



WORKING GROUP 3

FLEXIBLE GENERATION

Term of Reference

March 2021



ETIP SNET

European Technology and Innovation Platform
Smart Networks for Energy Transition

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1. INTRODUCTION AND BACKGROUND

The European Technology & Innovation Platforms (ETIPs) have been created by the European Commission in the framework of the new Integrated Roadmap Strategic Energy Technology Plan (SET Plan) by bringing together a multitude of stakeholders and experts from the energy sector. Its role is to guide Research & Innovation (R&I) to support Europe's energy transition.

The European Technology Innovation Platform Smart Networks for Energy Transition (ETIP SNET) has become a very active and representative actor in the European Energy Research & Innovation (R&I) eco-system. Its main challenge for the coming years is to maintain and possibly increase this level of representativeness, provide the highest-quality guidance on R&I strategic needs, and turn them into key messages that are heard by policy makers and regulators at EU and National levels.

Currently, the ETIP SNET activities are managed through an EU Service Contract (named SPRING) and it includes also the management of the European Commission Initiative BRIDGE.

The ETIP SNET positions itself together with the smart grid at the center of an energy system which is under transition towards a low carbon neutral energy. ETIP SNET will support the delivery of an EU R&I agenda that will enable the EU to deliver on its 2050 and the intermediate 2030 climate & energy targets in line with the EU 2030 and 2050 decarbonisation objectives, in which the share of electricity in the overall energy mix is expected to grow.



2. TERMS OF REFERENCE OF EACH WORKING GROUP

2.1 INTRODUCTION

In September 2015, the European Commission issued the SET-Plan Communication, addressing innovation in the context of the strategy of the Energy Union. Among the priorities highlighted, of particular interest for the energy networks community is the priority "Number 4 – Increase the resilience, security, smartness of the energy system".

The European Technology and Innovation Platform for Smart Networks for the Energy Transition (ETIP SNET) was set-up to reflect the increasing need to consider the smart grids as an integral part of the energy system. The mission of the Platform is to guide research and innovation activities to support Europe's energy transition. The ETIP SNET elaborated a Vision 2050 and a two Roadmaps for R&I activities (and the associated Implementation Plans) for smart networks, storage and other sources of flexibility, and integrated energy systems, engaging all stakeholders. It will also look at customer participation and the impact of digitisation. It will identify innovation barriers, notably related to market design, regulation and financing.

Five permanent Working Groups and a National Stakeholders Coordination Group (NSGC) have been set up as Governance Bodies of ETIP SNET to ensure the involvement and contribution of all the stakeholders of the energy system as a whole, providing vision, inputs, guidance and continuous feedback for the development of the integrated R&I Roadmap. The Working Groups are set up to ensure the most adequate balance between the effectiveness of their work on the planned deliverables and the openness towards new subjects and new issues which may appear. The following Working Groups are established:

- WG1: Reliable, economic and efficient energy system
- WG2: Storage technologies and system flexibilities
- WG3: Flexible Generation
- WG4: Digitalisation of the electricity system and Customer participation
- WG5: Innovation implementation in the business environment

WG1 to WG4 are dedicated to the different aspects of development of the energy system along its different main development paths, while **WG5** is horizontal, being more focused on technology transfer, application and market uptake.

Finally, the **National Stakeholders Coordination Group**, involves Governments and Regulators to ensure that all ETIP outcomes optimally complement national conditions and innovation directions, and to facilitate the uptake of ETIP outcomes into local/national policy. The following figure illustrates the main fields of activities of WG1 to WG4.

2.2 MISSION OF THE ETIP SNET WORKING GROUPS

Experts acting in the Working Groups ("WG Members") will aim at providing strategic guidance about RD&I priorities and activities, ensuring the interaction and involvement of the entire expertise needs raised by the integration issues of the electricity system into the wider European energy system.

The Working Groups (WG) will also exchange with the other ETIPs (roadmap and implementation plans) and the other European or International R&I coordination activities (e.g. ERA-Net SG+, GSGF, CEM initiatives, Mission Innovation, IEA TCPs such as ISGAN, Cigre, DSM, HTS, 4E etc.).

The Working Groups are set-up on the principle of avoiding overlaps among their goals and activities carried out.



- **WG1** focuses on both technological and market solutions for the European electricity networks as well as on the integration of generation, consumption, storage, and interfaces to other energy networks. This integration should make the power system sustainable, reliable, secure and affordable.
- **WGs 2, 3 and 4** focus on providing the main different technological and market solutions to ensure the flexibility of the power system. Through this focus on system integration and flexibility to meet system needs, they complement the system approach in WG1 and of the entire ETIP SNET.
- **WG 5** adopts a helicopter view of the activities carried out in the projects within the perimeter of the ETIP about the energy transition in order to build homogeneity in the analysis of projects, work done and lessons learned. They create a common platform for analysing the progress made with technologies through-out the EU and facilitate their scalability; WG5 is building a methodology to judge system needs in the energy transition capable of identifying tangible needs for building on progress made and give feedback to the other WGs for populating their R&I needs in the years ahead. Finally, they review the relevant BRIDGE reports that identify the economic, social, technical, legal, etc. barriers which may slow down business model deployment; to search for innovative solutions that will maximise the benefits of the innovation process that EU achieves through R&I activities in the area of Energy.

The Working Groups will focus on:

- Delivering a vision (overarching goals and constraints) for the European energy system and respectively of the contribution of various technologies to this system by 2030, 2050 and beyond, guiding the preparation and update of the RD&I Roadmap in the direction of the specific priorities of the European Energy Union addressed;
- Reviewing the monitoring reports of the implementation of RD&I activities at European, national/regional and industrial levels, produced by on-going research and demonstration activities with the goal to establish the state of the art (e.g.: analysis of recent success stories / innovation actions in the area of expertise of the working group, analysis of the results from the outstanding project's demonstrators, analysis of the potential of scaling up and replication, analysis of the coverage of each functional objective within the scope of the WG by past and ongoing R&I project achievements);
- Reviewing and link to the relevant BRIDGE reports that identify the economic, social, technical, legal, etc. barriers which may slow down business model deployment (impacting scaling, replication, deployment) avoiding overlapping or duplication of resources;
- Providing inputs to and reviewing output of the knowledge sharing activities at pan-European level organised by a) The Secretariat through inputs to regional workshops or the production/review of contents for the Knowledge Sharing Platform (KSP) and for EIRIE Platform and b) by ERA-NET SG PLUS by its Knowledge Community.
- Preparing consolidated stakeholder views about the Research and Innovation activities to meet both European and National/Regional Energy Policy orientations, also contributing to the process of development, review and validation of a common RD&I roadmap;
- Contributing to validate, integrate and prioritise the Research and Innovation activities in the updated RD&I roadmap and the related yearly implementation plans;
- Identifying the long-term challenges, disruptive technologies, solutions to be addressed by the future R&I activities and the innovation barriers to be removed to favour the deployment of new knowledge in their area of expertise;
- Estimating the financial resources need to carry out the proposed RD&I activities and potential financing mechanisms to be used (EU, National / Regional Funding, financial contributions by project participants).
- Contribute or lead discussion / analysis on specific themes in their area of expertise that are of wider interest and call for the support of stakeholders in identifying steps forward.

3. SPECIFIC OBJECTIVES PER WORKING GROUP

3.1 WORKING GROUP 3: FLEXIBLE GENERATION

WG3 addresses the business and technology trends of generation considering the contribution of flexibility from thermal power plants (bulk and distributed), and of innovative technologies and solutions in thermal-based generation systems (e.g. micro-CHP, industrial co-generation), heat distribution (e.g. district heating), storage and optimization of the RES generation technologies to contribute to reach a secure, clean and reliable energy system to address the needs for flexibility in the framework of an integrated energy system.

Shifting the management of thermal power plants from base load with low and limited flexible capability to flexible power generation poses a number of challenges which need to be addressed in terms of efficiency, reliability, life expectancy, operational costs, as well as environmental performances. Several solutions can be envisaged but need to be validated and demonstrated, ranging from bulk to distributed generation.

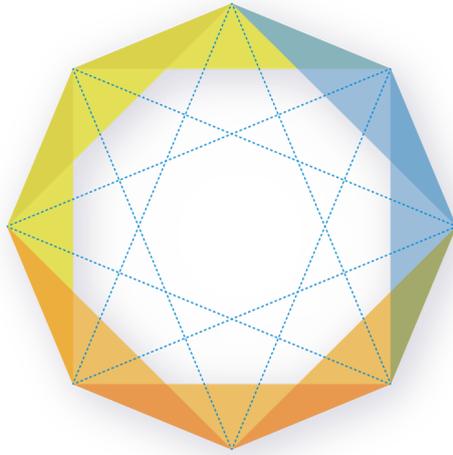
The future European energy scenario with very high shares of renewables in the energy mix (up to 100%), system support functions that are provided today by synchronous generation will need to be provided by renewable generation or procured from third parties. RES should significantly contribute to a more stable operation of the future energy system, allowing growing percentage of renewable sources. WG3 addresses the different technologies and solutions of flexible generation (including thermal power plants operated with synthetic green fuels, embedded storage and/or fuel cells) and RES optimisation from a technological, environmental, economic, regulatory and acceptance points of view.

WG3 addresses integrated solutions based on variable renewable energies (solar PV, wind energy, ...) and dispatchable renewable energies (e.g. hydro) + energy storage devices + smart technologies focused on the large integration of renewable energies in the network (both, transmission and distribution grids) in a secure and reliable mode.

The details of the items addressed are only partly included in the present roadmap (see Annex 2 of the Roadmap). New clusters and functional objectives need to be included to address these specific subjects.

Key targets and performance Indicators:

1. Create strong footprint of Flexible Generation in all ETIP SNET activities, in particular in Implementation plans and Road Maps of ETIP SNET;
2. Intensify collaboration with other related ETIP's and organisations;
3. Hold the monthly web calls of the Working Group with detailed agenda and minutes and at least one annual F2F-meeting;
4. Attend all regional workshops of ETIP SNET in support of project consortia in building their innovation roadmap in line with their key exploitable results.



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