

Public consultation

Communication on energy technologies and innovation

(This questionnaire will be converted into an Internet based consultation document)

Outline of the proposal

Introduction

The European Commission has foreseen a Communication on energy technologies and innovation for the first half of 2013. It intends to give a European energy technology policy perspective in the follow-up to the Energy Roadmap 2050..

The Communication on Energy Technologies and Innovation intends to propose an integrated and coherent long-term strategy incorporating technology and non-technology aspects, necessary for the successful market transformation towards low-carbon economy and the achievement of the overall EU energy policy objectives (competitiveness, sustainability and security of supply).

At the same time the Communication will give a new impetus for a truly effective long-term energy technology policy in Europe and to the Strategic Energy Technology (SET) Plan¹.

Why we need an updated, longer-term technology pillar for the EU energy policy

The Strategic Technology Plan adopted by the European Commission in 2007 and the Communication on investing in energy technologies (2009) represented the "technology pillar" of the Energy and Climate EU policy. It set up a governance structure at EU level with the aim to accelerate the development of low carbon energy technologies through European Industrial Initiatives focused on moving technologies from proof-of-concept to industrialization and with the European Energy Research Alliance addressing the long term research and innovation agenda of energy technologies . As a result an information exchange between different groups of stakeholders took place and common planning tools (Technology Roadmaps and Implementation Plans up to 2020) have been developed for various technologies². The Technology Roadmaps of the SET Plan European Industrial Initiatives federated a common view on priority activities for the respective technologies development up to 2020.

As a consequence, direct public support to innovation could be increased at EU level through additional funding (to the energy budget under FP7) made available through European Economic Recovery Plan for Offshore Wind and Carbon Capture and Storage. The Technology Roadmaps served also as base for the proposal of more ambitious EC funding (doubling compared to 7th Framework Programme) for energy technology developments under the "Energy Challenge" of Horizon 2020.

¹ SET Plan: http://ec.europa.eu/energy/technology/set_plan/set_plan_en.htm

²For the renewable heating-cooling sector, such tools are under development

However direct public support to innovation remains limitedly coordinated between Member States and Member States and EU. Furthermore, it relies mainly on grants and subsidies while other instruments such as loans, guarantees have a smaller role.

Since its launch , major elements evolved and have modified the context in which the SET Plan has been developed: the global economic crisis, the evolution of discussions in relation to the post Kyoto obligations, the post-Fukushima debate on nuclear energy, the competitive edge of various technologies and the competitive pressure of manufactures from outside EU.

Europe maintains its broad energy policy objectives of security of supply, competitiveness and decarbonisation. To provide predictability both to industry and Member States Governments, the European Commission addressed the new challenges through a number of initiatives at policy and programming level:

- The **Roadmap for moving to a low-carbon economy in 2050** adopted by the European Commission in March 2011 emphasised the importance of the Energy sector to achieve the EU objective of reducing greenhouse gas emissions by 80-95% by 2050 compared to 1990.
- The **Energy Roadmap 2050** adopted by the European Commission in December 2011 gives a perspective of the EU energy policy post 2020. It intends to create a more predictable policy environment for investments in the energy sector. It identifies the need to renew and transform Europe's energy system. Renewable energy sources and energy efficiency have been identified as no regret options for future EU energy systems. However other technologies have to play a role. It recognizes the role of technology development to deliver solutions for post 2020: *“Higher public and private investments in R&D and technological innovation are crucial in speeding-up the commercialisation of all low-carbon solutions (Energy 2050 Roadmap)”*.
- The new EU research and innovation financing framework:
 - **Horizon 2020** programme covering the period 2014-2020 (adopted by European Commission in November 2011) foresees the doubling of the existing EC budget for energy research and demonstration. In its "Energy Challenge" it incorporates both technology (SET-Plan driven) and non-technology (barriers removal-driven) aspects (under the 'Market uptake of energy innovation' – as a successor to the Intelligent Energy Europe Programme II). Further, it envisages also a more extensive use of other instruments such as provision of loans, equity, guarantees (Access to Risk Finance) for technology development.
 - The proposal for EU 2014 – 2020 financial perspective strengthens the support to technology development by foreseeing in its **regional policy** the allocation of part of European Regional Development Fund budget for research and innovation especially in supporting the development of low carbon economy

These proposals ensure a considerably higher availability of financing support at EU level and as such create the conditions for a new impetus to the development of European energy technologies for the next 7 years.

- The **Communication on Renewable Energy** adopted by the European Commission in June 2012 emphasises the role of RES as a major player in the European energy market. At the same time recognises the “*strong growth in renewable energy markets which suggest that significant maturing of technologies*” such as “*photovoltaic systems and onshore wind production which are expected to be competitive in several markets by 2020*”. It also stresses the importance of technology development: “*It is important that we continue to use every tool at our disposal to drive down costs, to ensure renewable energy technologies become competitive and ultimately market driven*”.
- The proposal for a **Regulation on "Guidelines for trans-European energy infrastructure"** adopted by the European Commission on 19 October 2011 which aims at ensuring that strategic energy networks and storage facilities are completed by 2020.

External causes modified the economic landscape for technological development:

- The economic financial crisis had direct consequences on the budgets of national research and development programmes for energy, on the support schemes for renewables which sometimes resulted in the abandon of certain technologies and industries. The private sector has been affected and consequently the leveraging effect of public budgets in SET-Plan was lower than hoped for.
- The low carbon price does not ensure the assumed market signals for the development of low carbon technologies and has as direct consequence in the delay of market entry of certain technologies, particularly CCS
- China, India, USA, South Korea build strong positions in RD&D and manufacturing
- The entry into the international energy market of new products such as shale gas which change the economic dynamics for the other products

Therefore we need a long-term EU energy technology policy to:

- correct the shortcomings of existing policies and outline a post 2020 framework both in the area of research and development and market deployment including removal of market barriers
- take into account the changed framework conditions in EU and internationally to develop a strategy which uses at the best EU financing resources based on the experience earned from the implementation of the SET Plan and the Intelligent Energy Europe Programme II.
- foster decarbonisation through a competitive green growth in a global market

Energy technology and innovation – enhanced link to the EU energy policy

Energy technologies are rendered commercially interesting by measures which increase the availability of products and services and realise economies of scale in their production and deployment.

These measures can belong to different categories such as: technology push where research, demonstration and technological innovation to test full-scale technology applications are supported, as well as market uptake solutions, focused on the removal of

market barriers (awareness, low confidence, inadequate business models and knowledge), policy implementation (processes innovation) or mobilisation of investments (innovation in finance) .

The large scale demonstration or innovative projects for 2nd generation biofuels, electricity networks or Carbon Capture and Storage, or Smart Cities financed by 7th Framework Programme (and some of those technologies also through European Economic Recovery Package) showed that support for demonstration and innovation should be timely complemented by the adaptation of the regulatory and policy framework. For example, they face the hurdle that market pull or off-take agreements are not sufficient and sometimes inexistent. Therefore, even if large EC public financing is available, new business cases might need to be developed together with the use of various technologies at local or pan European level to successfully accommodate industrial scale demonstration projects.

Energy system and sector approach for the development of EU energy technologies

In 2007, the SET Plan has taken a sector approach to development of the energy technologies. Attention was mainly paid to research and larger industrial projects for each of the technology sectors identified as having an EU impact and contribution to the energy and climate policies by 2020: wind, solar (photovoltaics, Concentrated Solar Power), bioenergy, electricity networks, carbon capture and storage, nuclear, hydrogen and fuel cells. The wind and solar sectors identified also the activities related to their integration to electricity networks.

Since then new technologies or applications emerged such as: ocean technology, new storage options, demand side response or interoperability and complementarity between different technologies (smart electricity integration, use of ICT)

Energy efficiency started to be supported through real scale application projects under Smart Cities and Communities Initiative of the SET Plan, further developed into a European Innovation Partnership. The energy efficiency is treated as the main driver as well as the component of a more integrated system which combines it with the use of RES at local level and optimisation of the energy supply and follows etc.

The timely and cost effective development of the energy technology should give consideration also to an energy system perspective as technological progress lies as well at the interfaces of the energy systems. A sectoral vision for technological development might not always be sufficient and a more comprehensive understanding of the role of various energy technologies in the future EU energy supply is needed.

Geographical, climatic conditions, feedstock resources (for bioenergy), sea waters levels, economic and social characteristic considerations are of relevance as well.:

Communication on energy technologies and innovation

Based on the elements presented above the Communication on energy technologies and innovation intends to:

- give an EU energy technology strategy up to 2050 by investigating on possible technology paths and their cost effectiveness by 2020, 2030 and 2050

- enhance the link between the development, demonstration and market uptake of energy technologies and solutions
- investigate the modalities to strengthen a more comprehensive energy system approach for the development of energy technologies
- develop a balanced combination of technology push instruments and market pull (enabling markets) measures (IEE III) using under Horizon 2020 in support of an enhanced SET Plan
- increase the cost effectiveness of EU investment in the development of energy technologies and trigger private investment availability for energy innovation through the use of other instruments than grants such as loans, equity, guarantees (Access to Risk Facility), and provision for investment mobilisation support via project development assistance)
- investigate measures for enhanced collaborative implementation actions between Member States and European Commission in the development and roll out into the market of energy technologies including through the use of EU regional policy.
- Strengthening the strategic orientation of cooperation on energy research , development and innovation with third countries

As part of the preparation of this Communication, the present consultation seeks the opinion from all relevant stakeholders. Its purpose is to consult on possible options for a European energy technologies policy and to receive feedback and additional ideas on this proposal. A public consultation by means of this online questionnaire offers the opportunity to all interested stakeholders to express their views in the preparation stage of the Communication.

This **questionnaire** is divided into 4 thematic areas including several questions. Each of them is introduced by a short text outlining the context of the questions.

After the end of the consultation), the Commission will publish the findings of the consultation in a **report**. It will explain how the results of this consultation will be taken into account in the view of the Communication on energy technologies.

It should be noted that another, related public consultation regarding the implementation modalities for the successor of the Intelligent Energy for Europe Programme II (IEE II), IEE III, was conducted in the period 21 June- 12 September 2012 and its results will be taken into account for the Communication. The IEE II has focused on the removal of non-technology barriers to the market deployment of sustainable energy solutions. The successor to the IEE II is now included under the Horizon 2020 Energy Challenge's part on 'Market uptake of energy innovations', and will form an integral part of the Communication.

Thank you very much for participating in this public consultation.

Questions

1. *Characteristics of the respondent*

Question 1: *To which of the following categories do you belong?*

<input type="radio"/> <i>Public authority (please specify)</i>
<input type="radio"/> <i>National</i>
<input type="radio"/> <i>Regional</i>
<input type="radio"/> <i>Local / city level</i>
<input type="radio"/> <i>Academic / Research Institution</i>
<input type="radio"/> <i>Business (please specify)</i>
<input type="radio"/> <i>Association</i>
<input type="radio"/> <i>Individual business (please specify main activity)</i>
<input type="radio"/> <i>Manufacturing</i>
<input type="radio"/> <i>Utility</i>
<input type="radio"/> <i>Consultancy</i>
<input type="radio"/> <i>Service sector (other than financial or consultancy)</i>
<input type="radio"/> <i>SME</i>
<input type="radio"/> <i>Non-governmental organisation (NGO)</i>
<input type="radio"/> <i>Private individuals</i>
<input type="radio"/> <i>Other (please specify):</i>

Question 2: *If you represent an academic/research or business organisation, which is your main sector of activity?*

<input type="radio"/> <i>Wind</i>
<input type="radio"/> <i>Solar (Photovoltaic or Concentrated Solar Power)</i>

<input type="radio"/> <i>Electricity networks (transmission, distribution,, retailer, regulator)</i>	
<input type="radio"/> <i>Bioenergy</i>	
<input type="radio"/> <i>Carbon Capture and storage</i>	
<input type="radio"/> <i>Energy Efficiency</i>	
<input type="radio"/> <i>RES Heating/cooling</i>	
<input type="radio"/> <i>Nuclear</i>	
<input type="radio"/> <i>Hydrogen</i>	
<input type="radio"/> <i>Others</i>	
<input type="radio"/> <i>Not applicable</i>	

Question 3: *If you represent an academic/research or business organisation, where do you see your activity located ?*

<input type="radio"/> <i>International</i>
<input type="radio"/> <i>National</i>
<input type="radio"/> <i>Regional</i>
<input type="radio"/> <i>Local / city level</i>

2. Boost the development of energy technologies in support of energy policy

The EU support to the development of the energy technologies should ensure that a portfolio of cost effective energy technologies is proposed in support of the implementation of energy policies.

Furthermore the EU support to the development of the energy technologies should target those sectors and actions which will ensure a wide replication potential and impact at European level.

Bringing to the market new solutions is challenging. It requires not only technology push efforts to turn new ideas into commercial products but also demand-side measures to support their diffusion into the market

Question 4: *What is your opinion on the priority of the proposed approaches for the focus of EU RD&D support for the development of energy technologies? Please rate importance from 1 (not important) to 5 (very important)*

<i>Importance (please rate also the general headings) →</i>	1	2	3	4	5
<i>Energy systems</i>					
<i>Electricity networks and integration of renewable and distributed energy sources , active demand, storage (in general)</i>					
<i>Regional electricity networks in combination with supply energy technologies (in geographical boundaries of clusters of Member States)</i>					
<i>Pan European transmission electricity networks together with storage (including power to gas)</i>					
<i>Local energy networks(power/ heat-cool supply) in combination with supply technologies and local storage (in local/city conditions)</i>					
<i>Energy efficiency</i>					
<i>Through Smart Cities and Communities</i>					
<i>Through energy efficiency in buildings and /or industries</i>					
<i>Other (please specify)</i>					
<i>Energy technologies as of SET Plan</i>					
<i>Wind</i>					
<i>Onshore</i>					
<i>Offshore</i>					
<i>Manufacturing techniques</i>					
<i>Solar</i>					
<i>Photovoltaics</i>					
<i>Concentrated Solar Power</i>					
<i>Manufacturing techniques</i>					
<i>Carbon Capture and Storage</i>					
<i>Bioenergy</i>					
<i>biofuels</i>					

	<i>For electricity (CHP)</i>					
	<i>Nuclear</i>					
	<i>Hydrogen and fuel cells</i>					
	<i>Others (please specify)</i>					
<i>New emerging technologies – combinations of technologies</i>						
	<i>Ocean</i>					
	<i>Storage (not limited to Pumped Hydro, Hydrogen ,batteries, etc)</i>					
	<i>Hybrid systems</i>					
	<i>Geothermal (electricity)</i>					
	<i>Others (please specify)</i>					

Question 5: *Please give the justification for your selected approach and your ranking regarding the R&D EU support in the areas listed above.*

Your individual comments regarding this question (max. 100 words):

Question 6: *Energy technology development can be also fostered by appropriate non technological measures, the "market pull" instruments. Industrial demonstration projects are also confronted with non-technological obstacles. According to your experiences which of the following measures represent major bottlenecks in the implementation of these projects? Please rate the importance from 1 (not important) to 5 (very important)*

	<i>Importance →</i>	1	2	3	4	5
	<i>Lack of business models</i>					
	<i>Public Procurement difficulties</i>					
	<i>Permit/authorisation delays</i>					
	<i>Public opposition</i>					
	<i>Others (please specify)</i>					

Please specify for the obstacle(s) you rated highest to which technology(s) is linked (max. 50 words):

Question 7 Energy technology development can be also fostered by appropriate non technological measures, the "market pull" instruments. What are the key regulatory issues that impact on the deployment of these innovative technologies?"

Your individual proposals regarding this question (max. 100 words):

3 Energy technologies and their impact on policies

All technologies are needed but commitments and progress so far has been uneven. In some areas the progress appears to be promising, but others have experienced delays. The EU support to the development of the energy technologies should target those sectors and actions which will ensure an impact at European level. This can be achieved through the creation of a critical mass for these technologies and solutions and through the transferability of the generated know-how. The potential for deployment of various technologies and their contribution to energy, environment and industrial policies varies in time.

Question 8: The estimation of the investments in the development of energy technologies showed that Member States dedicate 85% of their energy R&D budget to research activities while demonstration activities account for approximately 15% . At EU level under the 7th Framework programme for energy 50% of the budget was allocated to research and 50% to demonstration activities. On which type of activities do you think that EU should focus its support for the development of energy technologies? Please rate the importance from 1 (not important) to 5 (very important) :

<i>Importance →</i>	1	2	3	4	5
<i>Long term research</i>					
<i>Applied research</i>					
<i>Demonstration projects</i>					
<i>First of a kind industrial activities</i>					
<i>Market uptake measures to support technology deployment and policy developments</i>					
<i>Others (please specify)</i>					

Your individual arguments regarding the option you chose and the corresponding technologies for that choice (max.100 words):

Question 9 *What types of financing instruments (grants, prizes, procurement, loans equity) should be used for the different types of activities listed in Question 8*

	Grants	Prizes	Procurement	Debt and equity	Others (please specify)
Long term research					
Applied research					
Demonstration projects					
First of a kind industrial activities					
Market uptake measures to support technology deployment and policy developments					
Others (please specify)					

Question 10: *The development of energy technologies under the Strategic Energy Technology Plan was mainly driven by EU 2020 energy and climate objectives.*

Further, the EU internal energy market creates the conditions for a market driven choice of the energy technologies coming from worldwide with positive effects on the competitiveness of EU industry in general (due to lower energy costs).

Both cases show that industrial policy dimension should become more visible in the development of the new energy technology policy. What should EU favour as an industrial policy element in its energy technology policy?

- reduced energy cost
- EU technologies leadership
- economic growth and jobs

Question 11: *The international dimension plays an increasing role in the development of energy technologies. The cooperation should take into account the EU position in the respective technology. Different cooperation methods have been tried with different outcomes. According to your experience, which of the proposed partners/sectors has the highest positive impact on the development of EU energy technologies? Please rate your preference from 1 (not important) to 5 (very important)*

<i>Importance (please rate also the general headings) →</i>	1	2	3	4	5
<i>Strategic partners for a portfolio of low carbon energy technologies</i>					
<i>United States of America</i>					
<i>Japan</i>					
<i>Korea</i>					
<i>China</i>					
<i>Russia</i>					
<i>Brazil</i>					
<i>India</i>					
<i>Others (please specify)</i>					
<i>Sector based cooperation</i>					
<i>Wind</i>					
<i>Electricity networks and storage</i>					
<i>Solar (PV and Concentrated Solar Power)</i>					
<i>Nuclear</i>					
<i>Carbon Capture and Storage</i>					
<i>Biofuels</i>					
<i>Energy Efficiency</i>					
<i>Marine technologies</i>					
<i>Hydrogen and fuel cells</i>					

<i>Others (please specify)</i>					
Individual project based cooperation (bottom –up)					

Question 12: If you gave high preference to the “sector based cooperation” in Question 9 please indicate the technology and corresponding country(s) of cooperation

<i>Your individual comments regarding this question (max.50 words):</i>

4. Structure for implementing energy technology policy

The Strategic Energy Technology Plan is currently implemented through: European Industrial Initiatives (EIIs) set –up for 7 sectors identified as energy technology priorities up to 2020, European Energy Research Alliance (EERA) which is the platform joining the leading research institutes in the energy field in Europe and the Steering Group which gives the voice to Member States and European Commission for the overall coordination of the implementation of the SET Plan.

Question 13 Are you or your organisation a member of or working in collaboration with one of the European Industrial Initiatives (EII) or European Energy Research Alliance (EERA)?

<input type="radio"/> <i>Yes</i>	<input type="radio"/> <i>No</i>
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IF YOU ANSWERED ‘YES’ TO QUESTION 13

Please tick the box corresponding the structure you belong: European Industrial Initiative(s) (EIIs) or European Energy Research Alliance (EERA)

<input type="radio"/> <i>EII</i>	<input type="radio"/> <i>EERA</i>
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IF YOU ANSWERED ‘YES’ TO QUESTION 13

Question 14: Which in your experience of the following conforms to your viewpoint on European Industrial Initiatives/European Energy Research Alliance? Please indicate if you agree or disagree on the scale from 1 (fully agree), 2 (agree), 3 (not sure/neutral), 4 (disagree) to 5 (strongly disagree).

	1	2	3	4	5
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<i>The EII/EERA has delivered a useful way to organise the work with partners and officials (from the Commission, Member States).</i>					
<i>We find that the EII:EERA is well set-up and allows us to participate well in its technology road-maps, governance and related funding opportunities.</i>					
<i>The technology road-maps, key performance indicators and implementation plans are a useful and realistic guide to our work.</i>					
<i>We believe that the EII/EERA will deliver the results it promised by 2020.</i>					

Question 15: *If you wish, please identify the EII/ERRA Joint Programme in which you take part. Also if you wish, please add further comments and views on the nature and method of the EII's/EERA and how this can be improved .*

Your individual comments regarding this question (max. 100 words):

Question 16: *The general types of cooperation (Technology Platforms, SET Plan European Industrial Initiatives, Public Private Partnerships, Joint Undertakings, European Energy Research Alliance etc) and contractual arrangements available (collaborative projects, ERANET mechanism, support actions etc) under the 7th Framework programme are good. Please indicate if you agree or disagree on the scale from 1 (fully agree), 2 (agree), 3 (not sure/neutral), 4 (disagree) to 5 (strongly disagree).*

	1	2	3	4	5
Types of cooperation.					
• <i>Technology Platforms</i>					
• <i>SET Plan European Industrial Initiatives</i>					
• <i>Public Private Partnerships</i>					
• <i>Joint Undertakings</i>					
• <i>European Energy Research Alliance</i>					
• <i>Collaborative projects</i>					
• <i>Others (please specify)</i>					
Contractual arrangements					

Question 17: If you stated 'disagree' to either part of Question 16, please specify what you believe should be improved.

Your individual comments regarding this question (max. 100 words):

Question 18 . The European Commission deployed its financial support towards the priorities set up by European Industrial Initiatives. Member States allocate their efforts to support research and innovation for energy technologies according to national priorities and conditions. In financial terms European Commission accounts for 20 % of the public investments for research and innovation in energy technologies while Member States for 80%. The European Commission should continue to focus its limited financial support to finance projects of EU added value and impact and answering to the "excellence criteria". To what extent do you agree with this statement?

- Fully Agree Agree not surE disagree strongly disagree

Please justify your answer in the question above (max. 100 words):

Thank you very much for participating in this public consultation