eventual outcome of a ‘post-Kyoto’ agreement. The 2020 target was adopted in 2007 by the European Council. The new target is more ambitious than the Kyoto target, and projections indicate that a much steeper emission reduction path is needed. New measures and implementation of the Energy- and Climate package from 2008 (see section 3) is therefore crucial to meet the 2020 targets (EEA 2009).

Furthermore, prior to the Copenhagen meetings of the Parties to the United Nations Convention on Climate Change (UNFCCC) and the Kyoto Protocol in 2009 (COP 15/ MOP 5), the EU set an even more ambitious target of 30 percent GHG reduction by 2020 “..provided that other major emitters contribute their fair share to an ambitious global climate agreement in December in Copenhagen “ (CEC 2009a). Since this was not the outcome of the Copenhagen meeting, the EU

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\(^1\) Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and United Kingdom.

\(^2\) Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia all joined the EU in 2004, whereas Bulgaria and Romania became Member States in 2007.

\(^3\) The exceptions are Malta and Cyprus which have no national targets, because they are so-called ‘non-annex countries’ to the International climate-change convention (UNFCCC); that is, countries that are exempted from commitments within the global framework.
has recently left this ambition, awaiting the outcome of the next COP-meeting in Mexico in November 2010.4
Estimates from the EEA inventory report 2010 give, however, positive indications on the EU-27 track to meet their reduction target. Between 1990 and 2008 the EU-27 have decreased their emissions by 11.3 percent and are therefore more than half way to meet the 2020 target only by domestic emissions reductions (EEA 2010a and EEA 2010b).

Figure 1: EU-27 GHG emissions 1990–2008 (excluding Land Use and Land Use Changes; LULUCF) (EEA 2010a). The figure is showing a downward trend for the EU-27 GHG emissions.

As illustrated by Figure 2 below, the energy and transport sectors are the two most important contributing sector to EU GHG emissions, accounting for 79.1 percent of total EU-27 emissions in 2008 (EEA 2010a). The energy sector is still dominated by fossil fuels, and in the transport sector over 90 percent is still based on oil fuel (Eurostat 2009). The emissions from transport have demonstrated an increasing trend in EU-27 since 1990 (EEA 2010a).

4 However, in May 2010, the European Commission presented an analysis of the costs, benefits and options for moving beyond the EU’s greenhouse gas reduction target for 2020 – from 20 percent below 1990 levels to 30 percent. On the one hand, the Commission’s analysis emphasises that the current reduction in EU emissions – as a consequence of the economic crisis, together with a drop in carbon prices – have altered the cost estimations from two years ago. Analyses of the implications of the different levels of ambition as a motor for modernising the EU economy and creating new jobs by promoting innovation in low-carbon technologies are also included in the assessment. In sum, however, the Commission concludes that the EU is not yet ready to step up its efforts for climate-change mitigation, as long as the international climate regime is unsettled (CEC 2010).
Furthermore, the European Environment Agency (EEA) has conducted an assessment based on inputs from the Member States (EU-27) as to the expected contribution from different policy measures. This assessment indicates that the largest amounts of emission reductions are expected to result from the implementation of the EU Directives on renewable energy sources (RES) and the Emission Trading System (ETS); that is, the trading of quotas for greenhouse gas emissions (see sections 3.1 and 3.2) (EEA 2009).

A focus on implementation of measures and policy efforts in the energy sector is therefore crucial as we can also see from Figure 3 below which indicates that the largest saving potentials in 2020 are expected to come from the transport and energy sectors. The assessment reflected in the figure is taking account of all national measures, whether related to EU policies or not.
Figure 3: Sectoral savings from policies in 2020 (EEA 2009). The figure shows that most of the savings will come from the energy sector.

2.2 Decision-making rules for energy and climate in the EU

Currently, questions related to the energy market, security of energy supply, the promotion of energy efficiency and renewable energy, as well as interconnections and energy networks, can all be decided at the EU level (Article 194 of the Lisbon Treaty; EC 2009). In addition, and providing a broader and more ‘sector-encompassing’ perspective, decisions can also be taken with the aim of mitigating climate change (ibid: Article 191).

The European Commission generally has the exclusive right to propose new legislation, and functions as the EU’s executive branch. The Commission is composed of 27 commissioners who are initially promoted from each Member State, but have to be approved by the European Parliament, individually as well as collectively; as a cabinet. Although the Commissioners are nominated on a national basis they are to represent the interest of the EU as a whole, and not national interests. The EU Commission is responsible for proposing legislation, implementing decisions, upholding the Union's treaties and the general day-to-day running of the Union. The Commission’s secretariat is organized in different Directorates-general (DG’s) according to different sectoral domains. For climate and energy issues there are currently two different responsible DG’s; that is, the DG’s for Climate Action and Energy, respectively. These DG’s were established on the background of a re-shuffle in 2009/10. As part of the preparation of legal acts and policy proposals, it is well known, that there are frequently quite strong opposing positions within the Commission apparatus; including in-fights between the concerned DG’s. This has not least been the case for climate-relevant proposals which are often in conflict with sectoral interests like energy. In order to delimit the scope of the report, we have within the present context, however, chosen not to elaborate the importance of these internal processes.

Furthermore, decision-making procedures pertaining to energy policy vary with the various sub-issues in question. In issues with relevance for the internal market and/or the environment
(including climate change) the EU can employ qualified majority. This is done through the voting in the Council of the EU, where the Member States’ governmental representatives gather (see Text box 1), and means that a certain number of votes are required if the proposal is to pass. The number of votes allocated to each Member State is roughly determined by its population, but progressively weighted in favour of smaller countries.

In the cases where qualified majority applies, the EU must also employ the co-decision procedure between the Council of the EU and the European Parliament (EP); that is, joint decision-making. In such matters, the EP has the right, on equal footing with the Council, to propose amendments. If the Council and Parliament disagree on a proposal from the Commission, a second round of decision-making – or ‘reading’ – occurs, within which both institutions reconsider the proposal. If the institutions still disagree after a second reading, a reconciliation committee, with representatives from both institutions and the Commission, meet and seek to negotiate a compromise (see Text box 1).

Based on such voting rules, one could say that in energy policy issues with consequences for the environment and the functioning of the energy market, the EU is endowed with a ‘supra-national’ or ‘federal’ character. In contrast, matters relating to fiscal provisions – as for example an eventual common energy tax, as well as decisions affecting the composition of energy sources nationally, must both be approved by all the Member States; that is, in unanimity.

National implementation is, however, a major challenge for the EU’s energy policy. This challenge will be further elaborated in section 4. Text box 1 below provides a summary of the main functions of the EU decision-making bodies, and the main stages of the decision-making process. In section 3 this process is further illustrated by the case of the Directive for the promotion of renewable energy (RES) (text box 3). Since this vertical axis is crucial in order to understand the underlying dynamics of the EU climate and energy policy, we have here structured our analysis accordingly: That is, the vertical axis is presented and discussed in chapter 3, followed by an assessment of the horizontal axis in chapter 5. In chapter 4 we provide an illustration of the challenges met within the vertical steering dimension, by as represented by Denmark and Norway.
Text box 1: The EU’s decision-making system. Brief outline of the EU decision-making bodies; mandates and roles, and the organisation of the decision-making processes. For a further illustration, see text box 3 – in section 3.

The European Council:
Regular summits assembling the heads of state and government of the EU Member States. Decides in overall, principal matters and indicates the main direction of the EU development. The Council is presided by its President (currently, van Rompuy). The Council endorses policy strategies; e.g. in energy matters, the Council decided the 20/20/20 percent targets for 2020.

The European Commission:
The EU’s civil service working in the interest of the EU as a whole. Takes policy initiatives and proposes legislative acts, and checks the follow-up across the EU. The Commission is the only EU institution to propose common legislation. It is composed of 27 commissioners; one from each Member State, but approved by the European Parliament.

The Council of the European Union:
Different constellations according to the issues in question. Generally, the sectoral ministers from each Member State meet separately. As for climate-relevant energy policies, both energy and environment ministers may be involved; but within the Energy and Environmental Councils respectively. A number of issues must be decided together with the Parliament (see below). The Council is presided by the Presidency; that is rotating between the Member States, during a 6 months-term.

The European Parliament:
736 Members elected directly from the Member States every 5 years. Organised according to party constellations, not national basis. Decides in matters pertaining to legislation and the EU’s budget, together with the Council of the EU. The Parliament co-decides with the Council in matters regarding the internal market and the environment.

The co-decision procedure:
The decision-making process between the Council and the Parliament is termed the co-decision procedure. A policy proposal can be sent back and forth three times if the two institutions do not agree. The Commission can intervene in order to provide a solution. In the event of full disagreement between the Council and the Parliament, a reconciliation committee is convened.

Policy decisions:
Different decisions are taken and endorsed. Legislative proposals are to be decided by co-decision, but are normally building on formerly adopted policy strategies or programmes. See text box 2 below for a brief description of the main categories of policy decisions.
2.3 The emergence of an EU Climate and Energy Strategy

Energy policy in the EU has historically represented a challenging area for stronger policy integration (c.f. Matlary 1997; Eikeland 2008). From the mid-1980’s, however, energy policy became an important concern in relation to the general internal market programme, giving rise to various initiatives of an integrative nature designed and carried out by the Commission. Energy policy is also one of the areas where there have been major and persistent conflicts of interest between the Commission, the Member States, and various interest groups (energy, industry and environment).

The consideration of environmental concerns in relation to energy was first put on the agenda by the adoption of the Single European Act in 1986 creating a basis for legislation on energy efficiency and sustainable energy use. The Maastricht Treaty, signed in 1992, further strengthened the ability for EU decisions in environmental policy by introducing majority voting procedures and more active participation for the European Parliament.

In 1986 the EU adopted legally non-binding resolution to improve energy efficiency with 20 percent by 1995. Although this can not be considered as an explicit climate policy measure, it represents one of the first initiatives to link climate and energy policies in the EU.

The first common EU target on GHG emission reduction was agreed upon in 1990. It prescribes a stabilisation of GHG emissions at the1990 level by 2000 (Skjærseth & Wettestad, 2008: 3). The Commission immediately went on to formulate specific climate policy strategy including proposals for an energy/carbon tax; measures for the transport sector; and measures to improve energy efficiency and the use of renewable energy (ibid: 3-4).

In particular, a common carbon and energy tax was planned and considered as an important tool to combat climate change. The tax was never adopted, however, as it conflicted with the Member States’ regulation of fiscal questions, considered to be part of the Member States’ unique competence (see section 2.2 above). Hence, following a period of very intense lobbying from European industries, the proposal was finally rejected (Skjærseth 1994).

Related to the Earth Summit in Rio in 1992, and the adoption of the UN Framework Convention on Climate Change (UNFCCC), the EU proposed its first strategy to limit GHG emissions and improve energy efficiency. Energy efficiency measures were already in place from the beginning of the 1990’s, albeit not directly connected to climate change. This included an energy performance scheme and other related research and development projects within the program SAVE. Since 1990 the policy and research program ALTENER ensured the EU’s promotion of renewable energy, with a primary focus on energy security. Both SAVE and ALTENER became important elements in the EU climate-change mitigation strategy.

In sum, before the adoption of the Kyoto Protocol in 1997, even though climate change gradually gained importance, integration of energy and climate policy issues proved difficult because of different decision-making principles and structures. The EU had in principle no formal
competence related to energy policy. Energy-related issues required consensus among the Member States, as illustrated by the fate of the common carbon/energy tax.

As a result of the Kyoto protocol in 1997, the EU agreed to reduce their GHG emissions by 8 percent at 1990 level by 2012, through a ‘burden-sharing agreement’. This implied that the common objective was to be fulfilled by the Member States, but by differentiated national targets according to criteria related to level of welfare and economic performance. The EU climate strategy included a monitoring mechanism to ensure the Member States’ fulfilment of the commitments.

In 2000 the EU adopted the European Climate Change Program addressing measures to contribute to the fulfilment of the binding target under the Kyoto Protocol. In the program several proposals were made for “Common and Coordinated Policies and Measures on Climate Change”. The commitment to combat climate change was further demonstrated by listing the issue as one of four ‘priority areas’ in the 6th Environmental Action Program (2002-12).

The EU identified an Emission Trading System (ETS) as the primary follow-up tool for the fulfilment of the commitments under the Kyoto Protocol (Skjærseth & Wettestad 2008). The EU initially expressed significant scepticism towards US proposals of cap-and-trade schemes as part of the global climate regime. However, a shift occurred within the EU in the late 1990’s, due to internal changes in the Commission and the perceived pressure to identify effective implementation mechanisms for the Kyoto Protocol (ibid: 98-101). On this background, the EU adopted the ETS Directive in 2003 which stipulated a pilot phase for emission trading in 2005-07, before the actual period of commitment (according to the Kyoto Protocol), 2008-12.

GHG emissions continued to rise within the EU, however, and a second EU Climate Change Programme (ECCP) was adopted in 2005. The ETS, recently adopted – but not yet fully implemented, was considered to be the key measure to reduce GHG emissions in the revised ECCP. As part of this, proposals were also made to include aviation and road transport for the next phase of the ETS, the 2008-12 period. An increased focus on CCS and funding was also apparent in the second ECCP. At the same time the Commission pointed to the necessary integration of the previous separate policies of climate and energy, including transport.

The launch of the second ECCP coincided with a reinforced focus on energy within the Union. The energy focus was triggered by: (1) the lacking fulfilment of the ambitions for an internal energy market; and (2) several incidents demonstrating the vulnerability of the EU’s energy supply. On this background, the Commission initiated a process of formulating a revitalised energy policy strategy for Europe (Eikeland 2008). Building on this, the Commission put forward an outline for a European energy strategy taking into consideration both supply security, competitiveness and climate change in March 2006 (CEC 2006).

Hence, in spite of the more complex situation of an extended Union with 27 Member States (from 2007), energy and climate-change mitigation were identified as area of high political interest, and singled out as overall priorities for the future development of the EU. In 2005/06, the EU
institutions were strongly engaged in formulating a more ambitious climate policy strategy with energy as the key sector.

Based on this more integrated approach to climate and energy several ambitious proposals were put forward by the Commission in 2007. This included new targets of 20 percent reduction in GHG emissions – as compared to 2005; 20 percent increased energy efficiency; 20 percent share of energy from renewable sources and 10 percent energy from renewable sources in the transport sector; all targets to be achieved by 2020 (CEC 2007a). Shortly after, the targets were endorsed by the Member States during the meeting of the European Council (the EU’s superior decision-making body assembling all the heads of state and government) in March 2007.

The follow-up culminated in the Climate-Energy package launched in 2008 which included a set of legislative proposals, as well as revisions and updates of already implemented measures. The Climate-energy package was finally adopted by the Council in December 2008. The key initiatives and measures of the package will be further elaborated in section 3 below.
3 THE EU CLIMATE AND ENERGY PACKAGE, AND IMPLEMENTATION CHALLENGES

Evaluations of the impact of various policy initiatives on GHG emissions in EU-15 between 1990 and 2008 show that emissions have been reduced by 6.9 percent, whereas the emissions of the EU-27 are estimated to have been decreased by 9 percent since 2007 (see also section 2.1 above). In particular, the EU is well positioned to comply with the common Kyoto target of 8 percent reduction by 2008-12.

As far as the energy sector is concerned, however, there are a number of substantial challenges. This not least related to the establishment of a common framework and a more coherent energy policy strategy, as discussed in section 2. More particularly, the former target of having at least 21 percent renewable electricity (RES-E) by 2010, as well as the more specific target of 5.75 percent biofuels for transport by the same year – have both been left aside, as one considered it unlikely to fulfil them in time.

As a result of a reinforced focus on climate and energy, the Council adopted the Climate and Energy Package in 2008. For the first time, legal acts and strategies – based on previous policy processes for climate and energy – were integrated into one policy programme, or ‘package’. The main regulatory elements were:

- A Directive on the promotion of renewable energy (RES).
- A Directive on carbon capture and geological storage (CCS).
- A Directive extending the scope of the EU Emission Trading System (ETS) from 2013.
- A Decision on the effort-sharing in EU climate-mitigation policies.
- A Regulation on emission standards from light-duty vehicles.

The EU ETS will be extended to more sectors from 2013 (see section 3.1), and the RES Directive will contribute to a larger share of renewable energy in the EU’s final energy consumption. In addition to the above initiatives, the climate-energy package also implied follow-up measures related to energy efficiency.

The present section presents and discusses the main features of the 2008 package, focusing on the ETS, RES and CCS directives respectively, as well as policy measures related to energy efficiency. In relation to this, we will also present some experiences with national follow-up and implementation in order to pinpoint some key challenges for the further development of the EU climate- and energy policy. As emphasised in section 2, and summarised in text box 1, the eventual outcome of EU’s policy objectives is substantially dependent on an effective and consistent national implementation. This constitutes the vertical governance dimension.

As emphasised in section 2, the EU can regulate the energy sector by legislation based on a ‘supra-national’ approach in matters pertaining to the environment and the internal market. In the case of the climate-energy package the legislative elements were all based on these competences.
Text box 2 below provides an oversight of the different categories of regulatory decisions that can be taken by the EU institutions.

**Text box 2: Main categories of regulatory decisions taken by the EU institutions**

1. Policy strategies are normally first outlined and formulated through Green papers which scope and assess policy options.

2. Based on the Green Paper the Commission forwards a *Communication* within which a policy option/several options is/are explained, normally providing a proposal for a specific decision, often in the form of a legislative proposal.

3. There are three different categories of legislative acts:
   - **Directive**: Requires the Member States to fulfill certain objective(s), but the concrete legislative and other means are to be decided at the national level.
   - **Regulation**: A legislative act which becomes immediately enforceable as law in all member states simultaneously.
   - **Decision**: Binding on the person or entity to which it is addressed. Decisions may be addressed to Member States or individuals.

### 3.1 The EU Emission Trading System (ETS)

The main policy instrument to reduce GHG emissions was long thought to be a common carbon tax (Skjærseth 1994). The debate of such a tax began in the early 90’s, but was soon watered down due to resistance from various Member States, the European industrial lobby, and various parts of the EU Commission (Skjærseth & Wettestad 2008). An Energy Tax Directive was, however, adopted in 2003 to provide a common baseline for the taxation of energy products and electricity.

In stead of a common tax, the EU’s Emission Trading System (ETS) has become the major instrument in reducing GHG emissions across sectors. The ETS is a market-based policy instrument, and has been far less controversial than an eventual carbon tax. Perhaps this is because of a greater flexibility in how to allocate national quotas, the greater possibility for exemptions and the trading opportunity among the EU industries. The EU ETS was formally established by the *Directive 2003/87/EC*, and finally adopted in 2003 (OJEU 2003). The Directive initiated a first trial period of the ETS, from 1 January 2005-2007 (ibid.).

An important feature of the current EU ETS is that 90 percent of the quotas are allocated free of charge (without auctioning) to the industrial emitters. Only a few countries made use of the provision to auction (up to 10 percent for the second phase; 2008-12).
National allocation plans are formulated by each Member State, but finally approved by the Commission. National authorities must prepare reports on the allocations by the end of each year. The database of the EU ETS is composed of national emission inventories at installation level, in addition to national registries in each member states that keep track of emission allowances issued to installations and verifications. Industrial companies have reporting duties, and are in addition controlled by independent agencies. A penalty scheme applies for excess emissions. Companies then have to surrender the missing allowances and pay an additional penalty of EUR 100 per ton of CO₂.

The first phase of the EU ETS was characterised by the challenges of a nascent system; in particular, insufficient data quality, and generous allocations by national authorities. These factors were leading to a ‘collapse’ of ETS prices in spring 2006, with carbon prices at a much more inferior level than estimated. This was also due to inadequate and lacking capacity for registries and management of the auctioning process, inducing a lack of confidence from the market.

However, the period of 2005-07 was primarily considered as a pilot phase in order to test the concept of the EU ETS. No large reductions were thus expected from this first phase, whereas research indicates that some abatement actually was achieved. In addition, the EU ETS demonstrated some success as to pricing external costs into energy prices by effectively transmitting the carbon price signal, particularly in the electricity sector. The consequences for the industrial sector have been less clear (Skjærseth & Wettestad 2008).

In order to provide the possibility of treating emission quotas in relation to the national employment of the flexible mechanisms under the Kyoto Protocol, a second ETS-related directive was formulated. This supplemental ‘Linking Directive’, adopted in 2004, allowed the use of the other flexible mechanisms – Joint Implementation (JI) and Clean Development Mechanism (CDM) – as well as providing guidelines for the accounting of credits stemming from these mechanisms vis-à-vis the national allocations provided by the ETS. The Directive also sets limitations and criteria for the use of CDM and JI (OJEU 2004b).

The second phase of the EU ETS, 2008-12, corresponds with the period of commitments from the Kyoto Protocol. Similar principles and arrangements as for the first phase apply for the current period. The current scheme thus covers around 45 percent of the total CO₂-emissions from EU-25 (equiv. to 2.2 Gt CO₂). 5

As part of the climate-energy package put forward by the Commission, there was a Directive on the future outline of the EU ETS for the post-Kyoto period. The Directive 2009/29/EC stipulates the framework of the emission trading system for the period 2013-20, implying a stricter framework than what has been the case during the first and second phases (OJEU 2009b). Most notably, more sectors and gases will be included (50 percent of total EU GHG emissions) in the

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5 The industrial activities covered by the ETS include: Electric power, oil refineries, coke ovens, metal ore and steel, cement kilns, lime, glass, ceramics, paper and pulp.
'third phase' (ibid.). One of the most controversial sectors which is to be included already from 2012 is the aviation sector. Furthermore, the EU Commission will from 2013 allocate the quotas directly, in stead of delegating this to the national authorities. According to the Directive, the sectors covered by the ETS are to reduce GHG emissions with 21 percent compared to 2005, whereas the non-ETS sectors are to reduce their GHG emissions with 10 percent (ibid.). These commitments will contribute to reach the overall EU objective of 20 percent GHG emission reduction by 2020. The different sectors’ differentiated commitments are based on the assumption that the most cost-effective reductions will result from the ETS.

3.1.1 Experiences from the follow-up of the ETS

As the EU ETS in its first phases (2005-07, and 2008-12) was basically designed to be a decentralised system one has thus far also observed varying degrees of implementation (Skjærseth & Wettestad 2008: 159-180). Significant variation in domestic implementation points towards different national circumstances and domestic-level explanations (ibid.). In general, one can distinguish between frontrunner countries, reluctant ones, improving-laggards and laggards (ibid.).

The UK has been considered a front-runner mainly due to a ‘political fit’ between the market-based approach implied by the ETS and the country’s more general market-orientation towards environmental policy (Skjærseth & Wettestad 2008: 161).

Germany has been considered as more reluctant (Skjærseth & Wettestad 2008: 163-165). The country set out with clearly low ambitions as to the national allocation. This is quite surprising given the country’s traditional image as a front-runner in environmental politics. Although Germany also has been profiled as a country with very favourable conditions for the production of renewable energy, the country has been less ambitious within the context of the ETS. This is probably due to the fact that Germany at the time of the formulation and adoption of the EU ETS already was on track to over-fulfil its Kyoto commitment, not least because of the economic re-structuring after the reunification (from 1990 onwards).

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6 In addition to CO₂, the greenhouse gases to be covered from 2013 are (in concordance with the gases covered by the UNFCCC): Laughing gas (N₂O), methane (CH₄), hydrofluorocarbons (HFC), nitrous oxide, perfluorocarbons (PFC), sulphur hexafluoride (SF₆). Air transport and airlines will join the ETS from 2012, whereas the following sectors will be included from 2013: Petrochemicals, ammonia and aluminium industries.

7 International efforts to reduce GHG emissions from aviation have thus far not resulted in any global agreement. The sector currently accounts for 3 percent of total EU GHG gas emissions, and increased by 73 percent between 1990 and 2003. Should this growth continue, aviation will constitute one of the main emitters in the near future. The first strategy to address this challenge was the initiative to create a “Single European Sky”, proposed in 1999, which aimed at reforming the Air Traffic Management System. Regulations adopted in 2004 did not, however, deliver results as expected. In 2005 the Commission put forward a policy document (communication), entitled "Reducing the Climate Change Impact of Aviation", proposing the sector’s inclusion in the EU ETS as the most effective measure to reduce GHG emissions. This proposal was then followed up in the second legislative package under the “Single European Sky” shortly after: http://www.euractiv.com/en/transport/single-european-sky-greener-air-travel/article-173593
Spain was initially very delayed with its first national allocation plan, but has since proved to fulfill its ETS cap, and its second allocation plan was one of few that was accepted by the Commission at the first attempt (Skjærseth & Wettestad 2008: 166). Despite this seemingly good performance, one has observed that the Spanish implementation of ETS took place within a national context characterised by little experience with economic policy instruments for the environment. The country has also been considered as a “laggard” as to the lack of a national climate policy strategy. The shift of approach from the NAP I process to the NAP II is mainly explained by the change of government in 2004. The new socialist government intended to let Spain undertake a more offensive role in climate-change policies, both within the EU – as well as in terms of a broader national policy strategy and implementation.

Poland is considered to be among the “laggards” of the ETS implementation thus far (Skjærseth & Wettestad 2008: 167). This is not least due to lacking institutional capacity and a meagre tradition for environmental regulation (ibid.).

3.2 Renewable Energy (RES)

The EU Directive on the promotion of renewable energy (RES) was finally adopted in December 2008. The main objective of the Directive is to contribute to the overall target of 20 percent RES in the EU-27 by 2020 (8.5 percent in 2005 as baseline), as part of net energy consumption (stationary and transport). This includes a specific target on 10 percent renewable fuels for transport. Whereas the Member States are differently committed to the overall 20 percent target, and are free to stimulate electricity and heating, respectively, all Member States must achieve a 10 percent share of renewable fuels for transport.

The RES Directive is operational from 2009, and the Member States were obliged to present national action plans before 30 June 2010 (OJEU 2009a). However, several Member States postponed their communication of such plans, and by 30 June only two countries had respected the deadline (Denmark and the Netherlands). By October 2010, 6 national action plans are still missing. Building on the Member States’ own assessments and projections, the current and future status for RES in the EU emerge in a more concrete manner than before.

3.2.1 Renewable stationary energy

The new RES Directive replaces and extends the former Directive on the promotion of electricity from renewable sources (RES-E, adopted in 2001). The RES-E Directive aimed at obtaining 21 percent RES-E of total electricity consumption in EU-27 by 2010 (OJEC 2001). The RES-E directive was evaluated in 2005 and 2006, whereby the Commission concluded that the overall indicative target would not be fulfilled as a consequence of insufficient national follow-up measures. Furthermore, the Commission concluded that it was not conceivable with a common

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8 Belgium, Estonia, Hungary, Latvia, Poland and Slovakia (see the EU Commission, DG TREN’s website on the national action plans for renewable energy: http://ec.europa.eu/energy/renewables/transparency_platform/action_plan_en.htm).
EU-wide promotional scheme for RES-E, as initially proposed (CEC 2005; CEC 2007c; Rowlands 2005; Lafferty & Ruud 2008). The Commission, therefore, omitted any references to a common promotional scheme in its proposal for a new RES Directive.

The RES Directive contains more ambitious national targets compared to those of the RES-E Directive – which are, moreover, binding, whereas the former targets of the RES-E directive were only indicative. However, the compromise reads that there will be interim national targets in the run-up to 2020, and that governments missing their binding 2020 target will not automatically face financial sanctions (OJEU 2009a). The Directive will be reviewed in 2014. Whereas the wording makes clear that no changes should be made vis-à-vis the national targets, this condition is somewhat symbolic, since the Commission has the power to review any EU legislation and propose changes at any time (ENDS Europe Daily 2008d).

The issuance and use of Guarantees of Origin (GO) is stipulated as a major way to certify RES production. A new practice has, however, been introduced with the RES Directive: Member States that expect to over-fulfil their national targets have the opportunity to transfer RES production to Member States assumed not to comply with the target by own resources.

A GO enables a producer of renewable-source energy to prove that the energy being sold originates from a renewable source. In particular, a GO should guarantee that the origin of electricity produced from renewable energy sources can be guaranteed as such within the meaning of RES-Directive. Guarantees of origin are issued in accordance with the RES Directive (as well as in line with the former RES-E Directive).

Stronger requirements concerning the phase-in of new RES production – not least through facilitating grid access is also underlined by the new RES Directive. The Member States are required more forcefully than before to take the necessary steps to develop and adopt transmission and distribution infrastructure (‘shall’ in stead of ‘should’ as in the RES-E directive) (OJEU 2009a).

Furthermore, the new RES Directive also encourages the Member States to cooperate on joint RES projects as well as engaging in common support schemes – as, for example, common schemes of tradable RES certificates. The project of a possible common Norwegian-Swedish RES-E certificate market is profiled as an important example in this regard. The Commission has, however, ceased to stipulate any plans of a common EU RES support scheme.

Moreover, apart from the more committing and stricter national targets, the new RES Directive mainly consolidates the principle of national sovereignty in questions pertaining to what technology to stimulate, as well as on the selection of related incentives to promote renewables.
3.2.2 Renewable fuels for transport

As mentioned above all Member States must achieve a 10 percent share of renewable fuels for transport by 2020. The transport sector is one of the major and fastest growing emitters of GHG. Measures to reduce emissions through energy-efficiency had been around for several years, but the use of biofuels is a more recent initiative. A first proposal for the use of biofuels in the transport sector was introduced in the 2000 Green Paper “Towards a European strategy for the security of energy supply” (CEC 2000). The proposal aimed at the share of biofuels to 20 percent of fuel consumption by 2020 brought forward in Biofuel Directives in 2003 (OJEU 2003a). Much discussion and controversy around the use and production of biofuels reduced the ambition in the Directive adopted in 2009 (amending the Biofuel Directive from 2003) giving the Member States a binding target of 10 percent share of energy from renewable sources in all forms of transport in 2020 (OEUJ 2009a).

In addition to the RES Directive, the Transport Fuel Quality Directive stipulates provisions as to the fuel quality, including certain technical requirements in order to enable higher proportions of biofuels (OJEU 2009c). The first version of this Directive was adopted already in 1998 with the aim of reducing pollutant emissions from motor vehicles in general. It was revised in 2009 after a proposal in the Commission’s new strategy to reduce GHG emission from new passenger cars in 2007 and is one of the six new legal acts composing the Climate and Energy Package. The Directive also requires fuel suppliers to report and reduce life-cycle GHG emissions by minimum 6 percent between 2011 and 2020 (ibid.).
The EU decision-making system in operation:  
The case of the RES Directive

1. **March 2006:** The Commission puts forward a *Green Paper* on *A European Strategy for Sustainable, Competitive and Secure Energy*: Identifies the need for reinforced priority of RES.

2. **Jan. 2007:** The Commission presents a White Paper (Communication) on an energy policy for Europe, including RES. Here the 20 percent target for RES by 2020 is introduced.

3. **March 2007:** The European Council endorses the 20/20/20 percent-targets by 2020.

4. **March 2007 onwards:** Consultation processes provide inputs to the further policy formulation, led by the Commission. Lobbying from various interests occurred.

5. **Jan. 2008:** The Commission presents the Climate-energy package with a number of legislative and other initiatives (see above), including a proposal for an RES Directive. The Commission’s proposal for an RES Directive is handed over to the European Parliament and the Council of the EU.

6. **Jan. 2008 onwards:** The *European Parliament* (EP) has close contacts with lobbyists and governmental representatives from Germany and Spain. This induced substantial changes to the Commission’s proposal; both on guaranteeing the maintenance of national support schemes, and the importance of feed-in based approaches; and on the formulation of the sustainability criteria for biofuels. At the same time opting for strong commitments and regular checks from the Commission; the development of the template for national action plans.

7. **Feb. 2008 onwards:** The *Council of the EU* is characterised by different national positions on what policy instrument to choose in promoting RES: In particular a divergence between tradable green certificates (TGC) and feed-in tariffs; reflecting a divergence between market-orientation and technology-specific approaches.

8. **Dec. 2008:** The RES Directive is adopted by the Council and the EP, during the first reading of the co-decision, but including intense negotiations between representatives from both institutions.

9. **5 June 2009:** The RES Directive is published in Official Journal, as Directive 2009/28/EC. The technology-specific approach prevails and no there is no objective of a common EU certificate scheme.

10. The RES Directive requires that national authorities implement the content of the Directive, before **5 Dec. 2010**, as well as submission of national action plans before **30 June 2010**.


**Text box 3:** An illustration of the decision-making system of EU in practice by the case of the adoption and the follow-up of the RES Directive in 2006-10. See also Text box 1 in section 2.2 for a general overview of the EU institutions and their roles.

### 3.2.3 Experiences from the RES-E Directive

When dealing with the challenging implementation of the RES-Directive, EU decision-makers can reflect upon and learn from the follow-up of the former RES-E Directive. As highlighted above, this Directive was adopted in 2001 and established a common indicative target demanding a 21 percent renewable share of total electricity consumption in the EU by 2010. Hence, the RES-E Directive only regulated stationary electricity production and usage, and was not relevant for...
the transport sector. Accordingly the Member States were only assigned indicative national targets.

The RES-E Directive also stipulated that Member States had to provide better grid access for renewable energy generators; streamline and facilitate authorisation procedures; and establish a system of guarantees of origin. The EU Member States were, however, free to choose their preferred support mechanisms in order to achieve the targets, and could continue to do so for a transitional period of at least seven years, after which a new EU-wide regulatory framework would be adopted.

In December 2005 the Commission presented a review of the follow-up of the Directive. In particular, there is an assessment of the Member State’s various policies to fulfil the RES-E targets (CEC 2005). The Commission here points to the variation in national support schemes and concludes that a common EU scheme was not yet feasible. The Commission viewed, however, the variation as a positive learning experience, considering competition among the different schemes conducive for promoting a greater variety of solutions and benefits (ibid.). It was also pointed out that it was still too early to compare the advantages and disadvantages of well-established support mechanisms with other systems having a shorter history (ibid.).

The variety of support schemes in the Member States can be explained by the combined effects of: differing energy resources; differing market structures related to distribution and infrastructure; differing technology options and considerations; and differing policy and governance structures (Lafferty and Ruud 2008).

These very substantive divergences have represented general obstacles to the establishment of a common EU framework for renewable energy. For example, the EU has since the 1990’s introduced measures in order to establish a common, internal energy market – first and foremost related to electricity and natural gas. These efforts have lead to some common guidelines on a possible unbundling of energy production and distribution and increased transparency related to end prices and productions costs.

Regarding policy measures affecting the actual energy mix of the Member States, however, there are no common guidelines or common EU policy approach. The foremost examples are the targets on RES in general and RES-E in 2010. What kind of renewables the Member States decide to promote is still an issue to be decided at the national level.

The actual energy mix, including the RES-E mix, on the national level is thus the product of market and resource conditions, as well as the overall national energy policy and the institutional and structural factors related to RES-E promotion.

This can be illustrated by wind power, one of the most prevalent technologies across the differing national contexts. In general, land-based wind power constitutes a more mature technological option than off-shore wind power. The relationship between wind power and support systems has been summarised by the Commission in the above-mentioned communication. This assessment
indicates that green certificate systems in general provide a higher support level than feed-in tariffs. However, the most effective support systems for wind energy are considered to be feed-in tariffs, such as those in place in Denmark, Germany and Spain.

The question thus arises as to whether economic support schemes provide a sufficient explanation for why some countries (e.g. Denmark and Germany) have significantly higher and more expansive shares of wind power than other EU Member States. Unfortunately, the evaluations carried out by the Commission do not provide a comprehensive or consistent answer to this (Lafferty and Ruud 2008). Some answers have, however, been suggested. These include: administrative barriers related to lead times for construction and production licenses; the variation in management of the central and regional grids and access to the grid; and national and regional market structures. As indicated above, all of these issues are related to differing national contexts and energy histories (that is, ‘path dependency’) (ibid.).

In particular, the follow-up of the RES-E Directive demonstrates the importance of different national energy systems and contexts, substantially conditioning the promotion of RES-E (Lafferty and Ruud 2008). Furthermore, the RES-E promotion at the national level demonstrates the importance of political commitments to stable, long-term and technology-differentiated measures. Such measures should complement and support more market-based mechanisms for RES technology development and phase-in. Analyses also demonstrate, moreover, the necessity of taking the relevant social and political contexts sufficiently into consideration. This includes economic structures and interests, as well as the relevant institutional framework and conditions for public steering of the sector. Such a focus emerges as a decisive factor in the explanation of national variations in effective RES-E implementation (ibid.).

### 3.3 Carbon Capture and Storage (CCS)

Carbon Capture and Storage (CCS) has emerged on the EU agenda gradually over the last decade. The issue has been controversial, and there have been substantial and hard discussions within the Commission, the Parliament – as well as between the Member States (ENDS Europe Daily 2008a, 2008c, 2008e). The critics, on the one hand, were concerned that the large financial allocations need for CCS would have negative consequences for renewable energy investments (ibid.). On the other hand, the critics were concerned about the safety related to the storage of CO₂ (ibid.). Nonetheless, the proponents of CCS succeeded in convincing the EU Commission to include a legal proposal in its Climate and energy package of 2008. The Directive addresses environmental and safety aspects, as well as issues related to the deployment of the technology. A public consultation took place in the course of the assessment of the proposal for a Directive. Recurrent issues in the discussion was the amount of funding to provide for CCS projects, the modalities of the financing, as well as the extent to which there was to be an obligation of installing CCS facilities for new power plants.

The EU Directive on Carbon Capture and Geological Storage (Directive 2009/31/EC) was finally adopted in December 2008, along with the other legislative acts composing the EU climate and energy package. The final compromise reads that ‘stored emissions’ provided by CCS will be
treated as though they were not emitted. They are, therefore, exempted from the EU ETS, and CCS plant operators are avoiding the cost of buying carbon allowances. On the other hand, in the event of leakage operators will have to buy ETS allowances to cover escaped carbon dioxide.

New combustion plants with a capacity of at least 300 MW will, according to the Directive, have to include sufficient space for the installation of CCS equipment (OJEU 2009d). Plant operators will also have to assess the availability of suitable storage sites and transport facilities, and the technical feasibility of retrofitting for carbon capture at existing sites. There will be a concession system for permitting exploration of storage sites, as well as a permitting system for emission storage operations. The storage permits will fix the amount of carbon to be stored, monitoring conditions, corrective measures in the case of leakage, and conditions for closing the storage field. The Commission is entitled to be responsible for the issuance of these permits (ibid.).

Furthermore, the text of the Directive spells out detailed requirements for a review in 2015 which will also assess whether it is needed ‘to establish mandatory emission performance standards for new power plants’ (OJEU 2009d: Art. 38). The European Parliament’s rapporteur on the Directive, MEP Chris Davies's (ALDE-Liberal), proposed to cap the emissions of large power plants at 500 grams of CO2 per kilowatt hour from 2015. This proposal was, however, rejected by the Council during the final negotiations on the Directive (ENDS Europe Daily 2008b).

At a global level, the EU is actively engaging in discussions on the role of CCS, not least within the context of the UN Framework Convention on Climate Change, and the Kyoto protocol. The EU is also working directly with third countries (i.e. Norway) in these matters. The EU is also actively promoting CCS research – both to find measures for a swifter commercialisation of the technology, and investigation related to the environmental risks.

Finally, the EU is encouraging and funding a network of demonstration plants across Europe and in key third countries. In the EU, the funding has been a central part of the Recovery Plan after the financial crisis in 2008-09. CCS projects were prioritised in the first round of allocating almost 4 billion Euros set aside by the EU in May 2009 for energy projects to support economic recovery. A list of eligible energy projects to receive EU funding was presented in spring 2009. The list was finally adopted by the EU institutions (EP and the Council) in the autumn 2009. The list included both projects on fossil energy sources (gas infrastructure and CCS) and renewables. Infrastructure projects and transnational grids, as well as off-shore wind power projects were prioritised. Approximately 2.4 billion euros were allocated for CCS projects, whereas 565 million Euros were earmarked for wind power.

### 3.3.1 Further implementation of CCS: From demonstration to deployment

Due to the fact that there are still not any EU-funded CCS facilities in place, and given the relatively limited experiences with relevant policies at the national level, it is at this stage difficult to pinpoint the main challenges of the implementation of an EU framework. A number of issues stand out, however, as particularly critical dimensions for the further follow-up of the EU Directive and adjacent policies (c.f. Claes & Frisvold 2009: 232-233):
• A robust legal framework for the transport and safe geological storage of CO₂. The Directive on Geological storage is now awaiting transposition into national law. This codification constitutes the crucial first step in the implementation process.

• A funding scheme to close the cost gap in building and operating an EU CCS demonstration programme. There will be two schemes available for this purpose. One, the disbursement of incomes (EUAs) from the EU ETS, which is expected to provide 9-15 billion euros. Second, funding is provided through the Economic Recovery Plan. Yet critics claim that the schemes are insufficient to fund the needed number of pilot projects.

• A mechanism to allow for wide deployment of CCS once the demonstration programme has been built and completed. This implies the need for much more substantial funding than for the pilot projects. No framework is, however, yet formulated as to accommodate these costs.

• An open and transparent dialogue with civil society in order to gain acceptance for CCS. Although building on general provisions on environmentally relevant information to the wider public, the EU Directive does not stipulate concrete measures regarding how to ensure public acceptance of CCS facilities. This dimension will most likely induce a number of challenges when full scale CCS projects are to be sited and constructed.

3.4 Energy Efficiency

Although energy efficiency is not included as a concrete part of the 2008 Climate and energy package’s proposals for legislation, the target of cutting the annual consumption of primary energy by 20 percent by 2020 figures prominently as of one the three 20-20-20 objectives adopted in 2007. This includes an indicative target of 9 percent more energy efficiency by 2016, as a contribution to the overall target of reducing GHG emissions by 20 percent by 2020. There are however, indicative targets for the Member States. Hence, in contrast to renewable energy, there is no forceful legal driver committing the Member States to more active policy measures in the area of energy efficiency.

Energy efficiency is nevertheless characterised by numerous legal acts. The 2006 Directive on energy end-use efficiency and energy services provides important overall guidelines, including provisions concerning the national indicative targets and the formulation of national action plans (OJEU 2006).

The reason why energy efficiency was not a part of the broader Climate and energy package can partly be explained by the parallel, and at the time, ongoing, process of formulating national action plans. In addition, energy efficiency was included in the Second Strategic Energy Review from November 2008 (CEC 2008b). Two initiatives concerning energy efficiency were however mentioned as important in the Climate and energy package, namely the Directive on clean and energy-efficient road transport vehicles and the regulation on CO₂ emission performance standards for new passenger cars, both aimed at the transport sector (OJEU 2009e, 2009f).
As mentioned in section 2.2, energy efficiency has been a main element in the EU’s climate policy since 1993, with the establishment of the research and technology development programme SAVE. In addition, energy efficiency is also crucial to the concerns of security of supply. Energy efficiency was an important item at the EU agenda in 2000, included in the *Green Paper on the security of energy supply* (CEC 2000). In this strategy, the EU Commission concluded that if no action was taken on energy savings, the EU was to increase its dependency on external energy sources by 20 percent (to 70) (ibid.). A new common action plan on energy efficiency was supposed to be put forward in November 2009, but the date has been extended, and the plan is now (October 2010) expected to appear in February 2011 (ENDS Europe Daily 2010h).

Most of the energy-efficiency measures are aiming at: (1) provide common information on different product; and (2) harmonizing standards. Especially concerning products these initiatives also contributes to the harmonisation considered as necessary to realise the internal market, as well as simplifying trade between the Member States. The measures aim at improving the information of products in order to influence the consumers to purchase more energy efficient products and services. Some measures also imply minimum standards for products, and are, therefore, somewhat more directly applicable vis-à-vis national policies than the provisions on information. Accordingly, the actual implementation of the standards often proves to be more challenging because it affects established national legislation and practices as well as different industrial interests.

Apart from the different directives and regulations aimed at improving energy efficiency there are also several programmes, agreements and information campaigns promoted at the EU-level, but these initiatives are not considered here.

### 3.4.1 Information-related measures

The *Energy Labelling Directive* is one of the oldest and most extensive directives on energy products adopted as early as in 1992 (OJEC 1992). Back then the Directive was one of many measures under the program SAVE. The Directive seeks to harmonize national information measures on the consumption of energy and other resources and therefore requires labelling and the appliances’ level of performance in question. In 2005 the *Eco-design Directive* was adopted aiming at reducing the environmental impact of products throughout their entire life cycle. It includes specific measurement for all energy-using products placed on the market (OJEU 2005). The Eco-design Directive was amended in 2008 (OJEU 2008b).

Moreover, both the Labelling and Eco-Design directives are framework directives which mean the act itself does not put any restrictions or requirements on the Member States, but instead provides a legislative framework into which other directives can be introduced. This has somewhat made them easier to implement and step by step integrate more and more products under the ‘umbrella’. The last revision of the Labelling Directive was made in 2003, but a recast was adopted in 2010 in connection with the revised Eco-Design Directive (OJEU 2010a). This was related to the
Sustainable Consumption and Production and Sustainable Industrial Policy Action Plan\textsuperscript{9}. The recast broadened the scope of both directives to cover other energy related products than just household appliances.

Transport is one of the important sectors the Labelling Directive now covers. The Car Labelling Directive was, however, already adopted in 1999 in order to ensure that the consumer has access to information on fuel economy and CO\(_2\) emissions related to new passenger cars (OJEC 1999). The Directive also ensures the monitoring of the regulation of CO\(_2\) standards on new passenger cars by requiring information on the extent to which the specific emissions of CO\(_2\) of the passenger car offered for sale differ from the specific emission target for that passenger car (ibid.). A regulation for tyre labelling has also recently been adopted (OJEU 2009g). The regulation aims at promoting energy-efficient tyres through labelling tyres with respect to fuel efficiency and other essential parameters (ibid.).

In the Climate and energy package a Directive on clean and energy-efficient road transport vehicles was adopted aiming at promoting and developing a market for clean vehicles (OJEU 2009e). The Directive is first of all aimed at the consumers in the public sphere and requires them to take into account the impact of these vehicles during their operational lifetime in terms of energy consumption, CO\(_2\) emissions and other pollutant emissions (ibid.).

The last measure that will be mentioned under this section is the Co-generation Directive. Although the directive started off with high ambitions in 1997 when the Member States endorsed the proposed target of 18 percent cogeneration by 2010, the target is now outdated and the Directive is limited with a call to the Member States to carry out analyses of their potential for high efficiency cogeneration (OJEU 2004a). The Directive is therefore only relevant for harmonization of information and does not include any further requirements with effect for national policies. Co-generation is however an important element of the concerns of both security of supply and the environment, by its potential to reduce the energy consumption in heat and electricity production. The Directive aims at establishing a transparent common framework to promote and facilitate the installation of cogeneration plants, but has proved to be difficult to implement (ibid.).

3.4.2 Harmonization of minimum standards

A prominent example of legislation including harmonisation of more substantial standards for products is the Directive on the Energy Performance of Buildings, adopted in 2002 (OJEC 2002). The directive aims at improving the energy performance of buildings through minimum requirements for energy performance of new and existing buildings, and a certification scheme for the energy performance of buildings (ibid.). A recast of the Directive was adopted in 2010 strengthening the requirements for energy performance (OJEU 2010b). The implementation of the former version of the Directive has met several obstacles due to the highly different contexts.

\textsuperscript{9} http://europa.eu/legislation_summaries/enterprise/interaction_with_other_policies/l32037_en.htm
across the Member States. The program Build-up has been established to help Member States implementing the Directive.

For the transport sector, there is a new Regulation of CO₂ emission performance standards for new passenger cars, which is closely linked to the Car Labelling Directive (OJEU 2009f). The latter Directive represents the main instrument in the Community’s new strategy to reduce GHG emissions from new passenger cars under the framework of the European Climate Change Programme and one of the new legal acts in the Climate and energy package. The regulation originates from the strategy to reduce CO₂ emissions from cars (120g/km by 2012) in 1995 and the voluntary agreement with the car industry to cut emissions. The carmakers agreed to reduce average emissions from new vehicles by 25 percent between 1995 and 2008-2009 (from 186 g CO₂/km in 1995 to 140 g CO₂/km in 2008-2009). ¹⁰

The voluntary agreement with the car manufacturers was considered to be insufficient for the fulfilment of the EU target, and a more mandatory approach was therefore suggested. Hence, the regulation of CO₂ emission performance standards for new passenger cars was adopted. The objective of the Regulation is that the fleet average to be achieved by all cars registered in the EU is 130 grams per kilometre (limit value curve allows variation among the cars) by 2015. The A target of 95g/km is specified for 2020. ¹¹ A similar legislation is also adopted for light commercial vehicles with a target of 135g/km by 2020. Today’s emissions are 160g/km. From 2012 manufacturers who do not meet their targets must pay an ‘excess emissions premium’.

3.4.3 Experiences from the national implementation of energy efficiency

The EU Member States were committed to officially document and notify the Commission on their national action plans for energy efficiency before 30 June 2007. These plans were assessed by the Commission in 2007/08 (CEC 2008a). Only 17 Member States managed, however, to post notification within the deadline. The Commission presented a preliminary overview of the submitted national strategies and plans in early 2008. This was not, however, a standardized evaluation. The main focus was on the efforts related to the public sector and the information instruments.

Based on the action plans, the Commission concludes that only some Member States had embraced the opportunity of letting the public sector play an exemplary role. Several Member States signalled that they would comply with the provisions of the Directive, but did not clearly describe how (CEC 2008a: 7). Furthermore, most Member States indicated that they would advocate energy efficiency via general information campaigns and/or targeted efforts linked to incentive schemes (ibid.).

The Commission further concluded that the Member States expressed uncertainty as to which measures should/could be employed to meet the goals and ambitions of the directive, and that

¹⁰ [http://ec.europa.eu/environment/air/transport/co2/co2_agreements.htm]
¹¹ [http://ec.europa.eu/environment/air/transport/co2/co2_home.htm]
most Member States presented a ‘business-as-usual’ approach regarding specific policy measures (ibid: 11).

3.5 State aid rules

An important component for the phase-in of larger shares of RES, as well as other technologies with climate-change mitigation potential, is the possibility of providing public, financial support. The EU regulates the amount of public funding, as this is considered to represent potential distortions of the competition. The EU’s Guidelines for state aid for environmental protection set the specific rules and regulations regarding environmental state aid in the EU Member States and the EEA countries. The guidelines are revised every six or seven years, and new guidelines were published on 1 April 2008, following a reform process of roughly two years (OJEU 2008a). The state aid guidelines contain provisions on a wide series of issues, including renewable energy, cogeneration and district heating (heat distribution from a centralized location to multiple recipients).

EU environmental state aid policies have important and sometimes contentious implications. They regulate in detail how much an EU Member State can give in terms of environmental subsidies, as well as to what projects and on what conditions such subsidies can be provided. In practice, they can determine which type of domestic environmental policies can be implemented, and which cannot; they can determine which types of energy technologies should be subsidised, and which should not (Flåm 2008). On this background, the EU conducted an amendment of the State aid rules, in parallel with the decision-making of the EU Climate and energy package in 2008.

The 2008 version of the State aid guidelines allow public funding to cover as much as 100 percent of the extra investment costs entailed in a renewable energy project, a cogeneration- or a district heating installation (OJEU 2008a: 19-21). This is a considerable ‘upgrading’ from the previous guidelines. These set the aid limit at only 40-60 percent on renewable energy and cogeneration, and they did not even mention aid for district heating (OJEU 2001). In short, then, the new state aid guidelines have been rendered both broader and more generous – they leave Member States with a freer hand to subsidise ‘green’ energy production, including innovation projects (Flåm 2008).

This is due to widely acknowledged challenge of providing sufficient funding for energy and climate projects, as has also been substantially addressed through other policy processes, not least by the debate on the CCS Directive (see above). The revised guidelines have already resulted in new activities in the Member States. In March 2010, Austria and France received the Commission’s approval for state subsidies of second-generation biofuel project (France), and a combined heat and power (CHP) plant (Austria) respectively (ENDS Europe Daily 2010f).

On the other side, state aid rules also allow Member States to provide subsidies for fossil energy production: In September 2010 Spain was allowed by the EU Commission to subsidise its coal-based energy production, accompanied by strong protests from environmental NGOs (ENDS Europe Daily 2010c) The State aid rules allow the Member States to subsidise power production
from non-renewable sources to ensure security of supply; if the supply from the source in concern is below 15 percent of total, national electricity use.

3.6 Summary

<table>
<thead>
<tr>
<th>Policy Area</th>
<th>Relevant strategic documents</th>
<th>Major current legislation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ETS Directive 2009 (Dir. 2009/29/EC)</td>
</tr>
<tr>
<td></td>
<td>Energy recovery programme (2009)</td>
<td></td>
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<td>Energy recovery programme (2009)</td>
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<td></td>
<td></td>
<td>Labelling Directive (Dir. 2010/30/EU)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eco-design Directive (Dir. 2005/32/EC)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Energy end-use efficiency and energy services (Dir. 2006/32/EC and Dir. 2008/28/EC)</td>
</tr>
</tbody>
</table>

Table 1: Summary of the main, current energy policy and regulatory instruments with climate-relevance.

The above assessment of the main components of the Climate and energy package, as summarised in Table 1, demonstrates that there is an array of different legislative acts pertaining to both energy production and usage (and – to a much more limited degree – distribution). Drawn together these policy instruments have the potential to provide substantial reduction in GHG emissions within the EU. A major challenge is, however, that the various acts and policy measures are connected to different processes and different historical trajectories, making an overall coordination challenging. In particular, there are important differences vis à vis the ‘all-encompassing’ character of the RES Directive as compared to the multitude of different legal acts
for energy efficiency. This difference also affects the potential for follow-up at both the EU and national levels.

An additional challenge is thus to ensure a consistent and effective follow-up and implementation at the national level. As illustrated by the cases of the EU ETS and RES Directives above, there are substantial challenges in coordinating the efforts of 27 Member States, given the very different points of departure and national circumstances that will affect the eventual success of the various EU directives. In section 4 below, we further illustrate the challenges, as well as the importance of national contexts in the follow-up of EU policies as illustrated by Denmark and Norway.

Another challenging aspect of the EU's climate-energy strategy is the need to integrate the 'package' into the overall energy policy, thereby ensuring that the European energy sector as such actually contributes to climate-change mitigation. An important question to be raised in this context is to what extent the promotion of renewable energy, primarily through the RES directive, and the various measures for more efficient energy usage, are coordinated. RES and energy efficiency can represent complementary approaches for inducing a transition to a less carbon-inclined energy system, where, optimally, one should identify effective ways of combining the two.

There have not thus far been formulated guidelines or a methodology to monitor the net effects on the EU level of policies on GHG emissions. Hence there are currently no procedures in place with the objective of documenting the extent to which new RES production actually replaces fossil fuel-based energy production. It is thus challenging to document how new renewable energy production is coordinated toward an overall reduction in energy consumption within the EU as a whole.

Finally, and related to the challenges described above, it is clearly a very demanding task to further integrate the Climate and energy package into other energy-relevant, and overlapping, EU processes. We elaborate on this crucial question of horizontal governance in section 5 below.
4 THE VERTICAL DIMENSION OF EU POLICIES: THE CHALLENGE OF NATIONAL FOLLOW-UP

We will in this section briefly outline the efforts taken at the national level in Denmark and Norway in order to follow up the EU’s policy initiatives. This can be considered to represent cases of the vertical governance dimension, here exemplified by the climate-energy legislation presented in section 3. The national follow-up is a critical test for the net effect of the EU’s climate-relevant policies, since renewable energy, energy efficiency, transport and CCS all represent issues where the Member States must ground the decisions decided at the EU-level.

At this stage of the project, we have decided to illustrate the ‘vertical challenge’ with Denmark and Norway, because they represent two quite comparable countries in terms of population size and political-administrative structures (unitary, not federal states). At the same time, the two countries differ substantially when it comes to the overall mix of the energy supply.

The common guidelines and the Member States’ scope for action vary according to the legal act in question, as focused in Text box 2. Furthermore, the follow-up at the national level is monitored by the Commission. Inadequate follow-up can also be sanctioned by the European Court of Justice (ECJ) which has the authority to pass judgements, *inter alia* as economic fines, vis-à-vis the Member States.

4.1 Denmark

Denmark’s commitment under the Kyoto Protocol is 21 percent reduction by 2008-12 as to the 1990 level. This is particularly challenging because of the transport sector, where the emissions have demonstrated an increasing trend the last two decades. The GHG emissions from Denmark were at 62.1 mill. tons CO₂ equivalents in 2009. The emissions have decreased by 19 percent since 1990 as far as energy is concerned (Energiestyrelsen 2010). For renewable energy, there has been a remarkable *increase*, since Denmark has moved from virtually zero in the mid-1970’s to 19.7 percent renewable energy of total energy use in 2009 (ibid.). The country’s production of wind power is now the world’s highest per capita (Klima- og energiministeriet 2010).

Denmark is the Scandinavian country most reliant on fossil sources for energy production, albeit having the lowest electricity consumption. The country is provided with an extensive infrastructure for district heating and a substantially lower proportion of energy-intensive industry compared to the other Scandinavian countries. Denmark’s total energy intensity is generally among the lowest of the EU countries (IEA 2006). Since 1980 the economy has grown with about 80 percent, whereas the energy consumption has remained relatively constant (Klima- og energiministeriet 2010).
4.1.1 Background

Since the 1990’s, Denmark’s climate mitigation policy has been substantially integrated with the country’s energy policy. Having been strongly affected by the oil shocks of the 1970’s, Denmark adopted a national energy policy plan aimed at a more diversified and domestically produced energy supply, strongly focused on renewable energy and energy efficiency. Nuclear energy was ruled out as a possible option by the end of the 1970’s, due to strong popular resistance.

As follow-up mechanisms of the ambitious energy plan, Danish politicians adopted a broad range of technology-differentiated incentives to promote renewables and energy efficiency – such as guaranteed prices and investment subsidies, in addition to funding of research and innovation (Karnøe & Buchhorn 2008, 86).

In 1990 the Danish parliament adopted, prior to the final outcome of the negotiations on the Kyoto Protocol, an objective of reducing Danish CO₂-emissions by 20 percent by 2005. The target determined the major direction of the energy plan adopted the same year (DEA 2000), and from this point onwards Danish energy policies have been intimately connected with the climate-change policy (Knudsen 2009).

As an ongoing premise for the continued existence and strength of this connection, there has been considerable ‘push’ and support from below. Denmark represents in this regard an interesting case where innovative actors from civil society, science and industry have interacted with national political visions and top-down, regulatory approaches (Garud & Karnøe 2003; Karnøe & Buchhorn 2008). In particular, the combination of local ownership and nationally set incentives has ensured stable popular support for wind power (Hvelpelund 2005, 88).

A specific Danish technology regime has been identified (Lafferty & Ruud 2008: 296). This regime has been characterised as ‘bricolage’, particularly referring to the process whereby increased shares of wind power, initiated locally, has been set in production, assisted by the central government as a pragmatic facilitator rather than as an active promoter of huge technological breakthroughs (Garud and Karøe 2003). Although the foundations for the Danish wind power’s success to a certain degree is local initiatives and small-scale industry, the Danish policy approach has stimulated the development of a strong renewable energy industry. In particular, the Danish company Vestas Wind Systems is the world’s leading wind-turbine producer, and one of Denmark’s largest industrial employers.

During the period 2001-2005, the centre-right government aimed at modifying the traditionally ambitious climate-energy strategy, and lowered the feed-in tariffs for RES. From 2005, however, the government, in agreement with the parliament, has gradually re-increased the feed-in tariffs. In 2007, Denmark’s re-elected centre-right government adopted a new objective of doubling the renewable share of primary energy use from 15 to 30 percent by 2025, with total energy use to remain at its present level (Ministry of Transport and Energy 2005). In 2007 a Ministry of Climate and Energy was established, strongly motivated by Denmark’s hosting of the negotiations on the Climate Convention and the Kyoto Protocol (COP 15) in Copenhagen in December 2009.
The comprehensive energy planning still constitutes, therefore, a basis for Danish climate and energy policy and its follow-up of EU policies. This is also substantially reflected in Denmark’s national action plan for the follow-up of the EU RES Directive, which will be further elaborated below.

4.1.2 Status

Given Denmark’s particular focus on the energy sector within a climate-change perspective, the country has been considered as an example for the rest of the EU in environmentally benign energy policies. The country has over-fulfilled its target of the former RES-E Directive (CEC 2005), as well as being commended for very good performance in energy efficiency (IEA 2006). Hence, Denmark also has a generally good record in the follow-up of the EU directives on energy efficiency.

Denmark can also display very strong figures and results related to innovation and research for renewable energy and energy efficiency, whereas CCS has not constituted a priority in terms of public funding.

Denmark’s national action plan for the follow-up of the EU RES Directive is based on the country’s national target of 30 percent RES by 2020, which represents an increase of more than 30 percent in ten years. Denmark has, however, recently adopted several policy reforms aiming at accelerating the production of RES, as well as reducing the energy consumption; that is, both the numerator and the denominator of the RES Directive’s fraction. These reforms are based on all-party, long-term agreements in the Parliament – which also are intended to commit future governmental constellations.

As far as the energy sector’s contribution to climate-change mitigation is concerned, Denmark thus demonstrates a successful follow-up. In the RES action plan, the Danish Climate and Energy Department specifically points at the potential by additional on- and off shore wind power, as well as the increased conversion of CHP plants from fossil fuels to bioenergy (Klima- og energiministeriet 2010).

Given Denmark’s particular challenges related to emissions from the transport sector, the action plan also provides a set of specific measures in this regard: The government’s action plan, termed “Green Transport”, from 2008 determined that the upward tendency of CO₂ emissions must be stopped (ibid: 5-6). The ensuing political agreement in the Parliament entails several initiatives intended to strengthen public transport, as well as increasing energy efficiency of existing vehicles (ibid.). The government has decided to extend the tax exemption for electric cars up to 2015 and is also preparing a greener vehicle tax (ibid.). Danish authorities have thus far had a limited focus on biofuels, particularly compared to the biofuels ‘enthusiasts’ in Germany and Sweden.
4.2 Norway

Norway’s commitment for the reduction of greenhouse gas emissions, based on the Kyoto Protocol, is to limit the emission growth to 1 percent above the 1990 level; that is, approx. 50 million tons of CO² equivalents. The target has been considered as challenging, particularly due to the transport sector and the petroleum extracting activities at the Norwegian Continental Shelf. However, the Norwegian GHG emissions in 2009 were at 50.8 million tons CO² equivalents, probably caused by reduced activities as a consequence of the financial crisis (SSB 2010). In 2009 the petroleum sector emitted 26.2 percent of total GHG emissions, whereas 19.5 percent stemmed from road traffic (ibid.).

The Norwegian GHG emission profile has traditionally been characterised by a domestic energy sector where hydropower dominates. Hydropower provides (in an ‘average year’) more than 90 percent of the country’s total electricity consumption. As of 2008 less than 1 percent was generated by wind power, and an even smaller proportion by biomass. The energy profile is further characterized by a high degree of electricity-based heating, and an industrial sector (aluminium and light metals) that uses nearly one third of the country’s electricity production.

Interestingly, while enjoying an almost completely fossil free power sector, Norway is among the world’s largest petroleum exporters, and Europe’s second largest natural gas supplier. This industrial sector constitutes the most important cornerstone of the national economy.

4.2.1 Background

Norway’s interaction with the EU is mainly regulated through the Agreement on the European Economic Area (EEA) (since 1994; together with Iceland and Liechtenstein). Through the EEA, Norway takes fully part in the EU’s internal market. Thereby, Norway has to follow up the major parts of the EU environmental and energy-related regulation. In particular, Norway is committed by the legislation on renewable energy and energy efficiency.

However, Norway is not part of the EU climate-change policy framework, and thus not committed by the common EU targets for 2008-12, and 2020. Norway is, nevertheless, taking part in the EU ETS from 2005, by linking its national system and following the overall EU guidelines.

Norway adopted (under Prime Minister Brundtland in 1989) a quite ambitious strategy for climate-change mitigation relatively early, as part of a comprehensive programme based on the major issues of the Brundtland report. Norway was also one of the first countries to adopt a carbon tax, in 1991. Norway was, therefore, in the early 1990’s generally considered to be an international front-runner (Lafferty et al. 2007).

During the 1990’s Norwegian ambitions and efforts were, however, gradually modified, until new targets emerged in 2007. The Norwegian Parliament then adopted a strategy with more ambitious national emission reductions; 30 percent by 2020, and 100 percent - ‘carbon neutrality’ - by 2030.
The use of the flexible mechanisms under the Kyoto Protocol or similar arrangements is to contribute with at least one third to the fulfilment.

A challenge for providing a shift in energy production and consumption patterns in Norway is the traditionally abundant supply from domestic, renewable sources – as well as relatively low prices for the end users. Nevertheless, changes will probably occur. Increasing electricity consumption, power exchanges within the ‘Nord Pool’ market, and a limited amount of ‘new’ RES-E production, have all led to increasing shares of imported non-renewable electricity. Moreover, the Parliament has decided that, in principle, construction of new large-scale hydropower is no longer an option (Knudsen et al. 2008).

A political challenge is the fact that Norway lacks a coherent policy-planning framework for the energy sector as a whole (in contrast to Denmark). While there is a planning system for the assessment and classification of the country’s hydropower resources which includes the designation of protected areas, no such procedures have thus far been developed for other renewables. In particular, wind-power projects suffer in Norway from complex and time-consuming licensing processes (Knudsen et al. 2008, 266).

4.2.2 Status

The EU RES Directive is still not formally adopted by Norway, although it has been clarified that Norway is committed and will have a national target. There are still ongoing negotiations between Norway and the EU. Due to its renewable resources (both hydropower and wind power), one expects that the EU will demand an ambitious national target for Norway. The actual time span before the Directive will become operational in Norway is, however, more open. If substantial amendments in existing national legislation must be undertaken, the process can take as much as 5-6 years (Ruud and Knudsen 2009: 18). It is, however, not likely that substantial legal amendments will be necessary. What is more critical is the extent to which and how Norwegian interests are assumed to be affected, and whether the Norwegian government will demand adaptations adjusting the Commission’s proposal for a national target (ibid.). However, it is not yet (October 2010) publicly known what target the Commission expects from Norway, neither what is considered as acceptable by the Norwegian government.

The Norwegian Minister of petroleum and energy, Mr. T. Riis-Johansen, initially signalled the ambition of completing the negotiations with the EU Commission in 2010, in order to present a Norwegian action plan by 30 June 2010, in line with the EU Member States’ deadline (Riis-Johansen 2009). This signal has since been modified by the Ministry, which now only refers to an ongoing dialogue with the Commission, without a stipulated end date. By October 2010, the Government has only indicated that a common position has been formulated by the countries of the European Free Trade Association (EFTA), a step necessary to initiate formal negotiations with the EU Commission within the framework of the EEA Agreement.

An Energy Fund was established in 2001 to provide grants for RES-E projects, and to promote renewable heating and energy efficiency (Knudsen et al. 2008, 259-61). This fund is still the main
instrument for reaching Norway’s targets of at least 3 TWh per year wind power production by 2010, in addition to 4 TWh from renewable heating. These targets have been extended to 2016, at which time there should have been realised a total change (both renewables and energy efficiency) equivalent to 30 TWh. Major efforts have been undertaken to establish a common scheme for tradable certificates for renewable electricity, with Sweden, but negotiations stranded in 2006 (Knudsen et al. 2008: 268-269). New efforts were undertaken in September 2009, and the Norwegian government aims at forwarding a related legislation for the Norwegian parliament before 2011. It is, however, highly uncertain whether a common Norwegian-Swedish scheme can be realised as long as Norway has not formally adopted the EU RES Directive and set a national RES target for 2020. At least, Swedish politicians have signalled very clearly that this would be a prerequisite for adopting a common scheme.

As far as energy efficiency is concerned, this has not traditionally constituted a crucial priority in Norway (Knudsen 2009). Symptomatically, the transposition of the EU Building Energy Directive was substantially delayed. It is formally implemented by 2010, whereas the initial deadline was by the end of 2008. The EU Building Directive is followed up by the Norwegian Directorate for Energy and Water Resources, whereas the promotion of energy efficiency, including the construction and building sector, is provided through economic incentives based on the national Energy Fund, which in turn is managed by the publicly owned company, Enova.

Since CCS is considered as an important national interest, related to the country’s largest industry, Norway was relatively active (as compared to other energy policy processes) in trying to convincing stakeholders within the EU of the importance of adopting the related Directive, in 2008/09 (Ruud and Knudsen 2009). The final outcome was considered as satisfying from Norwegian authorities’ point of view. In the aftermath, the planned Norwegian CCS projects have encountered substantial challenges, both economically and technologically – and are currently (October 2010) heavily delayed. Norway has not been eligible to receive additional funding for the CCS projects from the EU Energy Recovery Programme.

### 4.3 Summary

The cases of Denmark and Norway illustrate that the EU legislation does not provide explicit and strong guidelines as to how implementation at the national level should go forward. National circumstances are thus decisive for when and how the EU directives are transposed and brought into force. Even for two countries as similar in size, culture and historical experience as Denmark and Norway, differences in energy resources and management systems are strong enough to provide very different bases for phasing out non-renewable energy production; phasing in renewable-energy solutions; and/or increasing the overall effectiveness of energy systems (cf. Lafferty and Ruud 2008).
5 THE HORIZONTAL DIMENSION: THE CHALLENGE OF INTEGRATING POLICY EFFORTS ACROSS DIFFERENT DOMAINS

As emphasised in the previous sections, the climate-relevant EU energy policies are not formulated and operated in isolation. Nevertheless, as outlined in section 2, the EU represents a complex governance system implying substantial challenges for the follow-up of the Climate and energy package. This overall challenge can be associated with a horizontal governance dimension. Moreover, as explained in section 2.2, there are important formal differences as to mandates and decision-making principles, depending on the specific energy issue in question.

In the present section we reflect upon these challenges by discussing the importance of the overarching concerns of EU energy policy: environment, security of supply and competitiveness. These issues are frequently presented as overall concerns for the energy policy sector, both internationally and nationally.

Furthermore, in an EU context the issue of competitiveness is closely related to efforts to consolidate the internal energy market, in addition to safeguarding domestic energy and related employment. In this regard, the issues of innovation and research are also profiled as important strategic measures, as well as being important measures by themselves within the EU climate-energy strategy.

5.1 Climate vs. other environmental concerns

Whereas it is challenging to integrate the environmental dimension and provide a sufficient priority compared to the other concerns, the environmental dimension does not represent a coherent field in itself.

This is succinctly illustrated by the RES Directive, and the controversial case of promoting biofuels. This has been particularly related to the trade-off between food and energy, but there are also qualified doubts as to the net environmental effects of certain types of biofuels. Responding to this increasing critique, the Commission forwarded an additional proposal for sustainability criteria for biofuels in the RES Directive so as to avoid an unsustainable promotion of biofuels. A core focus of the co-decision process of the RES Directive was nevertheless the debate on biofuels and the related sustainability criteria (ENDS Europe Daily 2008d). This process has recently resulted in a proposal for a certification scheme for biofuels (ENDS Europe Daily 2010a).

Another example is the EU’s Water Framework Directive (WFD). The WFD aims at preserving and restoring the environmental status of water courses in Europe (OJEC 2000). This is to be fulfilled by regional river-basin management plans (ibid.). The follow-up of the Directive can potentially conflict with a more active promotion of hydropower, which represents an important means to achieve climate-change mitigation and renewable energy targets.
There is also an increasing interest for using hydropower as a ‘balancing measure’, through both storage and pumping, in order to supplement the intermittent energy provided by wind power. A more active usage of hydropower in this regard will potentially be in conflict with some of the targets set according to the WFD. These are targets that have emerged through regionally based processes focusing on the management of specific water courses.

The promotion of measures contributing to the abatement of GHG emissions, does not, therefore, necessarily lead to environmentally benign projects along the entire value chain. In particular, a strengthened priority for developing renewable energy in the EU can coincidentally imply increased pressure on land use and certain natural resources, thereby posing a challenge for biodiversity.

Both of these policy areas are related to the environmental domain under the EU Treaty, whereby ‘supranational’ decision-making (with qualified majority voting and co-decision) is possible. The RES Directive is, however, constrained by the lack of EU decision-making competence vis-à-vis the national energy mix. Hence, the EU can not rule out the further development of, for example, hydropower or biofuels, although new criteria for the assessment of what is ‘renewable’ within the context of the RES Directive can still emerge.

5.2 Security of supply

Security of energy supply has represented a key priority of the European Community since its inception in 1957; although the period 1960-90 was characterized by ‘nationalization’ of energy policies, with little common action. Later, in the 1980’s and 90’s, the establishment of the internal energy market was seen as a key provision for security of supply. Currently, energy security has been revitalised as a crucial concern for the EU, and is now addressed on a range of levels: from pursuing closer relations with external suppliers; to increasing international and internal interconnections; from reducing demand, to increasing domestic supplies within the Union (IEA 2008: 59).

The EU is dependent to varying degrees on energy imports of oil, gas and electricity. Individual Member States may be self-sufficient in one of these energy sources, or overall net exporters. The EU net imports have increased since 1990, and currently (by 2005) stand at 51 percent of total primary energy supply (IEA 2008: 59). The EU net energy import share is therefore considerably higher than that of all OECD countries, which averages 31 percent. This reflects the small number of net energy exporters among EU Member States (ibid.).

From 2000 onwards, energy security gained new topicality in EU energy policy, particularly due to fresh energy growth rates and the extension of the Union with new Member States. Massive electricity blackouts in Denmark, Sweden and Italy in 2002 and 2003 added to this focus, as well as the events in 2006 when Russia shut down its gas deliveries to Ukraine, with repercussions for several EU countries in Central and Eastern Europe (Eikeland 2008: 45). Furthermore, this situation led to a new scepticism towards further deregulation and development of the internal energy market. The security concern also consolidated the divergence between pro-market vs.
market-sceptical Member States (ibid.). And last, but not least, security of supply concerns have been actively employed as arguments for a more ambitious EU policy for renewable energy; as a way of ensuring a more diversified energy supply. Hence, security of supply constituted a major objective in the 2007 Action Plan for an EU Energy Policy (CEC 2007a).

In order to ensure security of supply, the EU has addressed the external dimension of its energy policy. This includes working through international agreements and bilateral dialogues with important energy producing non-EU countries (particularly petroleum and natural gas), including Algeria, Norway and Russia.

An important internal measure is the programme for Trans-European Networks-Energy (TEN-E): This is a funding mechanism for prioritised (grid) projects (electricity and natural gas) in the EU. TEN-E provides funding for important energy infrastructure, but is always complementary to the Member State financing. The total annual budget in 2010 amounted to EUR 21 million. In the electricity sector the primary aim of TEN-E is to establish additional internal interconnections to support trade of electricity within the EU. The trade is estimated to equal cross-border transmission capacity corresponding to at least 10 percent of installed generating capacity.

In the gas sector, the main aim of the TEN-E programme is to provide additional routes and access to more sources of gas, in order to increase the overall energy diversification within the EU. TEN-E gas projects can either be pipelines, LNG import terminals, or storage facilities. There are no priority projects for increasing internal interconnections aiming to further EU gas market integration. The main factor challenging a common EU approach to security of supply is, however, the fact that the Member States retain full sovereignty on decisions concerning the overall domestic energy mix; that is, which energy sources are to be provided, when and where.

The 2nd Energy Policy Review, put forward by the EU Commission in November 2008 (CEC 2008b), represents, however, an important recent effort of formulating a common, comprehensive EU strategy for energy security. In practice, the Review constitutes a package of proposals for regulation that can secure the European energy supply. It is intended to promote energy security in Europe; support the 20-20-20 climate-change proposals; build up energy solidarity among the Member States; and provide a new policy on energy networks to stimulate investment in more efficient, low-carbon energy networks.

The Commission proposes a new EU Energy Security and Solidarity Action Plan which sets out five areas where more action is needed to secure sustainable energy supplies. The Commission also looks at the challenges that Europe will face between 2020 and 2050. In addition, a package of energy efficiency proposals aims to make energy savings in key areas, such as reinforcing energy efficiency legislation for buildings and energy-using products, and enhancing the role of energy performance certificates as well as inspection reports for heating and air-conditioning systems. This Review stipulates reinforced action on security of supply and energy efficiency, as well as including an action plan for off-shore wind power (CEC 2008b).
Through these latter efforts, a more explicit linkage between the efforts for increased security of supply and climate-change mitigation has been established. At the same time, however, the importance of Member State sovereignty related to the energy mix prevails (as stipulated by the energy chapter of the Consolidated EU Treaty).

5.2.1 Nuclear energy

Nuclear energy is a non-fossil option increasingly addressed by decision-makers both nationally and at the EU level. According to certain actors, nuclear energy represents an established technology that can complement or, replace, renewable energy. These actors also argue that nuclear energy is more cost-efficient and represents a more stable, base-load technology (as opposed to wind power). The status and further prospect of nuclear energy constitutes, therefore, an important element in an overall assessment of the status of policies for security of supply, as well as for climate-change mitigation, within the EU.

Nuclear energy accounts for around one third of the electricity and 15 percent of total energy consumption in EU-27. Although there are substantial disagreements and different positions between the 27 EU Member States, the further usage and development of nuclear energy has been promoted by the Commission as an important contributor to a sustainable energy sector in the EU.

Furthermore, nuclear energy constitutes a crucial basis for European cooperation since 1957, when the European Atomic Energy Community (Euratom) was established. Euratom still plays a key role in civilian nuclear activities within the EU. No major changes have been made to the Treaty since it came into force (IEA 2008: 169). As outlined by the treaty, the specific tasks of Euratom is to:

- promote research and disseminate technical information;
- establish uniform safety standards to protect the health of workers and the public;
- facilitate investment in the basic installations necessary for the development of nuclear energy in the EU;
- ensure that all Member States with nuclear power receive an equitable supply of uranium and nuclear fuel;
- ensure that civil nuclear materials are not diverted to other (particularly military) purposes.

More recently, nuclear cooperation in the EU focuses particularly on the issues of fuel and waste management, risk prevention, and innovation/technological development. The challenge of managing spent fuel and radioactive waste has been addressed through a variety of legislative instruments, mainly for general radiation protection and environmental matters.

In terms of technological development, and in order to reinforce the sector’s contribution to low carbon electricity, two key challenges are identified by the recently adopted EU Strategic Energy
Technology Plan (SET Plan – see below): That is, lifetime extension of facilities, and solutions for nuclear waste.\(^{12}\)

In June 2009, the EU agreed upon a Nuclear Safety Directive which establishes a common legal framework for nuclear safety in Europe. By the adoption of the Directive, the EU becomes the first major regional nuclear actor to provide binding legal rules to the main international nuclear safety standards, namely principles established by the International Atomic Energy Agency (IAEA) and the obligations emanating from the Convention on Nuclear Safety.

The Directive establishes a dynamic to protect workers and the general public with reinforced independence and resources of the national competent regulatory authorities. It will also continuously improve and strengthen the responsibility of license holders and transparency of regulators, based on expert groups, international cooperation and regular peer review schemes.

Such directives must be anchored within the Euratom Treaty, and enacted at the highest level of decision making: the European Council. As such, the nuclear policy cooperation of the EU is anchored within a multilateral framework, as indicated in section 2.2.

5.3 The internal energy market and competitiveness

The objective of an internal energy market was addressed for the first time in 1988 (Eikeland 2008). Deregulation and the establishment of a common market constitutes one of two main policy areas (in addition to the environment) where the Commission can propose common legislation with effect for energy, and where qualified majorities apply (supra-national decision-making). The linkage with the environmental aspects of energy is, however, seldom made explicit.

The process before the ‘first generation’ of deregulation directives (Electricity and Natural gas, in 1996 and 1998, respectively) was long and cumbersome (Eikeland 2008). These directives included, moreover, no strong enforcement mechanisms, and, as it turned out, did not lead to a functioning internal energy market. Some incremental changes were undertaken through amendments of the Electricity and Gas directives in 2003, through ‘the second liberalization package’.

More significant changes did appear, however, in 2007 with the introduction by the Commission of a ‘3rd internal energy policy package’ (Eikeland 2008; CEC 2007b). The revised liberalisation measures were prepared within the wider framework of more consolidated and integrated policy

\(^{12}\) In addition, EU has strong ambitions related to the development of fusion energy. Fusion is considered as a promising source of energy for the long term. This is developed through an extensive and ambitious international cooperation (EU, USA, Japan, Russia, China; ITER International Agreement). Euratom, as host member of the ITER International Agreement, and remains fully committed to the success of the ITER project, where high capital investment is needed for the construction phase.
approach to climate and energy (ibid.). A recurrent issue in the EU debates on further deregulation and market development has been how to ensure an *ownership unbundling* between commercial interests related to energy transmission and distribution. The EU focus on unbundling has been based on indices that vertically integrated companies misuse their ownership of networks to give own supply business better terms of access than their competitors (Eikeland 2008).

The proposal for a third package included new and stricter rules for unbundling and better functioning markets for electricity and natural gas. The proposal also emphasised a stronger coordination of national market regulation, and grid/transmission regulation (in parallel to increased focus on security of supply). Finally, the package included stronger mechanisms for border exchanges (again linked to concerns of security of supply).

In addition the third market package reinforced the regulation of cross-border exchange and trade with energy, and stipulated the establishment of an Agency for the Cooperation of European Energy Regulators (ACER).

ACER represents a transformation and formalisation of the existing European Regulators’ Group for Electricity and Gas (ERGEG). ERGEG was established in 2003 as an advisory body for the Commission in issues pertaining to the internal energy market. Its mandate is to facilitate a consistent application, in all Member States, of the provisions set out in the directives for an internal energy market.

‘The third package’ also introduced measures to strengthen the regulatory coordination in Europe by establishing a formalised cooperation between the transmission system operators for both electricity and natural gas, through the European Network of Transmission System Operators for Electricity (ENTSO-E), and the European Network of Transmission System Operators for Gas (ENTSO-G), respectively.

The new agency, ACER, will in addition to the tasks of the former ERGEG, also be responsible for supervising the national TSO’s and the operations of the ENTSO-E. ACER, in cooperation with the Commission, is further to supervise the operations of the national regulators, as well as advising the Commission and the national regulators in energy policy affairs. Its designated seat is Ljubljana, Slovenia, and the Agency will take up its duties from March 2011. It is important to point out that ACER has not been delegated any specific responsibility for climate-change mitigation and the phase-in of renewables.

The efforts of establishing an internal energy market represent important drivers for both EU and national energy policies, as well as constituting an important framework for the promotion of renewable energy and energy efficiency. It is, however, surprising to observe that there have been few efforts of linking these initiatives. Hence, the 3rd liberalisation package includes no references to the climate-energy package, and no overall assessment as to how these processes could be (better) coordinated.
The process of adopting the third deregulation package also demonstrated the huge differences in national positions between the Member States, not least by the issue of unbundling, where the more market-oriented countries like the UK and the Nordic Member States were opposed to the reluctant positions of France and Germany (Eikeland 2008). Another observation is that national positions and other stakeholders engage in a stronger interaction and dynamic than related to security of supply, although the policy processes for the internal market are not entirely separated from energy supply security considerations.

In sum, although the third liberalisation package of 2007 represented a certain progress in the further development of a European energy market, there is a long road ahead before the EU disposes of a coherent, well-functioning internal energy market.

5.3.1 Innovation and energy technology development

Parallel to the formulation and adoption of the climate-energy package, there has been a reinforced focus on the role of research and innovation as parts of the EU climate-energy policy. Although the research and innovation activities do not directly lead to emission reductions, the ensuing technological development will provide incentives for more effective abatement strategies, as well as contributing to a more eco-efficient, less carbon-intensive EU economy.

5.3.1.1 Recent initiatives: The Strategic Energy Technology Plan (SET Plan) and the European Institute of Innovation and Technology (EIT)

A cornerstone of the EU’s energy-relevant innovation strategy is the EU Strategic Energy Technology Plan (SET Plan). The final version of the SET Plan was adopted in October 2009, and comprises measures relating to planning, implementation, resources and international cooperation. The plan includes industrial initiatives, energy efficiency (‘Smart Cities’), and the establishment of a European Energy Research Alliance (EERA). The SET Plan is considered as the ‘technology pillar’ of the EU climate and energy policy (CEC 2009b).

Working together with stakeholders, the Commission has drawn up Technology Roadmaps 2010-2020 for the implementation of the SET-Plan. The road maps stipulate priorities for the various technologies, balancing the short-term needs against longer-term innovation potential.

There are related European Industrial Initiatives that also aim to strengthen European competitiveness by focussing efforts on key challenges and bottlenecks and proposing concrete actions for the period 2010-2020. These initiatives encompass: wind energy, solar energy, electricity production and grid, bioenergy, CCS, nuclear fission, fuel cells and hydrogen, energy efficiency and ‘smart cities’. The first four industrial initiatives were launched in June 2010 (ENDS Europe Daily 2010g)\textsuperscript{13}.

\textsuperscript{13} The four initiatives cover electricity grid, wind energy, solar power, and carbon capture and storage (ENDS Europe Daily, 2010d).
In addition, a European Energy Research Area (EERA) has been established to induce stronger, more focussed and coordinated research between European institutions, as well as stimulating joint programmes and projects. These will be strongly linked with the industrial initiatives mentioned above.\textsuperscript{14}

5.3.1.2 Innovation activities and funding as part of the EU Recovery Plan

The EU Recovery Plan was drafted by the Commission in 2008/09 as a response to the global financial meltdown. Included in the Plan there were several proposals related to the energy sector, in order to contribute to the overall GHG emission reduction target. This also included the funding of several projects for energy production and distribution.

Almost € 4 billion were set aside by the EU in May 2009 in order to support energy projects as part of the economic recovery plan. A list of eligible energy projects to receive EU funding was presented in spring 2009. The list had to be sanctioned and finally adopted by the EU institutions (EP and the Council). The list included both projects on fossil energy sources (gas infrastructure and CCS), as well as renewable energy production. Infrastructure projects and transnational grids, as well as off-shore wind power projects were prioritized.

In December 2009, the EU institutions finally agreed upon a list of 15 energy projects eligible for funding. Of these € 1 billion have been allocated for six CCS projects, whereas € 565 million are allocated to nine offshore wind energy projects.\textsuperscript{15}

Included in the offshore wind power projects, one finds Baltic-Kriegers Flak I, II and III. The financial support will be related to combined grid solution and interconnections between the three countries involved (Denmark, Germany and Sweden). In the aftermath, the Swedish partners have withdrawn from the project, but no changes in the remaining project or the EU funding have been announced thus far.

\begin{footnotesize}
\textsuperscript{14} In addition, the \textit{European Institute of Innovation and Technology} (EIT) was established in 2009. The EIT is set out to become the flagship for excellence in European innovation. Sustainable energy constitutes one of 3 priorities. The operation of the research related to the EIT is, however, conducted through Knowledge and Innovation Communities (KICs), representing innovative ‘webs of excellence’: highly integrated partnerships that bring together education, technology, research, business and entrepreneurship. After a selection in 2009/10 two KIC’s with relevance for climate and energy have been nominated: One called ‘Climate-KIC’ focusing on climate change mitigation and adaptation; and one called ‘KIC Inno-Energy’ focusing on ‘sustainable energy’ For more information see the following web site: \url{http://eit.europa.eu/kics1/kic-innoenergy.html}

\textsuperscript{15} The following CCS-projects have been allotted funding from the EU as part of the European Energy Programme for Recovery, in total 1 billion €: Belchatow (Poland); Compostilla (Spain); Hatfield (UK); Jänschwalde (Germany); Porto Tolle (Italy); and Rotterdam (The Netherlands). In addition, the following off shore transmission and wind power projects have been allotted funding: Baltic - Kriegers Flak I, II, III (Denmark-Germany); COBRA CABLE (large capacity interconnector between the Netherlands and Denmark); HVDC hub (addition of an intermediate offshore platform on the planned HVDC link between Shetland and Scottish mainland); BARD 1 (Germany); Global Tech I (gravity goundations for deep water wind farms using); Nordsee Ost (Germany); Borkum West II (Germany); Aberdeen Offshore Wind Farm (UK); Thornton Bank (Belgium).
\end{footnotesize}
5.4 Summary

The above discussion has aimed at demonstrating that the climate relevance of EU energy policies is the product of interwoven processes and interdependent concerns. This interaction is, however, crucially depending on the decision-making principles and structures which vary according to different policy sub-domains. While climate-change policy in itself can draw on a more supranational approach to decision-making, the follow-up within the policy sectors depends substantially on the different national approaches and positions.

Ongoing processes with the reinforcement of innovation and research elements of the common energy policy may represent a potential for stronger, future common projects and processes. The financial allocations provided for these activities, as well as the decision-making framework do, however, not induce a stronger potential for further integration than is already the case today. The altered mandate for common energy policy-making provided by the Lisbon Treaty creates new opportunities, but does not represent a substantial shift as long as the energy mix remains a vital national responsibility and unique area of competence.

As for the current status of EU energy policy, in addition to the climate-related ambitions, the main challenges are the further realisation of a European energy infrastructure, and a stronger common approach to security of supply. The EU also has a substantial challenge in following up its ambitions related to deregulation and the internal market.

As a reflection of the complex and interdependent nature of energy, the EU Commission has in November 2010 put forward a proposal for a Strategic EU energy plan for 2011-20. The strategy builds on an outline which was circulated for public consultation during the spring of 2010 (ENDS Europe Daily 2010b). The main priorities here are: (1) increased energy efficiency that translates into 20% savings by 2010; (2) a more integrated market, providing competitive prices, choice and security of supply; (3) European technological leadership in delivering innovative and cost-efficient solutions; (4) reinforced energy security for citizens and businesses; and (5) stronger international partnerships, notably with neighbouring countries. The Commission’s proposal is to be discussed at the EU Summit in February 2011 (ENDS Europe Daily 2010d). The strategy is thus intended to encompass all aspects of energy policy, and thereby cover a wider area than the existing strategic frameworks for climate and energy (see sections 3 and 5.2, respectively).

In this context, the lack of a European infrastructure framework is singled out as being particularly troublesome. The Commission has, therefore, also in November 2010, presented energy infrastructure priorities for the next two decades (ENDS Europe Daily 2010c). An off-shore North Sea grid together with related connections to Northern and Central Europe are singled out as priority areas for common European infrastructure projects (ibid.). In addition, the Commission foresees the development of new tools for realizing the infrastructure: (1) improved regional cooperation; (2) more effective licensing procedures; (3) better methods and information for decision-makers; and (4) innovative financial instruments (ibid.).
It is also hoped that a more coherent strategy with a stronger anchoring at the regional-local level, as implied by the recently proposed energy plan, will also induce a stronger common approach to energy as a whole in the EU. As indicated by the present report, however, such a supposition constitutes a significant future challenge.
6 Conclusion

The EU is generally considered to be a global front-runner for climate-change mitigation, not least by its ambitious targets and expressed willingness to implement policy changes domestically. The EU is on track to fulfil its Kyoto commitment of 8 percent reduction by 2008-12, whereas stronger uncertainties prevail as to the 2020-target of 20 percent reduction. Furthermore, this overall commitment is to be fulfilled by sectoral policy efforts where energy is a key area. Critical scrutiny of existing and projected energy policies is, therefore, required.

Climate change is in principle based on supra-national decision-making, as illustrated by the formulation and follow-up of a European Emission Trading System (ETS), but the EU’s 20 percent reduction-target for 2020 must rely on a broader set of efforts. The energy policy area is designated to play a vital role, not least through the targets of 20 percent renewable energy and 20 percent more energy efficiency by 2020.

The result of the actual follow-up of the energy-related targets – not least at the national level – remains, however, a more open question. The EU is substantially characterised by very different national energy systems, and various and often conflicting interests between the Member States. Generally, this situation also entails diverging policy priorities.

The cumbersome process of revising the treaties of the Union finally resulted in the recent adoption of the Lisbon Treaty. However, this last building-block of the European constitutional construction only formalises and consolidates already existing and established competencies related to energy: ‘Supranational’ authority is primarily executed indirectly through the EU’s competences for the internal market and the environment.

Unanimity among all EU Member States is, therefore, still required in issues related to the choice of energy sources – including the promotion of renewable energy; as well as in strategic decisions concerning security of supply. Moreover, although the climate-change mitigation strategy requires cross-sectoral efforts and stronger coordination of different sub-domains of the energy policy sector, there are no new instruments available for inducing such a reinforced integration for energy. The EU’s new Energy policy strategy, of which a draft is expected in spring 2011, can – eventually – provide some new incentives for such an integration; or – at least – represent a renewed arena for more coherent policy-making for energy.
7 REFERENCES


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ANNEX 1: OVERVIEW OVER CLIMATE-RELEVANT ENERGY POLICY STRATEGY DOCUMENTS AND LEGISLATION

8.1 Overview strategies and directives for climate change mitigation

**Strategies:**
- 2nd European Climate change Programme (2005)
- 2008 Climate and energy package

**Directives and other legal acts:**
- The Directive on linking the EU ETS with the Kyoto flexible mechanisms of JI and CDM: Directive 2004/101/EC.

8.2 Overview strategies and directives for renewable energy

**Strategies**
- 2008 Climate and energy package.

**Directives and other legal acts:**

8.3 Overview strategies and directives for energy efficiency

**Strategies**
- Action plan for energy efficiency 2000-2006 - The Action Plan is a follow-up to the Commission communication adopted in April 1998 on the rational use of energy and the Council resolution on energy efficiency.
- Energy efficiency Action plan 2006
- National Action Plans 2007
- Proposals for energy efficiency package 2008 – part of SER 2

• Revised Energy efficiency Action Plan soon (November 2009, but now after COP 15)

**Directives and other legal acts:**

- Directive on energy end-use efficiency and energy services (2006) – framework
  - Boiler efficiency directive (1992)
- The IPPC Directive
- The Motor Challenge Programme

8.4 **Overview strategies and directives for transport**

**Strategies:**

- The Greening transport package 2008
- The 2007 Green Paper on sustainable urban transport.
  - Commission communication of 8 February 2006 "An EU strategy for biofuels
  - Commission Communication of 7 December 2005 - Biomass Action
- The 2001 White Paper on transport policy
- The action plan for energy efficiency 2007

**Directives and other regulations:**

- The Transport Fuel Directive (98/70/EC)
- Car Labelling Directive (1999/94/EC)
- CO2 emission performance standards for new passenger cars
- Directive on clean and energy-efficient road transport vehicles (2009/33/EC)
- Proposal for tyre labelling 2008