



European Economic Area  
Consultative Committee  
Comité consultatif  
de l'Espace Économique Européen  
Beratender Ausschuß  
des Europäischen Wirtschaftsraums

**E U R O P E A N   E C O N O M I C   A R E A**  
**C O N S U L T A T I V E   C O M M I T T E E**

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**RESOLUTION AND REPORT**

**on**

**INNOVATION IN THE ENERGY FIELD**

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**Rapporteur:**

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## **RESOLUTION**

**on**

### **Innovation in the Energy Field**

The Consultative Committee of the European Economic Area (EEA CC):

- A. Having regard to the Europe 2020 strategy with its five headline targets
  - B. Having regard to the Europe 2020 flagship initiative on innovation (Innovation Union)
  - C. Having regard to Europe 2020 flagship on resource efficiency and energy (A resource efficient Europe), and as part of this, the following proposals: Energy 2020, Low-carbon economy 2050 roadmap, and European Energy Efficiency Plan 2020
  - D. Noting previous EEA CC resolution on innovation and energy, more specifically from 2007 and 2009
  - E. Noting EFTA CC and EESC opinions on innovation and energy, more specifically the recent EESC opinion on innovation
1. welcomes the Europe 2020 strategy; however underlines that rigorous efforts are needed to reach the ambitious headline targets. Similar targets were not reached under the Lisbon Strategy (2000-2010) even in periods when Europe's economic indicators were good; since then the financial crisis has put further pressure on Member States, businesses and other stakeholders which will require even more efforts and stronger focus at all levels to reach the targets and ensure a long-term sustainable recovery;
  2. underlines in the context of this resolution the specific importance of the climate, education, and employment targets under the Europe 2020 strategy and the flagship initiatives presented to achieve these. The EEA CC stresses that despite strained public finances, increased investment in innovation, R&D, and education cannot be postponed. Global competitors are making the necessary investments and Europe needs to follow suit to maintain and strengthen its position as a leader in innovation of new technology;
  3. underlines the important interaction between innovation and energy and the potential for further EU-EFTA cooperation in both fields. Innovation in the field of energy is specifically important to ensure smart, inclusive, and sustainable growth in Europe. A move to a low-carbon economy is crucial not only for the fight against climate change but also key to recovery from the current crisis. Creating green jobs is important to provide decent work for all and combat long-term unemployment. To

achieve a considerable greening of the economy more efforts need to be made to create a genuine Innovation Union in close cooperation with the EEA EFTA States where increased R&D investments are targeted towards a low-carbon economy;

4. stresses the specific importance of renewable energy, energy efficiency, and a more efficient internal energy market to both fight climate change and create green growth. These are areas where increased innovation is needed. They are also highly EEA relevant policy areas where EU-EFTA cooperation should be further strengthened;
5. stresses that the importance of innovation in the energy field in some areas is increasing for the civil society and in the activities of SME-s. To reach the environmental goals, more support instruments should be put in the hands of civil society and SME-s to take onboard energy innovation and energy saving issues.
6. emphasises that the EFTA States are leaders in energy efficiency, leading producers of renewable energy, and important exporters of energy, including electricity, gas, and oil, to the EU. They are also highly innovative in the different energy sectors and continued EEA EFTA participation in EU research and innovation programmes, relevant policies and initiatives are thus crucial.

## **Report on Innovation in the Energy Field**

### Introduction

1. Europe 2020 is the EU's growth strategy for the coming decade. In a changing world it is meant to make the EU become a smart, sustainable and inclusive economy. These three mutually reinforcing priorities should help the EU and its Member States deliver high levels of employment, productivity and social cohesion. More specifically, the Union has set five headline targets in the field of employment, innovation, education, social inclusion and climate/energy, to be reached by 2020, backed up by new flagship initiatives, the use of existing tools, reinforced monitoring, and improved governance. The headline targets are:

- a. 75% employment rate (as share of population aged 20-64).
- b. 3% of GDP (public and private combined) invested in R&D/innovation.
- c. The 20/20/20 climate/energy targets, i.e. 20% reduction in greenhouse gas emissions, 20% of energy from renewable sources, and 20% increase in energy efficiency.
- d. Reduce school drop-outs rates below 10%, and have at least 40% of 30-34-year-olds completing third level education.
- e. At least 20 million fewer people in or at risk of poverty and social exclusion.

2. To achieve the headline targets and boost growth and jobs, the EU has agreed on the following seven flagship initiatives: Digital agenda for Europe, Innovation Union, Youth on the Move, Resource efficient Europe, A new industrial policy for the globalisation era, An agenda for new skills and jobs, and European platform against poverty.

3. The rapporteur has in this report and resolution chosen to concentrate on two specific areas in the new Europe 2020 strategy, namely innovation and energy, and the interaction between the two. Two Europe 2020 flagships are important in this context and looked at in more detail: Innovation Union, and Resource efficient Europe. Investment in research and innovation is needed to ensure smarter and more sustainable growth. Despite the challenges currently facing Europe's public finances, it will be essential that all tools are used to increase investments in research and development (R&D) and education. Failure to do so will only cause Europe to fall behind its global competitors.

4. As pointed out in the EEA CC resolution on green jobs in 2009, innovation in the field of energy is specifically important to ensure long-term, sustainable growth. This is a highly topical issue both in the EU and EFTA, and an area where cooperation between the two should and could be further strengthened. The EU has asserted that energy is 'the life blood of our society' with the well-being of our people, industry and economy depending on safe, secure, sustainable and affordable energy. To achieve a more sustainable Europe and a considerable greening of the

economy and the energy sector, more efforts need to be made to create a genuine Innovation Union in close cooperation with the EEA EFTA States.

5. The EEA EFTA States are important partners to the EU in the energy field; Liechtenstein is situated at the heart of Europe, Iceland and Norway are prominent generators of renewable energy, and Norway the second largest provider of oil and gas to the EU. The EEA EFTA States are also closely linked to the EU through participation in research programmes and trade. Trade relations in the energy field will grow even stronger with the EU initiative to further complete the single European market for energy. The latter will require increased investments and innovation in cross-border, large-scale infrastructure that among others can ensure smarter grids combining different sources of energy.

6. The energy sectors in the EEA EFTA States are highly innovative. This is important when focusing on the interaction in the EEA between innovation and energy. Sophisticated technology has been developed, which can be utilised in other countries and transferred to other areas. This includes the geothermal power sector in Iceland and the oil and gas sector in Norway. For instance, knowledge and experience from the Norwegian offshore industry can be valuable in the development of floating offshore wind power. Close cooperation with the EU in this area is already in place, with research projects under the Competitiveness and Innovation Framework Programme (CIP). Similarly, Iceland participates together with relevant EU countries in the Joint Programme on Geothermal Energy, which was launched by the European Energy Research Alliance with the purpose of developing and advancing the next generation geothermal energy.

7. The Europe 2020 strategy emphasises the need for greener and more innovative economies. Green industry development, innovation and entrepreneurship are supported in the EU Energy and Climate Package. The greening of existing, and development of new green industries and services are of great importance as means to reach the ambitious Europe 2020 targets both in the employment and energy/climate field. Innovation in management, production technologies and standards will also be important in order to comply with the EU/EEA legislation in the field of environment and energy.

### Innovation Union

8. Firstly the rapporteur would like to emphasise the importance of investment in innovation and R&D, despite tight budgets in European countries in the aftermath of the financial crisis. Increased innovation should speed up growth and improves the way we conceive, develop, produce and access new products, industrial processes and services. It should be the key to creating more jobs, building a greener society and improving our quality of life, as well as maintaining our competitiveness on the global market.

9. The Innovation Union flagship initiative asserts that the EU should take collective responsibility for a strategic, inclusive and business-orientated research and innovation policy to improve competitiveness and create jobs. The plan will refocus R&D and innovation policy on challenges such as climate change, energy and resource efficiency, health and demographic change. It contains thirty-four action points which aim to make Europe into a world-class science performer; remove obstacles to innovation which currently prevent ideas from getting quickly to

the market; and promote enhanced and creative cooperation between public and private sectors, on European, national and local levels.

10. Europe has considerable potential for innovation, with world leading researchers, entrepreneurs and companies, but its resources are far from fully exploited. Europe is increasingly lagging behind on investments in R&D compared to US and Japan, and China is quickly catching up. Europe's main drawbacks concerning innovation are: little private investment in R&D, failure to use public procurement strategically, and inadequate R&D in highly technological sectors.

11. The Innovation Union initiative sets out a bold, integrated and strategic approach whereby; innovation is the overarching policy objective, a medium- to longer-term perspective is taken, all policy instruments, measures and funding are designed to contribute to innovation, EU and national/regional policies are closely aligned and mutually reinforcing; and last but not least, the highest political level sets a strategic agenda, regularly monitors progress and tackles delays.

12. Other initiatives, such as an Industrial Policy for the Globalisation Era, the Digital Agenda, Youth on the Move, an Agenda for Skills and Jobs, and the Single Market Act have been developed in conjunction, and should complement and strengthen the Innovation Union. These policies should be mutually reinforcing and together promote the smart, sustainable and inclusive growth that Europe pursues.

13. Today, a number of EU Member States are world leaders in manufacturing, creativity, design, aerospace, telecommunications, energy and environmental technologies. However, the EU is under-investing in its knowledge base, spending every year only 1.9% of GDP<sup>1</sup> in average (though spending varies significantly among EU countries) in R&D. The EEA EFTA States also need to increase their R&D spending, with Norway currently spending a meagre 1.6% and Iceland doing somewhat better at 2.6% of GDP. The US and Japan are spending significantly more, mainly due to investment by private entities.

14. The lack of private investment in R&D in Europe is the main reason for the low expenditure, public capital often accounts for about 50% of spending. Europe needs to tackle the problem of poor availability of finance, by encouraging private-public cooperation, allowing more favourable conditions and simplifying procedures. Increased business participation in innovative projects ought to be encouraged. More of the public spending on R&D should be allocated to competitive funds in order to further stimulate growth and public-private partnerships. In addition, public procurement has to be used strategically to promote innovation and focus research and development on prioritised areas.

15. R&D efforts are mostly national and the European dimension remains fragmented and poorly coordinated. Europe has a great number of excellent researchers, but time and money is wasted on duplicated work and administration. By creating a true European Research Area, where efforts are focused and unified, the quality and effectiveness of Europe's research should be enhanced.

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<sup>1</sup> All figures are taken from Eurostat's 2008 data on headline indicators.

16. Fragmentation combined with outdated regulations and procedures, makes innovation unnecessarily expensive. The efforts to create a common European patent to replace the current costly system, is an important measure in that regard. The EEA CC therefore welcomes that legislation setting up a unitary patent protection system has been prioritised as a key action in the recent Single Market Act<sup>2</sup>.

17. Actions taken to promote innovation should involve measures directed at both public and private organisations, central and regional government, and non-profit and businesses sectors. Special attention should be given to include small and medium-sized enterprises, as these tend to be innovative and resource-efficient, but often lack the financial means to make the necessary investments for ideas to develop into profitable products on the international market. Too few European SMEs are able to expand and grow into large companies. It should also be recognized that SMEs have great potential for job creation if conditions are favourable, thereby making them essential in achieving the Europe 2020 targets.

18. Research needs to be focused on innovations that address the major societal challenges identified in Europe 2020 and measures that enhance EU competitiveness, such as green industries and renewable energy sources. Innovation must become a key element in EU policies and the EU must use the strong potential of the public sector in areas such as energy and water, health, public transport and education, to bring new solutions to the market.

19. A broad concept of innovation should be pursued, allowing both research-driven innovation and innovation in business models, design, branding and services that add value for users and where Europe has unique talents. All actors and all regions should be involved in the innovation cycle, each contributing by focusing on their own strengths and potentials, but with an overarching strategy that assures that all actors are pulling together.

20. Efforts need to be made on all levels of education and in all regions and districts, assuring that good quality basic education is provided to all Europeans. The basic education has to be a sufficiently good platform for further academic specialisation, and universities should be harvesting grounds for future researchers. European universities generally hold a good standard, but too few are on the top 20 and top 100 scoreboards internationally. Measures need to be taken to lift more European universities to the level of excellence, in order to prevent Europe lagging behind our global competitors on research and development.

21. Europe needs to recognise the importance of global competitiveness and the importance of smart regulation in order to ensure an analysis of competitiveness on all levels of regulatory EU interventions. In particular, the competitiveness of energy intensive industries is the key for achieving the long term strategic goals of Europe 2020, as these industries provide an important part of the value chain of the manufacturing industry in Europe and have become one of the world leaders in energy efficiency. Therefore it is important to set the framework conditions to make sure the energy intensive industries find conditions for competitive production in Europe in the future, also by taking into account the risks of carbon leakage and possible indirect impacts of energy price increases caused by emission trading.

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<sup>2</sup> See [http://ec.europa.eu/internal\\_market/smact/docs/20110413-communication\\_en.pdf](http://ec.europa.eu/internal_market/smact/docs/20110413-communication_en.pdf) and EEC resolution on the Single Market Act from 12 May 2011.

22. Finally, innovation is what determines the future of European livelihood. If Europeans shall be able to live from export and consumption of high technology produce, we have to come up with new inventions in new areas, and make sure we are not outpaced by our global competitors. Especially important in this regard, is creating jobs to enable a high level of employment. The key to recovery from the financial crisis, as well as to creating well-functioning societies, is ensuring that people have a job and sufficient income to provide for themselves and their family.

## Energy

23. A common EU energy policy evolves around the objective to ensure the uninterrupted physical availability of energy products and services on the market, at a price which is affordable for all consumers (private and industrial), while contributing to the EU's wider social and climate goals. The central goals for energy policy are security of supply, competitiveness, and sustainability. The EU energy and climate goals have been incorporated into the Europe 2020 Strategy through the flagship initiative 'Resource efficient Europe'.

24. The Energy 2020 strategy focuses on five priorities: 1) Achieving an energy efficient Europe, 2) Building a truly pan-European integrated energy market, 3) Empowering consumers and achieving the highest level of safety and security, 4) Extending Europe's leadership in energy technology and innovation, 5) Strengthening the external dimension of the EU energy market.

### *Energy efficient Europe*

25. Energy related emissions account for almost 80% of the EU's total greenhouse gas emissions. The demand for electricity is expected to increase significantly. Energy is thus one of the greatest challenges Europe has to tackle to prevent climate change. Europe is moving in the right direction, as a majority of newly installed electricity generation capacity is from renewable sources, but other states such as the US and China are perceived as having better investment opportunities for renewable energy<sup>3</sup>.

26. Improving energy efficiency is one of the most cost effective ways to enhance security of energy supply, and to reduce emissions of greenhouse gas and other pollutants. In addition, energy savings have the potential of bringing major economic opportunities, improving productivity, driving down costs and boosting competitiveness. In this regard energy efficiency plays a vital part in achieving the Europe 2020 objectives of increased growth and job creation.

27. Competitiveness of green enterprises and development and implementation of innovative technologies are instrumental in moving towards a greener economy. Both EFTA and the EU subscribe to the principle of sustainable development and share a common objective of creating competitive and dynamic knowledge-based economies. Climate change prompts the urgency of greening of economies by minimising emissions and energy used per percentage of GDP created.

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<sup>3</sup> The independent 2010 Renewable Energy Attractiveness Index

Increased investments in green innovation should strengthen economic growth and inspire environmental and eco-sensitive management and production.

### *Integrated energy market*

28. The internal energy market is still fragmented and has not achieved its potential for transparency, accessibility and choice. Failing to achieve a well-functioning European energy market will only increase the costs for consumers and put Europe's competitiveness at risk. Companies have grown beyond national borders, but their development is still hampered by a host of different national rules and practices. Many barriers to open and fair competition remain.

29. The EU energy policy underlines the importance of reinforcing energy partnerships with key suppliers and transit countries. The EEA EFTA States are natural partners to the EU in this area, and share the aim of promoting key principles such as those contained in the Energy Charter Treaty (for example the freedom of transit, transparency, safety, investment opportunities as well as compliance with international law).

30. In its energy infrastructure priorities, the Commission underlines that the EU has to assure security of supply to its 500 million citizens at competitive prices against a background of increasing international competition for the world's resources. The relative importance of energy sources will change. For fossil fuels, notably gas and oil, the EU will become even more dependent on imports. The energy 2020 strategy stresses that diversification is key to increased competition and enhanced security of supply. On an EU level, supplies are diversified along three corridors; Northern Corridor from Norway, Eastern corridor from Russia, Mediterranean Corridor from Africa.

31. It is an important priority for the EU to ensure uninterrupted crude-oil supplies to land-locked EU countries in Central-Eastern Europe. This can be largely achieved within the existing infrastructure by reinforcing the interoperability of the Central-Eastern European pipeline network. The EEA EFTA States are net energy exporters to the EU and reliable trading partners. The North Seas Countries' Offshore Grid Initiative (NSCOGI) has been instrumental in reaching agreement on regional priorities and their implementation. The EEA EFTA States will be able to extend its export of energy to Central Europe with the planned integration and connection of energy production capacities in the Northern Sea with consumption centres in Northern and Central Europe and hydro storage facilities in the Alpine region and in the Nordic countries.

32. Improving the interconnectedness of the European energy infrastructure is vital to further market integration in the energy field. Europe needs smart, effective and competitive energy networks, and to exploit its potential for energy efficiency improvements. A single internal energy market for all EEA States will promote more affordable energy and better security of supply.

### *Energy technology and innovation*

33. Over the next ten years, energy investments in the order of €1 trillion are needed, both to diversify existing resources and replace equipment and to cater for challenging and changing

energy requirements. This should be achieved by accommodating investment in R&D through projects with private-public cooperation, as suggested in the Innovation Union strategy.

34. Measures must be taken to improve energy efficiency and switch to renewable energy sources. Innovation in the energy field is vital in achieving this and the industry depends on public finance as much of the technology related to renewables still is expensive and underdeveloped. For instance, the Liechtenstein government supports increased use of photovoltaics, i.e. electricity created from solar energy, in buildings. Although measures taken to reduce energy consumption will reduce cost in the long term, they often involve high initial cost. It is therefore important, especially for SMEs, that governments provide financial incentives.

35. Particular attention needs to be paid to a more strategic use of public procurement. Rules of public procurement need to insist on efficiency conditions to increase energy savings and spread innovative solutions, notably in buildings and transport. The potential of market-based and other policy instruments, including taxation, to enhance energy efficiency should be fully exploited.

36. Innovation in the energy sector is also an essential means to create new sustainable jobs, especially against the backdrop of Europe's recovery from the financial crisis. The EU has calculated that 3.7 million jobs could be created and annual GDP could be increased by close to 800 billion Euros by 2025 if the goal of spending 3% of EU GDP on innovation is met. Investments in innovation in the energy field are particularly targeted, as they contribute to Europe's global competitiveness and better the terms of operation in other sectors, in addition to job creation in the invested sector.

#### EEA EFTA/EU-cooperation

37. Through the Lisbon Strategy, the predecessor of Europe 2020, the EFTA States participated actively in the EU framework research programmes (the latest is FP7). For instance, the EEA EFTA States are associated members in the European Strategy Forum for Research Infrastructures (ESFRI). The EEA EFTA States also participate in the Competitiveness and Innovation Framework Programme (CIP) which proposes a coherent framework to improve competitiveness and innovation capacity in the EEA. It is part of the Community's efforts to deliver sustainable economic growth and create more jobs, by supporting actions that encourage the development of a knowledge society and sustainable development based on balanced economic growth. This valuable cooperation is expected and encouraged to continue under Europe 2020.

38. The EEA EFTA States make significant contributions to innovation, research and development in the EEA through the EEA and Norwegian Financial Mechanisms. The EEA grants amount to 998.5 million euro and the Norway grants 800 million euro and cover especially innovation in new green sectors. Funding is awarded to NGOs, businesses and organisations in the new EU Member States, as well as Greece, Portugal and Spain. The grants also serve the function of promoting close cooperation among the EEA States, as one in five projects are implemented in cooperation between project promoters in the beneficiary states and entities in the donor states. The rapporteur wants to highlight the existing strong relationship between EFTA

and the EU in research in the energy field and the contribution of the Financial Mechanisms to further enhance this. The EFTA States and the EU should continue their close cooperation and further improve it under the new proposals for an Innovation Union.

39. In the new Financial Mechanism 2009-14, priority is given to environmental protection, climate change and sustainable development. A quarter of the funding, around 450 million euro, will target environmental and climate efforts. EEA grants and Norway grants are also setting up a programme in the area of green industry innovation. The objective is to increase competitiveness of green enterprises, including greening of existing industries, green innovation and green entrepreneurship. The expected outcome is the realisation of the business opportunities of greening of the European economy, reduced production of waste and reduced emissions to air, water and ground, more use of environmentally friendly technologies, and increased green job creation and entrepreneurship.

40. Efforts to develop and promote carbon capture and storage (CCS) projects will be awarded an additional €160 million through the Norway Grants. The objective of the carbon capture and storage projects supported by the Norway Grants is to mitigate climate change, the goal being to capture and safely store CO<sub>2</sub> and possibly increase knowledge of and transnational cooperation on CCS. Research in this area is conducted in coordination and/or cooperation with other EEA States, for instance in European Carbon Dioxide Capture and Storage Laboratory Infrastructure under ESFRI.

41. Finally, the rapporteur wants to highlight the establishment of the European Institute of Innovation and Technology (EIT) in Budapest. The EIT is a novelty in the way it integrates education, research and innovation. It promotes new models of governance and financing, with its Knowledge and Innovation Communities (KICs) which aim to bring the world's best creative and innovative partners from research, business and academia to work together on major societal challenges. The EIT is an attempt to create a European equivalent to the excellent American research institutes, such as MIT. The EEA EFTA States participate fully in the EIT. The institute enhances research cooperation within the EEA and enables researches and industry in the EEA States to pool their efforts together and learn from each other's experiences.

### Recommendations

42. The rapporteur wants to underline the importance of the focus on renewable energy in the Europe 2020 strategy. Green innovation is the future and the essential means to achieve many of the major objectives of the strategy: limit climate change, the EU 20/20/20 goals, increase global competitiveness, boost economic growth, and job creation.

43. The EEA CC asserts that the green economy is the key to recovery from the financial crisis. Investment in innovation and R&D should be targeted towards a low-carbon economy and greening the energy sector. Innovation in the energy field is not only crucial in fighting climate change, but will create jobs for the highly skilled workforce that Europe aims to maintain and increase. Creating green jobs and employment is the key to provide decent work for all and combat long-term unemployment, and simultaneously limit the disastrous effects of climate change. The potential for job creation in sectors such as the renewable energy sector needs to

fully exploited and better accommodated for by the EEA States. Improving the conditions for innovation in such sectors is the most efficient means to achieve this.

44. The rapporteur wants to emphasise the benefits of close cooperation between the EEA States in the area of innovation generally, and in energy specifically. The EEA EFTA States' access to natural resources and advanced technology makes them attractive and reliable partners to the EU in the single energy market.

45. The EEA EFTA States and the EU share the goal of a prosperous Europe, that enjoys economic growth and simultaneously adhere to its ambitious climate objectives. Innovation in the field of energy towards renewable sources and energy efficiency is the only way to achieve this goal.

46. The rapporteur wants to stress that despite strained public finances, investment in innovation cannot be postponed. Our global competitors are making the necessary investments, and Europe needs to follow suit to maintain its position as a leader in innovation of new technology.