PANTERA

Pan European Technology Energy Research Approach

Work Package 2

Pan-European R&I community

Deliverable D2.3

1st Report on interactions with European platforms and organizations

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Abbreviations

ALTM	Advanced Laboratory Testing Methods
BESS	Battery Energy Storage System
CEM	Clean Energy Ministerial
DSO	Distribution System Operator
DER	Distributed Energy Resources
EERA	European Energy Research Alliance
ENEA	Italian Agency for Energy Efficiency
ETIP SNET	European Technology and Innovation Platform for Smart Networks for Energy Transition
IEA	International Energy Agency
IP	Implementation Period
IR	Innovation Radar
ISGAN	International Smart Grid Action Network
JP SG	Joint Programme on Smart Grids (of EERA)
JRC	Joint Research Centre
MI	Mission Innovation
R&I	Research and Innovation
RD&I	Research, Development and Innovation
RICAP	Research and Innovation status and Continuous gAP analysis
SET Plan	Strategic Energy Technology Plan
SGIA	Smart Grid Innovation Accelerator
SME	Small Medium Enterprise
SSERR	Support Services for Exploitation of Research Results
TCP	Technology Collaboration Program
TSO	Transmission System Operator
T&D	Transmissions and Distribution
WG	Working Group (of the ETIP SNET)
WT	Working Team (of the PANTERA project)
WP	Work Package

Executive Summary

This deliverable reports the results of the activities performed within the PANTERA project task 2.3 “Interactions with European platforms and organizations”. In brief, the aim of this task is to:

- ❖ Establish good collaboration links with European and International organizations in order to promote the activities of the PANTERA project;
- ❖ Engage stakeholders and gather valuable and updated information from the global smart grids research and innovation field;
- ❖ Develop collaboration between other platforms and the EIRIE platform to secure content that ensures engagement and interaction with stakeholders at pan-European level.
- ❖ Gather valuable as well as updated information from the global smart grids research and innovation field

Based on the above objectives and taking into consideration the following:

- Same direction and same objectives
- Strong impact and networking activities at International/EU level
- Special relations with the PANTERA target countries
- Existing connections / working relations

different collaborations were pursued with EU and international associations / projects.

Thanks to the deep involvement of PANTERA partners in international initiatives, good collaboration has been established between international consortia and the PANTERA project. Information flow has been established and most important news / actions / activities happening are reported and made available for further use by the linked stakeholders.

More in detail, the global level initiatives with which PANTERA has established good relations are: Mission Innovation – Innovation Challenge 1 on Smart grids and the International Smart Grid Action Networks (ISGAN) while at European level PANTERA partners succeeded in collaborating with the European Technology and Innovation Platform for Smart Networks for Energy Transition (ETIP SNET), BRIDGE initiative and the European Energy Research Alliance (EERA) Joint Programme on Smart Grids. Of course, DERlab that is a member of the PANTERA consortium has helped to strengthen working relations with the DERlab members and respective labs around Europe.

In particular, concerning the ETIP SNET, close collaboration has been established with its Working Group - WG 5 “Innovation implementation in the business environment”. Through this collaboration PANTERA partners supported the ETIP SNET’s regional workshops and within WG5 periodic meetings, PANTERA regularly gives an update about the international relations that it is monitoring (MI, ISGAN, EERA JP SG) benefiting in the process by collecting feedback from WG 5 members. In summary the activities achieved are the following:

- ❖ support the ETIP SNET’s regional workshops with direct interaction with several national and European projects gathering in this way rich feedback for populating the EIRIE platform.

- Share updated international news about the related initiatives that PANTERA is collaborating with (MI, ISGAN)
- Outreach the broader R&I community of the ETIPSNET through the dedicated newsletter and the circulation of presentations
- Collect feedback from WG 5 experts on various current themes forming valuable inputs for the EIRIE platform.

The collaboration and support to the ETIP SNET goes beyond the collaboration with WG5 and considers also the following activities performed within the PANTERA Working Team 3, expecting to go even wider to cover all the areas that current working teams are targeting:

- Provision of technologies and functionalities classification to secure a unified categorization under the EIRIE platform
- Development of a methodology of matching other platforms categorization to EIRIE classification to secure the seamless collaboration with other initiatives in the future.
- Secure that the classification is adaptive, flexible and up to date and that corresponds to the updated needs of the R&I community
- Maturity index methodology development to quantify the progress and identify the R&I needs at each point in time based on the achieved evolution of technologies, systems and solutions..

Finally, regarding the interaction with ETIP SNET/BRIDGE it is important to note the agreement reached between the two entities, for collaboration on generated data / information / knowledge handling, thus enabling the EIRIE platform to share also ETIP SNET's and BRIDGE's projects' data / information / knowledge and to be able to offer structured information through shared search functionalities and tools.

The individual members of the R&I community are also in the scope of the work performed in this task. In fact, establishing a high number of good connections will be very important in the launching phase of the EIRIE platform. In this view, a campaign to periodically release tweets has been set up and the most important news from the international initiatives and other content of interest e.g. projects. To this effect, EC consultations, Horizon Europe etc, are summarized and posted on twitter through the PANTERA project account.

Considering the PANTERA regional approach, work has also been performed on the Smart Specialisation S3 platform policies of the PANTERA targeted countries that are managed by JRC. In particular, the energy priorities and thus the main topics of interest for regional stakeholders have been identified. This would promote relevant interaction with local stakeholders and it will be useful in the EIRIE platform tools definition. Moreover, the EIRIE platform will be hosted by JRC: in this way collaboration with S3 platform will be further enhanced.

As far as collaborations with other platforms and projects are concerned, data and content that are useful and within the objectives of PANTERA shall be hosted in the EIRIE Platform. It has been agreed to host within EIRIE data and information related to:

- ❖ research infrastructure through the collaboration with the project ERIGRID 2
- ❖ training and education (through the collaboration with the projects ASSET and EDDIE)
- ❖ standards related material (together with DERlab)

Regarding the collaboration with ERA-NET SES, close collaboration with its EXPERA platform through the living documents have been agreed. In the figure 1 below, the summary of the initiatives that interaction and collaboration has been established with, is presented. Although all established collaborations so far target the whole European R&I community, they will have specific support to the low activity countries as well.

Especially for the support in the Regional workshops of ETIP SNET, the following low activity countries are inherently targeted: Estonia, Latvia, Lithuania, Poland, Slovakia, Ireland, Portugal, Bulgaria, Croatia, Cyprus, Greece, Hungary, Malta, Romania and Slovenia.

Moreover, within the collaboration with ERA-NET the following low activity countries are inherently targeted: Ireland, Romania, Portugal, Croatia, Hungary and Latvia.

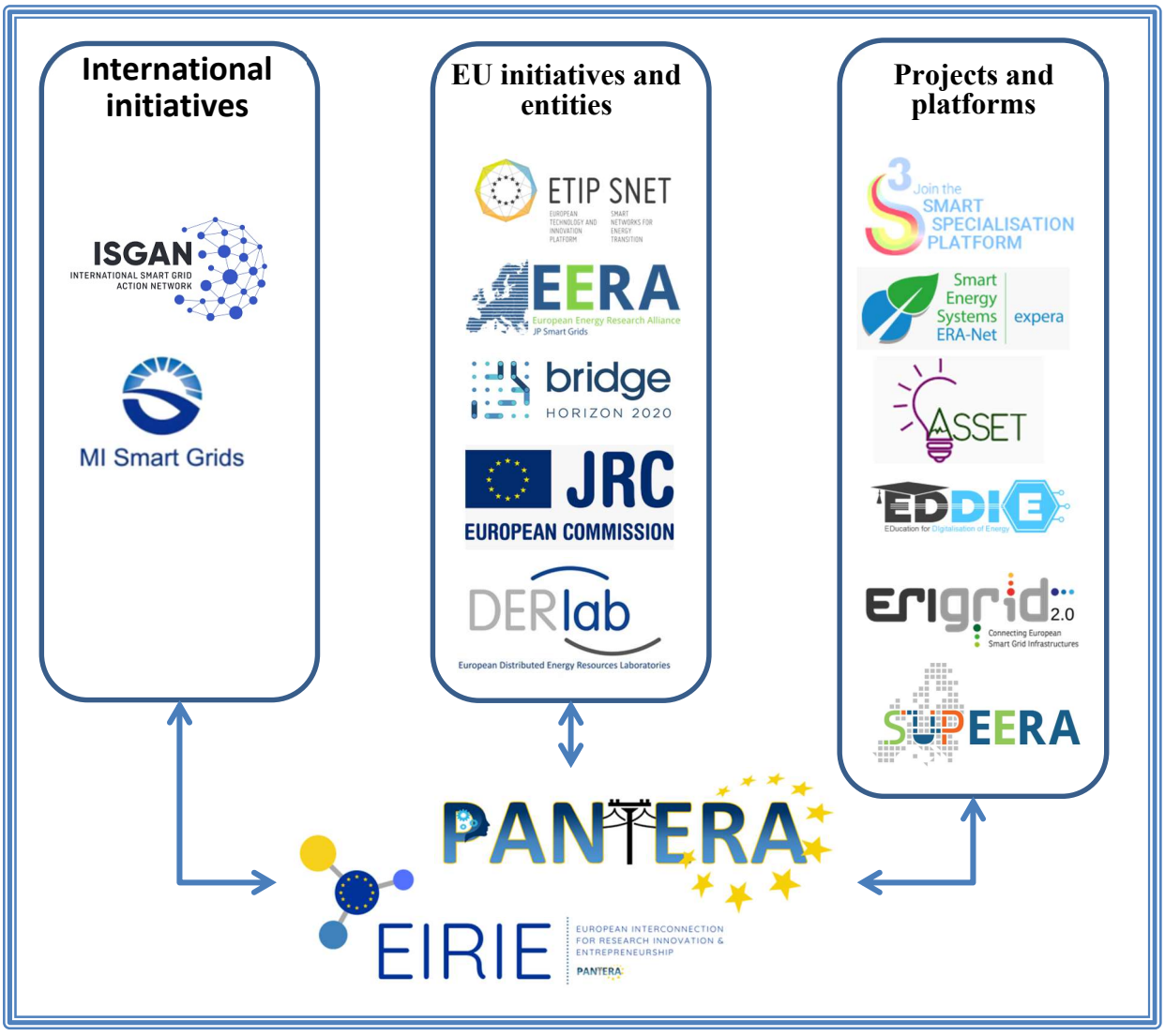


Figure 1:Summary of the initiatives, projects and platforms with which PANTERA has established collaborations

Finally, it should be pointed out that international collaborations give the possibility to the PANTERA project to collect and share relevant and updated material from several initiatives thus helping to make the EIRIE platform a reference point, a *one stop shop* in the smart grid domain where a user could find all the relevant information about smart grids, storage and local energy systems. This in turn would accelerate the growing interest from local stakeholders.

1 Introduction

This deliverable reports the results of the activities performed within the PANTERA project task 2.3 "Interactions with European platforms and organizations". In brief, the aim of this task is to:

- Establish good collaboration links with European and International organizations in order to promote the activities of the PANTERA project;
- Engage stakeholders and gather valuable and updated information from the global smart grids research and innovation field;
- Develop collaboration between other platforms and the EIRIE platform to secure content that ensures engagement and interaction with stakeholders at pan-European level.
- Gather valuable as well as updated information from the global smart grids research and innovation field

Hence, Task 2.3 aims at interacting with European level initiatives such as ETIP SNET, BRIDGE and EERA as well as international ones like Mission Innovation and ISGAN. The objective is to establish links and information flow between the mentioned initiatives and the PANTERA project in order to enhance awareness within the smart grid and more broadly in the energy research and innovation field.

In this view, the collaboration with ETIP SNET and the participation to its Regional Workshops and Working Groups, especially considering *WG5 - Innovation implementation in the business environment,* have been exploited.

2 PANTERA interactions and collaborations with European and international initiatives

In this chapter the interactions that the PANTERA project developed with international and European initiatives in the field of smart grids in the framework of WP 2 are reported and shortly described.

2.1 Interaction between PANTERA Working Teams with ETIP SNET WG5

In order to address at best the different R&I topics and gather information from all the relevant smart grid R&I contexts and thus to be able to provide value to PANTERA stakeholders, five Working Teams (WTs) have been set up[1]: in close collaboration with WG5 of ETIP SNET as seen in the Governance structure of ETIP SNET and the 5 times acting under WG5 "Innovation implementation in the business environment".

[1] PANTERA Periodic Technical Report - Part B

<table>
<tr><td rowspan="2">Domain
System
Technology
Market
Society</td><td colspan="4">Working Teams</td></tr>
<tr><td>WT1: Research Infrastructure</td><td>WT2: Regulation & Standardization</td><td>WT3: R&I Needs Mapping & Evaluation</td><td>WT4: Innovation support to the market uptake</td><td>WT5: Global & European Research and Innovation Community</td></tr>
</table>

- WT1: “Research infrastructures”;
- WT2: “Regulation & Standardization”;
- WT3: “R&I needs identification”;
- WT4: “Innovation support to the market uptake”;
- WT5: “Global & European Research and innovation community”

In line with the overall project’s goals, the main objectives of these WTs are:

- to evaluate results of R&I activity, to quantify achieved progress and to evaluate gaps in technology evolution;
- to explore and exploit synergies of projects, leveraging on achieved results, sharing R&I infrastructures, etc.;
- to establish European & international links to cover R&I needs and available knowledge;
- to contribute in generating tools and information / knowledge for the EIRIE platform that is valuable to the R&I community in Europe with specific emphasis on the low activity countries.
- to support existing initiatives and platforms such as ETIP SNET. In particular, PANTERA working teams are linked with the *ETIP SNET WG5 - Innovation implementation in the business environment.*

Considering the above stated overall objectives, all WTs are in line with the activities foreseen within WP2. All related activities are detailed in the paragraphs in Section 2 and 3 of this report.

2.1.1 Support to ETIP SNET regional workshops

Within this subsection, the Regional Workshops of the ETIP SNET along with their main objectives are presented. The presence of the PANTERA project and its contribution in supporting these activities are also highlighted through the activities of WT4: “Innovation support to the market uptake”.

As part of ETIP SNET **mission of guiding Research, Development and Innovation activities to support Europe’s energy transition, four Regional Workshops per year** have been organized since 2016**, covering the whole European Union.**

The Regional Workshops aim at:

- Presenting national and regional RD&I projects of significant added value addressing energy system integration issues, in line with the thematic priorities of the ETIP SNET Working Groups;

- Identifying unsolved RD&I topics and monitoring the implementation of RD&I activities at national and regional levels in Europe;
- Ensuring consistency between national and European views;
- Stimulating knowledge-sharing between stakeholders and among Member States and associated countries, to foster the efficient implementation of RD&I projects all over Europe.

Considering the above, the presence of PANTERA partners in supporting ETIP SNET Regional workshops are of significance for the following reasons:

- Boost and complement PANTERA Regional Desks Activities[2].
- Engage the R&I community to the Regional Desks network.
- Engage the R&I community in the EIRIE platform tools and functionalities
- The workshops' outcomes will feed the EIRIE platform and will be used as input for the development of documents in the Knowledge Area, thus ensuring coherence between national and European RD&I priorities, and fostering the deployment of ambitious national and regional RD&I projects.

In the following subsections, the support that has been provided to the Regional Workshops within 2019, by members of the PANTERA consortium through the collaborative work of WG5 of ETIP SNET, is summarized as an example of what can be achieved through carefully selected content.

2.1.2 Working Group 5 and activities in the Regional Workshops

PANTERA partners and WT4 have been supporting, as experts, the WG5 activities involved with other stakeholders that were active through WG5 of ETIP SNET in the Regional workshops. Within the year 2019, two workshops were organized between September and December 2019:

Central and Northern Regions' Workshop[3] (Petten, the Netherland, September 2019)

[2] PANTERA Deliverable D6.3 - Consolidated Summary Report of Desk Activities in the Target Regions

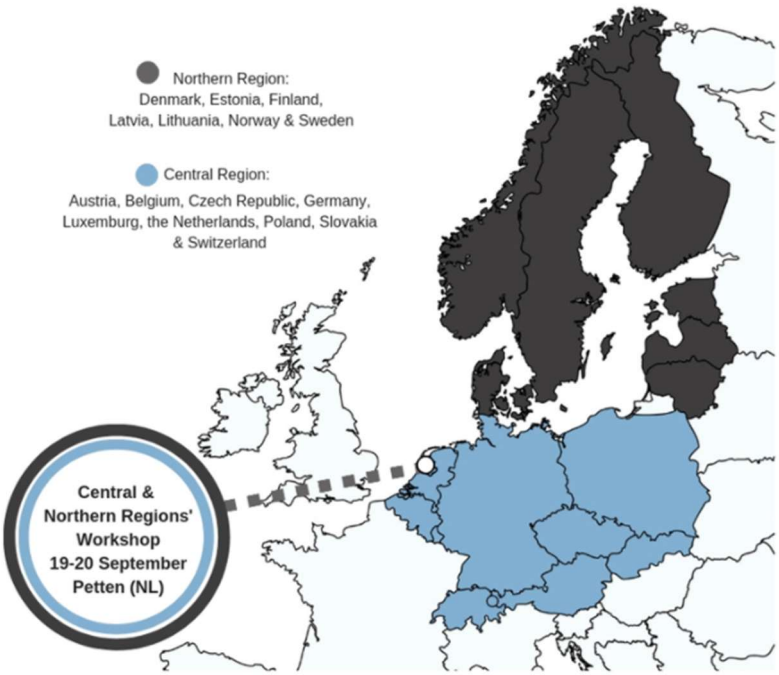


Figure 2 The central and northern regions workshop-target countries

South-Eastern and Western Regions' Workshop [4] (Paris, France, November 2019)

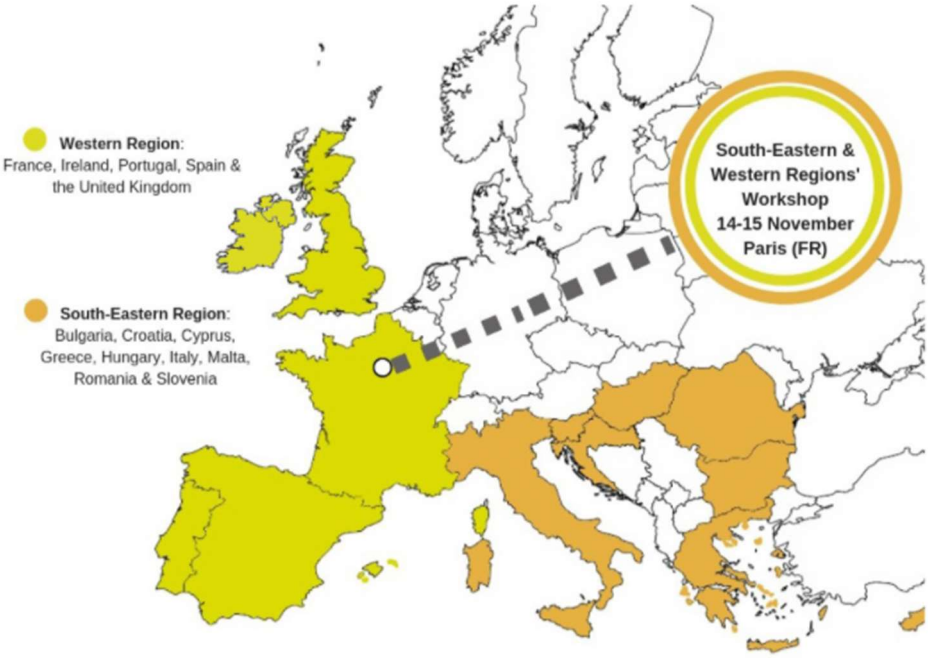


Figure 3 The south-eastern and western regions workshop-target countries

In both workshops, PANTERA partners following the approach of the previous workshops, fostered

[3] https://www.etip-snet.eu/regional-workshops/central-northern-regions-workshop/

[4] https://www.etip-snet.eu/regional-workshops/south-eastern-western-regions-workshop/

the active participation of participant projects both in the definition of main recommendations and in the positioning of the projects in their path to exploitation.

The work that has been conducted is in close collaboration with the Support Services for Exploitation of Research Results (SSERR) of the European Commission. In this view also theInnovation Radar Methodology[5] helps to clarify the different levels of project readiness, identify common project needs and based on that, suggests corresponding paths towards the uptake of project results through the steps reported below:

- **Assess the readiness**
- **Identify the needs**
- **Provide advice**

To this extent, during the workshop, the different projects presenters agreed with the WG5/PANTERA representatives their path to exploitation on the Innovation Radar (IR) diagram[6]. This is a policy tool widely used by the European Commission to identify potential innovations, their maturity levels and Go-to-Market needs and thus contributes in the first step "Assess the readiness".

The diagrams below (4 and 5) show, as an example, the analysis conducted during the regional workshop hosted in Petten[7]. The positioning of projects is presented with well documented reasons and appropriate advice that was shared with the consortia of projects.

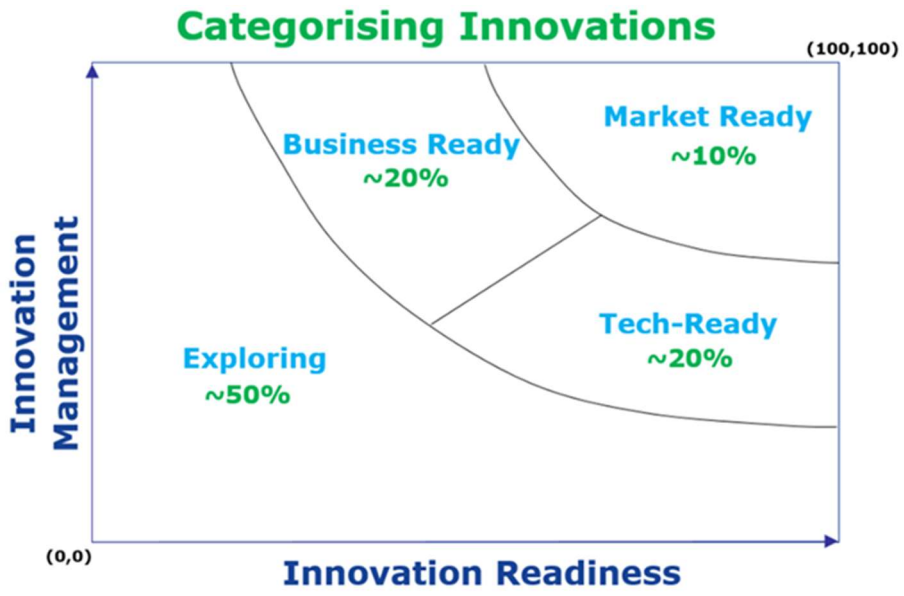


Figure 4: The Innovation Readiness indicator – 1

[5] booklet-a4_innovation_radar.pdf (europa.eu), Innovation Radar > Methodology (innoradar.eu)

[6] De Prato, G., Nepelski, D. and Piroli, G. (2015). Innovation Radar: Identifying Innovations and Innovators with High Potential in ICT FP7, CIP & H2020 Projects. JRC Scientific and Policy Reports – EUR 27314 EN. Seville: JRC-IPTS

[7] Regional Workshops - ETIP SNET (etip-snet.eu)

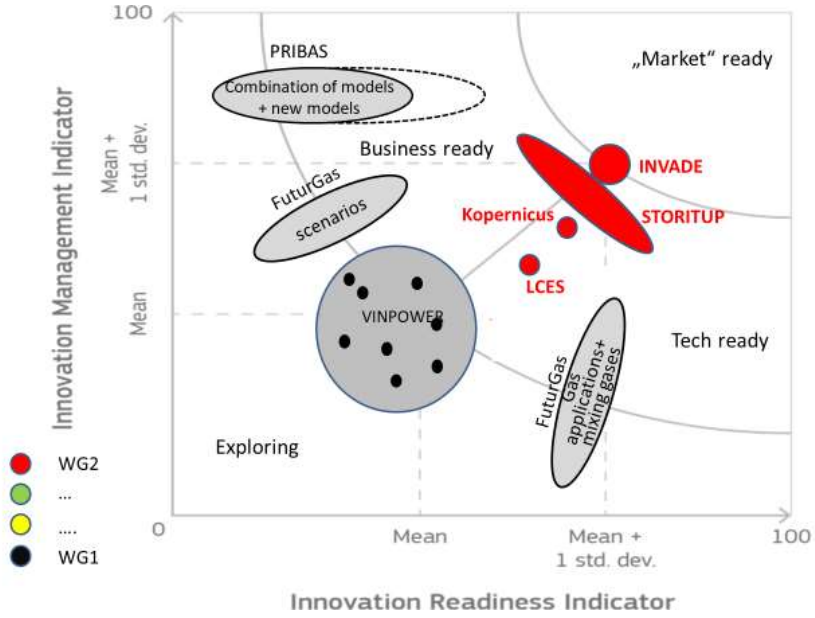


Figure 5: The Innovation Readiness indicator - 2

The Innovation Radar methodology identifies a comprehensive set of signals relating to the maturity of innovations developed in a project, their market readiness and the readiness of the relevant innovators to take the next towards the market.

This work will form a well-documented section on the EIRIE platform in collaboration with ETIP SNET DG RTD who pay particular attention is such activities and they populate services in support of project consortia.

2.1.3 Support the experts' work within ETIP SNET WG5

As already pointed out in paragraph 2.1, PANTERA experts support WG5 through different activities. As far as the regional stakeholders and workshops are concerned, the related activities are performed under the PANTERA **Working Team 4 (WT4) - Innovation capacity Evaluation.**

The work targeted through this WT is strongly connected with the objectives and ongoing activities of Regional Workshops of ETIP SNET and uses the identified gaps of projects to make suggestions for their commercial uptake through the mapping of their respective innovation radar plot. Having said that, the WT elaborates on the innovation content of projects and how this is addressed as clear as possible for supporting project consortia to achieve their replicability and scalability objectives to the highest degree possible.

Innovation support to the market uptake adopts a helicopter view of the activities carried out in the projects with the aim to support stakeholders and EIRIE platform as follows:

- Build homogeneity in the analysis of projects, work done, and lessons learned to ascertain common tools and methods in shaping a universal and consensual approach, comparable and trustworthy;
- Support EIRIE platform as a single point of reference for analyzing developments in technologies, judging results, qualifying and quantifying progress made with technologies, systems and solutions;
- Allow EIRIE platform to identify such progress made with means of being supportive for

deployment with potential scalability and replicability throughout the European Union.

- Search for innovative solutions that will maximize the benefits of the innovation process (evolution of the industry with a stronger presence in the world economy, improve efficiencies in all spheres of the economy, enrich the options of end users in managing their energy needs, strengthen the solutions that lead to a carbon free economy, etc.) that EU achieves through R&I activities in the area of Energy.

As a first step towards the above, and in order to support the second step "**Identify the needs**", PANTERA partners contributed through the activities of WT4, in the development of a questionnaire to evaluate the innovation capacity of the projects through interviews, serving as a tool for the projects to assess their needs before the market uptake. So, this process follows the Innovation Radar and can be seen as a self-assessment tool that can guide the project to fulfill their objectives and commitments under the maturity perspective.

The evaluation is based in different criteria that are of importance for the market uptake (see reference 5 above):

- Novelty
- Impact
- Managing Market Size
- Business Environment
- Replicability
- Preconditions
- Managing production side

Through the planned questionnaire it is expected that the criteria included will be quantified and plotted offering an evaluation graph as the drawing reported in the following.

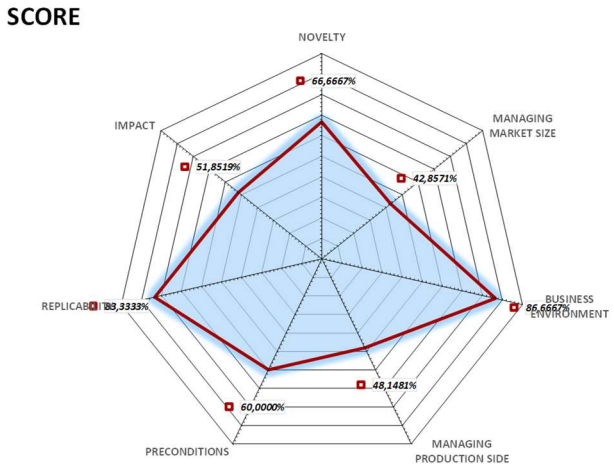


Figure 6: Evaluation of the projects according to market criteria

This procedure enhances the planned PANTERA RICAP (Research and Innovation status and Continuous gAP analysis process)[8] and it will be included as a complementary evaluation tool in the EIRIE platform.

2.1.4 European and International initiatives

PANTERA WT5 is devoted to monitor the European and International initiatives that are active in the smart grids field and report the achieved results through the appropriate channels (as will be discussed below) in order to give tangible benefits to the R&I stakeholders of the PANTERA project. In principle, WT5 activities are addressing the broad R&I community and when applicable with a special attention to the *PANTERA target countries e.g. best practices*. This, in practice, is performed thanks to the active involvement of PANTERA partners in several International and EU level initiatives. In fact, through WT5, the following International initiatives are constantly monitored and a bidirectional information exchange is promoted:

- ISGAN - International Smart Grid Action Network
- MI - Mission Innovation (in particular MI Innovation Challenge 1 on Smart Grids – IC1)
- EERA - European Energy Research Alliance Joint Programme on Smart Grids (JP SG)

In order to achieve its goals, WT5 performs different activities on a regular basis, one of which is the active participation in the periodic meetings of the ETIP SNET *WG5 - Innovation implementation in the business environment.* During the last period and through this context several information regarding the above mentioned have been collected and shared.

It is worth to recall that ETIP SNET brings together a multitude of stakeholders and experts from the energy sector in order to[9]:

- Set-out a vision for Research Development and Innovation (RD&I) for Smart Networks for Energy Transition and engage stakeholders in this vision.
- Prepare and update the Strategic Research and Innovation Roadmap.
- Report on the implementation of RD&I activities at European, national/regional and industrial levels.
- Provide input to the Strategic Energy Technology Plan (SET Plan) action 4 which addresses the technical challenges raised by the transformation of the energy system.
- Identify innovation barriers, including barriers related to regulation and financing.
- Develop enhanced knowledge-sharing mechanisms that help bring RD&I results to deployment.
- Prepare consolidated stakeholder views on Research and Innovation to European Energy Policy initiatives.

[8] PANTERA Deliverable D3.1 - Report on current status and progress in R&I activities: Technology

[9] https://www.etip-snet.eu/about/etip-snet/

In particular, the ETIP SNET WG5 adopts a helicopter view of the activities carried out in projects within the perimeter of the ETIP SNET about the energy transition in order to[10]:

- Build homogeneity in the analysis of projects, work done and lessons learned.
- Create a common platform for analysing the progress made by the different technologies through-out the EU and facilitate their scalability;
- Build a methodology to evaluate system needs in the energy transition capable of identifying tangible outcomes to building on progress made and give feedback to the other WGs for identifying their R&I needs in the years ahead;
- Review the relevant BRIDGE reports that identify the economic, social, technical, legal, etc. barriers which may slow down business model deployment;
- Search for innovative solutions that will maximize the benefits of the innovation process that EU achieves through R&I activities in the area of Energy.

Moreover, WT5 is responsible to promote the collaboration between the ISGAN and the EIRIE platform pursuing the following:

- Agreement on the data and content exchange
- Technical meetings on collaboration opportunities
- Continuous exchange and cooperation enhancement

In the section that follows, the information that the PANTERA consortium has shared during the regular monthly virtual work sessions of ETIP SNET WG5 is summarized. Moreover PANTERA WT 5 used this material to prepare specific presentations to support the information sharing and has always been shared to a wider audience of stakeholders including the monthly web calls of WG5 and the dissemination channels of ETIP SNET.

Moreover, the PANTERA consortium was available to answer to questions from the audience during the WT5 organized calls. Moreover, the material used during these meetings has been made available through ETIP SNET WG5 repository to WG5 members. The material generated will reside on the EIRIE platform for wider consultation by the users of the platform and through this, enter other channels linked to EIRIE for wider outreach.

The main objectives of this interaction are the following:

- Share updated international news with energy experts of ETIP SNET
- Reach the broader R&I community of the ETIP SNET through the dedicated newsletter and the circulation of the presentations
- Engage stakeholders to disseminate the main outcomes of this collaboration

10 https://www.etip-snet.eu/about/working-groups/wg-5/

2.1.5 Link with ISGAN

Several contributions at the WG 5 calls have been devoted to present the ISGAN initiative. The intention is to keep close with this international association and through EIRIE generate constant flow of information on international activities in the field of smart grids. Moreover, build a productive cooperation with ISGAN through the EIRIE platform for promotion material and common activities for the benefit of the R&I community of Europe.

ISGAN (*www.iea-isgan.org*) is both an International Energy Agency (IEA) Technology Collaboration Program (TCP) and a Clean Energy Ministerial (CEM) work stream. ISGAN is an international strategic platform to support high-level government attention and action for the accelerated development and deployment of smarter, cleaner electricity grids around the world. It gathers several organizations (research centers, utilities, regulatory bodies, governmental energy agencies) from 27 countries around the world. The main outcomes of the ISGAN initiative are:

- Casebooks
- Policy briefs
- Technology briefs
- Technical papers
- Discussion papers
- Organization of Webinars and Workshops
- Conference presentations

Considering the interest expressed by the ETIP SNET WG 5 members, more details about ISGAN organization and activities have been shared. It has been reported that ISGAN is organized in eight Annexes and their activities have been described. A summary of the shared information is reported in the following:

- **Annex 1 - Global Smart Grid Inventory**.
  - (Completed) This annex was aimed to identify countries' specific motivating drivers for pursuing smart grids deployment. Annex 1 has completed its activity.
- **Annex 2 - Smart Grid Case Studies.**
  - Knowledge sharing through topical casebooks: assess outstanding examples of current case studies on different topics, and then develop in-depth case studies highlighting the key lessons learned and best practices.
  - Dynamic Peer to Peer Learning through Knowledge Transfer Program (KTP) aiming to capture, collect, and share knowledge about smart grid technologies among countries and key stakeholders. It also fosters meaningful international dialogue on smart grids with a focus on developing competence and building capacity.
    - This annex is strongly related to the PANTERA objectives and the strengthening

of the low spending countries in smart grid investments. The PANTERA regional desks can channel the sharing of knowledge for selected cases studies and best practices so that regional stakeholders have direct benefit.

- **Annex 3 - Benefit-Cost Analyses and Toolkits.**
  - Analyse the benefits and costs of smart grid technologies, practices, and systems, from both top-down and bottom-up perspectives.
  - Develop toolkits to inform smart grid policy at global, regional, national, and/or sub-national levels and deployment priorities at project- and utility-scales. Results could be used to develop specific business cases, taking into account specific regulatory and market structures, as well as current system status, available generation assets and resources and demand profiles.
    - Regulators, utilities and other electricity system stakeholders could use these toolkits to define and decide on system needs and priorities for smart grid system investment and regulatory changes. This content is highly relevant to the EIRIE platform.

- **Annex 4 - Synthesis of Insights for Decision Makers**
  - To integrate the knowledge and lessons learned from other ISGAN Annexes and deliver the developed material through a variety of channels
  - To capture the attention of decision makers and provide them the information needed to advance more effective smart grid-enabling policies and programs.
  - To organize knowledge, identify key issues, distil important themes, and provide insightful analysis for the benefit of policy makers.
    - This content is useful for the knowledge area of the EIRIE platform and the identified key issues along with the analysis will be insightful for all users

- **Annex 5 - Smart Grid International Research Facility Network (SIRFN)**
  - Strong, active community of researchers engaging in applied research and impactful work on smart grids testing including smart inverters, BESS, DER, ALTM, power systems, microgrids, etc.
  - Open source software tools and testing cases and procedures to be used by DER vendors, universities, research institutions, certification laboratories, standards organizations, etc.
  - Inputs to national and international standards development has major impact on the capabilities of smart grid and DER equipment for electrical performance and communications capabilities.
    - This content is useful for the knowledge area of the EIRIE platform

- **Annex 6 - Power T&D Systems**
  - The main objective of Annex 6 is to establish a long term vision for the development of the future sustainable power systems.
  - Main goal is to facilitate the application of advanced technologies needed for power grids to contribute in the best way to the attainment of clean energy, climate goals and sustainable energy access to all.
  - Technical solutions that enable power grids to maintain and improve the security, reliability and quality of electric power supply while facing challenges related to significant trends in the electricity sector.
  - Condense to conclusions and recommendations for policy makers: Case Books, Discussion papers, collaboration with other initiatives, workshops
    - This content is useful for the knowledge area of the EIRIE platform

- **Annex 7 - Smart Grids Transitions**
  - Analysis and policy advice on institutional, governance and socio-technical issues associated with Smart Grid deployment as a long-term endeavor
  - Support the development of transition pathways and processes leading to electricity systems with distributed energy resources feeding into local grids
    - This content is useful for the knowledge area of the EIRIE platform

- **Annex 8 - ISGAN Academy on Smart Grids**
  - The objective of the ISGAN Academy is to offer the ISGAN community of high-level engineers, decision makers, students and public in general a means of rational and efficient continuous technical skills complement and updates in the field of smart grids.
  - The Academy contains structured information (public material) about new emerging topics and challenges, recent developments, best practices, novel methodologies, smart grids theory, applications, deployments and events of ISGAN activities.
    - This content is useful for the knowledge area of the EIRIE platform and especially the educational/training part that EIRIE hosts

Overall, all annexes of ISGAN can be seen as insightful content of the knowledge area of the EIRIE platform. This is of great importance especially for the low spending countries that will find a source full area that embraces both top-down and bottom-up knowledge that will be supportive for the regional stakeholders' endeavours.

As an example, Figure 7 shows some slides presented during the ETIP SNET WG 5 meetings by PANTERA WT 5.

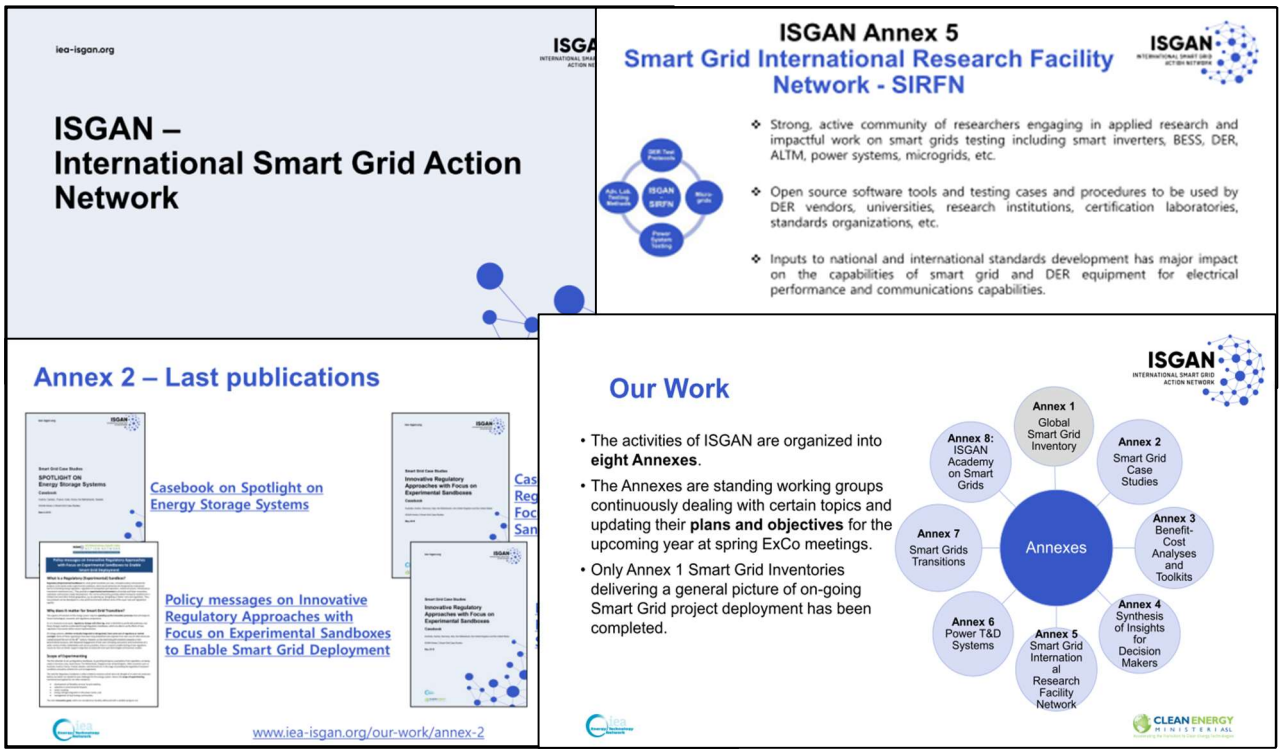


Figure 7: Slides from the presentations regarding ISGAN as shown during ETIP SNET WG 5 meetings by WT5

2.1.6 Link with MISSION INNOVATION

Mission Innovation (MI – www.mission-innovation.net) is a global initiative of 24 countries and the European Commission (on behalf of the European Union) working to accelerate clean energy innovation. Driven by sustained public investments coupled with private sector engagement, MI aims to make clean energy widely affordable and available for all sectors of the economy.

The intention is to keep close with this international association and through EIRIE generate constant flow of information on international activities in the field of smart grids. Moreover, build a productive cooperation with Mission Innovation through the EIRIE platform for promotion material and common activities for the benefit of the R&I community of Europe. The PANTERA consortium has already reached agreement with MI to link their platform to the EIRIE platform and hence, EIRIE to play a common point for access to all the promotion work of MI.

As part of the initiative, participating countries have committed to raise their governments' clean energy research and development investments and to foster greater levels of private sector effort in transformative clean energy technologies. These additional resources will dramatically accelerate the availability of advanced solutions that will define a future global energy mix that is clean, affordable, and reliable.

MI Innovation Challenge dedicated to *Smart Grids* (IC1 on Smart Grids) is co-Led by China, Italy and India and RSE who is a member of PANTERA consortium, represents Italy hence co-leading

this very important Innovation Challenge.

The following information about the global level initiative Mission Innovation has been shared. During a recent web meeting, MI gathered particular attention because the initiative, as reported in the following, is entering in its second phase and the participating countries are presently working to shape at best the new period of MI activities.

In particular, during the web meetings RSE reported about the activities and outcomes performed within the *MI Innovation Challenge* dedicated to *Smart Grids*. More in detail it has been reported about the:

- International workshop organised by MI IC1 in Paris on 12th November 2019 alongside the European Utility week
- document released by IC1 "Smart Grids Country Report 2019"[11] (CR 2019) that gathers relevant information about energy strategy, vision, ongoing activities, lighthouse projects and case studies in the smart grids field from 16 Countries active in Mission Innovation and the European Union. The PANTERA target countries are not included in the list but best practices and replicating schemes from the lighthouse projects and other case studies can be useful for the PANTERA best practices desk as Italy, Norway and Germany (partners in the consortium) are participating.

Moreover, during the last ETIP SNET WG5 web meeting information has been shared about the new phase of the MI initiative. In fact, Mission Innovation was announced, as a 5 year initiative, at United Nations Climate Change Conference (COP21) on November 30th 2015 when world leaders came together in Paris to undertake ambitious efforts to combat climate change. In 2020, after the first 5 years of activity and considering the good results achieved, MI member countries decided to go on with the initiative and to launch the second phase of Mission Innovation (MI 2.0). MI countries will collaborate in defining MI 2.0 considering a mission-oriented approach, identifying key innovation barriers and decarbonisation pathways in sectors where accelerated effort is most needed, and where commitments from governments and the private sector can send a strong signal to the market and innovators, thereby stimulating action, faster.

During the forthcoming MI2.0 phase activity, collaborations and partnerships built during the first MI period, especially considering the eight Innovation Challenges implemented by MI during the first phase will be exploited at best.

It should be noted that MI will work with other organisations active in the energy field committed to take actions that can accelerate innovation and strengthen pathways towards demonstration and deployment of promising clean energy solutions. In this view information exchange with the PANTERA project and especially through the EIRIE platform would be an important added value toward the mutual effort of a continued and strengthened cooperation to accelerate the clean energy revolution.

As an example, in the following Figure 8, slides regarding MI presented during the ETIP SNET WG 5 meetings by PANTERA WT 5 are reported.

[11] Available at https://www.mi-ic1smartgrids.net/wp-content/plugins/dms/pages/file_retrieve.php?obj_id=154

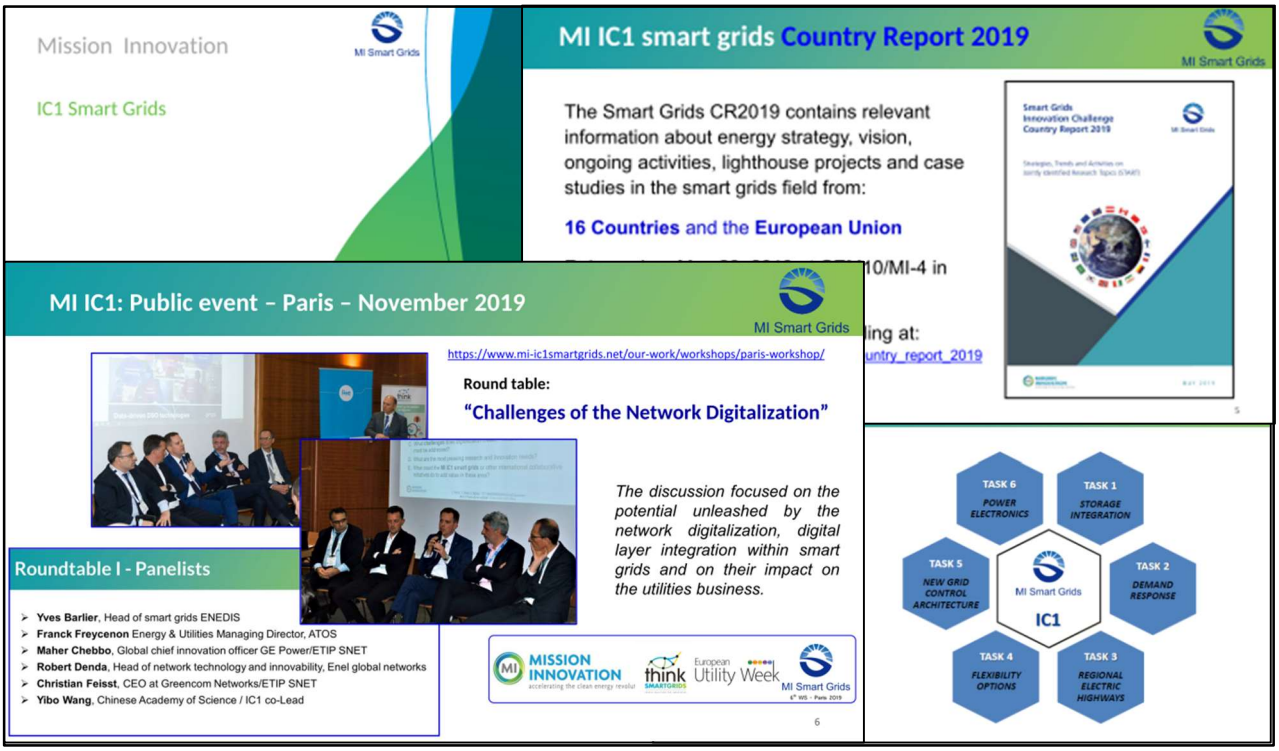


Figure 8: Slides from the presentations regarding MI as shown during ETIP SNET WG 5 meetings by WT5

Within Mission Innovation IC1 the Smart Grid Innovation Accelerator (SGIA) platform has been developed. SGIA is a cloud-based online platform to share knowledge on smart grids and the energy sector as a whole. By means of a powerful semantic search engine, the SGIA platform will allow advanced search functionalities on key documents selected and shared by IC1 country members from the public and the private sector. The objectives of the SGIA platform of fostering information sharing and promote collaboration opportunities toward Smart Grids solution deployment are perfectly in line with the EIRIE platform's ones. Thanks to the strong link between IC1 and the PANTERA project a fruitful collaboration a strong link between the two initiatives is foreseen. It is worth noting these two platforms have a different scope and are highly complementary. In particular SGIA has been developed at global level and it is gathering selected documents such as national energy policies and strategies, roadmaps, position papers and best practices; whereas the EIRIE platform has focus at European level and it will especially gather results and case studies form European R&D projects and related activities. Considering these aspects, a collaboration between these two initiatives is expected to highly enhance the potentialities of both platforms. Currently both platforms are under finalization and a preliminary interaction to discuss how to link them already took place taking also into account technical aspects. In the next six months a deeper interactions and a concrete way how to link SGIA and EIRIE will be realised.

2.1.7 EERA – JP on Smart Grids

Relevant information has been shared also regarding the EERA Joint Programme on Smart Grids (JP SG). However, all activities related to EERA JP4SG is presented in paragraph 2.2 below.

In the following figure 9 some slides are depicted that were presented during the ETIP SNET WG 5 meetings by PANTERA WT 5 regarding EERA.

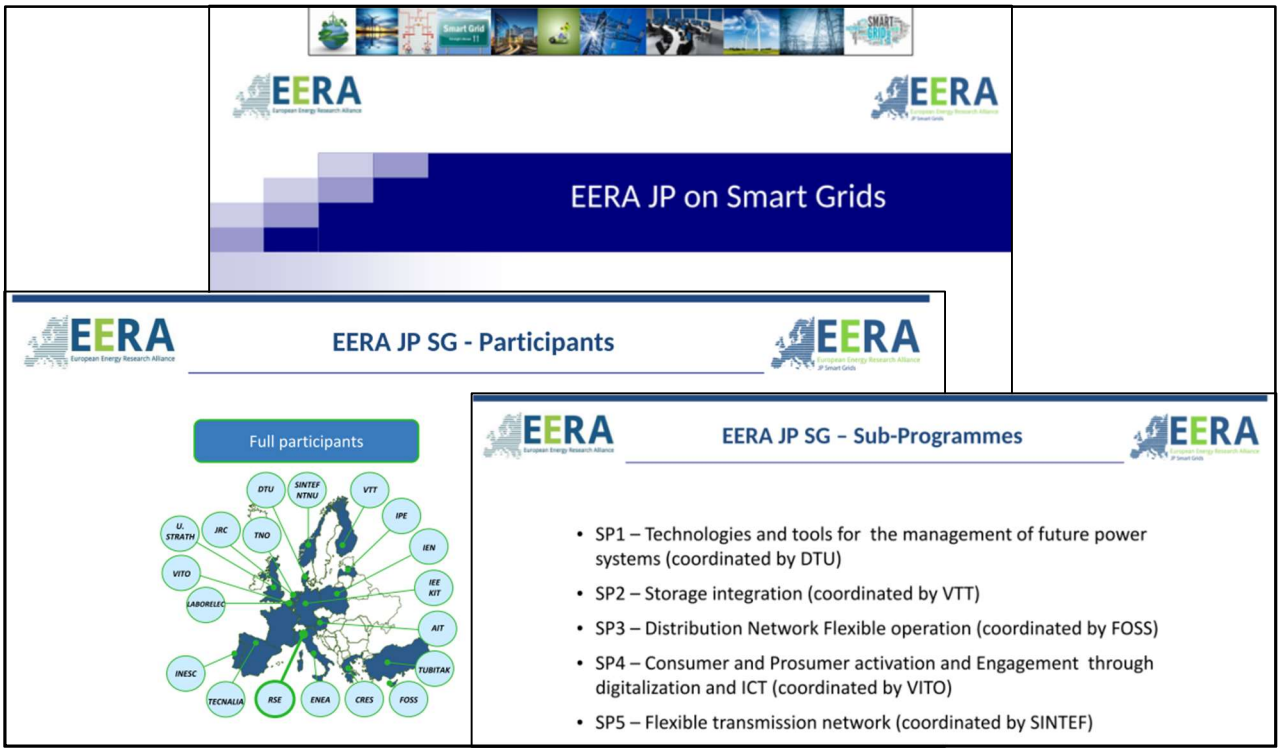


Figure 9: Slides extracted from the presentations regarding EERA JP SG as shown during the ETIP SNET WG 5 meetings by WT5

2.1.8 Broader information sharing through the Twitter social media

In order to reach a broad audience and raise interest about the PANTERA project, within WP2 and especially within the PANTERA WT5, it has been agreed to periodically publish information about the most important news related to international cooperation initiatives.

Relevant and updated information regarding the already mentioned international and EU initiatives (ISGAN, MI, EERA JP SG) has been therefore collected and summarized in tweets to be posted on the PANTERA twitter account.

The intention is to continue with these activities till the end of the project thus giving the possibility to reach a very broad audience. This process is very important for the PANTERA project since a well-established network of interested followers will be very important to promote the EIRIE platform when it will be on-line and active.

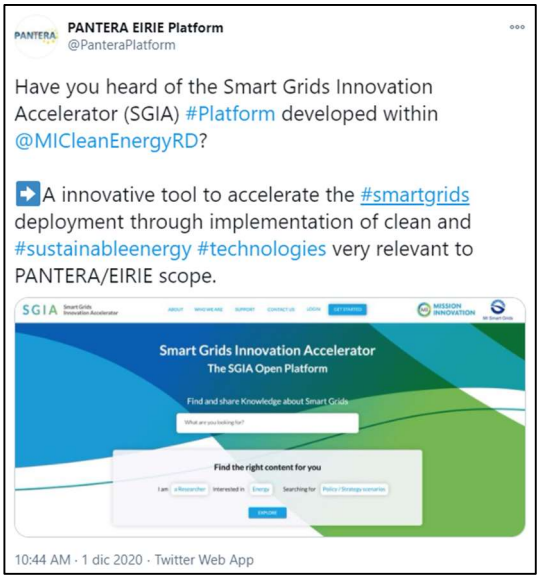
In the following, the tweets elaborated within WT5 and posted by the PANTERA project are reported.

The 11th Clean Energy Ministerial and the 5th #MissionInnovation Ministerial will take place virtually on 22 (CEM11) & 23 (MI-5) Sept. MI-5 will be a crucial moment for members to make decisions on the second phase of MI discussing future activities. → *https://bit.ly/2ZBAE0Z*

At #MI5 on Sep. 23, @MICleanEnergyRD member countries agreed on the second phase of MI 2.0 → A more mission-oriented approach to accelerate the deployment of #cleanenergy solutions having a big impact against #climatechange.

Who is @IEA_ISGAN? International Smart Grid Action Network, a IEA TCP (#Technology #Collaboration Programme) and a CEM (#clean #energy ministerial) work stream, is a platform to support governments to accelerate development and deployment of #smarter and cleaner #electricitygrids

#Thoughtoftheday: #Collaboration between @IEA_ISGAN and platforms aiming at the same objectives such as #PANTERA's #EIRIE platform, will provide better knowledge on the most relevant topics deserving the utmost attention to reach a #lowcarbon and #energyefficient Europe.



Have you heard of the Smart Grids Innovation Accelerator (SGIA) #Platform developed within @MICleanEnergyRD?

A innovative tool to accelerate the #smartgrids deployment through implementation of clean and #sustainableenergy #technologies very relevant to PANTERA/EIRIE scope.

@EERA_SET JP on #SmartGrids replied to the public consultation on the @ENTSO_E RDI Roadmap 2020-2030. @SINTEFenergy facilitated the collation of JP member's feedbacks to express the innovation priorities as perceived by research centers.

2.2 Collaboration between PANTERA consortium and EERA JP SG

The European Energy Research Alliance (EERA) was founded in 2008 by leading European research organizations with the goal to coordinate the research in the energy field across Europe and to accelerate the development of new energy technologies, combining national and Community sources of funding and maximizing complementarities and synergies. More than 175 organisations in the EU and associated countries are working together in 17 Joint Programmes (JPs), specific information is available at the web site www.eera-set.eu.

The EERA JPs constitute strategic permanent collaborations between major research organizations and institutes forming a virtual centre of excellence. The JPs implement the need for better coordination among research organizations from different European member states, maximizing synergies and identifying research priorities.

The EERA Joint Programme on Smart Grids (JP SG) was officially launched at the Strategic Energy Technology Plan (SET-Plan) Conference in Madrid (June 2010) and is coordinated by RSE with the support of ENEA (Italian Agency for Energy Efficiency) from Italy. By means of an extended cross-disciplinary cooperation involving many Research and Development (R&D) participants with different and complementary expertise and facilities, JP SG aims at addressing in a medium to a long term research perspective and the most critical areas directly related to the effective acceleration of smart grids development and deployment.

At present, 39 research organizations from 18 different European countries are participating in the JP on Smart Grids. Cyprus, Italy, Portugal, Latvia, Poland and Greece are participating in this association from the target countries of the PANTERA project. Each JP participant has a wide experience in specific fields pertaining to smart grids, important research infrastructures and relevant on-going research activities, funded by national or European resources. Through this cooperation, the PANTERA project aims to enhance content in the knowledge area of the platform and build a strong regional and European network for promoting the platform itself.

JP SG is organised in five Sub Programmes, dealing with a broad range of topics covering the R&I in the smart grid field:

- SP1 - Technologies and tools for the management of future power systems
- SP2 - Storage integration
- SP3 - Distribution Network Flexible operation
- SP4 - Consumer and prosumer activation and engagement through digitalization and ICT
- SP5 - Flexible transmission network

Good collaboration between PANTERA and the EERA JP on Smart Grids has been established, thanks also to the direct involvement of different PANTERA members in the JP SG. RSE, WP2 leader is the JP coordinator, while FOSS and SINTEF are JP Sub Programmes coordinators. IPE is also a JP member, and recently, following the very good collaboration started in the frame of the PANTERA project also UCD has applied to become a JP SG member. During the last JP Steering

Committee meeting UCD has been formally approved as an effective new JP member.

More in detail, updates from the PANTERA project activity has been systematically given at the different EERA JP SG meetings. All JP members are interested and willing to support the activities of the project. In particular PANTERA shared information and collected valuable feedbacks concerning the EIRIE platform development as well as the overall activities of the project.

As it can be seen from the agenda of the JP Steering Committee (SC) meetings**Error! Reference source not found.**, held during the years 2019 and 2020, an agenda point has been always dedicated to an update form the PANTERA project. For completeness, date and place of the JP SC meetings are reported in the following and the meeting's agendas are reported in figure 10.

- 31st JP SG SC meeting – May 2019, Larnaca, Cyprus
- 32nd JP SG SC meeting – October 2019, Porto, Portugal
- 33rd JP SG SC meeting – April 2020, On-line
- 34th JP SG SC meeting – November 2020, On-line

The presentations given at the JP SG events (some slides are reported in figure 10), complemented by other relevant information has always been shared through the JP SG repository as a reference and to make them available also to the JP members that did not have the chance to participate in the JP meetings.

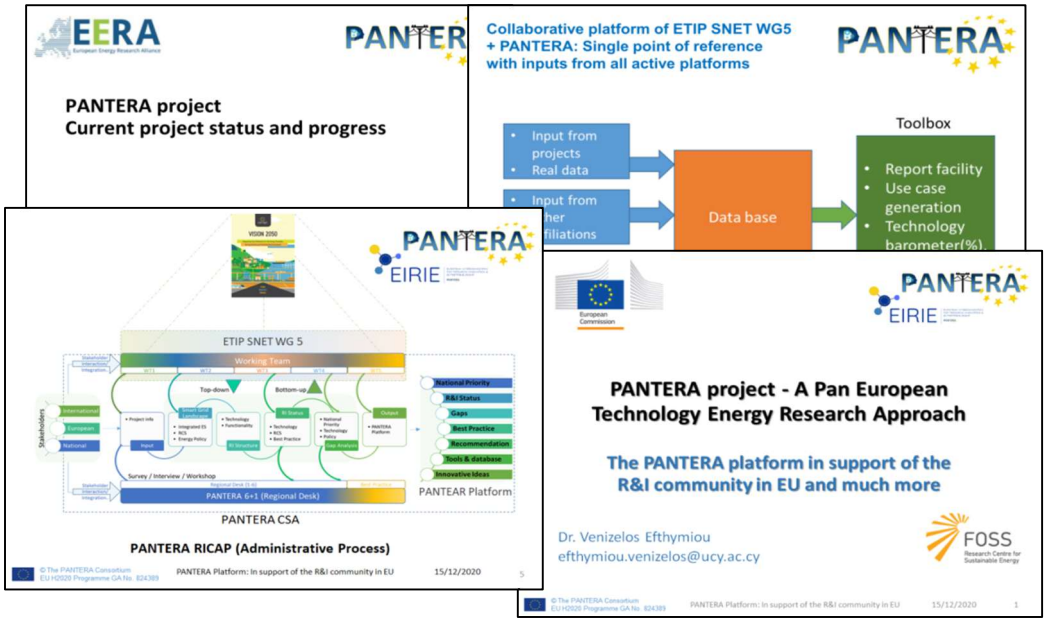


Figure 10: Some slide captions regarding the PANTERA project as presented during JP SG meeting and afterwards made available to the JP members.

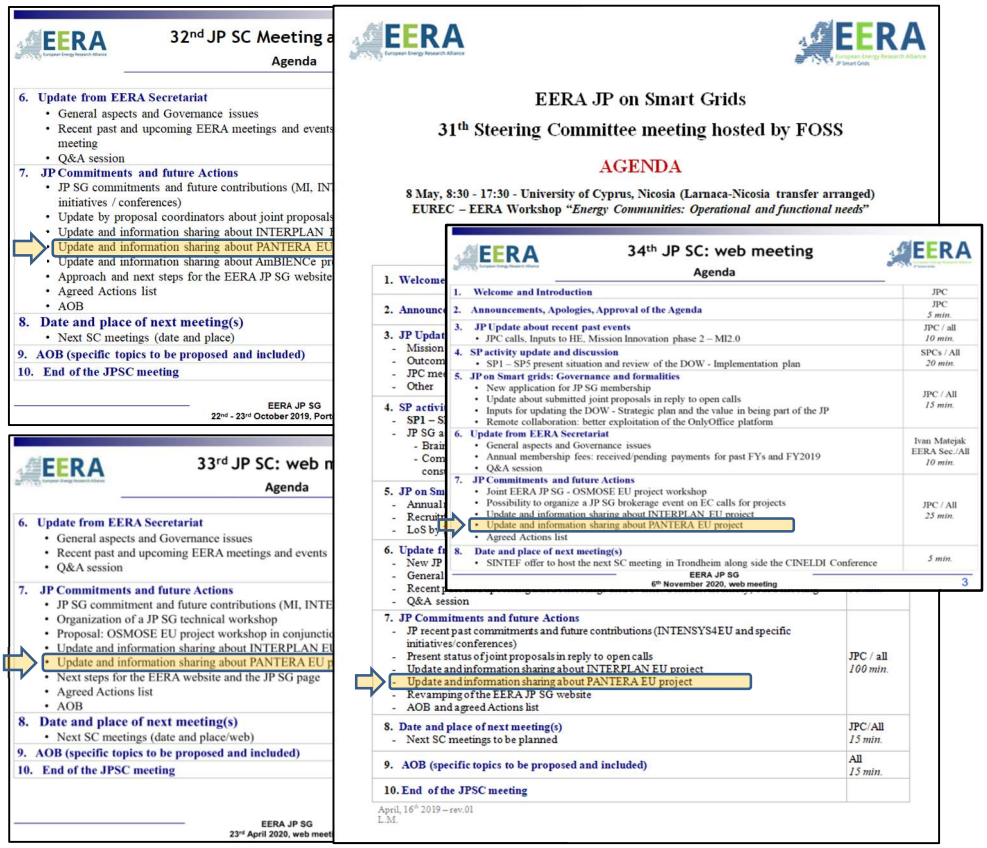


Figure 11: Agenda of the last four JP SG Steering Committee meetings; the PANTERA project had always the possibility to presents its activities and to collect valuable inputs from JP members.

2.3 Collaboration work with RIS3 and S3 Platform for building regional activity

The Smart Specialization[12] (S3) defines the EU approach to innovation at regional and country level and as such, the collaboration work of PANTERA partners with them is of critical importance. It is of fundamental importance the fact thatS3 enables the prioritization of R&I investment under cohesion policy in a number of EU policy areas, including energy.

Within this frame, a study on the *S3* policies of countries that comprise the PANTERA Regional Desks was performed. In order to evaluate the value given to energy sector and acknowledge priority setting trends in target countries relevant information was obtained from eye@RIS3 tool (available at *https://s3platform.jrc.ec.europa.eu/map*) and is summarized in the Public Deliverable D6.3 "Consolidated Summary Report of Desk Activities in the Target Regions"[13]

Under this approach, input was given to co-shape a profile for each country and to highlight related

[12] https://s3platform.jrc.ec.europa.eu

[13] https://pantera-platform.eu/resources/

energy policies. Through this process, the PANTERA project contributes in building the regional activity as follows:

- Identify the energy priorities and thus the main topics of interest for regional stakeholders promoting relevant interaction through Regional activities such as workshops and though tools of the EIRIE platform.
- Identify the scientific interest and support the R&I community through data and knowledge that can be found in EIRIE platform and be used for technologies advancement.
- Recommend best practices on intervention areas according the competences and the needs of each country.

Under this prism, the PANTERA partners are in close communication with the S3 contact points of the target countries and constantly build collaboration relations with them. The common collaboration and activities as already established and the future endeavours are presented in the same deliverable (D6.3).

S3 activities including development and implementation is supported by the Smart Specialization Platform (S3 Platform) operated by JRC. S3 Platform aims to provide information, methodologies, expertise and advice to national and regional policy makers, as well as promote mutual learning, transnational co-operation and contribute to academic debates around the concept of Smart Specialization.[14]

However, it seems that the platform is underused and S3 works best in countries that are already experienced with synergy-seeking strategies[15]. Moreover, not all active S3 regions have energy as their priority. In this view, PANTERA *has agreed* to work closely with the S3 platform to influence regions to strengthen their activities on energy issues and related R&I work. For this reason and in order to support the S3 platform and consequently, the regional stakeholders, the following actions have been prioritized by the PANTERA consortium:

- JRC through extensive negotiations has agreed to host the EIRIE platform on their servers. In this way, the EIRIE platform can operate in tandem with the S3 platform through the designated area for Regional Desks. The Regional Desks are focusing on the low spending countries and thus the linking to the S3 platform will be beneficial for both parties. In addition, the S3 platform and its effectiveness in supporting Regional Stakeholders can be highlighted by the best practice Desk that is operational on the EIRIE platform.

[14] European Commission, "Smart Specialisation Platform", [Online].Available: https://s3platform.jrc.ec.europa.eu/s3-platform [Accessed: 2020.10.02]

[15] [18] L.Tsipouri, "MLE on National practices in Widening Participation and Strengthening Synergies: Synthetic Synergies Paper", [Online]. Available: https://rio.jrc.ec.europa.eu/library/mle-national-practices-widening-participation-and-strengthening-synergies-synthetic [Accessed: 2020.10.02]

- The drafted Magna Carta document[16] as a dissemination material and other communication channels of PANTERA i.e. twitter, LinkedIn, supported by the Regional Desk leaders, are promoting the regional activities with direct support to the S3 actions as agreed and will be enabled in the near future.

[16] https://pantera-platform.eu/pantera-regional-desks-magna-carta-2/

3 The PANTERA platform EIRIE: interaction with EU bodies

3.1 JRC hosting and supporting the development and operation of EIRIE

The Joint Research Centre (JRC) is the European Commission's science and knowledge service in which scientists research to provide independent scientific advice and support to EU policy. Furthermore, the JRC plays a central role in creating, managing and making sense of collective scientific knowledge for better EU policies.

The PANTERA consortium and JRC have been working together since the start of the project in defining the requirements and the specification for the EIRIE. Moreover, the PANTERA regional desks have been working on close collaboration with JRC on Research and Innovation Strategies for Smart Specialisation to define the needs for each region. This close cooperation led to the following actions:

- To guarantee the sustainability and the continuity of the EIRIE platform after the PANTERA project ends, JRC agreed with PANTERA consortium to host the EIRIE platform on its servers.
- JRC agreed to connect the EIRIE platform with JRC smart grid databases and tools (e.g., CORDIS, DiNeMo, S3 Platform…etc.).
- Collaboration work with RIS3 and S3 Platform for building regional activity to support low spending countries.

The following sub-sections give an overview of some of the JRC databases' and tools' that are going to be connected with EIRIE platform:

3.1.1 CORDIS

The Community Research and Development Information Service (CORDIS) is the European Commission's primary source of results from the projects funded by the EU's framework programmes for research and innovation (FP1 to Horizon 2020). The EIRIE platform will host or provide a single point connectivity with the smart grid projects within the FP7, Horizon 2020 and Horizon Europe. This would allow the research and innovation community to have access to all the European projects in the field of Smart Grid under EIRIE platform.

3.1.2 DiNeMo

The DiNeMo (Distribution Network Models) is a web platform hosted by JRC. This collaborative platform offers a scientific service the possibility to all research centres, universities, start-ups and companies to model the electric distribution grids. The realistic distribution network models open the way to develop a myriad application and projects to boost the research and innovation in the smart grid energy field.

The EIRIE platform will be connected to DiNeMo platform which allows the EIRIE users to access the DiNeMo platform and model their electric distribution grids.

3.2 BRIDGE and evaluation of projects

BRIDGE database will be shared with EIRIE platform. So far, all projects from BRIDGE data base have been transferred to the new classification[13]. The evaluation of the projects is a task that WT3 in collaboration with BRIDGE TFs will put forward. The interaction that has agreed to reach the maturity indexes and thus the projects evaluation process is shown below (RICAP process), proposed by the PANTERA team.

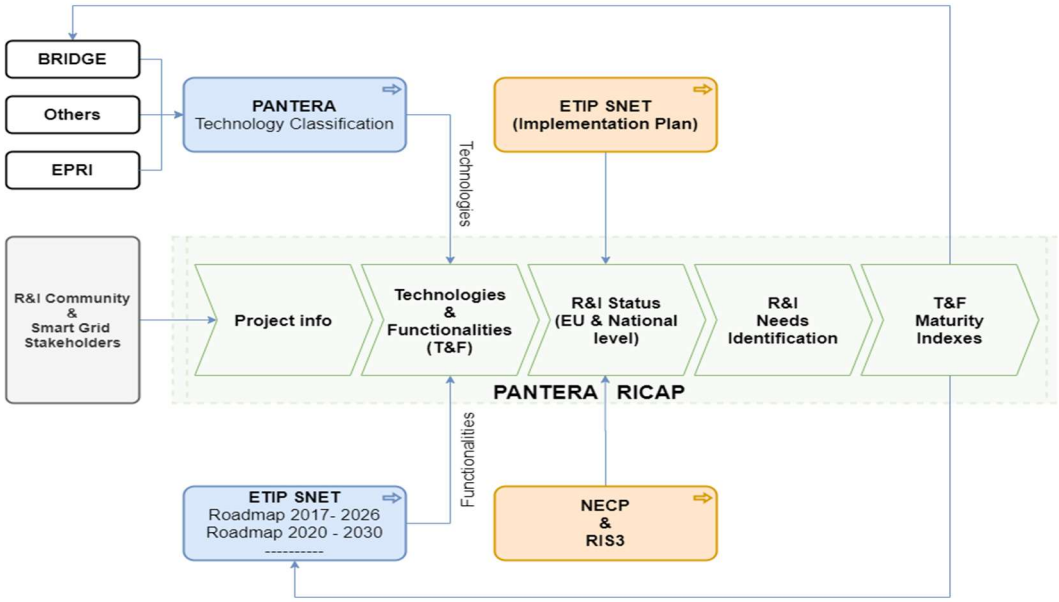


Figure 12The RICAP process

3.3 ETIP SNET project analysis in support of the 10-year Roadmap

Discussion between the PANTERA project and INTENSYS4EU/SPRING[17] (the EU projects that are supporting the coordination of the ETIP SNET activities by providing logistical and secretariat assistance) for sharing data repositories and other functionalities is on-going. This is a collective effort supported through the interaction with WG5 of ETIP SNET with the active contribution from the partners of the PANTERA project through WT3-R&I needs identification. The repository of the EIRIE platform will be developed to meet the requirements of ETIP SNET allowing full access to project results that can facilitate the envisaged R&I needs identification that is within the scope ETIP SNET.

The 10 year ETIP SNET roadmap 2020-2030[18] addresses the R&I activities to be carried out in order to reach the practical achievement of the functionalities by 2030, as well as those that must be started and conducted even when a further target of implementation later than 2030 is foreseen. Functionalities are the advanced operations that the future grid should implement for the

[17] https://www.etip-snet.eu/intensys4eu/

[18] https://www.etip-snet.eu/wp-content/uploads/2020/02/Roadmap-2020-2030_June-UPDT.pdf

materialization of the energy transition vision. More details will be provided in the next. The research activities to be conducted in the period 2020-2030 are organised according to six Research Areas. Each of these Research Areas is composed of several Research Sub-Areas and each Research Sub-Area is composed of several tasks (in total 120 associated Tasks). The ETIP SNET stakeholders have determined the potential for contributions of each of these tasks for achieving the functionalities.. In this context, the building of the EIRIE Platform supports the realization of the objectives set in the ETIP SNET 10-year plan. Moreover, the cooperation between all actors in the field of energy research and innovation in the form of an interactive platform further supports the achievement of the 2030 goals. Coordination and collaboration among all stakeholders are needed in order to identify and prioritise R&I actions. ETIP SNET's role in the energy transition is of big importance, thus the interaction between PANTERA and ETIP SNET in the EIRIE platform building process is of major significance.

The ETIP SNET R&I Roadmap 2020-2030[19], together with its four planned detailed Implementation Plans 2021-2024[20], 2023-2026, 2025-2028 and 2027- 20307, addresses the framework in which the European energy system shall develop along the path toward the goal of a full decarburization by 2050. In particular it focuses on the intermediate step of 2030, identifying the system functionalities to be ensured and considers the related tasks that need to be solved during the next decade to enable the functionalities and to prepare for the further steps toward 2040 and 2050.

This ETIP SNET Roadmap can also support the EC and national authorities in the process defining of R&I Project Calls and developing support instruments. Moreover, it can enable the R&I project proposal submitters to create highest impact proposals with goals and results to be achieved within the timeframe of the funded R&I projects that are aligned with the real R&I needs as identified in WT3.

Details of the immediate R&I activities (i.e. for the next IP time period 2021 until 2024) are described in the ETIP SNET Implementation plan 2021-2024. The ETIP SNET R&I Roadmap is planned to be updated every four years and is valid for a time frame of approximately 10 years.

Fi 1: ETIP SNET roadmap functionalities

N°	Functionalities
F1	Cooperation Between System Operators
F2	Cross Sector Integration
F3	Integrating the subsidiary principle – the customer at the center at the heart of the integrated Energy System
F4	Pan-European wholesale markets
F5	Integrating local markets (enabling citizen involvement)

[19] https://www.etip-snet.eu/etip-snet-ri-roadmap-2020-2030-4-billion-euros-investment-help-manage-europes-energy-transition/

[20] https://www.etip-snet.eu/etip-snet-ri-implementation-plan-2021-2024-e955-million-euros-investment-help-manage-europes-energy-transition/

F6	Integrating digitalization services (including data privacy, cybersecurity)
F7	Upgraded electricity networks, integrated components and systems
F8	Energy system business (includes models, regulatory)
F9	Simulation tools for electricity and energy systems (Software)
F10	Integrating flexibility in generation, demand, conversion and storage technologies
F11	Efficient heating and cooling for buildings and industries in view of system integration of flexibilities
F12	Efficient carbon-neutral liquid fuels & electricity for transport in view of system integration of flexibilities

Six research areas with 120 research and demonstration tasks are identified in the ETIP SNET R&I Roadmap 2020- 2030. Each task has impact on one or more Functionalities that has to be realized until 2030.

Functionalities will range across the energy system value chain (from generation to energy storage, transmission, distribution and end-use), its stakeholders (from the customer, to the market, network and service operators), its different vectors (from electricity to gas, heating and cooling, transport, water etc.) and the related non-technical issues (legislation, regulation, markets etc.).

With the increasing presence of DERs on the distribution network, the definition of new roles, regulatory framework and market design for the provision of grid services that have to be the result of a coordinated action among all the stakeholders: customers, Distribution System Operators (DSOs) and Transmission System Operators (TSOs). This is essential to further enhance cooperation among TSOs, DSOs and market participants (including consumers) all along the value chain of procurement of balancing, congestion management and ancillary services.

To enable a smooth transition, in 2030, regional demonstrations are implemented related to different tasks and research activities. The stakeholders involved in this process are DSO/TSO companies, agencies, regulators, research organizations, academia, energy communities, consumers and prosumers, householders, etc.

Having large amount of stakeholders groups engaged in realization of the Functionalities by 2030 ETIP SNET encourages a strong cooperation with other European Union Programs, and platforms aiming to intensify the cooperation between the stakeholders.

Realization of such vision needs effective and fully coordinated engagement of stakeholders in both Research and Demonstration areas, and easy access to information about different programs, funding opportunities, best practices results, etc. Considering the description of the ETIP SNET roadmap reported above the support of WT3 is summarised below:

- Provision of technologies and functionalities classification (task completed)[21]

[21] https://pantera-platform.eu/wp-content/uploads/2020/07/D3.1-Report-on-current-status-and-progress-in-RI-activities-Technology.pdf

- Secure data and provide a unified categorization under the EIRIE platform (ongoing)
- Development of methodology of matching other platforms categorization to EIRIE classification(ongoing)
- Secure that the classification is adaptive, flexible, up to date and that corresponds to the needs of the R&I community(ongoing)
- Maturity index methodology development (ongoing)

The EIRIE Platform collaborates with ETIP SNET as follows:

- Organization, participation and promotion events like (regional and national workshops, webinars etc) among the stakeholders
- All ETIP SNET's data is shared with EIRIE
- EIRIE offers structured data and information through integrated search functionalities and tools.
- EIRIE knowledge area is enhanced with ETIP SNET's functionalities to be universal in approach to meet the needs of the R&I community
- Functionalities at national, regional and industrial level.
- Ensuring relationship between different information platforms.
- Providing information about funding opportunities and legislation related to RD&I activities in the field of Smart Grids at European and National levels

3.4 ERA NET SES and the EXPERA platform

European Research Area Network Smart Energy Systems (ERA-Net SES *https://www.eranet-smartenergysystems.eu*) is a transnational joint programming platform aiming at co-creating and promoting energy system innovation. It contributes to the implementation plan of the European Strategic Energy Technology Plan (SET-Plan) Action 4 "*Increase the resilience and security of the energy system*". ERA-Net SES consists of three focus initiatives addressing specific challenges:

- smart grids plus (SG+)
- integrated regional energy systems (RegSys)
- digital transformation for green energy transition (EnerDigit).

As PANTERA objectives are supporting the same actions, exploring all possible cooperation opportunities is essential.

ERA-Net SES is a network of owners and managers of national and regional public funding programs. ERA-Net SES participating countries are Austria, Belgium, Croatia, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, India, Israel, Italy, Latvia, Morocco, The Netherlands, Nordics and Baltic region, Norway, Poland, Portugal, Romania, Slovenia, Spain, Sweden, Switzerland, Turkey and Italy. Five of sixteen PANTERA target countries are not represented: Cyprus, Malta, Greece, Lithuania, Estonia. It is worth mentioning that the funding partners are participating in the focus initiatives and are launching joint calls for proposals in variable geometry. Not all funding partners participate in each of the focus initiatives and related

joint calls. The list of countries participating in the specific call and possible budget is included in the call announcement. Calls' information is publicly available on the ERA-Net SES website, as well as general information on funded projects under each call.

Publicly available information on funded projects under 2018 and 2019 calls includes project acronym and title, very basic description of project idea, information on funding organisations, involved countries and project lead. More details are available for registered users only in the Expera platform. For projects funded under 2015, 2016 and 2017 calls project profiles, including more details (including total funding), are available.

Additionally, ERA-Net SES launched the cooperation and networking platform for the upcoming joint call 2020 organised in collaboration with the global Mission Innovation Initiative on digital transformation for green energy transition. At the moment there are registered 152 participants from 21 countries. Registered participants can create a cooperation profile, search and find cooperation partners in the cooperation profile database and connect via messaging and virtual one to one video calls.

ERA-Net SES activities are not limited to launching joint calls, but aim at maintaining a knowledge community as one of key instruments to foster transnational learning and maximise impact. Two main directions of this work are: the virtual knowledge sharing platform Expera and physical and virtual meetings of thematic ERA-Net SES Working Groups. Summary of Policy Briefs created by experts within the Working Groups is publicly available on the ERA-Net SES website. This contain generic information; more details are available for registered users of the Expera platform.

3.4.1 Expera as a knowledge sharing platform

The ERA-Net Expera platform[22] is the cooperation platform of ERA-Net SES and it allows communication and cooperation of registered members. It provides information structured by the following areas:

- ***living documents*** on different topics providing opportunity for registered members to leave comments or contribute to discussion.;
- ***working groups*** aiming to act as a powerful discussion forum on the following different topics:
  - System Architecture and Implementation Modelling;
  - Storage and Cross Energy Carrier Synergies;
  - Regulatory and Market Development;
  - Consumer and Citizen Involvement;
  - Interoperability and Standardisation;
  - Regional Matters.

  All WGs are active, i.e. activities and/or documents are available for 2020, with one

[22] https://www.eranet-smartenergysystems.eu/Community/Digital_Knowledge_Sharing_Platform

exception of Interoperability and Standardisation working Group with last documented activity held in 2019. Each WG area contains an open discussion, document repository and meeting schedule. The open discussion, briefly illustrated in Figure 13, is conducted in two phases:

- Phase 1 aimed at identifying relevant documents.
- Phase 2 aimed at sharing members project perspective in the discussion document. It includes discussion during WG meeting.

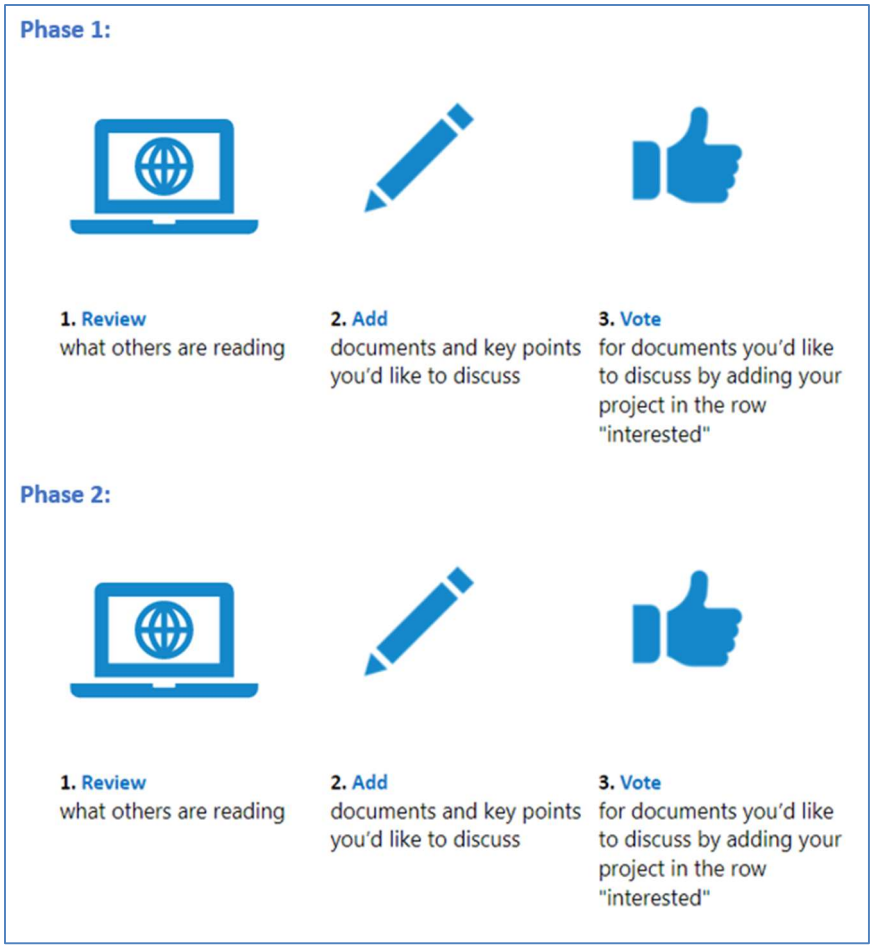


Figure 13: Discussion process within ERA-NET SES WGs

Access to WGs discussion documents is available for WG members only.

- ***Results*** such as policy brief produced by WGs Additionally, the results area contains spotlights, which are the newsletter-type documents providing a collection of findings of ERA-Net SES projects. Spotlights concentrate on specific topics with high relevance for project participants and practitioners. Something similar could be created for the EIRIE platform from target country perspective, for example, regional or country spotlights on specific topic.

- ***Projects*** area as ERA-Net SES projects repository. The web interface allows searching for projects by keywords. Considering the available information it is difficult to discuss about the linking possibilities between the Expera projects repository and the EIRIE projects repository.
- **Experts** area serves as ERA-Net SES experts database. Expert profiles include name, affiliation, country and short notes.
- **Event** area includes ERA-Net SES events calendar. In case of the EIRIE platform, it is recommended to include broader scope of events which will not be limited to PANTERA events only. Perhaps, it could be possible to include ERA-Net SES events as well.
- **Exchange** area serves as a common file repository for the knowledge community and ERA-Net SES organisational structures (with specific user access).

In conclusion of the discussion on Expera, it is worth saying that it contains some interesting collaboration practises, which could be partially adopted by PANTERA. At the same time, a pathway of effective integration of project data between the two platforms is to be more deeply analysed.

3.4.2 ERA-Net funded projects analysis from PANTERA target countries perspective

In order to acknowledge the intensity of involvement of PANTERA target countries in ERA-Net SES projects an analysis of publicly available data was performed. Calls covered by the analysis are listed in the table below.

Table 2: ERA-Net SES calls analysed

Call title	***Funded project number***
SG+ joint call 2015	20
SG+ joint call 2016	9
SG+ joint call 2017	3
RegSys joint call 2018	23
MICALL19 joint call 2019 on energy storage solutions	14

Based on published call results it was possible to evaluate the number of projects in which participants from each PANTERA target county were involved in the period from 2015 to 2019. From this point of view, Italy is the most successful target country: it is listed as participant in 12 projects and as a coordinator in two of these. However, it might be noted that all of these projects are funded under the two last calls, SG+ joint call 2019 on energy storage solutions and RegSys joint call 2018. At the same time, Italy was not participating as a funding partner in the previous calls included in the analysis. So, it appears that national funding of research activities in the field of smart grids in Italy developed in positive direction in the past few years. It might be useful to understand what were the circumstances triggering this positive change and if any actions or decisions could be replicated as best-practices in other target countries. Information available on the

ERA-Net SES website is not sufficient for making any conclusions on this subject.

As for other target countries, the intensity of their involvement is substantially lower (see Table 3). This gap becomes even more visible while comparing with the most actively involved countries, Sweden and Germany. Participants from Sweden and Germany were involved in almost 40% of total number of projects (29 and 28 projects respectively).

A deeper analysis considering funding allocation was not possible as publicly available information is limited. Information on total funding of each project is publicly available only for 2015, 2016 and 2017 projects in the project profiles. Additionally, information on proposed budgets of each funding partner is available in published calls of proposals. However, without having full information on financed project funding and distribution of it per countries, it gives no value for the analysis. It should be added that funding source as Baltic Nordic region was presented in the RegSys joint call 2018, the essence of which was that at least 3 countries, two Baltic countries and one Nordic, should be represented as one whole.

Table 3: PANTERA target countries' involvement in ERA-Net SES projects

Country	***Number of projects participants from target country were involved in***	***Number of projects led by participant from target country***
Italy	12	2
Ireland	4	3
Romania	4	-
Poland	3	1
Portugal	2	-
Croatia	1	-
Hungary	1	-
Latvia	1	-

Considering the list of countries in each call and project results, it seems that participants from every country with available funding for certain call were involved at least in one project in that call. Data on submitted, projects but left under the threshold is unavailable. Thus, more information is needed to assess if there any other barriers except the amount and availability of funding in winning projects for participants from PANTERA target countries.

The success rate in ERA-Net calls, it is around 30-40%, which is higher than for example average success rate in Horizon 2020 (according to Horizon 2020 dashboard it is 12%).

Finally, it seems that ERA-NET SES likely have no specific measures for stimulating involvement of less involved countries.

3.5 DERlab

STARGRID project - STandard Analysis supporting smart eneRgy GRID development project - is a

collaborative coordination and support action funded by the European Commission (EC) under the 7th Framework programme, aiming at the provision of a comprehensive analysis of the current standardisation efforts, considering also new industry developments and initiatives in the field. The project focuses on three Smart Grid topics: distributed energy resources (DER) integration and grid control, demand response and customer energy management, and smart metering. The project was carried out by a consortium of five partners from four European countries and ran for two years (October 2012 - September 2014). STARGRID repository of results is hosted on the DERLab's servers and will form the basis for the standards and regulations base of the EIRIE platform through an appropriate link of the two platforms.

The methodology of building on top of the STARGRID data and the related review on codes and standards have been carried out and has been presented in the deliverable D3.2 "Report on Regulations, Codes and Standards in EU-28"[23]

WT2 "Regulation & Standardization" team is responsible of systemizing this methodology and give feedback to the EIRIE platform allowing the R&I community to be channeled appropriately to the desired regulations, codes and standards covering smart grid, storage and local energy systems.

[23] https://pantera-platform.eu/wp-content/uploads/2021/01/D3.2_Report-on-Regulations-Codes-and-Standards-in-EU-28.pdf

4 Collaboration with other projects

The PANTERA consortium through the EIRIE platform is pursuing collaboration with all related platforms with data bases and project data that are related to its set out objectives. Under this prism, the collaborations with the following projects have been agreed till this date:

4.1 ASSET project

ASSET [24]is a research and innovation project financed by the European Commission under the H2020 Research and Innovation Programme in the topic of research, innovation and educational capacities for energy transition. The project aims to create a community and to provide the tools to create and share the knowledge and skills needed to efficiently tackle the energy transition processes. To do this, Asset will develop innovative programmes to educate students, trainers, employees, and citizens. As such, a collaboration is established under the knowledge area of the EIRIE platform. Technical details on how this can be achieved is already under way with detailed discussions with the respective experts.

4.2 EDDIE project

EDDIE[25] is an Erasmus+ European Union funded collaborative project creating a Sector Skill Alliance (SSA) to develop a long-driven blueprint for the digitalization the European Energy sector. The challenge is to develop this blueprint to enable the matching between the current and future demand of skills necessary for the digitalization of the Energy sector and the supply of improved Vocational Education and Training (VET) systems and beyond. The EDDIE project platform will be interacting with the EIRIE platform enhancing the educational and training section of the knowledge area. Technical details on how this collaboration will be established will kick off early 2021.

4.3 ERIGRID 2.0 project

ERIGrid 2.0[26] project is providing free laboratory access to engineers working in the domain of smart grids and DER through the Transnational Access *program (https://erigrid.eu/transnational-access/)* by offering the following:

- lab access to testing and simulation facilities of prestigious labs
- access to concentrated know-how
- best practices in the field of smart grid systems and DER
- networking and synergies opportunities

PANTERA WT1 - Research Infrastructures is in charge of collaborating closely with ERIGRID 2.0 to deliver through the EIRIE platform the aforementioned opportunities to the European R&I community as a whole and of course low activity countries will be specifically supported through this cooperation. It is the intention to enrich activities with related webinars and other events that

[24] https://energytransition.academy/

[25] http://projecteddie.org/ www.eddie-erasmus.eu

[26] https://erigrid2.eu/

can serve the R&I community with specific emphasis on the low activity countries.

4.4 SUPEERA

The SUPEERA[27] project is rooted in and supports the SET-Plan but also aims at integrating it into the broader context of the Clean Energy Transition to support Europe's strategic long-term vision, a Clean Planet for all.

Therefore, SUPEERA's main objectives are the following:

- Supporting the energy research organisations involved in the SET-Plan.
- Encouraging a stronger engagement of the EU-13 countries.
- Improving the exchange of information and making recommendations for joint actions.
- Helping accelerate the uptake of new technologies by industry.
- Examining the impact of EU policies in the view of bringing the SET-Plan forward in the broader context of the Clean Energy Transition.

As such, PANTERA and SUPEERA are in close collaboration supporting each other in the following ways:

- Through dedicated content and dissemination and outreach material in the EIRIE platform
- Through collaborative activities such as participation and interaction in the PANTERA regional workshops (e.g. MEDPOWER 2020 Paphos workshop)
- Organizing common events such as workshops, webinars etc.(e.g. organizing in Croatia (Zagreb) a physical meeting in 2021)
- Strengthen the networking and disseminate best practices and use cases for stronger engagement of the EU countries (e.g. interview of FOSS success story by SUPEERA and further dissemination)

[27] https://www.supeera.eu/

5 Conclusions and next steps: further synergies between PANTERA, EU and international stakeholders

During the first two years of PANTERA activities, thanks to the involvement of the Consortium in several international contexts, succeeded in establishing good connections and close working relations with the relevant EU initiatives in the smart grid field. Moreover, extensive effort was also made towards the development of channels with international initiatives like MI and ISGAN through which extensive collaboration has been concluded with visible benefits that will enrich the EIRIE platform for use by the R&I community in Europe. A summary of what has been achieved is shown in Figure 14 below. What are the plans ahead?

- The next period, till the end of the project, it will be dedicated to exploit at best the good international collaborations and enhance these collaborations.
- Establish new collaborations
- Find the appropriate way of effective dissemination of the outcomes.

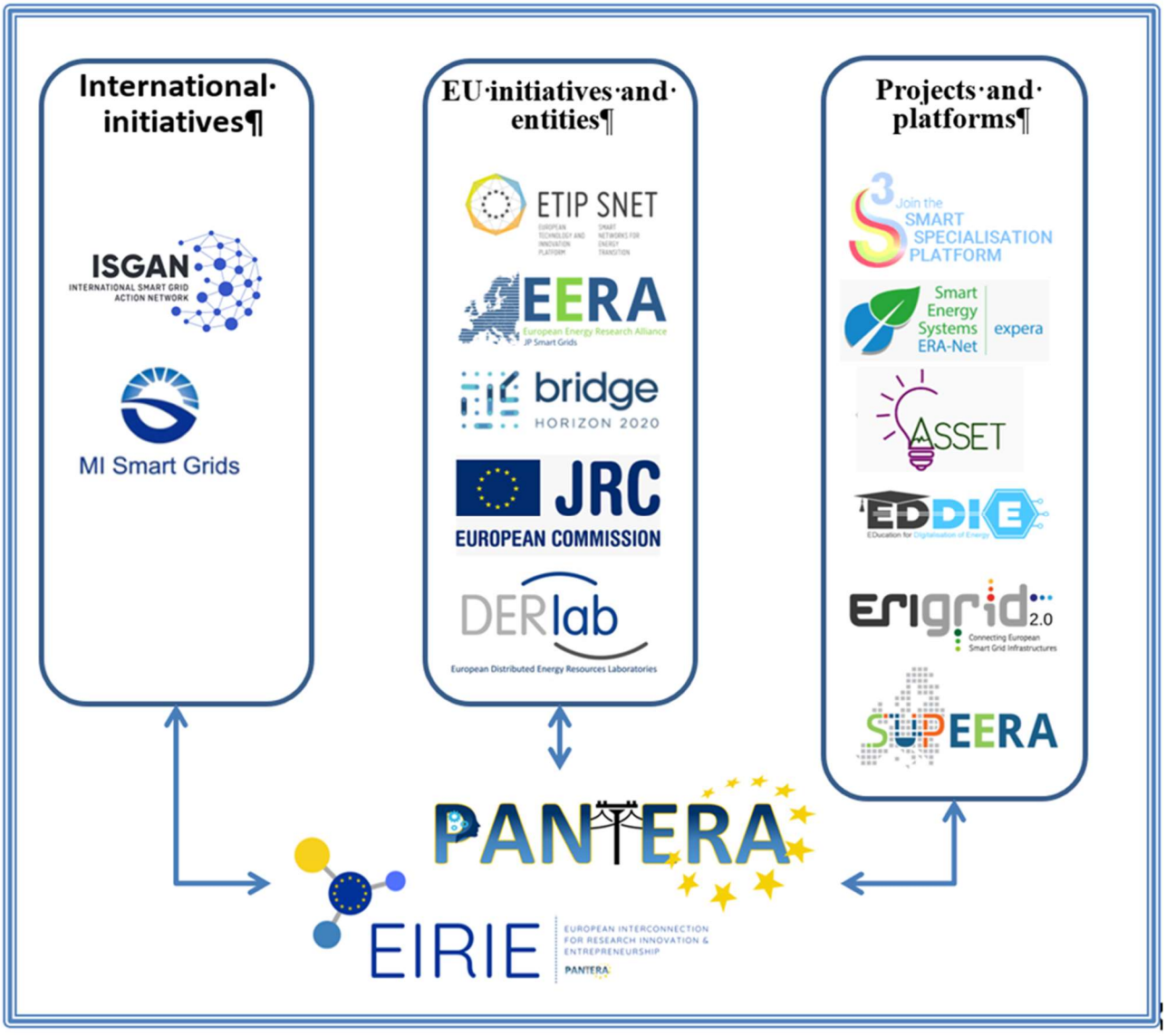


Figure 14: Summary of the initiatives, projects and platforms with which PANTERA has established collaborations

In this context the EIRIE platform will be a very important asset, considering its main areas:

- **data area** collecting project results and deliverables;
- **information area** collecting project contents considering the interaction with other established database in the domain of Smart Grids.
- **knowledge area** gathering know-how and information through living documents;

So, it will give the possibility to collect, share and especially make available to the R&I community, for their searching needs, extensive rich content and data. In this view, collaboration with international organizations like MI, ISGAN but also EERA JP on SG, ETIP SNET and ERA-Net will be important to support the full deployment of the platform functionalities. Moreover, international collaboration will allow to collect relevant and updated content from these initiatives thus helping to make the EIRIE platform a reference point, something like a *one stop shop* in the smart grid domain where a user can find all the relevant content about smart grid and the energy system. Besides, collaboration with key international organizations, these activities will allow to get valuable inputs and feedbacks from key experts for the further development of the platform functionalities.

Concerning the overall objectives of the project, another important expected outcome of the collaboration between PANTERA and international/EU level initiatives, is to accelerate the local stakeholders' engagement. The achievement of this goal will be facilitated by the data and information available through the platform, since an *one stop shop* is able to catch the attention of the users, thanks to the data and information that it could provide. Once again and as pointed out before, international collaborations is key to make possible this virtuous loop.

6 List of Tables

7 List of Figures