Demonstration of system integration with smart transmission grid and storage technologies with increasing share of renewables

Proposals will target the transmission grid and demonstrate a combination of at least 2 of the following aspects:

- Power transmission technologies and management of large scale generation in the context of a significantly increased share of variable renewables and interactions with the distribution grid;
- Large scale storage relevant to the transmission network (up to GWh scale), potentially including several storage technologies addressing different time scale (e.g. daily, seasonal), ramping rates and volumes, managed centrally or in a distributed way;
- Communication / ICT technologies / control tools to enhance real-time awareness, to introduce more flexibility in the transmission grid, to integrate storage facilities, more flexible generation, demand-response mechanism and its interface with the distribution grid; solutions to enhance cross-border collaboration;
- New approaches to the wholesale market facilitating the participation of variable renewable energy sources, remunerating adequately new flexibility services to the grid such as offered by storage, active participation of demand and new players such as aggregators and reducing the cost of operations.

The targeted technology readiness levels (TRL) will range typically between 5 and 8 (please see part G of the General Annexes). Proposals will indicate the estimated levels of TRL at the beginning and at the end of the project.

Proposals will include an analysis of current regulations, codes and standards applying to their case as well as an analysis of business models and pan-European EU market integration if relevant. Where appropriate, environmental issues will be...
ongoing policy developments in the field of the design of the internal electricity market, of the retail market, ongoing discussions on self-consumption, enhanced interconnections between Member States and/or between energy networks.

is capable of integrating large share of renewables (at least 50%[[In the GHG40 EU reference scenario 2014 (medium ambition), the share of renewables in electricity is close to 50%, see 'A policy framework for climate an energy in the period 2020 up to 2050 - Impact Assessment' (SWD(2014)16 final) ]] by 2030), in particular from variable sources;

Proposal tackling problems of transnational nature will be given specific attention.

Proposals will also foresee coordination with Horizon 2020 funded projects carrying out demonstration in the context of smart grid and storage in particular for policy-relevant issues such as regulatory framework, business models, data management, obstacles to innovation. It is recommended to reserve of the order of 2% of the EU funding for these activities. A Coordination and Support Action is foreseen for the organisation of this collaboration in this Work Programme (see Topic LCE 3)

The Commission considers that proposals requesting a contribution from the EU between EUR 15 and 20 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

The integration of variable renewable energies challenges the electricity transmission network technologies, economics, and existing storage systems. Also, the target to reach 10% of interconnection of the production capacity calls for new approaches to the transmission network and its management and opens new perspectives in terms of sharing and resources (e.g. production, storage, trading and handling of electricity from variable renewable energy sources) across borders.

Proposals must demonstrate that they are relevant, compatible with the broad EU energy policy context such as Climate-Energy packages, Energy Union. Where relevant, proposal should clearly describe how they will contribute to:

- ongoing policy developments in the field of the design of the internal electricity market, of the retail market, ongoing discussions on self-consumption,
- enhanced interconnections between Member States and/or between energy networks.

Proposals will demonstrate that the proposed solution can be scaled up to GW or GWh level (if relevant) and replicated, indicating where, how the demonstrated solution could apply with an estimate of the quantities of energy and power involved. Proposals will also describe if and how they contribute to ensure that the EU electricity network:

- is capable of integrating large share of renewables (at least 50%[[In the GHG40 EU reference scenario 2014 (medium ambition), the share of renewables in electricity is close to 50%, see 'A policy framework for climate an energy in the period 2020 up to 2050 - Impact Assessment' (SWD(2014)16 final) ]] by 2030), in particular from variable sources;
- can operate in a stable and secure way;
- operates within a well-functioning wholesale market, providing the EU consumers with competitive prices of electricity and integrating renewable sources in a cost effective manner;
- evolves towards a pan-European network with increased levels of security of resource sharing.

Finally, proposals will also include ad-hoc indicators to measure the progress against specific objectives of their choice which could be used to assess the progress during the project life.

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