# PANTERA
## *Pan European Technology Energy Research Approach*

## Work Package 2
## Pan-European R&I community

### Deliverable 2.2
### Report on enhanced collaboration opportunities

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# Contents

# TABLE OF FIGURES

# EXECUTIVE SUMMARY

Deliverable 2.2 "Report on enhanced collaboration opportunities" covers the reported collaboration activities of stakeholders reported in the various actions and deliverables of the PANTERA consortium. It reports primarily the activities of stakeholders in the field of smart grids, storage and local energy systems relates it to government policies, and the collaboration of research institutes and organisations. Through comparing all these areas of research, possible intersection/collaboration of these different groups is brought in the focus, with the goal to improve the implementation of the targeted technologies and identify barriers that may prevent them.

In Section 2 the findings through the various deliverables are presented giving evidence of collaboration possibilities for stakeholders. More specifically the following are identified:

- In WP2 the interactions with European platforms and organizations are presented revealing the wealth that activities like this bring to EIRIE to share out with all stakeholders.

- WP3 and WP4 point to the bottlenecks/barriers identified in regulation, codes and standards including content. Additionally, it aims to identify the gaps and missing subjects within the key topics and content of PANTERA aiming to assist to cover and rectify. Moreover, WP3 covers the relationship between the consumer and industries together with the ability for consumer to become a prosumer. The consumer is put at the centre of the clean energy transition and the new rules enable the active participation of consumers, whilst putting in place a strong framework for consumer protection.

- WP5 reveals issues identified by the stakeholders at workshops.

- WP6 looks at regional activity and more specifically, at each regional desk and country to ascertain what the acceptance barriers are. There are 6 different regional desks with each desk covering either 2 or 3 countries, the goal is that the regional desk can work closely with these countries factoring in their needs and individual cultures. Every Country is experiencing their own barriers to R&D, however, there are certain barriers that are a common occurrence across every country such as research funding and tax incentives.

In Section 3 gives evidence of the attempts done through the project in bringing closer the stakeholders to relevant international activities The PANTERA Project and its activities have been extensively presented in the DERlab Public activity report 2021-2022. The report has been published both in electronic and paper format. The electronic format is available for download on the DERlab website and has been disseminated not only in the DERlab and ISGAN-SIRFN community but also beyond, through social media and public newsletters. The printed version has been distributed both in the DERlab community and in the PANTERA Consortium. The recipients have been advised to further disseminate it as a reference public report giving visibility to the PANTERA project activities and to the EIRIE platform. Furthermore, this report has been continuously made available at international conferences and events that focus on smart grids, digitalization, and grid integration of renewable generation (https://der-lab.net/mediapartners/). The section goes on to present results achieved through extensive collaboration work with ETIP SNET, BRIDGE, Mission Innovation, EERA JP for SG, the SUPEERA project, JRC and ERIGrid 2.0 project.

Section 4 gives evidence of the work done in linking the stakeholders of the targeted countries. Details are given of the important activity "Key topics and content management" within the PANTERA project through which, regular interaction was established based on more than 30 semi-structured interviews and surveys, which have been accomplished to establish an open

dialogue and identify specific stakeholder needs and expectations. Considering that PANTERA as a project aims specifically at Smart Grids domain, which is normally associated with distribution, the intention was to focus on respondents, which are engaged in and have expertise there. The activity identified the main challenged requiring implementation of Smart Grids Technologies in the focus countries, where the most important were:

- Massive introduction of distributed Renewable Energy Sources (RES)

- Electrification of transport, Electric Vehicles (EVs)

- Growing necessity for consumers' empowerment and engagement

- Economic challenges

- Growing quantity of data from different sources

Moreover, in Section 4 details are given of the developed interaction with important stakeholders through the planned workshops. Additional this section covers the work done through the project for participating in other EU activities as means for strengthening collaboration in R&I and promoting regional / national strong points. Finally, in this section the published work of the project is listed with all the required references.

Section 5 elaborates on the wealth generated through EIRIE in support of the R&I community in Europe. EIRIE is truly a platform acting as a one stop shop involving different key stakeholders for feeding in the work of projects and hosting knowledge, information, and data of major platforms in Europe and internationally in the field of smart grids, storage, and local energy systems. The sections give evidence of the collaboration work of PANTERA with JRC to develop the platform and have it operationally ready for this delivering journey ahead for the benefit of the R&I community in Europe with specific emphasis on the low activity countries.

# 1 Introduction

Deliverable 2.2 "Report on enhanced collaboration opportunities" covers the reported collaboration activities of stakeholders reported in the various actions and deliverables of the PANTERA consortium. It reports primarily the activities of stakeholders in the field of smart grids, storage and local energy systems relates it to government policies, and the collaboration of research institutes and organisations. Through comparing all these areas of research, possible intersection/collaboration of these different groups is brought in the focus, with the goal to improve the implementation of the targeted technologies and identify barriers that may prevent them.

Throughout this report the main issues that stakeholders face is dissected down to the basic roots of the problem. Analysing the content of reports from the viewpoint of barriers that the stakeholders face allows us to draw a more conclusive result as to the issues that they face. This is the primary area of focus for the start of the report and the underlying theme of the report throughout joined with potential collaboration opportunities to mitigate these issues.

In section 3 of this report "Approach and actions/examples: teamwork to strengthen the relations with EU stakeholders", we look at the collaboration opportunities between different organisations that are currently innovating and advancing the field of smart grids, storage and local energy systems. Through future collaboration and the shared knowledge of these organisations that are leaders in their field, the path to a carbon neutral future will be accelerated and obstacles more easily overcome.

Section 4 of this report covers the collaboration between various organisation and the stakeholders in smart grids, storage and local energy systems. Throughout the various workshops that have been organised around Europe by PANTERA, organisations and stakeholders have had the opportunity to communicate with each other and discuss the barriers that they are facing. Continuing this form of open dialogue helps to close the gap between stakeholders and organisations therefore improving the ability of both parties to help each other. Also discussed in this section is the issue of sharing of research and research papers to facilitate international collaboration.

The fifth section covers multifunctional platform EIRIE. The EIRIE platform is an active platform that is designed to be the single point of reference of EU activity smart grids, storage and local energy systems. It is designed to facilitate the work of the R&I community in Europe covering the areas of smart grids, storage and local energy systems. It supports access to exploitable results that can spark further work and cooperation capable of bridging the existing gaps. This section of the report discusses the functionalities that the platform offers as well as the future of the EIRIE platform.

# 2 List of challenges faced by stakeholders

In the paragraphs below the findings through the various deliverables are presented giving evidence of collaboration possibilities for stakeholders.

## 2.1 Deliverable 4.2

Aimed to identify the gaps and missing subjects within the key topics and content of PANTERA. It broke apart the research into two main areas of study, the first being technological and the second being government policies. Regarding the second aspect of study, the policies, there are three new documents to be noted. They are,

- The European long-term decarbonisation strategy,
- The Strategic Energy Technology (SET) plan, and
- The New Circular Economy strategy.

These policies reinforce the path towards carbon neutrality and the shift to renewable energy resources.

Deliverable 4.2 recognised ETIP SNET as a driving force towards carbon neutrality, on this basis, PANTERA adopted the ETIP SNET road map for R&I. PANTERA conducted many interviews and surveyed stakeholders with the result being several challenges specially mentioned, which will require implementation of Smart Grid technologies within the next 5-10 years.

- Monitoring and controlling small-scale renewables will be the most critical challenge within the next 5-10 years. It raises the necessity of improved utilisation of the potential for the existing distribution and transmission assets instead traditional expansion of the grid.
- Electrification in general and especially the growing number of electrical vehicles is going to be a huge challenge.
- The current market design needs to be adapted to incorporate novel technology and energy production methods.
- Smart Grid interventions and transferring innovations to the industry, and growing need for training of DSOs personnel according to the new challenges.
- Stakeholders agreed that the benefits of a smart grid outweigh any possible cons. The linking together of various aspects of the grid will reduce losses and therefor cost for the producers and consumers.

## 2.2  Deliverable 2.3

The deliverable is the 1st Report on interactions with European platforms and organizations. In this deliverable the following are identified and documented:

- The ETIP SNET WG5 (Innovation implementation in the business environment) that adopts a helicopter view of the activities carried out in projects within the perimeter of the ETIP SNET about the energy transition to:
  o Build homogeneity in the analysis of projects, work done, and lessons learned.
  o Create a common platform for analysing the progress made by the different technologies through-out the EU and facilitate their scalability.
  o 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.
  o Review the relevant BRIDGE reports that identify the economic, social, technical, legal, etc. barriers which may slow down business model deployment.
  o Search for innovative solutions that will maximize the benefits of the innovation process that the EU achieves through R&I activities in the area of Energy.

  Based on the above 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 work of the stakeholders involved including the envisaged gap analysis that is within the scope of ETIP SNET.

- ISGAN 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. Moreover, international collaboration will allow to collect relevant and updated material 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 could find all the relevant material about smart grid and the energy system.
- The EERA Joint Programme on Smart Grids that is detailed in section 3 of this report).
- EIRIE is collaborating closely with ERA-Net SES has developed the cooperation and networking platform organised in collaboration with the global Mission Innovation Initiative on digital transformation for green energy transition. At the moment there are 152 participants registered 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. It seems that ERA-NET SES has no specific measures for stimulating involvement of less involved countries.

## 2.3  Deliverable 3.3

It covers the relationship between the consumer and industries together with the ability for consumer to become a prosumer. The consumer is put at the centre of the clean energy transition and the new rules enable the active participation of consumers, whilst putting in place a strong framework for consumer protection. There are, however, some issues that these prosumers face based off of country of origin both at an industry level and an individual level. Some examples are given below:

- Bulgaria- The lack of a differential approach towards the integration of small-scale RES, in practice, means that the administrative paperwork for households and small businesses is much greater than for an energy company investing in a large-scale capacity.
- Croatia- Suppliers are obliged to purchase the surplus of prosumers' generated electricity and pay them a fixed price.
- Cyprus- As it used to happen with small islands, the main electricity source in Cyprus is constituted still nowadays by oil power plants with a reluctance to change a system that works.
- Czech Republic- With respect to power generation, distribution and transmission companies are obliged, through a nominated trader, to buy electricity from renewable energy producers.
- Greece- With Law 4602/2016, the government limited the ability of investors to enjoy, both directly and indirectly through affiliated companies, new PV plants with a capacity lower than 500 kW and wind plants of less than 3 MW
- Hungary- Hungary is lagging behind other European countries in terms of both renewable energy utilisation and community energy, as well as supporting the transition to a prosumer culture, all of which would require a more flexible and less centralised energy system.
- Ireland- Due to the current legislation, in Ireland it is extremely complicated, costly, long and risky for a community energy project to connect into the National Electricity Grid nowadays, and in case of achieving this connection.
- Lithuania- However, currently there is not a specific regulation addressed to prosumers and decentralized generation.
- Malta- there is not a specific legislation for "prosumption" or decentralized generation.

## 2.4  Deliverable 3.2

The state of R&I, standardisation, and regulation. The deliverable, identifies the need to work closer on the issues of the DSOs, since the distribution network appears to be the most affected area in R&I. The aim is to engage DSOs in R&I strategies planning and implementation, identify their R&I needs and attempt to encourage further collaboration. The following have been identified as issues affecting stronger collaboration:

- Currently, there is insufficient standardisation to achieve a decarbonised energy system, lacking in interoperability of technologies. There are many advantages associated with standardisation. In the future, standardisation of data and technology will yield greater energy efficiency in the smart grid domain.
- There is of course the issue of free-riding and the reluctance of researchers to share their findings, preferring to strive for intellectual property rights. However, this way of thinking is inefficient and does not align with the collaborative, interoperable concept of a smart grid and decarbonised energy system.

## 2.5  Deliverable 2.1

Report on Stakeholders identification and interaction

The purpose of deliverable 2.1 was to identify stakeholders and the interactions PANTERA could have with them that would be mutually beneficial. A specific emphasis was placed on stakeholders from European countries who had lower average spending on research and development when compared to other European countries. Major points addressed are the following:

- Once potential stakeholders had been identified they would be given a survey, this survey was designed to give a more conclusive analysis of who the stakeholder is, and their role within the energy community. The surveys were also used to discuss and identify any barriers/issues that the stakeholder may face. These stakeholders were then integrated into the PANTERA system and were offered the opportunity to participate in conferences, workshops and discussions around smart grids and R&D. Stakeholders are an instrumental part of the PANTERA process and as such it is important that they are constantly engaged with and made to feel like their voice is being heard.
- When observing the feedback from these surveys we can see that over half of the respondents were from academia or research backgrounds. With the integration of the EIRIE platform we can compile large amounts of research for these stakeholders in order to collaborate on research, development, and innovation. When given a list of potential barriers and asked to select the most prevalent one, the majority selected the option "lack of access to reliable information/data to facilitate R&I activity." Given that this is such a prevalent issue the implementation and utilization of the EIRIE platform is essential to aid in providing access to relevant topical data on R&D within renewables. A selection of stakeholders when asked what they were looking for from PANTERA mostly discussed access to data and improved networking opportunities.

## 2.6 Deliverable 5.2

Deliverable 5.2 covers the effects and outcomes of the PANTERA workshops. Workshops have proven to be an effective way of engaging stakeholders and expanding PANTERA's numbers and reach. At the time of deliverable 5.2 three workshops and one nano workshop had occurred, however, many more have taken place since. During these workshops the facilitators conducted a SWOT analysis with a specific focus on the strengths and weaknesses of the current systems, and regulations that are in place surrounding innovation and implementation of novel technologies. It was found that putting these stakeholders into small discussion groups yielded insightful results that could help with the progression of PANTERA and demonstrate how it can better facilitate its stakeholders.

Three workshops had taken place before deliverable 5.2, these were in Bulgaria, Ireland, and Greece. Through these workshops we saw a significant uptake in people joining the PANTERA project as well as gained an insight into the current condition of R&D in these countries. A virtual workshop was held as part of the med power conference and was aimed at tackling various aspects of the energy transition. As well as a nano workshop in Bulgaria that dealt with bottlenecks within the energy system in a more concise way than previous full-scale conferences.

It is worth noting the following results from the SWOT analysis conducted:

**Strengths**

- A lot of knowledge and experience around the EU
- Good networking synergies
- Easy access to knowledge & resources
- Networking activities


**Weaknesses**

- R&D results are not well communicated
- Lack of access to project results & knowledge

- Lack of demonstration of projects
- Lack of information about the possible coupling of instruments/supplementary funding

## 2.7 Deliverable 6.4

Deliverable 6.4 is designed to look at each regional desk and country to ascertain what the acceptance barriers are. There are 6 different regional desks with each desk covering either 2 or 3 countries, the goal is that the regional desk can work closely with these countries factoring in their needs and individual cultures. Every Country is experiencing their own barriers to R&D, however, there are certain barriers that are a common occurrence across every country such as research funding and tax incentives.

The desks and their specific barriers can be seen below.

### Desk 1 - Latvia, Estonia, Lithuania

There have been two conferences hosted here since the start of the project, these have proved highly effective in raising awareness of the issues faced by these countries. The outcomes of these conferences were posted in the Latvian energy journal. Members of this desk stated that they felt like they were falling behind in terms of collaboration with horizon Europe, perceiving it was more interested in dealing with the perceived advanced countries.

### Desk 2 - Bulgaria, Romania, Greece

This desk, pre PANTERA project had the lowest ranking of R&I and funding for research. As such this desk has been a big focus of PANTERA and conferences have been hosted in each of the countries to raise awareness and encourage collaboration. The main issues that arose at these conferences were the need to improve the quality of the electrical grid as well as integrating new smart technology into the grid. Bringing about a change in the grid structure will require active stakeholders and a change in current policies and funding.

### Desk 3 - Cyprus, Malta

Three workshops have taken place in these two countries since the start of the PANTERA project which have seen a great level of engagement from our stakeholders. The level of interaction and enthusiasm towards change demonstrates that the issue lays not with the people, but with the policies that are in place. One of the main issues comes in the form of a lack of data and information with regards to technology, previous studies, trials, and other countries R&D processes. Due to the needs of this specific desk , the EIRIE website should be of great benefit to Cyprus and Malta giving them the data that they need to conduct more informed R&I.

### Desk 4 - Poland, Czechia, Slovakia

Unfortunately, due to a variety of reasons PANTERA has been unable to host conferences in these countries, a nano workshop and interviews with stakeholders has been conducted instead to gain an insight into the countries R&I. One issue that needs to be dealt with is the lack of people specialised in renewable and smart grid technology, this has made it difficult to secure grants and funding. Citizens and companies alike are hesitant to participate in new initiatives, there is a need for pilot programs to be run in order to demonstrate the success of these new technologies and changes.

### Desk 5 - Italy, Hungary, Croatia

There have been workshops run by PANTERA in each of the countries in this regional desk since the start of PANTERA. The stakeholders from this desk focused on the need for networking and the sharing of data to improve their knowledge of novel practises and EU funding opportunities. Also encountered in these regions was a reluctance to participate or change ways unless immediate results were to be observed. Similarly, to desk 4 there is a lack of skilled human resources to participate in R&I.

**Desk 6 - Ireland, Portugal**

In the case of Ireland, there has been one Workshop run by PANTERA that garnered support and participation from Irelands academics and stakeholders. The main issue that arose during this workshop was with regards to data. Data protection laws and hesitancy of companies to share data combined with the lack of standardised systems can make R&I difficult, hindering the implementation of new technologies. In the case of Portugal there is a need for greater collaboration both in terms of the companies operating within Portugal as well as other EU entities. With a greater emphasis placed on open-source data, sharing of new technologies, and funding opportunities to further R&I.

## 2.8 Deliverable 4.3 - SINTEF

This report is one in a series of four reports each looking at the identification of gaps and missing subjects. The purpose of this deliverable is to present the R&I status and Continuous gAP analysis for the countries identified by the JRC report on countries investment into renewables and research. PANTERA has done this by gathering existing data from each country in terms of their R&I and compared it to the nation energy and climate plan to rank how various countries are performing. Investigations were conducted into the various project's countries have/are working on and any gaps in research where different countries may start falling behind.

Deliverable 4.3 outlines how PANTERA can be used to facilitate the EU's climate action plans and decarbonisation of the industry sector. It does this through acting as a link between the stakeholders and relevant information/processes allowing free flowing communication between policy makers, consumers, and academics.

The European Commission is working towards carbon neutrality in a safe manner, this involves many different aspects such as diversifying renewable generation sources, innovating new technologies, and, most relevant to this deliverable, identifying gaps in research and technology. Currently PANTERA uses its own RICAP process to identify barriers and bottlenecks that stakeholders experience. This method is done with a broad outlook and needs more resources in the future to further refine the identification process.

Currently we see a large portion of research and innovation is being spent focused on integrated grid systems, customers, and the market. Each country has varying methods to achieve their goals and prioritise their research differently, however, all can be assisted using PANTERA and the EIRIE platform. One common theme that each country needs further development in, that PANTERA and EIRIE can directly deal with is that of data, communication, and digitalization of the grid. PANTERA has acquired a diverse group of stakeholders covering multiple disciplines allowing gaps in any aspect of the energy transition to be detected.

The main issues outlined in deliverable 4.3 were as follows,

- The main challenge is high variability in production of electricity based on renewables. Massive deployment of RES (as for example in Poland) has not been followed by development of the grid.
- Growing necessity for consumers' empowerment and engagement.
- Deployment of electric mobility, especially in the major European cities.
- Necessity to improve the economics within the power sector, making it more targeted, and to facilitate reliability and security of energy supply.
- Optimal use of the existing assets and avoiding stranded assets.
- In conclusion, the RICAP method is proving successful and yielding results, yet needs more work and fine tuning to yield results with improved accuracy.

## 2.9 Deliverable 3.4

This deliverable discusses the barriers and bottlenecks that are currently stopping involvement of stakeholders, consumers, researchers, and other members of the industry. Resolving the issues that arise throughout this deliverable will be an effective way to progress towards carbon neutrality and achieve the goals set by the EU. The deliverable mainly focuses on bottlenecks

regarding the consumer and their integration and functionality in the energy market as other deliverables deal with the technical bottlenecks and barriers. The EU understands the need to involve citizens into the transition to clean energy, yet there are policy changes that need to happen before this can take place in an effective manner.

PANTERA has identified 4 main areas where consumers can be integrated into or encouraged to participate in the system:

- Energy efficiency, and demand response
- DERs (distributed generation, CHP, HP), RES (PV), and Energy storage systems (ESS)
- Local energy markets
- Technological advancements

For the EU to meet its climate goals it requires the participation of each member state. This is one of the main purposes of PANTERA, to identify EU members that are falling behind in R&D and investigate the cause and propose potential solutions.

Through integrating prosumers into the generation industry via grants, information, and encouragement we can accelerate the green energy transition. Prosumers can contribute to the grid in many ways and add balance to the network through energy production, trading, and decentralising the renewable energy production systems. These prosumers can face various barriers when attempting to join the network an example being, unable to share energy that they generate due to lack of a low voltage substation. Another issue that needs to be addressed is the energy efficiency of houses, through increasing houses energy efficiency we reduce the need to produce as much electricity making them more environmentally friendly. There is a need to raise awareness of the positive benefits of improving citizens houses energy rating both financially and environmentally. However, there are some issues that these prosumers face that could make them hesitant to engage, these include lack of transparency from companies, lack of easy-to-read data that show their contributions, and lack of a standardised system allowing interoperation of multiple groups of citizens.

The main list of issues for energy citizens outlined in deliverable 3.4 can be seen below.

- Citizens' unfamiliarity and mistrust.
  - Unfamiliar technology/technical terms
  - Lack of transparency around what DR entails and whom DR benefits
  - Mistrust in community-based mechanisms
- Perceived loss of control and associated risk
  - Long-term time-varying pricing may hinder enrolment
  - Fear of loss of control of the citizens over their demands/tasks
  - Unpredictable short-term prices that may deter citizens' persistence
  - The prices should be predictable, but variable enough to guarantee the earning
  - Lack of DR models that is understood by citizens and offer acceptable control
- Complexity and effort
  - Inconvenience and discomfort associated with demand shift
  - Low reimbursement compared to the underlying decrease in comfort level
  - Complexity and required effort of responding to time-varying prices
  - Unpredictability of the weather in western European countries
- Need to install new equipment and technologies
  - High cost of such technologies
  - Space required
  - Disruption of services while installing the required equipment
  - Lack of trust in additional technology
  - Associated complexity of new technologies
- Insufficient wholesale price variation discourage engagement in dynamic pricing DR
  - Conflict with other conventional use cases that favour low variation in prices
- Energy and network tariff structure does not support demand shift in time
  - Lack of motivation to switch to e-mobility and the use of electrical heating

- Distribution System Operators (DSO) remuneration approach
  - Preferring wire solutions over non-wire solutions
  - Lack of policies for the gradual transition from old DSO remunerating models
- The necessity to give access to third-party actors
  - Low weight of the demand-side stakeholders in policymaking
- No definitions for rights for direct control of citizen's loads: Since different entities might make use of customers' load control for different purposes, it turns into a requirement to define certain rights and obligations which apply to the parties responsible for power balance.

In conclusion to this deliverable, the importance of empowering citizens cannot be understated. There are many changes that need to occur to better engage with these consumers including, policy change, financial incentives, transparency from network operators, easy to understand data sets and further information about why and how they can help.

# 3 Approach and actions/examples of teamwork to strengthen the relations with EU stakeholders

## 3.1 Bringing closer the stakeholders to relevant international activities (Contributing: EERA JP SG, ISGAN, ETIPSNET, Mission Innovation, DERlab etc)

The PANTERA Project and its activities have been extensively presented in the DERlab Public activity report 2021-2022. The report has been published both in electronic and paper format. The electronic format is available for download on the DERlab website and has been disseminated not only in the DERlab and ISGAN-SIRFN community but also beyond, through social media and public newsletters. The printed version has been distributed both in the DERlab community and in the PANTERA Consortium. The recipients have been advised to further disseminate it as a reference public report giving visibility to the PANTERA project activities and to the EIRIE platform. Furthermore, this report has been continuously made available at international conferences and events that focus on smart grids, digitalization, and grid integration of renewable generation (https://der-lab.net/mediapartners/).



Figure 1: *DERLab Public Activity Report 2021-2022, promoting PANTERA among the DERLab community, Link:* *https://der-lab.net/derlab-activity-report-2021-2022/*

Figure 2: *EIRIE in DERLab Public Activity Report*

The DERlab Research Infrastructure database (DERlab RI database) is directly linked to the PANTERA Project webpage. The contents of the DERlab RI database have been synchronized with the RI database available on the EIRIE platform, thus supporting the added value of the EIRIE platform concerning the accessibility to a wide range of information on the internationally available testing infrastructure.

Furthermore, DERlab members (beyond the PANTERA Consortium) have been actively involved in PANTERA workshops and activities, offering valuable inputs on the Capacity building on R&I in Smart Grids, Storage, and Local Energy Systems to the different regional Desks.

In the International Smart Grid Action Network (ISGAN) Working Group 5, Smart Grid International Research Facility Network (SIRFN), DERlab has the role of operating Agent. During the SIRFN technical meetings and ISGAN ExCos, DERlab has been reporting since the beginning of the project about the PANTERA project activities and promoting the capabilities of the EIRIE platform among the international scientific community. The descriptions of the testing infrastructure available among the SIRFN community have been synchronized with the EIRIE platform, thus widening the infrastructure coverage of EIRIE RI database.

DERlab has a strong collaboration with the EERA JP on Smart Grids. During the technical meeting and networking event, DERlab cared to raise awareness of the EIRIE Platform functionalities and on the promotion, opportunities offered by the technical workshops organized by the PANTERA project. Members of the EERA JP on SG have been attending some of the PANTERA workshops and provided valuable contributions to the panel discussions.

## 3.2  ETIP SNET WG5 and PANTERA WTs

The EIRIE platform is a living platform offering rich functionalities in support of the work of the R&I community in Europe. For the platform to be responsive to the needs of the R&I community, experts should contribute to enrich the content and capabilities of the EIRIE platform both in the initial stages but additionally, as developments prevail that call for added capabilities of the EIRIE platform. For this reason, the PANTERA consortium as linked work with WG5 of ETIP SNET and formed the required Working Teams (WTs) of experts covering areas of interest to the wider R&I community.
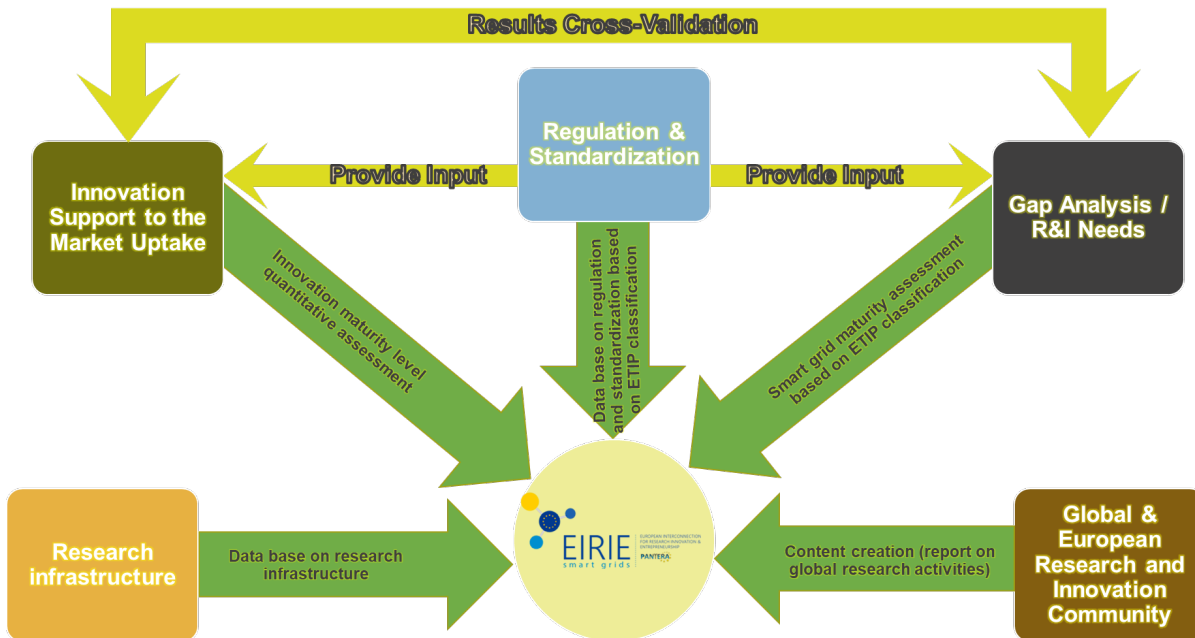
Currently, the active WTs are the following:

| Domain | Working Teams | | | | |
|---|---|---|---|---|---|
| System | | WT2: Regulation & Standardization | | | WT5: Global & European Research and Innovation Community |
| Technology | WT1: Research Infrastructure | | WT3: R&I Needs Mapping & Evaluation | WT4: Innovation support to the market uptake | |
| Market | | | | | |
| Society | | | | | |

Figure 3: *Active working teams of WG5 of ETIP SNET*

**WT1: Research Infrastructure**

Following detailed investigation by the WT, it was found out that common work between DERlab, JRC, ERIGrid and PANTERA can develop a common repository on EIRIE that can serve all the interests of the R&I community with multiple benefits! For this reason, work progressed between the entities collaborating that led to the agreement of the structure and content of such a repository.

Work has progressed well, and the partners have agreed on a common taxonomy in detail. Following, the detailed agreement, the common repository has been formed and all details have successfully been transferred and currently they offer the planned services to all stakeholders in Europe.

Future work of the stakeholders, will involve constant update of provided infrastructure by the entities involved directly through the services offered by EIRIE.
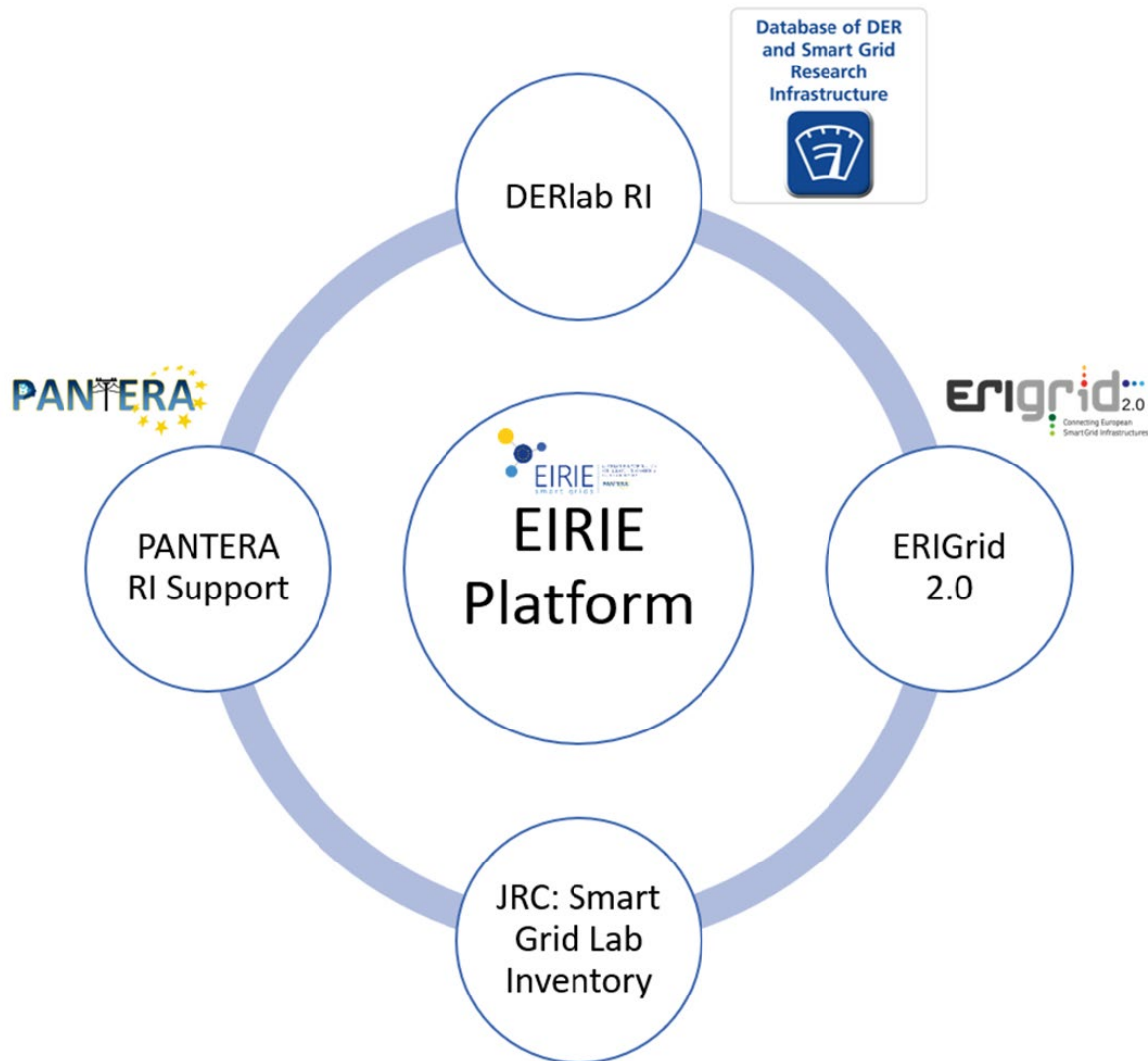
Figure 4: WT 1 Research Infrastructure functioning

**WT2: Regulation and standardization**

The experts of WT2 have concluded following a detailed investigation that linking codes and standards to the agreed list of Technologies constituting the integrated grid, will be a great support to the R&I community. For this reason, WT2 worked to link exhaustively current valid standards with the technologies and populate on EIRIE a hosting library with all the details with a reference paragraph introducing the standard and details of where the standard can be consulted.

Work was completed by the end of 2022 and released in EIRIE for wider use. Current work is on updating the provided lists with the new releases of standards. Moreover, current work is in progress, to link approved codes with the approved list of technologies as a service to the R&I community.



Figure 5: Technologies related to standards

## WT3: R&I needs mapping and evaluation

The set-up objective of WT3 is to work to identify R&I needs within the smart grids domain at a European level and quantify current standing with the maturity of the technologies and systems and thus identify the gaps. The aim is to have a quantitative identification with minimum input by R&I EU projects that can be complemented with qualitative feedback based on the experts' feedback.

The work proceeded with exhaustive collaboration with BRIDGE and EPRI for identifying and agreeing on technologies and systems unified taxonomy and classification. Following that, a detailed design of a tool was done by experts of the WT, and currently it is in its final stages of being implemented on EIRIE for wider use by project consortia. Before releasing it, detailed validation of results achieved will be conducted using real data from selected projects.

The tool is expected to be operational in the next few weeks and it will be used by the experts of WT3 in support of the wider work that ETIP SNET is doing in preparing the implementation and 10-year plans.
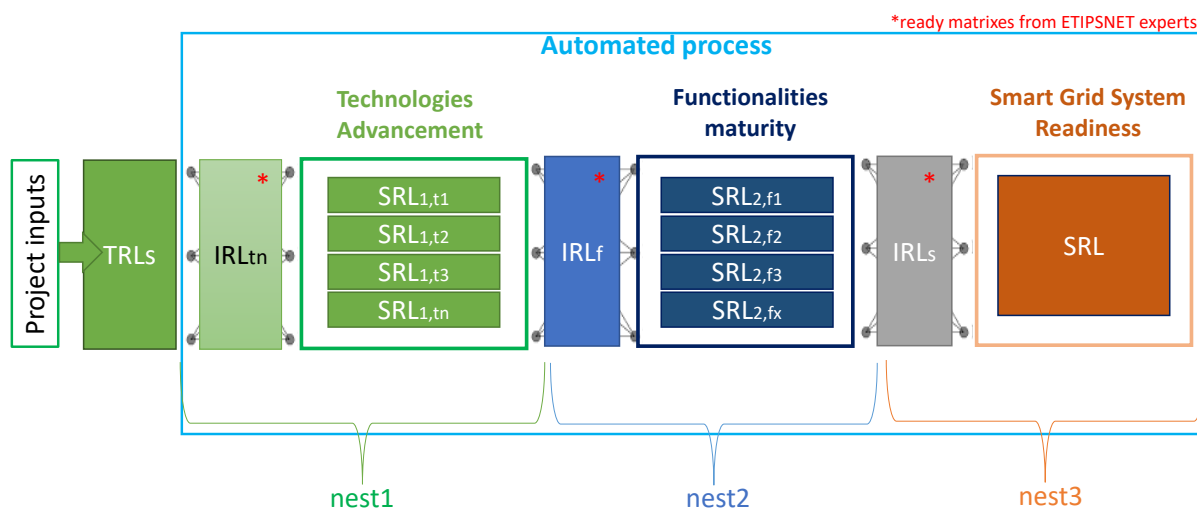


Figure 6: Maturity Index mapping.

## WT4: Innovation support to the market uptake

The targeted objective of WT4 is to bring together innovative solutions owners and investors/incubators for facilitating the "go-to-market route". Working closely with the services of the commission, the WT is targeting project consortia and their innovation endeavours to reach the roots of the economy with their research work. Building the methodology forward of the innovation radar process put forward by the Commission, aims to raise awareness of project consortia in the process, to raise their aspirations for achieving market driven results that can build their role in the market. This is expected to be transformed into a process within EIRIE in the near future, with real life examples to assist project consortia in building their strategies forward.
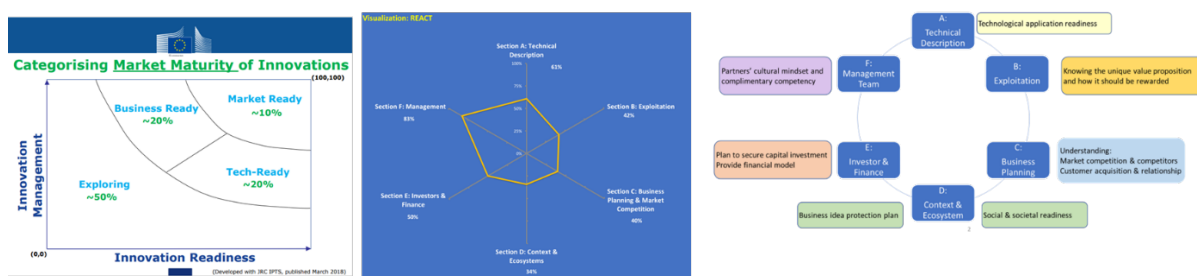


Figure 7: Innovation and support action mapping

**WT5: Global and European research and innovation community**

The Objective of WT5 is to build a constantly growing repository with information and actions of EU with international associations / initiatives / groups contribution to the energy transition and smart grids for enriching knowledge in the field and building a best practice library of useful use cases in the field in support of the R&I community of the EU.

In the process the WT is utilizing the good connections of members of ETIP SNET / WG5 to Mission Innovation, ISGAN, EPRI etc for constant infeed of dissemination activities that emerge from these reputable international associations / organisations.

By supporting the generation of monthly notes of activities in progress in a format that can be disseminated through the EIRIE platform (these are in the form of presentable leaflets/ dissemination pamphlets that can be circulated, slides that can form the update of WT5 and tweets covering the noted progress for broader dissemination) and other social media, the WT5 is working to promote wider knowledge sharing and a valuable repository in support of the work of the R&I community.

The EIRIE platform is developing a dedicated area for this international activity, connect bilaterally with their respective knowledge areas for continuous update that is open to all members of ETIP SNET to contribute thus enriching our activities in the field.

## 3.3  Collaboration with other ETIP SNET WGs

The ETIP Smart Networks for Energy Transition (SNET) role is to guide Research, Development & Innovation (RD&I) to support Europe's energy transition, through six different Working Groups representing the main areas of interest and as such it is imperative for EIRIE and PANTERA to build working relations and find the way of hosting their work on EIRIE for higher impact of their work in support of the needs of the R&I community in Europe:

| **Working Group 1** Reliable, economic and efficient energy system | **Working Group 2** Storage technologies and system flexibilities | **Working Group 3** Flexible generation |
|---|---|---|
| **Working Group 4** Digitalisation of the electricity system and customer participation | **Working Group 5** Innovation implementation in the business environment | **NSCG** National Stakeholders Coordination Group |

It is for this reason that wide support was pursuit through the WTs of WG5 as indicated in section 3.2 above, and through that build constructive links with the rest through:

- The regional workshops organised 3 times every year with the participation of all WGs.
- Horizontal tasks called in by the Governing Board of ETIP SNET for promoting horizontal issues like the policy paper on Regulatory Sandboxes that received support from all WGs.

The developed architecture of EIRIE adequately suits the active participation of all WGs of ETIP SNET through EIRIE and promote their work. This has been taken on board by the Governing Board and the current plans consider EIRIE as the hosting platform for all knowledge creation by all WGs and appropriate mechanisms have been designed and deployed. Undoubtedly, such activities bring the stakeholders closer together generating the right platform for fruitful collaboration open to all and leaving no one behind.

## 3.4 BRIDGE and other initiatives/project's introduction to local stakeholders

The PANTERA project through EIRIE platform which connects and brings together the EU R&I community in smart grids, storage and local energy systems, focused on introducing BRIDGE and other initiatives to the local stakeholders especially in countries with low R&I activity in the energy transition.

Interlinking the data and information from BRIDGE, EERA, ISGAN, ETIP SNET, EC JRC, Mission Innovation, DERLab, and national, international projects and transnational projects (for example those funded by ERA-Nets and others) with the multifunctional repository of EIRIE allowed one-stop-shop easy access to information to the interested stakeholders.
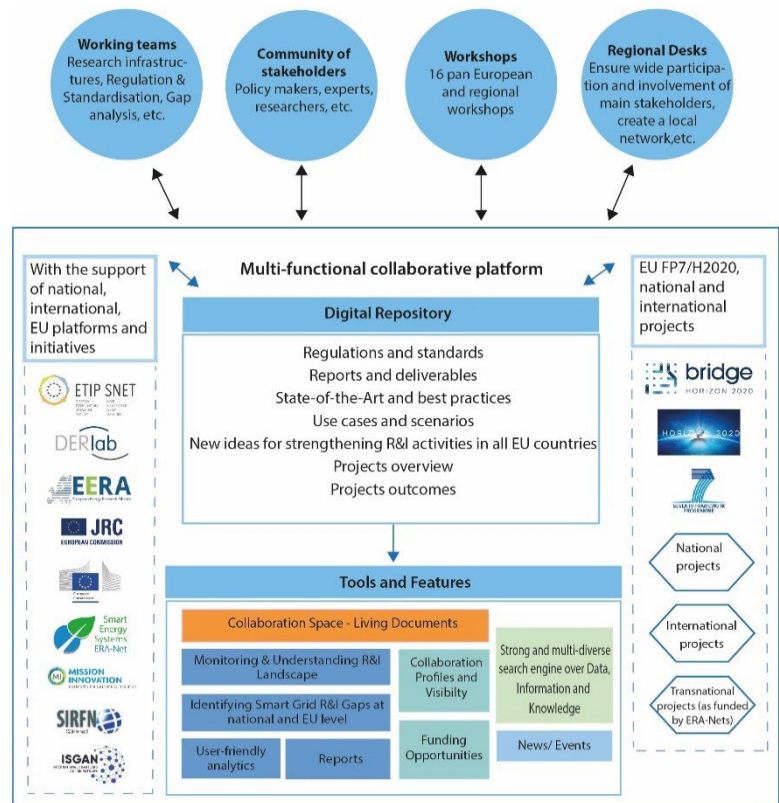


Figure 8: EIRIE concept

The EC BRIDGE initiative brings together Horizon 2020 and Horizon Europe Smart Grid, Energy Storage, Islands, and Digitalisation Projects to structure a common view of cross-cutting issues for the demonstration projects which are supporting the innovation towards the energy transition.

To stimulate continuous knowledge sharing amongst projects the BRIDGE process was deeply engaged in finding a way to allow projects to deliver conclusions, recommendations about future exploitation of the project results in one voice and in one common repository without losing project outcomes, data and information.

The PANTERA project responded to these needs and developed the EIRIE platform fully functional to allow access to project results and provide a common repository for knowledge sharing, accessible to all with helping tools to facilitate effective management and long term availability to bridge gaps that existed and help continuity of R&I utilizing to the maximum work done and solutions achieved.

As a result of the work performed the EIRIE platform was adequately evaluated and recognized by the hierarchy of BRIDGE classifying it as the home for all project results for sharing and future use.

During the BRIDGE General Assembly on 28th, 29th and 30th March 2023 held in Brussels showed the importance of the EIRIE platform for the BRIDGE initiative outlining in the official document with the Conclusions and next steps (https://bridge-smart-grid-storage-systems-digital-projects.ec.europa.eu/news/bridge-general-assembly-2023-conclusions-next-steps ) that the EIRIE platform will play a key role for the work of BRIDGE as for example for the use case repository of the Data Management Working Group.

Additionally, the work done within the PANTERA project gained good acceptance while developing EIRIE and supporting the collaborative work of ETIP SNET and BRIDGE to facilitate and improve the evaluation process of projects giving valuable input to the R&I priorities roadmap

meeting the needs of the "R&I priorities" task force of BRIDGE in qualitatively identifying priorities utilising project results.

Moreover, hosting BRIDGE activities in EIRIE in line with the PANTERA process for valuation of project results, offers many benefits to the stakeholders connected to EIRIE, offering the platform to confront ideas, results and offer a dialogue for the future steps ahead in the energy transition process. The process as set, offers the added benefit of extracting the most valuable results and lessons learned from the EU funded R&I projects and make them accessible reusable by all connected Stakeholders.

## 3.5 Supporting the R&I community by providing on EIRIE the current links of Regulations, Codes and Standards with the Technologies forming the integrated grid

The EIRIE platform has extended its serving capability to R&I communities, by introducing search tools on "Regulations & Standards", as shown in the following Figure X". R&I communities must appreciate this initiative by EIRIE. All the standards and regulations information have been collected from the authorised committees and a database has been created in EIRIE.
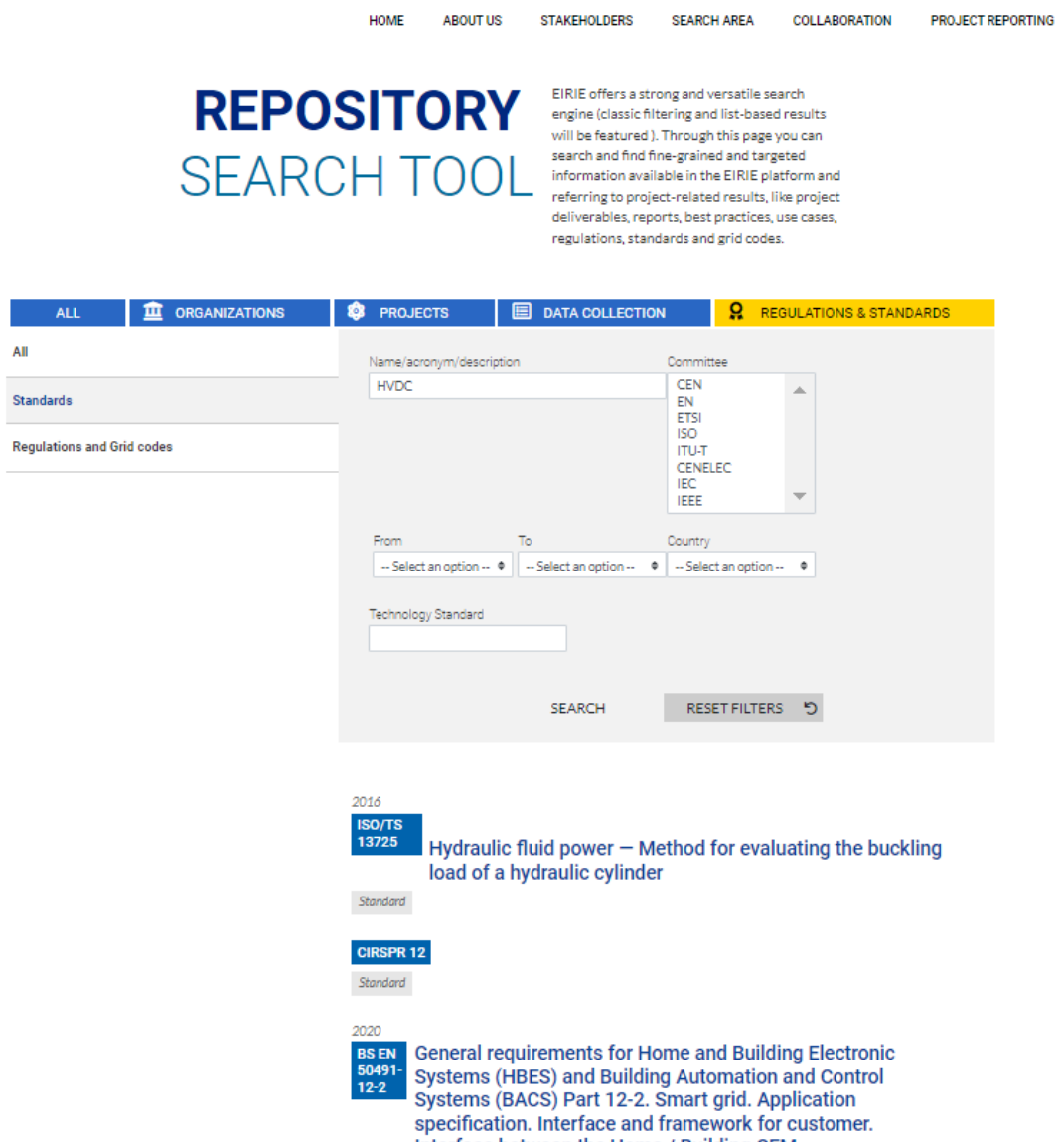


Figure 9: Search tool for Regulations and Standards

Figure Y shows an example of a search on HVDC standards. It shows a brief description of the standard, its owner, published year, link for the details of the standard and its link with "Technologies". Similar activities have been created for Regulations. Information will be periodically updated by the EU Commission.

Thus, EIRIE is serving as a one stop resource hub for RCS and its link to Technologies. R&I communities will be extensively benefiting from these functionalities.

Most importantly, this search tool and other relevant information in the EIRIE platform will

- provide the users information on how the technologies within their research projects can be linked to RCS and hence easily identify those RCS that are of interest to the project.

- the users can easily identify the important RCS field that is now missing and thus offering a must-needed process for identifying the RCS needs of projects.

- extend the collaboration area within EIRIE to host the work related to RCS in relation to Technologies, in addition to the area developed for Standards, serving the R&I needs for identifying maturity gaps.

## Design of earth electrode stations for high-voltage direct current (HVDC) links - General guidelines

View    Revisions

Language English

Technical committee  High Voltage Direct Current (HVDC) Transmission for DC Voltages Above 100 kV

Type  Standard

Acronym IEC TS 62344:2013
Committee  IEC

Published year 2013
Keywords
HVDC

Description
IEC/TS 62344:2013(E) applies to the design of earth electrode stations for high-voltage direct current (HVDC) links. It is intended to provide necessary guidelines, limits, and precautions to be followed during the design of earth electrodes to ensure safety of personnel and earth electrodes and prevent any significant impact they may exert on d.c. power transmission systems and the surrounding environment. This technical specification cancels and replaces IEC/PAS 62344 published in 2007. This first edition constitutes a technical revision.

Link https://webstore.iec.ch/publication/6897
Technology
HVDC Integrated Grid

Figure 10:  – Example of a HDVC standard search tool

## 3.6  Collaboration with SUPEERA project and the benefits to the stakeholders

The PANTERA project has seen value in cooperating closely with the project SUPEERA since the targeted audience and stakeholders in the widening countries was the same since SUPEERA is aiming to address the issues for stronger involvement of the 13 widening counties in the SET Plan process and the needs for effective contribution to the energy transition process. SUPEERA is coordinated by EERA AISBL, who has a strong position in Europe through its wide membership in most of the countries of Europe and accession countries.

The European Energy Research Alliance (EERA) is an association of European public research centres and universities active in low-carbon energy research. EERA pursues the mission of catalysing European energy research for a climate-neutral society by 2050. Bringing together more than 250 organisations from 30 countries, EERA is Europe's largest energy research

community. EERA coordinates its research activities through 18 Joint Programmes and is a key player in the SET Plan. For further information, see https://www.eera-set.eu/.

- Among different high-level objectives, the "SUPEERA" project aims at raising awareness about the SET Plan and the Clean Energy Transition among research organisations, funding bodies and National Contact Points (NCPs) from the EU-13 countries and it proposes to widen the activity of those countries towards the SET Plan by facilitating the mobilisation of the identified stakeholders. SUPEERA aims to realise these objectives through the implementation of the following actions:

- The identification and mapping of national research organisations from targeted EU-13 countries with limited or inexistent participation in the SET Plan Implementation Plans, with great potential to be strategically involved in the future.

- The engagement at EERA activities and the SET Plan of those stakeholders beyond EERA network through the organisation of workshops and events.

- The facilitation of knowledge exchange activities and sharing best practices between EU-13 stakeholders and key EERA members with the ambition of establishing long-lasting interactions.

Linking the activities of the PANTERA project with those of the SUPEERA project in the targeted widening countries, has led to successful co-organized events with notable satisfactory results presented through detailed outcome reports issued by the two consortiums and shared for the wider audience through the web pages of the two projects. The events that were co-organized are the following:

- Splitech, Croatia on 10 September 2021

- Riga, Latvia on 27 April 2022

- Sofia, Bulgaria on 25th of May 2022

- Nicosia, Cyprus on 1st June 2022

- Budapest, Hungary on 26 October 2022

- Bucharest, Romania on 23 March 2023

- Vilnius Lithuania on 27 April 2023

Examples of the work done through these workshops are shown below, and detailed reports were prepared for each, and every workshop done giving tangible results achieved.
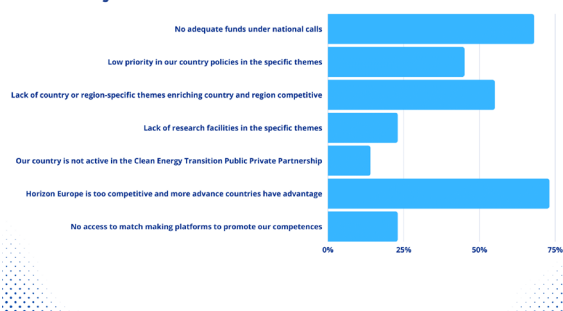


Figure 11: A typical workspace for the planned workshops

## 3.7 Cooperation with EERA JP SG

The PANTERA project closely collaborated with the EERA Joint Programme on Smart Grids (EERA JP SG). In particular, the main interactions took place during the regular EERA JP SG meetings when the results of the project have been presented to JP members. During these events were also possible to get feedbacks and useful suggestions about the development of the EIRIE platform. The JP SG covers topics closely related to the PANTERA project and has almost 40 members from all around Europe thus representing a key interlocutor for PANTERA.

A joint event between EERA JP SG and PANTERA have been organized during the MELECON 2022 conference in Palermo. During the workshop titled "The EIRIE platform enabling R&I activities and investment in smart grids" it was presented the EIRIE multifunctional platform collecting feedbacks and answering questions from the audience. Moreover, the event was the opportunity to discuss with local stakeholders about the topics of storage and electromobility as a huge opportunity to enhance system flexibility and about the role of policies in fostering the deployment of innovative solutions with a special attention on recent development in the renewable energy community's field. In Figure 13 it's reported a picture taken during the event and some slides of the PANTERA project presentation.

**Are there any mechanisms supporting the initiation and completion of R&I projects organized by national institutions? How do you rate support services provided by national institutions / agencies?**
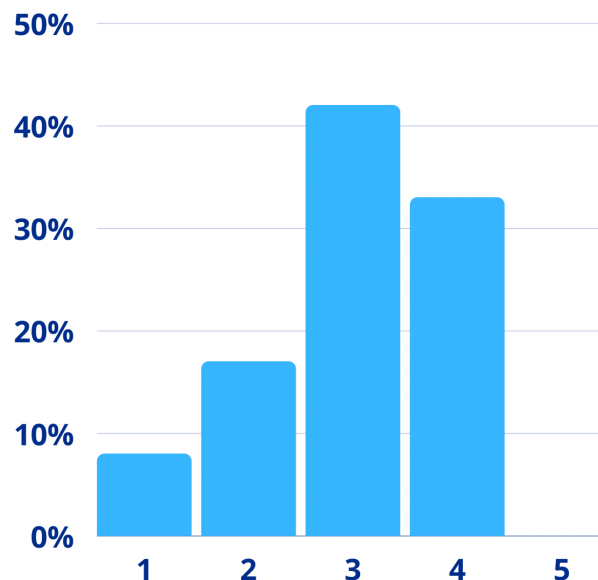
Figure 12 Online questions to participants assisting the discussions

Figure 13 – Luciano Martini and Venizelos Efthymiou open the workshop

By the end of the PANTERA project, it will be organised, jointly with the JP on SG, a webinar dedicated to present the EIRIE platform and the project's main outcomes to the EERA JP SG members. The organization of the event has been approved by the EERA JP SG management board and will be schedule for the second half of June 2023.

## 3.8 JRC working with DERLab and EriGrid 2.0 to have a common repository for R&I infrastructure
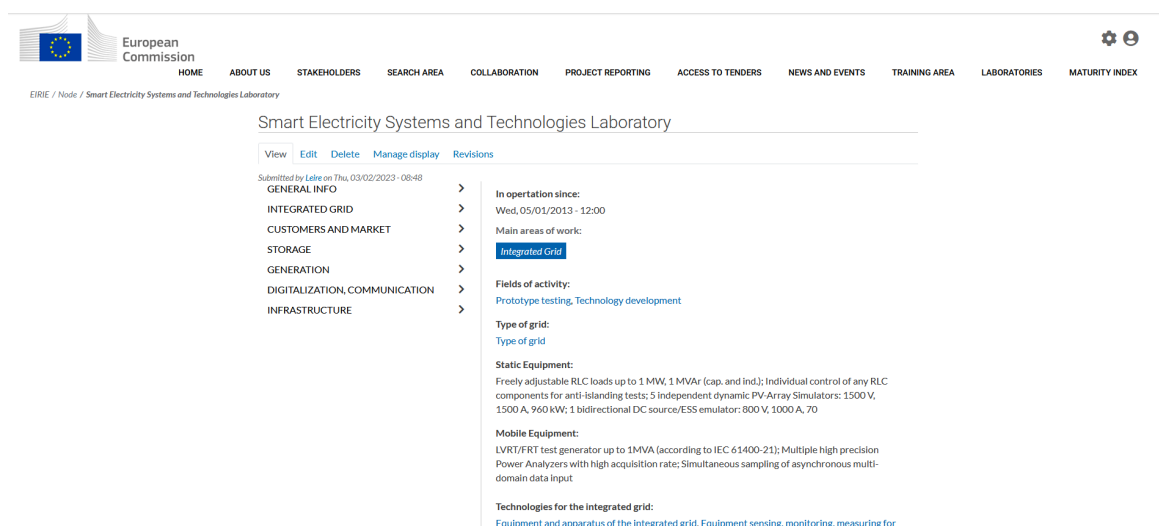


**Testing Infrastructure Common Repository**

Figure 14: The procedure for generating a common repository

A partnership between PANTERA and the H2020 ERIGrid project has been established to support the stakeholders from the lower-activity countries to get in touch and obtain free access to leading smart grid and energy systems laboratories and services of the best laboratories in Europe including 21 physical laboratories, 10 virtual laboratories, education in smart grids and smart energy systems as well as resources which support the process of establishing and developing research infrastructure.

To supply the EIRIE platform with initial information about research infrastructures, JRC and DERlab agreed to provide their information and databases. In collaboration with the contractor BILBOMATICA they worked out a database structure for research infrastructures that reconciles the structure of both sources of information. This database structure contains fields that adhere to the technologies matrix that was developed within the scope of the PANTERA project. After agreeing upon a common database format, both parties submitted the respective data to the EIRIE platform. Further development has been taken over by INYCOM. Currently, the discussion revolves around the topic of how to keep the research infrastructure owners engaged such that they regularly update their respective entry in the platform.



*Figure 15: Exemplary Laboratory Display*

The above Figure shows the Exemplary Laboratory Display that shows how the EIRIE platform displays the information of a laboratory. The structure of the entry was proposed in collaboration with JRC, and DERlab. On the left-hand side, there are anchor links that jump to the corresponding section. An entry currently contains general information, for example, the address, the main areas of work, mobile and static equipment, simulation equipment, testing services, and accreditation standards. Subsequently, it lists more specialized information about technologies the laboratory is active in. The technologies correspond to the technology matrix developed in the PANTERA project.

In support of this process, common workshops, webinars, and education activities on the most important RI development topics were conducted. As a good example, the joint PANTERA-ERIGrid 2.0 webinar "Remote Testing & EIRIE Platform" held on 8 March 2021 can be given. A joint team formed by Graeme Burt, Mohamed Shalaby, Thomas Strasser, J. Emilio Rodriguez-Seco, Kai Heussen, Steffen Vogel, Kostas Latoufis and Venizelos Efthymiou, presented key topics considering the integrated validation and testing approaches in the domain of power and energy systems. Due to the raising complexity, this issue becomes more critical and requires adequate research infrastructure and technology development. Additionally, advanced approaches with virtual services were presented in the context of the activities of ERIGrid 2.0 and PANTERA projects and the DERlab network.

During the webinar, the following main key topics were considered:

- Overview of the ERIGrid 2.0 Research Infrastructure for Smart Grids and Smart EnergySystems

- Introduction of the ERIGrid 2.0 Lab Access Programme

- Experiences with Remote Lab Access Services on the Example VILLAS4ERIGrid

- Virtual Research Services in ERIGrid 2.0

- Demo of the VLab Services from RWTH Aachen

- Demo of the OpenAFPM Services from ICCS-NTUA

- PANTERA project - A pan-European Technology Energy Research Approach

As a result, a significant increase in the participation of stakeholders from the lower-activity countries has been achieved, through which the RI knowledge in these countries is increased and valuable connections have been established.

The actions mentioned above offered improved knowledge transfer in the field of RI building and usage. It also made possible the establishment of contacts between researchers who are seeking collaborative participation in EU-funded projects. This has further enabled more intensive participation of partners from low-activity countries in some of the prospective project proposals.

A good example demonstrating this process is the associated participation and inclusion of RI stakeholders from Bulgaria, Romania, and Greece (National Technical University of Athens (NTUA), Technical University of Sofia (TUS), Universitatea Politehnica din București (UPB)), in a project proposal for the Horizon program call '[HORIZON-INFRA-2023-SERV-01-01] - Research infrastructure services to enable R&I addressing EU priorities' together with a solid consortium conformed by prestigious research institutes.

Regarding the EIRIE platform, currently and also in the future, activities that aim to improve and support the information quality and structure regarding the laboratory entries together with the contractor INYCOM, which has taken over the development from BILBOMATICA.

# 4 Linking the stakeholders to initiatives through barriers and challenges

## 4.1 The local stakeholder's involvement: wrap up of the interviews especially considering the presentation of EIRIE and other EU and international initiatives

In activity "Key topics and content management" within the PANTERA project regular interaction was established based on more than 30 semi-structured interviews and surveys, which have been accomplished to establish an open dialogue and identify specific stakeholder needs and expectations. Considering that PANTERA as a project aims specifically at Smart Grids domain, which is normally associated with distribution, the intention was to focus on respondents, which are engaged in and have expertise there. The activity identified the main challenged requiring implementation of Smart Grids Technologies in the focus countries, where the most important were:

- Massive introduction of distributed Renewable Energy Sources (RES)

- Electrification of transport, Electric Vehicles (EVs)

- Growing necessity for consumers' empowerment and engagement

- Economic challenges

- Growing quantity of data from different sources

When it comes to priorities for implementation of Smart Grid Solutions, several respondents indicated three main areas:

- Advanced Metering Infrastructure (AMI)

- Enabling observability and controllability functions for DSOs

- Enabling flexibility and Big Data technologies for enhancing the planning and operation of the grid

Among the nontechnical barriers for more activities in the Smart Grids the dialogue brought into focus several points, including:

- The role of National Contact Points and potential revision of these

- National Energy and Climate Plans

- Several aspects related to funding procedures for R&I Projects

- Issues related to national regulations.

It appears that the last point is essentially caused by slow transposition of the Pan-European regulatory acts into the national legislations and is one of the main concerns for the stakeholders in the target countries. Considering the steady growing Pan-European targets it may further increase the existing R&I gaps.

The activity specifically discussed regional cooperation among the focus countries and issues, which seem to limit this. Making parallels with the Nordic countries, where this cooperation has well-functioned for several decades, it was concluded that establishment of such cooperation requires presence of common regional challenges and strong political will and engagement. The detailed results are presented in the finalising report D4.4[1].

## 4.2  Interaction of PANTERA with EU actors through workshops

SUPEERA and PANTERA projects jointly organized two workshops aiming to enhance collaboration in R&I activities in Hungary and Romania.

**Workshop 1**: SUPEERA and PANTERA joint workshop "International research collaboration opportunities: fostering EU Clean Energy transition in Hungary", Budapest

SUPEERA and PANTERA projects jointly organized the workshop aiming to enhance collaboration in R&I activities in Hungary, facilitate knowledge exchange, and showcase best practices of how international networking and cooperation between national stakeholders and key international organizations can be beneficial for establishing long-lasting interactions in R&I activities. The event took place in Budapest on the 26th of October 2022 and was attended by 20 participants and gathered stakeholders, including representatives from RTOs, industry, and government.

Several stakeholders from academia, research institutes, and industry were invited to participate in the panel discussion. The workshop was officially opened by János Levendovszky, Vice-Rector for Science and Innovation at the Budapest University of Technology and Economics. He stressed that projects such as SUPEERA and PANTERA are crucial catalyzers for bringing together key EU stakeholders in the energy sector. He also highlighted the importance of developing new approaches to R&I to reach strategic autonomy considering the unfolding energy crisis. Finally, Dr. Levendovzsky pointed out that since Hungary has set ambitious goals towards a low-carbon economy (e.g., smart metering) there is a high need for cooperation among all the key stakeholders to transfer knowledge and participate in European calls.

**1st Panel discussion: R&I activities in Hungary**

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[1] A. Morch, S. Khadem, M. Bahloul, L. Sanchez, A. Mutule and I. Antoskova, "D4.4 Assessment of the defined topics: relevance, driving forces and trends," H2020 project PANTERA, 2023.

Figure 16: *2nd Panel discussion: R&I activities in Hungary, stakeholders (right->left): Peter Kaderjak (Director, Zero Carbon Hub (ZKK)), Orsolya Küttel (National Contact Point for the National Research and Innovation Office), Ákos Horváth (Director General, Centre for Energy Research in Hungary), Márton Pete (Senior Knowledge Management Expert at MVM)*

The panel discussion was moderated by Ivan Matejak (EERA coordinator) and Andrei Morch (Researcher RSE). Peter Kaderjak highlighted that in Hungary is paramount to reduce natural gas dependency, where district heating (replacing natural gas with geothermal, biomass, and solar), system integration (especially via energy storage), and energy efficiency will play a crucial role in this direction. He also stressed that R&I is essential to repurpose natural gas infrastructure to the current and future energy and storage needs.

Orsolya Küttel pointed out that international cooperation and knowledge sharing play a crucial role in changing and updating energy policies, and those Hungarian stakeholders should be keener to work together with partners from other countries in Europe. Ákos Horvath mentioned that in the short term, it is important to invest in energy savings and that small modular nuclear reactors, which now are more affordable, could be utilized to co-produce heat and electricity. However, he remarked that nuclear energy has a long-term outlook, while hydrogen might constitute a shorter-term solution. Marton Pete highlighted that from the point of view of innovation, MVM group wants to move towards new markets and beyond the meter services. As far as the low performance of Hungarian stakeholders in Horizon 2020/Europe projects, Ms. Kuttel and Mr. Kaderjak agreed that this is partly happening due to an abundance of domestic and cohesion funds available in the country, which are easier to access and less competitive compared to the European ones. Yet, Ms. Kuttel indicated that Horizon Europe calls are becoming more attractive to Hungarian stakeholders in periods when national funding is limited.

**2nd Panel discussion: International research collaboration opportunities in Hungary**



Figure 17: *2nd-panel discussion, stakeholders (right -> left): Chavdar Ivanov (Founder GriDigit), Borbala Schenk (Chief European research funding advisor BME), Daniel Horn (director of the Institute of Economics - Centre for Economic and Regional Studies (KRTK))*

Mr. Horn first stressed that a fundamental outcome of the twinning project is the creation of personal connections. In addition to that, Ms. Schenk and Mr. Horn agreed that also unsuccessful projects can bring new collaborations, which is a fundamental objective of CSA projects. In answering Mr. Panelist's request to give more information about the competence map, Ms. Schenk pointed out that although the BME Competence map is new, they have already received positive feedback from innovative companies in Hungary who are using it as a tool to strengthen ties with the researchers. Also, she explained that a side effect of the map is to help the researchers know who is dealing with similar topics within the university. Finally, she confirmed that the model can be replicated in other countries if someone is willing to invest hard work in it and added that this year or the next one, they would like to extend the showcase of the competencies to other participants as well.   Dr. Ivanov clarified what are the most beneficial activities (not only in terms of money but also networking and experience) for their company. For example, by participating in different projects they can build valuable knowledge that they can transfer to their partners. They help stakeholders take into consideration cross-cutting issues, which are crucial for the utilities that want to succeed in the energy transition. Mr. Ivanov also added that, as a consultant, he sees the added value to put tricky questions (that may not be seen from people working in the industry or research) on the table.  At the end of the discussion, Mr. Horn was asked if he has up taken any of the discussions from the twinning project and established a new research-based project. Mr. Horn clarified that they tried to apply to new calls for R&D with some of the partners, but they were unsuccessful. Finally, he observed that the most active people are the Ph.D. students because the project opened the scenery for them.

**Workshop 2**: "International research collaboration opportunities fostering EU Clean Energy transition in Romania", Sofia

Romania has been actively working towards the success of the energy transition objectives and implementation of declared policies for achieving a low-carbon economy. Yet, together with other less involved countries, it showed low participation rates in research and innovation (R&I) activities and the realization of the European Union's Strategic Energy Technology (SET) Plan Implementation Plans. Consequently, compared to more successful Member States, it has received only a marginal contribution of EU R&I Horizon 2020's budget. In this context, SUPEERA and PANTERA have joined forces to enhance collaboration in R&I activities in Romania, facilitate knowledge exchange and showcase best practices of how international networking and cooperation between national stakeholders and key international associations and organizations can be beneficial for establishing long-lasting interactions and fostering joint R&I activities. Therefore, this workshop offered a detailed overview of the European policies, strategies, EU funding programs, and collaboration opportunities at the disposal of the research community of Romania to bring them closer to the R&I activities of Europe and get active with the SET Plan process. Meanwhile, the invited experts and stakeholders will share their experiences in the project implementation.

### 1st First Panel Discussion: R&I activities in Romania

During the panel discussion, Ms Diaconu from RATEN expressed her satisfaction with the SET Plan Steering Group, as a very useful and powerful collaboration network to show, promote and finance some of their projects/activities, and highlighted the importance of being a member of EERA. Mr. Matejak asked Professor Albu about the balance of funding sources and the lack of collaboration between industry and research, which she attributed to the low national investment in R&I, missing collaboration among national entities, and hence lack of strategy at the national level. Ms. Albu suggested strengthening collaboration between entities and disciplines and identifying missing points to improve national-level work. Further, Ms. Albu mentioned that at the national level, MicroDERLab is only running one national project; all other projects are international. This indicates a clear unbalance in resources and different sources of funding. She stressed that the national efforts to finance R&I in the past have been extremely low, and they have had to rely on international financing sources to promote research. Ms. Albu attributed this poor national R&I engagement to volatile collaboration, unfair competition, and lack of collaboration among national entities and local stakeholders, particularly, but not exclusively with the Ministry of Energy. According to her, this is because limited resources led to a lack of time

and understanding, and interests often clash, highlighting a structural problem. In her opinion, it would be of added value to receive feedback from this Ministry on the current national energy challenges Romania faces in their view. When asked about what could be done to increase the activity of Romanian players in the EU, Mr. Paun emphasized the need to enhance collaboration between universities and industries and to have a more understanding of the evaluation process for EU-funded projects. The lack of cooperation at the national and international levels was also attributed to limited resources and structural problems. Mr. Paun was also asked about the challenge Romania has and will continue having in accommodating all the new renewable energy, especially in the three regions with the most renewable energy production capacity. He was certain that hydrogen will play a pivotal role in the future energy mix in Romania and will be truly part of the solution.



Figure 18: *Panel Discussion, stakeholder(right->left): Mihaela Albu (Polytechnic Bucharest), Mihai Paun (Energy Security and Investments Commission and Member of the Supervisory Board of TRANSELECTRICA S.A.), Daniela Diaconu (Institute for Nuclear Research), Ivan Matejak (SUPEERA coordinator from EERA)*

**2nd Panel Discussion: International research collaboration opportunities in Romania**



Figure 19: *2nd Panel Discussion, stakeholders (left->right): Marius Ienculescu-Popovici (President of GreenInitiative), Monica Florea (Head of Unit of European Projects at SIMAVI), Chrysanthos Charalambous (FOSS Research Centre for Sustainable Energy), Andrei Daniel Groșeanu (Management Consultant at Măgurele Science Park)*

During the panel discussion, the participants highlighted the importance of collaboration for research and innovation. Mr. Ienculescu-Popovic emphasized the challenges faced by NGOs engaged in research activities when it comes to forming partnerships. Initially, GreenInitiative

focused on education and dissemination aspects within the projects rather than actively engaging in project research. As time went on, they were able to build collaborations with experts and stakeholders in the field, which increased their credibility and demonstrated their expertise. These collaborations provided also more opportunities for networking and active participation in project research. Mr. Groșeanu discussed how they provide training to SMEs to access funding and improve innovation management. He also mentioned that the bureaucratic processes in the country can be sometimes challenging for SMEs, which may hinder their participation in national funding projects. Ms. Florea added that collaboration is key to success in EU-funded projects and that the most difficult element is to keep the collaboration active throughout the project implementation phase. Finally, Mr. Charalambous underlined the importance of collaboration among research centers, ministries, and local stakeholders in driving research and innovation forward, underlining that such collaborations in Cyprus have been proven crucial to their success; adding that this could be replicated in Romania. He concluded, stating that by working together, organizations can access resources, share knowledge, identify local needs, build networks, and address complex challenges, leading to more impactful research outcomes and a more innovative society.

The SUPEERA and PANTERA projects organized a workshop aimed at promoting knowledge exchange and best practices among Romanian entities active in Research and Innovation (R&I) activities. The workshop sought to increase Romanian stakeholders' participation in the Implementation Working Groups of the SET Plan and attract them to participate in EU-funded R&I activities. During the workshop, the EIRE platform, developed by the PANTERA project, was also presented. The platform has been developed to support a deeper involvement at the EU level of all the EU countries and functions as a reference point for R&I activities in the energy system. Speakers from various organizations discussed Romania's energy sector, its energy mix, and dependencies, as well as its participation in the SET Plan and the Clean Energy Transition (CET), along with Romania's engagement in H2020. The panel discussion touched on the lack of collaboration between national entities, low national investment in R&I, limited resources, and a structural problem. The session on R&I opportunities for collaboration and funding highlighted the funding available for Clean Tech through the European Innovation Council (EIC) and their EIC strategic approach and Innovation funding. The EEA and Norway Grants were also introduced, focusing on successful proposals, the importance of collaboration in European projects, and the quality of research work. Overall, the workshop was a step towards enhancing collaboration and promoting research and innovation in Romania.

## 4.3 Participation in other EU activities as means for strengthening collaboration in R&I and promoting regional / national strong points

Throughout the R&I activities within the PANTERA timeline, a close collaboration has been established with ETIP SNET, especially its Working Group - WG 5 "Innovation implementation in the business environment". Through this collaboration, PANTERA partners supported the ETIP SNET's regional workshops by presenting RICAP outcomes, R&I status, and gaps in specific countries. PANTERA team also participates in WG5 periodic meetings and regularly gives updates about the international relations it monitors (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. PANTERA team has developed the RICAP process, detailed in D3.1, with support from WT3, PANTEARA team analyses R&I status and gap analysis are performed at national levels, whereas the technological maturity indexing is outlined and presented.

- ✓ Share updated international news about the related initiatives that PANTERA is collaborating with (MI, ISGAN)

- ✓ Outreach to 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.

WG5 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. For example, in 2019 two workshops were organized between September and December 2019: Central and Northern Regions' Workshop3 (Petten, the Netherlands, September 2019). PANTERA Deliverable D6.3 - Consolidated Summary Report of Desk Activities in the Target Regions.

PANTERA team also supports extensively on the development of a 10-year ETIP SNET roadmap 2020-2030 that addresses the R&I activities to be carried out 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.

This ETIP SNET Roadmap can also support the EC and national authorities in defining R&I Project Calls and developing support instruments. Moreover, it can enable the R&I project proposal submitters to create the 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.

Some more details of these activities can be found in Deliverable D2.3 "1st Report on interactions with European platforms and organizations".

PANTERA team also has close interaction with ETIP SNET/BRIDGE for collaboration, 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.

PANTERA also collaborated closely with the project ERIGRID to utilise their research infrastructure, training and education-related material to strengthen the R&I activities in the low-active countries.

Regarding the collaboration with ERA-NET SES, close collaboration with its EXPERA platform through the living documents has been agreed upon. Although all established collaborations so far target the whole European R&I community, they will have specific support for the low-activity countries as well. Especially for the support in the regional workshops of ETIP SNET, the low-activity countries are inherently targeted.

Collaboration between PANTERA and the European Energy Research Alliance (EERA) Joint Programme on Smart Grids (JP SG). JP SG addresses a medium to long-term research perspective and the most critical areas directly related to the effective acceleration of smart grid development and deployment. 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. All JP members are interested and willing to support the project's activities. In particular, PANTERA shared information and collected valuable feedback concerning the EIRIE platform development as well as the overall activities of the project.

PANTERA utilises every opportunity to deliver its CSA activities to strengthen the R&I activities in the low-active countries. Besides these dedicated activities as mentioned above, PANTERA also regularly participates in Enlite, Utility Weeks and most other EU events.

**Participation in European Union Sustainable Week (EUSEW)**

PANTERA Project actively participated in the European Union Sustainable Week (EUSUW) 2020, 2021, and 2022. Unfortunately, in 2020 and 2021, due to the COVID-19 pandemic, PANTERA participation in EUSEW was through virtual means.

EU Sustainable Energy Week 2020(Virtual)

In EUSEW 2020, the PANTERA consortium with the members of JRC, DG ENER, S3PEnergy team, and EERA organized a Pan-European PANTERA Virtual Workshop at EUSEW 2020. The PANTERA project was presented by Dr. Efthymiou (Project Coordinator) to the audience as its goals and mission. Furthermore, he highlighted the value that PANTERA will bring to the research and innovation energy community via PANTERA regional desks, working teams, and the EIRIE platform. The project coordinator extensively presented the EIRIE platform and its concept. The vision of the platform is to support the Energy Research & Innovation community in Europe by providing them with tools and features that would provide them with the needed knowledge, information, and data. The platform will interconnect with other similar platforms (e.g. EXPERA, BRIDGE, JRC, ETIP-SNET, Mission innovation …etc) to enhance collaboration, wider interest, use on the project results and avoid duplication and lost Euros. EIRIE will be hosted on the Smart Energy System servers of JRC to guarantee the sustainability of the platform after the PANTERA project is completed. Dr. Efthymiou presented the conceptual architecture of the platform and the work plan and progress achieved for the design and development of the multifunctional platform. Dr. Peteves (Head of Unit JRC) gave a presentation on research and innovation and its role in the green recovery.

Two roundtable sessions were organized in the workshop. The first roundtable discussion focused on the collaboration with JRC and the Smart Specialization Platform for meeting the objectives of the Green Deal for reaching out and leaving no one behind. And the second focused on teaming with ETIP SNET and BRIDGE in enhancing the evaluation process of projects in support of the R&I priorities roadmap

EU Sustainable Energy Week 2021 (Virtual Event)



The EU Sustainable Energy Week (EUSEW) took place on 25-29 October 2021 under the theme: 'Towards 2030: Reshaping the European Energy System'. The event comprised a 3-day digital Policy Conference, the EUSEW Awards, the second European Youth Energy Day as well as 1:1 video meetings, virtual stands, and other networking activities. Participants also had access to online side events and Sustainable Energy Days, digital events taking place all over Europe.  This year's edition brought together more than 4 500 green energy researchers, entrepreneurs, policymakers, campaigners, and enthusiasts engaged in EUSEW 2021. The event held 32 Policy Conference sessions, 40 Energy Talks, and 40 Extended Programme sessions led by over 275 inspiring clean energy experts. Over 3 500 one-on-one exchanges took place through the online networking feature. On top of this, 116 Sustainable Energy Days were held in 20 countries around Europe.  PANTERA participated in the Networking Village, by exhibiting at the Energy Fair. A virtual booth was prepared (see Figure 1), which included the project information, links to the website and social media channels, as well as relevant materials (PANTERA flyer, EIRIE flyer, booklet, map with all project partners, etc.). An advertisement was also created to lead to the EIRIE platform (See Figure 2). According to the analytics (see figure 3) provided by Swapcard (platform used by EUSEW), the advertisement was seen by 57 people.

*Figure 20: Screenshot of the PANTERA virtual booth at the online Energy Fair (EUSEW 2021)*

The PANTERA virtual booth was bookmarked 9 times (selected as favorite), which enabled to the participants bookmark it a quick access to the booth. 141 people in total viewed the booth and 10 contacts were made. 2 meetings also took place between members of the project consortium and other participants, during which PANTERA was promoted.
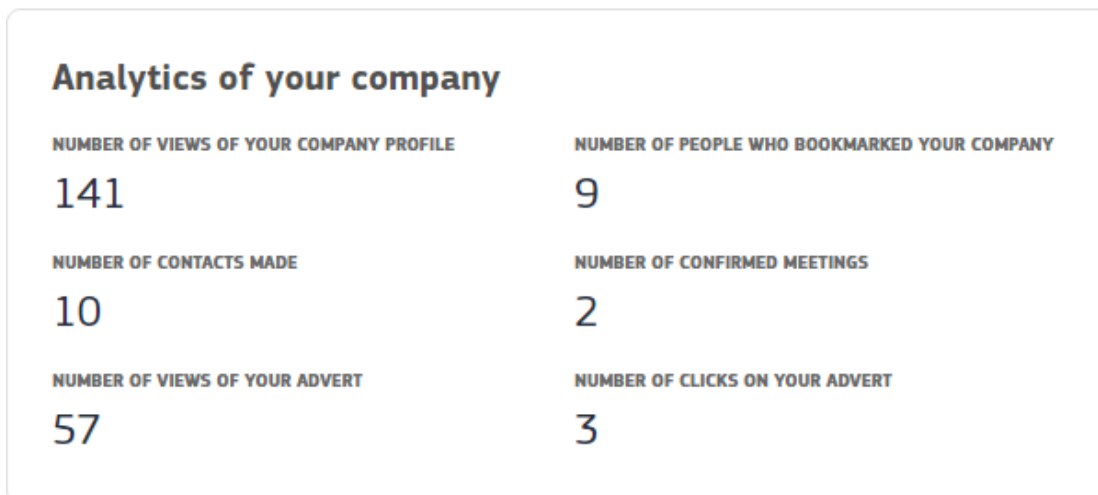


*Figure 21:  Analytics of the virtual booth*

**EU Sustainable Energy Week 2022**

In 2022, EUSEW took place in a hybrid format, on the theme of 'Going green and digital for Europe's energy transition', with speakers and participants in Brussels, Charlemagne Building (European Commission), and online on the B2Match Platform.  PANTERA took part in the European Sustainable Energy Week 2022's Networking Village with a physical booth in Brussels, as well as an online booth. The Networking Village included different features and activities to allow participants to interact with topics that interest them, connect with other participants with shared interests, and visit exhibition stands to find more information and further network.

The name of our stand was: PANTERA – The European Interconnection for Research Innovation & Entrepreneurship (EIRIE) Platform. As shown in the figure, Representatives (Dr. Katerina Maxouti (FOSS University of Cyprus) and Yaksh Kumar (DERlab) were at the booth.

We showcased in our stand the EIRIE platform and all the tools and functionalities it can offer to the audience and stakeholders. Screens were used to showcase videos of how the platform users can get easy access to information on potential funding and consortium building, projects data collection (results and outcomes, best practices, reports, and deliverables, etc.), standards and regulations, all of these searchable via an easy-to-use search tool.

Figure 22: PANTERA stand at EUSEW 2022

We used the online exhibitor page to give an overview of the PANTERA project and the EIRIE platform, by giving access to material such as an explanatory video, a brochure, and a booklet (proposed in an interactive format allowing to flip through the pages) as well as links to our website and platform. Project representatives were online during the whole week of the EUSEW to be available in case of questions or meeting requests. A few meetings took place, in which the PANTERA project and the EIRIE platform were explained in more detail.
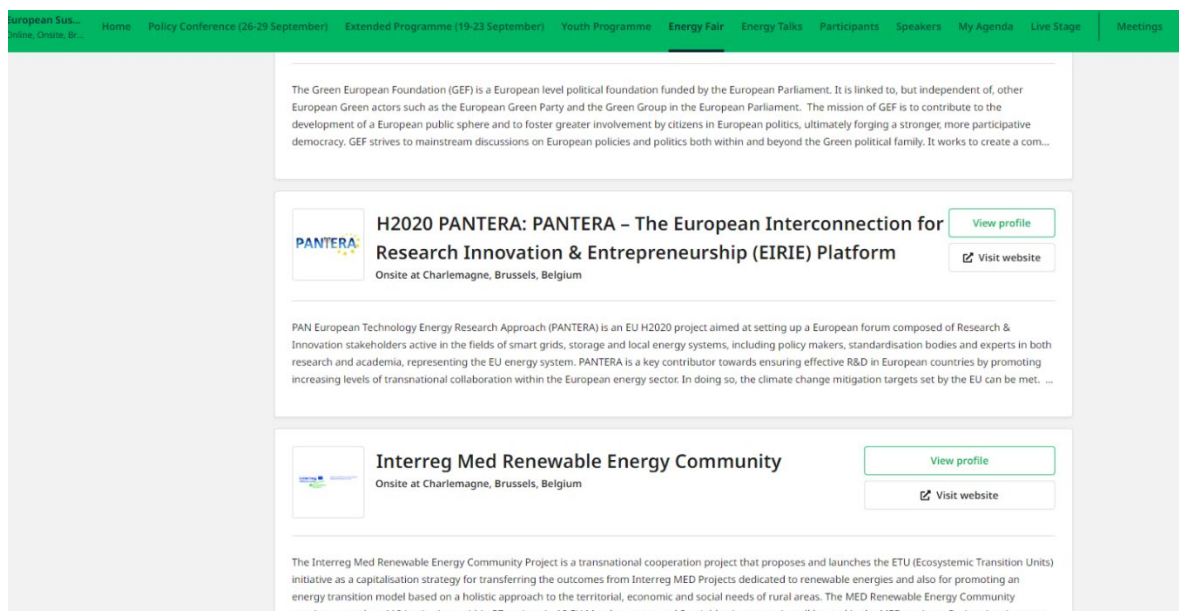


*Figure 23: The PANTERA online stand*

## 4.4   Paper presented at academic conferences and journal articles

In the EIRIE project framework, 10 research articles have been published. Out of 10 articles, 7 are published in international research journals and three are published in regional journals based in Latvia and Estonia.

| Title: | "PAN European Approach for Strengthening Research and Innovation in Smart Grids, Energy Storage and Local Energy Systems" |
|---|---|
| Authors: | R. Stanev, A. Krusteva, M. Georgiev, T. Todorova, C. Papadimitriou, V. Efthymiou, C. Panayi, M. Shalaby, P. Carroll, S. Khadem, M. Cabiati, L. Martini, A. Morch, A. Mutule, I. Antoskova, T. Tsitsanis, G. Papadopoulos, A. Tsitsanis |
| Month: | September 2019 |
| Publication: | 11th Electrical Engineering Faculty Conference (BulEF) |
| Link: | https://ieeexplore.ieee.org/document/9030767 |

| Title: | "The Role of Research and Innovation in the European Union's energy development" |
|---|---|
| Authors: | A. Mutule, I. Antoskova, R. Lazdins |
| Month: | October 2019 |
| Publication: | EP Energija Un Pasaule (Latvian professional journal) |
| Link: | http://www.energijaunpasaule.lv/wp-content/uploads/2019/10/EP.pdf |

| Title: | "Facilitating research and innovation for energy transition" |
|---|---|
| Authors: | A. Mutule, I. Antoskova, R. Lazdins, R. Urbonas (Lithuanian Energy Institute) |
| Month: | June 2021 |
| Publication: | Lithuanian energy journal "ENERGETIKA" |
| Link: | https://www.lmaleidykla.lt/ojs/index.php/energetika/article/view/4250 |

| Title: | "Research and Innovation Supporting Energy Transition: Challenges for Wider Participation of Lagging Countries" |
|---|---|
| Authors: | A. Mutule, I. Antoskova, A. Morch, V. Efthymiou, C.N. Papadimitriou |
| Month: | June 2021 |
| Publication: | 2021 IEEE Madrid PowerTech |
| Link: | https://ieeexplore.ieee.org/document/9495094 |

| Title: | "Development of Network Codes to Facilitate the Energy Transition" |
|---|---|
| Authors: | P. Carroll, S. Khadem, A. Mutule, A. Nouri, C.N. Papadimitriou, R. Stanev, M. Cabiati |
| Month: | July 2021 |
| Publication: | ICSmartGrid2021 |
| Link: | https://icsmartgrid.com/assets/VP/abs/15-Carroll-Development-Ireland.pdf |

| Title: | "Development of Smart Grid Standards in View of Energy System Functionalities." |
|---|---|

| Authors: | A. Mutule, I. Antoskova, C. N. Papadimitriou, V. Efthymiou, A. Morch |
|---|---|
| Month: | September 2021 |
| Publication: | Splitech 2021 |
| Link: | https://ieeexplore.ieee.org/document/9566337 |

| Title: | "A concept for flexible and self-adaptable classification of ETIP SNET technologies and functionalities." |
|---|---|
| Authors: | C.N. Papadimitriou, V. Efthymiou, R. Stanev, S. Khadem |
| Month: | July 2021 |
| Publication: | ELMA 2021 IEEE |
| Link: | https://ieeexplore.ieee.org/document/9503042 |

| Title: | Empowering energy transition in Estonia *"Energiapöörde mõjuvõimu suurendamine Eestis"* |
|---|---|
| Authors: | Anna Mutule (IPE), Irina Antoskova (IPE) |
| Month: | September 2021 |
| Publication: | Elektrijaala |

| Title: | "Implementing The Clean Energy Package: best practices in overcoming barriers" |
|---|---|
| Authors: | A.Z. Morch, V. Efthymiou, C.N. Papadimitriou, A. Mutule, K. Berg |
| Month: | September 2021 |
| Publication: | CIRED 2021 |
| Link: | https://ieeexplore.ieee.org/document/9692873 |

# 5 The EIRIE platform: a one stop shop involving different key stakeholders

## 5.1 High level reference to what is offered through EIRIE

As indicated in the above paragraphs, EIRIE is a living multifunctional platform offering multiplicity of services to connected users. All users can have access to EIRIE using their EU credentials since it is situated within the safe environment of EUROPA. On first connection, the new user has to register in the system and automatically will be given the basic role of "Simple User" out of a multiplicity of possible user roles that are available for more advanced interactive authorization to selected users. See the extracted screenshot with roles available.
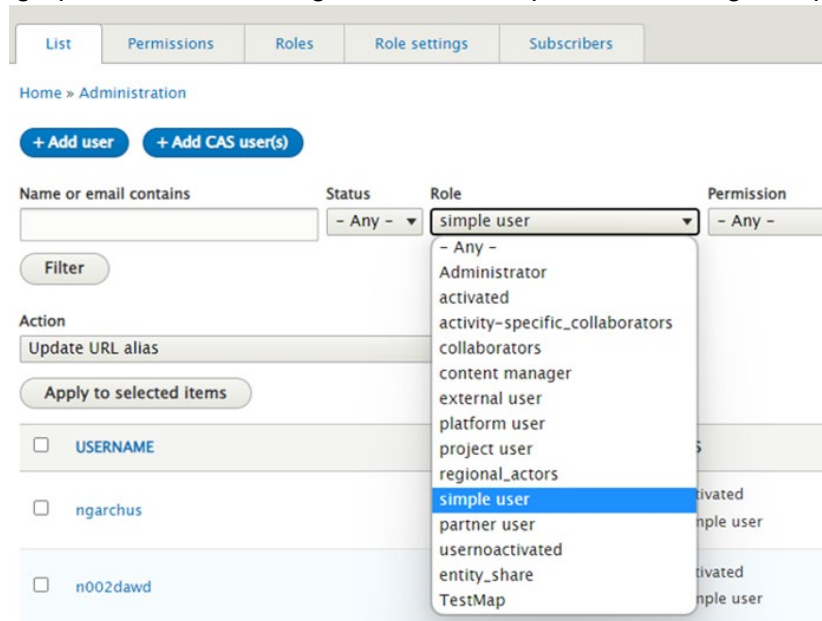


The landing page of EIRIE that offers all possible uses on the platform is given below with possibilities also to:
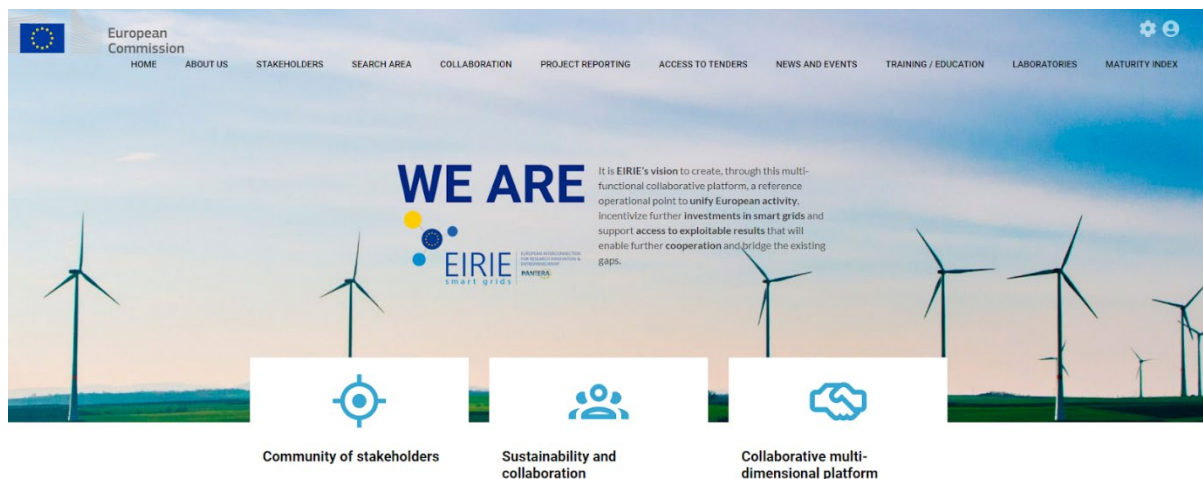


- Subscribe to the newsletter if desired, or

- "Contact" the services of EIRIE for support on any issue required using the respective possibilities on the landing page.

The functionalities offered to users are many and cover all possible needs of projects. It gives the possibility for uploading in EIRIE many types of content that once is checked, approved and published it is searchable through the Search Tool provided for use by the R&I community of Europe and worldwide. This content management is an important step in the functioning of EIRIE since there is the need of preserving quality of content, hence a process is set in place for having the authorised users who can upload material, check it and approve it for publication. This is divided into the various types of content which are shown in the drawing below and can be supported by stakeholders / experts coming from ETIP SNET, BRIDGE and the interested projects to publish their results etc.

Content on EIRIE extends to categories such as:

- Use cases

- Research infrastructure

- Standards and codes

which are very specific, and they are given separate dedicated areas of importing on EIRIE by the authorised users.

Currently, the authorised user for uploading laboratory research infrastructure data, are the experts of DERlab but the intention is to extend it to the owners of labs hosting the infrastructure.
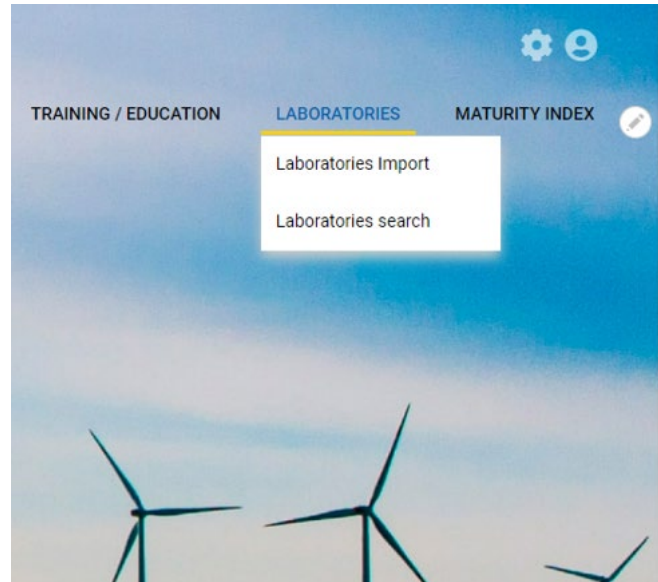


## Create Use cases ☆

Home » Add content

Title *

1 Description of the use case *

1.1 Name of use case *

ID *

*The identification number (ID) of a use case is unique within a repository or project and serves for organization/administration of use case*

Area/ Domain(s)/ Zone(s) *

*Use cases can be used in various areas (e.g., energy system). Within these areas, different domains are used to define/determine a more specific subgrouping. Zones might describe additionally zones within an automation system or a reference architecture. Experts in a particular field can suggest their set of domains (and zones) in order to provide a common understanding how to group use cases within a complex area. These predefined domains (and zones) can be chosen by the author of a use case (preselection). The author can select one or more domains and zones, comma separated, as it is usual that use cases are crossing different domains and zones.*

Name of use case *

*A short name, which should be unique within the area/domain and which refers to the activity of the use case itself using "Verb + description", should be used.*

Show row weights

1.2 VERSION MANAGEMENT

## Create Regulation, Grid codes & Standard ☆

Home » Add content

Title *

Type *
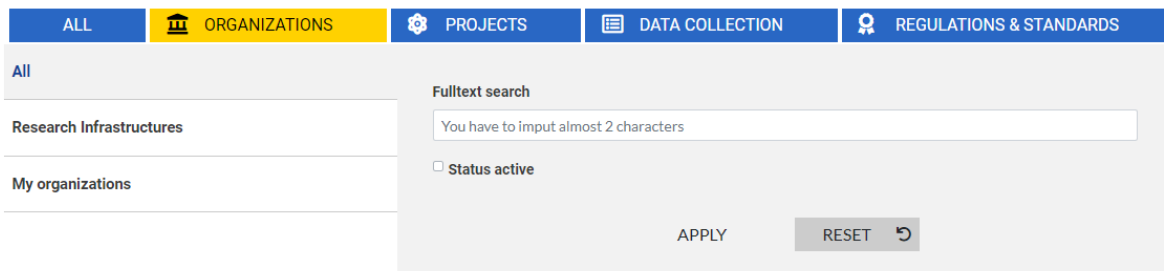
Source

Acronym *

Show row weights

SIMILAR STANDARDS

⊹

Add another item

Technical committee

It is apparent, that the majority members of the R&I community are the users searching material etc for their work. For this reason, EIRIE is ready to offer through a versatile but strong search tool the possibility of filtering loaded information, data, and knowledge to meet their needs.



Moreover, EIRIE is offering the strong possibilities of searching content of projects through a versatile heatmap with diverse capabilities. Up to 3 countries can be chosen to compare their activities in smart grids, storage, and local systems in addition to the collective investigation for the whole of Europe.
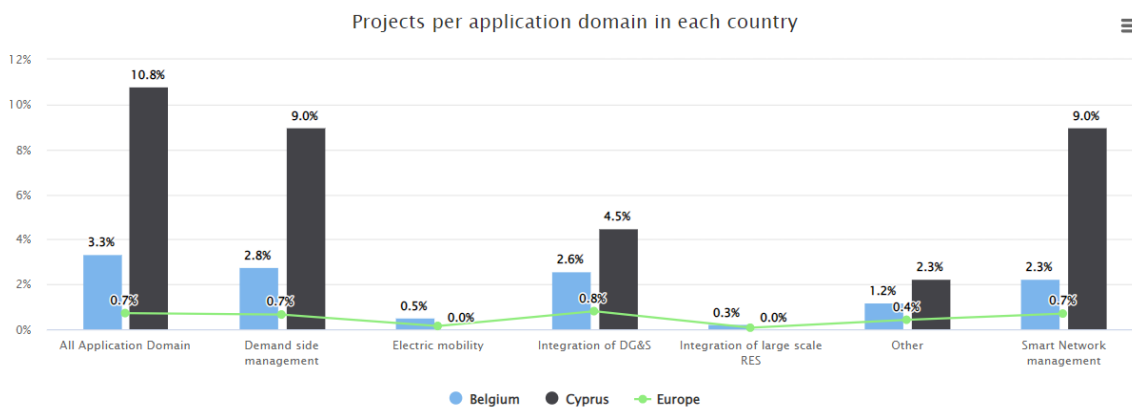
## Smart Grid Projects Map

In the following map aggregated data of Smart Grid/ Smart Energy Systems projects awarded across the EU through National, Regional and EU programmes (Horizon 2020 and Horizon Europe) is presented, based on the choices you make from the options given below. In all cases the results can be seen for each country by hovering with the mouse over the country of interest.

When no countries are selected, all EU countries are included and apart from the visualization of aggregated project data, the map offers you an interactive environment that allows for further drilling in and analyzing the project-related information available in EIRIE with the use of a wide variety of filters (e.g. maturity level, application domain, technology deployed, etc).

Through the map and for a **maximum of 3 countries** each time, you will also be able to further analyze project-related information with the use of dedicated bar diagrams appropriately correlating pairs of data elements such as:

- Number of projects per technology deployed in each country
- Number of projects per stakeholder type in each country
- Funding amount per technology deployed in each country
- Funding amount per stakeholder type in each country

(Note: Normalised in the figures below means the sum of all country results is 100)
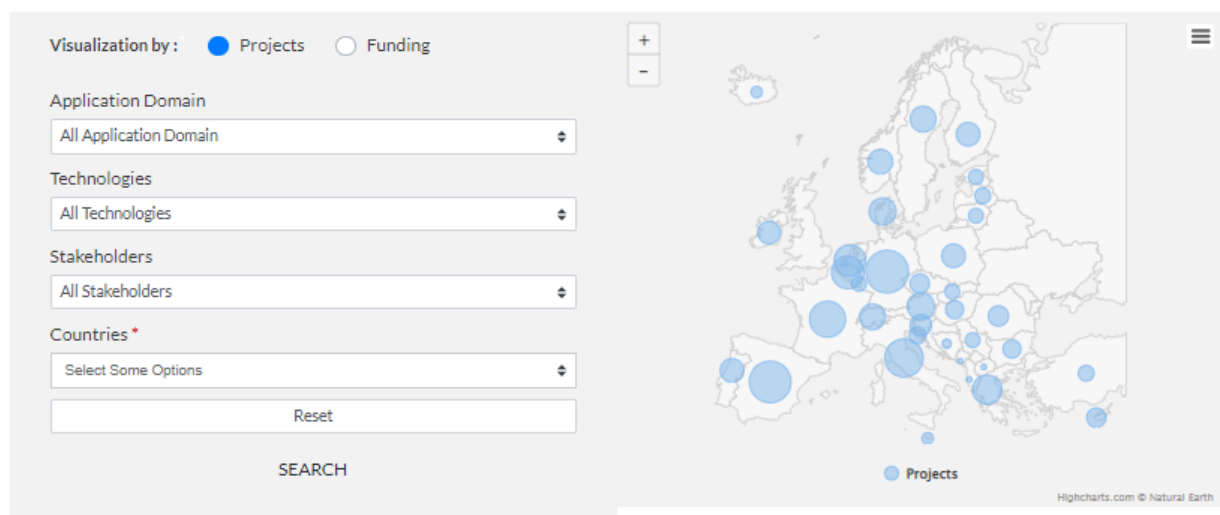


## 5.2  JRC – PANTERA: Developing, operating & populating the PANTERA / EIRIE platform

EIRIE is hosted on the Smart Energy Systems servers of JRC with the responsibility taken up by JRC for daily operation and storage of material in support of the EIRIE users. This entails the responsibility of making sure that embedded systems are operational with the most updated versions of software and accessibility is preserved with adequate resources for smooth operation.

JRC with the supporting services offered daily support to the contractor of PANTERA, BILBOMATICA for having the right development environment for all the required work and have the facilities to test developed applications prior to being released to the production environment accessible by all.

JRC has also given access to the EIRIE users on the specialised environment of CONFLUENCE for hosting the teams searching for collaboration. This environment moves the users to a more restricted area within EUROPA with two stage authentications for added safety in operation. The landing page for this work is shown below, offering all the possibilities that the CONFLUENCE environment offers:
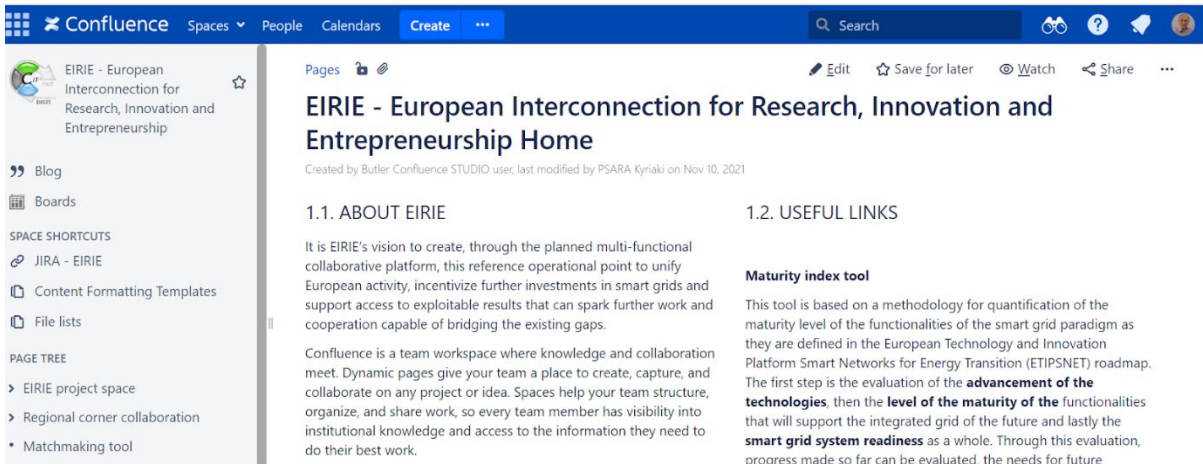
Within CONFLUENCE, the PANTERA consortium was given the authority to build the working environment to the requirements of the expected users / stakeholders and giving them the appropriate authorizations to be limited to the pages that they have subscribed to collaborate.

## Summary

| | |
|---|---|
| **Name** | EIRIE - European Interconnection for Research, Innovation and Entrepreneurship |
| **Description** | EIRIE's vision is to become a reference operational point to unify European activity, incentivize further investments in smart grids and support access to key exploitable results. |
| | The EIRIE web platform is financed through a H2020 project (Pantera project) and it's maintenance is carried out by the JRC through an Administrative Arrangement with DG ENER. |
| | This Confluence space will be used for creating and managing knowledge that will be uploaded to the EIRIE portal. |
| **Lead** | barbomo - BARBONI Marcello |
| **Key** | EIRIE |
| **Govis ID** | |
| **Creation date** | 20.10.2021 13:37 EEST |
| **Creator** | barbomo - BARBONI Marcello |
| **Organisation** | JRC |
| **Jira project** | ENABLED 🗑 |
| **Confluence space** | ENABLED 🗑 |
| **Bitbucket project** | NONE + |
| **Subversion repository** | NONE + |

Such areas can be populated as required to serve the purpose adapted by the collaborating group of stakeholders. As an example, the working environment generated by Working Team 3 bringing together the countries Malta and Cyprus is the following:

- Cyprus
- Malta
- Stakeholders
- NEEMO project
  - E-mobility details of Malta
  - Publishable activities
  - Work Package 1
  - Workshop Cyprus
    - Agenda
    - Presentations
- Conferences
  - MEDPOWER22 Conference in Valetta Malta
    - Planning the conference and workshop
    - PANTERA MEDPOWER2022 Report
- Research
  - GRIDPV100_Proposal - Application - Evaluation
  - GRIDPV100_Simulation tests at AIT
  - GRIDPV100_Results - Reporting - Publications
- Support for VirtualKES

## 5.3 Working closely with SPRING to make possible the continuation of EIRIE

DG ENER has taken the decision that EIRIE is the reference platform for projects financed by the Commission to publish their results / outcomes. For this reason, the Service Contract SPRING financed by DG ENER for supporting the work of ETIP SNET and BRIDGE was given the responsibility of taking over from BILBOMATICA on completion of the contract on 31st of December 2022, to continue supporting the daily operations of the platform.

In support of this requirement, the consortium of PANTERA has set up monthly calls as of May 2022 to brief SPRING of progress achieved and open issues so that transition will be smooth in December of 2022. Through these meetings all pending work till the end of year 2022 was tracked with the participation of PANTERA consortium, BILBOMATICA and INYCOM on behalf of SPRING, giving constant update on progress achieved and open issues.

Specific dates were planned during this period for training the personnel of SPRING / INYCOM on the functionalities of EIRIE and make them aware of all operational needs through a detailed manual prepared by BILBOMATICA. Very importantly, the upgrade of the software components was done by INYCOM under the supervision of BILBOMATICA to make sure that all details are well understood and that all details of functionalities are in place and adequately tuned for the purpose.

At handover, a detailed snack list was prepared by BILBOMATICA and with the approval of the PANTERA consortium was passed over to SPRING / INYCOM to track their completion within January 2023 before finally approving the completion of EIRIE and full handover to SPRING / INYCOM for future operational needs and requirements.

Since January 2023 till the end of the project of PANTERA 30th of June 2023 full responsibility for the daily operation of EIRIE is on the shoulders of SPRING / INYCOM in collaboration with JRC. A detailed list of open issues is agreed with time slots for their attention in response to daily operations of the platform and the connected users. The list is extended to cover work possibilities until the end of August 2023 which is the end date of the project SPRING and the handover to the new Service Contract, commencing 1st September 2023. The tender which is out calling for interested parties to submit bids for their services, covers all the needs of EIRIE for continuing smooth operation including anticipated developments to cover upcoming needs of users.

# 6  Conclusions

PANTERA through its networking and workshops has gained substantial ground in acknowledging and combatting issues that have arisen within the R&I community related to smart grids, storage and local energy systems. Workshops have highlighted the predominant issues within each country and given us insight into social, political, and industrial barriers that these countries are facing. In this document we have pointed out some of these barriers and suggested possible solutions to mitigate them moving forward.

The collaboration between various organisations within R&D of smart grids, storage and local energy systems both between themselves and with potential stakeholders cannot be understated. Through collaboration with the likes of ETIP SNET, BRIDGE and PANTERA / EIRIE we can better inform citizens of the contributions they can make as well as helping each other's research through data sharing. As of now the communities tend to be disjointed with different groups not being informed of funding opportunities, research developments, and novel technology. Through EIRIE and increased communication between these groups and prosumers we can facilitate the sharing of data to better inform the progression and integration of smart grid technology.

Section 4 of this document describes how PANTERA has linked various initiatives with stakeholders based on the challenges they are facing and the area of the initiatives research. This has proved to be highly effective at bringing together people who can aid each other's research and political goals. In the future it is imperative that PANTERA / EIRIE continues with this project of linking initiatives with stakeholders to help them reach their climate goals set by the EU.

The final section of this document discusses the EIRIE platform, a one-stop-shop for all knowledge, data and information regarding smart grids, storage, and local energy systems. The EIRIE platform helps to solve many issues that arose during meetings with stakeholders regarding open-source data and keeping informed. EIRIE provides up to date real time information for all to avail of to help facilitate R&I and make people aware of various opportunities and happenings within the energy community. Also mentioned is the further continuation and maintenance of the website by SPRING, pending the end of the PANTERA project. All the information and data collected throughout the PANTERA project is made available on the EIRIE website accessible by all.