

Ten Innovation Actions



to Deliver
the Energy Union

Main Messages

- 1 A power system fit for the next decade: sound innovation and R&D actions to facilitate the integration of novel solutions into the existing system
- 2 Digitalisation is the main tool for and driver of the power system of the future and must be a horizontal priority in all research activities
- 3 Power system modernisation to be achieved through development of innovative elements and components
- 4 Develop a special focus on markets with consumers at their centre
- 5 Link extensive related research activities, specifically on energy networks, to the overarching climate agenda set by COP 21 and make them contribute to climate goals
- 6 Double energy transition-related research funding in FP9 to ensure competitiveness with other global players, e.g., China and the U.S.
- 7 Recognise R&D spending in transmission and distribution tariffs
- 8 Set up a Strategic Public Private Partnership for the energy transition with an Innovation Board formed by independent experts to monitor progress with clearly set KPIs (yearly progress report)
- 9 Shorten the time of innovation to the market by appropriate support for market uptake, demonstrators and education
- 10 Combine EU and national efforts and enhance the exchange of best practices and therefore uptake of national and European research projects through dedicated transparency tools (websites, exchange, etc.)

Research, Development and Innovation Directions for TSOs, DSOs, ENTSO-E and EDSO

1

Europe, ambitious to be the global leader in energy transition and renewables development, needs to **strengthen the system approach and indispensable network development**. The integration of transmission, distribution networks, energy conversion and storage options are the enabler for that leadership. The European industry and utilities should enhance their leading-edge capability through **continuous and focused investments in research and innovation at the European level along with cooperative actions, bringing this integration into the existing system**.

2

Digitalisation has become the main tool and driver of the power system transition and therefore requires horizontal priority in all research activities. Digitalisation will facilitate integration with other energy systems and the advent of new services that will be based on digital information, analytics and connectivity. Electricity, digital and ICT infrastructures will be combined.

3

Power system modernisation should continue by focusing research and innovation activities on the development of its **elements and components**, as well. The power system will operate with high penetration of power electronics owing to distributed resources. New innovative technologies, such as **storage**, should be put in place. A power system with low inertia will require **new operational and planning methods**. **Novel maintenance approaches and protection systems** will require adapted monitoring, control and cyber secure and fast data communication.

4

The energy system will increasingly become a network of networks where customers will be at the centre. In addition to digitalisation, the coupling between electricity, gas, heat and mobility will offer new options for optimisation across sectors and between the local, national and regional levels towards Pan-European exchanges. This will result in **more volumes exchanged in the electricity and energy markets**, enhanced cross-border exchanges, local markets and participation of customers. More **research and innovation** in techniques and processes enabling **market integration and coordination as well as automation** will be required.

The Framework Needed to Achieve the Development of the Future Power System

5

Research and innovation in energy networks should be a **key objective of the European research and energy policy**, representing an opportunity for economic growth through the creation of **business opportunities** while at the same time contributing to the achievement of the objectives of **COP 21**. Research and innovation is hence one of the pillars of the Energy Union. This position should be enhanced as the transformation towards a decarbonised energy sector will be made possible by faster developments of the power system.

6

ENTSO-E, EDSO, TSOs and DSOs strongly support the recommendation of the European Parliament to **increase by 50 % the research and innovation budget for energy in the future Framework Programme 9**. The transmission and distribution networks will continue to be the backbone of the electricity and energy systems of the future by acting as integrators of low carbon technologies. Therefore, **the power system should be a priority of energy research and innovation with a corresponding budget.**¹⁾

¹⁾ Horizon 2020 budget for transmission, distribution and storage R&I projects is approx. 100 million€/year. This should double.

7

In parallel with funding, **regulation for research and innovation activities** for regulated entities, such as TSOs and DSOs, should also be adapted to the energy transition. To that end, R&D spending should be recognised in network tariffs.

8

Right skills for the energy transition: Setup of **Strategic Public Private Partnerships** at the European level that will bring together and function as a bridge between regulated entities, public funding, industries, start-ups and the research community. The success of activities carried out should be monitored by an Innovation Board formed by independent experts. The update and transition of power systems will need to be thought of and developed by researchers, engineers and socio-economists, thereby **combining skills** from the electricity and ICT sectors with societal and economic insights. Therefore, **education and training** must be a key priority at once.

9

Innovations should be tested and validated in **demonstrators**, which in the case of transmission and distribution networks exist under real-time conditions. This includes fast and real-time simulations that should take place in **interoperable infrastructures** across Europe, making certain the faster market uptake of the project results. **The market uptake of results** of research and demonstration projects is enhanced by linking R&I successes from FP9 programmes to deployment actions carried out in programmes, such as the Connecting Europe Facility.

10

Linking **EU funding with national funding and developing simple tools for access to information:** through combining insights from national and European research and innovation projects by **setting up a dedicated website**.



ENTSO-E, the European Network of Transmission System Operators, represents 43 electricity transmission system operators (TSOs) from 36 countries across Europe. ENTSO-E was established and given legal mandates by the EU's Third Legislative Package for the Internal Energy Market in 2009, which aims at further liberalising the gas and electricity markets in the EU.

For more information:

www.entsoe.eu | [@ENTSO_E](https://twitter.com/ENTSO_E)

EDSO for Smart Grids gathers 36 leading electricity distribution system operators (DSOs), including 2 associations, from 20 European countries. Through its work on electricity distribution-related technologies, policies and projects, its members cooperate to ensure the reliability of Europe's electricity supply for citizens and enabling their active participation in our energy system. In short, EDSO is shaping smarter grids for your future.

For more information:

www.edsoforsmartgrids.eu | [@EDSO_eu](https://twitter.com/EDSO_eu)