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Horizon 2020 Work Programme for Research & Innovation 2018-2020

Global Leadership in Renewables

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Research and
Innovation

Renewable energy solutions for energy system level implementation

LC-SC3-RES-11-2018 1/2

Achieving or maintaining global leadership in renewable energy technologies requires cost reductions

TRL 3-4 to 4-5

RIA

EUR 2 to 5 million

Reduce the CAPEX and/or OPEX of energy generation

Developing solutions to reduce the cost and increase performance of renewable technologies

Floating Wind Technology development including reliable, cost efficient anchoring and mooring system, dynamic cabling, installation techniques, and O&M concepts;

Onshore Wind Disruptive technologies for the rotor, generator, drive train and support structures for the development of the advanced or next generation wind energy conversion systems;

Ocean New integrated design and testing of tidal energy devices with behavioural modelling to achieve extended lifetime and high resistance in marine environment;

Geothermal Novel drilling technologies to reach cost-effectively depths in the order of 5 km and/or temperatures higher than 250°C;

Renewable energy solutions for energy system level implementation

LC-SC3-RES-11-2018 2/2

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Reduce the CAPEX and/or OPEX of energy generation

Developing solutions to reduce the cost and increase performance of renewable technologies

CSP Novel components and configurations for linear focusing and point focusing technologies;

Hydropower Novel components for hydropower hydraulic and electrical machinery to allow efficient utilization also in off-design operation conditions (ramp up and ramp down phases) and reduce related machinery wear and tear;

Bioenergy Improve small and medium-scale combined heat and power (CHP) from biomass to reduce CAPEX and OPEX through achieving high resource efficiency and high overall and electrical conversion performance.

Renewable energy solutions for energy system level implementation

LC-SC3-RES-12-2018

Progressive replacement of fossil fuels used in the heat and power sectors by means of renewable energy sources

TRL 5 to 7-8

IA

EUR 15 to 20 million

Reduce the cost of combined heat and power generation from renewable sources, making it competitive to fossil fuel based solutions

Demonstrate highly performant renewable technologies for combined heat and power (CHP) generation and their integration in the EU's energy system

Biomass based combined heat and power (CHP) Demonstration of technically feasible and cost-effective installation of medium to large-scale CHP through retrofitting of existing fossil-fuel driven CHP or power plants >10 MW electrical to CHP plants with the use of sustainable biomass feedstock. Commercial operation of the plant with biomass after the end of the project is to be envisaged;

Geothermal Demonstration of geothermal plants to respond cost-effectively to the heat and to the power demand of the network. Proposals are expected to propose technologies for more flexible or more efficient geothermal plants or a combination of these two aspects. Associating other renewable heat sources to geothermal and adding storage would increase its flexibility (not a necessary condition).

Renewable energy solutions for energy system level implementation

LC-SC3-RES-16-2019 1/2

Increase the potential and performance of dispatchable technologies to provide flexibility services to the energy system

TRL 3-4 to TRL 4-5

RIA

EUR 3 to 5 million

Penetration of a higher share of variable output renewables in the energy mix without affecting system stability

Development of solutions based on renewable sources that provide flexibility to the energy system

Bioenergy Development of intermediate bioenergy carriers for energy and transport from biogenic residues and wastes and energy crops from marginal lands not applicable to food or feed production, through feedstock flexible technologies at a conversion cost reduced by at least 25% from the state-of-the-art, with increased energy density storage and trade characteristics and improved GHG performance;

Hydropower Development of low and ultra-low head and sea water resistant equipment (such as for example bulb-pump turbines) guaranteeing at least 70% round-trip efficiency and making low-head seawater storage and other low head applications of hydropower viable for example at unexplored locations (e.g. like at coastal dams and islands), by minimising at the same time potential impacts on fish.

Renewable energy solutions for energy system level implementation

LC-SC3-RES-16-2019 2/2

Increase the potential and performance of dispatchable technologies to provide flexibility services to the energy system

TRL 3-4 to TRL 4-5

RIA

EUR 3 to 5 million

Penetration of a higher share of variable output renewables in the energy mix without affecting system stability.

Development of solutions based on renewable sources that provide flexibility to the energy system

Virtual Power Plant Increase the performance of an integrated portfolio of renewable energy sources to operate together as a Virtual Power Plant, capable of providing flexibility and ancillary services to the energy system. The solution has to be competitive compared to solutions combining variable output renewables with electrochemical storage.

Renewable energy solutions for energy system level implementation

LC-SC3-RES-17-2019 1/2

Increase the potential and performance of dispatchable technologies to provide flexibility services to the energy system

TRL 5 to 7

IA

EUR 12 to 15 million

Technologies that allow plant and system operators to operate successfully in the modern power markets

Demonstration of solutions based on renewable sources that provide flexibility to the energy system

Bioenergy Demonstration of the most cost-efficient intermediate bioenergy carrier pathways for energy and transport, addressing solid, liquid and gaseous intermediate bioenergy carriers from biogenic residues and wastes with increased energy density, storage and trade characteristics (where relevant) and improved GHG performance. Production at a scale of up to 5000 tons and process feasibility through applications to fuel production including for the heavy duty, maritime and aviation sectors, as well as to combined heat and power generation, are to be included.



Renewable energy solutions for energy system level implementation

LC-SC3-RES-17-2019 2/2

Increase the potential and performance of dispatchable technologies to provide flexibility services to the energy system

TRL 5 to 7

IA

EUR 12 to 15 million

Technologies that allow plant and system operators to operate successfully in the modern power markets

Demonstration of solutions based on renewable sources that provide flexibility to the energy system

Hydropower Improvement of the average annual overall efficiency of hydroelectric machinery. Projects are expected to provide high availability and to maximise performance of hydropower plants of all sizes by adapting to variable speed generation and optimising maintenance intervals; digitalisation measures to increase flexibility can be included.

Concentrated Solar Power (CSP) Demonstration of innovative thermal storage systems. The solutions proposed will have to achieve much higher storage densities than current mainstream solutions (i.e. at least two times higher) while guaranteeing similar performance in terms of cycles.

Market-uptake support

RES-28-2018-2019-2020

Challenges for large-scale deployment of RES: initial high cost, consumer acceptance, legal and financial barriers, competition with incumbent solutions

Support for a broad range of issues, including:

- Recommendation for harmonisation of regulations, life cycle assessment approaches, environmental impact methodologies of renewable energy solutions;
- Development of additional features for RES to be compliant with the electricity market requirements, making them 'market fit';
- Sharing of best practice between public funding bodies for the cross-border participation in RES electricity support schemes
- Increasing the use of the 'RES co-operation mechanisms'
- Development of insurance schemes
- Development of innovative financing mechanisms/schemes
- Support tools to facilitate export markets
- ...

Engagement of relevant stakeholder and market actors is crucial!

CSA, recommended EU contribution: EUR 1-3 million/project





Thank you!

Find out more:

<http://ec.europa.eu/programmes/horizon2020>