

# Energy Roadmap 2050

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A EURELECTRIC Response Paper



The **Union of the Electricity Industry–EURELECTRIC** is the sector association representing the common interests of the electricity industry at pan-European level, plus its affiliates and associates on several other continents.

In line with its mission, EURELECTRIC seeks to contribute to the competitiveness of the electricity industry, to provide effective representation for the industry in public affairs, and to promote the role of electricity both in the advancement of society and in helping provide solutions to the challenges of sustainable development.

EURELECTRIC's formal opinions, policy positions and reports are formulated in Working Groups, composed of experts from the electricity industry, supervised by five Committees. This "structure of expertise" ensures that EURELECTRIC's published documents are based on high-quality input with up-to-date information.

For further information on EURELECTRIC activities, visit our website, which provides general information on the association and on policy issues relevant to the electricity industry; latest news of our activities; EURELECTRIC positions and statements; a publications catalogue listing EURELECTRIC reports; and information on our events and conferences.

EURELECTRIC pursues in all its activities the application of the following sustainable development values:

Economic Development

▶ Growth, added-value, efficiency

Environmental Leadership

▶ Commitment, innovation, pro-activeness

Social Responsibility

▶ Transparency, ethics, accountability

# Energy Roadmap 2050

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## **Key Messages**

### **Support markets and market-based instruments**

A well-functioning single European energy market and an effective EU Emissions Trading Scheme (ETS) are the best way of ensuring the objectives of the European energy policy are met. They will ensure a cost-effective transition to a low-carbon economy, while guaranteeing security of supply and system stability.

### **Go for the ETS as the key driver of decarbonisation**

Coherent and integrated policy instruments based on the ETS as the key driver can best serve the EU's decarbonisation goal. EURELECTRIC believes that the effectiveness of the ETS would be enhanced if Europe's policymakers adopted ambitious, economy-wide greenhouse gas reduction targets for 2030 and beyond, up to 2050.

### **Focus on investments and cost-effectiveness**

Europe needs a cost-effective EU energy policy and a transparent and predictable regulatory framework that can spur investment in low-carbon technologies. A coordinated and converging European approach is needed to drive investment in generation, storage and infrastructure. The Roadmap does not yet elaborate on these crucial aspects.

### **Develop a system approach to the energy transformation**

The EU should adopt a holistic system approach if the power industry is to deliver on the transformation required by the Roadmap 2050. A coherent expansion of grids and generation, a level playing field for all low-carbon technologies (including RES, nuclear and CCS), and a market framework are all needed to steer the change.

### **Find a global answer to a global challenge**

Climate change is a global challenge, and as such it requires a global answer. We welcome the Roadmap's commitment to promoting a global solution engaging all major emitting economies. To support the EU's international efforts within the United Nations Framework Convention on Climate Change the EU should enhance the role of the EU ETS as the cornerstone of EU decarbonisation policy.

## THE ROLE OF ELECTRICITY IN THE TRANSITION TO 2050

The electricity sector plays a pivotal role in delivering a low-carbon economy and society. **It remains committed to delivering carbon-neutral electricity by mid-century**, as expressed in the declaration by more than sixty Chief Executives of electricity companies in March 2009.<sup>1</sup> It is now time to enable further progress and permit the electricity industry to fully play its role as the vehicle for a cost-effective decarbonisation of the energy system. This paper, responding to the European Commission's recent published Energy Roadmap 2050,<sup>2</sup> sets out EURELECTRIC's views of how to get there.

**A well-functioning single European energy market**, i.e. a market environment establishing a level playing field on which energy companies can operate and take their investment decisions, **and an effective EU Emission Trading Scheme (ETS) are the best way of ensuring the objectives of the European energy policy are met**, and in particular:

- **tackling climate change**
  - ✓ by stimulating investment in low-carbon technologies and cost-effective energy savings
- **ensuring a cost-effective transition**
  - ✓ by eliminating current inefficiencies through genuine liberalisation, based on the removal of current market distortions and harmonisation of market rules
  - ✓ by driving greater policy coordination and integration of policy instruments
- **guaranteeing security of supply and system stability and mitigating the risk of power outages**
  - ✓ via well integrated electricity and gas markets
  - ✓ via an integrated and improved European network for transmission and distribution and a coherent approach to risks to system stability

## IS THE PROPOSED FRAMEWORK FIT FOR PURPOSE?

### Yes to a European approach

**EURELECTRIC welcomes the European Commission's approach of presenting an energy roadmap to 2050 based on a comprehensive, coordinated, EU-wide strategy.** This will provide clarity about the direction of energy policy and help avoid potentially diverging national approaches that do not consider the overall European picture.

### Yes to the role of electricity

**EURELECTRIC welcomes the Roadmap's confirmation that "electricity will have to play a much greater role than now** and will have to contribute to the decarbonisation of transport and heating/cooling." Electricity is an excellent means to reduce greenhouse gas emissions in sectors that would otherwise be far more difficult to decarbonise, such as space and water heating (which accounts for the greatest part of overall energy use) and transport.

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<sup>1</sup> EURELECTRIC, *Climate Change, Electricity Markets, Supply Security: A Declaration by European Electricity Sector Chief Executives*, Brussels, March 2009.

<sup>2</sup> European Commission, Directorate-General for Energy, *Energy Roadmap 2050*, (COM(2011)885/2), Brussels, December 2011.

## But three overlapping targets are not the right answer. Go for the ETS as the key driver

DG Energy's Energy Roadmap 2050 comes in the wake of the *Roadmap to a competitive low carbon economy* prepared by the European Commission's DG Climate. Intended as the energy modelling to support and provide a sound basis for the Commission's analysis, the Roadmap broadly appears to revolve around the need to justify renewable and energy efficiency targets by 2030, rather than tackling the coming transformation of the energy landscape and the essential requirement for least-cost delivery of this transformation. **Coherent and integrated policy instruments based on the ETS as the key driver can best serve this outcome. EURELECTRIC takes the view that the effectiveness of the ETS would be enhanced if Europe's policymakers supported it by adopting ambitious, economy-wide greenhouse gas reduction targets for 2030 and beyond, up to 2050<sup>3</sup>.** The European electricity industry would welcome such targets as a clear signal of Europe's commitment to a cost-effective, market-based process towards carbon-neutral electricity supply.

## Competitiveness and cost-effectiveness: two sides of the same coin

Energy has a deep impact on all aspects of the economy, but also on all European citizens. In order to reach the 2050 target of reducing greenhouse gas emissions by 80-95%, **a cost-effective EU energy policy needs to be designed, implemented, and clearly and transparently communicated to the wider public. A transparent and predictable regulatory framework, able to spur investments in low-carbon technologies, should complement such an EU energy policy.**

Cost-effectiveness is particularly important given the significant competitive challenge which Europe now faces, notably from the fast-growing economies of Asia. **The development of an integrated market will require a coordinated and converging European approach to drive investment in generation (including flexible generation), storage and infrastructure (both transmission and distribution).** The Roadmap as it stands does not yet elaborate on these crucial aspects.

## 'No regret options', a level playing field for all low-carbon technologies and the needed system approach

The Roadmap identifies a few 'no regret options' – renewables (RES), energy efficiency and infrastructure – which will allow the EU to achieve its long-term policy objectives. **EURELECTRIC favours the development of RES<sup>4</sup> because of their contribution to carbon neutrality and security of supply.** But RES development has to be cost-effective, market-oriented, and European<sup>5</sup>. **EURELECTRIC is also supportive of energy efficiency** – the European electricity industry is ready to offer more, and more specialised, energy services. Likewise, **EURELECTRIC believes that the development of transmission and distribution infrastructure** is critically needed up to 2020 and beyond.

**The EU should adopt a holistic system approach if the industry is to deliver on the transformation required by the Roadmap 2050.** A coherent expansion of grids and generation, a level playing field

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<sup>3</sup> The Polish Electricity Association – Polski Komitet Energii Elektrycznej (PKEE) – is of the opinion that a cost-benefit analysis detailing the impacts of such new targets on the energy sector and on the different national economies should be conducted before introducing further GHG emission reduction targets.

<sup>4</sup> See, inter alia, EURELECTRIC, *20% Renewables by 2020: a EURELECTRIC Action Plan*.

<sup>5</sup> See EURELECTRIC's response to the European Commission public consultation on the renewable energy strategy for more details.

for all low-carbon technologies (including RES, nuclear and CCS), and the market framework described above are all needed to steer the change.

### **And finally: global challenge = global answer**

Climate change is a global challenge, and as such it requires a global answer. **We welcome the Roadmap's commitment to promoting a global solution engaging all major emitting economies**, as "Europe cannot alone achieve global decarbonisation." The decarbonisation challenge is best addressed by an international agreement within the United Nations Framework Convention on Climate Change, with binding commitments to reduce global greenhouse gas emissions. To support these international efforts the EU should enhance the target-setting and cost-minimising role of the EU ETS as the cornerstone of EU decarbonisation policy.

## THE EU ENERGY POLICY AND EURELECTRIC'S APPROACH: TALKING DIFFERENTLY?

In March 2007 the European Council set the overall energy policy objectives for the EU going forward: sustainability, competitiveness and security of supply. Setting the right framework is decisive at the eve of the massive investment cycle required to push the low-carbon energy transition from promise to practice.

The following table compares the European Commission's views and proposals with those of EURELECTRIC. It sets out EURELECTRIC's approach to the energy policy 'trilemma' and to broader issues such as the role of policy (and regulation) and the (missing) coordination of energy policies at EU level.

	EUROPEAN UNION ENERGY POLICY	EURELECTRIC VIEWS
<b>ROLE OF POLICY AND REGULATION IN SETTING THE FRAMEWORKS FOR A CARBON-NEUTRAL ELECTRICITY SUPPLY</b>	<ul style="list-style-type: none"> <li>➤ Focus on targets, not frameworks</li> </ul> <p>Political interventionism, often down to the smallest details, by the EC and member states, e.g.</p> <p><i>"Timely consideration should be given to options for 2030 milestones"</i></p> <p>[DG ENER, Energy Roadmap 2050]</p> <ul style="list-style-type: none"> <li>➤ Multiple conflicting targets               <ul style="list-style-type: none"> <li>✓ Renewables</li> <li>✓ CO<sub>2</sub> reduction</li> <li>✓ Energy savings</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>➤ Focus on frameworks, not targets</li> </ul> <p>Policymakers should stick to their basic mission: agree on a relevant direction, i.e. set the policy framework, and then let the market work and deliver. This is not just EURELECTRIC's views; as the Roadmap's Advisory Group put it</p> <p><i>"A distinction should be made between setting the policy framework and detailed intervention in specific markets"</i></p> <p>[Recommendation Nineteen, Report of the Advisory Group on the Energy Roadmap 2050]</p> <ul style="list-style-type: none"> <li>➤ Prioritise the key policy objective and coordinate targets with a key driver to deliver cost-effectiveness               <ul style="list-style-type: none"> <li>✓ ETS to be the cornerstone of the EU decarbonisation policy</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>➤ Recognition of electricity's major role in decarbonisation. Nevertheless, EU policy instruments obstruct this role</li> </ul>	<ul style="list-style-type: none"> <li>➤ Remove barriers to electrification, for instance in transport or heating &amp; cooling</li> </ul>
<b>EU VS. NATIONAL APPROACHES</b>	<ul style="list-style-type: none"> <li>➤ Energy Roadmap 2050 tries to strengthen the EU's role as coordinator of policy</li> </ul>	<ul style="list-style-type: none"> <li>➤ The EC should support the European Council in better reconciling the different national approaches towards a coherent EU policy in 2050 <ul style="list-style-type: none"> <li>✓ The Energy Roadmap 2050 is a good step forward!</li> </ul> </li> </ul>
<b>COMPETITIVENESS</b>	<ul style="list-style-type: none"> <li>➤ Establishment of the Internal Energy Market <ul style="list-style-type: none"> <li>✓ Energy liberalisation packages, i.e. an approach based on development of network codes and integrated network planning</li> <li>✓ Integration via Regional Initiatives</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>➤ In an increasingly competitive international environment, Europe has to deliver policy in the most cost-effective manner</li> <li>➤ Establishment of the Internal Energy Market <ul style="list-style-type: none"> <li>✓ Fully-fledged approach to a European market integration process based on the development of regional markets</li> <li>✓ Integrate the North Western European (NWE) region by 2012 as a cornerstone for a European market</li> <li>✓ Implement ACER cross-border regional roadmaps and develop the network codes on capacity allocation and congestion management</li> <li>✓ Promote the development and reinforcement of electricity grids to ensure stable conditions for cross-border trading</li> <li>✓ Allow the market to work and eliminate end-use regulated prices. Liberalised markets are best equipped to deliver the right signals for cost-efficient investment</li> </ul> </li> </ul>
<b>SECURITY OF SUPPLY &amp; GENERATION ADEQUACY</b>	<ul style="list-style-type: none"> <li>➤ Development of specific generation technologies <ul style="list-style-type: none"> <li>✓ Major focus on RES technologies to decrease import dependency and increase security of</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>➤ Development of generation technologies <ul style="list-style-type: none"> <li>✓ Use all available technologies in the framework of a carbon-constrained industry in the most cost-</li> </ul> </li> </ul>

	supply	<p>effective way</p> <ul style="list-style-type: none"> <li>✓ Enable the deployment of flexible generation and storage capacity to back up RES</li> <li>✓ Create appropriate frameworks to deliver the necessary investment</li> <li>✓ Enable innovation to offer a wider portfolio of options (including RES and other low-carbon technologies)</li> </ul>
	<ul style="list-style-type: none"> <li>➤ Tap into energy savings <ul style="list-style-type: none"> <li>✓ Focus on primary energy savings</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>➤ Tap into energy efficiency <ul style="list-style-type: none"> <li>✓ Focus on final energy <ul style="list-style-type: none"> <li>• Energy prices should internalise externalities and inefficiencies, giving the right signals for investing in energy efficient technologies</li> </ul> </li> <li>✓ Support technological innovations in energy conversion and end-use</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>➤ Protect against security of supply risks via regulation</li> <li>➤ Continuous information exchange via 'coordination groups'</li> <li>➤ Need to actively pursue relationships with supplying and transit countries (also via e.g. the Energy Community) and strengthen supply infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>➤ Protect against security of supply risks via market mechanisms</li> <li>➤ Involve industry in the coordination groups (where possible) through EU legislation</li> <li>➤ Need to actively pursue relationships with supplying and transit countries (also via e.g. the Energy Community) and strengthen supply infrastructure</li> </ul>
<b>INFRASTRUCTURE DEVELOPMENT</b>	<ul style="list-style-type: none"> <li>➤ Infrastructure as the backbone of the energy system <ul style="list-style-type: none"> <li>✓ Major focus on trans-European energy infrastructure</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>➤ Infrastructure as the backbone of the energy system <ul style="list-style-type: none"> <li>✓ Coherent approach to the development of generation, transmission and distribution</li> <li>✓ Grant appropriate incentives to secure investments in distribution grids, fit for 2050</li> <li>✓ Set up an appropriate regulatory framework to incentivise innovation (RD&amp;D) in smarter grids</li> </ul> </li> </ul>

## THE CORNERSTONES OF EURELECTRIC'S 2050 STRATEGY

### An increased role of electricity

Electricity will represent the biggest source of energy in the European energy mix by 2050 and beyond, and thus become Europe's main energy source. While the industry is advancing and delivering on its carbon-neutrality and energy efficiency commitments, electricity must play a far greater role in different parts of energy demand, and most notably in the space and water heating and transport sectors, which are currently the most difficult sectors to decarbonise.

The Energy Roadmap 2050 confirms the trend towards electrification of final energy usage, a necessary change that EURELECTRIC already identified as a "paradigm shift" in its own modelling exercise, *Power Choices*, in 2010.<sup>6</sup>

### Investment is key

The Roadmap 2050 must address investors' reluctance to invest. Investment cycles in energy are very long for both industry and consumers and thus critically depend on a consistent long-term policy framework. Although there is still generation over-capacity in most European markets, the shut-down of nuclear plants in some EU countries and of other power plants due to the Large Combustion Plant Directive and the Industrial Emissions Directive will create a capacity gap. This gap has to be filled in a timely manner. Investment in flexible back-up generating facilities is also of the utmost importance to integrate ever-growing shares of variable renewable generation.

Electricity companies work in an environment with typical business risks (e.g. long lead times and possibly delays of investment, fluctuating fuel prices or demand). However, political and regulatory risks are much more difficult to manage and have become an increasing hurdle, together with market distortions and a dwindling economic case for conventional capacity (which remains vital for guaranteeing generation adequacy and back-up). The current economic and financial climate impacts the whole economy and has made lenders more risk-averse.

How can the investment deadlock be overcome? Firstly, consistent and stable policy frameworks – both at national and European level – should enable the industry to deliver on the policy objectives, without prescriptive or indeed conflicting targets. Secondly, energy prices need to reflect market fundamentals in supply and demand. This entails a move away from price caps in the traded markets and regulated end-user prices.

### The urgent need for a fully-fledged European market

The development of fully-fledged European energy markets will significantly contribute to a cost-effective pathway to carbon-neutral electricity. Well-integrated electricity and gas markets underpinned by coherent and convergent energy policies and market rules are the main catalyst to such an approach. Having carbon-neutral electricity generation as a firm target, and 2050 as an explicit date, are essential to determine the adequate pathway for a well-balanced EU decarbonisation policy. Once these prerequisites are set, an efficient market environment will be the main instrument to achieve this long-term policy aim in the most cost-effective way. Other means such as heavily interventionist policies or centrally planned investment in generation (be it at

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<sup>6</sup> EURELECTRIC, *Power Choices, Pathways to a Carbon-Neutral Electricity in Europe by 2050*, June 2010

national or European level) will be far less optimal, increase the costs of the electricity system and reduce welfare for society.

In this context, it is thus important to maintain momentum and progress towards an integrated NWE region which will serve as the cornerstone for a future European electricity market. Continued leadership from the European Commission and the Agency for the Cooperation of Energy Regulators (ACER) is needed to keep this process on track and deliver by 2014 an Internal Electricity Market in line with the expectations and aspirations of the Heads of State and Government, as expressed at the European Council on Energy in February 2011. Specific attention also needs to be paid to gas markets, in particular their convergence with electricity markets and the need for them to offer flexible, competitive and secure supply for gas-fired power stations, including flexible back-up generating facilities.

With a view to enhancing and speeding up the integration of renewables into the internal energy market, RES generators must be gradually incentivised to enter the market on an equal footing with other generators. RES generators should be incentivised to sell their production into markets and to meet scheduling, nomination and balancing requirements as other generators do. In addition, there should be a progressive convergence towards European-wide market-based support mechanisms. Specific support beyond 2020 should focus on RD&D and be primarily directed to technologies which have not yet reached maturity. This would increasingly expose RES generators to market prices that reflect demand and supply variations and would also substantially enhance cost-effectiveness<sup>7</sup>.

To conclude, all the tools to develop and further enhance energy-only markets should be used to attain the objective of carbon-neutral electricity production:

- Establishing liquid and integrated electricity markets which are given the chance to work (development of coordinated national policies, unconstrained price formation in wholesale and retail markets);
- Bringing RES into the market;
- Reinforcing transmission and distribution grids and making them smarter;
- Fostering active demand-side participation from customers;
- Making gas markets flexible and competitive.

### **Use all technologies, innovate on a European level**

EURELECTRIC's approach to generation technologies is 'use them all', which means technology neutrality. Technologies should be used and developed in line with the objective of carbon-neutrality as well as on a market-driven basis. Efforts should be made to keep all energy options open, with a view to ensuring a diversified fuel mix which will help to reduce risks to security of supply.

Energy is the backbone of society, and the major decarbonisation change requires an unprecedented innovation effort. Therefore energy must play a central role in the European funding for research and innovation within the EU's new Multiannual Financial Framework 2014-2020.

EURELECTRIC sees a clear added value of an EU approach to research and innovation: this added value includes leverage for additional public and private investments, sharing best practices across

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<sup>7</sup> See EURELECTRIC's response to the European Commission public consultation on the renewable energy strategy for more details.

member states, and setting up the European Research Area as a necessary complement to the European single market.

RD&D support needs to be available for technologies throughout the entire innovation cycle. Promising technologies close to market deployment require support in overcoming the final hurdle before entering the market. The early stages of the innovation cycle require ‘technology push measures’: policies that support research so that the technology can be developed and deployed. The final steps of the innovation cycle then require policies which ‘pull’ technologies into the market once they have been demonstrated and early commercial market uptake is taking place. These stages are decisive for going ‘from promise to practice’, but pose high financial risks.

### **Develop smart distribution networks with no delay**

Major investments will be needed at distribution level to ensure distribution grids can meet the needs of the 2050 energy landscape, including the integration of RES generation at low and medium voltage levels and more responsive behaviour from customers. The Energy Roadmap 2050 estimates that, depending on the decarbonisation scenario, investments in distribution grids until 2050 could be four to five times bigger than in transmission grids. Appropriate incentives as well as lighter and streamlined permitting procedures are thus of the utmost importance for distribution system operators (DSOs). Incentives for investments in distribution grids must be delivered together with a sound market model which underpins customer participation.

New markets for system services to the distribution grid have to be designed so as to create a level playing field where different distributed energy resources can fairly compete with each other. The development of a range of cost-effective flexible distributed energy systems is likely to deliver a sustainable energy system post 2020 at a reduced overall cost and with enhanced network flexibility. EURELECTRIC therefore encourages the European Commission to further address the market uncertainty surrounding the various flexibility options that affect the distribution grid, including demand response, decentralised electricity storage and distributed generation.

In order to smoothly connect distributed energy resources to a smarter distribution grid, the right information and communication technologies will have to be in place. An appropriate regulatory framework ensuring cost-recovery for innovative investment is also needed to incentivise DSOs to further innovate in technologies and systems that will contribute to the development of smart grids.

Evolving towards low-carbon mobility also requires charging electric vehicles in a smart way. This will allow the grid to exploit synergies with renewable electricity generation and it will allow load management in the smart grid context. EURELECTRIC emphasises that public support will be needed during the early market phase to roll out public charging infrastructure for electric vehicles. It is important to find European solutions to enable a single EU-wide e-mobility market that can strengthen Europe’s competitiveness while paving the way for a decarbonised European economy and securing its energy supplies. EURELECTRIC therefore calls for a close dialogue between European industrial actors and policymakers to turn e-mobility into a market success.

### **Pay attention to the social dimension of the change**

Energy’s social dimension includes the concern for jobs, for energy prices, as well as the public acceptance of new build, both in infrastructure and in generation. EURELECTRIC welcomes the fact that the Energy Roadmap 2050 has considered the social dimension of the decarbonisation process.

This was one of the clear requests made by the European social partners in the electricity sector – namely EURELECTRIC on the employer side and EPSU (European Federation of Public Service Unions) and EMCEF (European Mine, Chemical and Energy Workers’ Federation) on the trade union side – in their joint response to the public consultation on the Energy Roadmap 2050 in March 2011<sup>8</sup>.

Indeed, the important social dimension of the Roadmap should not be considered as a side-issue. The transition towards a low-carbon economy will require an in-depth change in several sectors, affecting companies, employment and working conditions. The joint study “Towards a low-carbon economy: employment effects and opportunities for social partners”, published in January 2011 by EURELECTRIC, EPSU and EMCEF, underlined the profound changes that can be expected throughout the transition process. Education and training will need to be addressed at an early stage in order to avoid any skills mismatch. The transition will also require a strong social dialogue, as it is the key mechanism enabling companies to anticipate and manage changes in a just and efficient way. EURELECTRIC therefore welcomes the Commission’s call for the involvement of social partners at all levels.

We nevertheless regret the absence of concrete proposals from the European Commission on how it will take into consideration the social impact of the decarbonisation process in its future decisions and how social partners can be assisted in addressing those profound changes.

EURELECTRIC agrees that the lack of available studies makes it difficult to assess the social impact of the transition towards a low-carbon economy. We thus agree with the Commission on the need to gather more knowledge about the social implications of far-going and long-term decarbonisation.

We welcome the Commission’s attention to the most vulnerable customers for whom coping with the energy system transformation will be challenging. We agree with the Commission on the need to define specific measures at national and local levels to avoid energy poverty.

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<sup>8</sup> EURELECTRIC, EPSU and EMCEF, “Towards a Low-Carbon Electricity Industry: Employment effects & opportunities for the social partners”, January 2011

## A CLOSER LOOK AT THE ENERGY ROADMAP 2050 MODELLING AND IMPACT ASSESSMENT

### Access to PRIMES results

- Stakeholders are not able to access the country-specific output from the PRIMES model used to develop the different scenarios. Without this national breakdown of information (to allow comparison, for example, with national studies on 2050 pathways) it is difficult to provide detailed comments on the validity of the assumptions and output from the PRIMES 2050 pathway analysis. This national breakdown should be made available to all stakeholders.

### Scenario selection

- There is also an issue over the choice and range of scenarios included in the Roadmap. Since the European Commission explicitly recognises that “the scenario analysis undertaken is of an illustrative nature” and has stated that it does not prefer one scenario over the others but aims to develop “a technology-neutral framework”, we wonder why a broader set of scenarios – supplemented by technology-specific sensitivities – has not been run and communicated to stakeholders.
- The Roadmap does not include a low, base and high scenario for each major technology (renewables, nuclear, CCS). Instead, it only offers selected scenarios, *inter alia*, a low-nuclear scenario without a high-nuclear one – or delayed CCS but not for example a delayed offshore wind scenario. The European Commission’s selection of scenarios is neither right nor wrong, but it is incomplete, does not fairly reflect the contributions that different low-carbon technologies can make to decarbonising the EU and can be interpreted as political interventionism from the Commission in setting the energy mix of the EU member states.

### Treatment of costs and subsidies

- The estimated cost development of renewable energy sources is both optimistic and conservative. For instance, the assumed cost of developing offshore wind power in more demanding areas is considerably lower than the present cost level. On the other hand, the Roadmap assumes no learning effect at all for wind power, both onshore and offshore.
- It is not clear how subsidies for renewables evolve over time. The impact assessment only refers to the removal of “operational aid to new onshore wind power” by 2025. A better definition of ‘operational aid’, as well as more transparency on the assumptions for all RES technologies is needed. The modelling should also give visibility to the costs and benefits associated with a convergence of support schemes.
- Another perplexity arising from the modelling is that only capital cost figures are provided. Conversely, no data at all is given for electricity generation costs, which goes under the well-understood concept of levelised costs of electricity (LCOE). Understanding and assessing the economics of the roadmap without such an important metric is difficult.
- The report should improve the presentation of costs. Although the report recognises that the average electricity prices could vary from €145/MWh to €199/MWh, it then goes on to say that “the overall system costs of transforming the energy system are similar in all scenarios.” It suggests that the difference between 14.05% of EU GDP – the costs in the delayed CCS scenario – and 14.6% – the costs in the energy efficiency scenario – is negligible. Considering that the cumulative EU GDP in 2010 was €12.3 trillion, a 0.50% difference amounts to €61.5 billion per

year – 60% of the investments that the Commission has estimated are needed up to 2020 just to make Europe’s electricity grids fit for the 2020 targets. A simple calculation shows that the difference in costs between the most expensive decarbonisation scenario and the less expensive one amounts to €2 to 2.5 trillion by 2050. In order to reduce any intentional or unintentional misinterpretation of data, it should ideally be shown as a percentage and as euros in real terms, or any inflation assumptions should be made very clear.

- The costs of transforming the energy system could greatly increase the proportion of households suffering from energy poverty. It is important to consider the full range of potential cost drivers, including maintaining higher fossil fuel prices into the future.

### **Linkages between the international climate talks and fossil fuel prices**

- We are concerned that all the decarbonisation scenarios are based on the assumption that there are global agreements to reduce greenhouse gas emissions. In the PRIMES modelling this is reflected as a significant reduction in fossil fuel prices below those in the baseline. We regret the Commission has chosen this single assumption as it risks developing a view of the future based on only one of several possible outcomes of global negotiations and policies in other important fossil-fuel importers such as China or India. Even worse, by doing so the Roadmap takes only one of several possible views on future energy prices into account. This is a severe limitation of the supporting studies in our view and we urge that a more balanced view be assessed.

### **Role of electricity storage**

- The Roadmap ascertains that electricity storage has an increasingly important role going forward. However, the impact assessment shows that storage only provides about 1% of (gross) final electricity demand in the two base cases and in all decarbonisation scenarios but the high-renewables scenario, where its share rises to 6.5%. Moreover, the Roadmap does not recognise that no single storage option can sufficiently cover all storage requirements in all European regions and that different options are in different development stages and need further work to be brought to the market.
- The modelling fails to provide any sound and robust assessment of the economics and technological development of storage technologies. We regret that the Commission failed to stress that any potential EU policy on electricity storage should remain technology-neutral and that the development of the different storage options should be left to the market.

### **Infrastructure requirements**

- A low-carbon energy system requires a strong, reliable and supportive grid infrastructure at the transmission and the distribution levels. Although the impact assessment states that grid expansion modelling has been carried out for each of the decarbonisation scenarios, further clarity would be needed to understand how cross-country transmission capacities, as well as national distribution capacities, are considered in the PRIMES approach.

### **Public engagement and social acceptability**

- The document has little to say on public engagement. Any large change to business-as-usual needs to have broad acceptance by the general public in order to truly be successful. Generally speaking, a lack of public acceptance leads to political pressure for change, which – if sufficiently strong – could undermine the stability of any of the scenarios.

- The modelling does not provide any metric for evaluating the impacts of public acceptance on the different scenarios. Developing such metrics would undoubtedly be challenging, but we believe the European Commission should discuss this issue with stakeholders.
- We also regret that the European Commission has failed to give a detailed assessment of the social impact of each scenario, especially in terms of employment and quality of jobs.

### **Impacts on the supply chain**

- It is critically important to secure an EU low-carbon technology supply chain, given the potential level of capital spend on low-carbon generation technologies in particular and the need for this to be an integral part of any EU economic growth strategy. If a large part of the low-carbon supply chain is outside the EU, then the net revenue will also flow outside the EU, which does not help GDP, employment and ultimately affordability for EU consumers. The strategy for implementing the 2050 Roadmap therefore needs to look at supporting and reinforcing all elements of the supply chain within the EU, from R&D to manufacture and installation. Unless the EU becomes internationally competitive and a potential net exporter of low-carbon technology, it is hard to see how significant investment in low-carbon technology within the EU can be sustainable unless other parts of the economy do particularly well and can underwrite the decarbonisation costs.



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