

MISSION INNOVATION

Accelerating the Clean Energy Revolution

Smart Grids Innovation Challenge – Progress Summary

Issue

Research and Development (R&D) in the field of Smart Grids is needed to address the challenges related to the development, integration, operation, management, and optimization of accessible, reliable and resilient power systems with steadily increasing penetration of Renewable Energy Sources (RES) worldwide. This implies the development, demonstration, and application of innovative technologies and solutions. Smart grids offer the promise of increasing the efficiency and utilisation across the whole energy system, deferring or avoiding investments in costly physical infrastructure, and increasing access to electricity at a lower cost than traditional solutions.

Objective

The Smart Grids Innovation Challenge will support the transition from today's power grid - strongly based on fossil fuelled power plants - to tomorrow's grid powered by affordable, reliable, decentralised renewable electricity systems able to balance supply and demand at any time, even when primary energy sources are not available. In particular, the Challenge aims at developing an improved and shared understanding of main R&D needs and gaps; fostering national research towards jointly identified R&D priorities; promoting opportunities to researchers, innovators and investors from around the world; and strengthening and expanding collaboration between key partners, leveraging their complementarity and synergies.

Organization

The Smart Grids Innovation Challenge is co-led by: China, India, and Italy.

Other participating members include: Australia, Brazil, Canada, Denmark, the European Commission, Finland, France, Germany, Indonesia, Mexico, Norway, Saudi Arabia, Republic of Korea, Sweden, the Netherlands, the United Kingdom, and the United States.

Approach

The Smart Grids Innovation Challenge aims at highlighting and demonstrating the considerable benefits arising from the widespread use of smart grids technologies in different grid applications at regional and distribution grids as well as micro-grids in different geographical areas. In order to accommodate up to 100% of RES based power plants, this Challenge will identify specific technological solutions to be further developed, and push forward their implementation into reliable clean energy systems.

The cornerstone of success for the Challenge will be the ability to leverage the knowledge already available from participating members on technology and power system management, and the endorsement and widespread implementation of the identified solutions. In this frame, the Challenge will extend a collaborative network to involve institutes, businesses and investors and expand its influence worldwide.

This Challenge recognizes the importance of interacting with and leveraging on the outcomes available from ongoing initiatives. Therefore, interaction with international agencies, such as International Energy Agency (IEA), IRENA and other frameworks (e.g. WEF, ETIP SNET, EERA, CRES, etc.) will be pursued.

Progress

Four main sub-challenges have been identified: Regional grid innovation, distribution grid innovation, micro grid innovation, and cross innovation.

Research on smart grids is ongoing in many countries, and the identification and selection of the most relevant research, development and demonstration (RD&D) topics for each participating member has been the first action and constitutes the basis for the future work. In order to achieve this, the Smart Grids Innovation Challenge asked the participating members to identify their smart grids innovation priorities, and provide information on their ongoing national and international activities, engaged stakeholders and their initial ideas for precise measurable targets for the Challenge. This information will help build a shared understanding of R&D gaps and opportunities in the smart grids field.

The template for an annual R&D Smart Grids Country Report has been developed and approved. Preparatory work under the Challenge has been undertaken both remotely and by means of dedicated Challenge workshops, namely on April 4 in Ispra (IT) and on May 22 in New Delhi (IN). Fruitful interactions have been already established with IEA and in particular with the IEA ISGAN TCP with whom a close collaboration is deemed highly strategic.

Next Steps

A 3.5 day technical workshop will be held in Beijing (4th-7th June) which looks to bring together a diverse group of international experts, policy makers and innovators in the field of smart grids. The workshop aims to achieve a shared view on the agreed top R&D priorities and related actions towards smart grids innovation. The main outcomes will include a consolidated version of the Challenge work plan and a draft country report including members' contribution that will be finalized by the end of 2017. Building on the first Challenge workshop, the co-leads propose to organize a series of deep-dive workshops (likely two a year) on different key aspects of the Innovation Challenge to discuss its ongoing strategy and shared achievements.

During 2017, the Smart Grid Innovation Challenge will develop a set of Key Performance Indicators (KPIs) to monitor the progress and the rate of success of the Challenge activities. Before the end of 2017 a service platform supporting this Challenge's activity with respect to information sharing, data repository, working space for experts, etc. will be developed. In the meantime, relevant information and documents are stored at www.electrairp.eu.

Annual country reports will be produced by each member in order to continuously update information about smart grid related activities. In addition, an annual General Report will be released to provide an overview of the smart grids innovation landscape worldwide, recommendations for stakeholders, and provide an increased and shared understanding of actions required to address the Innovation Challenge. The first one of these will be published by June 2018 based on 2017 information.

Further collaboration on Smart Grids innovation beyond 2020 will likely be needed to realise the foreseen objectives. The role of Smart Grids Innovation Challenge will be reviewed in 2019.