

**WORK PROGRAMME 2012**

*(Revised)*

***COOPERATION***

**THEME 5**

***ENERGY***

*(European Commission C(2011)9493 of 20 December 2011)*

The amendment includes a provision for a mapping information tool of sustainable biomass resources for biofuel production. The aim is to overcome the current lack of information regarding the available biomass resources produced in a sustainable way in Europe and globally in view of biofuel production. This tool is important for the achievement of the 10% target under the Renewable Energy Directive<sup>1</sup> by facilitating the circulation and availability of essential information throughout the European Union.

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<sup>1</sup> Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009

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**ANNUAL WORK PROGRAMME**  
**2012 COOPERATION THEME 5: ENERGY**

<b>Overall objective for FP7:</b>
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Adapting the current energy system into a more sustainable one, less dependent on imported fuels and based on a diverse mix of energy sources, in particular renewables, energy carriers and non polluting sources; enhancing energy efficiency, including by rationalising use and storage of energy; addressing the pressing challenges of security of supply and climate change, whilst increasing the competitiveness of Europe's industries.

## I. CONTEXT

### **Innovation Union aspects**

The Innovation Union initiative underlines that research and innovation are key drivers of competitiveness, jobs, sustainable growth and social progress. The work programme 2012 has been designed to support the implementation of the Innovation Union Initiative and in particular to bring together research and innovation to address major challenges.

The work programme can contribute to the innovation objective in two ways, and constitutes a significant change to the approach in earlier work programmes:

- By supporting more topics aimed at generating knowledge to deliver new and more innovative products, processes and services. This will include pilot, demonstration and validation activities.

The focus on innovation will be reflected in the description of the objectives and scope of the specific topics, as well as in the expected impact statements. The innovation dimension of the proposals will be evaluated under the evaluation criterion 'Impact'.

- By identifying and addressing exploitation issues, like capabilities for innovation and dissemination, and by enhancing the use of the generated knowledge (protection of intellectual property rights like patenting, preparing standards, etc).

Information on the Risk-Sharing Finance Facility (RSFF), an innovative financial instrument under FP7, is available on line<sup>2</sup>. The Commission will respond to further needs of potential beneficiaries for information on the RSFF (by, e.g., awareness-raising activities in conjunction with the European Investment Bank, participation to thematic events).

### **Approach for 2012**

The FP7 Energy Theme continues its focus on the implementation of the Strategic Energy Technology Plan (SET-Plan)<sup>3</sup>, the technology pillar of the EU's Energy and Climate policy. The great majority of topics included are supporting the SET-Plan European Industrial

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<sup>2</sup> <http://www.eib.org/products/loans/special/rsff/?lang=en> and [http://ec.europa.eu/invest-in-research/funding/funding02\\_en.htm](http://ec.europa.eu/invest-in-research/funding/funding02_en.htm)

<sup>3</sup> COM(2007) 723, COM(2009) 519

Initiatives' (EII) Technology Roadmaps and Implementation Plans. The Roadmaps specify the research and demonstration needs for the next decade to accelerate the market up-take of the most promising technologies in the areas of solar, wind, bioenergy, smart grids, Carbon Capture and Storage and smart cities. They are thus to a large extent geared towards innovation. The focus on the implementation of the EIIs has resulted in a concentration of activities on objectives and priorities commonly agreed between industry, Member States and the European Commission.

This approach has been endorsed by the European Parliament and the European Council of 4 February 2011 dedicated to energy and innovation. Its conclusions<sup>4</sup> state that "*the EU and its Member States will promote investment in renewables and safe and sustainable low carbon technologies and focus on implementing the technology priorities established in the European Strategic Energy Technology plan. (...) Europe's expertise and resources must be mobilized in a coherent manner and synergies between the EU and the Member States must be fostered in order to ensure that innovations with a societal benefit get to the market quicker. Joint programming should be developed*".

Embracing the spirit of the Council conclusions and the Innovation Union, this work programme launches for the first time a number of joint actions between the European Commission and Member States as well as Associated Countries:

- Topics, where relevant, encourage FP7 projects to cooperate with relevant national and regional projects in order to establish project clusters that facilitate knowledge sharing and dissemination of results.
- The proposed ERA-NET Plus on bioenergy offers Member States and the European Commission the possibility to jointly support demonstration activities in the bioenergy area.
- A number of topics encourage additional financial contributions from third parties.

In line with the objectives of the "Innovation Union", this work programme ensures that the whole chain of research and innovation is strengthened and made more coherent, from high risk / high impact frontier research to the market uptake: topics included in this work programme address key innovation bottlenecks that energy technologies are currently facing at:

- the technology creation stage, i.e. at the frontier research, R&D / proof of concept stages;
- the demonstration/commercialisation stage where companies seek scale-up capital to finance large, first of a kind projects with a view to commercial exploitation.

Reflecting the high priority of energy efficiency in the European energy and climate policy, the profile of energy efficiency research has been strengthened in this work programme. Adopting a challenge driven approach, a new area on 'Smart Cities and Communities' has been created within Activity 8 ('Energy Efficiency and Savings'). Topics under this area address the challenge of smart cities and communities in a holistic way that cuts across many technology areas. Close cooperation with other FP7 Themes and Programmes that also support research on this horizontal issue will be continued.

In addition, the innovation component of this work programme is reinforced by:

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<sup>4</sup> Council conclusion of 4 February 2011; EUCO 2/11 (note 10, 18)

- The inclusion of non-technical aspects such as users involvement, increasing public understanding and the development of testing methodologies;
- Requirements for industry leadership in a great number of topics.

Participation of SMEs is explicitly encouraged in the following topics:

- ENERGY.2012.2.5.1: Research, development and testing of solar dish systems;
- ENERGY.2012.3.2.1.: Biofuels from microalgae or macroalgae;
- KBBE.2012.1.2-01 (joint topic between the KBBE and the Energy Theme): Development of new or improved logistics for lignocellulosic biomass harvesting, storage and transport;
- ENERGY.2012.10.2.1: Future Emerging Technologies.

To ensure a high extent of knowledge sharing and update of research results, proposals funded under the various calls for proposals will be fully integrated into the Monitoring and Review Framework of the SET-Plan. Each funded project will be asked, where relevant, to report according to the Key Performance Indicators of the Industrial Initiatives and agreed Knowledge Sharing Arrangements<sup>5</sup>. National projects will also be invited to join the knowledge sharing scheme to maximise its impact. The Energy Theme continues also its participation in the Open Access Pilot in FP7: project participants are required to deposit peer-reviewed articles resulting from projects to an institutional or subject-based repository, and to make their best efforts to ensure open access to these articles within six months after publication.

For projects whose results are nearing market introduction, standardisation is often a key enabler for interoperability, ensuring product quality, opening markets and free trade and thereby building consumer confidence. Standardisation can help fostering market access of innovative solutions and thus help ensuring the practical application of research results. As such, projects could strengthen future innovation by considering the inclusion of pre- and co-normative research tasks and the integration of standardisation organisations to support standardisation.

This work programme is expected to impact decisively the implementation of the industry-led European Industrial Initiatives of the SET-Plan by providing Community funding – that will leverage national resources – to tackle their research and demonstration priorities. As a consequence, these activities will boost the development of new energy technologies and their market roll-out for the transition to a low-carbon society.

### **International cooperation**

All activities are open to researchers and research institutions from third countries and strong efforts are made to encourage them to seize this opportunity. Particular attention is paid to support strategic bilateral agreements and dialogues.

A topic has been explicitly highlighted as particularly well suited for international cooperation with CSLF (Carbon Sequestration Leadership Forum) countries:

- ENERGY.2012.5.2.2: Impact of the quality of CO<sub>2</sub> on transport and storage

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<sup>5</sup> For more information please consult the SETIS website: <http://setis.ec.europa.eu/>

With a view to promoting international cooperation with selected countries, initiatives for collaboration between project(s) under the following topics and suitable project(s) funded by these countries will be encouraged on the basis of mutual benefit and reciprocity:

- ENERGY.2012.7.3.2: Facilitating the deployment of safe stationary batteries (with Japan);
- ENERGY.2012.2.5.1: Research, development and testing of solar dish systems (with China).

In view of the strategic importance of our Southern neighbourhood and in line with the recently adopted Joint Communication 'A Partnership for Democracy and Shared Prosperity with the Southern Mediterranean'<sup>6</sup> active participation of relevant partners from Mediterranean Partner Countries will be encouraged in two topics:

- ENERGY.2012.2.5.2: Hybridisation of CSP with other energy sources;
- ENERGY.2012.4.1.1: Research and development for medium temperature range solar collectors (100°-250°C).

### **Cross Thematic approaches**

A cross sectoral approach is often necessary to achieve the breakthroughs needed. The Energy Theme collaborates thus with other FP7 Themes in the following topics:

- KBBE.2012.1.2-01: Development of new or improved logistics for lignocellulosic biomass harvesting, storage and transport (with the KBBE Theme);
- ENERGY.2012.3.2.2. Development and testing of advanced sustainable bio-based fuels for air transport (with the Transport Theme);

This work programme also continues to support the PPP on Energy-efficient Buildings with the topic 'ENERGY.2012.8.1.3: Demonstration of Zero Carbon Building Renovation for cities and districts'.

This work programme will also contribute to the cross-thematic call "The Ocean of Tomorrow" with a study of the environmental impacts of noise, vibrations and electromagnetic emissions from marine renewables.

Following the two previous "The Ocean of Tomorrow" cross-thematic calls, several topics will be launched to support the implementation of the Marine Strategy Framework Directive<sup>7</sup>. Cooperation will involve Theme 2 Food, Agriculture, Fisheries and biotechnology, Theme 5 Energy, Theme 6 Environment, (including climate change), and Theme 7 Transport (including Aeronautics). "The Ocean of Tomorrow" related topics are implemented in the framework of the Communication "A European strategy for marine and maritime research" COM(2008)534. The focus will be on research gaps about the definition and monitoring of the "Good Environment Status" (GES) of EU waters, to be achieved by 2020. Special

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<sup>6</sup> Joint Communication to the European Council, the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: 'A Partnership for Democracy and Shared Prosperity with the Southern Mediterranean', COM (2011) 200 final

<sup>7</sup> Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy, OJ L 164 25.6.2008, p.19

attention should also be given to the investigation of mitigation measures and SME participation whenever relevant.

Synergies and/or complementarities among projects selected for funding will be encouraged within the same theme or across themes. For information on "The Ocean of Tomorrow" related topics in other themes, see the corresponding work programme chapters<sup>8</sup>.

### **Socio-economic dimension of research**

Where relevant, account should be taken of possible socio-economic impacts of research, including its intended and unintended consequences and the inherent risks and opportunities. A sound understanding of this issue should be demonstrated both at the level of research design and research management. In this context, where appropriate, the projects should ensure engagement of relevant stakeholders (e.g. user groups, civil society organisations, policy-makers) as well as cultivate a multi-disciplinary approach (including, where relevant, researchers from social sciences and humanities). Projects raising ethical or security concerns are also encouraged to pay attention to wider public outreach.

### **Gender dimension**

The pursuit of scientific knowledge and its technical application towards society requires the talent, perspectives and insight that can only be assured by increasing diversity in the research workforce. Therefore, all projects are encouraged to have a balanced participation of women and men in their research activities and to raise awareness on combating gender prejudices and stereotypes. When human beings are involved as users, gender differences may exist. These will be addressed as an integral part of the research to ensure the highest level of scientific quality. In addition, specific actions to promote gender equality in research can be financed as part of the proposal, as specified in Appendix 7 of the Negotiation Guidance Notes ([ftp://ftp.cordis.europa.eu/pub/fp7/docs/negotiation\\_en.pdf](ftp://ftp.cordis.europa.eu/pub/fp7/docs/negotiation_en.pdf))".

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<sup>8</sup> 'Food, Agriculture and Fisheries, and Biotechnology' (KBBE), 'Environment (including climate change)' and 'Transport (including aeronautics)'

## **II. CONTENT OF CALLS IN 2011**

### **ACTIVITY ENERGY.1: HYDROGEN AND FUEL CELLS**

Starting from 2009, the topics in this Activity are defined in the Annual Implementation Plan of the Fuel Cells and Hydrogen Joint Undertaking (FCH JU), established on the basis of Article 187 TFEU (ex-Article 171 TEC). The FCH JU is an industry led public private partnership (PPP) which defines and manages a strategic, target-oriented research and development programme to support the broad market introduction of fuel cell and hydrogen technologies.

The FCH JU covers fundamental, industrial and applied research as well as demonstration and relevant cross-cutting activities. The detailed programme of activities is decided by its Governing Board. Therefore, such activities are not longer covered within this work programme. Please note, however, that topic "ENERGY.2012.10.2.1: Future Emerging Technologies" is open to all novel energy technologies.

## **ACTIVITY ENERGY.2: RENEWABLE ELECTRICITY GENERATION**

Research into, development and demonstration of integrated technologies for electricity production from renewables, suited to different regional conditions where sufficient economic and technical potential can be identified, in order to provide the means to raise substantially the share of renewable electricity production in the EU. Research should increase overall conversion efficiency, cost efficiency, significantly drive down the cost of electricity production from indigenous renewable energy resources including biodegradable fraction of waste, enhance process reliability and further reduce the environmental impact and eliminate existing obstacles.

### **AREA ENERGY.2.1: PHOTOVOLTAICS**

Research will include the development and demonstration of new processes for photovoltaic manufacturing, including the manufacturing of equipment for the Photovoltaic (PV) industry, new photovoltaic-based building elements complying with existing standards and codes and the demonstration of the multiple additional benefits of photovoltaic electricity. Longer term strategies for next-generation photovoltaics (both high-efficiency and low-cost routes) will also be supported.

#### **Topic ENERGY 2012.2.1.1: Reliable, cost-effective, highly performing PV systems**

*Open in call:* FP7-ENERGY-2012-1

*Content/scope:* Penetration of PV electricity in the European market is expected to increase. In order to reach grid-parity for photovoltaics, an intensive and constant R&D support is required to achieve cost reduction of the technology (€/Wp), increased performance, functionality, reliability and lifetime. Enhancement of these aspects at cell and module level has so far been quite extensively investigated. The present topic addresses these issues at system level, through integrated-testing, monitoring and performance modelling. Emphasis is given to:

- robust modelling for system design, addressing e.g., plant size and yield, module size, cell material and technology, BoS components, costs, uncertainty estimates;
- robust modelling for predicting and optimising the system output with respect to both the solar resource and local weather conditions, and the system behaviour itself;
- integrated energy management and storage control for both ground-based installations and building-integrated PV;
- sensors, advanced communication and feedback, real-time power control, global system monitoring and control for PV installations;
- hardware and software solutions (as a "toolbox") for field and laboratory testing.

The tools developed should take into consideration the variety of solar resource and photovoltaics systems in Europe and should be validated in a representative set of installations.

The extent of innovation of the projects will be measured, inter alia, against the envisaged impact on the enhancement of the system performance and reliability, the reduction of power losses and the improvement of grid integration.

*Funding Scheme:* Collaborative project

**Implementation/management:** The active participation of key industrial partners and technology suppliers is essential to form a multisectorial, multidisciplinary consortium able to achieve the full impact of the project. This will be considered during the evaluation under the 'Implementation' criterion.

For the system validation, coverage of a pan-European dimension is recommended in the analysis of existing PV installations or data collection from manufacturers. For this purpose, networking with relevant actors in the photovoltaics market and R&D community is strongly encouraged.

**Expected impact:** Quite apart from further advances in the core technology itself, the development of toolbox solutions for system modelling, monitoring and control is expected to optimize and enhance performances and reliability of the state-of-the-art commercial PV technology.

Proposals will have to include a clear plan for the exploitation of the scientific and technical results. This will be considered during the evaluation under the 'Impact' criterion.

**Additional information:** This action supports the implementation of the Solar Europe Industrial Initiative of the SET-Plan (SEII). Some issues of this topic are intended to be complementary to the activities of the project SOPHIA of the FP7 Research Infrastructures Programme. The European Commission reserves its right to ask the project, during the negotiation, to establish strong links, where appropriate, with relevant R&D projects at EU, national or regional level.

Up to 2 projects may be funded.

### **Topic ENERGY.2012.2.1.2: Demonstration of smart multi-functional PV modules**

**Open in call:** FP7-ENERGY-2012-2

**Contents/scope:** A multi-functional photovoltaic module is the basic electricity production element which shows several of the following features: enhanced modularity; simplicity of installation and utilization; suitability for use in a distributed generation configuration; flexibility in the utilization; easiness to integrate in power plants and/or buildings. Multi-functional PV modules development and demonstration combine electricity production with substantial ICT part (e.g. communication standards) and open new fields of applications. In the long run, functions in addition to electricity production such as electricity storage, light transmission or protection, thermal insulation or thermal power production will increase in relevance.

Multi-functional PV modules are the basic brick in the architecture of the smart grid, in stable connection with the network and the load to optimize/control energy use, energy delivery and energy storage and increase overall electricity system flexibility. It integrates the inverter, the monitoring of cell/module/system performances/failures (weather conditions included), the protection and safety devices, is self-configurable, under different shadowing conditions.

The demonstration of an innovative multi-functional PV module embedding the required functions may require the introduction new production steps in the already proven manufacturing processes. The demonstration phase follows the equally required development phase. A field demonstration of grid-connected PV systems based on multi-functional PV modules to measure the advantages of the new configurations should also be envisaged.

**Funding scheme:** Collaborative Project with a predominant demonstration component

**Implementation/management:** The leading role of relevant industrial partners is essential to achieve the full impact of the project. This will be evaluated under the 'implementation' and 'impact' evaluation criteria.

**Expected impact:** Higher reliability of the photovoltaic modules and systems; enhanced modularity; simplicity of installation and utilisation, also in a distributed generation configuration.

**Additional information:** This topic is focusing on development and demonstrating of multi-functional PV modules for both large power installations and distributed generation.

This action supports the implementation of the Solar Europe Industrial Initiative of the SET-Plan (SEII). The European Commission reserves its right to ask the project, during the negotiation, to establish strong links, where appropriate, with relevant R&D projects at EU, national or regional level.

It is envisaged that up to two projects could be funded.

## **AREA ENERGY.2.2: BIOMASS**

**In this Area, no topics are open in calls published in this work programme**

## **AREA ENERGY.2.3: WIND**

Innovative large scale on and off-shore wind power plants based on improved technologies, more robust, reliable and low-maintenance multi-MW turbines, combined with dependable output forecasting tools as well as with standards and certification schemes should bring wind power to higher levels of market penetration.

### **Topic ENERGY.2012.2.3.1: Innovative wind conversion systems (10-20MW) for offshore applications**

**Open in call:** FP7-ENERGY-2012-1

**Content/Scope:** The objective is to bring major innovations in the design and manufacturing of large wind energy conversion systems (aiming at 10-20MW) for offshore applications. Particular attention should be paid to substantially reducing the wind turbine head mass (rotor/nacelle) as well on marine-compatible substructures, including floating platforms. Innovations such as compact superconductor generators, smart blades, reliable magnetic pseudo-direct drive trains should be investigated alongside new turbine designs. Innovative low-cost substructures with suitable hydro-dynamic properties should be developed using long-lasting, anti-fouling, corrosion resistant materials with high damping properties.

**Funding Scheme:** Collaborative project

**Implementation/management:** The active participation of key industrial partners and technology suppliers is essential to form a multisectorial, multidisciplinary consortium able to achieve the full impact of the project. This will be considered during the evaluation under the 'Implementation' criterion.

**Expected impact:** Such development will allow the deployment of wind energy conversion devices from shallow to deep waters and to dramatically increase the offshore wind potential while reducing public acceptance barriers (noise, visual impact).

Proposals will have to include a clear plan for the exploitation of the scientific and technical results. This will be considered during the evaluation under the 'Impact' criterion.

**Additional Information:** This action directly supports the implementation of the European Industrial Initiative on Wind Energy of the SET-Plan.

A complementary topic on materials for wind turbine blades is included in the NMP Call (Provisional title: NMP.2012.2.2-4: Cost-effective materials for larger blades for off-shore wind energy applications). Avoiding duplication will be part of the negotiation of any ultimately selected project.

### **Topic ENERGY.2012.2.3.2: Demonstration of innovative designs to reduce fatigue loads and improve reliability of multi-MW turbines**

**Open in call:** FP7-ENERGY-2012-2

**Contents/scope:** A strategic objective of the industrial initiative of the SET Plan on wind energy is to reduce cost of energy by improving reliability and availability of wind turbines and their components. Optimizing operation and maintenance is an additional strategy for achieving this objective. Both increasing reliability and optimizing operation and maintenance have a direct impact on the availability of wind turbines and thus reduce costs and increases energy output.

This strategy contributes considerably to making wind energy fully competitive. This topic focuses on the first strategy: improving reliability by incorporating this concept in the design process of the entire wind turbine system.

The main goal of the project will be to upgrade existing reliability engineering methodologies to large wind turbine systems and demonstrate their effects during operation. The projects could address different types of climatic conditions and geographical locations in order to demonstrate improved reliability and availability under such operating conditions.

The application of reliability engineering methods and their validation may be applied to new rotor concepts and other turbine components, such as drive train components, designed for very large wind turbines (in the 2 to 6 MW range), in particular for offshore applications.

The project may focus on one or several of the following areas of work:

- Application of established reliability design methodologies to wind turbine systems, including enhancement, adaptation and demonstration on the basis of specific wind turbine issues;
- Comprehensive analysis of the flow inside wind farms and its impact on increased fatigue loading of wind turbines operating in wind farms;
- New concepts and materials for components aiming at considerable higher reliability levels.

**Funding scheme:** Collaborative Project with a predominant demonstration component

**Implementation/management:** The leading role of relevant industrial partners is essential to achieve the full impact of the project. This will be evaluated under the 'implementation' and 'impact' evaluation criteria.

**Expected impact:**

- Demonstrate the impact of improved reliability design on the cost of energy for large wind turbines;
- Demonstrate the effects of improved reliability on the maintenance needs and on operation and maintenance cost in general.

**Additional information:** This action supports the implementation of the European Wind Initiative of the SET-Plan (SEII). The European Commission reserves its right to ask the project, during the negotiation, to establish strong links, where appropriate, with relevant R&D projects at EU, national or regional level.

It is envisaged that up to two projects could be funded.

#### **AREA ENERGY.2.4: GEOTHERMAL**

**In this Area, no topics are open in calls published in this work programme.**

#### **AREA ENERGY.2.5: CONCENTRATED SOLAR POWER**

Concentrated solar power (CSP) has much scope for improvements in the optical and thermal efficiency of the solar components, power generation efficiency (including hybridisation with other fuel), and operational reliability.

A large reduction in both capital cost and maintenance cost, together with the improvement of the environmental profile, is necessary to make CSP systems more competitive with conventional electricity sources and other renewables.

##### **Topic ENERGY.2012.2.5.1: Research, development and testing of solar dish systems**

**Open in call:** FP7-ENERGY-2012-1

**Content/scope:** The topic aims to support applied research, development and testing of solar dish technology, which has the main advantages of high efficiency and modularity.

Further research and development is needed in order to reduce operation and maintenance costs and increase system reliability and life-time. This can be obtained, among others, by means of increased engine efficiency, increased mirror reflectivity, innovative and optimal designs and configurations, power block optimisation, and substitution of the Stirling engine with other types of engines, while keeping manufacturing costs low. The feasibility of linking the dish system to a storage system should be verified and developed if considered beneficial. The development should be undertaken with due consideration of the optimal range of output capacity of solar dish systems.

The project shall test the equipment developed at industrial scale.

**Funding scheme:** Collaborative project

**Expected impact:** Improved reliability, extended life-time and lower costs, notably for operation and maintenance costs, can significantly contribute to the widespread deployment of the solar dish technology.

Proposals will have to include a clear plan for the exploitation of the scientific and technical results. This will be considered during the evaluation under the 'Impact' criterion.

**Implementation/management:** The active participation of key industrial partners and technology suppliers is essential to form a multisectorial, multidisciplinary consortium able to achieve the full impact of the project. This will be considered during the evaluation under the 'Implementation' criterion.

The participation of SMEs is particularly encouraged. This will be considered under the 'Impact' criterion.

**Additional Information:**

Consortium(a) ultimately supported under this topic will be requested to participate, in the course of the execution of the project(s), in workshops organised between China and the EU in this area, aiming at defining areas of mutual interest for further exchange of information and cooperation with relevant Chinese projects. The costs of attending these workshops will be met by the European Commission.

This action supports the implementation of the Solar European Industrial Initiative of the SET-Plan (SEII).

Up to 2 projects may be funded.

**Topic ENERGY.2012.2.5.2: Hybridisation of CSP with other energy sources**

**Open in call:** FP7-ENERGY-2012-1

**Content/scope:** The objective of this topic is to support research, development and demonstration activities in the area of hybridisation of CSP technologies with other energy generation systems.

Different configurations can be considered to increase the efficiency, power availability, flexibility, dispatchability, energy storage, etc.

Project will have to demonstrate its potential in these respects and will have to prove the concepts at least at pre-industrial scale.

**Funding scheme:** Collaborative project

**Implementation/management:** The active participation of key industrial partners and technology suppliers is essential to form a multisectorial, multidisciplinary consortium able to achieve the full impact of the project. This will be considered during the evaluation under the 'Implementation' criterion.

The active participation of relevant partners from Mediterranean Partner Countries could lead to an increased impact of the RD&D activities to be undertaken. This will be considered during the evaluation under the 'Impact' criterion.

**Expected impact:** Efficient hybridisation of CSP plants is expected to broaden substantially the potential for use of the CSP technology

Proposals will have to include a clear plan for the exploitation of the scientific and technical results. This will be considered during the evaluation under the 'Impact' criterion.

**Additional Information:** Only the additional costs related to the innovative elements of the CSP plant and the hybridisation will be eligible for support.

This action supports the implementation of the Solar European Industrial Initiative of the SET-Plan (SEII).

Up to 1 project may be funded.

## **AREA ENERGY.2.6: OCEAN**

Electricity generation from ocean currents, waves, salinity gradients, tidal stream systems and ocean thermal energy conversion will benefit from further cost reductions through technological improvements in new components and system designs, leading to higher FP7 efficiencies and lower operator and maintenance requirements. Estimated current cost of electricity generation from the first-generation prototype plants are of the order of €0.08-0.20/kWh. Demonstration of ocean energy technologies should mainly address their intrinsic technical and financial risks. Among them the proving of the energy conversion potentials and the technical problems associated to the site's harsh environment. The large scale success of ocean energy needs demonstration at full scale of reliable, efficient and cost-effective systems with a view to commercial exploitation.

### **Topic ENERGY.2012.2.6.1: Demonstration of first ocean energy farms**

***Open in call:*** FP7-ENERGY-2012-2

***Contents/scope:*** This topic aims at demonstrating the manufacturing and the deployment of ocean energy farms for electricity generation, in real sea environments, with an installed capacity of 3MW or over. The energy farms should be composed of several devices of the same type, serving as a reference to facilitate bankability of similar projects in the future. The ocean systems should be connected to the electricity grid. The innovative component of the project, the monitoring of the operation, the reporting and the dissemination activities foreseen are expected to be described in detail. Key outputs should also include a detailed analysis of potential future energy cost reduction and the creation of a detailed business plan for full scale commercialisation.

***Funding scheme:*** Collaborative Projects with a predominant demonstration component

***Implementation/management:*** The leading role of relevant industrial partners is essential to achieve the full impact of the project. Applicants should be able to demonstrate a past record of success with deployment of large scale technology in the real sea environment and prove their ability to obtain necessary leases and licensees for project delivery (grid, environmental, etc.). Information and main results should be presented in the proposal. This will respectively be evaluated under the 'implementation' and 'impact' evaluation criteria.

***Expected impact:*** Large scale demonstration of ocean energy technology with a view to its commercial exploitation; higher visibility of the technology; reduction of manufacturing and production costs; improved reliability and efficiency; lower operation and maintenance requirements; increased availability and improved market confidence in the technology.

***Additional information:*** It is envisaged that up to two projects could be funded.

**See also the call for tender (IV. 'Other actions') in the context of 'THE OCEAN OF TOMORROW'**

## **AREA ENERGY.2.7: HYDRO**

**In this Area, no topics are open in calls published in this work programme**

**AREA ENERGY.2.8: INNOVATIVE INTEGRATION OF RENEWABLE ENERGY SUPPLY AND ENERGY EFFICIENCY IN LARGE BUILDINGS AND/OR CONCERTO COMMUNITIES**

**In this Area, no topics are open in calls published in this work programme**

**AREA ENERGY.2.9: CROSS-CUTTING ISSUES**

**Topic ENERGY.2012.2.9.1: Power generation in the low temperature range**

***Open in call:*** FP7-ENERGY-2012-1

***Content/Scope:*** The activities under this topic will focus on research and development of innovative systems for low temperature power generation such as binary plants and/or installations based on low enthalpy resources suitable for commercial scale power production. The aims are to significantly improve the current technologies and to increase the overall conversion efficiency in order to produce electricity from thermodynamic cycles of both of lowest possible temperatures and lowest possible temperature differences.

***Funding Scheme:*** Collaborative project

***Implementation/management:*** The active participation of key industrial partners and technology suppliers is essential to form a multisectorial, multidisciplinary consortium able to promote the innovative results of the projects and to achieve the full impact of the project at European level. This will be considered during the evaluation under the 'Implementation' criterion.

***Expected impact:*** The efficient exploitation of low enthalpy resources is expected to significantly broaden the potential of geothermal electricity production. Furthermore, as the use of the technology is not limited to geothermal resources it will also allow the efficient exploitation of other low enthalpy resources and make the European energy system more resource efficient. New technologies, new job opportunities and new markets are also expected.

Proposals will have to include a clear plan for the exploitation of the scientific and technical results. This will be considered during the evaluation under the 'Impact' criterion.

***Additional information:*** Up to 2 projects may be funded.

### **ACTIVITY ENERGY.3: RENEWABLE FUEL PRODUCTION**

Research into, development and demonstration of improved fuel production systems and conversion technologies for the sustainable production and supply chains of solid, liquid and gaseous fuels from biomass (incl. biodegradable fraction of waste). Emphasis should be on new types of Biofuels in particular for transport and electricity as well as on new production, storage and distribution routes for existing Biofuels, including the integrated production of energy and other added-value products through biorefineries. Aiming to deliver 'source to user' carbon benefits, research will focus on improving energy efficiency, enhancing technology integration and use of feedstock.

#### **AREA ENERGY.3.1: FIRST GENERATION BIOFUEL FROM BIOMASS**

**In this Area, no topics are open in calls published in this work programme**

#### **AREA ENERGY.3.2: SECOND GENERATION FUEL FROM BIOMASS**

Second generation biofuels comprise a range of alternatives such as lignocellulosic ethanol, syngas gas based fuels, pyrolysis-oil based biofuels and others. Activities will cover process development and system integration focusing on the conversion process, with a view to improve cost-competitiveness of biofuels while minimizing the environmental impact of biofuel production. Results are expected to expand the biomass feedstock available for biofuel production, assisting the take-off of a large biofuel industry while helping to avoid food/fuel competition for the land use.

#### **Topic ENERGY.2012.3.2.1: Biofuels from microalgae or macroalgae**

*Open in call:* FP7-ENERGY-2012-1

*Content/Scope:* The activities under this topic will focus on research and development of processing systems to convert microalgae or macroalgae in either an intermediate energy carrier or in biofuels ready for use. The project will bring together specialists from both algae production and algae conversion to biofuels in order to ensure adequate R&D feedback loops between the two communities. The aims are to reach optimum overall energy and mass balances, to improve the reliability and robustness of the relevant biofuels production systems, and to lower capital and operational costs. Research on production, development and optimization of algae strains will be conducted hand-in-hand with research on conversion and extraction technologies.

Research may consider the exploitation of co-products derived from algae conversion, but this is not the primary aim of the project.

*Funding scheme:* Collaborative project

*Implementation/management:* In order to maximise industrial relevance and impact of the research effort, the active participation of industrial partners, including SMEs, along with research organisations is essential. This will be considered during the evaluation under the 'Implementation' criterion.

*Expected impact:* The development of new or improved production technologies of algal biofuels is expected to foster the production of sustainable biofuels in an economically, socially, and environmentally manner, to largely contribute to the increasing demand from the

transport sector and to alleviate possible problems regarding competition with food in the bioenergy field. New competences, new job opportunities and new markets are also expected.

Proposals will have to include a clear plan for the exploitation of the scientific and technical results. This will be considered during the evaluation under the 'Impact' criterion.

**Additional information:** Up to two projects may be funded.

This action supports the implementation of the European Bioenergy Industrial Initiative of the SET-Plan.

**Topic ENERGY.2012.3.2.2: Development and testing of advanced sustainable bio-based fuels for air transport**

*(Topic implemented jointly by Themes ENERGY and Transport but only open in call FP7-ENERGY-2012-1)*

**Open in call:** FP7-ENERGY-2012-1

**Content/scope:** The topic will support the development and testing of biofuels for use in air transport. The project is expected to demonstrate the production of biofuels suitable for aviation at large enough scale and through long enough production runs in order to allow testing them in typical short to medium distances in Europe. The project should target the best possible sustainable feedstock and second generation conversion processes and building where relevant on existing plants. It should also make use of existing infrastructures for transportation, logistics, fuelling and testing. Flight testing shall be carried out and relevant datasets shall be collected for the final assessment.

The project should also investigate the complete engine fuel system with a special attention to the relationship between fuel composition range, combustion and air pollutant emissions. The potential variation of fuel blend properties resulting from the conversion process or from the mixing should be studied. Health and safety aspects of the fuel handling should be addressed, as well as logistic issues, such as transport and storage.

The project must meet relevant aviation fuel quality standards (ASTM specification). An environmental, economic and social sustainability assessment of the fuel cycle should be done. The biofuels should meet the 60% greenhouse gas emission saving requirement of the Renewable Energy Directive<sup>9</sup>. The project should also address barriers to innovation and include a study of the economic, social and regulatory implications of the large-scale biofuels utilisation in aviation.

**Funding scheme:** Collaborative project

**Implementation/management:** In order to maximise industrial relevance and impact of the research effort, the active participation of all relevant industrial actors from the production of the fuel to its testing is essential. This will be considered during the evaluation under the 'Implementation' criterion.

**Expected impact:** This project is expected to demonstrate the readiness of the technology to produce aviation biofuels in an economically, socially, and environmentally sustainable manner. The results should also serve the development of future scientifically sound

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<sup>9</sup> Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources

regulatory framework. Recommendations to solve potential barriers to large-scale commercialisation should be drawn.

Proposals will have to include a clear plan for the exploitation of the scientific and technical results. This will be considered during the evaluation under the 'Impact' criterion.

**Additional information:** Up to one project may be funded.

This action supports the implementation of the European Bioenergy Industrial Initiative of the SET-Plan. The work should complement the results of the SWAFEA study<sup>10</sup>.

**Topic ENERGY.2012.3.2.3: Pre-commercial industrial scale demonstration plant on lignocellulosic ethanol**

**Open in call:** FP7-ENERGY-2012-2

**Contents/scope:** This topic aims to support the construction of the first pre-commercial plant on lignocellulosic ethanol based on sustainable biomass resources including waste streams. The call aims at industrially led projects with minimum installed production capacity of 60,000 tons per year. The proposals should address the complete value chain including the supply chain of the sustainable biomass resource and the eventual use of the biofuel in the market wherever appropriate. A detailed Life Cycle Analysis and GHG calculations must be included in the proposal and will be evaluated under the "Scientific and Technological Quality" criterion.

**Funding scheme:** Collaborative Projects with a predominant demonstration component

**Implementation/management:** The leading role of relevant industrial partners is essential to achieve the full impact of the project. Applicants must demonstrate that by the time of the submission of their application (deadline of the call) they have been operating demonstration scale plants with minimum installed production capacity of 4,000 tons per year or have such plants under construction with planned commissioning the latest by 31/12/2012 (justification shall be provided in the proposal and will be evaluated under the 'Implementation' criterion). The number of operating hours by the time of the submission of the application (deadline of the call) may be an asset for the applicant. In addition, the proposers must provide additional information by completing Table 1 "Techno-economic Analytical data" and Table 2 "Key Performance Indicators" that have been approved by the TEAM of European Industrial Bioenergy Initiative (EIBI). Tables 1 and 2 as well as information on EIBI are made available through the relevant Guide for Applicants. The elements will be evaluated respectively under the 'Implementation' and 'Impact' evaluation criteria.

**Expected impact:** The construction of such pre-commercial plants will accelerate the deployment of lignocellulosic ethanol technologies aiming to facilitate achieving the EU lignocellulosic biofuels targets of the Renewable Energy Directive. Furthermore it will provide reasonable basis for ensuring the reliable supply of sustainable biomass resources to the plants and it will be the first step towards reducing the relative high cost of the enzymes used in the process and lignocellulosic ethanol. The combined production of a high annual volume of lignocellulosic ethanol will be the first step towards commercialisation and market deployment.

**Additional information:** The topic aims to facilitate the implementation of the SET Plan European Industrial Bioenergy Initiative (EIBI). The European Commission reserves its right

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<sup>10</sup> SWAFEA is a study for the European Commission's Directorate General for Transport and Energy to investigate the feasibility and the impact of the use of alternative fuels in aviation: <http://www.swafea.eu/>

to ask the project, during the negotiation, to establish strong links, where appropriate, with relevant R&D projects at EU, national or regional level.

It is envisaged that up to two projects could be funded.

### **Area ENERGY.3.3: Biorefinery**

**In this Area, no topics are open in calls published in this work programme**

### **AREA ENERGY.3.4: BIOFUELS FROM ENERGY CROPS**

**In this Area, no topics are open in calls published in this work programme**

### **AREA ENERGY.3.5: ALTERNATIVE ROUTES TO RENEWABLE FUEL PRODUCTION**

**In this Area, no topics are open in calls published in this work programme**

### **AREA ENERGY.3.6: BIOFUEL USE IN TRANSPORT**

**In this Area, no topics are open in calls published in this work programme**

### **AREA ENERGY.3.7: CROSS-CUTTING ISSUES**

Activities will focus on assessing and optimising the availability of biomass resources and biomass supply chains, feedstock logistics, market uptake, pre-normative research and harmonised methodologies. The results are expected to facilitate the expansion of renewable biofuel production in Europe.

### **KBBE.2012.1.2-01: Development of new or improved logistics for lignocellulosic biomass harvest, storage and transport**

*(Topic implemented jointly by Themes KBBE and ENERGY but only open in call FP7-KBBE-2012-6)*

**Content/scope:** The topic aims at the development of new or improved logistics for harvesting, transport and storage for each of the following raw material types: (1) agricultural residues (e.g. cereal straws, harvested weeds ...), (2) forestry residues (e.g. low value forestry wastes) and (3) biomass from energy crops. Each raw material type shall be investigated separately i.e. through an individual project. The projects should include the adaptation of agricultural practices (including sustainable soil management), the development of harvesting machineries adapted to the raw material used (combined harvesting equipment when appropriate), possible on-site pre-treatment of the biomass, storage and transport. The process operations for all the steps from harvesting to transport and storage should be defined and demonstrated at an industrial pilot-scale under real operational conditions.

Environmental (e.g. effect on soil organic content), economic (e.g. potential market for lignocellulosic biomass, economic viability and added value for farmers / forest owners) and social sustainability for the developed logistics shall be assessed, including scenarios for transport distances. The projects shall also investigate the social, economic, regulatory and

other barriers to innovation in this area. Proposals will have to include a clear plan for exploitation of the scientific and technical results.

**Funding scheme:** Collaborative project (small or medium-scale focused research project targeted to SMEs).

**Additional eligibility criteria:**

- The requested European contribution shall not exceed EUR 3 500 000 per proposal.
- Projects will be selected for funding on the condition that the estimated EU contribution going to SME(s) is 25% or more of the total estimated EU contribution for the project as a whole.

**Implementation/management:** In order to maximise industrial relevance and impact of the research effort, the active participation of agriculture and forestry sector players, machinery manufacturers and biomass end-users is essential.

**Expected impact:** The development of improved logistics to harvest, store and transport lignocellulosic biomass for the production of bio-energy and bio-materials is expected to create a market for agriculture and forestry residues, and for energy crops; and to foster the bio-energy market in Europe. The creation of a market for biomass residues is also expected to improve economic conditions at the farm and forestry level.

Projects will deliver practical solutions, implementable in the rural communities across Europe, to the supply of lignocellulosic biomass for bioenergy and bio-materials in an economically, socially, and environmentally sustainable manner. The projects will contribute to the implementation of EU policies, notably with respect to the SET-Plan and the bio-based economy.

**Additional information:**

- Up to one project will be funded in each of the three raw material types (agricultural residues, forestry residues and energy crops).
- The total budget of the topic is limited to EUR 10 000 000.

## **ACTIVITY ENERGY.4: RENEWABLES FOR HEATING AND COOLING**

Research, development and demonstration of a portfolio of technologies and devices including storage technologies to increase the potential of active and passive heating and cooling from renewable energy sources contribute to sustainable energy. The aim is to achieve substantial cost reductions, increase efficiencies, further reduce environmental impacts and optimise the use of technologies in different regional conditions where sufficient economic and technical potential can be identified. Research and demonstration should include new systems and components for industrial applications (incl. thermal sea water desalination), district and/or dedicated space heating and cooling, building integration and energy storage.

### **AREA ENERGY.4.1: LOW/MEDIUM TEMPERATURE SOLAR THERMAL ENERGY**

The focus of the solar thermal area will be on the following topics: i) to develop higher efficiency, and lower cost solar systems with high performing collectors (e.g. using plastic materials with high thermal and optical performances); ii) to develop small scale, high performing, low price, solar thermal cooling systems to meet the increasing demand from the tertiary and household sectors; iii) to demonstrate large scale solar thermal systems for industrial applications and solar heating and cooling as well as for sea water desalination.

#### **Topic ENERGY.2012.4.1.1: Research and development for medium temperature range solar collectors (100°-250°C)**

*Open in call:* FP7-ENERGY-2012-1

*Content/Scope:* Increasing the temperature range of collectors up to 250°C would open the way for industrial use of solar thermal energy, encompassing power generation, heating and cooling. The projects will develop innovative concepts and technologies to extend the working temperature range of solar collectors up to 250°C, to keep collector efficiency above 50%, to reduce heat losses and optimise energy output of collectors for industrial use. Projects will also have to consider the manufacturing issues (cost, equipment) associated with these novel collectors.

*Funding Scheme:* Collaborative project

*Implementation/management:* The active participation of key industrial partners and technology suppliers is essential to form a multisectorial, multidisciplinary consortium able to promote the innovative results of the projects and to achieve the full impact of the project at European level. This will be considered during the evaluation.

The active participation of relevant partners from Mediterranean Partner Countries could lead to an increased impact of the RD&D activities to be undertaken. This will be considered during the evaluation under the 'Impact' criterion.

*Expected Impact:* Expanding the temperature range in which solar collectors can be efficiently used will result in novel devices for power generation, heating and cooling. The technology is generic and hence a large economic impact and significant contributions to decarbonising our economy by replacing fossil fuels with an increased use of solar power are expected.

Proposals will have to include a clear plan for the exploitation of the scientific and technical results. This will be considered during the evaluation under the 'Impact' criterion.

**AREA ENERGY.4.2: BIOMASS**

**In this Area, no topics are open in calls published in this work programme**

**AREA ENERGY.4.3: GEOTHERMAL ENERGY**

**In this Area, no topics are open in calls published in this work programme.**

**AREA ENERGY.4.4: INNOVATIVE INTEGRATION OF RENEWABLE ENERGY SUPPLY AND ENERGY EFFICIENCY IN LARGE BUILDINGS AND/OR CONCERTO COMMUNITIES**

**In this Area, no topics are open in calls published in this work programme.**

**AREA ENERGY.4.5: CROSS-CUTTING ISSUES**

**In this Area, no topics are open in calls published in this work programme.**

## **ACTIVITY ENERGY.5: CO<sub>2</sub> CAPTURE AND STORAGE TECHNOLOGIES FOR ZERO EMISSION POWER GENERATION**

Research, development and demonstration of technologies to drastically reduce the adverse environmental impact of fossil fuel use aiming at highly efficient and cost effective power and/ or steam generation plants with near zero emissions, based on CO<sub>2</sub> capture and storage technologies, in particular underground storage.

### **AREA ENERGY.5.1: CO<sub>2</sub> CAPTURE**

**In this Area, no topics are open in calls published in this work programme.**

### **AREA ENERGY.5.2: CO<sub>2</sub> STORAGE**

Projects in this area should address the safety of geological CO<sub>2</sub> storage at all timescales, the liability issues, for different kinds of CO<sub>2</sub> storage underground, e.g. saline aquifers, depleted oil or gas fields, enhanced oil or gas recovery, enhanced coal bed methane.

#### **Topic ENERGY.2012.5.2.1: Sizeable pilot tests for CO<sub>2</sub> geological storage**

***Open in call:*** FP7-ENERGY-2012-1

***Content/scope:*** Pilot tests to validate and improve model predictions of the behaviour of injected CO<sub>2</sub> at scale, and demonstrate the technologies and protocols for successfully implementing and validating long-term safe storage of sequestered CO<sub>2</sub>. Injection of CO<sub>2</sub> should be at a meaningful scale, allowing extrapolation of the results to industrial scale storage operations. Research could include storage complex characterization (testing of reservoir/cap rock systems), modelling of injection and storage (including model verification with field test data), risk assessment, well technology, reactive transport processes, etcetera. Projects should include real-time monitoring (including for induced seismicity) and should address mitigation/ remediation of leakage as well as public engagement and education. Proposals should demonstrate how they plan to obtain any necessary leases and licenses, as well as how they plan to engage with the local community.

***Funding scheme:*** Collaborative Project

***Additional eligibility criterion:*** The requested EU contribution per project shall not exceed EUR 9 Million.

***Expected impact:*** To maximise the EU-added value, the test site(s) used in the project should be developed into open-access laboratories for research and training. The project should contribute significantly to increasing public understanding through effective and continuous communication, in particular using real-time visualisation of the CO<sub>2</sub> containment.

Knowledge sharing with other storage pilots and industrial CCS demonstration projects is a key element of this topic. In order to validate the results of the project and to maximise the potential impact, the consortium should establish cooperation with the research carried out in at least one industrial-scale CCS demonstration projects including those supported by the European Energy Programme for Recovery (EPR) and the NER300 of the Emissions Trading Scheme.

Proposals will have to include a clear plan for the exploitation of the scientific and technical results. This will be considered during the evaluation under the 'Impact' criterion.

***Additional Information:***

To realise such storage pilot at meaningful scale, a substantial part of the funding is expected to come from third parties.

In case the total volume to be stored exceeds 100 kilo tonnes, the Directive on Geological Storage of CO<sub>2</sub> applies.

This topic contributes to realising the Implementation Plan (2010-2012) and the Technology Roadmap (2010-2020) of the European Industrial Initiative on CCS, and the resulting project(s) will form part of the EII.

Up to 2 projects may be funded.

**Topic ENERGY.2012.5.2.2: Impact of the quality of CO<sub>2</sub> on transport and storage**

***Open in call:*** FP7-ENERGY-2012-1

***Content/scope:*** Techno-economic assessment of the impact of impurities in CO<sub>2</sub>, from power plants and other CO<sub>2</sub> intensive industries, on fluid properties, phase behaviour and chemical reactions in the transport pipelines and the storage infrastructure and storage site integrity. This should include the determination of physical-chemical characteristics of most important mixtures, assessing their impact on pressure drop, compressor power and design of pipelines/wells, and testing the behaviour of these mixtures at relevant conditions. Projects should include a pre-normative research component; results should form the basis for a classification of impurities in CO<sub>2</sub> streams from power plants and other CO<sub>2</sub> intensive industries with CCS, and provide recommendations for tolerance levels, mixing protocols and material selection for transport and storage infrastructure, on storage site integrity, and health and environmental hazards.

***Funding scheme:*** Collaborative Project

***Expected impact:*** Mixing CO<sub>2</sub> streams of different composition is a challenge for the development of integrated CO<sub>2</sub> pipeline infrastructure. Projects should provide a technical knowledge base for the definition of protocols, pipeline specifications and safety regulations. Inclusion of research organisations specialising in relevant pre-normative research, as well as industrial partners active in CO<sub>2</sub> capture, could lead to an increased impact of the research to be undertaken.

Proposals will have to include a clear plan for the exploitation of the scientific and technical results. This will be considered during the evaluation under the 'Impact' criterion.

***Implementation and management:*** The active participation of relevant partners from the Carbon Sequestration Leadership Forum, in particular the U.S., Canada and China, could add to the scientific and/or technological excellence of the project(s).

***Additional Information:*** This topic contributes to realising the Implementation Plan (2010-2012) and the Technology Roadmap (2010-2020) of the European Industrial Initiative on CCS, and the resulting project(s) will form part of the EII.

**ACTIVITY ENERGY.6: CLEAN COAL TECHNOLOGIES**

Research, development and demonstration of technologies to substantially improve efficiency, reliability and cost of coal (and other solid hydrocarbons) fired power plants. This can also include the production of secondary energy carriers (including hydrogen) and liquid or gaseous fuels. 'Clean coal' in this context really means a sustainable solid hydrocarbon value chain with a focus on efficient and clean coal utilization, i.e. coal use aiming at zero or significantly reduced emissions by means of enhanced plant efficiency and CO<sub>2</sub> capture and storage.

**AREA ENERGY.6.1: CONVERSION TECHNOLOGIES FOR ZERO EMISSION POWER GENERATION**

**In this Area, no topics are open in calls published in this work programme.**

**AREA ENERGY.6.2: COAL-BASED POLY-GENERATION**

**In this Area, no topics are open in calls published in this work programme.**

**CROSS-CUTTING ACTIONS BETWEEN ACTIVITIES ENERGY.5 AND ENERGY.6**  
**(Activity ENERGY.5&6)**

This section includes areas and topics that are cross cutting between 'CO<sub>2</sub> capture and storage for zero emission power generation' and 'clean coal technologies', which in many ways are complementary activities.

**AREA ENERGY.5&6.1: POWER GENERATION TECHNOLOGIES FOR INTEGRATED ZERO EMISSION SOLUTIONS**

**Topic ENERGY.2012.5&6.1.1: Pilot plant-scale demonstration of advanced post-combustion CO<sub>2</sub> capture processes with a view to integration in fossil fuel power plants**

*Open in call:* FP7-ENERGY-2012-2

*Content/scope:* This topic aims to further develop and demonstrate advanced post-combustion CO<sub>2</sub> capture processes, already tested but not yet fully validated, with a view to their implementation and integration with fossil-fuelled power generation.

The topic addresses enhancements to currently available post-combustion technologies but is also open to proof of reliability of innovative, next-generation CO<sub>2</sub> post-combustion processes (for instance high temperature carbonate looping cycling, membranes or vacuum swing absorption processes and low temperature thermal swing absorption processes) and to the novel use of known technologies. This can also include the construction and operation of appropriately sized slipstream facilities at operational power plant for R&D on advanced solvent development. The focus of the activities should be the up-scaling and demonstration of the proposed capture processes from state-of-the-art to pilot plant stage, ideally in the order of 10 MW or more, depending on the level of maturity and readiness of the technological pathway investigated. The targeted applications are those for both new and retrofitted power plants.

Successful project(s) under this topic are expected to further develop, test and integrate the proposed CO<sub>2</sub> capture concepts with the power plant. Issues to be addressed in such projects include: the seamless operation of the capture processes, even at relatively low CO<sub>2</sub> concentrations: tolerance to impurities in flue gas, including SO<sub>x</sub>, NO<sub>x</sub>, oxygen and water, as well as traces of metals, chlorides and particulate matter.

The proposed technological solutions should aim to optimise critical components of the CO<sub>2</sub> capture system for improved overall performance, in terms of efficiency and cost, as well as to fine-tune responses to the power generation process. The objectives are to demonstrate process efficacy, to minimise losses and enhance the capture plant efficiency, to maximise the power output in the integrated system, to reduce the capital and operating costs, and to increase the reliability and operability of the proposed system. Issues such as robustness and environmentally friendly integration, with respect to water consumption, pollutants and waste generation, but also potential health and safety concerns where relevant, should also be carefully addressed.

*Funding scheme:* Collaborative project with a predominant demonstration component

*Implementation/management:* The leading role of relevant industrial partners is essential to achieve the full impact of the project. This will be evaluated under the 'Implementation' and 'Impact' evaluation criteria.

**Expected impact:** The successful project(s) should result in a major step forward in the validation and demonstration of integrated CO<sub>2</sub> post-combustion capture technologies in power generation, leading to significantly lower energy penalties and environmental impacts, and mitigating the drawbacks of current processes.

**Additional information:** This action supports the implementation of the European Industrial Initiative on CCS of the SET-Plan. The European Commission reserves its right to ask the project, during the negotiation, to establish strong links, where appropriate, with relevant R&D projects at EU, national or regional level.

**Topic ENERGY.2012.5&6.1.2: Pilot plant-scale demonstration and integration of emerging and new combustion technologies**

**Open in call:** FP7-ENERGY-2012-2

**Content/scope:** This topic aims to conduct research and demonstrate inherent CO<sub>2</sub> separation technologies based on Chemical Looping Combustion (CLC) and realise their integration in to an industrial pilot plant for the reduction of efficiency penalties and costs.

Successful project(s) are expected to verify an optimised performance of the CLC concepts investigated with respect to, for instance, the fuel conversion process, the performance and subsequent scaled-up potential of: oxygen carriers (in terms of capacity, kinetics, mechanical and chemical stability, or possibilities for fuel flexibility) and ash separation. In addition, reactor design and eventually structural optimisation will be prerequisites for the effective scaling-up of the process and should be accordingly addressed.

The overall performance of the optimised CLC/CO<sub>2</sub> capture process configuration and its plant integration should be demonstrated under real operating conditions to fully validate its potential, compared to currently available processes or those under development, for: lowering energy consumption, significantly improving net plant efficiency, reducing operating costs, and enhancing fuel or load flexibility. In addition, the environmental viability of the proposed integrated solution, and its impact on the power plant operation, should be carefully assessed, building upon current experiences and state-of-the-art data.

The demonstration should ideally be performed at a scale in the order of 10 MW to enable conclusions to be drawn about large-scale plant implementation.

**Funding scheme:** Collaborative project with a predominant demonstration component

**Implementation/management:** The leading role of relevant industrial partners is essential to achieve the full impact of the project. This will be evaluated under the 'Implementation' and 'Impact' evaluation criteria.

**Expected impact:** The successful project(s) should result in the acceleration of the development path of emerging CO<sub>2</sub> capture technologies with a view to their later integration in power plants and their potential for lowering costs and increasing net efficiencies.

**Additional information:** This action supports the implementation of the European Industrial Initiative on CCS of the SET-Plan. The European Commission reserves its right to ask the project, during the negotiation, to establish strong links, where appropriate, with relevant R&D projects at EU, national or regional level.

## **AREA ENERGY.5&6.2: CROSS CUTTING AND REGULATORY ISSUES**

Projects in this area should address economic, social, environmental and infrastructural development issues essential to the large scale commercial deployment of CCS technologies and/or the deployment of technologies to reduce GHG emissions in the coal sector.

### **Topic ENERGY.2012.5&6.2.1: Support to the coordination of stakeholders' activities in the field of Zero Emission Energy Production**

***Open in call:*** FP7-ENERGY-2012-1

***Content/scope:*** Major stakeholders in the field of Zero Emission Energy Production have established the ZEP European Technology Platform in order to foster cooperation in the field and to design and implement a Strategic Research agenda. This process should be supported by appropriate administrative and communication activities. Activities include the organisation and management of workshops, conferences and meetings among stakeholders as well as on the preparation of information leaflets, brochures, reports and other relevant documents. Communication activities will focus on facilitating the flow and exchange of information within the Technology Platform, with other relevant Technology Platforms, and externally, in particular with the European CCS Demonstration Project Network.

***Funding Scheme:*** Coordination and support action (supporting action)

***Additional Information:*** Up to one project may be funded. For this topic, the EU contribution will be up to 50% of the total eligible costs of the project for all participants, with a maximum contribution of EUR 500 000 for a period of three years.

## **ACTIVITY ENERGY.7: SMART ENERGY NETWORKS**

To facilitate the transition to a more sustainable energy system, a wide-ranging R&D effort is required to increase the efficiency, flexibility, safety, reliability and quality of the European electricity and gas systems and networks notably within the context of a more integrated European energy market.

### **AREA ENERGY.7.1: DEVELOPMENT OF INTER-ACTIVE DISTRIBUTION ENERGY NETWORKS**

Work in this sub-area aims to launch "families of projects" to contribute to the implementation plan of the European Electricity Grids Initiative. Families of projects combine local pilot or demonstration projects (primarily supported at national or regional level), and common R&D work packages for cross-border co-operation that are the object of the topics in this sub-area. Synergies with relevant projects funded by the ICT theme will be ensured.

#### **Topic ENERGY.2012.7.1.1: Integration of variable distributed resources in electricity distribution networks**

*Open in call:* FP7-ENERGY-2012-1

*Contents/scope:* The project should provide recommendations as well as scalable and replicable solutions for the technical, regulatory and economic challenges of integrating a very large share of distributed renewable generation units in distribution networks while maintaining reliable and high quality power, with particular emphasis on medium-scale resources. The work should be motivated by experiences from analyses, pilot projects and early demonstrations and should plan its validation in advanced large-scale demonstration projects. It may address issues such as network design rules, optimised connection and protection schemes, real-time supervision and operation, and remedies for harmonics and other disturbances that could be generated by power electronic interfaces. The solutions may require active real-time management of distributed generation and loads and/or the involvement of electricity storage options. Appropriate coordination with the transmission-level system operation and market operations should be considered. The project should analyse and compare different technical and organisational solutions being tested in Europe and measure these against appropriate key performance indicators. It should prepare replication options for the successful solutions.

*Funding scheme:* Collaborative Project.

*Expected impact:* The results should open the path for technically and economically viable deployment of smart grids solutions that enable a substantial increase of the hosting capacity for medium- and small-size renewable sources (mainly wind and PV farms) in existing medium- and low-voltage networks and allow an effective planning of necessary network reinforcements. It should allow distribution networks to be operated with reverse flows of electricity at times of high renewable electricity generation and low load. It should also allow for better observability of distributed resources for the system operator.

Significant Distribution System Operator (DSO) involvement is crucial for maximising the impact of the project. This will be considered in the evaluation under the 'Impact' criterion.

Proposals will have to include a clear plan for the exploitation of the scientific and technical results. This will be considered during the evaluation under the 'Impact' criterion.

**Implementation and Management:** The project(s) supported under this topic will require strong links with R&D and large-scale pilot/demonstration projects in Europe to form a family of projects addressing a functional project of the SET Plan European Electricity Grids Industrial Initiative. Links with grid integration projects expected to be supported by the NER300 scheme may also be included.

It is expected that most demonstration activities will take place in these linked projects.

**Additional Information:** This family of projects is expected to form part of the EEGI and to contribute to its monitoring and knowledge sharing scheme.

### **Topic ENERGY.2012.7.1.2: Enhancing electricity networks through use of distributed intelligence**

**Open in call:** FP7-ENERGY-2012-1

**Contents/scope:** The project should provide recommendations as well as scalable and replicable solutions for the application of advanced distributed sensors, monitoring and control systems to increase the intelligence of electricity distribution networks. The solutions may cover the assessment and monitoring of the components of the electricity system (condition monitoring), as well as the enhancement and optimization of the real-time operation of networks in real time at all voltage levels, with a special focus on the distribution network. The solutions should enable the dynamic loading of the components and the continuous assessment of their progressive ageing. The R&D activities could include the integration of distributed, simple and cheap sensors supporting local intelligence, inter-sensor communications, and communication with a central supervision system. Development of sensors should be excluded from the research activities. Reliability and security issues should be considered. Compatibility with network supervision systems (SCADA - supervisory control and data acquisition) and with existing equipment should be demonstrated. Interoperability of the sensors and of the communication schemes shall be at the core of all the developed systems. The work should contribute to mapping relevant standards and provide information for the development of further standardization activities. The project should analyse and compare different technical and organisational solutions being tested in Europe and measure these against appropriate key performance indicators.

**Funding scheme:** Collaborative project.

**Expected impact:** The systems developed and demonstrated should enable the deployment of cost-effective solutions for enhancing the observability and intelligence of European electricity networks, leading to more rational network management and appropriate scheduling of network investments.

Significant Distribution System Operator (DSO) involvement is crucial for maximising the impact of the project. This will be considered in the evaluation under the 'Impact' criterion.

Proposals will have to include a clear plan for the exploitation of the scientific and technical results. This will be considered during the evaluation under the 'Impact' criterion.

**Implementation and management:** The project supported under this topic will require strong links with R&D and large-scale demonstration projects in Europe to form a family of projects addressing a functional project of the SET Plan European Electricity Grids Industrial Initiative.

**Additional Information:** This work should take into account results of previous projects. This family of projects is expected to form part of the EEGI and to contribute to its monitoring and knowledge sharing scheme

**Topic ENERGY.2012.7.1.3: Empowering smart customers to participate in active demand and electricity supply system efficiency**

**Open in call:** FP7-ENERGY-2012-1

**Contents/scope:** The project should investigate barriers, opportunities and solutions for the active participation of users in active demand and in energy efficiency of the overall electricity system. This R&D project should emphasize the socio-economic aspects of demand participation and should investigate customer behaviour for different classes of users such as residential and small commercial/industrial users. The project should analyse and compare different technical and user interaction solutions and customer awareness initiatives being tested in Europe and measure these against appropriate key performance indicators. It should ensure the engagement of customer representation and pay particular attention to data protection issues.

**Funding scheme:** Collaborative Project.

**Expected impact:** The results should allow a better understanding of the measures that allow the active participation of the demand side in electricity markets and its contribution to the stability of the electricity networks. It should facilitate the deployment of active demand programmes in Europe by collecting and comparing technology solutions, providing a better understanding of customer behaviour, and providing insight in the success factors of customer awareness measures.

Proposals will have to include a clear plan for the exploitation of the scientific and technical results. This will be considered during the evaluation under the 'Impact' criterion.

**Implementation and management:** The FP supported R&D project will require strong links with R&D and large-scale demonstration projects in Europe to form a family of projects addressing a functional project of the SET Plan European Electricity Grids Industrial Initiative.

**Additional Information:** This family of projects is expected to form part of the EEGI and to contribute to its monitoring and knowledge sharing scheme.

**AREA ENERGY.7.2: PAN-EUROPEAN ENERGY NETWORKS**

**Topic ENERGY.2012.7.2.1: Planning for European Electricity Highways to ensure the reliable delivery of renewable electricity and pan-European market integration**

**Open in call:** FP7-ENERGY-2012-1

**Contents/scope:** Pan-European electricity networks may need to be enhanced with "electricity highways", in order to reliably deliver renewable electricity from distant sources to the load areas, to allow pan-European market flows and to exploit storage capacities where needed. The project should develop methods and tools to support the planning of these highways, based on various future power system scenarios, including for back-up and balancing

generation and storage capacities, and develop options for a pan-European grid architecture under different scenarios, taking into account benefits, costs and risks for each. It should engage a wide range of stakeholders in this process. The project should consider a wide range of drivers and potential barriers such as functionalities and boundary conditions of such highways, grid design options, technology bottlenecks, technical planning, operation and management, supply chain gaps, environmental and public acceptance as well as implications for market models, governance and regulation. It should also address transition planning between now, 2020, 2030, 2040 and 2050. The project should consider existing standardisation efforts and contribute as appropriate to their future development. It should in addition clearly identify bottlenecks needing additional research and development, including through demonstrators and in-situ testing, both onshore and offshore.

**Funding scheme:** Collaborative Project.

**Additional eligibility criterion:** Participation of at least 3 European Transmission System Operators (TSO's) is an eligibility criterion.

**Expected impact:** The project should clarify realistic options for future electricity highways in Europe and allow planning of their progressive deployment. It should hence contribute to the European policies on energy infrastructure. It should also provide information on required technology standardisation and regulatory changes that will unlock a staged deployment programme and prepare the way for further research, development and demonstration needed in the coming decade.

The active involvement and commitment of European TSO's is crucial for maximising the impact of the project. This will be considered in the evaluation under the 'Impact' criterion.

Proposals will have to include a clear plan for the exploitation of the scientific and technical results. This will be considered during the evaluation under the 'Impact' criterion.

**Additional Information:** This work should take into account the results of previous projects and be coordinated with ongoing R&D projects concerning the planning and operation of the pan-European electricity transmission network. The project(s) will contribute to realising the Implementation Plan (2010-2012) of the European Electricity Grids Industrial Initiative and is/are expected to form part of the EEGI and the work performed under the Electricity Highways Platform of the Florence Electricity Forum and to participate in its monitoring and knowledge sharing scheme.

## **AREA ENERGY 7.3: CROSS CUTTING ISSUES AND TECHNOLOGIES**

This activity will cover enabling and emerging technologies and cross-cutting issues, of a technical and non-technical nature, required to support the development of the Smart Energy Networks. It will also address activities of support to the coordination of non-community research programmes.

### **Topic ENERGY.2012.7.3.1: Networking of national R&D and demonstration projects on smart metering infrastructure and data processing**

**Open in call:** FP7-ENERGY-2012-1

**Contents/scope:** The project should support the interaction among national projects preparing the deployment of smart meters in the context of the 3<sup>rd</sup> internal energy market package, and in particular, elaborate an in-depth comparison among different solutions for smart metering infrastructure and smart meter data processing being tested in demonstration projects in

Europe. Topics include the integration of standardised solutions for metering and communication that enable future smart grid functionalities, information exchange between stakeholders as enabler for new businesses, and measures taken to respect consumer privacy and to ensure "cyber-security". Exploitation of electricity metering infrastructures for multi-metering addressing different utilities can be considered.

**Funding scheme:** Coordination and support action – coordinating action

**Expected impact:** The exchange of information among R&D and demonstration projects should speed up the learning curve for open, standardised metering technologies and infrastructure, and for the opportunities to exploit metering information to support smart grids functionalities, while respecting the needs for consumer privacy.

Proposals will have to include a clear plan for the exploitation of the scientific and technical results. This will be considered during the evaluation under the 'Impact' criterion.

**Implementation and management:** This FP supported coordination action project will require strong links among R&D and large-scale demonstration projects in Europe to form a family of projects addressing a functional project of the SET Plan European Electricity Grids Industrial Initiative. This family of projects is expected to form part of the EEGI and to contribute to its monitoring and knowledge sharing scheme. The partnership and its links with other initiatives should ensure appropriate impact. This will be considered in the evaluation under the 'Impact' criterion.

### **Topic ENERGY.2012.7.3.2: Facilitating the deployment of safe stationary batteries**

**Open in call:** FP7-ENERGY-2012-1

**Contents/scope:** Research should focus on safety aspects of Li-ion batteries with a cell size larger than 10 Ah and in a system larger than 1 MWh. The work should take account of international activities in the field of standardisation.

Through the use of recognised risk assessment, the research should propose improved methodologies and protocols for safety testing in several or all of the following sub-areas: transport, installation/commissioning, operation, periodic inspection, maintenance, decommissioning, and removal phase. Relevant environmental aspects should be considered in the proposal. The work should include modelling, measurement and testing development with robust validation. The consortium composition should be balanced. The involvement of the battery manufacturing industry and end-users is encouraged.

**Funding scheme:** Collaborative Project

**Expected impact:** The results should contribute to safe deployment of Li ion batteries for grid applications.

Proposals will have to include a clear plan for the exploitation of the scientific and technical results. This will be considered during the evaluation under the 'Impact' criterion.

**Additional Information:** With a view to promoting international cooperation with Japan, initiatives for collaboration between project(s) under this topic and selected Japanese project(s) will be encouraged on the basis of mutual benefit and reciprocity. The Commission reserves the right to ask the coordinators of FP7 projects, during the contract negotiations, to include collaboration activities (e.g. exchange of information, exchange of researchers) with selected Japanese project(s) that are financed by the Japanese Ministry for Economy Trade and Investment (METI) and the New Energy and Industrial Technology Development Organization (NEDO).

**Topic ENERGY.2012.7.3.3: Support to the coordination of stakeholders activities in the field of Smart Grids**

*Open in call:* FP7-ENERGY-2012-1

*Contents/scope:* Major stakeholders in the field of electricity grids have established the European Technology Platform on Smart Grids in order to foster cooperation in the field and to design, update and implement a Strategic Research agenda. This process should be supported by appropriate administrative and communication activities. Administrative activities include the organisation and management of workshops, conferences and meetings among stakeholders. The platform should support the involvement of a wide range of stakeholders in the activities of the SET Plan European Electricity Grids Initiative, and liaise with other initiatives in the SET Plan and in other contexts. Communication activities will focus on facilitating the flow and exchange of information within the Technology Platform, with other relevant Technology Platforms, and externally; on development and maintenance of IT tools, as well as on the preparation of information leaflets, brochures, reports and other relevant documents.

*Funding scheme:* Coordination and support action – coordinating action

*Expected impact:* The exchange of information among R&D and demonstration projects and initiatives should speed up the learning curve for open, standardised smart grids technologies, while respecting the needs for consumer privacy.

*Additional Information:* This FP supported coordination action project will aim at creating strong links among stakeholders and RD&D initiatives at European, national and regional level to contribute to the success of the SET Plan EEGI.

Up to one project may be funded. For this topic, the EU contribution will be up to 50% of the total eligible costs of the project for all participants, with a maximum contribution of EUR 500 000 for a period of three years.

## **ACTIVITY ENERGY.8: ENERGY EFFICIENCY AND SAVINGS**

The vast potential for final and primary energy consumption savings and improvements in energy efficiency need to be harnessed through the research into, optimisation, validation and demonstration of new concepts, optimisation of proved and new concepts and technologies for buildings, transport, services, and industry. Large-scale actions may be supported by innovative R&D addressing specific components or technologies. A key aim is the optimisation of the local community energy system, balancing a significant reduction in energy demand with the most affordable and sustainable supply solution, including the use of new fuels in dedicated fleets.

### **AREA ENERGY.8.1: EFFICIENT ENERGY USE IN THE MANUFACTURING INDUSTRY AND BUILDING SECTOR**

The manufacturing industry is consuming large quantities (percentage of primary energy) of energy - electricity, heat, cold, fuels - for the production of industrial and consumer goods; any increase in energy efficiency in the manufacturing processes would deliver significant benefits on security of energy supply as well as reduction of green house gases emissions while reducing the cost of the manufactured goods.

#### **Topic ENERGY.2012.8.1.1: Next generation heat pump technologies**

***Open in call:*** FP7-ENERGY-2012-1

***Content/Scope:*** This R&D topic is aimed at development of very efficient heat pumps using alternative refrigerants (e.g. natural refrigerants), sorption heat pump technologies and high power heat pumps. Projects will also investigate heat pump systems combined with other renewable energies and intelligent integration of heat pumps into large renewable energy systems including storage.

***Funding scheme:*** Collaborative project

***Implementation/management:*** The active participation of key industrial partners and technology suppliers is essential to form a multisectorial, multidisciplinary consortium able to promote the innovative results of the projects and to achieve the full impact of the project at European level. This will be considered during the evaluation.

***Expected Impact:*** Heat pumps are components that can enhance significantly the efficiency of various energy systems, e.g. for heating and cooling and in geothermal installations. The research project will enhance the application range of heat pumps by focusing on high power heat pumps and heat pumps with environmentally friendly working fluids as well as their cost effective integration into larger systems.

Proposals will have to include a clear plan for the exploitation of the scientific and technical results. This will be considered during the evaluation under the 'Impact' criterion.

***Additional information:*** Up to 2 projects may be funded.

### **AREA ENERGY.8.2: HIGH EFFICIENCY POLY-GENERATION**

**In this Area, no topics are open in calls published in this work programme.**

**AREA ENERGY.8.3: LARGE-SCALE INTEGRATION OF RENEWABLE ENERGY SUPPLY AND ENERGY EFFICIENCY IN BUILDINGS: ECO-BUILDINGS**

**In this Area, no topics are open in calls published in this work programme.**

**AREA ENERGY.8.4: INNOVATIVE INTEGRATION OF RENEWABLE ENERGY SUPPLY AND ENERGY EFFICIENCY IN LARGE COMMUNITIES: CONCERTO**

**In this Area, no topics are open in calls published in this work programme.**

**AREA ENERGY.8.5: INNOVATIVE STRATEGIES FOR CLEAN URBAN TRANSPORT: CIVITAS-PLUS**

**In this Area, no topics are open in calls published in this work programme.**

**AREA ENERGY.8.6: SOCIO-ECONOMIC RESEARCH AND INNOVATION**

**In this Area, no topics are open in calls published in this work programme.**

**AREA ENERGY.8.7: THEMATIC PROMOTION AND DISSEMINATION**

**In this Area, no topics are open in calls published in this work programme.**

**AREA ENERGY.8.8: SMART CITIES AND COMMUNITIES**

The following topics are part of the SET-Plan Smart Cities and Communities Initiative. In the framework of this initiative, cities are expected to devise innovative measures to accelerate the deployment of low carbon technologies.

The initiative encompasses a broad range of energy related topics such as energy efficiency, energy networks and renewable energy production as well as other urban issues in the area of for electricity, heating and cooling, transport, waste and water management. The topics under this theme are focused on the energy dimension, including the topic from the Energy-efficient Buildings (EeB) Public Private Partnership.

In addition, the Work Programme 2012 of the Transport Theme – in particular topics under the Sustainable Surface Transport (SST) sub-theme including the European Green Car Initiative (EGCI) Public Private Partnership – addresses some aspects which are relevant for the Smart Cities and Communities Initiative. Accordingly, the topics "*GC.SST.2012.1-2 Smart infrastructures and innovative services for electric vehicles in the urban grid and road environment*" and "*SST.2012.3.1-3 Take-up of transport innovation in urban and regional transport*" can be seen as complementary activities. The projects funded under the topic *Energy.20123.8.8-1* will be invited to establish strong links with those funded under *GC.SST.2012.1-2* and *SST.2012.3.1-3* as well as with other relevant projects financed at EU, national or regional level to stimulate exchanges and cross-fertilization.

European cities are diverse in terms of size, economic morphology, organisational structure, climatic and geographic conditions, proximity to transport networks and progress towards sustainability achieved so far.

Smart Cities and Communities Initiative intends to promote replication of successful solutions through clustering of cities with similar framework conditions and similar ambitions. To enhance this replication potential, ensure an EU-wide impact of the measures and to facilitate the exchange of knowledge, cities from at least three Member States and/or Associated Countries are expected to team up for a project proposal under the call FP7-ENERGY-SMARTCITIES-2012. Financial support will be given to measures proposed in these topics on the basis that such measures would help cities to substantially reduce greenhouse gas emissions in an innovative and integrative manner and represent a high replication potential.

The topics "ENERGY.2012.8.8.1: Energy planning and screening of city plans" and "ENERGY.2012.8.1.2: Large scale systems for urban area heating and/or cooling supply" can be addressed on their own or in combination with each other.

### **Topic ENERGY.2012.8.8.1: Strategic sustainable planning and screening of city plans**

***Open in call:*** FP7-ENERGY-SMARTCITIES-2012

***Contents/scope:*** This action aims at i) creating the models for strategic sustainable planning by addressing the efficiency of energy flows across various sectors in various types of cities across Europe and ii) supporting cities with the development of ambitious and innovative projects embedded in comprehensive urban planning. All key aspects that are relevant for the whole city need to be addressed, such as urban planning covering the whole city (communities and districts) and addressing energy efficiency in: renovating a major share of the building stock, energy systems, heating/cooling smart grids, electricity smart grids, climate adaptation and mitigation, efficient water networks and use, efficient waste collection, treatment, recycling and energy use, efficient transportation and mobility systems, promotion of efficient vehicles.

The successful project(s) will gather cities with proven credible and ambitious targets and innovative planning, while finding the optimal mix of all these measures and indicating the time line, the costs and pay-back periods. The pay-back period analysis should build on different regulatory and market conditions. These plans must be validated by experts on technology and finance and be supported by the public authorities on the highest political levels as well as show commitment from the key public and private stakeholders involved in its implementation.

***Funding scheme:*** Coordination and Support Action – Coordinating

***Expected impact:*** The planning exercise is expected to show that the integrative approach achieves much better economics than individual actions without integrative planning. The project will help exchange of best practices and dissemination of Key Performance Indicators.

***Additional information:*** Smart cities will be evaluated according to their credible targets, innovative planning and robust calculations under the "Scientific and Technological" criterion.

This action supports the implementation of the Smart Cities and Communities Initiative of the SET-Plan. The European Commission reserves its right to ask the project, during the negotiation, to establish strong links, where appropriate, with relevant R&D projects at EU, national or regional level.

**Topic.ENERGY.2012.8.8.2: Large scale systems for urban area heating and/or cooling supply**

***Open in call:*** FP7-ENERGY-SMARTCITIES-2012

***Contents/scope:*** This topic aims to demonstrate technically and economically innovative concepts of urban heating or cooling systems in support to the Smart Cities initiative.

The successful project(s) should address energy efficiency integration of city districts with industrial parks. More and more industrial parks do offer innovative energy services business to business, within the parks. This approach aims to extend such services to cities or city districts, ideally through heating/cooling smart grids. Low temperature heat that is wasted today in nearby industrial cooling towers, air conditioning systems, cooling of data centres, etc. or heat from manufacturing industry, industrial buildings, office buildings, data centres, private homes, shall be collected and used to provide heating and cooling for end users in city districts. Space heating and domestic hot water production might be complemented by high efficiency heat pumps. Cooling can be supplied through the use of cold from rivers, lakes, sea/ocean water, ground source water, liquefied natural gas terminals, cooling or freezing warehouses to provide cooling systems for end users in urban environment. The objective is to demonstrate the high energy efficient innovative technologies and measures resulting in very low energy districts. All elements and systems that could contribute to a better energy efficiency and sustainability through integrated design and planning should be envisaged, including heat recovery technologies and very efficient water/waste management, enhanced systems for energy behaviour monitoring and demand response and load control systems. The system should be based primarily on recovering waste heat (or using heat from e.g. waste incineration) and adapting the temperature levels of the grid to the applications: floor and radiant wall heating for example allows very efficient use of low temperatures (mostly below 30°C); radiant wall and ceiling cooling allows efficient cooling with water temperatures up to 20°C. High efficiency heat pumps may adjust the temperature to 60°C for domestic hot water production if needed. Also the most efficient forms of renewables (solar thermal, biomass boilers or combined heat and power) shall be used to supply a significant part of the remaining energy needs, while the return on investment for the energy saving measures should be calculated and presented and should be acceptable under current market standards.

Building energy management systems should be combined with district energy management systems and city energy management systems.

***Funding scheme:*** Collaborative Project with predominant demonstration component

***Implementation/management:*** The projects should have a high potential of replication contributing to large scale market deployment before 2020. The demonstration should happen at district level, but with the aim to deploy at city wide level in the near future. The detailed metering/monitoring programme should last at least for one heating and one cooling season; however, longer term commitment and programmes of the energy system operators (e.g. in continuous monitoring and/or guarantees of performance to the tenants) would give an added value to the proposal. An ambitious dissemination and market deployment programme shall be included in the proposal and will be evaluated under the "implementation" and "impact" criteria.

***Expected impact:***

- Cost effective highly energy efficient practices, devices (heating, cooling and/or electrical) and techniques.

- Acceleration of the market uptake of the most innovative tools for efficient city energy management.
- Creation of best practice examples for the Data Centre design and construction sector based on innovation and competitiveness, with benefits for the operators and the environment.
- Contribution to raise the performance standards and regulations on European, national and local level, in the urban design and construction sector, through the best practice examples.

***Additional information:***

This action supports the implementation of the Smart Cities and Communities Initiative of the SET-Plan. The European Commission reserves its right to ask the project, during the negotiation, to establish strong links, where appropriate, with relevant R&D projects at EU, national or regional level.

**Topic EEB.ENERGY.2012.8.8.3: Demonstration of nearly Zero Energy Building Renovation for cities and districts**

***Open in call:*** FP7-2012-ENV-ICT-ENERGY-NMP-EeB

***Contents/scope:*** This topic aims to demonstrate innovative technical, economical and financial solutions to significantly increase overall energy efficiency of cities and districts. The objective is to renovate a district of existing buildings, in support to the Smart Cities initiative.

Retrofitting existing individual buildings to very high performance buildings will result in excessive costs for extremely ambitious levels. Previous programmes have shown high added value and significant economies of scale to optimise a large amount of buildings in a fully integrated concept. Optimising a whole district consisting of a large number of buildings in a fully integrated way, with extension of the building energy management system to the whole district, and including efficient urban planning allows further significant savings. Mixed societies bringing together living with working, leisure, shopping, etc may result in reduced needs for transportation, but also allow for better peak management of energy (energy peaks on offices happen at different times of the day than for private homes), water, wastes, etc.

A systemic approach is expected in the measures to be taken. All elements and systems of the buildings that could contribute to a better energy efficiency and sustainability through integrated design and planning should be envisaged, including heat recovery technologies and very efficient water/waste management, enhanced systems for energy behaviour monitoring and demand response and load control systems as well as ICT tools in a district level.

Building Information Modelling and other methods of integrated project delivery should also be used.

While the proposed measures can encompass all types of buildings (residential, commercial, public) the focus should lie on retrofitting of residential buildings. The retrofitting should be as cost effective as possible. The return on investment for the energy saving measures should be calculated and presented and should be acceptable under current market standards. Priority will be given to buildings of which typology and use could be representative for large geographical areas in Europe.

Innovation should rely in the technologies to be demonstrated and in the innovative integration of the whole city/district with appropriate and cost-effective balance between

energy efficiency measures and the integration of active systems for energy generation, distribution, storage and use.

For the city area to be affected, detailed information should be provided on the current and future energy use, with emphasis on the building(s): their design, their current and future energy use, the energy efficiency measures to be applied should also be described extensively. The gross floor area of the building(s) should be specified together with the targeted annual energy use per m<sup>2</sup> (kWh/m<sup>2</sup>/year, broken down by space heating, cooling, domestic hot water heating, electricity (including lighting) consumption etc.).

In addition to the detailed description of the buildings and the measures to be taken, it is strongly suggested for participants to complete and include in the proposals the Building Energy Specification Table (BEST) summarizing this information for every type of building proposed. The template of the BEST table is made available through the relevant Guide for Applicants.

Successful proposals will be asked to follow a common monitoring data structure, using a common methodology, in order to feed the relevant Commission data bases.

Additional accompanying measures affecting the future operation of the building (e.g. behavioural changes, post occupancy evaluation, active training of the occupants, training of professionals and architects in view of the replication of the project in other European regions) should be clearly addressed. Social and economic issues should also be addressed. Buildings utilising thermal masses through their architecture while being of high aesthetic quality that people like to live and work in should be envisaged.

**Funding scheme:** *Funding scheme:* Collaborative Project with predominant demonstration component – Scale of Units (CP-SoU)

**Implementation/management:** The leading role of relevant industrial partners is essential to achieve the full impact of the project. This will be evaluated under the "implementation" and "impact" evaluation criteria.

**Expected impact:**

- Cost effective highly energy efficient practices, devices (cooling and/or electrical) and techniques.
- Acceleration of the market uptake of the most innovative tools for efficient city energy management.
- Creation of best practice examples for the construction sector based on innovation and competitiveness, with benefits for the operators and the environment.
- Contribution to raise the performance standards and regulations on European, national and local level, in the urban design and construction sector, through the best practice examples.

The projects should have a high potential of replication contributing to large scale market deployment before 2020. It is expected that the successful project(s) will be replicated at the level of the entire city resulting in an accelerated refurbishment rate – double the EU average. An ambitious dissemination and market deployment programme should be included in the proposal. The detailed metering/monitoring programme should last at least for one year, however, longer term commitment and programmes of the building operators (e.g. in continuous monitoring and/or guarantees of performance to the tenants) would give an added value to the proposal. This will be evaluated under the "impact" evaluation criterion.

**Additional information:**

The evaluation of the proposals will also take into account under the "S&T excellence" criterion the degree of excellence and innovation of the technology used, the level of projects ambition and the most cost effectiveness of the practices to be demonstrated (euros/efficiency gain; euros/CO<sub>2</sub> reduction, kWh/m<sup>2</sup>/year saved). For this reason, the above figures should be indicated in the proposal.

The form of grant applied is based on additional energy efficiency measures in buildings. The grant will always be composed of a combination of: the typical reimbursement of eligible costs, and flat rate financing determined on the basis of scale of unit costs only for the building-related demonstration activities part of the buildings. The scale of unit cost for European Union financial contribution is fixed at EUR 100 /m<sup>2</sup> eligible costs and thus EUR 50 /m<sup>2</sup> European Union contribution. The amounts determined on the basis of the scale of unit

Costs are reimbursed by applying the upper funding limits specified in Article II.16 of the model grant agreement. Therefore, the reimbursement rate will be up to 50%, i.e. EUR 50/m<sup>2</sup>. The eligible costs per m<sup>2</sup> for the building demonstrated in the project(s) are fixed costs. The total of European Union financial contribution based on scale of unit costs may not exceed EUR 15 million per project.

This action supports the implementation of the Smart Cities and Communities Initiative of the SET-Plan. The European Commission reserves its right to ask the project, during the negotiation, to establish strong links, where appropriate, with relevant R&D projects at EU, national or regional level.

For further details concerning the implementation of the PPP calls please see Annex 5 of the Cooperation work programme.

**ACTIVITY ENERGY.9: KNOWLEDGE FOR ENERGY POLICY MAKING**

Development of tools, methods and models to assess the main economic and social issues related to energy technologies. Activities will include the building of databases and scenarios for an enlarged EU and the assessment of the impact of energy and energy-related policies on security of supply, environment, society, competitiveness of the energy industry and issues of public acceptability. Of particular importance is the impact of technological progress on EU policies. Activities will include scientific support for policy development.

**AREA ENERGY.9.1: KNOWLEDGE TOOLS FOR ENERGY-RELATED POLICY MAKING**

**In this Area, no topics are open in calls published in this work programme.**

**AREA ENERGY.9.2: SCIENTIFIC SUPPORT TO POLICY**

**In this Area, no topics are open in calls published in this work programme.**

## **ACTIVITY ENERGY.10: HORIZONTAL PROGRAMME ACTIONS**

The topics described in the section have a horizontal character not linked specifically to any particular technology.

### **AREA 10.1: ERA-NET**

#### **Topic ENERGY.2012.10.1.1: ERA-NET Plus - Bioenergy Demonstrations of the European Industrial Bioenergy Initiative**

**Open in call:** FP7-ERANET-2012-RTD

**Content/Scope:** The aim of this ERA-NET Plus is to promote joint strategic planning and programming for the implementation of Bioenergy demonstration projects, in accordance with the priorities set out in the SET-Plan European Industrial Bioenergy Initiative (EIBI)<sup>11</sup>, as derived from the corresponding Implementation Plan.

It will involve the launch of a single joint call for proposals by the promoters of national and/or regional programmes, thereby allowing a more efficient use of existing financial resources and promoting knowledge sharing. Demonstration plants are considered the last non-economic step to demonstrate the performance and reliability of all critical steps in a value chain, so that the first commercial unit can be designed and its performance thoroughly assessed from the outcome of the demo unit. It is expected that the results of the call for expression of interest to be launched by the EIBI, which will be available on the SETIS website<sup>12</sup>, will be used by the ERA-NET Plus participants to prepare the joint call.

**Funding scheme:** Coordination and Support Action (coordination)

**Expected impact:** This ERA-NET Plus will contribute to reach the objectives of the EIBI as far as demonstration projects are concerned, i.e. it will contribute to accelerate the development and deployment of the concerned Bioenergy technologies through an enhanced and effective cooperation between the various stakeholders at European level.

**Additional information:** For further details concerning the implementation of the ERA-NET and ERA-NET Plus calls see Annex 4 of the Cooperation work programme.

#### **Topic ENERGY.2012.10.1.2: ERA-NET on Solar Electricity: Implementation of the Solar Energy Industry Initiative**

**Open in call:** FP7-ERANET-2012-RTD

**Content/Scope:** The aim of this ERA-NET is to promote joint strategic planning and programming for RTD&D in the area of solar electricity generation (i.e., PV and CSP), in accordance with the priorities set out in the context of the SET-Plan Solar Energy Industry Initiative (SEII) as derived from the related PV and CSP Implementation Plans.

It will primarily involve the launching of joint calls for RTD&D proposals by the promoters of national and/or regional programmes. It may also involve supporting joint planning and programming by other means such as intensifying the exchange of information and

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<sup>11</sup>[http://setis.ec.europa.eu/activities/implementation-plans/European%20Industrial%20Bioenergy%20Initiative\\_-EIBI.pdf](http://setis.ec.europa.eu/activities/implementation-plans/European%20Industrial%20Bioenergy%20Initiative_-EIBI.pdf)

<sup>12</sup> <http://setis.ec.europa.eu>

projects/programmes synchronisation between the interested parties, while keeping the overarching objective of implementing the SEII.

**Funding scheme:** Coordination and Support Action (coordinating)

**Expected impact:** This ERA-NET will contribute to reach the objectives of the SEII, i.e. to accelerate the development and deployment of the concerned solar electricity technologies through an enhanced and effective cooperation between the various stakeholders at European level.

**Additional information:** Up to one project may be funded.

For further details concerning the implementation of the ERA-NET and ERA-NET Plus calls see Annex 4 of the Cooperation work programme.

## AREA ENERGY.10.2 OTHER HORIZONTAL ACTIONS

### **Topic ENERGY.2012.10.2.1: Future Emerging Technologies**

**Open in call:** FP7-ENERGY-2012-1

**Technical content/scope:** Progress in energy research requires advances in both science (new phenomena, tools and techniques) and technology (new design devices and systems). This topic aims at ensuring a genuine chance for “emerging ideas” to be funded and consequently follows a complete bottom-up approach.

This topic is also designed to provide reward for “**high risk / high impact**” approach and to vigorously promote multi-disciplinarity. Research should focus on novel technologies and novel materials for energy applications, should have tangible objectives, go beyond conventional paths, and be highly innovative and very ambitious – the FET “spirit”.

However, this topic is “purpose driven” and not “blue-sky” research. “Increased understanding” alone would not be considered sufficiently tangible. Projects should try reaching clearly defined scientific goals and/or creating a new basic technology. They should have the potential to open up new fields of inquiry and be well beyond the international state of the art.

When developing a new technology one often encounters gaps in understanding that require going back to science to develop new knowledge. This feedback loop between science and technology is a critical part of how progress is made. The more active the feedback loop, the higher the likelihood of rapid success. This key element of **innovation** is at the core of this FET topic.

Also, real breakthroughs in the energy sector are quite often due to the radical upgrade in the properties of the materials. Proposals related to advanced materials for energy applications, and particularly proposals on materials that could find their way into a continuum of energy applications, are within the scope of this topic (providing they have the FET “spirit”).

Any research that constitutes a technology demonstration or a combination of existing technologies will not be considered for funding. Research directed towards hypothetical phenomena, with no convincing evidence as to their existence also falls out of scope of this topic.

**Funding scheme:** Collaborative project.

***Expected impact:*** New paths leading to highly innovative technologies for energy applications, and contribution to the establishment of a strong scientific and technical base for European science and technology in emerging areas in the energy field. The potential impact on the energy system has to be clearly demonstrated, already at stage 1.

***Implementation and management:*** Projects shall involve multinational partnerships, often from different scientific disciplines and/or different technological sectors, in order to cross traditional boundaries. High-tech SMEs participation is encouraged.

***Additional eligibility criterion:*** Requested EU contribution per project shall not exceed EUR 3 Million.

### III. IMPLEMENTATION OF CALLS

#### **Call title: Energy Call Part 1**

- **Call identifier:** FP7-ENERGY-2012-1
- **Date of publication:** 20 July 2011 <sup>13</sup>
- **Deadline:**
  - For CSA topics (one stage submission): 25 October 2011 at 17.00.00, (Brussels local time)<sup>14</sup>
  - For Collaborative Project (CP) topics (two stage submission):
    - First stage: 25 October 2011 at 17.00.00, (Brussels local time)<sup>15</sup>
    - Second stage: 3 April 2012 at 17.00.00, (Brussels local time)<sup>16</sup>
- **Indicative budget <sup>17</sup>:** EUR 141 million from the 2012 budget

#### **INDICATIVE BUDGET**

	Indicative budget
ENERGY.2.1: PHOTOVOLTAICS ENERGY.2.5: CONCENTRATED SOLAR POWER	EUR 19 million
ENERGY.2.3: WIND	EUR 16 million
ENERGY.2.9: CROSS-CUTTING ISSUES ENERGY.2012.3.2.1: BIOFUELS FROM MICROALGAE OR MACROALGAE ENERGY.4.1: LOW/MEDIUM TEMPERATURE SOLAR THERMAL ENERGY ENERGY.8.1: EFFICIENT ENERGY USE IN THE MANUFACTURING INDUSTRY AND BUILDING SECTOR	EUR 17 million
ENERGY.2012.3.2.2: DEVELOPMENT AND TESTING OF	EUR 10 million <sup>18</sup>

<sup>13</sup> The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

<sup>14</sup> The Director-General responsible may delay this deadline by up to two months.

<sup>15</sup> The Director-General responsible may delay this deadline by up to two months.

<sup>16</sup> The Director-General responsible may delay this deadline by up to two months.

<sup>17</sup> Reserve lists per sub-area of the indicative budget table will be constituted if there are a sufficient number of good quality proposals. It will be used if extra budget becomes available.

<sup>18</sup> The FP7 Theme 5 ('Energy') will contribute EUR 5 million and the FP7 Theme 7 ('Transport (including Aeronautics)') will contribute EUR 5 million.

ADVANCED SUSTAINABLE BIO-BASED FUELS FOR AIR TRANSPORT	
ENERGY.5: CO <sub>2</sub> CAPTURE AND STORAGE TECHNOLOGIES FOR ZERO EMISSION POWER GENERATION	EUR 21.5 million
ENERGY.2012.5&6.2-1 SUPPORT TO THE COORDINATION OF STAKEHOLDERS' ACTIVITIES IN THE FIELD OF ZERO EMISSION ENERGY PRODUCTION ENERGY.2012.7.3.1: NETWORKING OF NATIONAL R&D AND DEMONSTRATION PROJECTS ON SMART METERING INFRASTRUCTURE AND DATA PROCESSING ENERGY.2012.7.3.3: SUPPORT TO THE COORDINATION OF STAKEHOLDERS ACTIVITIES IN THE FIELD OF SMART GRIDS	EUR 3 million
ENERGY.7: SMART ENERGY NETWORKS	EUR 30.5 million
ENERGY.10.2: FUTURE EMERGING TECHNOLOGIES	EUR 24 million

All budgetary figures given in this work programme are indicative. The final budgets may vary following the evaluation of proposals.

The final budget awarded to actions implemented through calls for proposals may vary:

- The total budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the whole call.

**TOPICS CALLED:**

Activity/ Area	Topics called	Funding Schemes
<b>ACTIVITY ENERGY.2: RENEWABLE ELECTRICITY GENERATION</b>		
<b>AREA ENERGY.2.1: PHOTOVOLTAICS</b>	Energy 2012.2.1.1: Reliable, cost-effective, highly performing PV systems <i>(Up to 2 projects may be funded)</i>	Collaborative Project
<b>AREA ENERGY.2.3: WIND</b>	ENERGY.2012.2.3.1: Innovative wind conversion systems (10-20MW) for offshore applications	Collaborative Project
<b>AREA ENERGY.2.5: CONCENTRATED SOLAR POWER</b>	ENERGY.2012.2.5.1: Research, development and testing of solar dish systems <i>(Up to 2 projects may be funded)</i>	Collaborative Project
	ENERGY.2012.2.5.2: Hybridisation of CSP with other energy sources <i>(Up to 1 project may be funded)</i>	Collaborative Project
<b>AREA.2.9: CROSS-CUTTING ISSUES</b>	ENERGY.2012.2.9.1: Power generation in the low temperature range <i>(Up to 2 projects may be funded)</i>	Collaborative Project
<b>ACTIVITY ENERGY.3: RENEWABLE FUEL PRODUCTION</b>		
<b>AREA ENERGY.3.2: SECOND GENERATION FUEL FROM BIOMASS</b>	ENERGY.2012.3.2.1: Biofuels from microalgae or macroalgae <i>(Up to 2 projects may be funded)</i>	Collaborative Project
	ENERGY.2012.3.2.2: Development and testing of advanced sustainable bio-based fuels for air transport <i>(Up to 1 project may be funded)</i>	Collaborative Project
<b>ACTIVITY ENERGY.4: RENEWABLES FOR HEATING AND COOLING</b>		
<b>AREA ENERGY.4.1: LOW/MEDIUM TEMPERATURE SOLAR THERMAL ENERGY</b>	ENERGY.2012.4.1.1: Research and development for medium temperature range solar collectors (100°-250°C) <i>(Up to 2 projects may be funded)</i>	Collaborative Project
<b>ACTIVITY ENERGY.5: CO<sub>2</sub> CAPTURE AND STORAGE TECHNOLOGIES FOR ZERO EMISSION POWER GENERATION</b>		
<b>AREA ENERGY.5.2:</b>	ENERGY.2012.5.2.1: Sizeable pilot tests	Collaborative Project

<b>CO<sub>2</sub> STORAGE</b>	for CO <sub>2</sub> geological storage <i>(Up to 2 projects may be funded)</i>	<i>(Requested EU contribution per project shall not exceed EUR 9 Million)</i>
	ENERGY.2012.5.2.2: Impact of the quality of CO <sub>2</sub> on transport and storage behaviour	Collaborative Project
<b>ACTIVITY ENERGY.5&amp;6: CROSS-CUTTING ACTIONS BETWEEN ACTIVITIES ENERGY.5 AND ENERGY.6</b>		
<b>ENERGY.5&amp;6.2: CROSS CUTTING AND REGULATORY ISSUES</b>	ENERGY.2012.5&6.2.1: Support to the coordination of stakeholders' activities in the field of Zero Emission Energy Production <i>(Up to 1 project may be funded)</i>	Coordination and support action (supporting action)
<b>ACTIVITY ENERGY.7: SMART ENERGY NETWORKS</b>		
<b>ENERGY.7.1: DEVELOPMENT OF INTER-ACTIVE DISTRIBUTION ENERGY NETWORKS</b>	ENERGY.2012.7.1.1: Integration of variable distributed resources in distribution networks	Collaborative Project
	ENERGY.2012.7.1.2: Enhancing electricity networks through use of distributed intelligence	Collaborative Project
	ENERGY.2012.7.1.3: Empowering smart customers to participate in active demand and energy system efficiency	Collaborative Project
<b>AREA ENERGY.7.2: PAN-EUROPEAN ENERGY NETWORKS</b>	ENERGY.2012.7.2.1: Planning for European Electricity Highways to ensure the reliable delivery of renewable electricity and market integration	Collaborative Project <i>(Participation of at least 3 European TSO's)</i>
<b>AREA ENERGY 7.3: CROSS CUTTING ISSUES AND TECHNOLOGIES</b>	ENERGY.2012.7.3.1: Networking of national R&D and demonstration projects on smart metering infrastructure and data processing	Coordination and support action (coordinating action)
	ENERGY.2012.7.3.2: Facilitating the deployment of safe stationary batteries	Collaborative Project
	ENERGY.2012.7.3.3: Support to the coordination of stakeholders activities in the field of Smart Grids <i>(Up to 1 project may be funded)</i>	Coordination and support action (supporting action)

<b>ACTIVITY ENERGY.8: ENERGY EFFICIENCY AND SAVINGS</b>		
<b>AREA ENERGY.8.1: EFFICIENT ENERGY USE IN THE MANUFACTURING INDUSTRY AND BUILDING SECTOR</b>	ENERGY.2012.8.1.1: Next generation heat pump technologies <i>(Up to 2 projects may be funded)</i>	Collaborative Project
<b>ACTIVITY ENERGY.10: HORIZONTAL PROGRAMME ACTIONS</b>		
<b>AREA ENERGY.10.2: FUTURE EMERGING TECHNOLOGIES</b>	ENERGY.2012.10.2.1: Future Emerging Technologies	Collaborative Project <i>(Requested EU contribution per project shall not exceed EUR 3 Million)</i>

### ELIGIBILITY CRITERIA

The general eligibility criteria for this call are set out in Annex 2 to the work programme, and in the Guide for Applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

The minimum number of participating legal entities required, for all funding schemes, is set out in the Rules for Participation. They are summarised in the table below<sup>19</sup>:

<b>Funding scheme</b>	<b>Minimum conditions</b>
Collaborative Project	At least 3 independent legal entities, each of which is established in a MS or AC, and no two of which are established in the same MS or AC.
Coordination and Support Action (coordinating action)	At least 3 independent legal entities, each of which is established in a MS or AC, and no two of which are established in the same MS or AC.
Coordination and Support Action (supporting action)	At least 1 independent legal entity.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

<sup>19</sup> MS = Member States of the EU; AC = Associated country. Where the minimum conditions for an indirect action are satisfied by a number of legal entities, which together form one legal entity, the latter may be the sole participant, provided that it is established in a Member State or Associated country.

**Additional eligibility criteria:**

- **Topic ENERGY.2012.5.2.1:** Sizeable pilot tests for CO2 geological storage: Requested EU contribution per project shall not exceed EUR 9 Million.
- **Topic ENERGY.2012.7.2.1:** Planning for European Electricity Highways to ensure the reliable delivery of renewable electricity and pan-European market integration: Participation of at least 3 European TSO's.
- **Topic ENERGY.2012.10.2.1:** Future Emerging Technologies: Requested EU contribution per project shall not exceed EUR 3 million.

**EVALUATION PROCEDURE:**

- The evaluation criteria and scoring scheme are set out in annex 2 of the work programme.
- Proposal page limits: Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the EPSS.

The Commission will instruct the experts to disregard any pages exceeding these limits.

The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left, right) should be at least 15 mm (not including any footers or headers).

***ALL TOPICS FOR COLLABORATIVE PROJECTS***

The evaluation for these topics shall follow a two-stage procedure.

**Evaluation criteria and thresholds for stage 1 proposals:**

The first stage proposal should focus on the S&T content and on clear identification of the intended results. Information on the consortium composition and the estimated financial resources involved should also be provided.

Stage 1 proposals are evaluated on the basis of their **S/T quality**

	<b>Minimum threshold</b>
<b>S/T quality</b>	<b>3/5</b>

A list of proposals for 250% of the available budget will be invited to proceed to stage 2 at the condition that they reach the minimum threshold as above. If there is a tie between the proposals with the lowest mark to enter the list of proposals to proceed to stage 2, all those proposals with the same mark will be added to the list. Only the information on budget provided in Part A of the proposal will be used to define the threshold.

They will be evaluated remotely with the consensus session being held in Brussels. Stage 1 proposals shall be submitted at the closure date mentioned above.

Coordinators of retained proposals in stage 1 ('go' proposals) will receive an invitation to submit their full proposal instead of an Evaluation Summary Report. The complete proposal will then be evaluated against the entire set of evaluation criteria. The closure date of the

second submission will be specified in the invitation to submit the complete proposal. The indicative closure date is 03.04.2012

**Evaluation criteria and thresholds for stage 2 proposals:**

Stage 2 proposals are evaluated on the basis of the following three criteria: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	<b>Minimum threshold</b>
<b>S/T quality</b>	<b>3/5</b>
<b>Implementation</b>	<b>3/5</b>
<b>Impact</b>	<b>3/5</b>
<b>Overall threshold required</b>	<b>10/15</b>

Proposals will not be evaluated anonymously.

**The procedure for prioritising proposals with equal scores:**

Ranked lists of proposals will be established for each section of the indicative budget table above. At the Panel stage, in contrast to Annex 2, proposals with equal overall scores will be prioritised according to their scores for the S/T quality criterion. If they are still tied, they will be prioritised according to their scores for the Impact criterion. If any proposals are still tied, then overall Work Programme coverage will be used to decide the priority order. Reserve lists per sub-area of the indicative budget table will be constituted if there are a sufficient number of good quality proposals. It will be used if extra budget becomes available.

**The maximum number of projects that may be funded under a specific topic is restricted in the following topics:**

- **Topic Energy 2012.2.1.1:** Reliable, cost-effective, highly performing PV systems: Up to 2 projects may be funded
- **Topic ENERGY.2012.2.5.1:** Research, development and testing of solar dish systems: Up to 2 projects may be funded
- **Topic ENERGY.2012.2.5.2:** Hybridisation of CSP with other energy sources: Up to 1 project may be funded
- **Topic ENERGY.2012.2.9.1:** Power generation in the low temperature range: Up to 2 projects may be funded
- **Topic ENERGY.2012.3.2.1:** Biofuels from microalgae or macroalgae: Up to 2 projects may be funded.

- **Topic ENERGY.2012.3.2.2:** Development and testing of advanced sustainable bio-based fuels for air transport: Up to 1 project may be funded.
- **Topic ENERGY.2012.4.1.1:** Research and development for medium temperature range solar collectors (100°-250°C): up to 2 projects may be funded.
- **Topic ENERGY.2012.5.2.1:** Sizeable pilot tests for CO2 geological storage: Up to 2 projects may be funded.
- **Topic ENERGY.2012.8.1.1:** Next generation heat pump technologies: Up to 2 projects may be funded.

**INDICATIVE EVALUATION TIMETABLE:**

- Evaluation stage 1 proposals: November / December 2011
- Evaluation stage 2 proposals: April/May 2012.
- Evaluation results: estimated to be available within two months after the closure date. A reserve list of projects might be established.

***ALL TOPICS FOR COORDINATION AND SUPPORT ACTIONS (CSA)***

The evaluation shall follow a single step procedure.

Proposals may be evaluated remotely.

Proposals will not be evaluated anonymously.

- The evaluation criteria and scoring scheme are set out in annex 2 of the work programme.

Proposals are evaluated on the basis of the following three criteria: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the possibility of 0.5 point scores. Successful proposals must pass the minimum thresholds as follows:

	<b>Minimum threshold</b>
<b>S/T quality</b>	<b>3/5</b>
<b>Implementation</b>	<b>3/5</b>
<b>Impact</b>	<b>3/5</b>
<b>Overall threshold required</b>	<b>10/15</b>

**The procedure for prioritising proposals with equal scores:**

At the Panel stage, proposals with equal overall scores will be prioritised according to their scores for the S/T quality criterion. If they are still tied, they will be prioritised according to their scores for the Impact criterion. If any proposals are still tied, then overall work programme coverage will be used to decide the priority order.

**INDICATIVE EVALUATION AND CONTRACTUAL TIMETABLE:**

Evaluations are expected to be carried out in November / December 2011. It is expected that the contract negotiations for the short-listed proposals will open by March 2012.

**The maximum number of projects that may be funded under a specific topic is restricted in the following topics:**

- **Topic ENERGY.2012.5&6.2.1:** Support to the coordination of stakeholders' activities in the field of Zero Emission Energy Production: Up to one project may be funded.
- **Topic ENERGY.2012.7.3-3:** Support to the coordination of stakeholders activities in the field of Smart Grids: Up to one project may be funded

## **POINTS RELEVANT TO CSA AND COLLABORATIVE PROJECTS**

### **CONSORTIA AGREEMENTS:**

Participants in Collaborative Projects are required to conclude a consortium agreement; participants in Coordination and Support Actions are encouraged, but not required, to conclude a consortium agreement.

### **FORMS OF GRANTS AND MAXIMUM REIMBURSEMENT RATES:**

Further information on the offered grants and reimbursement rates are specified in Annex 3 to the Cooperation work programme.

### **FLAT RATES TO COVER SUBSISTENCE COSTS:**

In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available at the following website: [http://cordis.europa.eu/fp7/find-doc\\_en.html](http://cordis.europa.eu/fp7/find-doc_en.html) under 'Guidance documents/Flat rates for daily allowances'.

### **DISSEMINATION:**

Grant agreements of projects financed under this call for proposals will include the special clause 39 on the "Open Access Pilot in FP7". Under this clause, beneficiaries are required to make their best efforts to ensure free access to peer-reviewed articles resulting from projects via an institutional or subject-based repository, and to make their best efforts to ensure open access to these articles within six months<sup>20</sup>.

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<sup>20</sup> Further information: [http://cordis.europa.eu/fp7/find-doc\\_en.html](http://cordis.europa.eu/fp7/find-doc_en.html), [http://ec.europa.eu/research/science-society/open\\_access](http://ec.europa.eu/research/science-society/open_access), [http://ec.europa.eu/research/science-society/scientific\\_information/](http://ec.europa.eu/research/science-society/scientific_information/).

**Call title: Energy Call part 2**

- **Call identifier:** FP7-ENERGY-2012-2
- **Date of publication:** 20 July 2011<sup>21</sup>
- **Deadline:** 08 March 2012 at 17.00.00, Brussels local time<sup>22</sup>
- **Indicative budget:** EUR 81 million

<b>Activity</b>	<b>Indicative Budget (EUR million)</b>
ACTIVITY ENERGY.2: RENEWABLE ELECTRICITY GENERATION	24
ACTIVITY ENERGY.3: RENEWABLE FUEL PRODUCTION	35
CROSS-CUTTING ACTIONS BETWEEN ACTIVITY 5 and 6.	22

The budget for this call is indicative.

The final budget awarded to actions implemented through calls for proposals may vary:

- The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.

- **Topics called:**

<b>Activity/ Area</b>	<b>Topics called</b>	<b>Funding Schemes</b>
<b>ACTIVITY ENERGY.2: RENEWABLE ELECTRICITY GENERATION</b>		
<b>AREA ENERGY.2.1: PHOTOVOLTAICS</b>	Energy.2012.2.1-2: Demonstration of smart multi- functional PV modules	Collaborative Project with a predominant demonstration component
<b>AREA ENERGY.2.3: WIND</b>	Energy.2012.2.3-2: Demonstration of innovative	Collaborative Project with a predominant

<sup>21</sup> The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

<sup>22</sup> The Director-General responsible may delay this deadline by up to two months.

		designs to reduce fatigue loads and improve reliability of multi-MW turbines	demonstration component
<b>AREA OCEAN</b>	<b>ENERGY.2.6:</b>	Energy.2012.2.6-1: Demonstration of first ocean energy farms	Collaborative Project with a predominant demonstration component
<b>ACTIVITY ENERGY.3: RENEWABLE FUEL PRODUCTION</b>			
<b>AREA SECOND FUEL FROM BIOMASS</b>	<b>ENERGY.3.2: GENERATION</b>	Energy.2012.3.2.3: Pre-commercial industrial scale demonstration plant on lignocellulosic ethanol	Collaborative Project with a predominant demonstration component
<b>CROSS-CUTTING ACTIONS BETWEEN ACTIVITIES ENERGY.5 AND ENERGY.6 (ACTIVITY ENERGY.5&amp;6)</b>			
<b>AREA POWER TECHNOLOGIES FOR INTEGRATED EMISSION SOLUTIONS</b>	<b>ENERGY.5&amp;6.1: GENERATION FOR ZERO</b>	Energy.2012.5&6.1-1 Pilot plant-scale demonstration of advanced post-combustion CO <sub>2</sub> capture processes with a view to integration in fossil fuel power plants	Collaborative Project with a predominant demonstration component
		Energy.2012.5&6.1-2: Pilot plant-scale demonstration and integration of emerging and new combustion technologies	Collaborative Project with a predominant demonstration component

- **Eligibility criteria:**

The general eligibility criteria are set out in Annex 2 to this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

The minimum number of participating legal entities required, for all funding schemes, is set out in the Rules for Participation. They are summarised in the table below<sup>23</sup>:

<b>Funding scheme</b>	<b>Minimum conditions</b>
Collaborative Projects	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and Support Actions	At least 3 independent legal entities, each of

<sup>23</sup> MS = Member States of the EU; AC = Associated Country. Where the minimum conditions for an indirect action are satisfied by a number of legal entities, which together form one legal entity, the latter may be the sole participant, provided that it is established in a Member State or Associated Country.

(coordinating action)	which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and Support Actions (supporting action)	At least 1 independent legal entity.

- Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

• **Evaluation procedure:**

- The evaluation criteria and scoring scheme are set out in annex 2 of the work programme.

Proposals are evaluated on the basis of the following three criteria: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the possibility of 0.5 point scores. Successful proposals must pass the minimum thresholds as follows:

	<b>Minimum threshold</b>
<b>S/T quality</b>	<b>3/5</b>
<b>Implementation</b>	<b>3/5</b>
<b>Impact</b>	<b>3/5</b>
<b>Overall threshold required</b>	<b>10/15</b>

- Proposal page limits: Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the EPSS.

The Commission will instruct the experts to disregard any pages exceeding these limits.

The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left, right) should be at least 15 mm (not including any footers or headers).

- The evaluation shall follow a single stage procedure.
- Where mentioned in the topic description, "predominant demonstration component" refers to the elements described in the Guide for Applicants.
- The procedure for prioritising proposals with equal scores is described below:

Ranked lists of proposals will be established for each activity. At the Panel stage, proposals with equal overall scores will be prioritised according to their scores for the Quality criterion. If they are still tied, they will be prioritised according to their scores for the Impact criterion. If any proposals are still tied, then overall Work Programme coverage will be used to decide the priority order. A reserve list will be constituted if there

are a sufficient number of good quality proposals. It will be used if extra budget becomes available.

- **Indicative timetable:** Evaluations are expected to be carried out in May 2012. It is expected that the negotiations with the proposals of the main list will open by July 2012, in view of signing the Grant Agreements by January 2013.
- **Consortia agreements:** Participants in Collaborative Projects are required to conclude a consortium agreement.
- **The forms of grants and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.
- **Flat rates to cover subsistence costs:** In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available at the following website: [http://cordis.europa.eu/fp7/find-doc\\_en.html](http://cordis.europa.eu/fp7/find-doc_en.html) under 'Guidance documents/Flat rates for daily allowances'.
- **Dissemination:** Grant agreements of projects financed under this call for proposals will include the special clause 39 on the "Open Access Pilot in FP7". Under this clause, beneficiaries are required to make their best efforts to ensure free access to peer-reviewed articles resulting from projects via an institutional or subject-based repository, and to make their best efforts to ensure open access to these articles within six months<sup>24</sup>.

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<sup>24</sup> Further information: [http://cordis.europa.eu/fp7/find-doc\\_en.html](http://cordis.europa.eu/fp7/find-doc_en.html), [http://ec.europa.eu/research/science-society/open\\_access](http://ec.europa.eu/research/science-society/open_access), [http://ec.europa.eu/research/science-society/scientific\\_information/](http://ec.europa.eu/research/science-society/scientific_information/).

**Call title: Smart Cities and Communities**

- **Call identifier:** FP7-ENERGY-SMARTCITIES-2012
- **Date of publication:** 20 July 2011<sup>25</sup>
- **Deadline:** 01 December 2011 at 17.00.00, Brussels local time<sup>26</sup>
- **Indicative budget:** EUR 40 million

<b>Activity</b>	<b>Indicative Budget (EUR million)</b>
ACTIVITY ENERGY.8 ENERGY EFFICIENCY AREA 8.8. SMART CITIES AND COMMUNITIES	40

The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.

- **Topics called:**

<b>Activity/ Area</b>	<b>Topics called</b>	<b>Funding Schemes</b>
<b>ACTIVITY ENERGY.8: ENERGY EFFICIENCY AND SAVINGS</b>		
<b>AREA 8.8: SMART CITIES AND COMMUNITIES</b>	Energy.2012.8.8-1: Strategic sustainable planning and screening of city plans	Coordination and Support Action (Coordinating Action)
	Energy.2012.8.8-2: Large scale systems for urban area heating and/or cooling supply	Collaborative Project with a predominant demonstration component

- **Eligibility conditions:**

The general eligibility criteria are set out in Annex 2 to this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

<sup>25</sup> The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

<sup>26</sup> The Director-General responsible may delay this deadline by up to two months.

The minimum number of participating legal entities required, for all funding schemes, is set out in the Rules for Participation. They are summarised in the table below<sup>27</sup>:

<b>Funding scheme</b>	<b>Minimum conditions</b>
Collaborative Projects	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and Support Actions (coordinating action)	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and Support Actions (supporting action)	At least 1 independent legal entity.

- Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

• **Evaluation procedure:**

- The evaluation criteria and scoring scheme are set out in annex 2 of the work programme.

Proposals are evaluated on the basis of the following three criteria: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the possibility of 0.5 point scores. Successful proposals must pass the minimum thresholds as follows:

	<b>Minimum threshold</b>
<b>S/T quality</b>	<b>3/5</b>
<b>Implementation</b>	<b>3/5</b>
<b>Impact</b>	<b>3/5</b>
<b>Overall threshold required</b>	<b>10/15</b>

- Proposal page limits: Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the EPSS.

The Commission will instruct the experts to disregard any pages exceeding these limits.

<sup>27</sup> MS = Member States of the EU; AC = Associated Country. Where the minimum conditions for an indirect action are satisfied by a number of legal entities, which together form one legal entity, the latter may be the sole participant, provided that it is established in a Member State or Associated Country.

The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left, right) should be at least 15 mm (not including any footers or headers).

- The evaluation shall follow a single stage procedure.
- Where mentioned in the topic description, "predominant demonstration component" refers to the elements described in the Guide for Applicants.
- The procedure for prioritising proposals with equal scores is described below:

Ranked lists of proposals will be established for each activity. At the Panel stage, proposals with equal overall scores will be prioritised according to their scores for the S/T quality criterion. If they are still tied, they will be prioritised according to their scores for the Impact criterion. If any proposals are still tied, then overall Work Programme coverage will be used to decide the priority order. A reserve list will be constituted if there are a sufficient number of good quality proposals. It will be used if extra budget becomes available.

**Additional information related to the evaluation of the criterion 'Implementation' can be found in the topic descriptions under the heading 'Additional information'.**

- **Indicative timetable:** Evaluations are expected to be carried out in January 2012. It is expected that the negotiations with the proposals of the main list will open by March 2012, in view of signing the Grant Agreements by November 2012.
- **Consortia agreements:** Participants in Collaborative Projects are required to conclude a consortium agreement; participants in coordination actions are encouraged, but not required, to conclude a consortium agreement.
- **The forms of grants and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.
- **Flat rates to cover subsistence costs:** In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available at the following website: [http://cordis.europa.eu/fp7/find-doc\\_en.html](http://cordis.europa.eu/fp7/find-doc_en.html) under 'Guidance documents/Flat rates for daily allowances'.
- **Dissemination:** Grant agreements of projects financed under this call for proposals will include the special clause 39 on the "Open Access Pilot in FP7". Under this clause, beneficiaries are required to make their best efforts to ensure free access to peer-reviewed articles resulting from projects via an institutional or subject-based repository, and to make their best efforts to ensure open access to these articles within six months<sup>28</sup>.

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<sup>28</sup> Further information: [http://cordis.europa.eu/fp7/find-doc\\_en.html](http://cordis.europa.eu/fp7/find-doc_en.html), [http://ec.europa.eu/research/science-society/open\\_access](http://ec.europa.eu/research/science-society/open_access), [http://ec.europa.eu/research/science-society/scientific\\_information/](http://ec.europa.eu/research/science-society/scientific_information/).

#### **IV. OTHER ACTIONS**

The activities described in this section fall outside of the mainstream 'calls for proposals' means of implementation of the work programme<sup>29</sup>. Funds will be made available to support the following activities

- Contributions to the IEA
- Calls for tender
- Expert appointment
- Evaluation, monitoring and review

##### **a) International Energy Agency**

The Commission represents the European EU in the Implementing Agreements (hereinafter 'IAs') concluded under the framework of the International Energy Agency where it participates in activities in certain areas of energy research.

The Commission will make annual financial contributions required by its participation, up to a total amount of EUR 300.000. The annual financial contributions will be paid to the entities responsible for managing the respective agreements. The table below shows only those IAs for which the financial contribution will be paid from the budget of this part of the Cooperation work programme. It is not an exhaustive list of all of the IAs to which the Commission participates.

The Commission may participate in additional activities agreed under the IAs mentioned above or in any other existing or future IA and in any other activities of the IEA where such participation is in the interest of the EU, in line with the objectives and priorities of the present work programme, and within the limits of the budgetary provisions. The table below will be updated in any future modifications of the work programme.

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<sup>29</sup> Funding Scheme Coordination and Support Actions (supporting action), in accordance with Article 14 (a), (b), and (c), 17 and 27(5) and other actions in accordance with Article 14 (d) of the FP7 Rules for Participation.

**IEA Implementing Agreements financed under the Energy work programme<sup>30</sup>:**

<b>Implementing Agreement</b>	<b>Date IA signed by the European Commission</b>	<b>Estimated Annual EU Contribution in nominal currency</b>	<b>Estimated Annual EU Contribution in Euro (Exchange rate 16/03/2011)</b>
<b>IEA Implementing Agreement for Co-operation in the Research and Development of Wind Turbine Systems</b>	Commission signature in 1996. Extended until 2013.	EUR 15 000	15 000
<b>IEA Implementing Agreement for the Establishment of a Project on Solar Power and Chemical Energy Systems</b>	Commission signature in 1998.	EUR 5 250	5 250
<b>Programme to Develop and Test Solar Heating &amp; Cooling Systems</b>	Commission signature in 1979. Extended until 2013	EUR 5 100	5 100
<b>IEA Implementing Agreement for a Programme of Research, Development and Demonstration on Bioenergy</b>	Commission signature in 1995. Extended until 2014.	USD 68 200	49 600
<b>IEA Geothermal Implementing Agreement</b>	Commission signature in 1997. Extended until 2012.	EUR 10 300	10 300
<b>IEA Implementing Agreement on Photovoltaic Power System Programme</b>	Commission signature in 1992. Extended until 2012.	EUR 8 500	8 500
<b>IEA Implementing Agreement for the establishment of IEA Coal Research</b>	Commission signature in 1989. Extended until 2013.	GBP 73 600	86 140
<b>IEA Implementing Agreement for a Co-operative Programme on Technologies Relating to Greenhouse Gases derived from Fossil Fuel Use</b>	Commission signature in 1991.	GBP 62 287	72 900

**b) Calls for tender**

<sup>30</sup> As a contribution from the EU in accordance with Article 108 (2) (d) of the Financial Regulations applicable to the General Budget of the European Communities.

<b>Subject (indicative title)</b>	<b>Indicative budget in Euro</b>	<b>Expected duration</b>	<b>Indicative timetable</b>
Study on renewable energy in Sub-Saharan Africa	1 000 000	12 months	3 <sup>rd</sup> quarter 2011
Study of the environmental impacts of noise, vibrations and electromagnetic emissions from marine renewables	1 000 000	12 months	3 <sup>rd</sup> quarter 2011
Study on the impact of EU funded energy research projects	250 000	12 months	3 <sup>rd</sup> quarter 2012
Mapping information tool of sustainable biomass resources for biofuel production	500 000	24 months	1 <sup>st</sup> quarter 2012

### **Study on renewable energy in Sub-Saharan Africa**

Sub-Saharan Africa offers important renewable energy sources that could be exploited to help the development of the region. This potential should be exploited alongside the development of the indigenous capacity for deploying it. This in turn, requires to raise the R&D capacities in the region. However, the exact research capacities and needs are not well known, nor the social, economic and environmental impacts of different technologies. Therefore, it is highly desirable before putting forward any targeted RD&D renewable energy topics in Sub-Saharan Africa to undertake a feasibility study. It will result in a clear strategy on whether and how to undertake a research and demonstration programme of mutual benefit with the region in the area of renewable energy.

**Funding scheme:** Coordination and Support Action (supporting action), public procurement

### **Study of the environmental impacts of noise, vibrations and electromagnetic emissions from marine renewables**

Marine renewable energy has enormous potential and a large deployment of off-shore wind is included in the SET-Plan. However, due care should be taken that possible environmental impacts are brought to a minimum in order to address public and other stakeholders concerns for such projects. In order to be able to propose a technical mitigation measures, we need to develop a clear understanding of the likely environmental impacts of noise (both during installation and operation), vibrations and electromagnetic emissions of current marine renewable technologies. Therefore, a study will be launched to critically review the available scientific evidences of those impacts.

This call for tender is complementary to the 2012 "The Ocean of Tomorrow" related topics.

**Funding scheme:** Coordination and Support Action (supporting action), public procurement

### **Study on the impact of EU funded energy research projects**

The study's objective is to investigate the scientific, technological and innovation impact of energy research projects funded under the current and previous European RD&D Framework Programmes. The study should analyse on a case-by-case basis to what extent project results were used by project partners or other organisations and how the project results influenced the

participants' economic performance. The European dimension of the project should be carefully analysed. Based on this fact finding work more general conclusions should be drawn on the key factors influencing the outcomes and EU added value of EU funded projects.

**Funding scheme:** Coordination and Support Action (supporting action), public procurement

### **Mapping information tool of sustainable biomass resources for biofuel production**

The European Union is promoting the use of renewable energy to reach the objective of 20% renewable energy in the energy mix and 10% renewable energy in transport by 2020 as set out by the Renewable Energy Directive<sup>31</sup> (RED). Bioenergy contributes at present to more than 60% of all renewables in all three energy sectors. The main alternative to fossil based transport fuels are biofuels, whether liquid<sup>32</sup> or gaseous<sup>33</sup>. Bioenergy is the only RES that can physically replace fossil fuels. The contribution of Bioenergy will remain at least to 50% of all renewables by 2020.

The RED has specified sustainability criteria for the use of biofuels in the European Union and the Fuel Quality Directive<sup>34</sup> increased the volumetric limits of ethanol and FAME to 10 vol% and 7 vol% respectively. This has also been addressed by the CEN EN 228 and EN 590 standards for the market. Sustainability issues for power and heat from bioenergy are not specified in the legislation, but the Member States shall follow the bioenergy operations in their countries and report to the Commission. Furthermore the Commission is considering whether to introduce sustainability criteria for power and heat from bioenergy in a future legislation.

Land use change (direct or indirect) has been discussed extensively and although uncertainty exists on the various predictive models and their reliability, the issue has become important and needs to be addressed.

In relation to these developments, the Commission, the national authorities and the stakeholders need on a regular basis technical and market information on conversion processes, feedstocks, costs, technology developments etc. Such information is difficult to access and often fragmented, making it difficult to collect and consolidate into a consistent picture. Although some tools like the BIOMAP<sup>35</sup> site and other national sites are available, there is little information available on the actual production of sustainable biomass resources.

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<sup>31</sup> Directive 2009/28/EC of the European Parliament and of the Council of 23/04/2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC.

<sup>32</sup> E.g. biodiesel (Fatty acid methyl ester-FAME), bioethanol (EtOH), dimethyl ether (DME), Fischer-Tropsch (FT) and hydrotreated vegetable oils (HVO).

<sup>33</sup> E.g. biomethane, derived by upgrading biogas or synthetically via gasification of biomass.

<sup>34</sup> Directive 2009/30/EC of the European Parliament and of the Council of 23/04/2009 amending Directive 98/70/EC as regards the specification of petrol, diesel and gas-oil and introducing a mechanism to monitor and reduce greenhouse gas emissions and amending Council Directive 1999/32/EC as regards the specification of fuel used by inland waterway vessels and repealing Directive 93/12/EEC.

<sup>35</sup> <http://setis.ec.europa.eu> (see Tool Kit N° 4)

In this context, this Supporting Actions aims at developing an information system (under the form of a website) about the available biomass resources produced sustainably in the EU and beyond, integrating whenever possible issues regarding certification. This information should be used by all stakeholders as a reference tool and could eventually support policy development at national or EU level.

The work to be performed should be based on land boundary data from actual plantations and agricultural parcels, on biomass resources (agricultural product, agricultural residues or energy crops) and address the following:

- A visual map and GIS representation of plantations and agricultural parcels cultivated for the purpose of using the biomass resources for biofuel production;
- Annual information about what biomass resources various plantations and agricultural parcels have produced for biofuel production.

Any other information such as protected areas, administrative regions and other information related to the RED that could be used to facilitate information on the actual resources produced sustainably in the EU and are aimed for biofuel production.

**Funding scheme:** Coordination and Support Action (supporting action), public procurement (service contract)

#### **c) External expertise**

##### **Group(s) of external experts for policy relevant analyses and forward looking reflection on energy research**

Group(s) of external experts will be established to provide analyses of past activities in policy relevant areas and to advise on or support the design and implementation of EU Research Policy. The indicative budget for this activity is EUR 100.000.

**Funding scheme:** Coordination and Support Action (supporting action), expert appointment letters

#### **d) Evaluation Monitoring and reviews**

The indicative budget for evaluation of proposals is EUR 1 700 000 while the budget for the monitoring, reviewing and auditing of projects is foreseen to be EUR 2 300 000.

**Funding scheme:** expert appointment letters

## Indicative budget for the Energy Theme for the 2012 work programme

<b>Call/ activity</b>	<b>DG RTD</b> EUR million	<b>DG ENER</b> EUR million
<b>FP7-ENERGY-2012-1</b>	136	
<b>FP7-ENERGY-2012-2</b>		81
<b>FP7-ENERGY-SMARTCITIES-2012</b>		40
<b>FP7-ERANET-2012-RTD</b> <sup>36</sup>	17	
<b>FP7-2012-NMP-ENV-ENERGY-ICT-EeB</b> <sup>37</sup>		35
<b>FP7-KBBE-2012-6</b> <sup>38</sup>	5	
<b>General Activities (see Annex 4)</b>	1.82	2.53
<b>Other actions:</b>		
• <b>Evaluations</b>	1.20	0.60
• <b>Monitoring, reviews and audits</b>	0.85	1.50
• <b>Contribution to IEA IAs</b>	0.1	0.20
• <b>External expertise</b>	0.10	
• <b>Call for tender</b>	2.13	0.63
<b>Total Other actions</b>	4.38	2.93
<b>Estimated total budget allocation</b>	164.2	161.46

Summary of budget allocation to general activities for 2012 (cf. Annex 4):

<sup>36</sup> For further details concerning the implementation of the ERA-NET and ERA-NET Plus calls see Annex 4 of the Cooperation work programme.

<sup>37</sup> For further details concerning the implementation of the PPP calls please see Annex 5 of the Cooperation work programme

<sup>38</sup> For further information please see the KBBE work programme 2012 that includes the call FP7-KBBE-2012-6.

	<b>DG RTD EUR</b>	<b>DG ENER EUR</b>
<b>CORDIS<sup>39</sup></b>	280 862	274 300
<b>Eureka/Research Organisations</b>	12 443	12 152
<b>COST</b>	1 491 001	2 205 734
<b>Strat. Oriented Support actions</b>	35 552	34 721
<b>Experts</b>	2 133	2 083
<b>Total</b>	1 821 991	2 528 990

All budgetary figures given in this work programme are indicative. The final budgets may vary following the evaluation of proposals.

The final budget awarded to actions implemented through calls for proposals may vary:

- The total budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the whole call.

For actions not implemented through calls for proposals:

- The final budgets for evaluation, monitoring and review may vary by up to 20% of the indicated budgets for these actions;
- The final budget awarded for all other actions not implemented through calls for proposals may vary by up to 10% of the indicated budget for these actions.