Support to the coordination of national research and innovation programmes in areas of activity of the European Energy Research Alliance

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 949125.

Mobilization of EU13 national public research resources in the Clean Energy Transition: challenges and opportunities

SUPEERA/PANTERA workshop, Bucharest, Romania
23rd March 2023

Ivan Matejak, EERA

Agenda 1/3

Time (EET)	Topic	Speaker
13:30 - 13:40	**Welcome address** **Ana-Maria Dumitrescu,** Professor, Faculty of Electrical Engineering, University Politehnica of Bucharest	
13:40 - 14:00	The SUPEERA project: Mobilization of EU-13 national public research resources in the Clean Energy Transition: challenges and opportunities ➢ SET Plan and CET - benefits and engagement possibilities ➢ Investment and reform measures for Romania for CET SUPEERA findings: engagement of Romania in H2020 or R&I	**Ivan Matejak,** SUPEERA coordinator, EERA
14:00 - 14:30	PANTERA and the EIRIE platform The EIRIE platform in support of the R&I European ecosystem: Objectives and opportunities EIRIE's functionalities and tools facilitating the work of stakeholders: ➢ Active participating & contributing on the EIRIE platform ➢ The Romanian corner and its role in bringing together the stakeholders that matter most for Romania and its R&I community	**Rad Stanev,** PANTERA project, TU Sofia **Mattia Cabiati,** PANTERA Project, RSE

Agenda 2/3

14:30 - 15:30	**Panel discussion and Q&A** Moderators: **Ivan Matejak,** SUPEERA coordinator, EERA	
	The Strategic Role of Romanian TSO for Green Transition in East and Central Europe	**Mihai Paun**, President of Energy Security and Investments Commission, Member of the Supervisory Board, TRANSELECTRICA S.A.
	RATEN's national and international involvement in the clean energy transition	**Daniela Diaconu**, Scientific Deputy Director, Institute for Nuclear Research (RATEN ICN)
	Towards emerging power systems: Correlation of national, European and international R&D efforts	**Mihaela Albu**, Professor, Polytechnic University of Bucharest
15:30 - 15:50	**Coffee break**	

Agenda 3/3

15:50 - 16:10	R&I opportunities for collaboration and funding: • Horizon Europe o Cluster 5 o Widening Calls • Norway/EEA Grants	**Spyridon Pantelis**, Project Manager, EERA **Berta Matas Güell**, Senior Research Scientist, SINTEF (online)
	EIC funding opportunities for Clean-tech technologies	**Francesco Matteucci,** Programme Manager, European Innovation Council
16:10 - 17:10	**Panel discussion and Q&A** *Moderators:* ***Spyridon Pantelis,*** *Project Manager, EERA*	
	Is there a place for small NGOs in R&I projects?	**Marius Ienculescu-Popovici,** President of Greenitiative
	FOSS experience in EU funded collaboration opportunities	**Chrysanthos Charalambous,** Special Scientist, FOSS Research Centre for Sustainable Energy
	Let's build the First Local Green Deal in Romania	**Andrei Daniel Groșeanu,** Management Consultant at Măgurele Science Park Association
	SIMAVI best practices in EU funding opportunities	**Monica Florea,** Head of Unit European Projects, SIMAVI

EUROPEAN ENERGY RESEARCH ALLIANCE

EERA
European Energy Research Alliance

- A key player in the European Union's **Strategic Energy Technology (SET) Plan**.
- The **largest low-carbon energy research community** in Europe bringing together **leading research institutes** to expand and optimise EU energy research capabilities.
- Membership-based, non-profit association.

250
public research centres and universities

30
countries

50K
energy experts

Support to the coordination of national research and innovation programmes in areas of activity of the European Energy Research Alliance

EERA 6 European Energy Research Alliance

We support the Clean Energy Transition by catalysing European energy research and providing world-leading scientific expertise on three thematic categories.

LOW- CARBON TECHNOLOGIES

MATERIALS

SYSTEMIC TOPICS

SUPEERA supports the SET Plan and the Clean Energy Transition

We...

- → Facilitate the coordination of the research community (also by “widening”)
- → Accelerate innovation and uptake by industry
- → Provide recommendations on policy
- → Promote the SET Plan and the Clean Energy Transition

We connect the dots.

EERA
European Energy Research Alliance

cea

DTU

KIT
Karlsruhe Institute of Technology

SINTEF

VTT

The new European/World Context

Revamping SET Plan

REPower EU

EU Green Deal

Energy crisis emergency

New Energy Paradigm

EU Strategic Autonomy

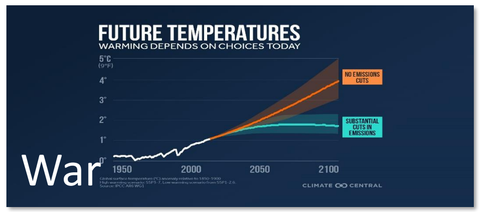
New Geopolitical Order

200 – 700 M migrants 2050

2° in 2050, 3°-4° in 2100

Rebound Fossil invest.

Increasing emissions



Strategic Energy Technology (SET) Plan

Established in 2008 (currently in revision process), it plays a key role in serving the goals of the European Green Deal by facilitating the delivery of clean energy innovations necessary to achieve the European transition to climate neutrality by 2050.

Synergies with the EGD and FIT455

- Alignment with EC strategies
- Break down the silos
- Track for 55% reduction

R&I alignment

- NECPs measures
- Improving competitiveness
- Coordination between MS

Monitoring of R&I spending

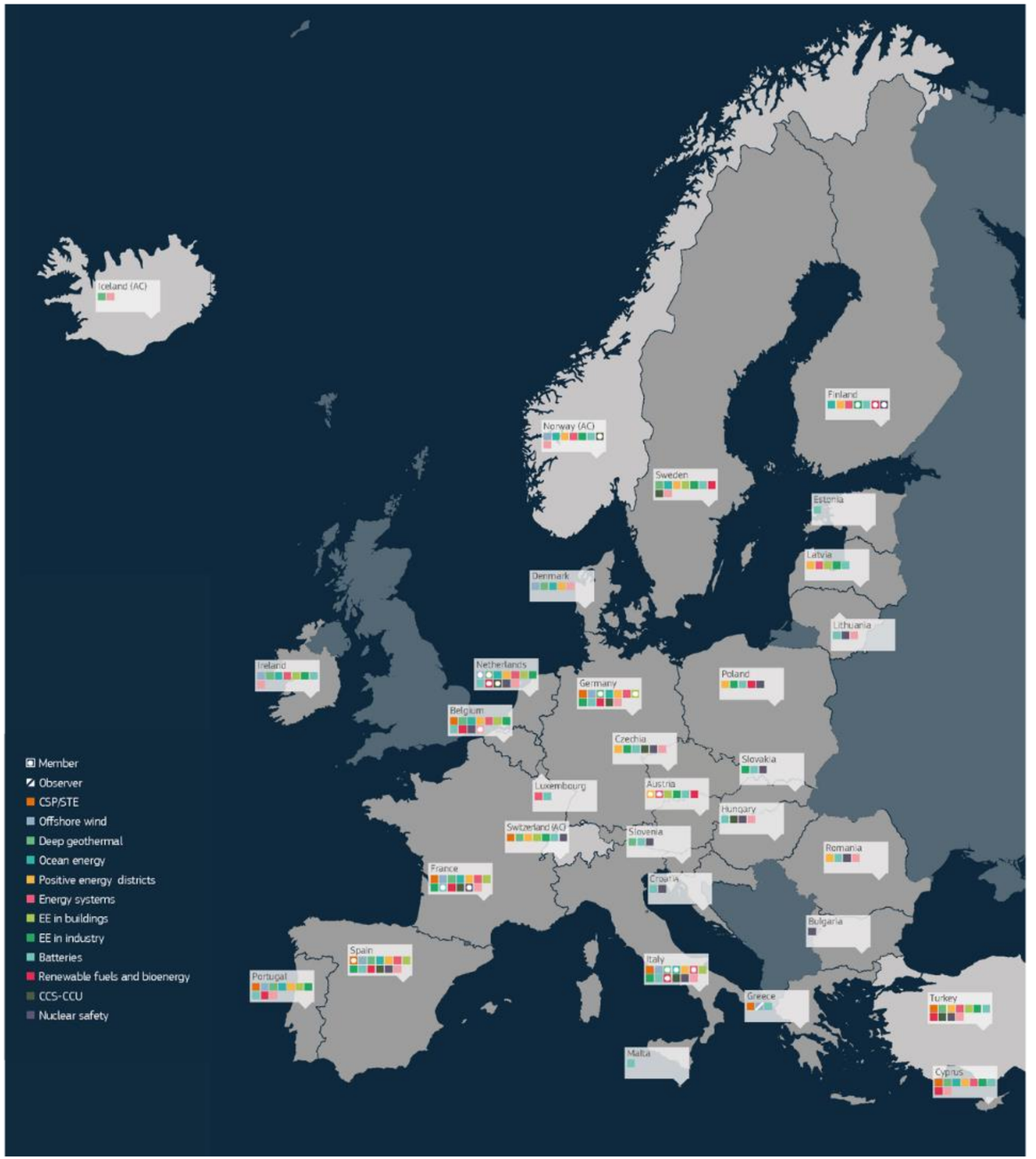
- Defining the shared methodology
- Monitoring evolution of spending
- Identifying trends

Mobilising public and private investment

- Facilitate private investments
- Scale/up of infrastructure
- Avoid duplication

The European Strategic Energy Technology Plan

	SET Plan key actions	13 implementation working groups
N°1 in renewables	#1 Performant renewable technologies integrated in the system #2 Reduce costs of technologies	→ Offshore wind → Photovoltaics → Deep geothermal → Ocean energy → Concentrated solar power / Solar thermal electricity
Energy systems	#3 New technologies & services for consumers #4 Resilience & security of energy system	→ Energy systems → Positive energy districts
Energy efficiency	#5 New materials & technologies for buildings #6 Energy efficiency for industry	→ Energy efficiency in buildings → Energy efficiency in industry
Sustainable transport	#7 Competitive in global battery sector and e-mobility #8 Renewable fuels and bioenergy	→ Batteries → Renewable fuels and bioenergy
CCS - CCU	#9 Carbon capture storage / use	→ Carbon capture and storage Carbon capture and utilisation (CCS – CCU)
Nuclear safety	#10 Nuclear safety	→ Nuclear safety



The gap in relation to the SET Plan

EU13 participation to SET Plan Implementation Working Groups (IWGs)

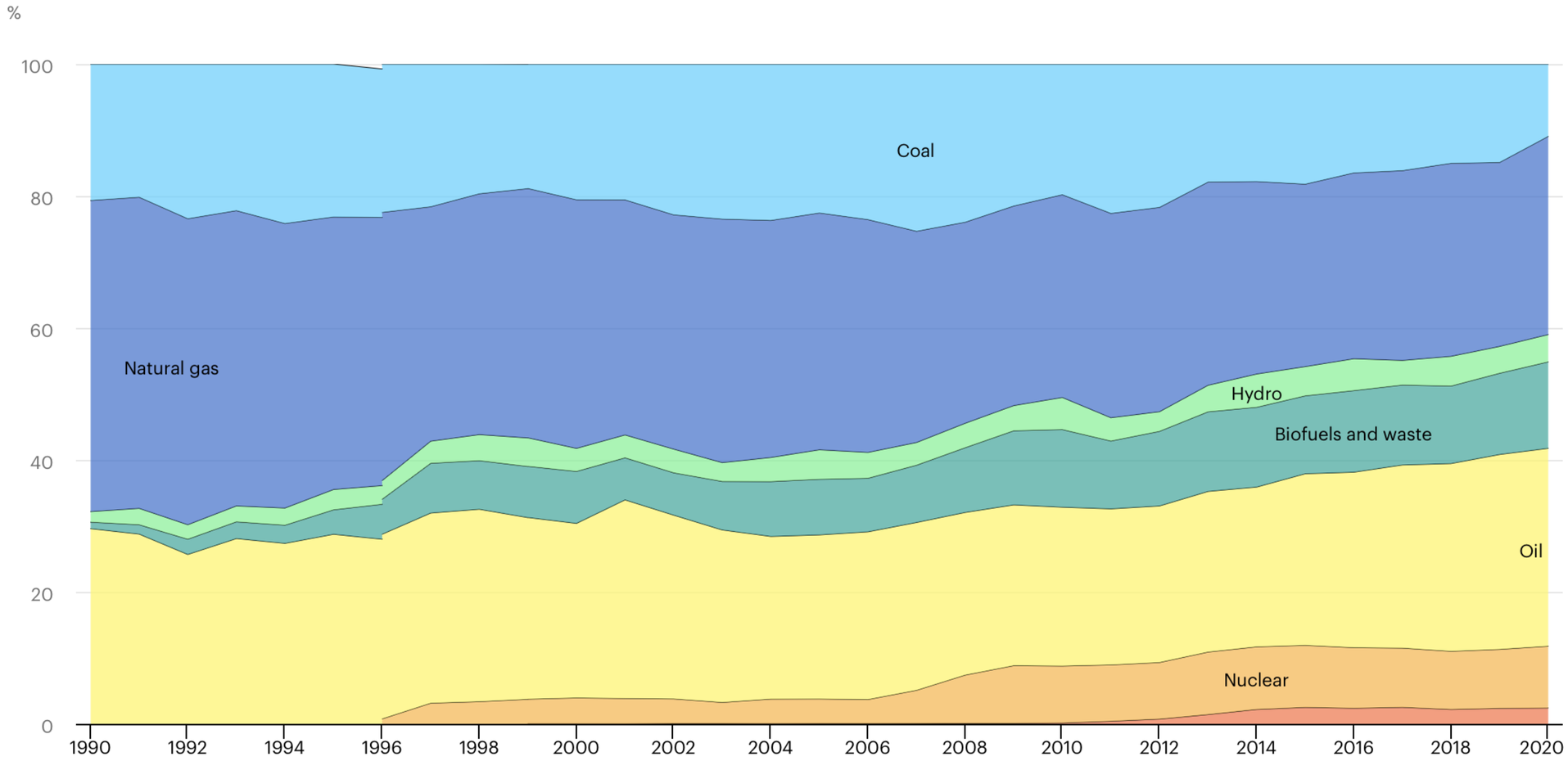
Country	Batteries	CCU-CCS	CSP-STE	Deep Geothermal	Energy Efficiency in Buildings	Energy Efficiency in Industry	Energy system	Nuclear safety	Ocean energy	Offshore wind	Photovoltaics	Positive energy districts	Renewable fuels and bioenergy
Bulgaria								X					
Croatia	X							X					
Cyprus	X		X	X		X	X		X		X	X	X
Czechia	X	X				X		X			X	X	
Estonia	X												
Hungary	X	X						X					
Latvia	X				X	X	X					X	
Lithuania	X							X			X		
Malta	X												
Poland	X					X		X				X	X
Romania	X							X			X	X	
Slovakia	X					X		X					
Slovenia	X					X		X					

All EU13 countries participate in the SET IWGs, with Cyprus being the most active country.

EU13 involvement is mostly circumscribed to nuclear safety, batteries, energy efficiency in industry and positive energy districts.

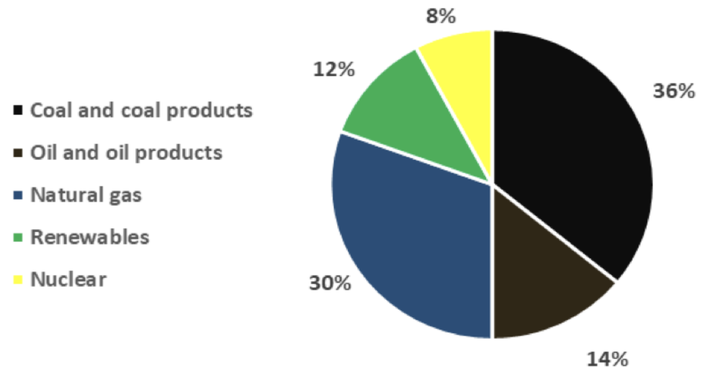
Source: SETIS's website, Implementing the actions.

Romania's energy sector, total energy supply (TES) by source



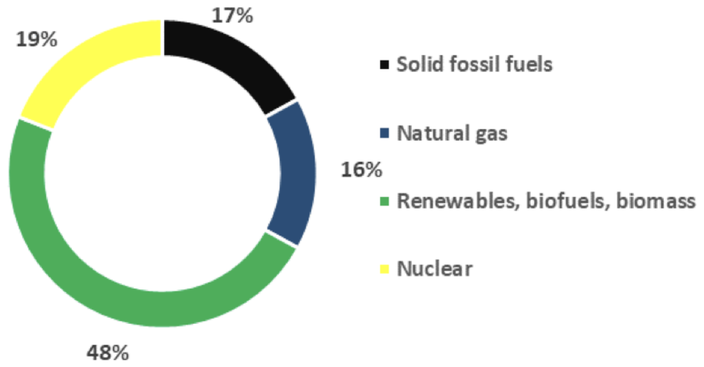
Romania's energy sector, energy/electricity mix and dependencies

Energy mix – 2021



Source: DG ENER and Eurostat

Electricity mix - 2021



Source: DG ENER and Eurostat

Dependency from Russian fossil fuels (2020) (c)(d)

	Gas	Oil	Coal
EU27	44%	26%	54%
RO	45%	32%	99%

Source: Eurostat (nrg_ti_sff, nrg_ti_oil, and nrg_ti_gas)

Romania in the SET Plan and CET

SET Plan

→Romania participates in four Implementation Working Group: Nuclear Safety, Positive Energy Districts, Batteries and PV

→RO's NECP compared to other EU MS relatively extensively addresses how the SET Plan objectives and policies (mainly related to 4 above-mentioned areas) are being translated to a national context

CET in the Recovery Plan

→ Allocation: **€14.2 billion** in grants and €**14.9 billion in loans**.

→ **41%** of allocated funds to channel towards **climate objectives**.

→Specific investments:

- **Transport**: €3.9 billion for the modernisation and electrification of the railway system and €1.8 billion for improved infrastructure in urban areas.
- **Energy**: €855 million for the RES deployment and innovative energy resources, particularly hydrogen.
- **Buildings**: €2.7 billion to improve energy efficiency
- **Biodiversity and environmental protection**: €1.1 billion

SUPEERA

Support to the coordination of national research and innovation programmes in areas of activity of the European Energy Research Alliance

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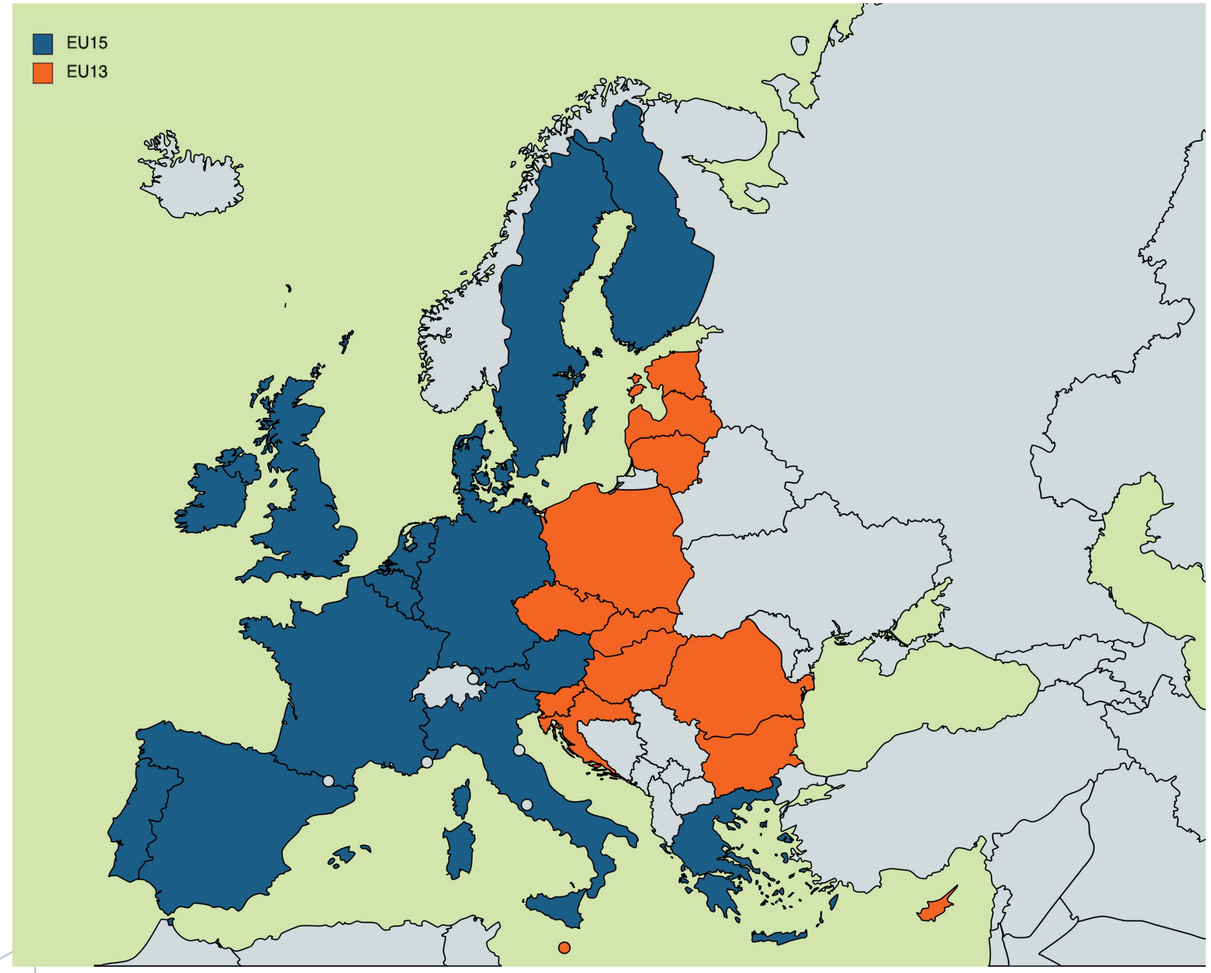
Engagement of Romania in H2020

Introductory note

The research and innovation gap between EU13 and EU15 Member States

The R&I gap between EU13 and EU15 Member States

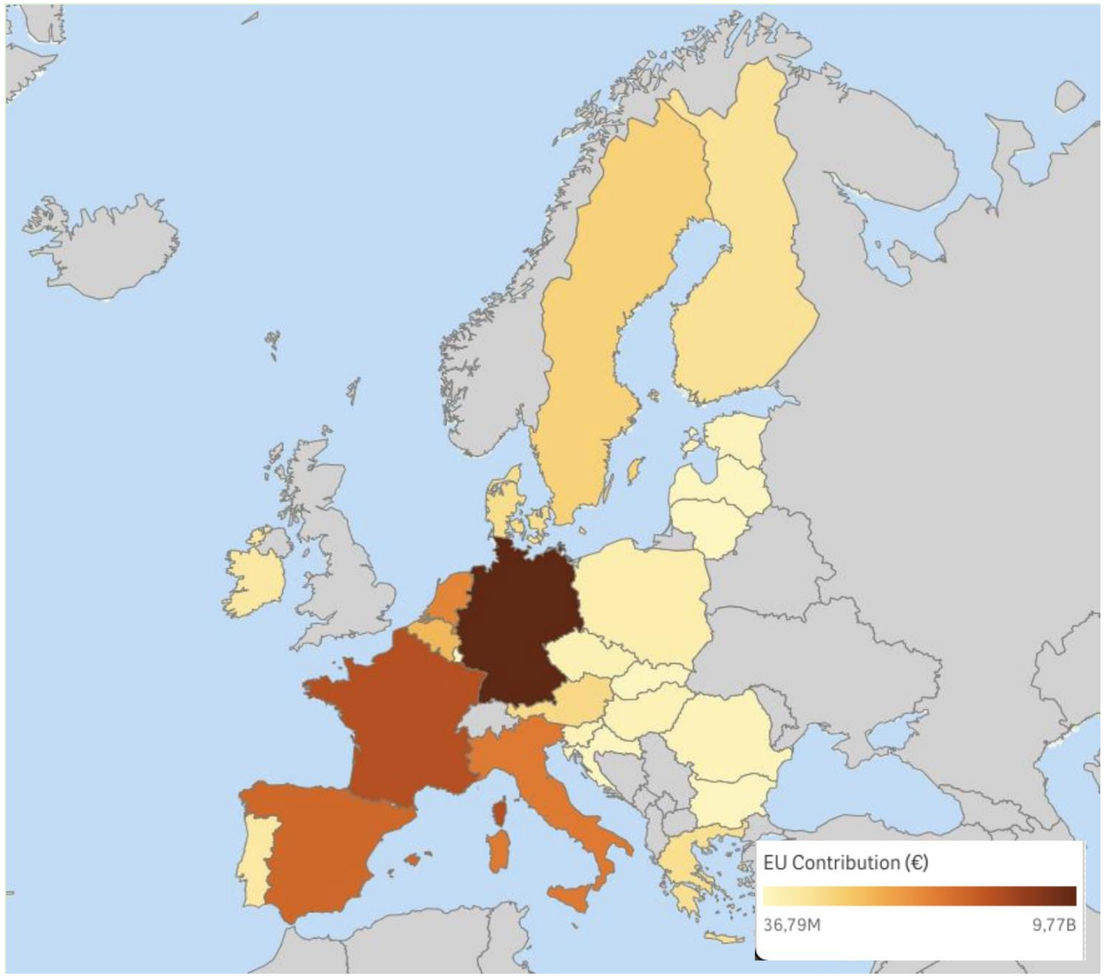


The **research and innovation (R&I) gap** in the EU is a pressing **challenge**, especially in consideration of the **2030** and **2050 climate goals**.

EU13 countries have **low participation rates** in the SET Plan, their national research organisations have **limited awareness** of the Clean Energy Transition (CET) priorities, funding schemes and initiatives and have received only a **marginal contribution** of Horizon 2020's budget.

The gap in relation to Horizon 2020 contribution: geographical distribution

Geographical distribution of Horizon 2020 net contribution by country



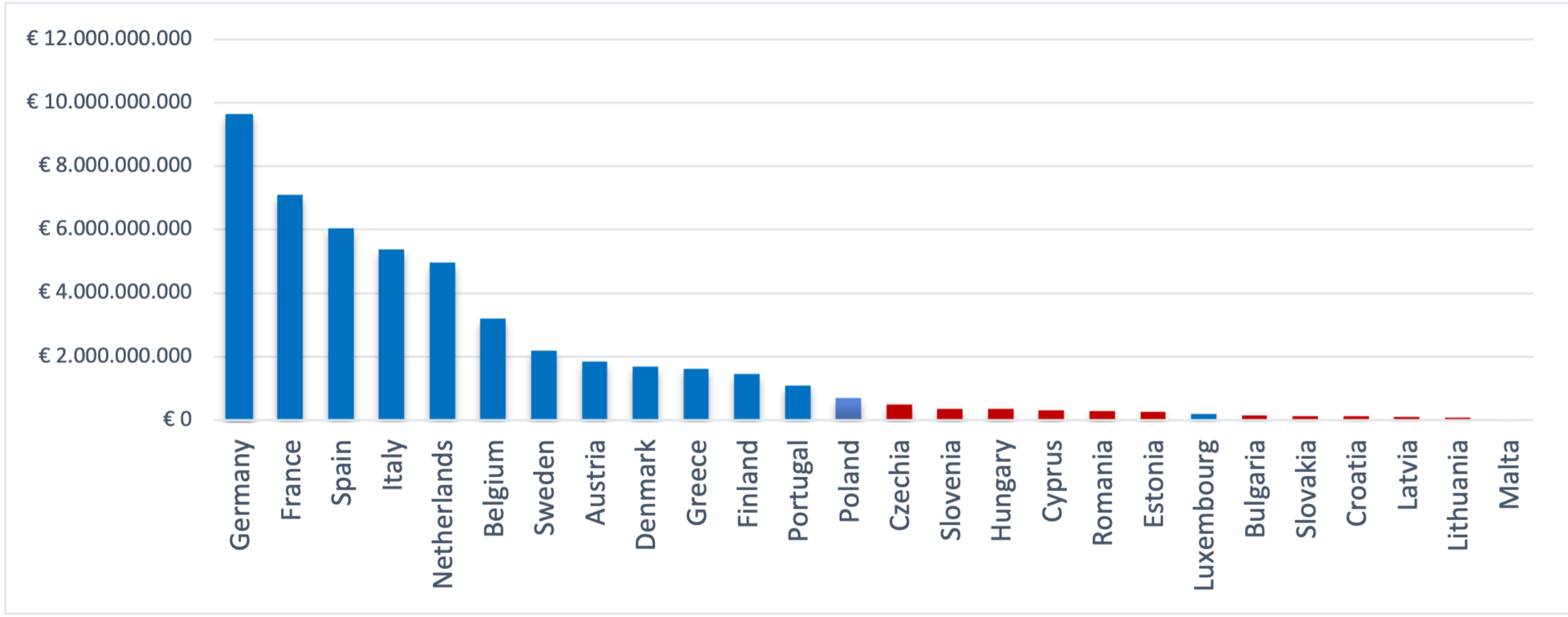
The limited commitment to the SET Plan reflects in **low H2020 performance**.

EU13 countries have received only a **marginal contribution** of Horizon 2020's budget compared to EU15.

Image source: Horizon 2020 dashboard (European Commission, 2021).

The gap in relation to Horizon 2020 contribution: EU13 vs EU15

H2020 net EU contributions (mil. EUR)



Only 5% of the total Horizon 2020 budget has been allocated to research teams from the EU13 Member States.

Source of the data: Horizon 2020 country profile database (European Commission, 2021).

H2020 performances

Sample	Organisations involved in H2020 projects	Organisations involved in H2020 projects (% of EU total)	H2020 net EU contribution (in Mil)	H2020 net EU contribution (% of EU total)
EU total	151.718	100,00%	€ 59 580	100,00%
EU13 total	14.640	9,65%	€ 3 470	5,82%
EU15 total	137.078	90,35%	€ 56 120	94,18%

→Among EU13, **Malta** receives the lowest net contribution (EUR **36,79 million**), while **Poland** receives the highest contribution (EUR **713,12 million**).

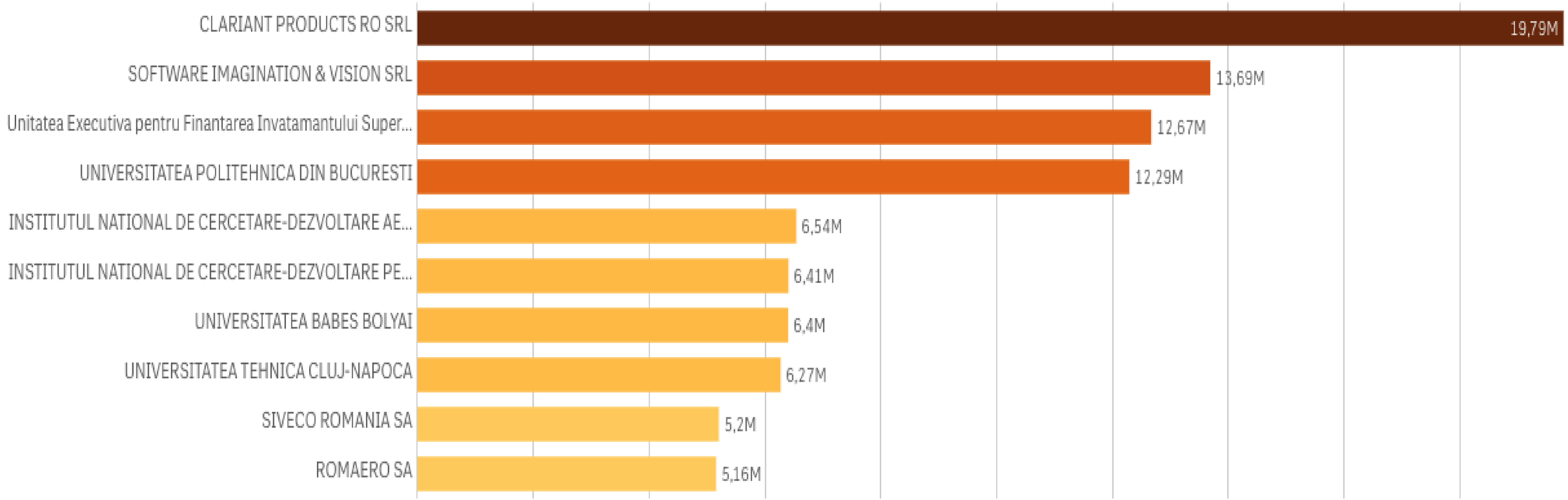
vs.

→Among the EU15 countries, **Luxembourg** is the country receiving the lowest share from Horizon 2020 (EUR **189 million**), while **Germany** receives the highest contribution of EUR **9 600 million**

Romania's H2020 performances

Sample	H2020 signed grants	H2020 signed grants (percentage of EU total)	Organisations involved in H2020 projects	Organisations involved in H2020 projects (percentage of EU total)	H2020 net EU contribution (in Mil)	H2020 net EU contribution (percentage of EU total)
Romania	1.025	3,20%	1.567	1,03%	€ 288	0,48%
EU total	32.064	100,00%	151.718	100,00%	€ 59 580	100,00%
EU13 total	6.229	19,43%	14.640	9,65%	€ 3 470	5,82%
EU15 total	30.881	96,31%	137.078	90,35%	€ 56 120	94,18%

Ten highest-ranking organisations by net Horizon 2020 contributions (mil. EUR)



Romania's Horizon Europe performances

Romania table with HORIZON EUROPE*					
Sample	HORIZON EUROPE signed grants	Organisations involved in HORIZON EUROPE	Organisations involved in HORIZON EUROPE (% of EU total)	HORIZON EUROPE net EU contribution (in mil)	HORIZON EUROPE net EU contribution (% of EU total)
Romania	271	396	1,27%	109	0,75%
EU total	6386	31.181,00	100%	14.440	100%
EU13 total	1543	3096	9,93%	1.130	7,83%
EU14 total	4843	28085	90,07%	13.310	92,17%

Possible reasons and challenges

Explaining the performance gap between EU13 and EU15 Member States

Root causes and structural challenges

Among the reasons explaining EU13 performance gap are:

- **National priorities not aligned** with European ones;
- **Weakness** of the **R&I systems**;
- **Administrative** and **regulatory burdens** obstructing R&I;
- Socio-economic **relevance of fossil fuels** (especially coal) making the transition towards a low-carbon economy less appealing;
- **Limited involvement** in the **SET Plan** landscape;
- **Lack of ties** at European and international level;
- **Absence of integration** between **business** and **academia**.

Reasons for the Horizon 2020 performance gap

Main causes for EU13 performance gap are:

1. **Relative weakness** of the **R&I systems** of EU13 vs EU15;
2. **Relative lack of scientific excellence in institutions** from EU13 vs EU15;
3. **Relative lower quality of proposals** involving EU13 participants compared to those that do not.

These three hypotheses have been assessed through a set of indicators and led to the identification of a **correlation between low scores** in these **indicators** and **Horizon 2020 performance**.

Other challenges related to Horizon 2020

- **Lack of experience** and **complexity of Horizon 2020** dissuading from participating in the Framework Programme;
- **Lack of international network** and **regional cooperation**;
- Ease of accessing **alternative** sources of **funding**;
- **Lack of adequate administrative support.**

Opportunities and recommendations

Opportunities arising participating in the SET Plan

Deeper involvement in the SET Plan would lead EU13 to:

- **Get involved in the EU discourse** about research in energy technologies and influence underlying policies;
- **Understand current priorities**;
- Enhance **international ties**;
- Share **research infrastructures**;
- Higher **awareness** of and **involvement** in **transnational funding schemes**.

Recommendations

Some preliminary recommendations may include:

1. **Link** national **R&I priorities** to European ones;
2. Strengthen **participation** in EU **R&I networks**;
3. **Increase R&I funding**;
4. Foster stronger **academia-business cooperation**;
5. **Improve** administrative **procedures** and **reduce** administrative **barriers**;
6. **Enhance** the activities of **National Contact Points**.

Benefits of being EERA member

In return for its expertise, our members gain unrivalled opportunities to:

1	2	3	4
Build a **pan-European expert network** to share knowledge and develop leading-edge expertise in the field of clean energy.	Participate in the structuring of the research field by **creating critical mass**, avoiding duplication, and leveraging the best R&I capabilities.	Gain **visibility at EU and international level** and influence the EU policymaking process.	Collaborate with **international initiatives** on both bilateral and multilateral levels.

As part of the process of becoming a trusted advisor to the EU on the Clean Energy Transition, we are strengthening our 18 Joint Programmes to develop them into European Centres of Excellence with the purpose of achieving:

Higher level of cross-border collaboration.

Higher integration with existing/planned national strategies & funding.

Higher focus on EU strategic technologies and CET priorities.

Higher integration with industry / European Industrial Alliances.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SINTEF


VTT

PANTERA project:
A Pan-European
Technology Energy
Research Approach

Mattia Cabiati (RSE)

Rad Stanev (TUS)

PANTERA
and the EIRIE platform

EIRIE in support of the R&I European ecosystem: Objectives and opportunities

"International research collaboration opportunities fostering EU Clean Energy transition in Romania"

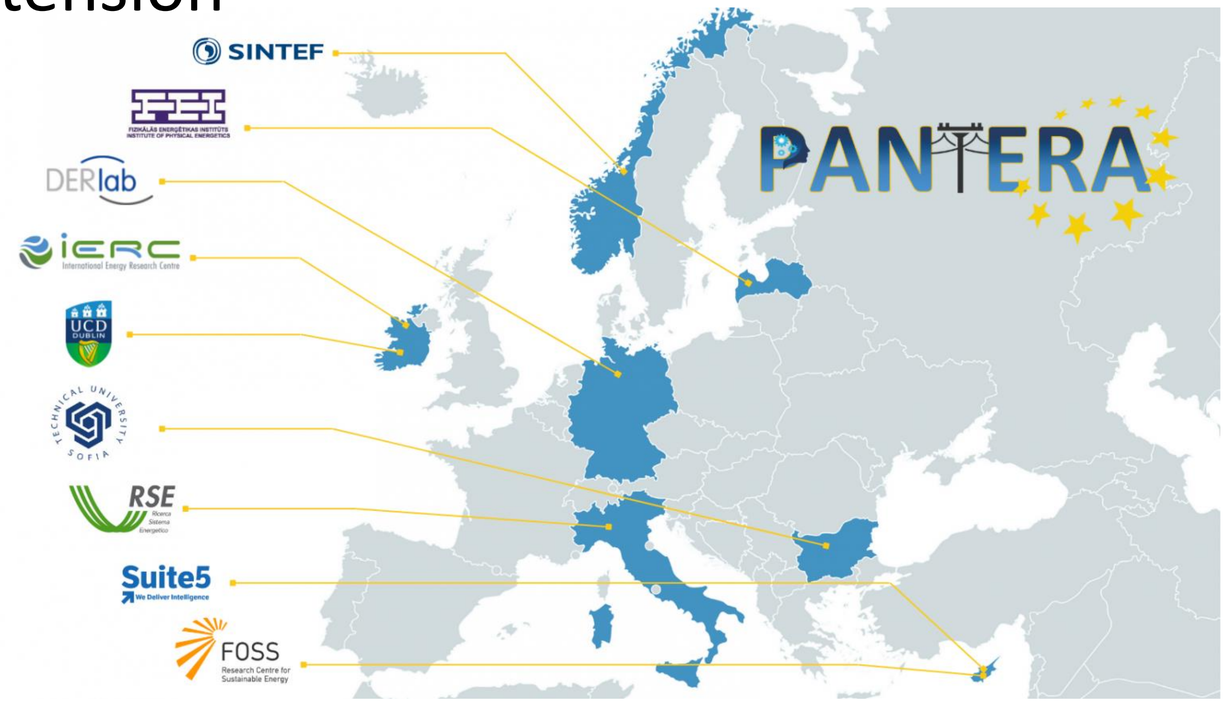
SUPEERA and PANTERA projects joint workshop

Bucharest - 23 March 2023

EU H2020 Programme GA No. 824389

General information

- **Type of Action:** Coordination and Support Actions (CSA)
- **Duration:** 48 months + 6 months extension
- **Starting date:** 1 January 2019
- **Total Budget:** 3.9 Million Euro
- **Coordinator:** FOSS Research Centre for Sustainable Energy
- **Consortium:**

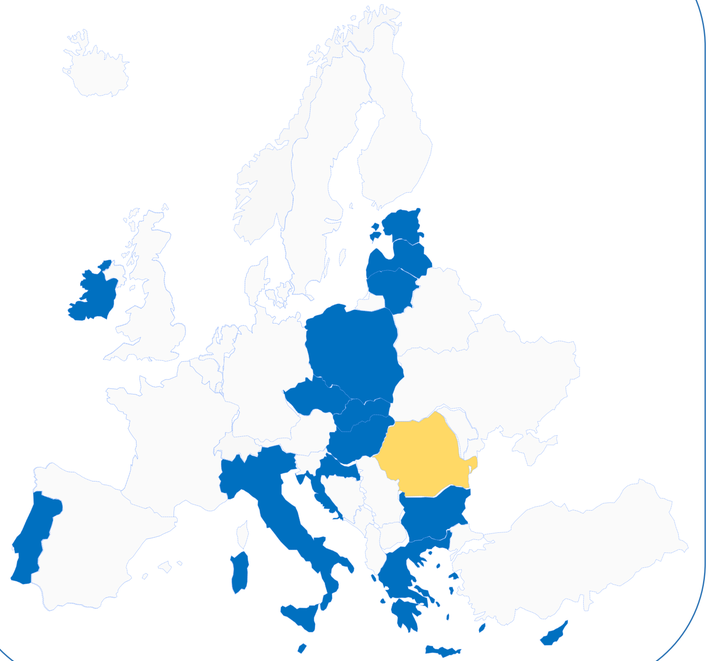


PANTERA Mission

PAN European **T**echnology **E**nergy **R**esearch **A**pproach (PANTERA) is an EU H2020 project aimed at **setting up a European forum composed of Research & Innovation stakeholders** active in the fields of smart grids, storage and local energy systems, including policy makers, standardization bodies and experts in both research and academia, **representing the EU energy system**.

The project's main goal is to bridge the gaps in research and innovation in the energy field that exists between EU member states.

PANTERA key countries



Regional desk approach

- **Six regional desks** addressing PANTERA target countries
- One **best-practice desk** elaborating on good experiences in projects and R&I governance from more successful countries
- Link R&I with regional priorities and competences
- Understand local context and suggest best practices

Discussion with stakeholders:

Some of the workshops organized:

- July 2019 – workshop in **Sofia**
- December 2019 –workshop in **Dublin**
- February 2020 – workshop in **Athens**
- June 2020 – Virtual meeting at **EUSEW**
- November 2020 – **Cyprus** virtual workshop
- July 2021 – workshop in **Crete**
- August 2021 – workshop in **Varna**
- September 2021 – workshop in **Croatia** at the SpliTech conference
- November 2021 – booth at **ENLIT** conference – Milano
- June 2022 – workshop in **Italy** at MELECON 2022

Feedbacks from the survey

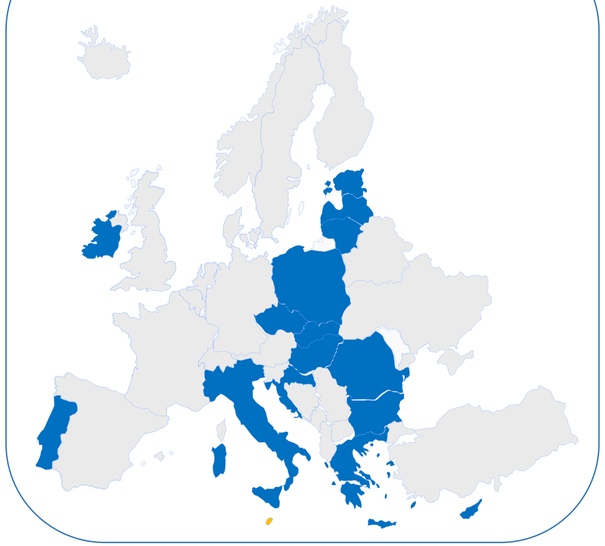
What kind of benefits and/or support do you expect from PANTERA?

- **Firsthand insight** into interesting smart grid projects, results, ideas and initiatives
- **Networking** and potential partnerships
- **Learning from others experience** (especially in practice-oriented projects)
- Cross-cutting information about different project initiatives
- Policy recommendations

What are the ***main*** barriers, gaps which limit the funding and development of R&I in the energy field?

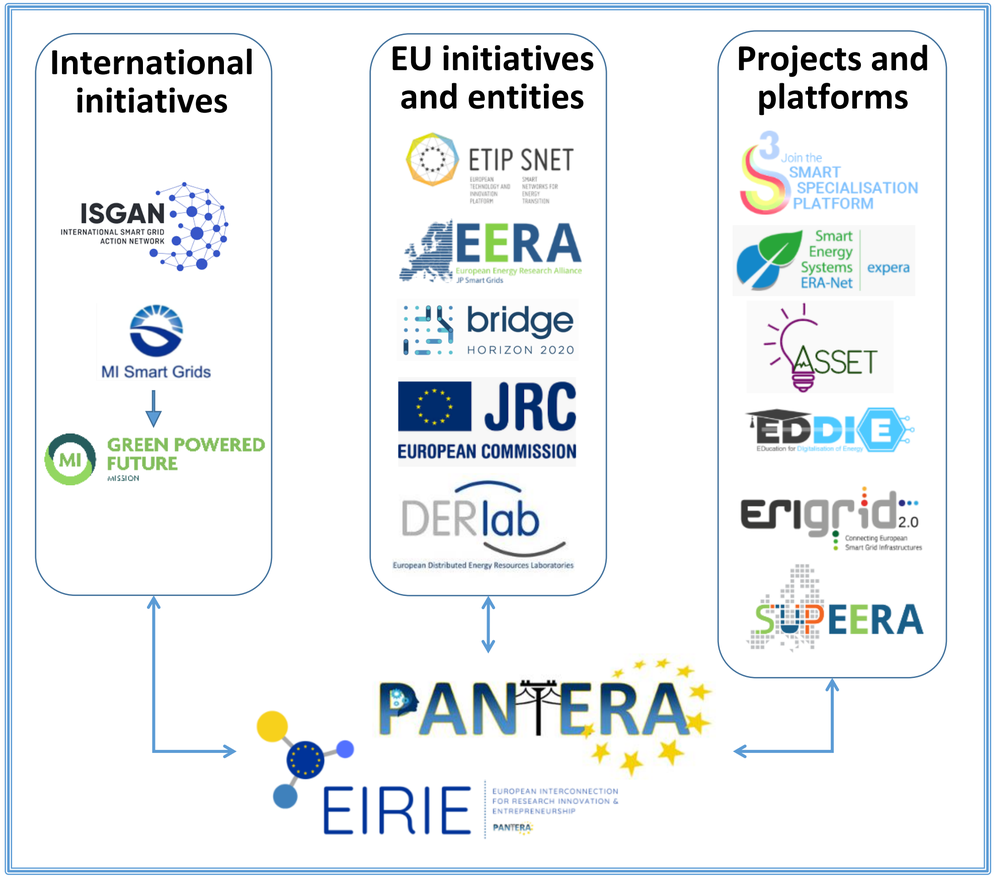
Lack of responsive networking facilities	●●●●●
Limited monetary resources	●●●●
Limited human resources	●●●●
Limited national policy in support of R&I activity	●●●

PANTERA key countries



We are still collecting feedbacks at the following link!

PANTERA: links and collaborations with internationals initiatives and projects



Thanks to the deep involvement of PANTERA partners in international initiatives, **good collaboration has been established with international consortia and other projects**.

Romania: background information

Energy sector

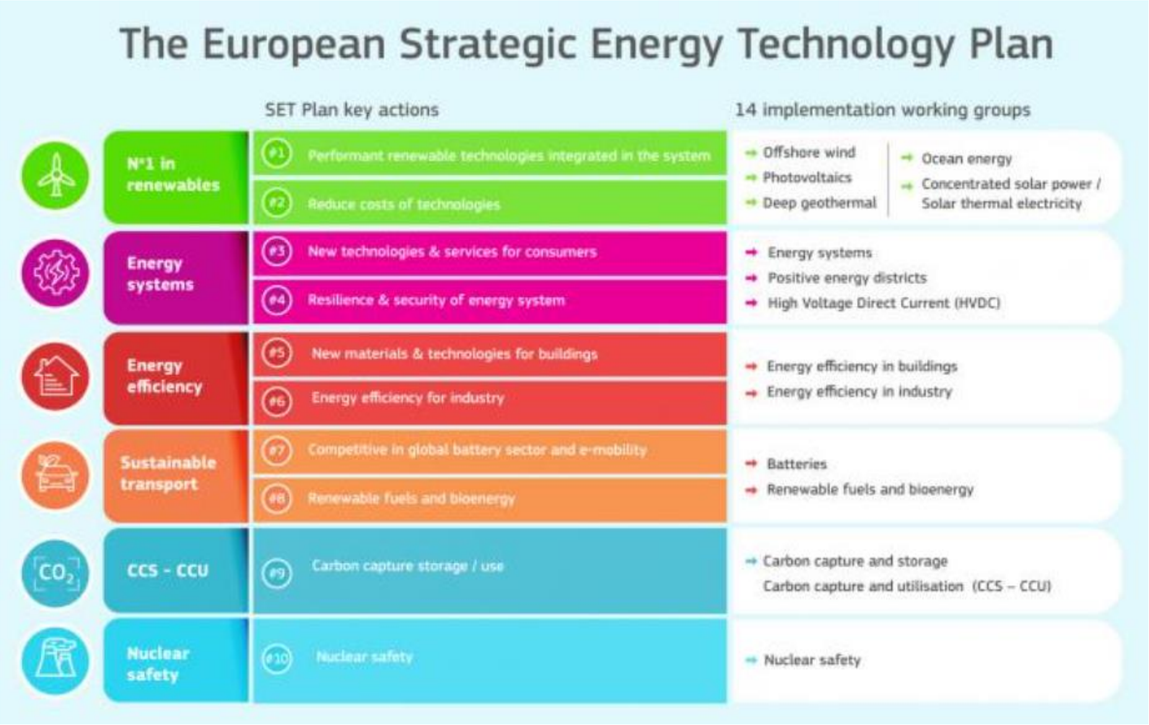
- Romania has assumed the European target of achieving carbon neutrality by 2050 and has set an ambitious target for reducing greenhouse gas (GHG) emissions by 2030 (at least 55% of the level in 1990).
- Romania aims to completely give up coal from the energy mix by 2032.
- Share of renewable energy in the gross final energy consumption exceeded the 2020 target of 24% since 2013. The 2030 target is 30.7%, with intermediate targets of 25.2% (in 2022), 26.9% (in 2025) and 28.4 (in 2028), respectively.
- Romania still has several carbon-intensive industries and sees hydrogen as a potential route towards decarbonisation. Over the 14-year period from 2005, Romania reduced its carbon intensity per unit of GDP by 54 % against an EU average reduction of 33 %
- Romania is a part of the Common European Electricity Market (together with Greece and Bulgaria)

Romania: background information

Energy sector

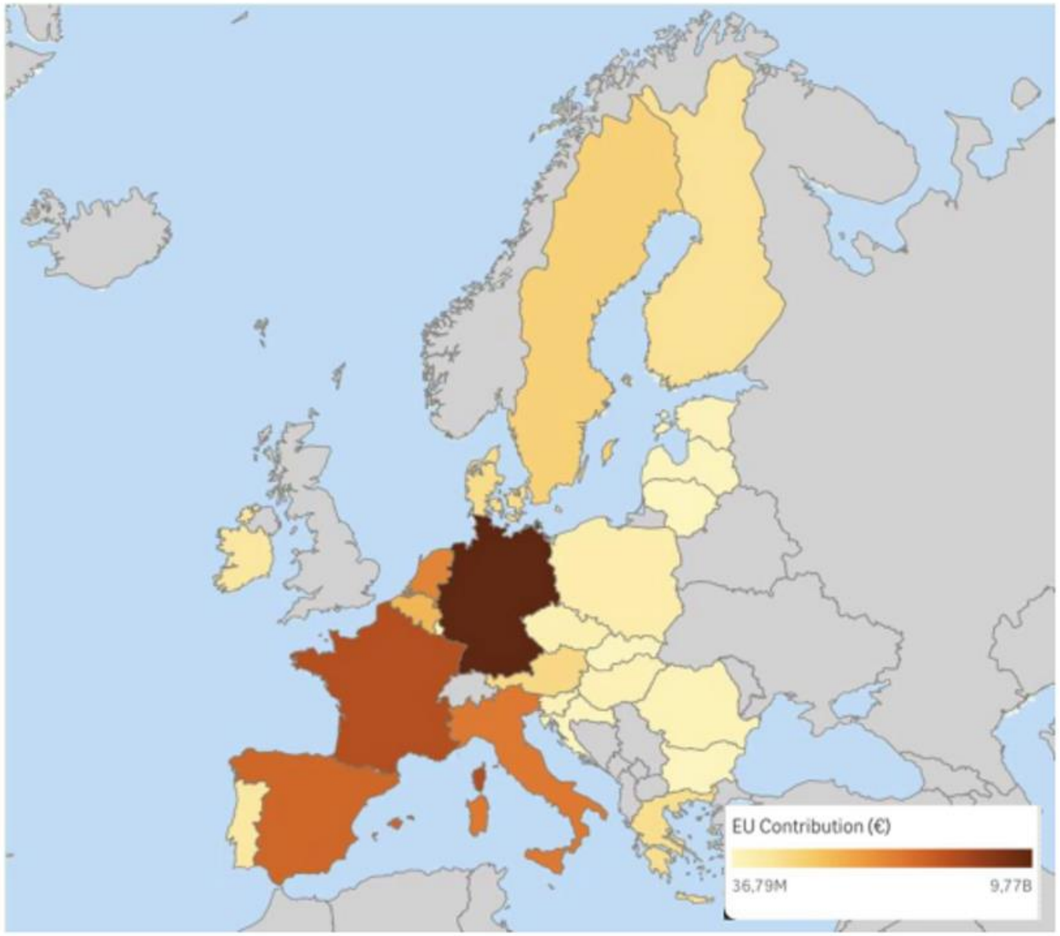
The Strategic Energy Technology (SET) Plan was established in 2007 to support the EU's energy and climate goals and make Europe a global leader in low-carbon energy and energy efficiency technologies. It is linked to the 5th dimension of the Energy Union – research, innovation and competitiveness – which are translated into SET Plan's 10 key actions

- **Romania is participating in four Implementation Working Groups** (IWG) of the SET Plan (Positive energy districts, Batteries, Nuclear Safety, High voltage direct current (HVDC) & direct current (DC) technologies)



Romania: background information

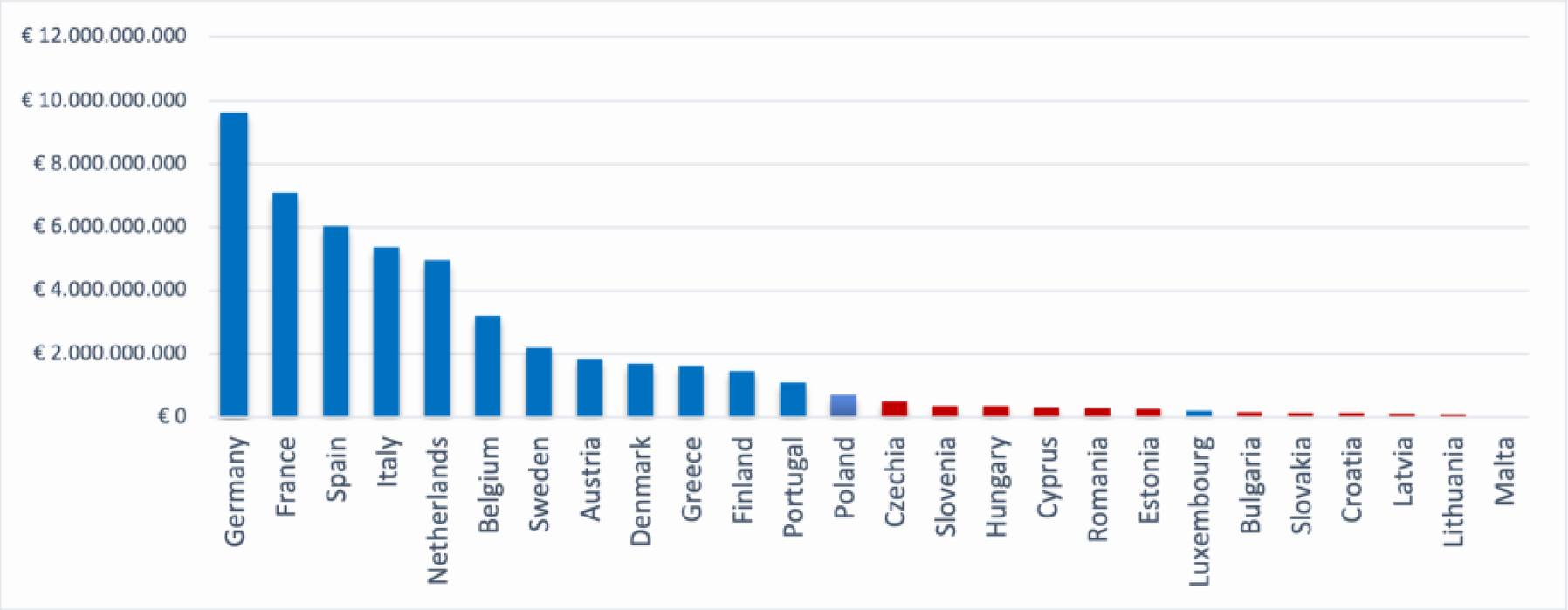
Graphical distribution of H2020 net contribution by country



Source: H2020 dashboard (European Commission, 2021)

Romania: background information

Graphical distribution of H2020 net contribution by country

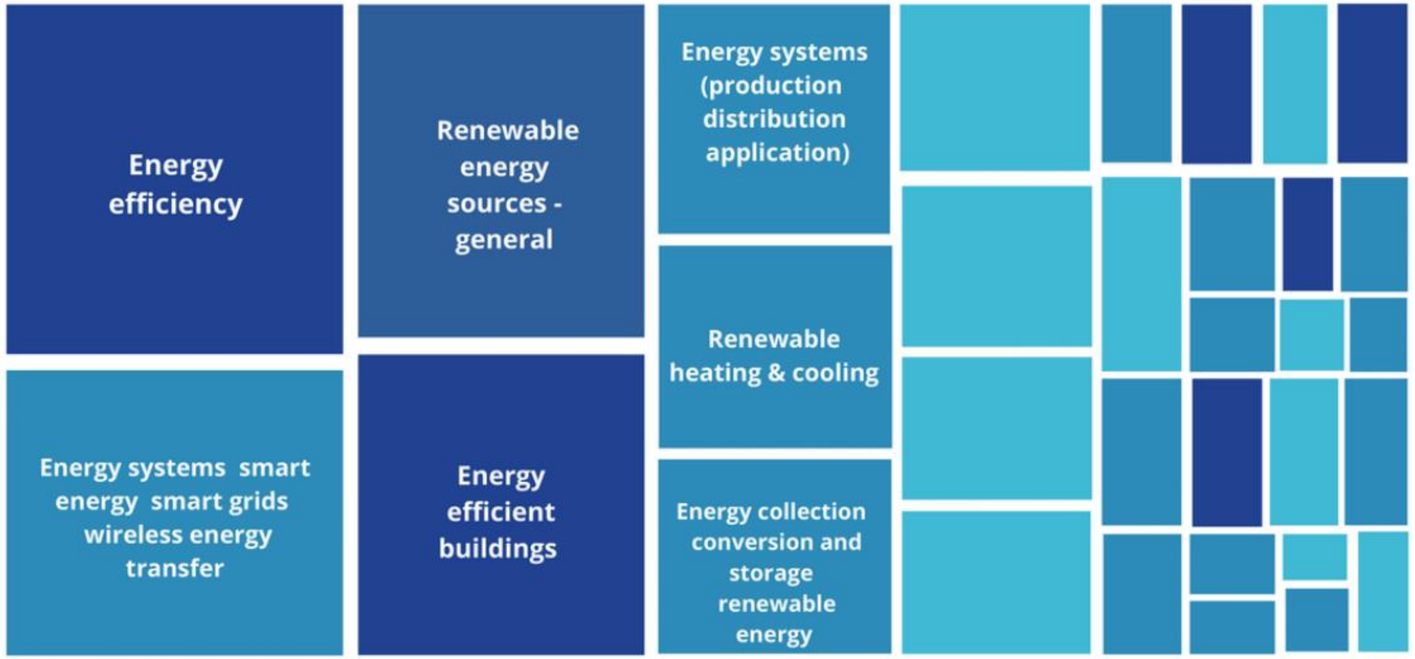


Only approximately 5% of the total H2020 budget goes to the Eu13 member states

H2020 “Secure, clean and efficient energy”

Romania: overview of participations by keyword in thematic priority

- Romania has received 300.3 M€ net EU contribution. Ranked 20 in terms of budget. But considering the size of the country, this is rather week performance.
- 30.5 M€ (10%) were allocated to thematic priority “Secure, clean and efficient energy”.
- Main technical topics: smart grids, storage, renewable heating and cooling and smart cities and communities.
- Most successful organisations: Polytechnical University of Bucharest, The Romanian Energy Centre and Technical University of Cluj Napoca.

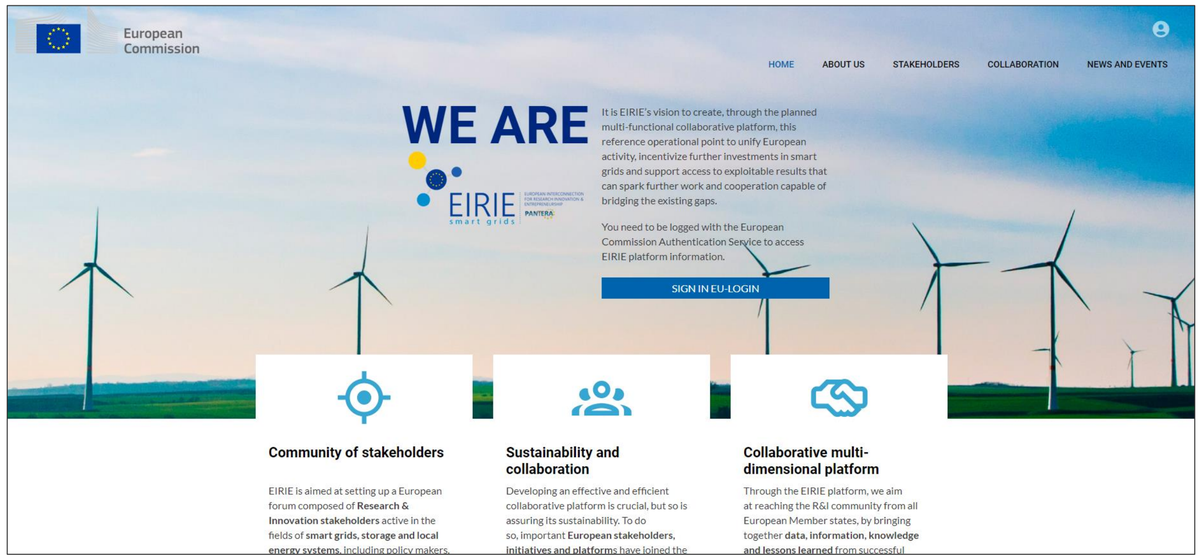


Source: Horizon dashboard

The EIRIE platform

*"**E**uropean **I**nterconnection for **R**esearch **I**nnovation and **E**ntrepreneurship"*

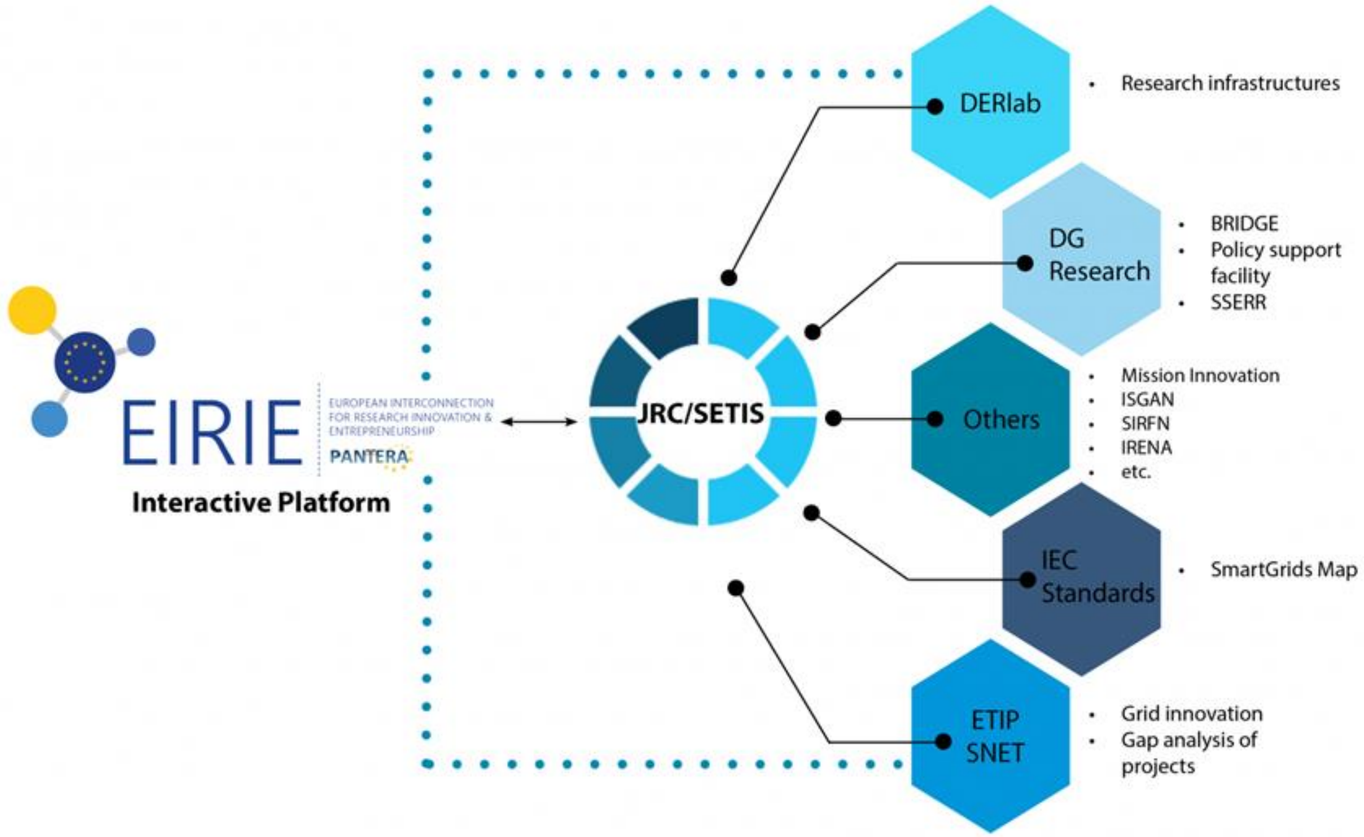
EIRIE's vision is to become a **reference operational point** to unify European activity, **incentivize further investments in smart grids** and support access to key exploitable results. We believe **pan-European cooperation, enabled by the right tools**, will help bridging the existing gaps.



www.EIRIE.eu

The EIRIE platform

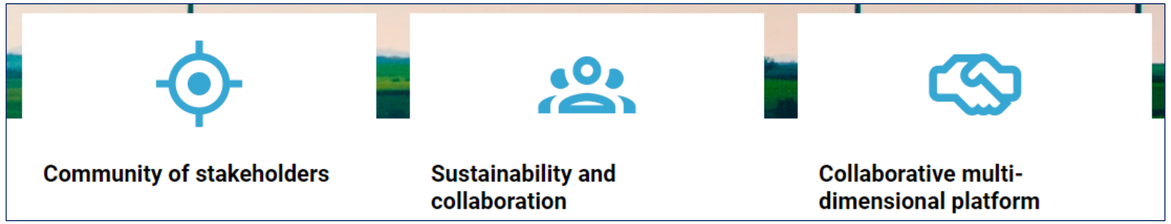
- Hosted in JRC's Smart Energy Systems environment
- **EU login credentials** for centralized authorization and verification
- State-of-the-Art **tools for the promotion of collaboration** between stakeholders at all different levels
- **Integrated with other relevant platforms**



Why EIRIE?

EIRIE will help bridge the gaps that currently exist in the energy field in Europe between Member States, by bringing together the attractiveness of successful partnerships being national, regional or European.

EIRIE will act as THE meeting point of all actors active in the fields of smart grids, storage and local energy systems in Research & Innovation from all Europe and will contribute to the achievement of the envisioned carbon-free system of 2050.



Benefits of using the platform

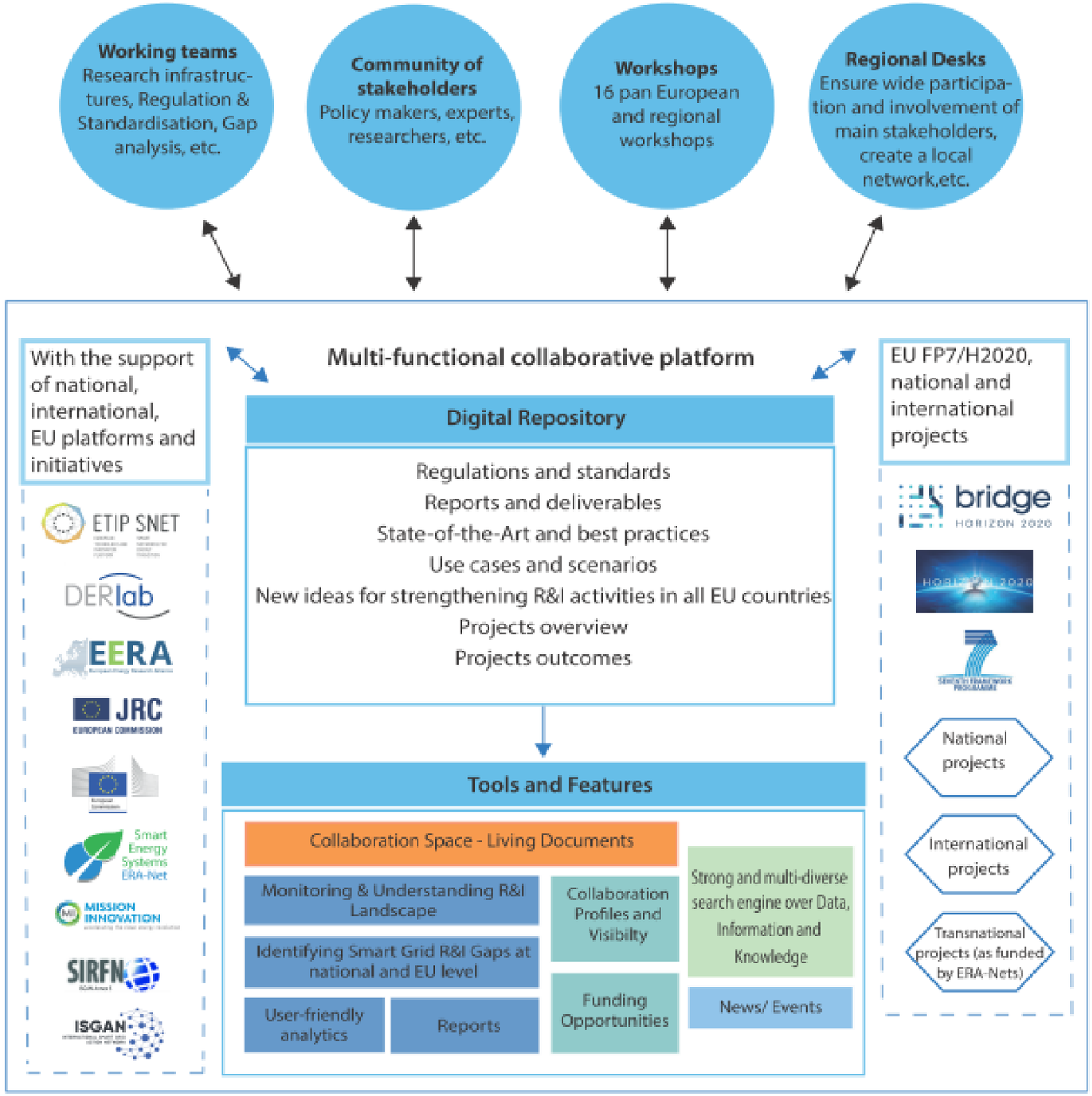
An easy access to information on potential funding and consortium building,

A central point for collaborating on the issues relevant for the energy sector

An active role in the community and a support in providing input to European policies,

The EIRIE platform

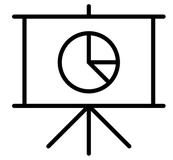
- A sustainable and interactive multi-dimensional pan-European platform.
- Knowledge-sharing mechanisms that will help identify, discuss and structure key R&I challenges.
- Regional desks and ad hoc working groups to respond to R&I needs and tackle key topics identified in the project.



EIRIE: Key areas and functionalities

Data area:

- Projects data collection (results, and outcomes, best practices, reports and deliverables, etc.)
- Standards and regulations



Information area:

- Projects related information through integration with JRC and CORDIS, Mission Innovation, ETIP SNET, BRIDGE, EXPERA, etc.

Knowledge area:

- Living documents

Search and linking functions:

- Advanced search functionalities

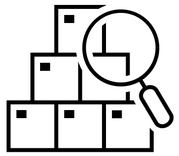
EIRIE: Value proposition

For researches

- ✓ Exploitable information from **smart grid projects**
- ✓ Information about **best practices** in the R&D sector
- ✓ **First-hand insights** into interesting smart grid projects, results, ideas, initiatives
- ✓ Access to **training material** and education programs

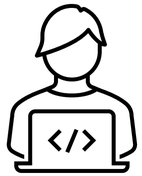
For R&I Organizations

- ✓ **Networking opportunities**, encouraging synergies with projects and initiatives
- ✓ **Information sharing** and promotion opportunities through highlighting key achievements
- ✓ **Fostering the engagement** of low R&I spending countries in EU level activities



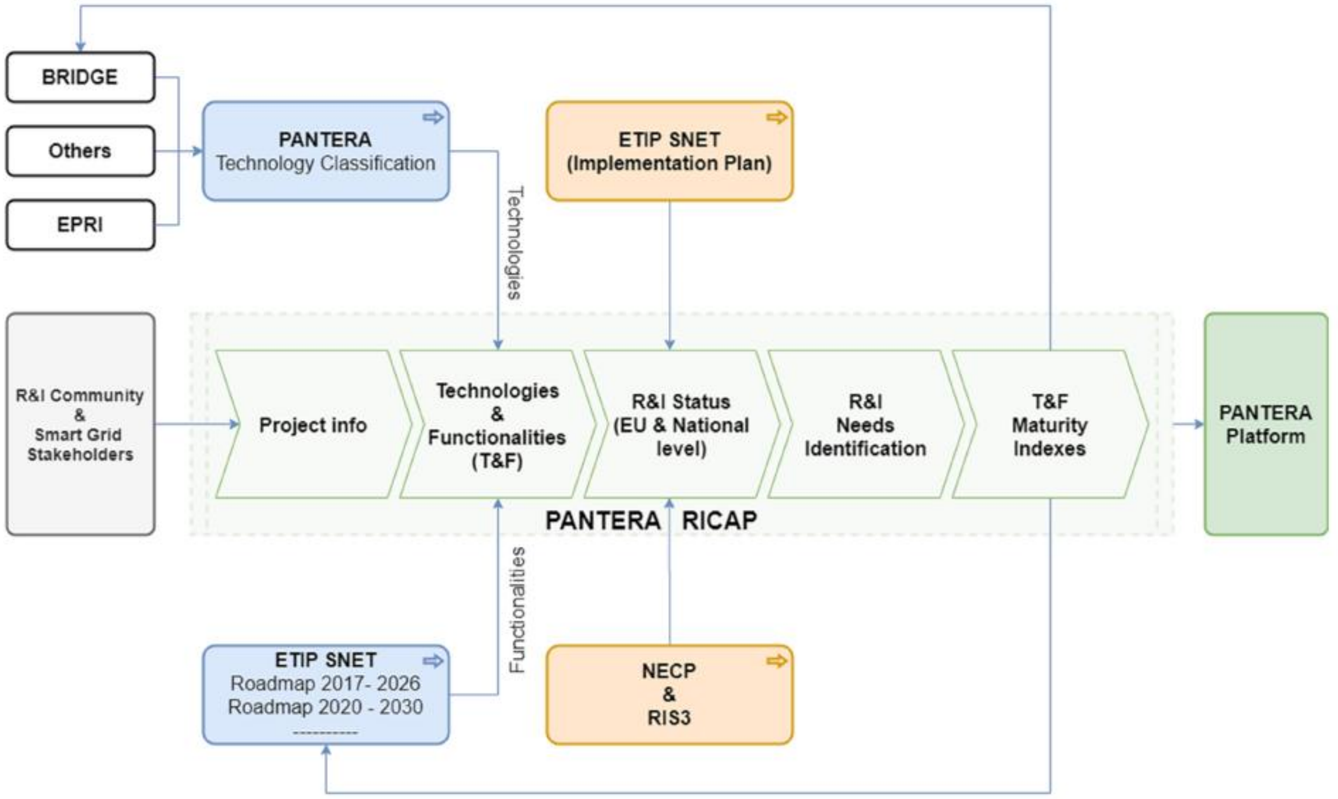
For Policy Makers

- ✓ Insights about R&I activities at **EU and national level**
- ✓ Policies fostering **R&I activities advancing**
- ✓ **Pooling together** different available instruments
- ✓ **Coordination** of R&I activities and networking



The RICAP process

Through the R&I status and Continuous gAP analysis (RICAP), the PANTERA project provides a methodology for EU initiatives' activities (such as the development of the ETIP SNET Implementation Plan and BRIDGE task forces) to focalize the efforts and promote the connection with Stakeholders.



Supporting the ETIP SNET

Group of Technologies	№	Technology/Systems
Integrated grid	IG1	Flexible ac transmission systems (FACTS)
	IG2	Models, Tools, Systems for the operation analysis, control and the development of the integrated grid including cost elements
	IG3	HVDC
	IG4	Forecasting (RES)
	IG5	Asset management
	IG6	Outage management, fault finding and associated equipment (including protection)
	IG7	Equipment and apparatus of the integra
	IG8	Equipment, sensing, monitoring, meast analysis and solutions and control
	IG9	Advance distributed control
	IG10	Feeder auto-restoration / self-healing
	IG11	Smart metering infrastructure
Generation	Ge24	Flexible generation
	Ge25	Solar including PV & Concentrated So
	Ge26	Wind
	Ge27	Hydropower
	Ge28	Hydrogen & sustainable gases
	Ge29	Other generation
Customers and market	CM12	Distributed flexibility, load, forecasting, management & control and demand response including end devices, communication infrastructure and systems
	CM13	Smart appliances
	CM14	Building control, automation and energy management systems
	CM15	Electric vehicles
	CM16	Energy communities
	CM17	Lighting
	CM18	Electricity market
Storage	St19	Electric Storage
	St20	Thermal Storage
	St21	Power to X
	St22	Pumped storage
	St23	Other Storage
Digitalisation, Communication and Data	DCD30	Communication networks including devices and systems for signals and data connectivity and solutions
	DCD31	Digital Twins
	DCD32	Artificial intelligence
	DCD33	Data and cyber security including repositories

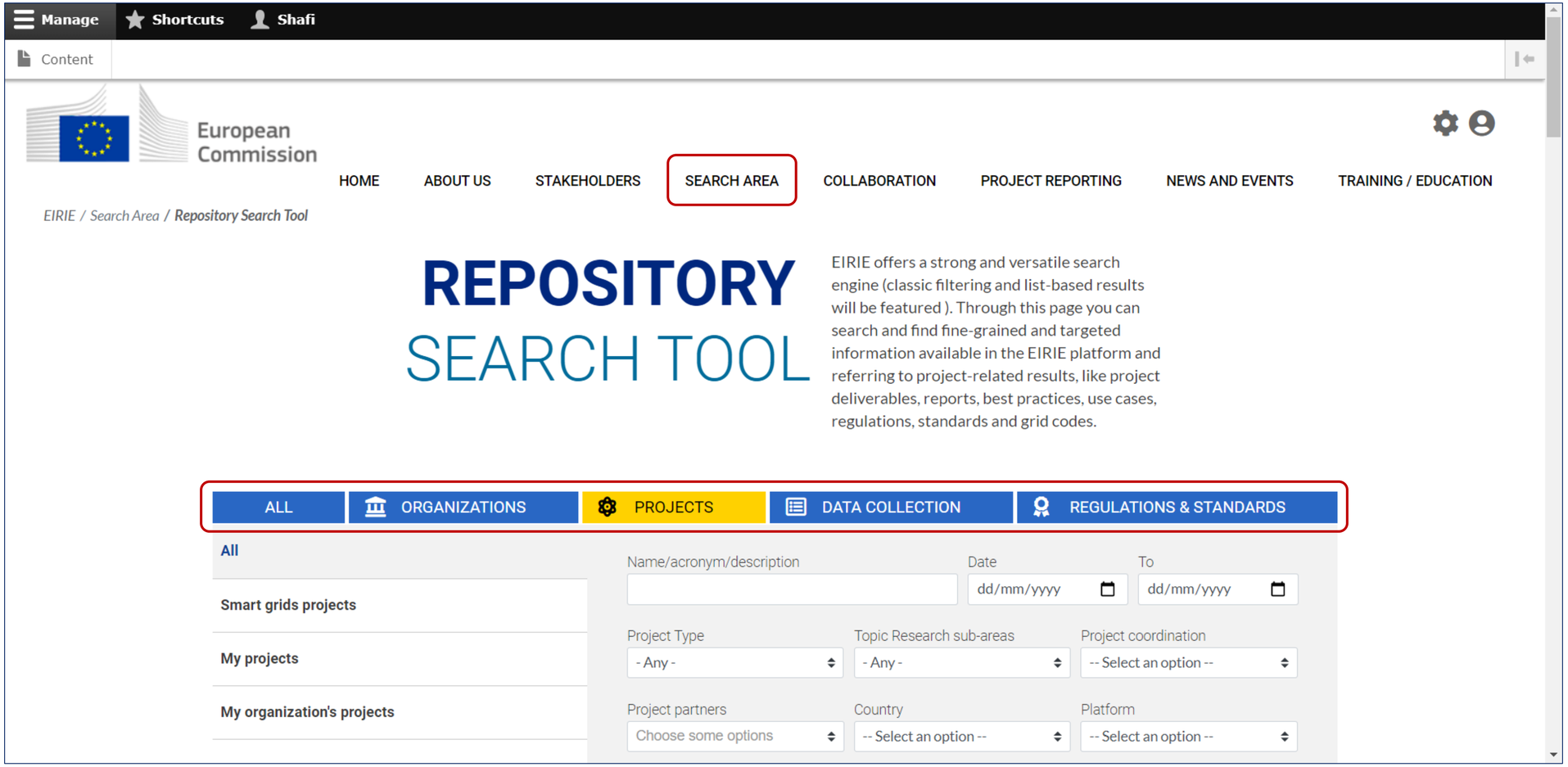
Functionalities

F1	Cooperation Between System Operators
F2	Cross Sector Integration
F3	Integrating the subsidiary principle – the customer at the center at the heart of the integrated Energy System
F4	Pan-European wholesale markets
F5	Integrating local markets (enabling citizen involvement)
F6	Integrating digitalization services (including data privacy, cybersecurity)
F7	Upgraded electricity networks, integrated components and systems
F8	Energy system business (includes models, regulatory)
F9	Simulation tools for electricity and energy systems (Software)
F10	Integrating flexibility in generation, demand, conversion and storage technologies
F11	Efficient heating and cooling for buildings and indu view of system integration of flexibilities
F12	Efficient carbon-neutral liquid fuels & electricity for in view of system integration of flexibilities

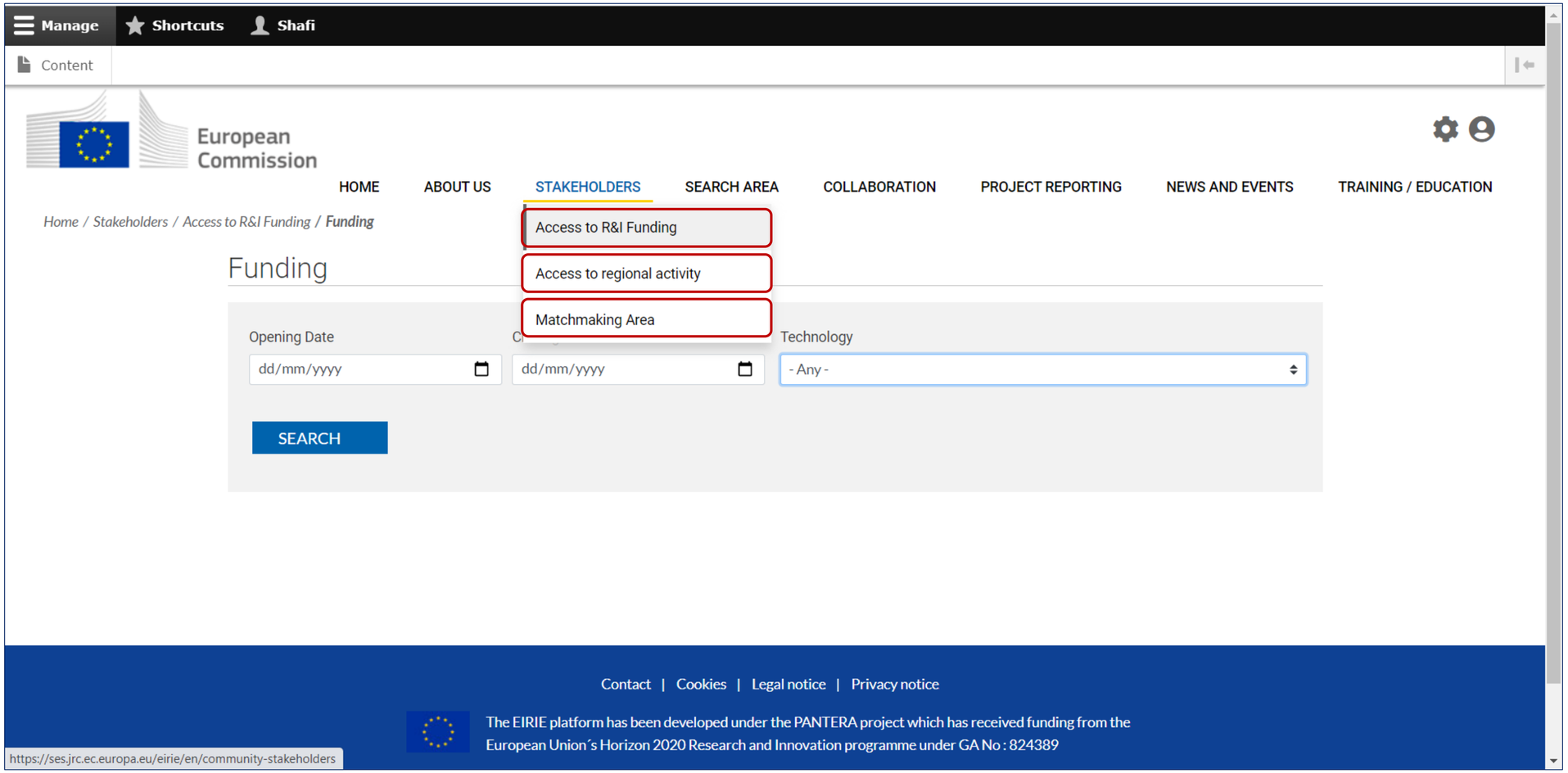
Functionalities-technologies link

Energy System Building Blocks	Functionalities (Short Name)	Relevant Systems and technologies
The efficient organisation of energy systems	F1 - Cooperation	5 - 11
	F2 - Cross-sector	15, 18, 20 - 25, 28
	F3 – Subsidiarity	12, 14, 18
Markets	F4 - Wholesale	4, 18, 19 ,24, 25, 26
	F5 - Retail	4, 12, 13, 15, 16, 18, 19, 24
Digitalization	F6 - Digitalization	8, 11, 13, 30 - 33
Infrastructure for Integrated Energy Systems	F7 – Electricity Systems & Networks	1, 3, 5 - 12
	F8 - Business	11 - 29
	F9 - Simulation	2, 4, 31, 32
Efficient energy use	F10 - Flexibility	12, 14, 16 - 24, 27 - 29
	F11 - Heating and Cooling	12, 14, 16, 18, 20, 22
	F12 - Transport	16, 18, 19, 28, 29

EIRIE: Search tool



EIRIE: Stakeholders section



PANTERA regional desk approach

- ✓ Strengthening national participation rate in smart grid investments by making national stakeholders' **needs and expectations more visible** on the European level.
- ✓ **Raise discussions** with national decision-makers, **sharing experience and challenges** in research and innovation, inviting local stakeholders to **interact more actively.**

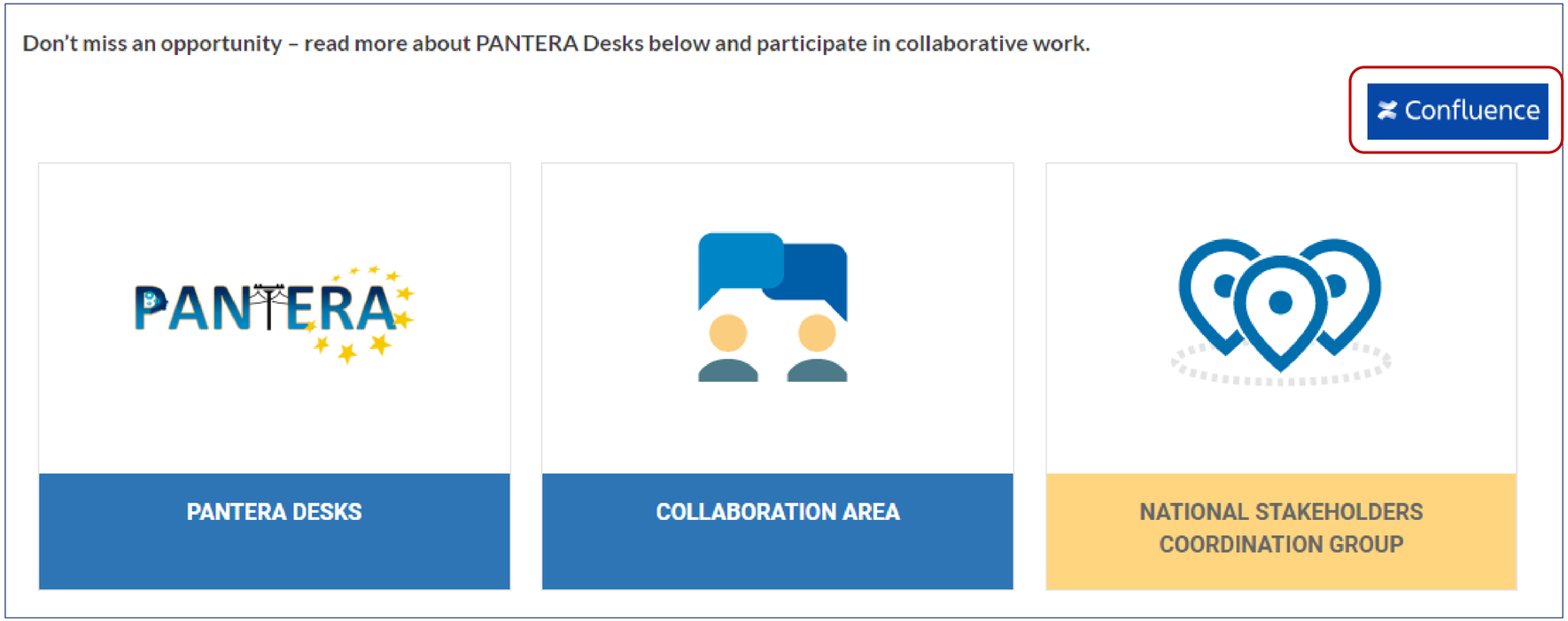
DESK 1	DESK 2	DESK 3
LATVIA	GREECE	MALTA
LITHUANIA	ROMANIA	CYPRUS
ESTONIA	BULGARIA	

DESK 4	DESK 5	DESK 6
CZECH REPUBLIC	ITALY	PORTUGAL
SLOVAKIA	CROATIA	IRELAND
POLAND	HUNGARY	

BEST PRACTICE DESK

EIRIE: Access to regional activity

- ✓ **Connecting the Research & Innovation EU community**
- ✓ **Creating a strong and expandable network**
- ✓ **Enhancing collaboration and knowledge sharing**

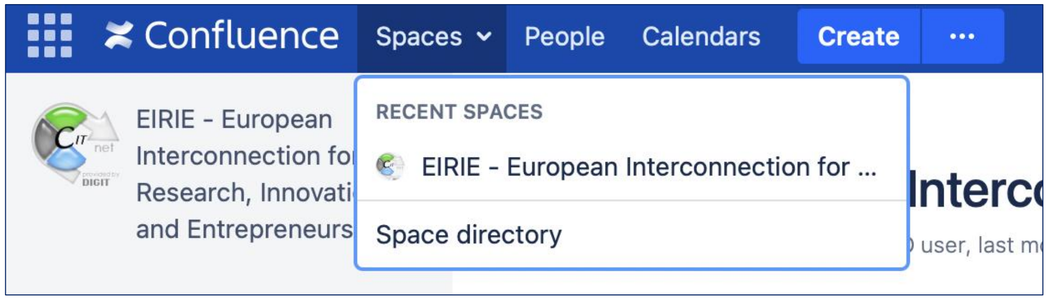


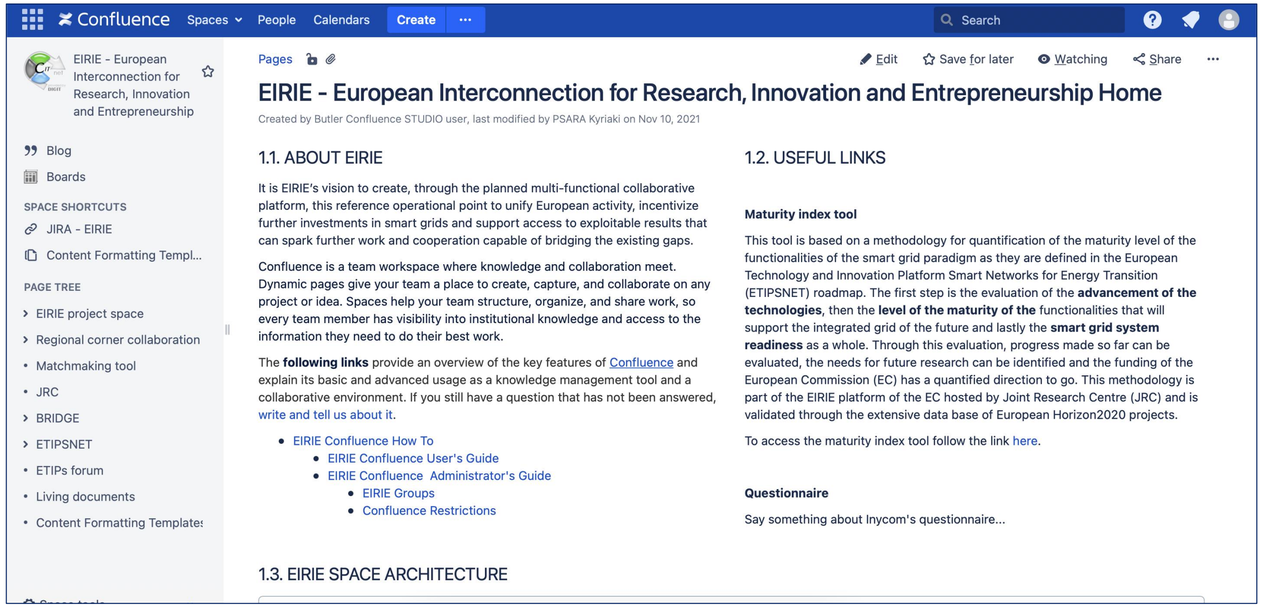
EIRIE: Collaborating through Confluence

Confluence is a collaboration wiki tool

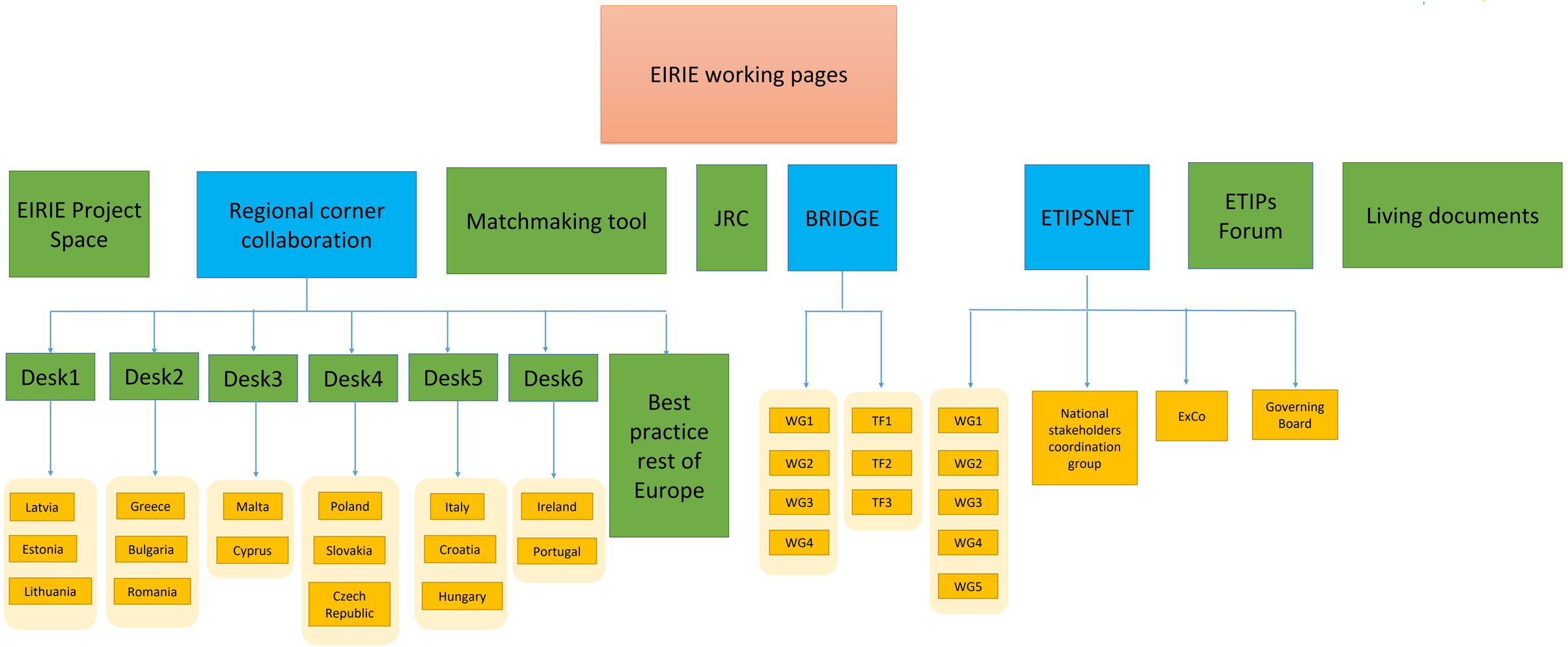
Confluence is a **team workspace** where knowledge and collaboration meet by creating, collaborating, and organising all the work done within EIRIE in one place.

Confluence is for teams of any size and type, from those with mission-critical, high-stakes projects that need rigor behind their practices, to those that are looking for a space to build team culture and engage with one another in a more open and authentic way.

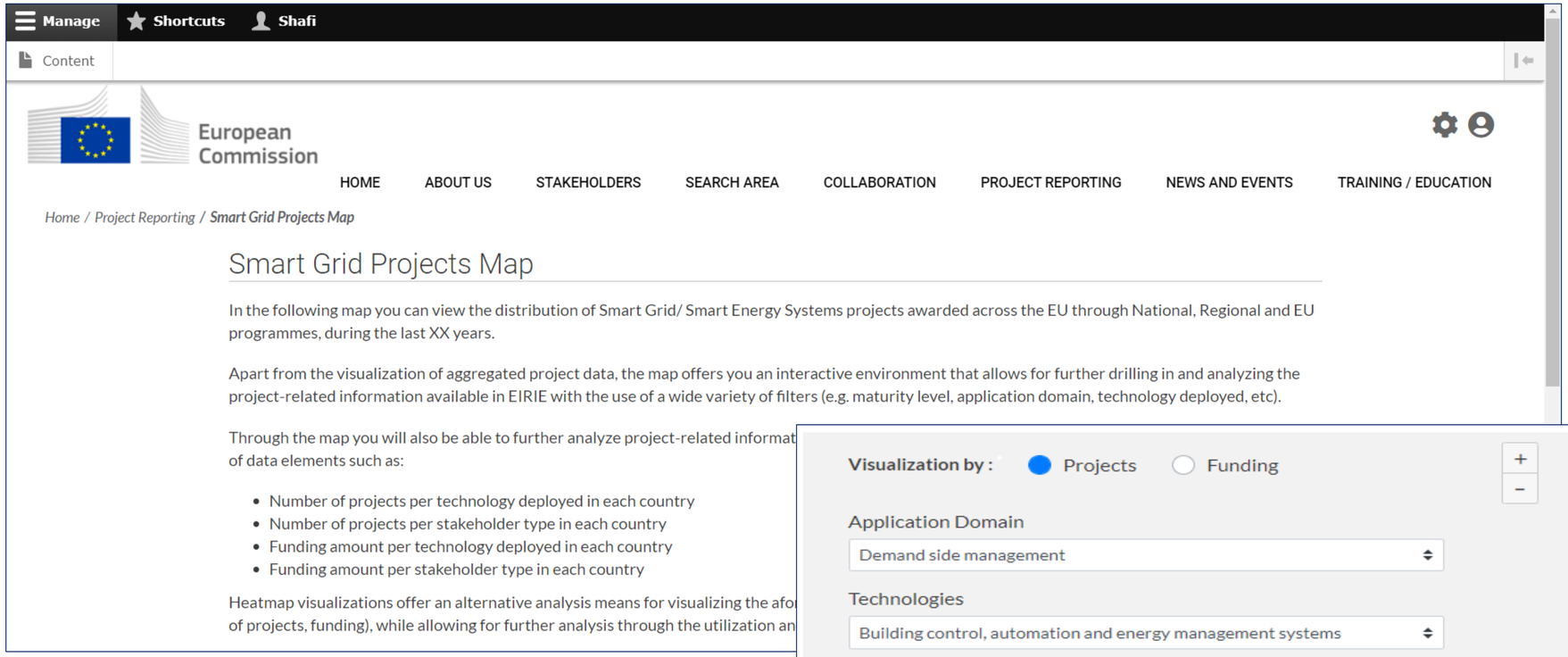


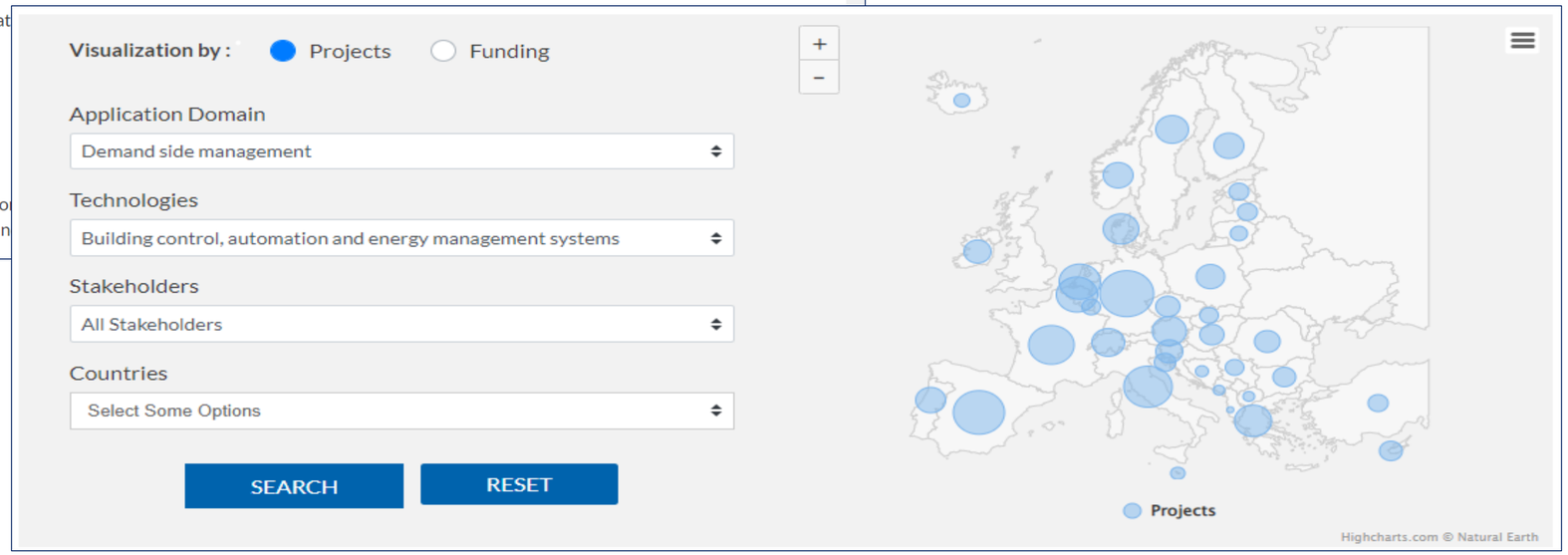


EIRIE: Collaborative space

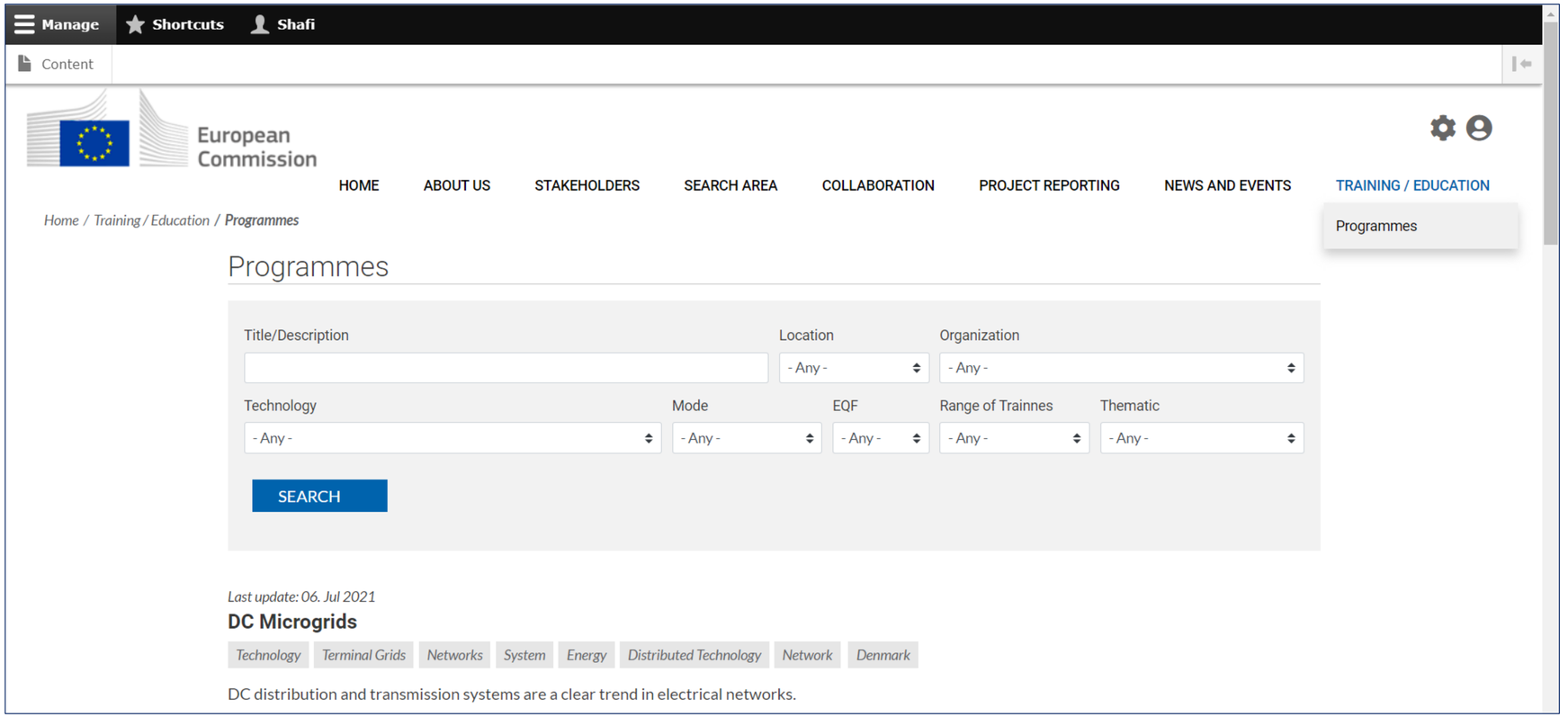


EIRIE: Smart grid projects map





EIRIE: Training/Education



In collaboration with:

EIRIE: Collaborations

SUPEERA

eneuron

ERIGRID 2.0
Connecting European
Smart Grid Infrastructures

EDDIE
EDucation for DIgitalisation of Energy

Smart Built4EU
The European Smart Buildings Community

ASSET

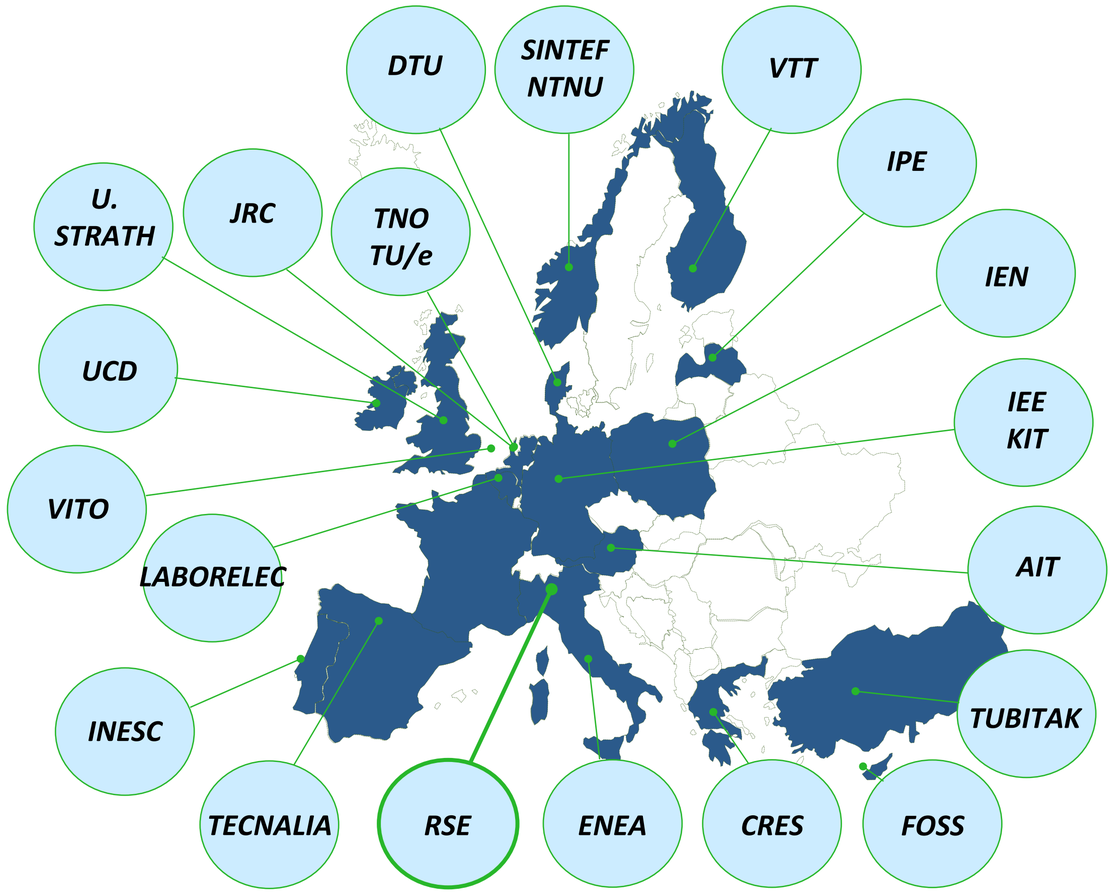
Get in touch

www.pantera-platform.eu

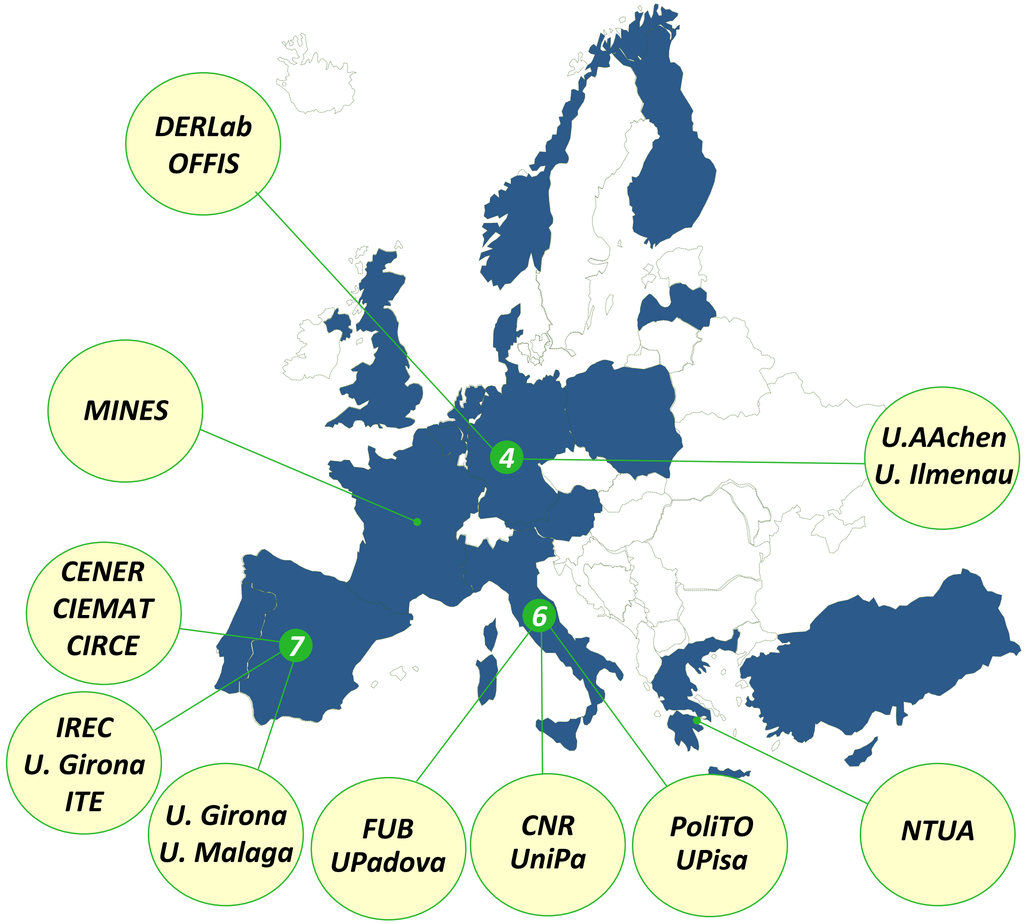
www.eirie.eu

EERA JP Smart Grids Participants

Full participants

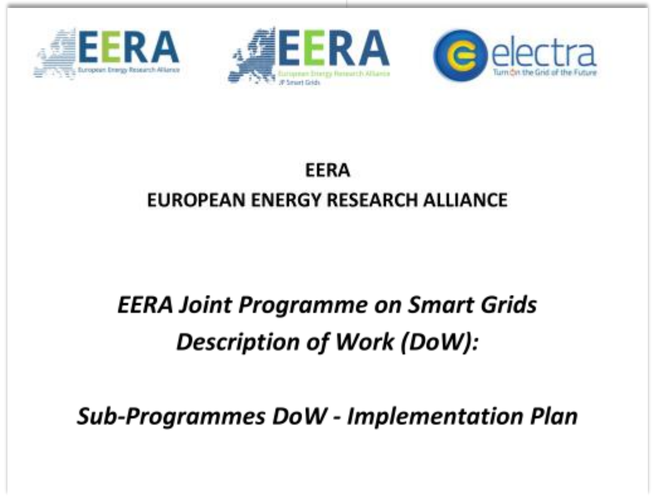


Associated participants



EERA JP Smart Grids – Sub-Programmes

- **SP1** – Technologies and tools for the management of future power systems (coordinated by DTU)
- **SP2** – Storage integration (coordinated by VTT)
- **SP3** – Distribution Network Flexible operation (coordinated by FOSS)
- **SP4** – Consumer and Prosumer activation and Engagement through digitalization and ICT (coordinated by VITO)
- **SP5** – Flexible transmission network (coordinated by SINTEF)



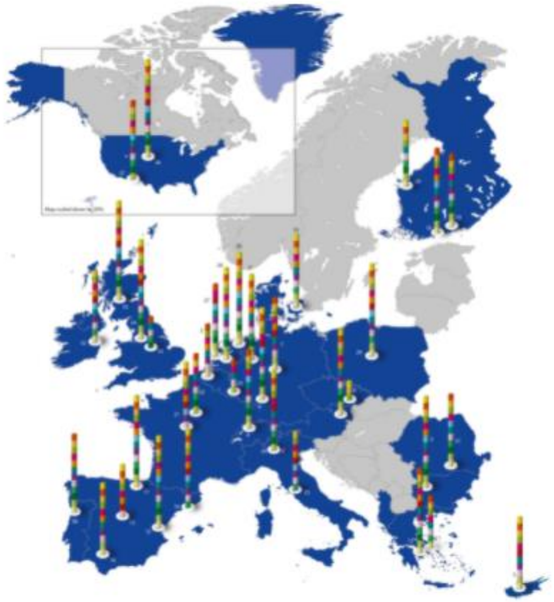
DERLab

DERLab is an association of over thirty institutes from Europe and U.S. performing testing and research related to Smart Grids and grid integration of DER

- Accredited **testing of DER-units and SG-equipment**
- **Support of SG development** and integration of Renewable Energies
- Information and **knowledge exchange**
- Contribution to **standardisation** activities

DERLab - database

The Database of DER and Smart Grid Research Infrastructure **contains systematic information on research infrastructure and related assets, testing capabilities** and services of research institutes and organisations worldwide focusing on DER and Smart Grids.



	High Voltage & High Power	Microgrids & Distribution Network	Power Electronics	Power Quality & EMC	PV Systems	Wind Systems	Biomass / CHP Systems	Fuel Cell Systems	Storage Systems	E-Mobility	Smart Buildings	ICT	Cybersecurity	HIL / Co-simulation	Education & Training
1 Austrian Institute of Technology (AT)	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
2 Lemcko of Ghent University (BE)		■		■	■	■			■	■	■				■
3 Technical University of Sofia R&DS (BG)	■	■	■	■	■	■		■	■	■	■	■	■	■	■
4 HES-SO Valais (CH)		■	■	■	■			■	■	■	■	■	■	■	■
5 FOSS of the University of Cyprus (CY)	■	■	■	■	■		■		■	■	■			■	■
6 Brno University of Technology (CZ)	■		■	■											
7 Fraunhofer IEE (DE)		■	■	■	■	■	■		■	■	■			■	■
8 Karlsruhe Institute of Technology (DE)	■	■	■	■	■		■	■	■	■	■	■	■	■	■
9 RWTH Aachen (DE)	■	■	■	■	■	■			■	■	■	■	■	■	■
10 DTU Electrical Engineering (DK)	■	■	■		■	■			■	■	■	■		■	■
11 CRES (EL)		■	■	■	■				■		■	■			■
12 NTUA (EL)		■	■	■	■	■	■		■	■	■	■	■	■	■
13 CIEMAT (ES)	■	■	■	■	■	■	■				■				
14 EES-US Group of the University of Seville (ES)	■	■	■	■	■	■			■	■	■			■	■
15 ITE (ES)	■	■	■	■	■	■		■	■	■	■	■	■	■	■
16 SEER (ES)	■	■	■	■	■	■	■	■	■	■	■	■			
17 TECNALIA (ES)	■	■	■	■	■	■		■	■	■	■	■	■	■	■
18 VTT Technical Research Centre of Finland (FI)		■	■	■	■	■		■	■	■	■	■	■	■	■
19 TUAS (FI)		■	■	■	■				■	■	■	■	■	■	■
20 University of Vaasa (FI)	■	■	■	■					■		■	■	■	■	■
21 CEA-INES (FR)	■	■	■	■	■	■	■	■		■	■				
22 EDF (FR)		■	■		■				■	■	■	■	■	■	
23 Enel (IT)			■	■	■	■	■			■	■	■			
24 RSE (IT)	■	■	■	■	■		■		■	■	■	■	■	■	
25 SnT (LU)		■			■				■		■			■	
26 KEMA (NL)	■	■	■	■	■	■		■	■	■	■	■	■	■	■
27 TNO (NL)		■			■		■	■	■	■	■	■	■	■	■
28 TU Delft (NL)	■	■	■	■	■	■		■	■	■	■	■	■	■	■
29 TU Lodz (PL)	■	■	■	■	■	■	■	■	■	■	■	■		■	■
30 INESC Porto (PT)		■	■	■	■	■			■	■	■	■	■	■	■
31 MicroDERlab Group (RO)		■	■	■	■		■	■	■		■	■	■	■	■
32 University College Dublin (IE)			■	■	■	■	■	■	■	■	■	■			■
33 Keele University (UK)		■							■		■	■	■		
34 University of Manchester (UK)	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
35 University of Strathclyde (UK)	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
36 NREL (US)	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
37 Sandia DETL (US)		■	■	■	■	■		■	■	■	■	■	■	■	

International research collaboration opportunities fostering EU Clean Energy transition in Romania –

PANTERA / SUPEERA joint Workshop, 23 March 2023, Bucharest

The Strategic Role of Romanian TSO for Green Transition in East and Central Europe

Dr. Mihai PAUN

Member of the Supervisory Board

CNTEE TRANSELECTRICA SA

Transelectrica

WE LEAD THE POWER

TRANSELECTRICA – MAIN FIGURES

- **KEY INFRASTRUCTURE**
- **81 ELECTRICAL SUBSTATIONS**
- **9000 KM OVERHEAD LINES LENGTH**
- **400/220/110 kV VOLTAGE LEVELS OPERATED**

- **BUSINESS ENVIRONMENT IN KEY FIGURES**
- **≈ 1,4 BILLIONS EURO TEN YEARS DEVELOPMENT PLAN**
- **740 mil EURO TURNOVER (2021)**
- **424 million Euro - funding from the Modernisation Fund for 9 strategic investment projects**
- **Financing Structure:**

i. 30% own funds;
ii. 50% european funds
iii. 20% credits

Transelectrica

WE LEAD THE POWER

Strategic Priorities of Transelectrica

- **Integration of Renewables / Decarbonization / Energy system transformation**
- **Security of supply / System security**
- **HV Grid development**
- **Cooperation with other TSOs, Distribution System Operations (DSOs), cooperation with Non-EU countries**
- **Digitalization**
- **Offshore**
- **Market development**
- **Interface between two Regional Coordination Centers (CCR) namely Core CCR and SEE CCR**
- **Reduce the costs with grid losses**
- **Energy storage**

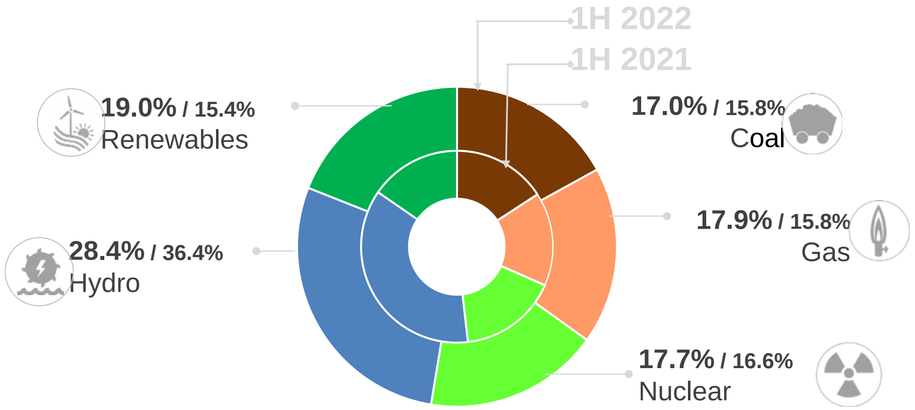
Successful energy system transformation and security of supply are TSO top priorities; to reach this goal, grid development and cooperation are deepened.

Transelectrica

Results 1H2022

1H 2022

Electricity net production mix

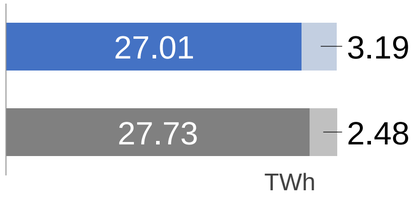


1H 2022

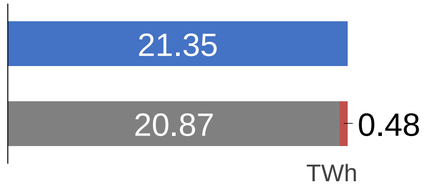
0,72TWh
Net import

2.23%

National electricity balance



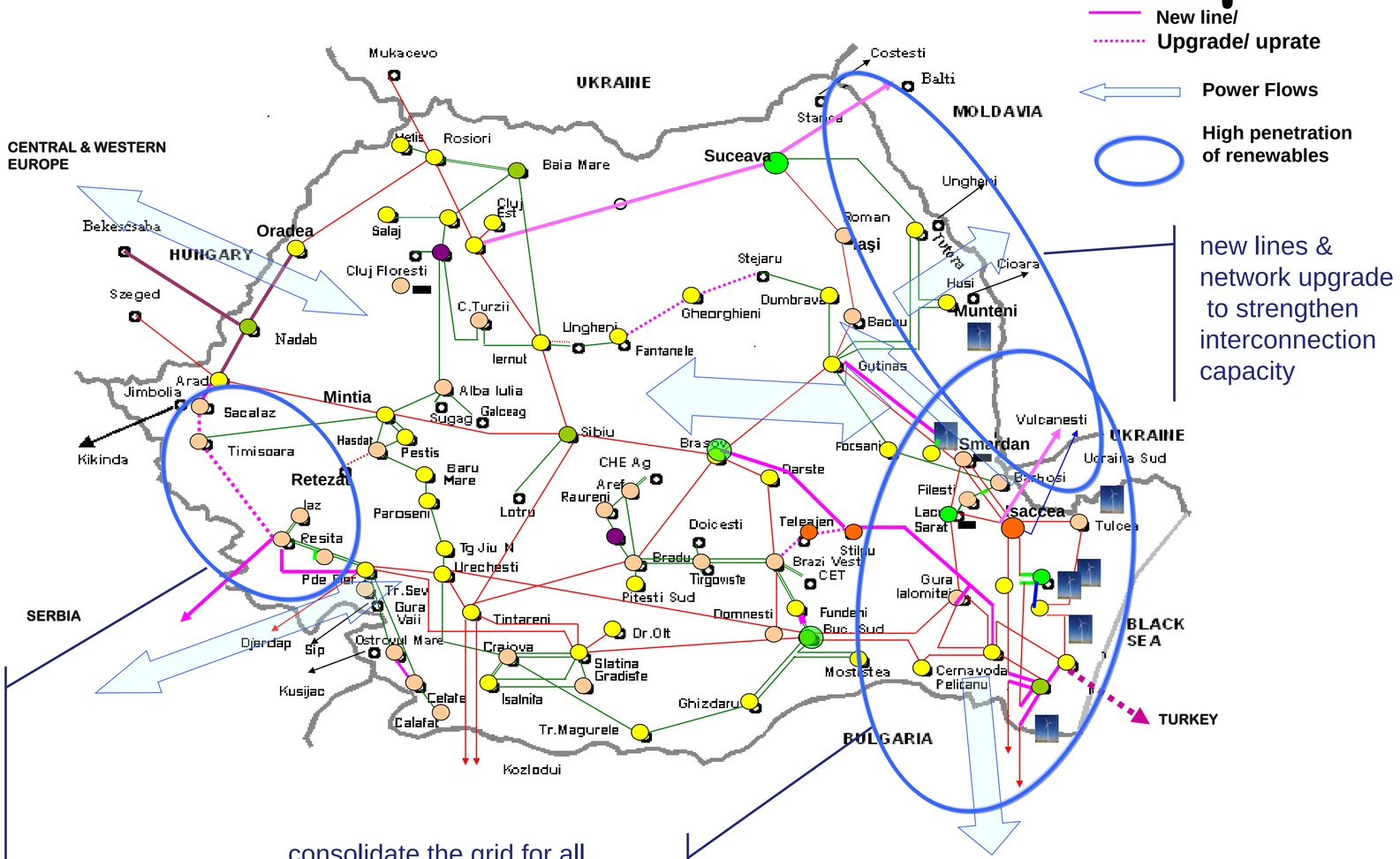
Transmission loses



National power plant output
Import
National consumption
Export

Grid in-take volume
Grid out-take volume
Grid losses

Strategic Priorities of Transelectrica
Romanian Transmission Grid Map



Transelectrica

WE LEAD THE POWER

National Ten Years Network Development Plan 2022-2031

- **Frequency:** National TYNDP - once every two years
- Last approved version – 2022

- **Content:**
- Main projects are meant to:
  - refurbish and modernize the substations from the National Power System;
  - increase the interconnection capacity;
  - integrate the wind energy production (increase the transmission capacity to evacuate energy production from the south-east area);
  - integrate the energy production from other power plants (solar, hydro)
  - increase the security of supply for the energy consumers.
- Other projects for:
  - EMS SCADA system
  - Mettering system
  - Security system

Renewables installed Capacity and NECP targets [MW]

Type	Already Installed Pi [MW]	Connection contracts Pi [MW]	Technical approvals and connection studies Pi [MW]	Total Pi [MW]	NECP target 2025 Pi [MW]	NECP target 2030 Pi [MW]

NECP - National Energy and Climate Plan
NECP targets for wind and solar will be met.

Transelectrica

European Projects

European “Ten-Years Network Development Plan (TYNDP) 2022” and the National Development Plan contain the following project for RES integration and increased capacity on RO-BG border:

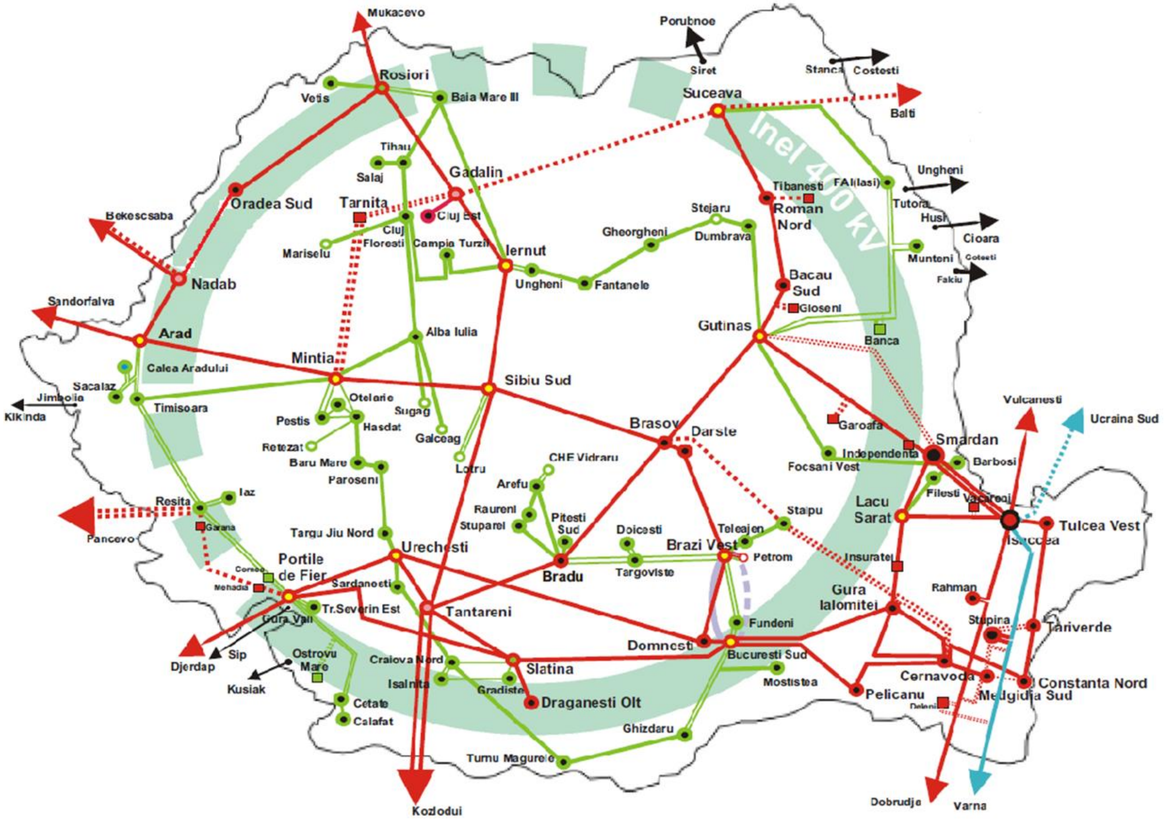
Project 138 „Black Sea Corridor”

- 400 kV OHL d.c. Smârdan – Gutinaş(RO) ;

- 400 kV OHL d.c. Cernavodă - Stâlpu, one circuit in-out in Gura Ialomiţei substation(RO) ;

- 400kV OHL Varna - Burgas (BG).

In January 2018 CNTEE Transelectrica SA obtained European funds through CEF mechanism for the PCI - OHL Cernavodă-Gura Ialomiței –Stâlpu.



Transelectrica

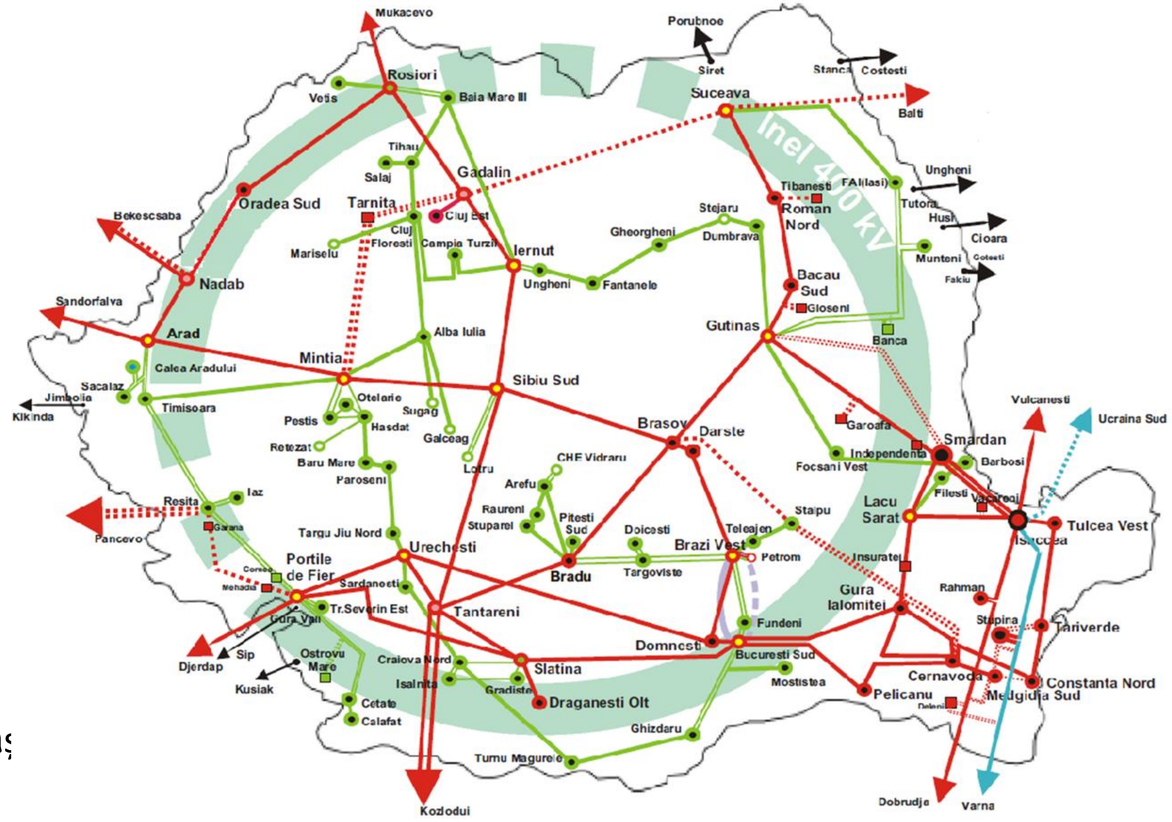
WE LEAD THE POWER

Joint Application on Call for Cross Border Renewable Energy (CB RES) Status

In 2022 ESO EAD and Transelectrica applied for the following cluster of projects:

RO part:

- New RES production capacities (1 000 MW)
- Increase the capacity of the following existing power lines:
- OHL 220 kV Gutinaș – Dumbrava;
- OHL 220 kV Dumbrava – Stejaru;
- OHL 220 kV Fântânele – Ungheni;
- OHL 400 kV Gura Ialomiței – București Sud;
- OHL 400kV Cernavodă-Pelicanu;
- OHL 400kV Pelicanu-București Sud;
- Install second circuit of the new 400kV OHL Smârdan-Gutinaș
- Install Static VAR compensators (SVC);
- Install Flexible AC transmission systems to control power flows.



Transelectrica

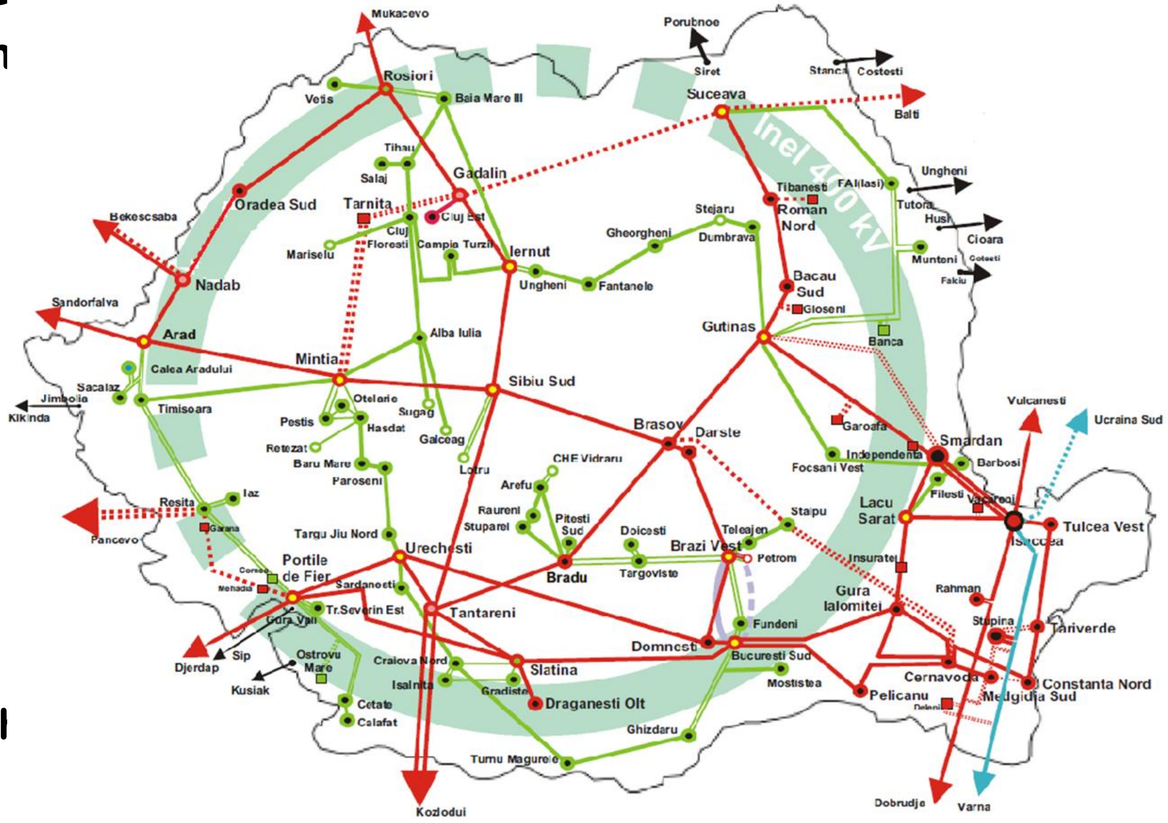
WE LEAD THE POWER

Joint Application on Call for Cross Border Renewable Energy (CB RES) Status

In 2022 ESO EAD and Transelectrica applied for the followin cluster of projects:

BG part:

- New wind generation capacities in North Bulgaria (5 430 MW),
- New solar generation capacities in North Bulgaria (2 483 MW),
- Construction of three new 400/110 kV substations
- Retrofit of two legacy substations from 220/110 kV to 400/110 kV, and extension of 400 kV switchyard of one 400/220 kV substation
- Construction of new 400 kV power lines with a total lengtl of 310 km
- Reconstruction and construction of 110 kV power lines with a total length of 350 km

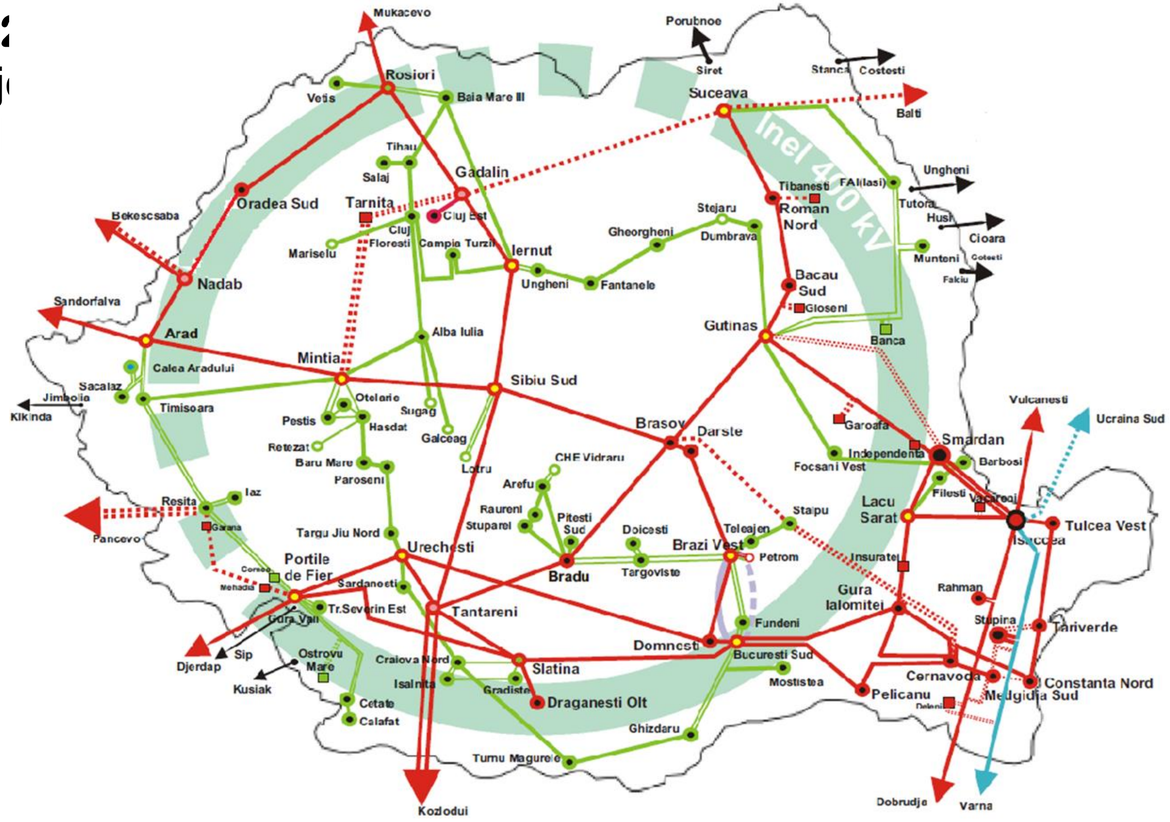


Transelectrica

WE LEAD THE POWER

European Projects

European "Ten-Years Network Development Plan (TYNDP) 20
and the National Development Plan contain the following proj
for for RES integration and increased capacity on RO-RS and
RO-HU border:



Project 144 „Mid Continental East Corridor"

- **400 kV OHL d.c. Reşiţa (RO) – Pancevo (Serbia);**
- **400 kV OHL Porţile de Fier – Reşiţa and 400 kV Reșița substation(RO) ;**
- **upgrade to 400 kV of OHL 220 kV d.c. Reşiţa – Timişoara – Săcălaz – Arad, and 400 kV substations Timişoara and Reşiţa(RO).**

Transelectrica

WE LEAD THE POWER

European Projects

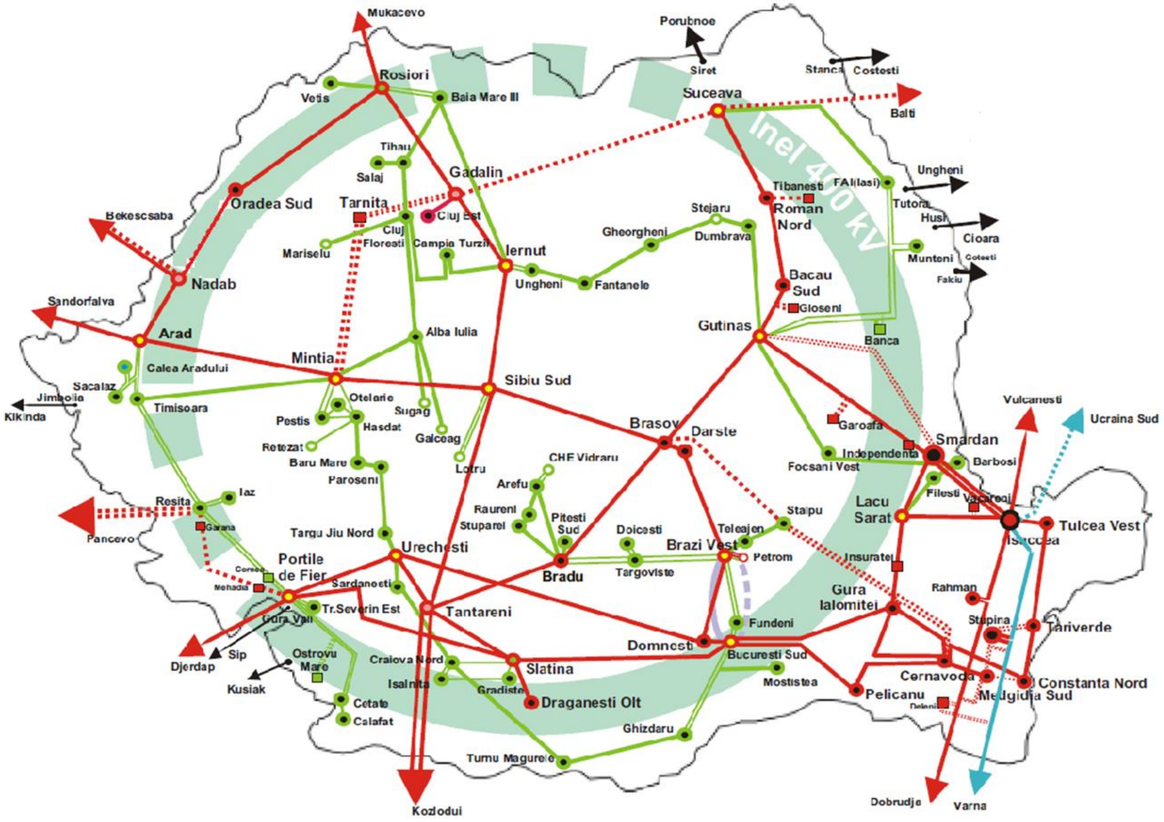
European “Ten-Years Network Development Plan (TYNDP) 2022” and the National Development Plan contain the following project for RES integration and increased capacity on RO-HU border:

Project 259 „RO-HU”

- new 400kV interconnection line Oradea (RO)-Jozsa (HU)

- new 400/220 kV transformer in substation Rosiori (RO)

- increase the capacity of 220 kV OH line Urechesti-Tg. Jiu-Paroseni- Baru Mare-Hasdat (RO)



Transelectrica

WE LEAD THE POWER

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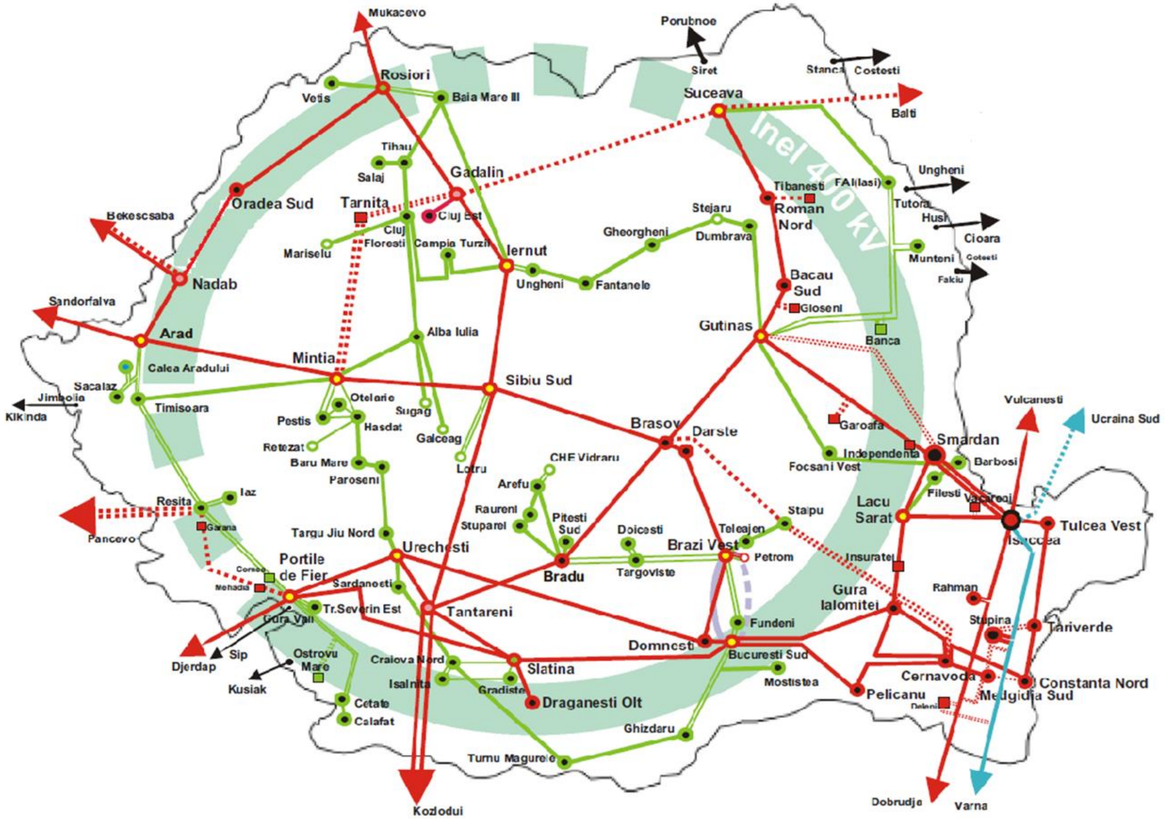
European “Ten-Years Network Development Plan (TYNDP) 2022” and the National Development Plan contain the following project for RES integration and increased capacity on RO-RS border:



Project 341 „North CSE Corridor”

- **Portile de Fier (RO) - Djerdap (RS) - 2nd circuit**
- **New SS 400/110 kV Belgrade 50 (former name Belgrade West) (RS)**
- **New OHL 400 kV WPP Cibuk - SS Belgrade 50 (RS)**

Transelectrica

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Looking to the Future

→ Encourage TSOs Regional Cooperation

→ Strengthen European TSOs Cooperation

→ Securing the European Electricity Grid

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RA TEN
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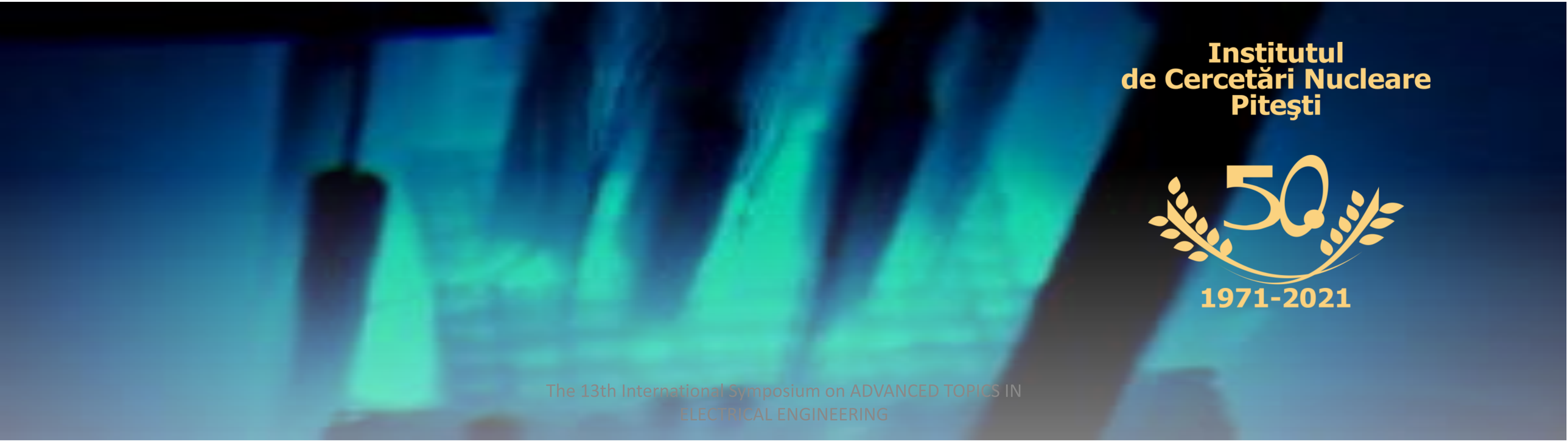
INSTITUTUL DE CERCETĂRI NUCLEARE

RATEN's national and international involvement in the clean energy transition

Daniela Diaconu

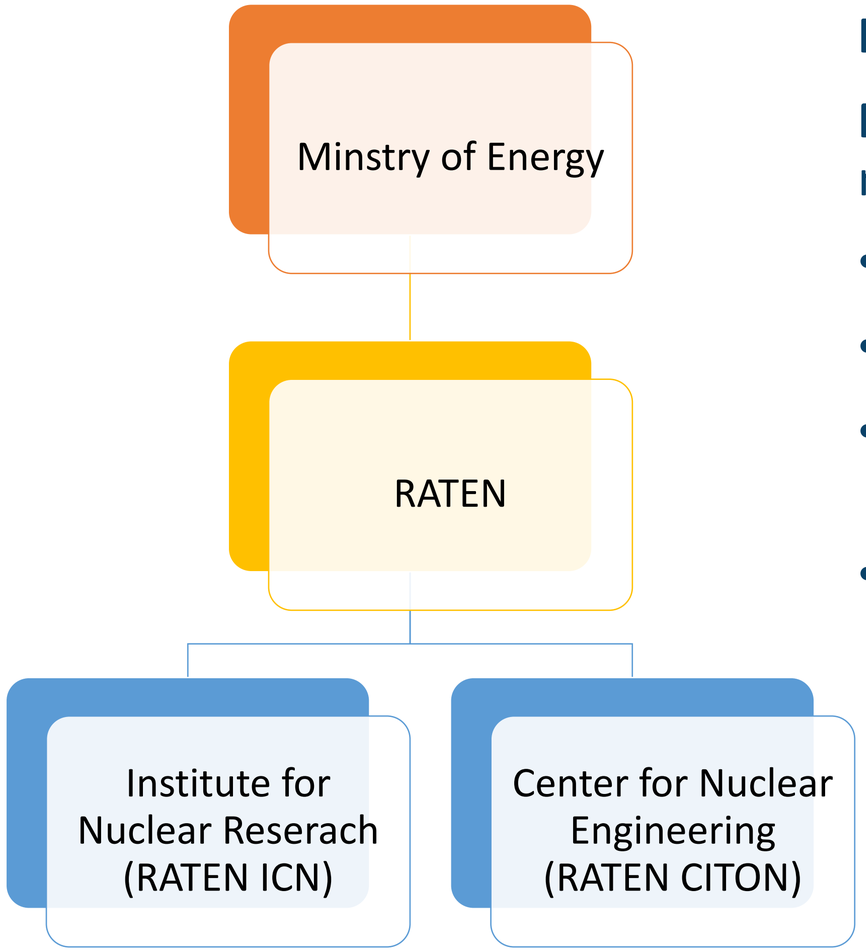


The 13th International Symposium on ADVANCED TOPICS IN ELECTRICAL ENGINEERING

Outlines

- RATEN mission, competences and infrastructure
- Nuclear power programme in Romania
- R&D activity and projects towards climate neutrality
- European dimension of RATEN activity – participation in European Platforms

RATEN



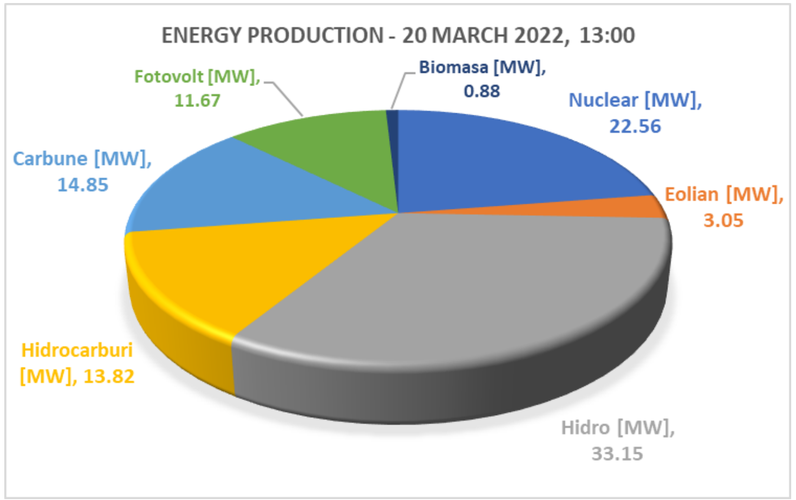
RATEN - State Owned Company ‘’Technologies for Nuclear Energy’’

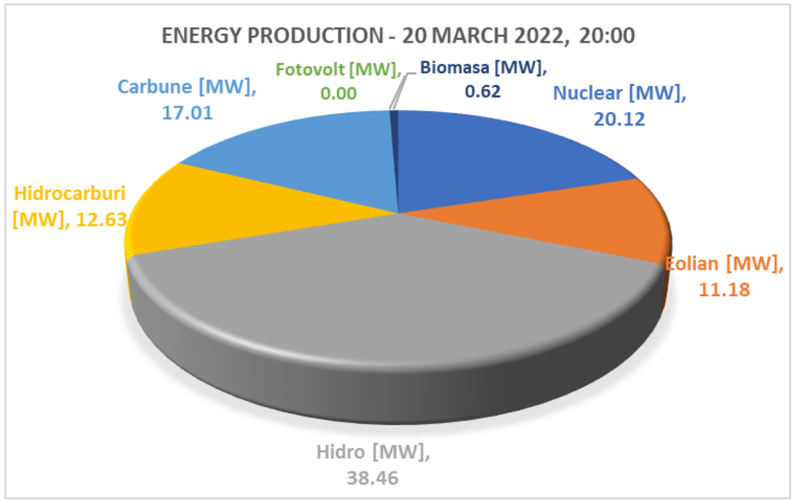
Main mission: provide scientific and technical support for the national nuclear energy programme

- continuous development of competences and skills
- continuous development of R&D infrastructure
- broad area of nuclear research – experimental, computing, modelling
- international cooperation in nuclear energy research

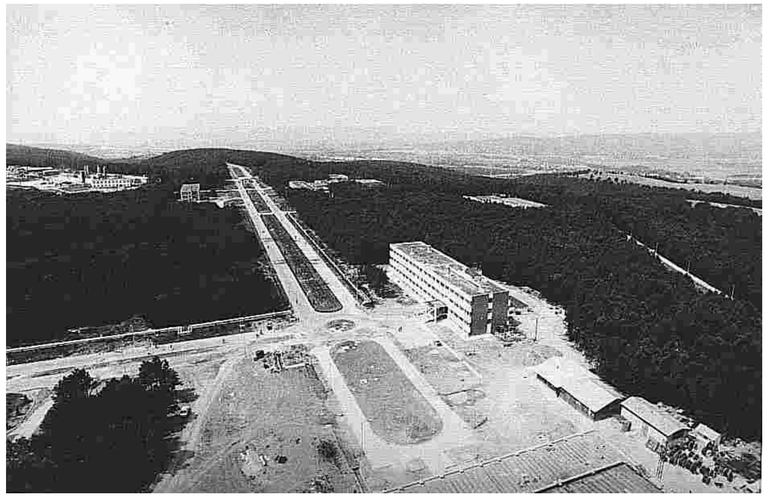
Nuclear programme in Romania

- Currently: 2 CANDU Units in operation at Cernavoda NPP – 20% electricity production
- Future plans: increase nuclear share to **35% by 2030**
  - **U1 refurbishment (2027-2029)→ +30 years of operation**
  - **Completion of Units 3&4 (2030, 2031)**
  - **SMRs: NUSCALE 462MWe (2030)**
  - **ALFRED Demonstrator 125MWe (2035) → development of LFR technology**





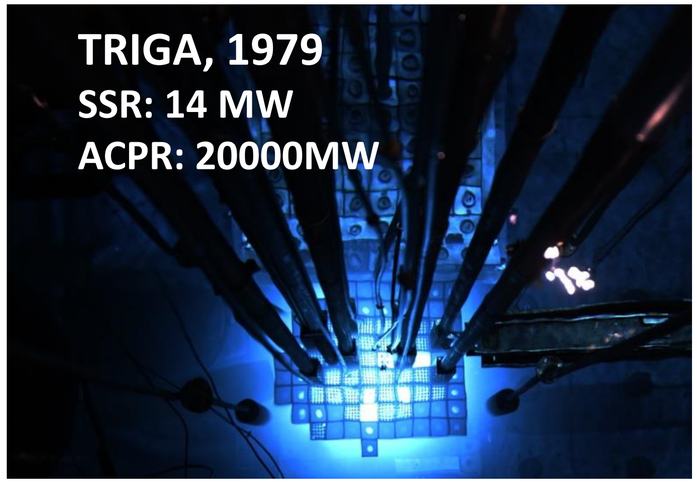
RATEN ICN

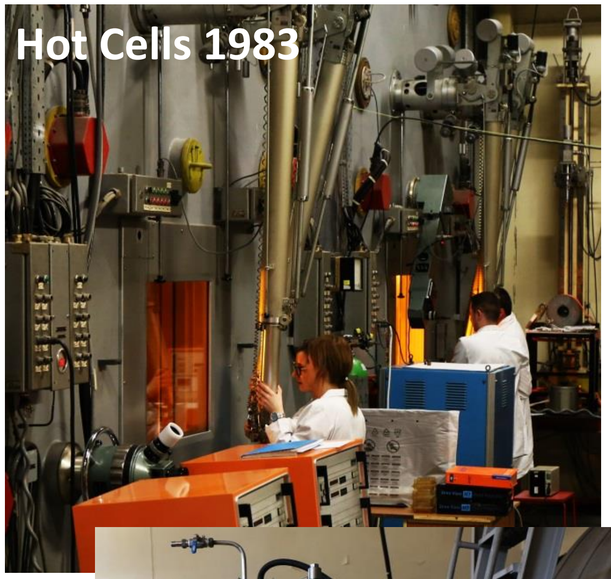


- Established in 1971 to support the development of the nuclear power programme
- First mission:
  - develop, test and qualify the standard CANDU fuel fabrication technology → transferred to Fuel Fabrication Plant

- Other important contributions:
  - Assistance to the Cernavoda NPP commissioning and first criticality (U1- 1996 and U2 -2007)
  - Testing fueling heads for U2
  - Design and manufacture I&C equipment (ex. for radioactivity monitoring of heat transfer system, failed fuel detection, etc.)

Complex infrastructure supporting our mission





R&D activity in support to nuclear safety

18 thematic programmes

P1	Reactor Physics and Nuclear Safety
P2	Fuel Channel
P3	Nuclear Fuels
P4	Fuel Handling System
P5	Radioactive Waste Management
P6	Radiation and Environmental Protection
P7	Steam Generator
P8	Nuclear Equipment and Process Systems
P9	Circuit's Chemistry
P10	Instrumentation and Control
P11	Plant Life Management
P12	Advanced Reactors
P13	TRIGA Reactors Performance
P14	Radioisotopes and Irradiation Technologies
P15	Information Technology
P16	Non Power Nuclear Applications
P17	Heavy Water and Tritium
P18	International Cooperation

CANDU technology

Gen IV
LFR technology

Research reactor

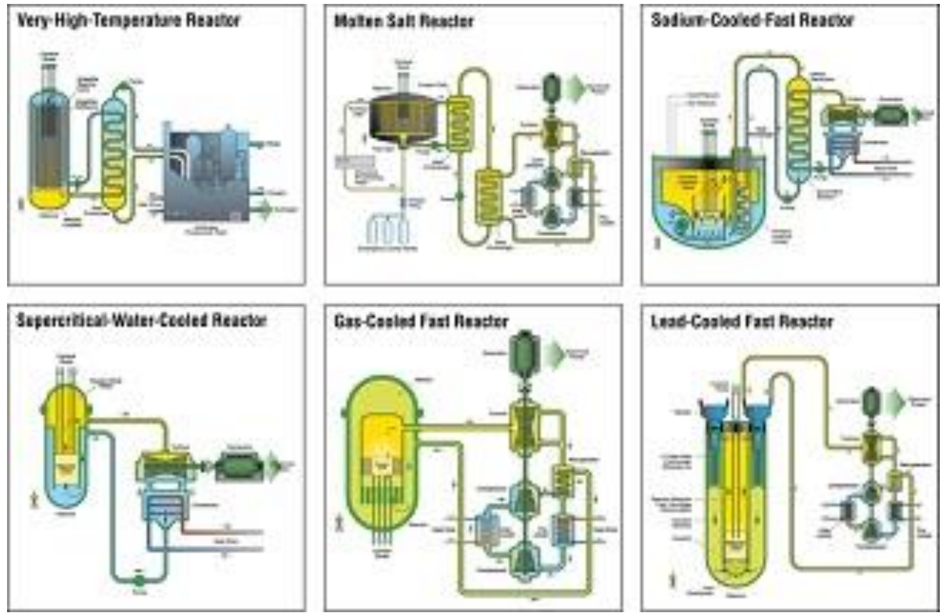
Generation IV nuclear systems

- Efficient use of natural resources (x1000)
- Waste minimization (radiotoxicity and volume) (by 10)

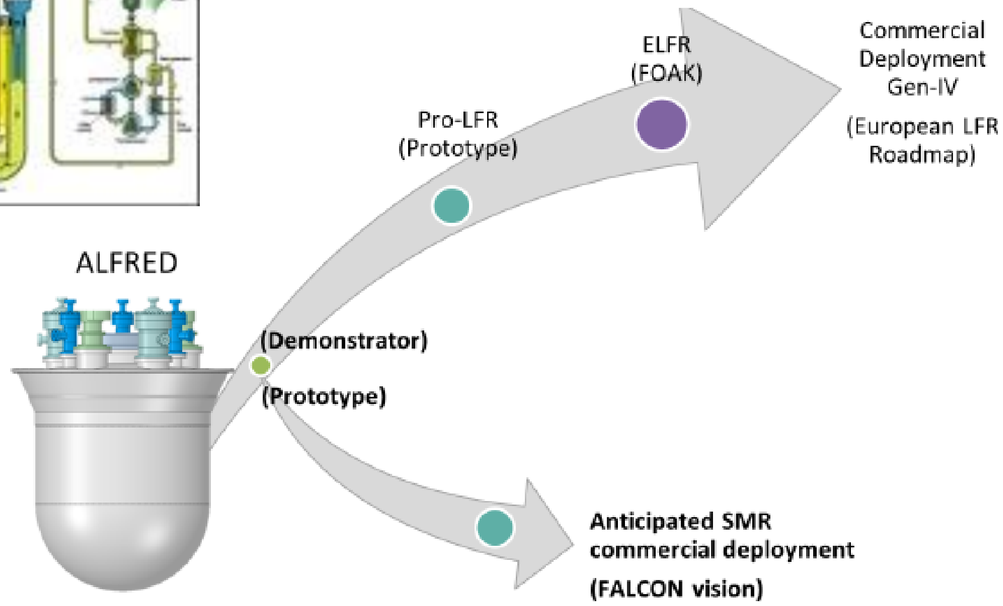
- Clear advantage of life-cycle costs compared to other energy sources
- Financial risk comparable with other energy project

- Excellence in safety and reliability
- Extreme low probability and degree of core failure.
- No need for emergency plans outside the reactor site

Lead-cooled fast reactor technology (LFR)



- ALFRED - Advance Lead Fast Reactor European Demonstrator
  - demonstrate technological and economic viability of the European LFR concept (mid term)
  - prototype of a commercial LFR SMR (shorter time)

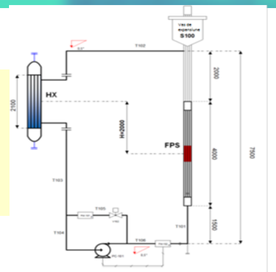


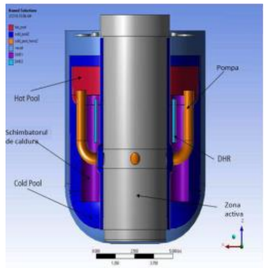
FALCON

ANSALDONUCLEARE
ENEA
RATEN ICN

The ALFRED Project and FALCON consortium

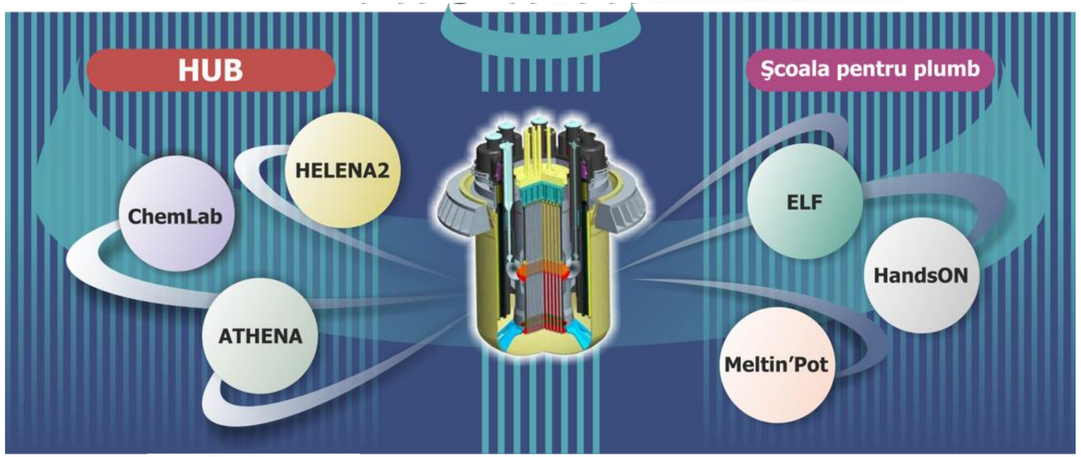
- demonstration of flow regime control (forced and natural circulation)
- fuel assembly and control rods behavior

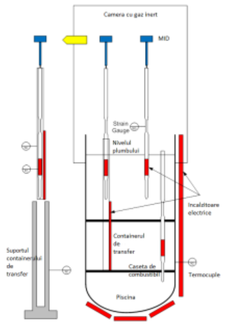




- complete simulation of all ALFRED operating regimes
- endurance tests for components, equipment and systems
- measuring reliability characteristics

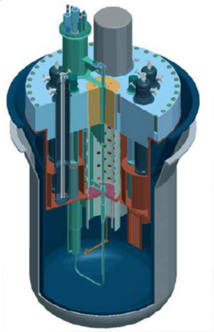
- control and monitoring of chemical regime of liquid lead (Oxygen control)
- interaction between liquid lead and structural materials

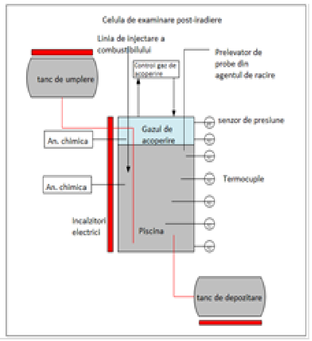




- fuel assemblies handling (full scale) to demonstrate complete control of fuel loading / unloading

- multi-purpose experimental installation, designed to test the major components of ALFRED reactor: steam generator, primary pumps, fuel assembly, control rods (scale: 1: 1)





- phenomenology associated to severe accidents in LFR (FP transport and retention)
- interaction between fuel, cladding and lead

RATEN Participation in EU Platforms

SNETP
Sustainable Nuclear Energy Technology Platform

ESNII
European Sustainable Nuclear Industrial Initiative

NUGENIA
NUclear GENeration II & III Association

RATEN ICN PITEŞTI
INSTITUTUL DE CERCETĂRI NUCLEARE

enen

eurad science

ETSON
EUROPEAN TECHNICAL SAFETY ORGANISATIONS NETWORK

igd·tp

SET Plan

- Representation of Romania in:
  - Steering Group
  - Bureau of SG
  - Action 10, Nuclear

- Active participation in IWG-Nuclear, definition of Implementation Plan
  - RDI for Generation IV, LFR systems
  - CANDU specificities (RWM, LTO, radiation protection - Tritium)
-

- Position paper of the SET-Plan Implementation Working Group 10
  - Harmonization of licensing of SMRs, both WCR and Gen IV for a deployment in EC countries
  - Facilitate deployment of large LWR units with advanced safety features based on proven technology by reasonable simplification of licensing and permitting processes
  - Maintain and strengthen the existing European know-how, skills and nuclear technology infrastructure to establish European industrial leadership in nuclear energy sector
  - Support utilization of nuclear energy for decarbonized hydrogen production
  - Utilization of suitable funds for accelerating of new state-of-the-art nuclear energy technologies deployment

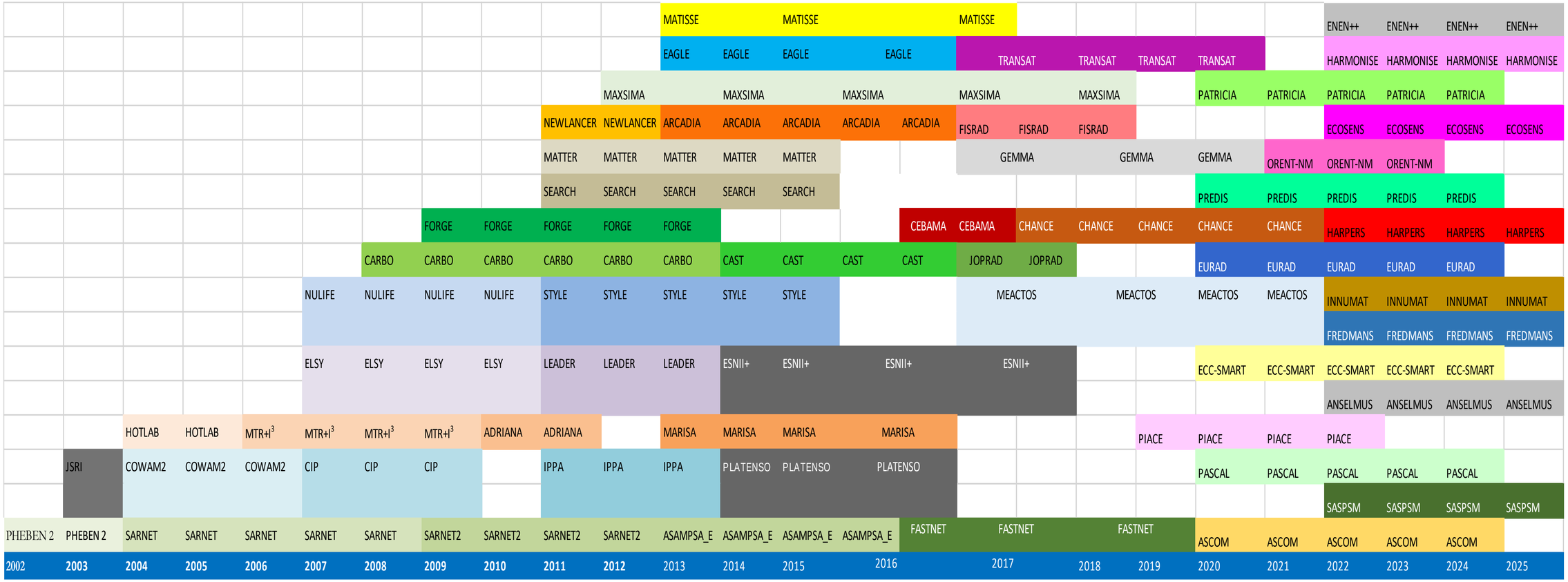
ESNII

ESNII addresses the need for demonstration of Generation IV Fast Neutron Reactor technologies, together with supporting research infrastructures, fuel facilities and R&D work.

*..... **The ALFRED demonstrator for Lead-cooled Fast Reactor**, and ALLEGRO for Gas-cooled Fast Reactor technologies are also **part of the roadmap**.*

EU projects

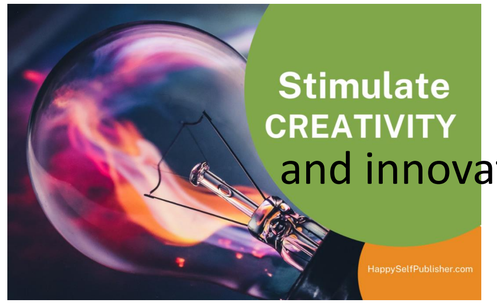
- 60 projects since 2002
- 16 projects ongoing
- 4 projects coordinated by RATEN ICN



Benefits

Provide framework to promote projects and consolidate political and professional support

Facilitate creation of communities of practice



Foster cooperation between specialists, teams, institutes

Faster transfer of knowledge and competencies building

RA TEN ICN PITEŞTI
INSTITUTUL DE CERCETĂRI NUCLEARE

Thank you for your attention!

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Tel: +40 248 213400
Fax: + 40 248 262449
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E-mail: office@nuclear.ro

Towards emerging power systems: Correlation of national, European and international R&D efforts

Mihaela Albu

Politehnica University of Bucharest,
Faculty of Electrical Engineering
MicroDERlab group

- MicroDERLab is a Research Group at UPB, reuniting teams from the **Faculty of Electrical Engineering, Faculty of Automation and Control and the Faculty of Power Engineering**. It promotes a **common research agenda on electrical engineering topics** focusing measurements and instrumentation for a faster deploying of the intelligent networks of the future.
- Expertise:

  Instrumentation for power systems;

  synchronized measurements; WAMCS

  DC measurements

  Grid integration of RES; active distribution grids

  Microgrids (including DC and hybrid architectures)

  Emerging Power Quality concepts

  Real time digital simulation (HIL)

  Work on **standardization** (IEEE SA, various IEC bodies, ASRO)

- **MicroDERLab is a member of DERLAB network**

http://erris.gov.ro/microderlab

Research and Innovation Projects

EMERGE

Advanced Measurement Framework for Emerging Electric Power Systems

I-GRETA

Intelligent FIWARE-based generic energy storage services for environmentally responsible communities and cities.

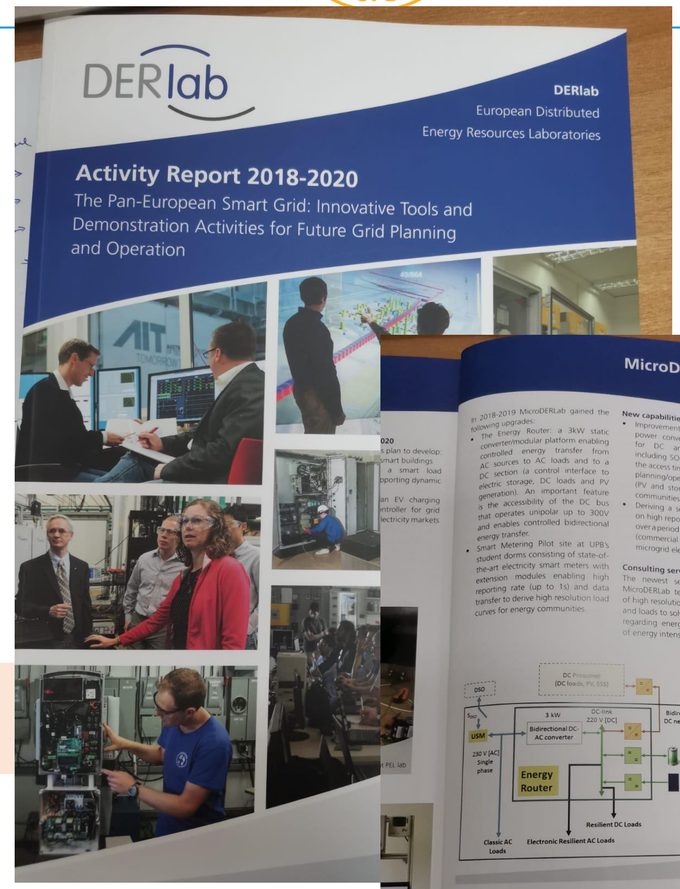
STORAGE 4 GRID

DC NEXT Eve

DCNextEvE a H2020 –MSCA (2016-2018) project (Fellow dr. Irina Ciornei) with the main purpose to design and analysis of novel methods for management and control of multiple building scale DC microgrids

FI SMEP

FIWARE for Smart Energy Platform



An ICT platform for Sustainable Energy Ecosystem in Smart Cities

ITCity

Flexible Smart Metering for Multiple Energy Vectors with active Prosumers

FLEXMETER

Nobel Grid

Smart energy for people

New cost-efficient models for flexible Smart grids

[EMERGING] POWER SYSTEMS

100%

GHG em.

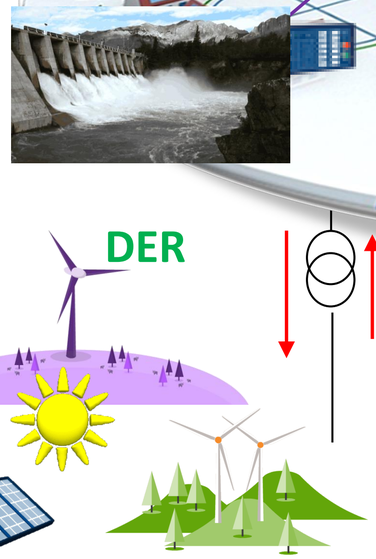
Measurements

DER

Energy harvesting

EU Clean Energy Transition

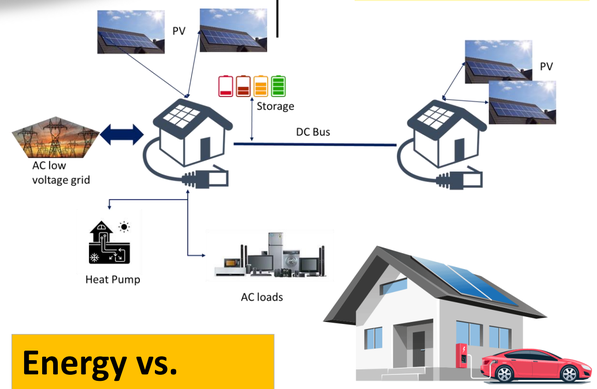
Transmission network



DER

HIL / PHIL

Microgrid



- Big Data
  - Data Analytics
- Optimal planning

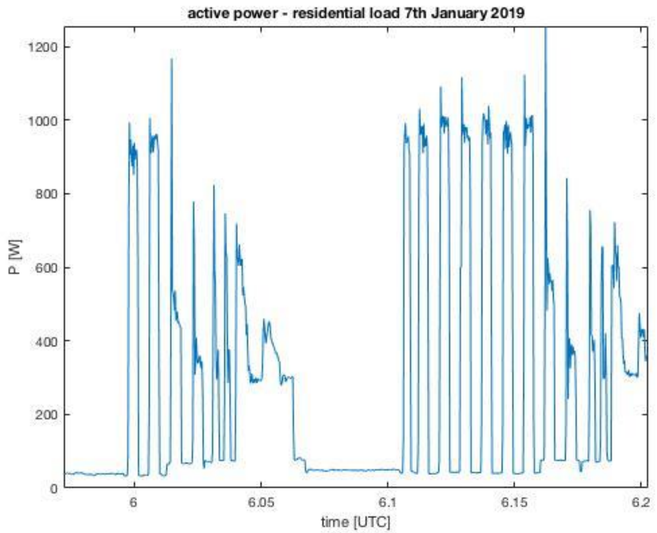
real time control

Power electronics

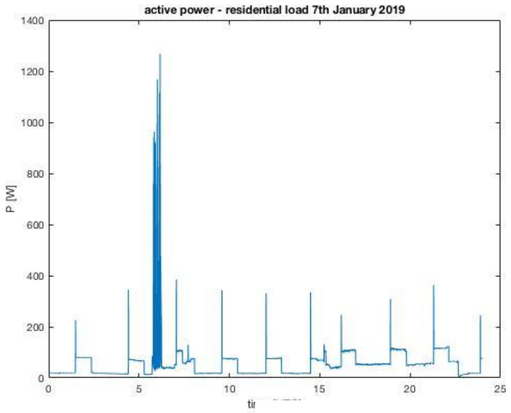
Lower inertia→ lower time constants

Energy vs. Power control

EU Clean Energy Transition



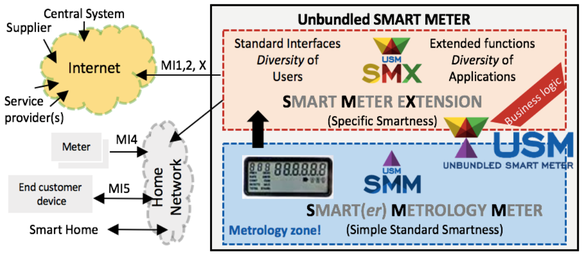
2Q Power Profiles from USM

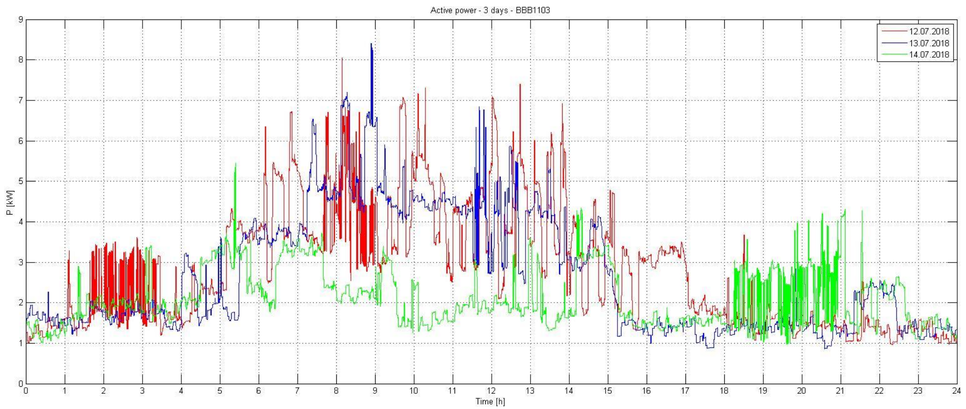


Energy vs. Power control

Active power @ community level: aggregation in time **&** space (customers) – **daily load curves**

Smart Meters @ Load Control



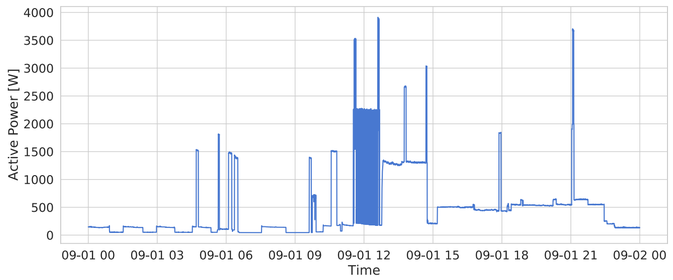


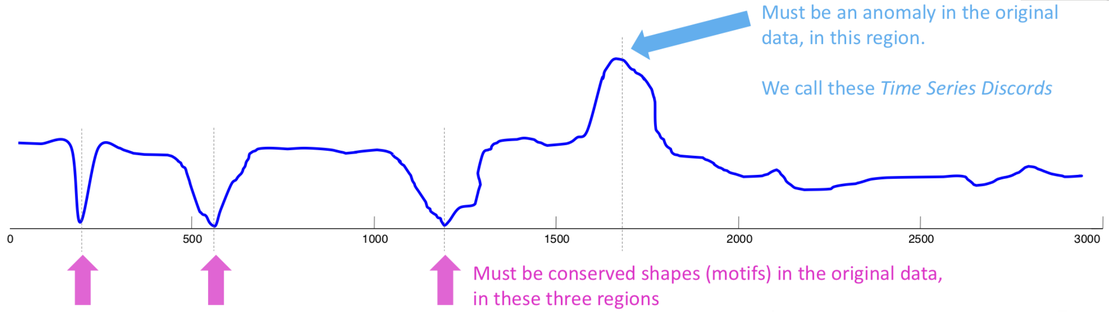
Grigore Stamatescu, Mihaela Albu, Mihai Sanduleac, September 20, 2022, "Residential Smart Meter Energy Time Series: Active power measurements with 1s reporting rate", IEEE Dataport, doi: https://dx.doi.org/10.21227/3yea-xm39.

EU Clean Energy Transition

MULTI-SCALE DATA ANALYTICS FOR POWER PROFILES

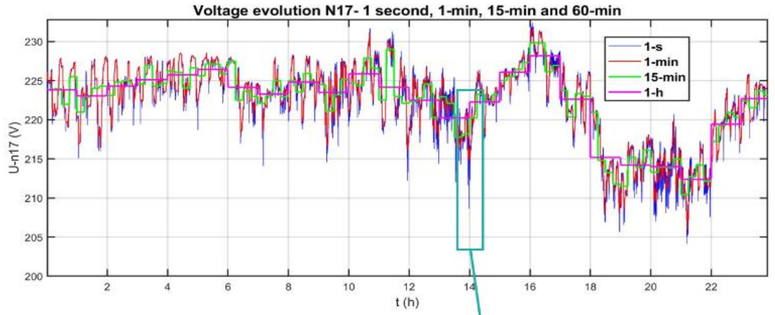
- **Big Data**
- **Data Analytics**

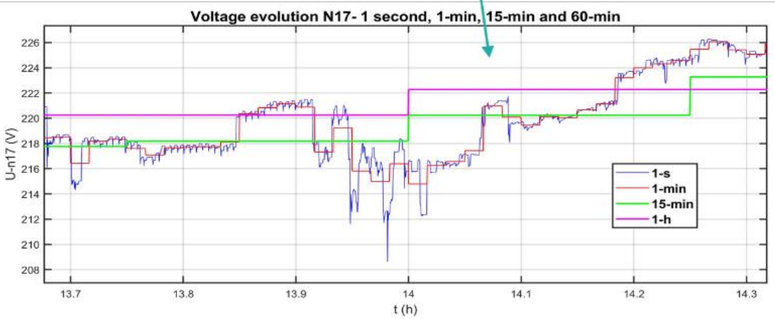


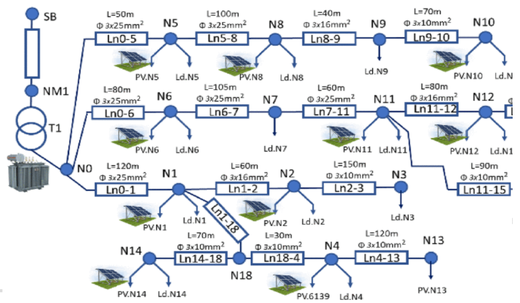


Grigore Stamatescu, et ot., *Reporting Interval Impact on Deep Residential Energy Measurement Prediction,* Proc. of AMPS2021, 2021

- Development of **data driven models** that operate in a robust manner at various timescales - incorporate domain knowledge at pre-processing and feature engineering stages.
- **Micro-load forecasting and classification e.g. steady state and transients labelling**
- **How do data-driven models perform under varying input reporting rates?**
- **fusion of data** recorded at significantly different reporting rates → **increase the situational awareness**
- a framework for **knowledge extraction** from HRR data. The process takes place at smart meter level
- **higher accuracy of the monitoring** tools for distribution power grids by using statistics able to capture system dynamics relevant for **network diagnosis**.







M. Sanduleac, et ot., "*High reporting rate smart metering data for enhanced grid monitoring and services for energy communities*," in IEEE Transactions on Industrial Informatics, 2021

R&D EFFORT

- Builds on national priorities:

Smart specialization Strategies in Romania include energy

the National Research and Innovation Strategy 2014-2020: national S3 priorities:

(i) Bioeconomy; (ii) ICT; (iii) Space and security; (iv) **Energy,**

environment and climate change, eco-nano-technologies and advanced materials.

the National Strategy for Research, Innovation and Smart Specialization 2021-2027 (SNCISI)→ national S3 priorities: (i) Bioeconomy; (ii) Digital economy and Space ; (iii) Energy and mobility: green mobility // elecicity generation (low GHG emissions) // Digitalisation //Storage; (iV) advanced manufacturing; (v) advanced materials (vi) environment and eco-technology; (vii) health

PN III closed; PN IV launched (March 2023); it includes “Solutions for industry” Calls

Innovation is only partially targeting SoA applications and solutions

R&D EFFORT

- …. Builds on national priorities:
  - Collaboration among disciplines still missing (competing areas for funding!)
  - Collaboration among entities fostered (Research Institutes, Companies, Universities)

    → **PhD students** can be the link
  - **Fundamental research is less attractive for engineering projects** (gap |R||D||I|)
  - *Emerging power system* concept in Romania is volatile (!)

    ← missing National Roadmap for Energy
  - Professional societies very active – IRE, AGIR, CIGRE-RO

R&D EFFORT

- Builds on regional and European collaboration:

  ERA-NET initiatives / projects:, but more funding is necessary for energy projects

  FISMEP (ERA Net Smart Grids Plus), 2017-2020

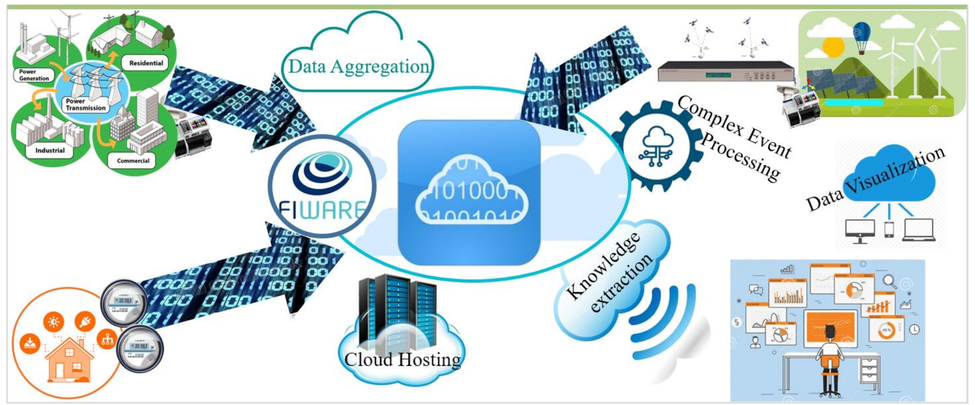
  ITCity (ERA Net LAC 2016), 2017-2020

  I-GRETA (ERA-Net Joint Call 2019 (MICall19)), 2020-2023

  COST Actions // MSCA Actions

  Erasmus plus

  CEN-CENELEC standardization



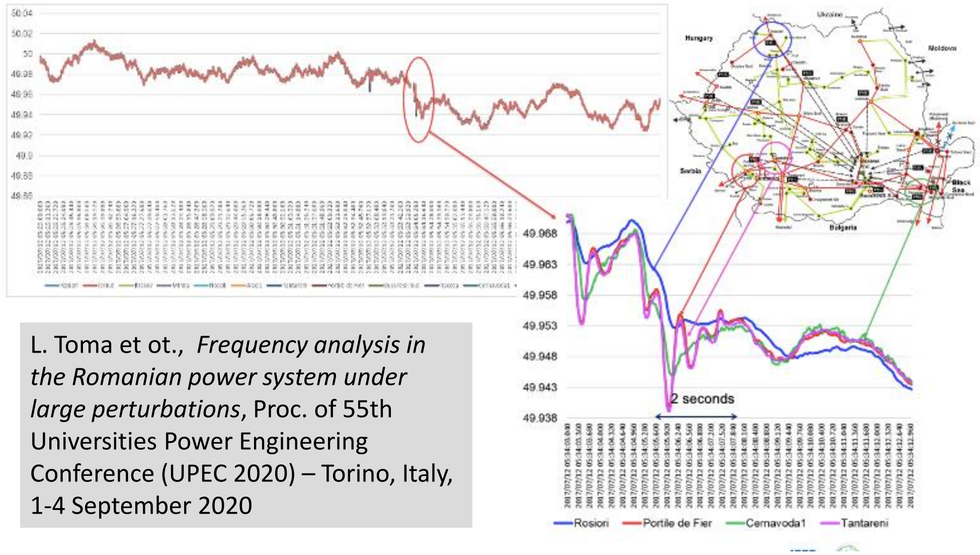
- Link to ETIP SNET
- PCIs // Innovation Fund // targets for RES integration // links between sectors missing
- Answers to specific regulatory conditions – lessons learned from other states (for example, policy on promoting energy communities / prosumer integration/ energy prices cap etc.)

R&D EFFORT

- Builds on international collaboration:

  third countries Calls (India / SA, …):

  microgrids symposium / remote microgrids
- Contribution to IEC, IEEE standardization
- Activity in relevant professional societies: IEEE, CIGRE …
- Subjects on low TRL level (modelling, instrumentation)
- WAMCS, system dynamics, HIL/PHIL
- LVDC
- Data analytics



L. Toma et ot., *Frequency analysis in the Romanian power system under large perturbations*, Proc. of 55th Universities Power Engineering Conference (UPEC 2020) – Torino, Italy, 1-4 September 2020

correlation between national and EU funding based on the needs of Romania – importance of **understanding what issues and challenges need to be overcome**

Q&A session

www.microderlab.pub.ro

SUPEERA

Support to the coordination of national research and innovation programmes in areas of activity of the European Energy Research Alliance

Panel discussion

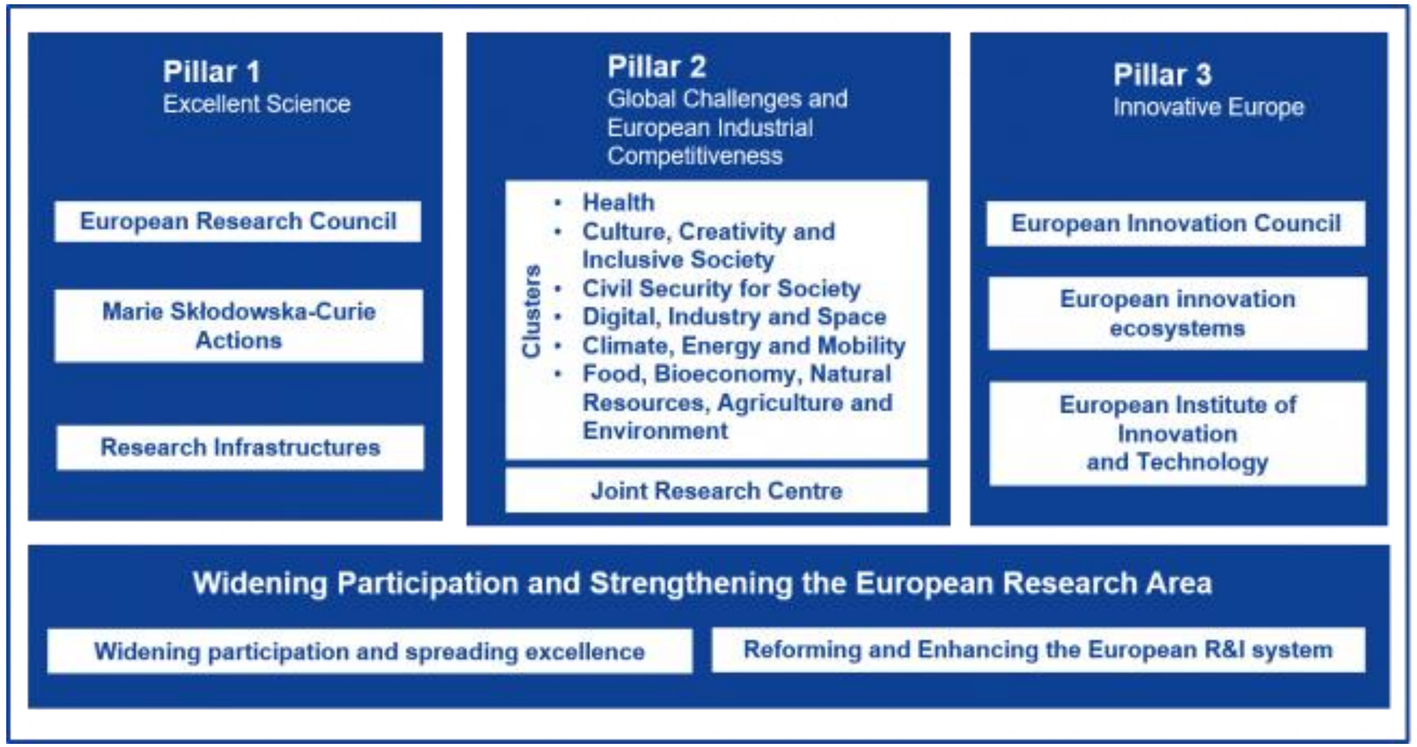
Coffee break

R&I opportunities for collaboration and funding Horizon Europe (Cluster 5 & Widening)

Spyridon Pantelis, EERA Project Manager

Horizon Europe – General Overview

- EU's most ambitious R&I framework programme ever and largest transnational programme of its kind worldwide
- Budget **of EUR 95.5 billion** to be distributed between 2021 and 2027
- Provides new instruments such as the **European Innovation Council, Research Missions and Partnerships** to boost the EU R&I landscape.



Horizon Europe – General Overview

Cluster 5: Climate, Energy and Mobility

Horizon Europe – Detail on Clusters

Horizon Europe - Pillar 2

Cluster 1 - Health

1. Staying healthy
2. Living & working in a health-promoting environment
3. Tackling diseases & reducing disease burden
4. Innovative, sustainable and high-quality health care
5. Unlocking the full potential of new tools, technologies and digital solutions for a healthy society
6. Maintaining an innovative, sustainable & globally competitive health industry

Cluster 2 - Culture, Creativity and Inclusive Society

1. Democracy and Governance
2. European Cultural Heritage and the Cultural and Creative Industries
3. Social and Economic transformations

Cluster 3 - Civil security for Society

1. Better protect the EU and its citizens against Crime and Terrorism
2. Effective management of EU external borders
3. Protected infrastructure
4. Increased Cybersecurity
5. A Disaster-Resilient Society for Europe
6. SSRI (Strengthened Security Research and Innovation)

Cluster 4 - Digital, Industry and Space

1. Climate neutral, circular and digitised production
2. increased autonomy in key strategic value chains for resilient industry
3. world leading data and computing technologies
4. digital and emerging technologies for competitiveness and fit for the green deal
5. open strategic autonomy in developing, deploying and using global space-based infrastructures, services, applications and data
6. a human-centred and ethical development of digital and industrial technologies

Cluster 5 - Climate, Energy and Mobility

1. Climate sciences and responses
2. Cross-sectoral solutions for the climate transition
3. Sustainable, secure and competitive energy supply -2021-2024
4. Efficient, sustainable and inclusive energy use
5. Clean and competitive solutions for all transport mode
6. Safe, Resilient Transport and Smart Mobility services for passengers and goods

Cluster 6 - Food, Bioeconomy, Natural Resources, Agriculture and Environment

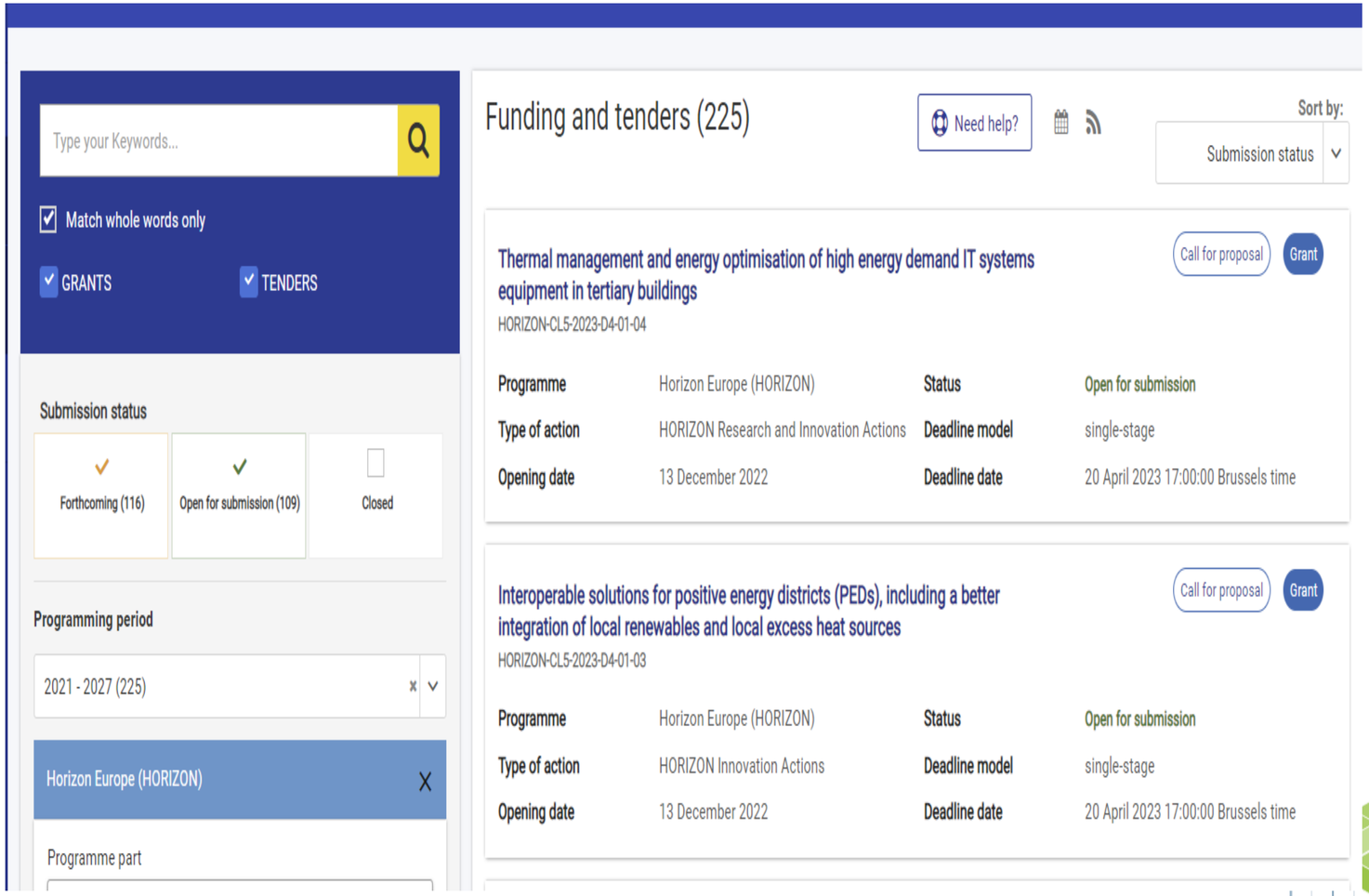
1. Biodiversity and Ecosystem Services
2. Fair, healthy and environmentally-friendly food systems from primary production to consumption
3. Circular economy and bioeconomy sectors
4. Clean environment and zero pollution
5. Land, oceans and water for climate action
6. Resilient, inclusive, healthy and green rural, coastal and urban communities
7. Innovative governance, environmental observations and digital solutions in support of the Green Deal

info@efmc.eu / https://efmc.eu

Horizon Europe Calls
Cluster 5: Climate, Energy and Mobility

- **109 calls open for submission**
- **116 forthcoming calls**
- **Type of actions**: RIA, IA, CSA

More information on Tenders and Funding Portal (link)



Selected open calls

Call Reference	Type of Action	Budget available	Deadline
Development of near zero-emission biomass heat and/or CHP including carbon capture - HORIZON-CL5-2023-D3-02-01	RIA	8mio (2*4mio)	Open: 4 May Deadline: 5 Sept
Fast-tracking and promoting built environment construction and renovation innovation with local value chains (Built4People Partnership) - HORIZON-CL5-2023-D4-02-04	CSA	2mio (1 project)	Open: 4 May Deadline: 5 Sept
Supporting the creation of an accessible and inclusive built environment (Built4People Partnership) - HORIZON-CL5-2023-D4-02-05	IA	10mio (2*5mio)	Open: 4 May Deadline: 5 Sept
Industrial manufacturing for lower-cost solar thermal components and systems - HORIZON-CL5-2023-D3-02-03	IA	6mio (2*3mio)	Open: 4 May Deadline: 5 Sept
Operation, Performance and Maintenance of PV Systems - HORIZON-CL5-2023-D3-02-13	IA	10mio (2*5mio)	Open: 4 May Deadline: 5 Sept

Horizon Europe - Widening participation and strengthening the European Research Area

- **DESTINATION 1: IMPROVED ACCESS TO EXCELLENCE**
  - Aims at underpinning geographical diversity, building the necessary capacity to allow successful participation in the R&I process and promoting networking and access to excellence
- **DESTINATION 2: ATTRACTING AND MOBILISING THE BEST TALENTS**
  - Aims at reverting the brain drain from widening countries, emphasis on intersectoral mobility, better exploitation of existing research infrastructures
- **DESTINATION 3: REFORMING AND ENHANCING THE EU RESEARCH AND INNOVATION SYSTEM**
  - Four objectives: Prioritise investments and reforms, improve access to excellence, translate R&I results into the economy and deepen the ERA

DESTINATION 1: IMPROVED ACCESS TO EXCELLENCE

Open Calls

Excellence Hubs - HORIZON-WIDERA-2023-ACCESS-07-01

Twinning Green Deal - HORIZON-WIDERA-2023-ACCESS-02-02

Dissemination and Exploitation Support Facility - HORIZON-WIDERA-2023-ACCESS-05-01

Twinning Bottom-Up - HORIZON-WIDERA-2023-ACCESS-02-01

Pathways to Synergies - HORIZON-WIDERA-2023-ACCESS-04-01

Hop on Facility - HORIZON-WIDERA-2023-ACCESS-06-01

DESTINATION 2: ATTRACTING AND MOBILISING THE BEST TALENTS

Open Calls

ERA Talents - HORIZON-WIDERA-2024-TALENTS-03-01

ERA Chairs - HORIZON-WIDERA-2023-TALENTS-01-01

ERA Fellowships - HORIZON-WIDERA-2023-TALENTS-02-01

DESTINATION 3: REFORMING AND ENHANCING THE EU RESEARCH AND INNOVATION SYSTEM

Open Calls (6/12)

Capacity building on Intellectual Property (IP) management to support open science - HORIZON-WIDERA-2024-ERA-01-07

Programme level collaboration between national R&I policy-makers - HORIZON-WIDERA-2024-ERA-01-01

Strengthening researchers' skills for better careers – leveraging the European Competence Framework for Researchers - HORIZON-WIDERA-2024-ERA-01-04

European Excellence Initiative: Acceleration services in support of universities - HORIZON-WIDERA-2024-ERA-01-06

Support to the development and implementation of policies and practices for reproducibility of scientific results - HORIZON-WIDERA-2024-ERA-01-09

Policy coordination to support all aspects of inclusive Gender Equality Plans and policies in the ERA - HORIZON-WIDERA-2024-ERA-01-10

Hop On Facility (HORIZON-WIDERA-2023-ACCESS-06-01)

- The Hop On Facility integrates **one additional participant** from a Widening country to an ongoing project under Pillar 2 **OR** the European Innovation Council pathfinder scheme
- Especially encouraged: Applications with activities that contribute to **the policy objective** of the **transition** towards a **green and digital economy**
- Applications must demonstrate the **R&I added value** of the new partner and present a visible and distinct work package for the acceding partner

Conditions for the Call			
Type of action	RIA	**Total Budget**	40.00 (EUR million)
Deadline	28 Sep 2023	**EU contribution per project**	0.10 – 0.60 EUR million
No of projects	160		

More information on WIDERA programme in this Link

Do you want to know more?

- Link to the webinar page
- Link to YouTube recording


SUPEERA


EERA
European Energy Research Alliance


cea


DTU


KIT
Karlsruhe Institute of Technology


SINTEF


VTT

Iceland Liechtenstein Norway grants

Norway grants

The EEA and Norway Grants

Working together for a green, competitive and inclusive Europe

Berta Matas Güell, Senior Researcher, SINTEF

23 March 2023, Bucharest

EEA Agreement – Art 115-117

… the Contracting Parties… agree on the need to reduce the economic and social disparities between their regions…

Protocol 38c

The EEA/EFTA States “shall contribute to the reduction of economic and social disparities in the European Economic Area and to the strengthening of their relations with the Beneficiary States”

We work through funding periods

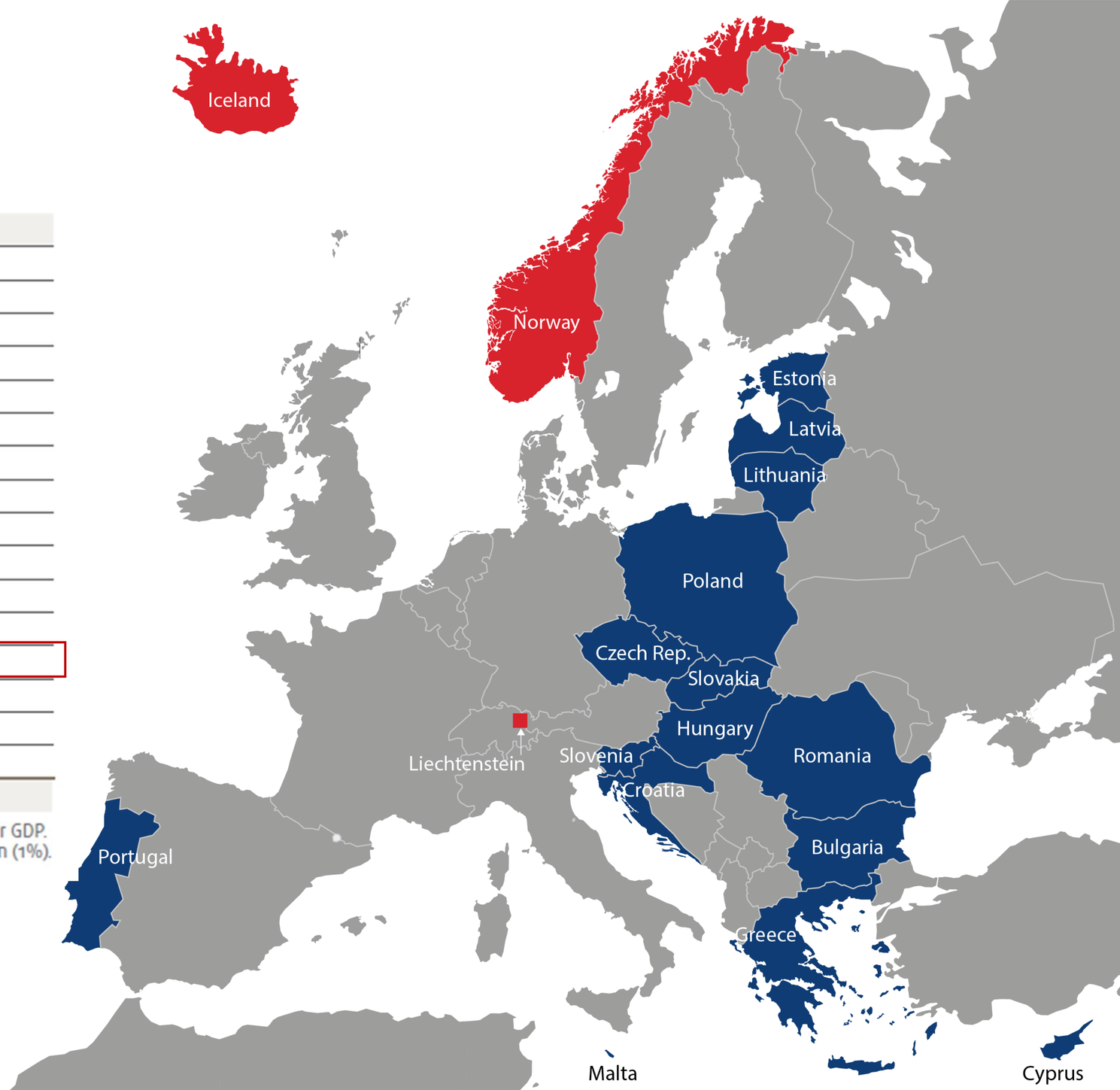
2004-2009 = €1.3 billion
2009-2014 = €1.8 billion
2014-2021 = €2.8 billion

2022-2024 → last funded projects to be implemented

Beneficiary countries (€ million) 2014-2021

Country	EEA Grants	Norway Grants	Total
Bulgaria	€115.0	€95.1	€210.1
Croatia	€56.8	€46.6	€103.4
Cyprus	€6.4	€5.1	€11.5
Czech Republic	€95.5	€89.0	€184.5
Estonia	€32.3	€35.7	€68.0
Greece	€116.7	-	€116.7
Hungary	€108.9	€105.7	€214.6
Latvia	€50.2	€51.9	€102.1
Lithuania	€56.2	€61.4	€117.6
Malta	€4.4	€3.6	€8.0
Poland	€397.8	€411.5	€809.3
Portugal	€102.7	-	€102.7
Romania	€275.2	€227.3	€502.5
Slovakia	€54.9	€58.2	€113.1
Slovenia	€19.9	€17.8	€37.7
Regional Funds	€55.2	€44.8	€100.0
Total	**€1 548.1***	**€1 253.7**	**€2 801.8**

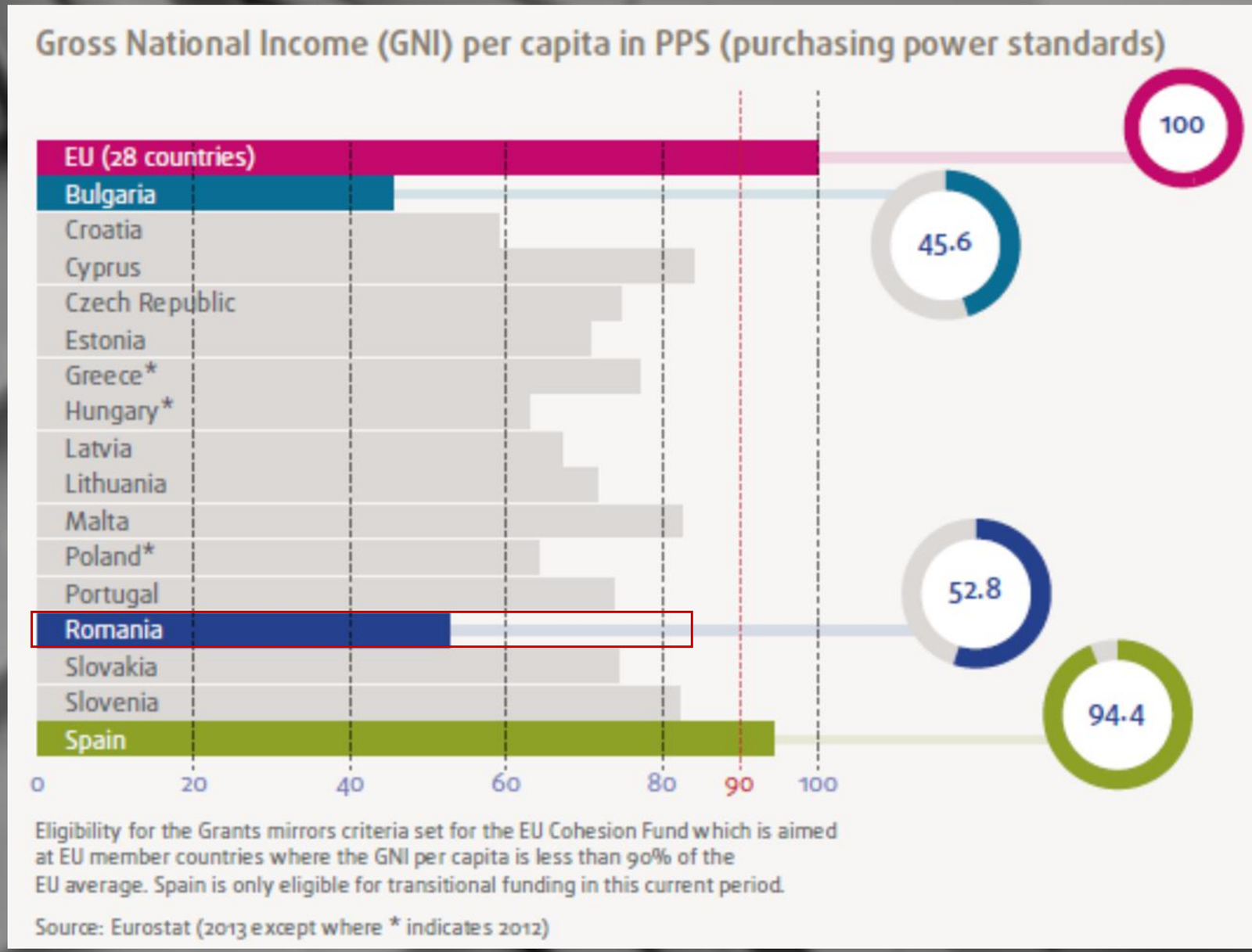
*The EEA Grants are jointly financed by all three donors, where contributions are based on their GDP. The estimated share of contributions equates to: Norway (96%), Iceland (3%) and Liechtenstein (1%).



Eligibility criteria

Mirror EU
Cohesion Funds

GNI less than 90%
of EU average



Programme design process

Negotiations on political priorities between donor and beneficiary states

MoU

Concept note

- Stakeholder consultations
- Alignment with EU and national policies and regulations
- Results-based
- ‘Participatory’
- Use available analysis

- Legally binding
- Sets results frameworks and provisions for modalities, selection, reporting, payments etc.

Programme Agreement

Implementation

Implementation of projects identified through competition (main rule) or pre-definition (exception)

The EEA and Norway Grants' programme targets contributing to the Green Deal

- Priority Sector 'Environment, energy, climate change and low carbon economy' consists of:

Programme Area 11

Ecosystems, air quality, circular economy, water management

Programme Area 12

Energy efficiency in buildings and industry and renewable energy in connection with energy measures

Programme Area 13

Climate change mitigation and adaptation activities, awareness raising

Ongoing Environment, Energy and Climate programmes are expected to lead to:

Emissions reductions: More than 1 million ton of CO2 eq. per year

Energy savings: 897 000 MWh/year

Renewable energy production: 118 000 MWh/year

Restoration of ecosystems: 600 000 m2 of wetland etc.

Promotion of a circular economy: 17 pilot projects etc.

Environmental awareness-raising

New infrastructure for alternative fuels

Overview PA 12: Renewable Energy, Energy Efficiency, Energy Security

Grants allocation, supported areas and objective

Allocation (EEA Grants): **184 503 300 EUR**

Allocation (Norway Grants): **33 778 986 EUR**

Total: **218 282 385 EUR**

Areas of support:

- Energy efficiency in production
- Renewable energy production and/or distribution
- Recovery of energy from waste and hazardous waste
- Energy security
- Renewable energy policies in all relevant sectors
- Energy markets

Objective:

Less carbon intensive energy and increased security of supply

EEA/Norway Grants 2014-2021 in Romania

- Areas of support
  - Fighting poverty and improving living conditions for the Roma population
  - Strengthening the business and innovation sector with a focus on green industry development, blue growth and ICT
  - Supporting improvement of correctional services and strengthening the rule of law.
  - **Increasing the generation of energy from renewable sources and the reduction of CO_2 emissions.**
  - Continuing the strong support to strengthen civil society
- Relevant Programmes (among others)
  - Business Development, Innovation and SMEs
  - Environment, Climate Change Adaptation and Ecosystems
  - **Renewable Energy, energy Efficiency, Energy Security**
  - Research
- Main focus areas
  - Energy efficiency in buildings
  - Electrification of households
  - Increased capacity for renewable generation (geothermal)

https://eeagrants.org/countries/cyprus
http://www.eeagrants.gov.cy/dgepcd/eeagrantscy.nsf/home_en/home_en?openform

Project example 1 – Energy efficiency/Renewable energy

Project title : Improving IRIS hotel's energy efficiency by using local geothermal resources
Project Promoter: SC Oradea Express Hotel Srl (RO)
Donor Project Partner: Navigo SLF (IS)
Initial project cost: € 294,000

The project aims at **increasing the general efficiency level at the company**, along with **promoting clean energy production** to improve the eco-friendly approach of the company long-term as well as sustain low carbon emissions.

The main investment of the project consists of **replacing the current gas-based heating system** with a new one and innovative **geothermal solution** with an installed capacity equivalent with 0.25 MW and to **connect the Iris Hotel** owned by the company to the geothermal supplier **for hot water and heat**

The project will also allow the **Romanian partners to strengthen relationship with the Icelandic market**

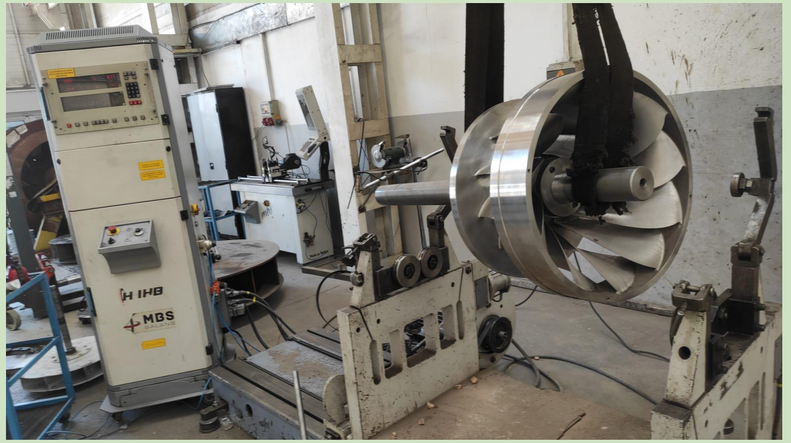
Project example 2 – Renewable energy

Project title : Small hydropower plant to increase local potential
Project Promoter: TMK Hydroenergy Power S.R.L. (RO)
Initial project cost: € 300,000

The project focuses **on construction of a small hydropower plant** on the Bârzava river in the Văliug dam area, with the purpose **to capitalize on the hydropower potential of the Banat basin**.

The project will generate approximately additional 350 kWh utilizing available current flows, at a **very low cost compared to alternative generation** from thermal or other hydropower projects, because part of the infrastructure such as the dam and reservoir is already constructed.

The project will contribute to enhance **local employment** and create **business opportunities** during construction, installation and operation of the plant.

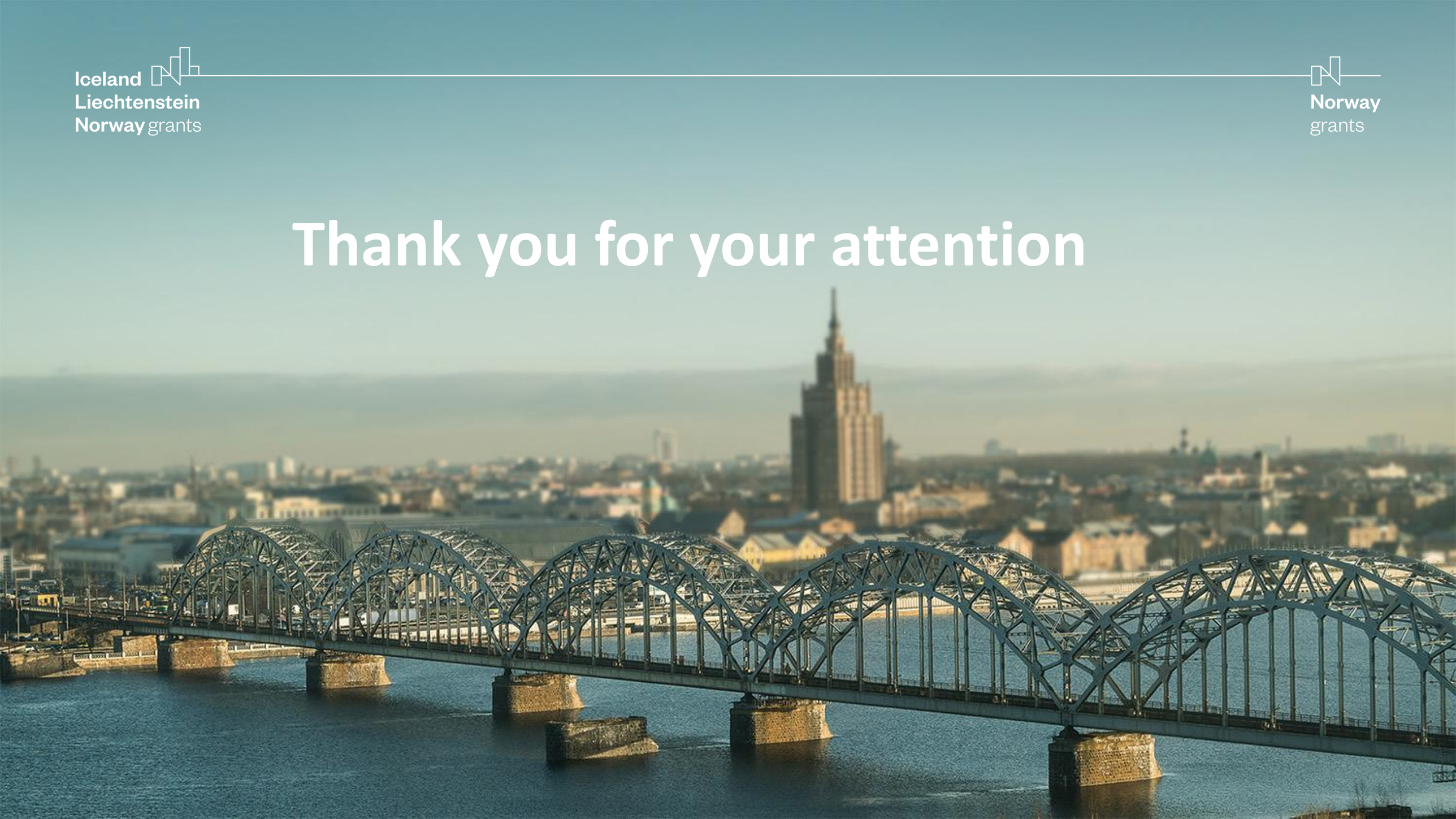


https://eeagrants.org/archive/2014-2021/projects/RO-ENERGY-0014

Iceland Liechtenstein Norway grants

Norway grants

Thank you for your attention



SUPEERA Support to the coordination of national research and innovation programmes in areas of activity of the European Energy Research Alliance

PANTERA

International research collaboration opportunities fostering EU Clean Energy transition in Romania – PANTERA / SUPEERA joint workshop

EIC funding opportunities for Clean-tech technologies

23rd March 2023

Francesco Matteucci

EIC Programme Managers on Advanced Materials for Energy and Environmental Sustainability

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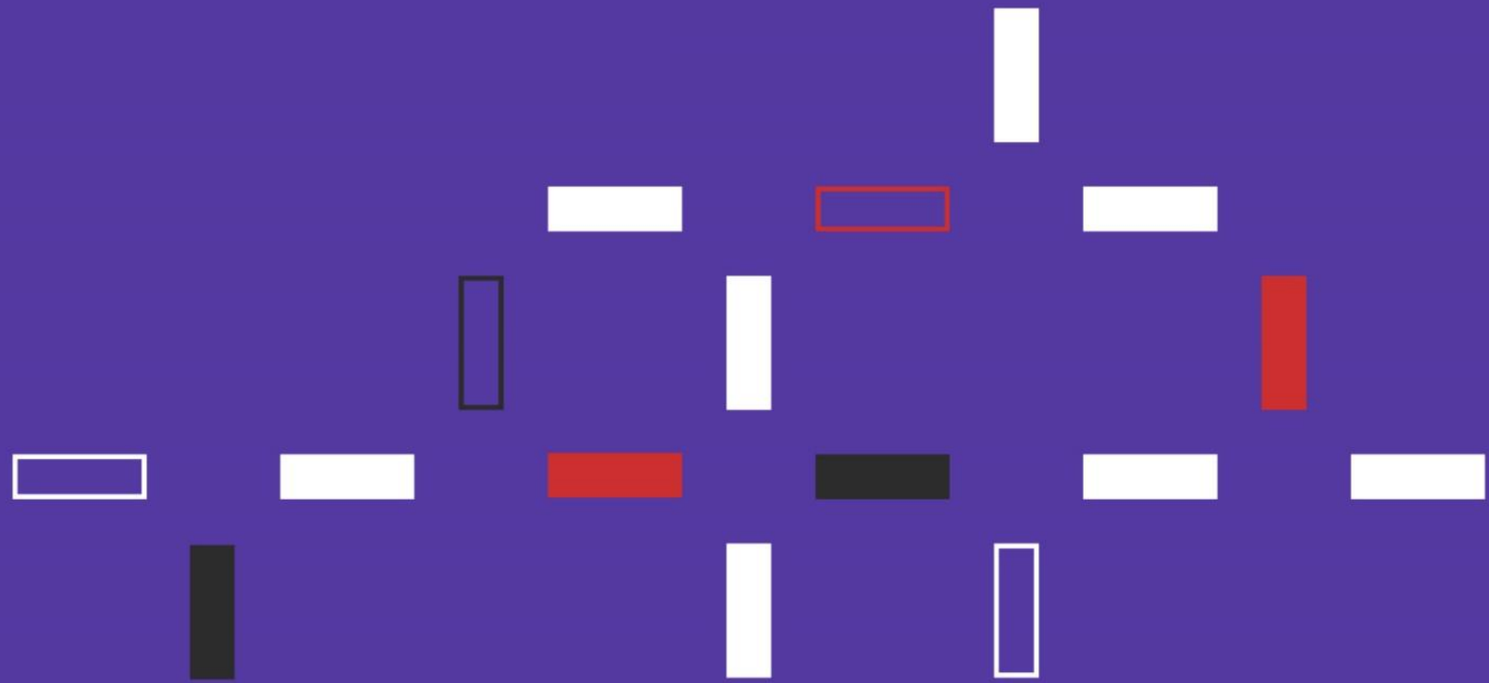
1. The European Innovation Council – why, what, how?
2. EIC strategic approach in Cleantech
3. EIC funding opportunities for Cleantech

European Innovation Council

The European Innovation Council

why, what and how?



Deeptech

European Innovation Council

Problem and Hardware oriented

Multidisciplinary

High risk, high fund needed

Open innovation approach (ecosystem of innovation)

investments include private investments, minority stakes, initial public offerings and M&A

Source: Boston Consulting Group and Hello Tomorrow

What's holding back European innovation?

European Innovation Council

Innovation **performance**	• **Strong research performance not translated** into innovation • **Lack of breakthrough/ disruptive innovations** that create new markets
Innovation **funding**	Financing gaps (2 "valleys of death") in • **Transition** from lab to enterprise • **Scaling up** for high-risk innovative start-ups
Innovation **ecosystem**	• Many national & local ecosystems, but **fragmented at European** level • Need to **include all regions and all talent** (especially female)

We need to overcome European Paradox – perceived failure of EU countries to translate scientific advances into marketable innovations.

EU Research & innovation programme 2021–27

European Innovation Council

HORIZON EUROPE

EURATOM

SPECIFIC PROGRAMME: EUROPEAN DEFENCE FUND

Exclusive focus on defence research & development

- Research actions
- Development actions

SPECIFIC PROGRAMME IMPLEMENTING HORIZON EUROPE & EIT*

Exclusive focus on civil applications

Pillar I
EXCELLENT SCIENCE

- European Research Council
- Marie Skłodowska-Curie
- Research Infrastructures

Pillar II
GLOBAL CHALLENGES & EUROPEAN INDUSTRIAL COMPETITIVENESS

Clusters
- Health
- Culture, Creativity & Inclusive Society
- Civil Security for Society
- Digital, Industry & Space
- Climate, Energy & Mobility
- Food, Bioeconomy, Natural Resources, Agriculture & Environment

Joint Research Centre

Pillar III
INNOVATIVE EUROPE

- European Innovation Council
- European innovation ecosystems
- European Institute of Innovation & Technology*

WIDENING PARTICIPATION AND STRENGTHENING THE EUROPEAN RESEARCH AREA

- Widening participation & spreading excellence
- Reforming & Enhancing the European R&I system

EURATOM

- Fusion
- Fission
- Joint Research Center

* The European Institute of Innovation & Technology (EIT) is not part of the Specific Programme

The main EIC Support Schemes

European Innovation Council

Pathfinder

For advanced research on breakthrough / game-changing technologies

Pathfinder Open: bottom-up approach; no predefined topics
Pathfinder Challenges: top-down challenge-driven calls for tackling specific issues by portfolios of projects

Transition

For transforming research results into innovation opportunities; follow up results from EIC Pathfinder and ERC Proof of Concept

Transition Open: no topic prescription
Transition Challenges: selected challenges

Accelerator

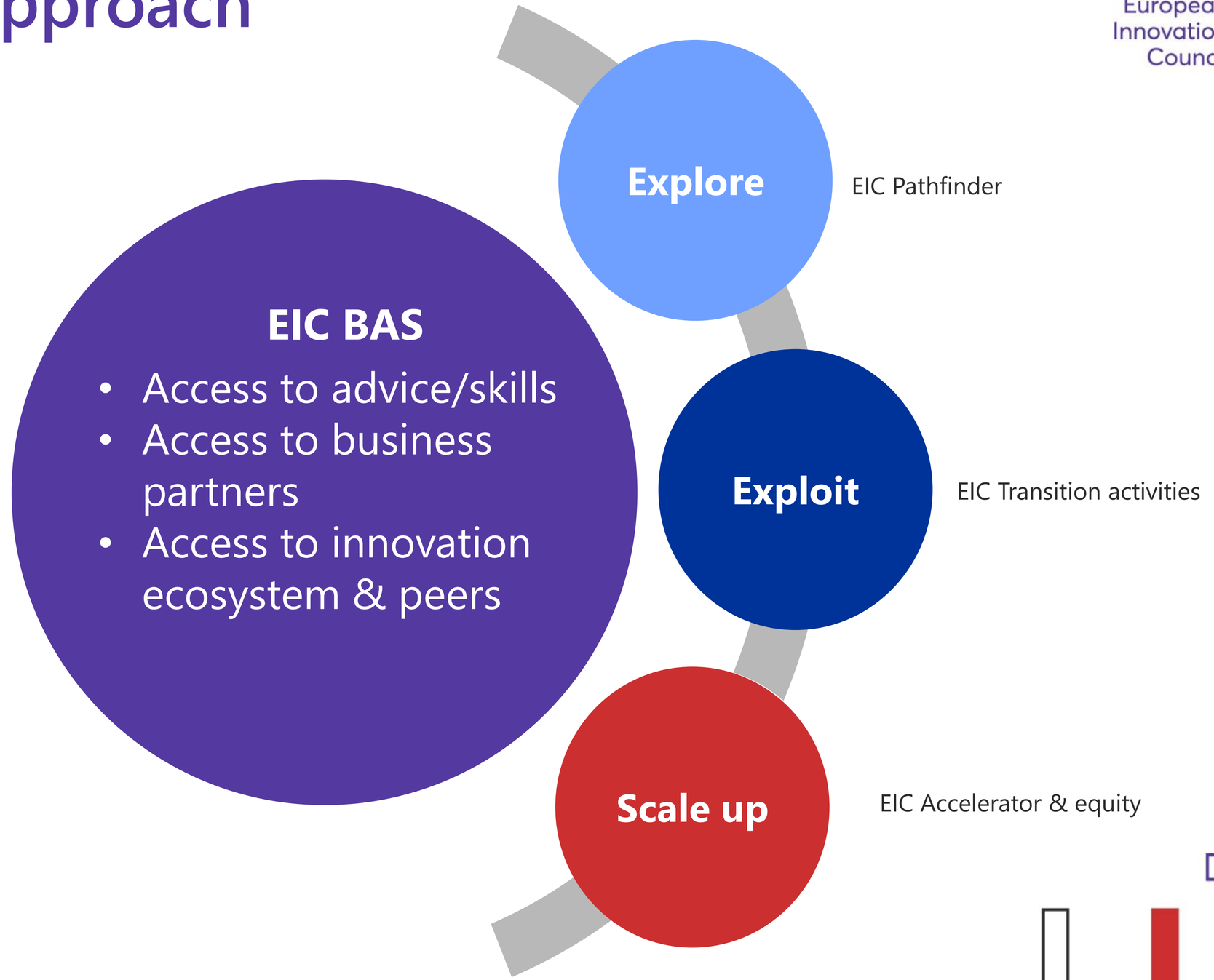
For individual companies to develop and scale up breakthrough innovations with high risk and high impact

Grant Funding
Equity Funding
Business Acceleration Service

EIC Fund: VC fund – EC shareholder / Bridging equity funding gap at early stage / Crowding in other investors

Business Acceleration Service: access to advice, to business partners and to innovation ecosystems & peers

Hands on approach



Hands on approach

European Innovation Council

Identify emerging challenges for Europe's deep-tech roadmap

Science and innovation intelligence activity

Hands-on approach

Strategic assessment and clustering of projects

Building strategic intelligence portfolios

Scientific / Business portfolios management

EIC Ambassador

Networking with other programmes and with innovation ecosystem communities

Outreach and organization of events, participation to national events / workshops

EIC Proactive Management

The EIC Programme Managers

https://eic.ec.europa.eu/eic-communities/eic-programme-managers_en

Carina Faber

Renewable energy conversion and alternative resource exploitation

Samira Nik

Quantum tech and electronics

Isabel Obieta

Responsible electronics

Antonio Marco Pantaleo

Energy systems and green technologies

Francesco Matteucci

Advanced materials for energy and environmental sustainability

Stella Tkatchova

Space systems and technologies

Iordanis Arzimanoglou

Health and biotechnology

Enric Claverol-Tinturé

Medical technologies and medical devices

Ivan Stefanic

Food chain technologies, novel & sustainable food

Franc Mouwen

Architecture engineering construction technologies

Thematic Portfolios & content-wise approach

European Innovation Council

Some of the **EIC Cleantech Thematic portfolios**

- **Renewable Hydrogen** (production, storage, logistics, end use)
- **Energy storage** (electrical, thermal, chemical, mechanical and electrochemical)
- **Solar conversion technologies** (solar-to: thermal, fuel, electricity)
- **Ocean technologies** (wave, tidal, offshore wind, etc.)
- **Sustainable Materials**
- **Climate and Environment** (air/water/soil monitoring/depolluting, environmental intelligence)

EIC Cleantech challenges

European Innovation Council

EIC Challenges 2021

	Pathfinder	Transition	Accelerator
Cleantech	• Novel routes to green hydrogen production (Portfolio kick off meeting October 2022)	• Energy harvesting and storage technologies	• Green Deal innovations for the economic recovery

EIC Challenges 2023

	Pathfinder	Transition	Accelerator
Cleantech	• Carbon dioxide & Nitrogen management and valorisation (final retained list end March 2023) • Mid-long term, systems-integrated energy	• Process and system integration of clean energy technologies • Green digital devices for the future	• Technologies for 'Fit for 55'

	Pathfinder (32.7mln Euro)	Transition (20mln Euro)	Accelerator (100mln Euro)

Portfolio content-wise approach in the different EIC funding schemes

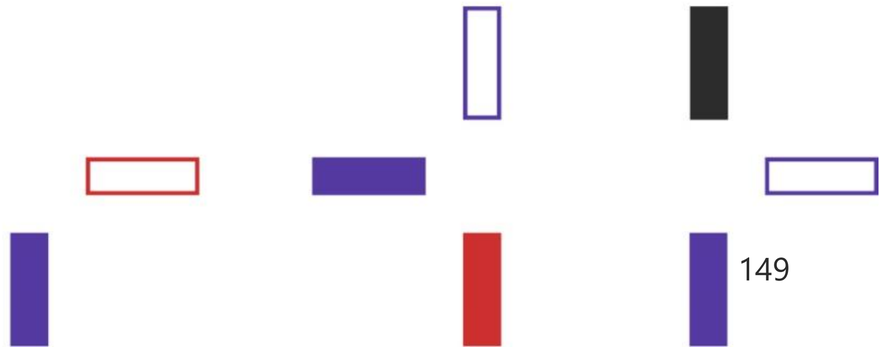
A portfolio is a coherent set of projects aligned to a common “challenge” or “thematic area

The EIC portfolio approach is aimed at facilitating the projects innovation journey via:

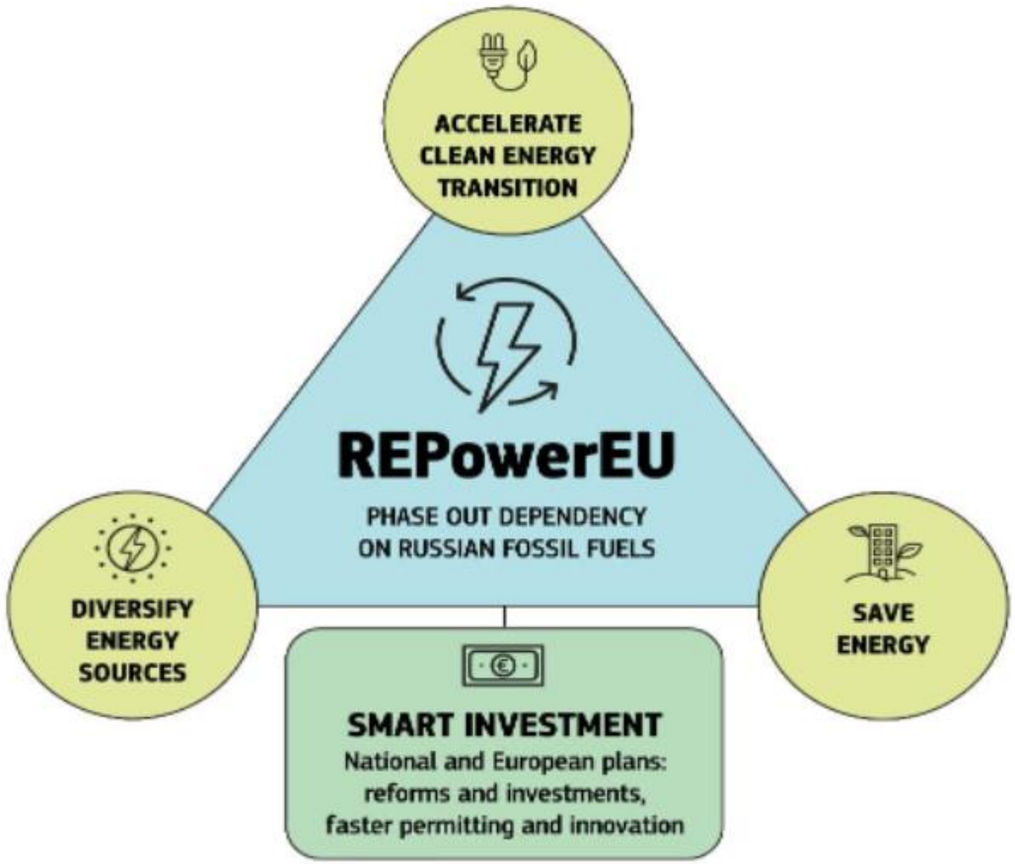
1. **Exploring:** competing approaches or complementary aspects of the Challenge;
2. **setting up** multidisciplinary interactions and exchanges for synergies;
3. **contributing** to an overarching medium to long-term business goal and technology-based strategic plan.

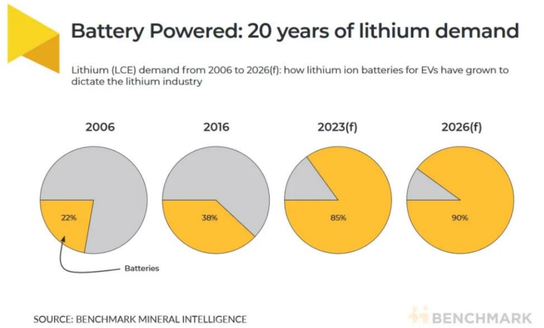
European Innovation Council

Accelerator Challenge



START FROM WHY





MATERIALS TRANSITION

In 2006 Li was primarily used by the glass, ceramics, and grease industries.

UP AND RE SKILLING

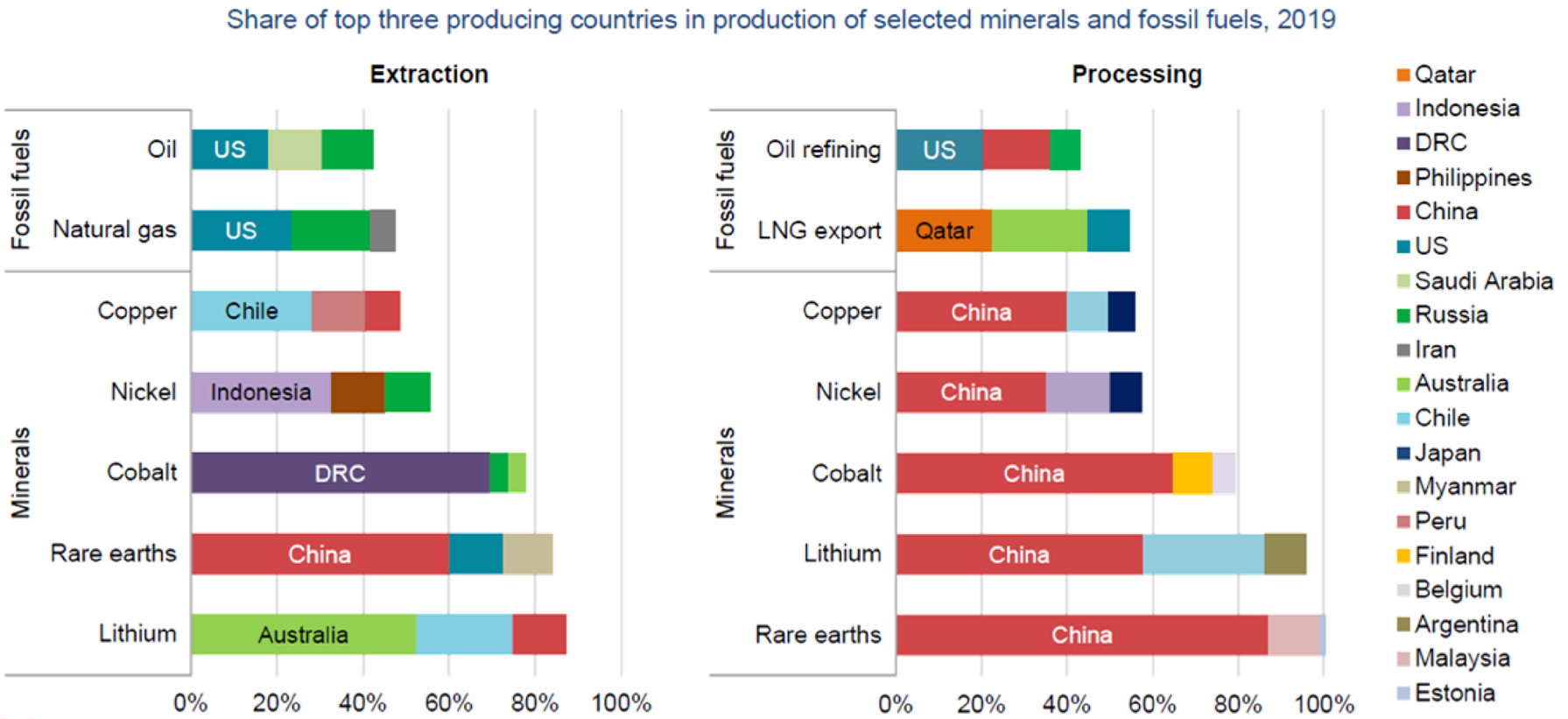
Also training for innovation managers and scientific entrepreneurs.

DIGITAL ENERGY TRANSFORMATION

Smart grid management, energy system flexibility

European Innovation Council

Production of many energy transition minerals



CNR ISMN
ISTITUTO PER LO STUDIO DEI MATERIALI NANOSTRUTTURATI

Inventing the sustainable batteries of the future. Research Needs and Future Actions, BATTERY 2030+ Roadmap.
On the Implementation of the Strategic Action Plan on Batteries: Building a Strategic Battery Value Chain in Europe, Brussels, 9.4.2019 COM(2019) 176 final

Background and Scope

European Innovation Council

- The aim is to develop of breakthrough technologies able to store **electrical or thermal energy at low cost, high density, high charging/discharging efficiency, without the use of critical raw materials (CRM) or demonstrating the full re-use or recycle of CRM** at different scales, duration and uses including their hybridization.
- To reach these goals, it is crucial to develop a **range of breakthrough solutions for electrical and thermal energy storage** (chemical, electrical, electrochemical, mechanical, thermal, combined) **minimising their carbon footprint** measured through a life-cycle analysis. The integration of technologies in products and services shall embrace circular and **life cycle thinking approach** supporting the transition to a circular economy.
- Technologies could also address the **smart operation and control of storage assets**, their integration with demand response strategies, **predictive maintenance**, load forecasting and **decentralised renewable energy technologies, and novel business models** (i.e. storage as a service) to increase energy systems flexibility and facilitate the integration of energy storage.

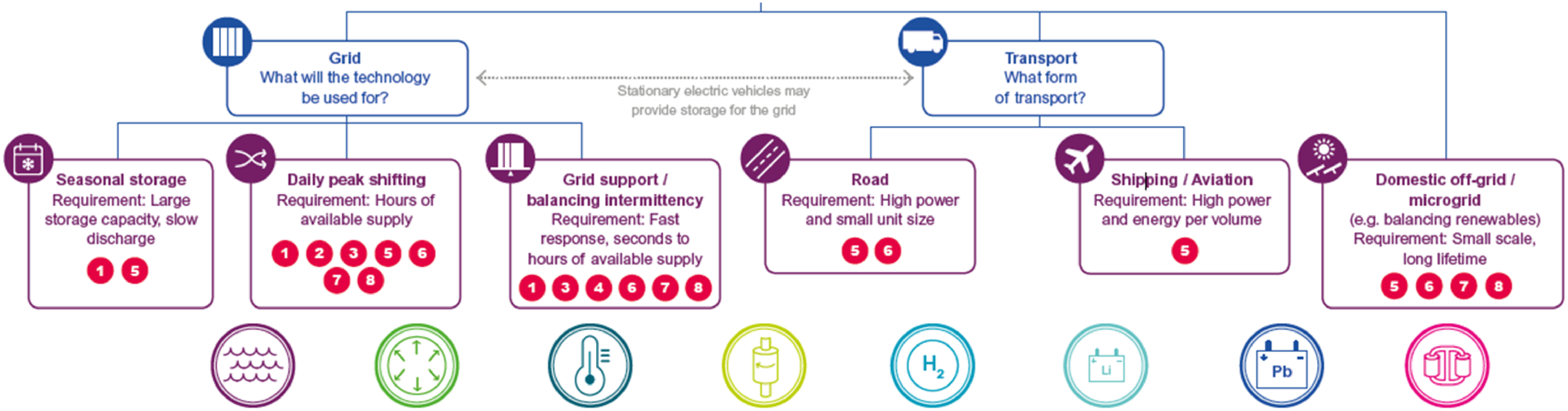
Expected impact

The possibility to store electrical or thermal energy at low cost, high density, high charging/discharging efficiency and for different duration (from short to long) including their optimal operation to enable demand response strategies and ‘storage as a service’ concepts will:

- enable a **strong penetration of intermittent renewable energy resources** by addressing the spatial and temporal mismatches between generation and demand,
- set up **decarbonised, interconnected, sector-coupled and flexible energy systems,**
- Increase Europe's energy independence from unreliable suppliers enabling an EU supply chain,
- create potential business models for a fair energy transition in the field of energy services and the involvement of end users, **facilitating participative approaches to energy consumption**, energy savings and the development of energy communities preserving Europe’s natural environment and tackling climate change.

Different types of electrochemical energy storage

European Innovation Council

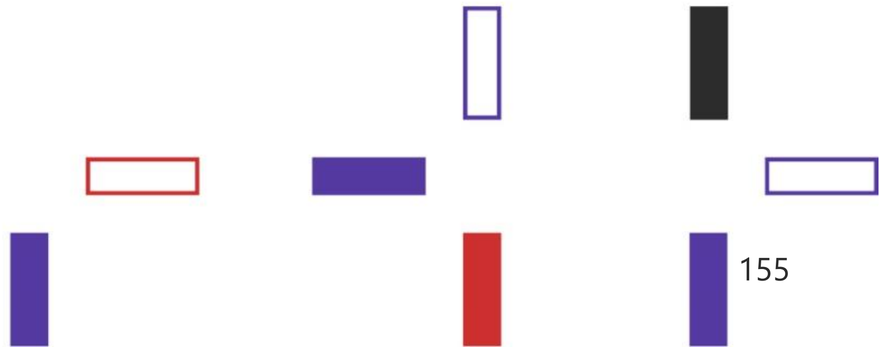


Grantham Institute
Climate Change and the Environment
An Institute of Imperial College London

Environmental intelligence

European Innovation Council

Transition Challenge



ENVIRONMENTAL INTELLIGENCE

European Innovation Council

February 28, 2017
By Jessica Rohde

Transition	Environmental intelligence

- The challenge is to develop materials, processes or systems that will enable the onset of synergies between sensors and artificial intelligence, at the interface of environment/sustainability and data science, so allowing the implementation of environmental monitoring and/or remediation actions

- The specific objective is to detect/monitor, prevent, reduce or eliminate environmental recalcitrant and/or emerging contaminants present in air, soil or hydrosphere.

- Solutions are encouraged to combine, analyze and interpret data (environmental intelligence), also coming from different sources – *in situ* (e.g. biological, chemical or physical sensors) or remotely (e.g. satellite) – eventually enabling the making of decision-ready information-based policies.

Transition	Environmental intelligence

European Innovation Council

The expected outcomes of your EIC Transition Challenge proposal are

- **Environmental intelligence technologies** that can positively demonstrate through pilot-scale prototypes to **perform environmental monitoring and/or remediation actions**, so to ultimately protect the environment from contaminations and to avoid the exposure of people to contaminants as well as to mitigate or reverse the effects of climate change.

A credible, business model for the deployment and use of the environment intelligence technology in the relevant environment.

An exploitation strategy including the IP protection of the novel results integrated in the environment intelligence technology .

Feedback from the Jury Members

European Innovation Council

Applicants must provide clarity on aspects related to

- Technical **milestones**,
- **IPR** ownership,
- budget and allocation of resources,
- **technical** and **business** risks,
- current and expected **TRLs** at the end of the project,
- **interdependence** of work packages and tasks,
- the **future exploiting team**, and
- the **credibility of the business objectives**.

What is next

- EIC Info day link: https://eic.ec.europa.eu/events/european-innovation-council-online-info-day-work-programme-2023-13-december-2022-2022-12-13_en

European Innovation Council

Thank you!

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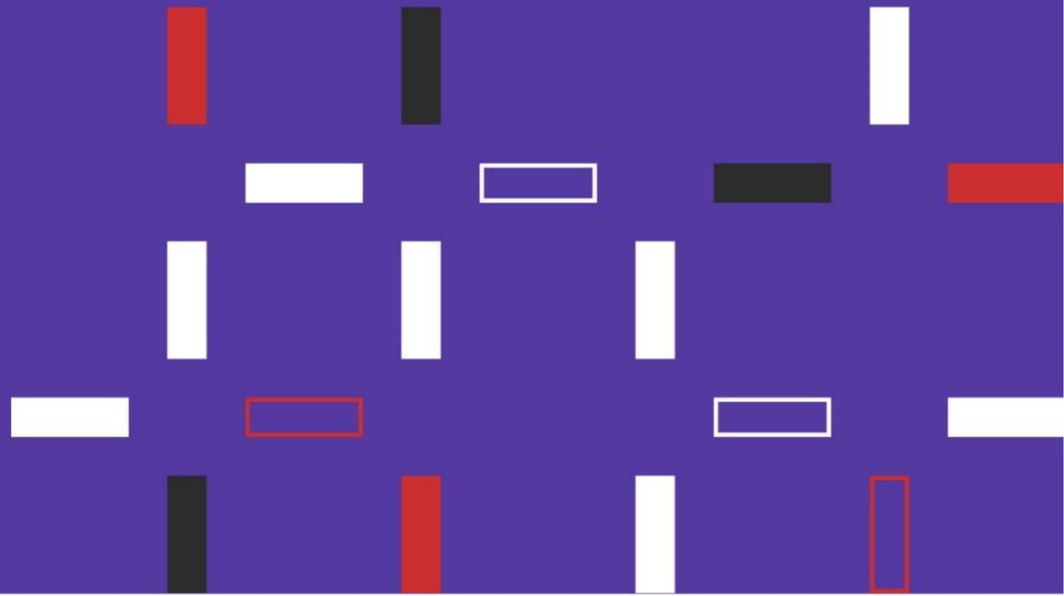
Antonio.PANTALEO@ec.europa.eu

Carina.faber@ec.europa.eu

@EUeic

#Eueic



Greenitiative

Is There a Place for Small NGO's in R&I Projects?

Pantera/Supeera WS
Bucharest 03.23.23

Greenitiative

Green Mogo @ Mogosoaia

Greenitiative

Green Mogo @ Mogosoaia

Greenitiative

What is Green Mogo?

Greenitiative

A green building used for many purposes

- A “LAB” for testing green living and climate adaptation solutions, mini-grids, air quality monitoring
- A nonformal EDUCATION center
- A COMMUNITY center
- A place where we PRODUCE our own food, energy and where we design and create objects we need
- A place used by other organizations and businesses for their green events
- A green home and a work place

Greenitiative

Achieving excellence in green building standards

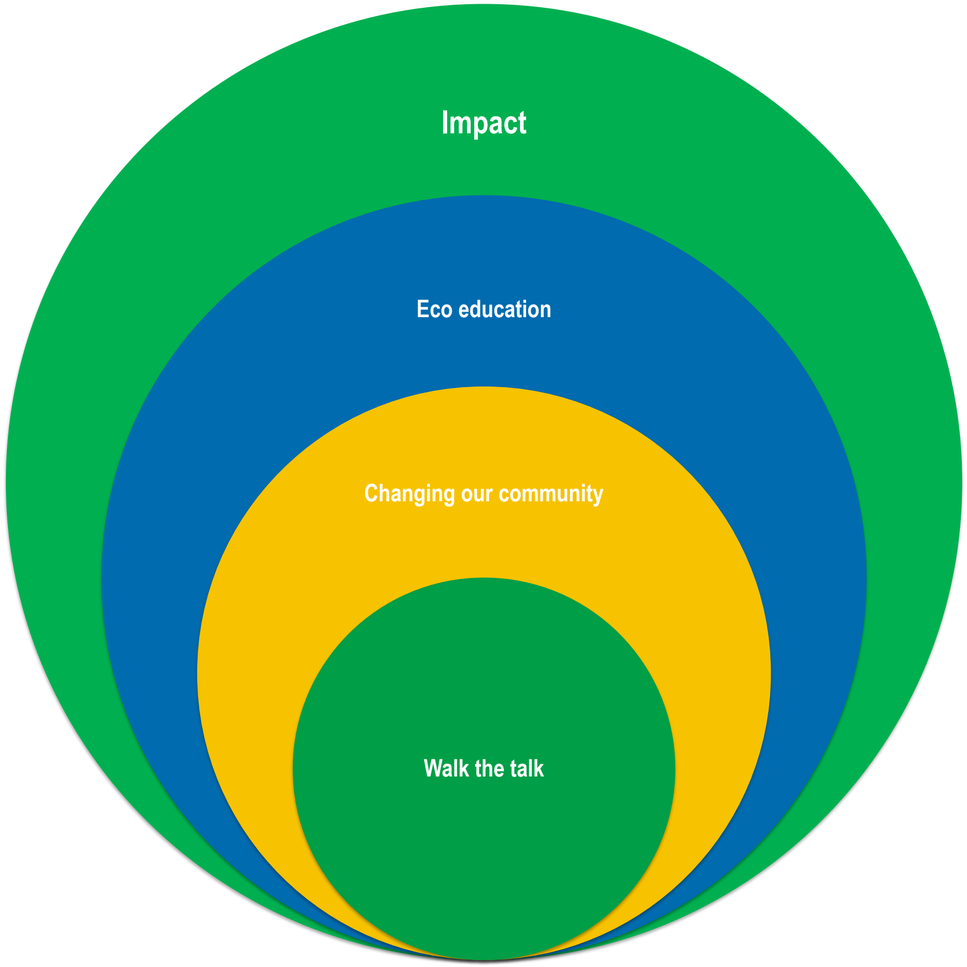
- Sustainable use of the site
- Water efficiency
- Energy efficiency
- Sustainable construction materials
- Indoor air quality/ comfort and green living
- Innovative design
- Impact

Greenome - Green Award – Romania Green Building Council Awards 2012

Greenitiative

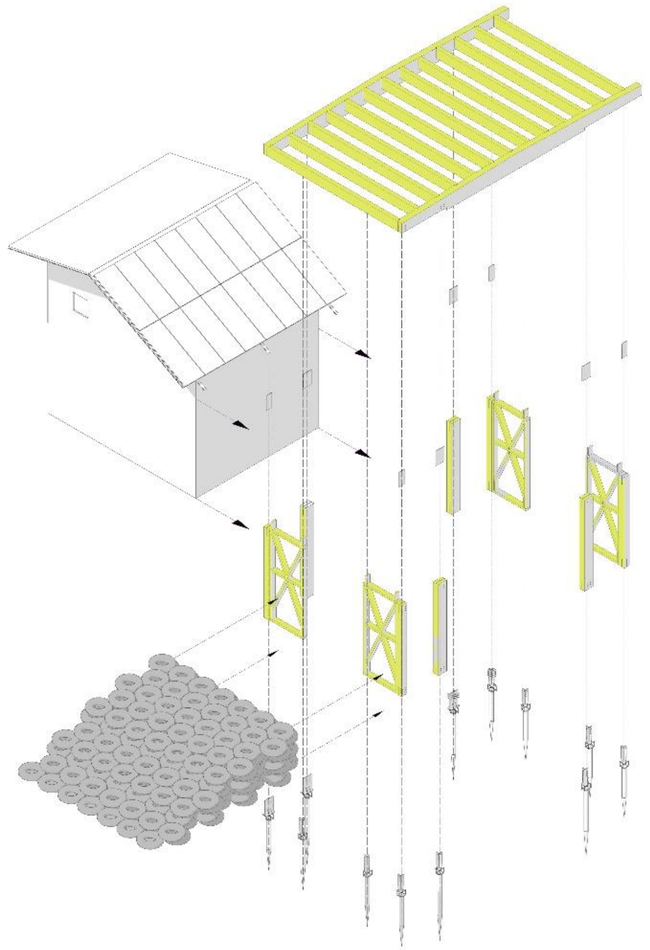
What we set out to do in 2007

- Eco education for the youth
- Local sustainable development
- Green building & living, promoting renewable energy

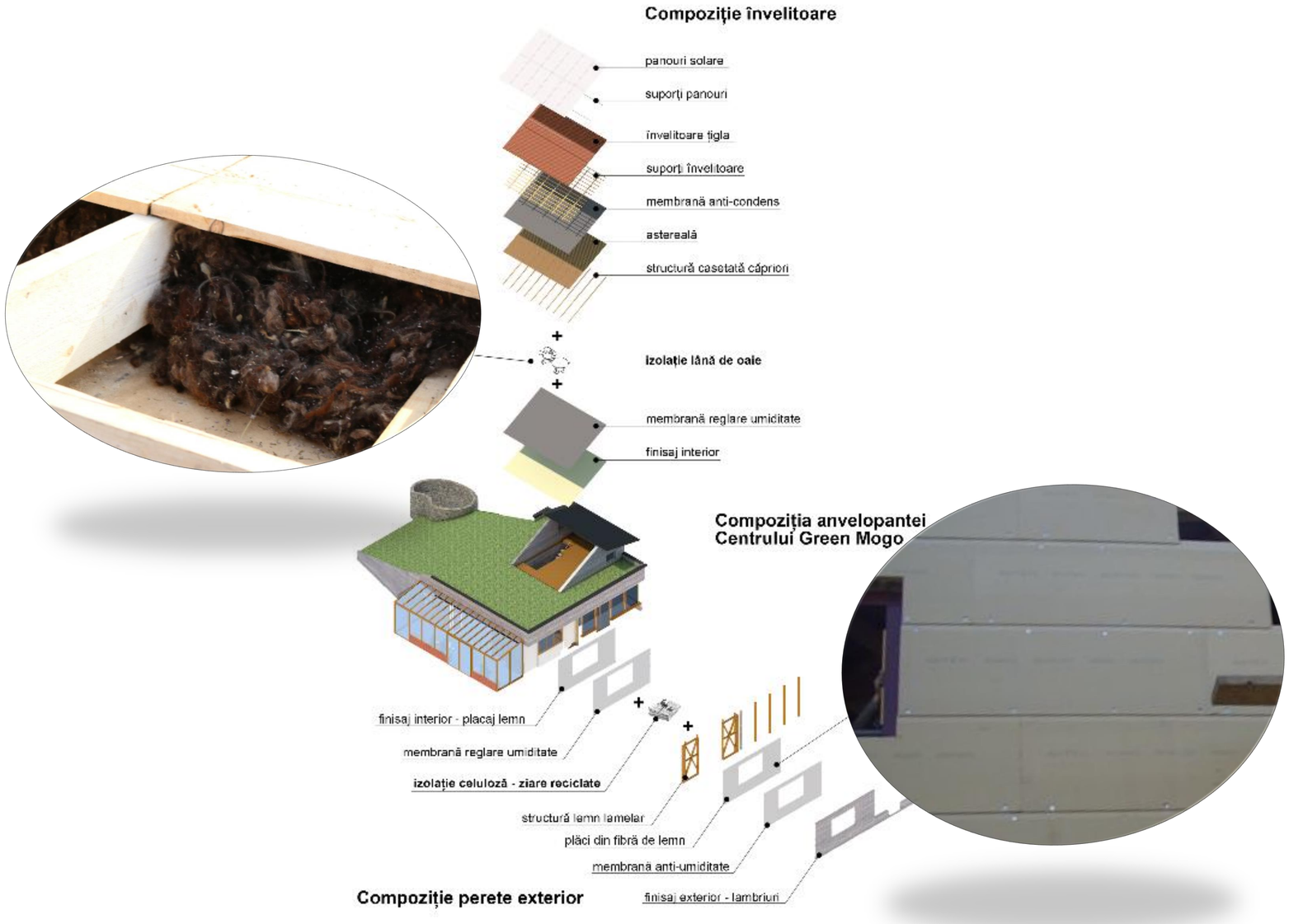


Greenitiative

Eco structure for an eco building

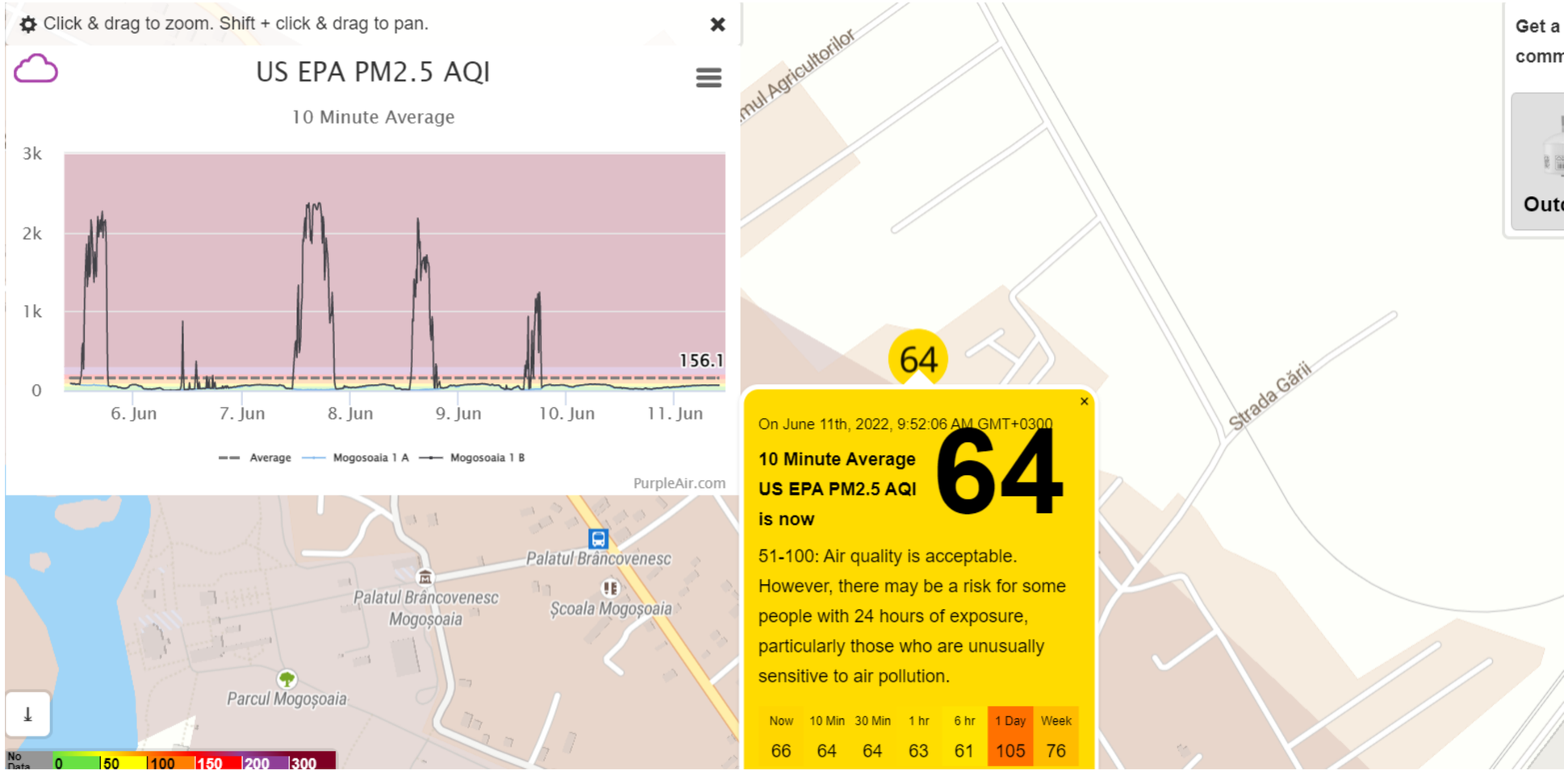


Sustainable building materials



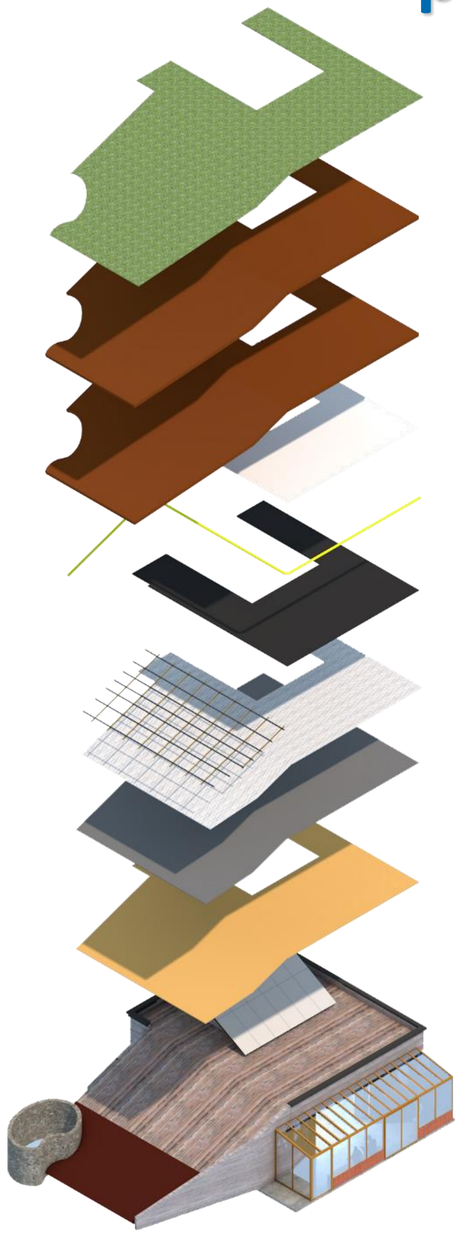
Greenitiative

Outdoor Air Quality Sensor



Greenitiative

The green roof as a solution for many problems we have created



Greenitiative

A rich biodiversity near a big and polluted city

Greenitiative and Universities

Greenitiative

Hands-on learning with university students

Greenitiative

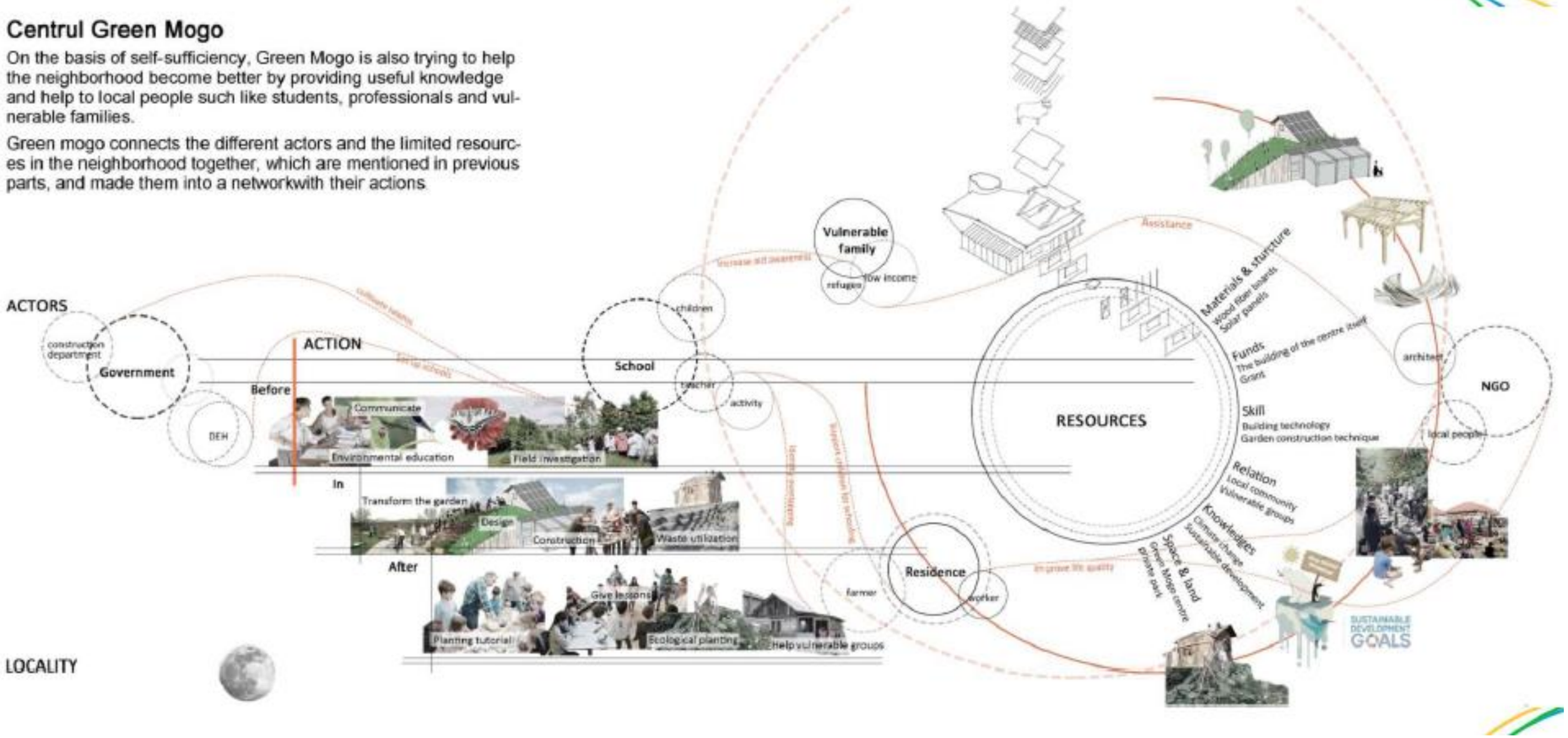
Sheffield University Visitors

Greenitiative

Centrul Green Mogo

On the basis of self-sufficiency, Green Mogo is also trying to help the neighborhood become better by providing useful knowledge and help to local people such like students, professionals and vulnerable families.

Green mogo connects the different actors and the limited resources in the neighborhood together, which are mentioned in previous parts, and made them into a networkwith their actions.



Greenitiative

I-Greta Research Project

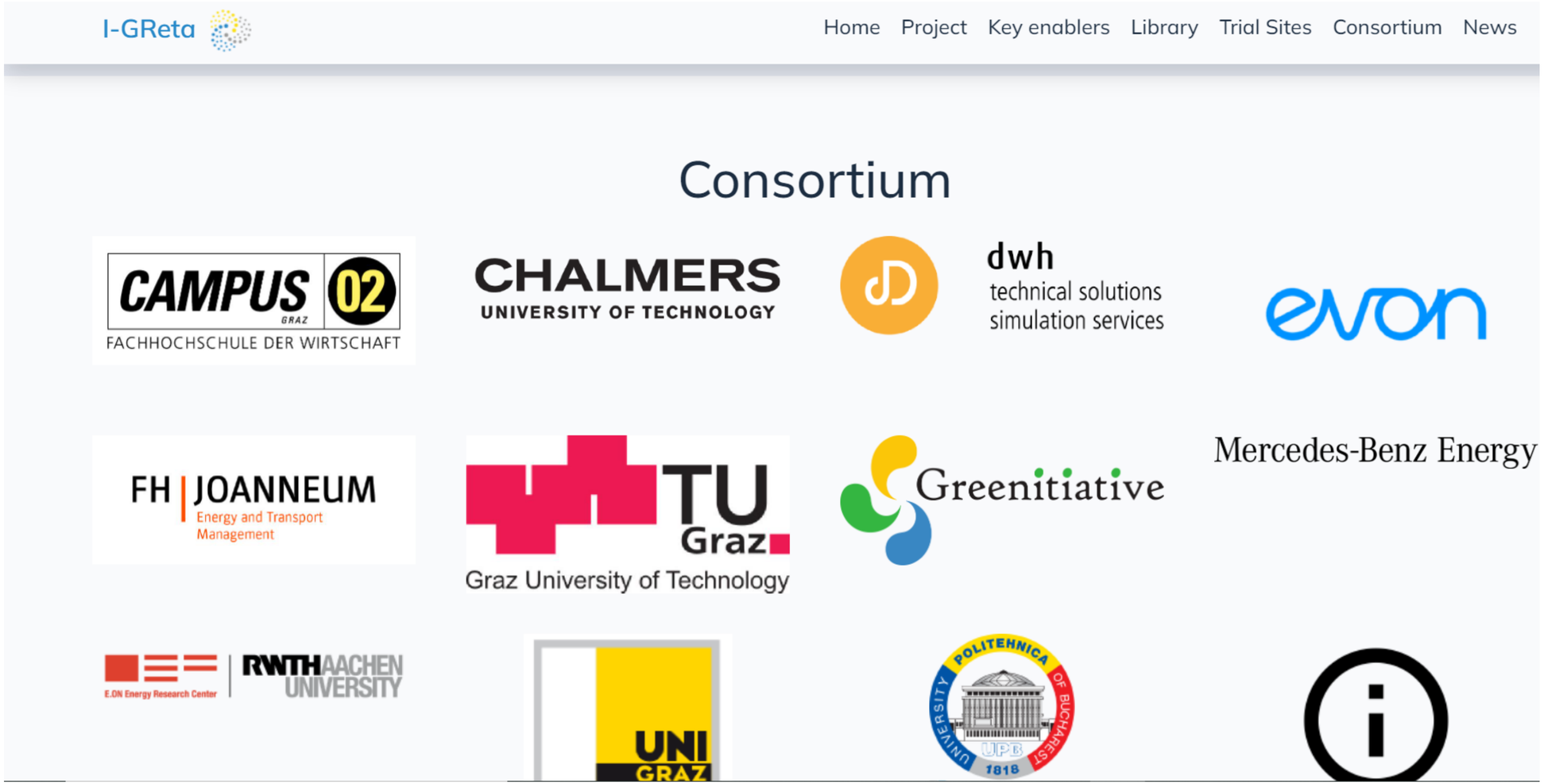
Smart Energy Systems ERA-Net

I-GRETA

Intelligent FIWARE-based generic energy storage services for environmentally responsible communities and cities.

Greenitiative

I-Greta Research Project



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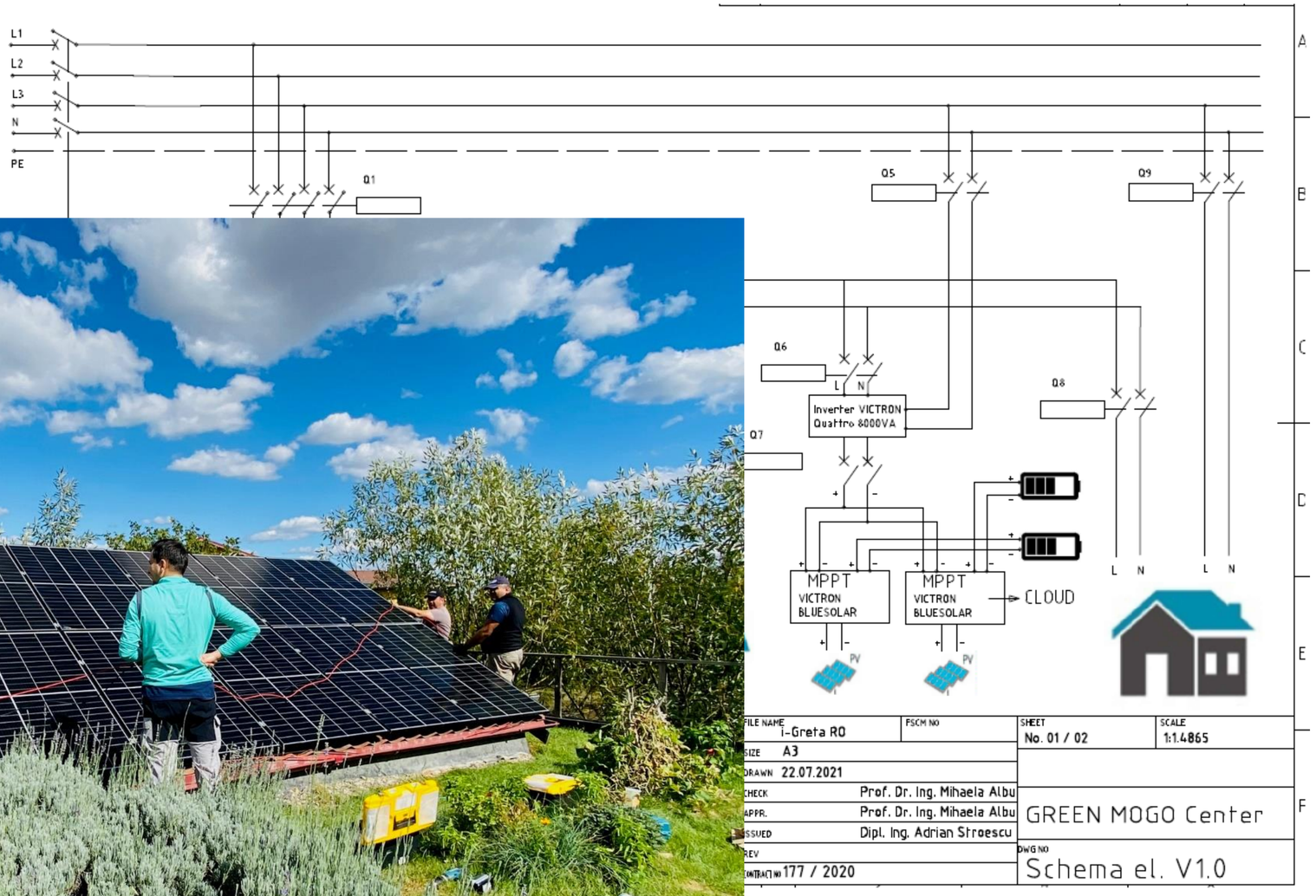
I-Greta Research Project



Transition from education to research

- From self-professed LAB to proper LAB and demonstration/test site for novel ideas
- NGO’s are natural drivers of innovation
- Consortiums of universities and NGO’s in research projects could be just as productive as those between universities and businesses
- 2 new consortiums with UPB as follow-up on I-Greta

Greenitiative

Thank you for your attention

Greenitiative, Green Mogo

Centrul Green Mogo

www.greenmogo.ro

FOSS
Research Centre for
Sustainable Energy

University of Cyprus
PV Technology

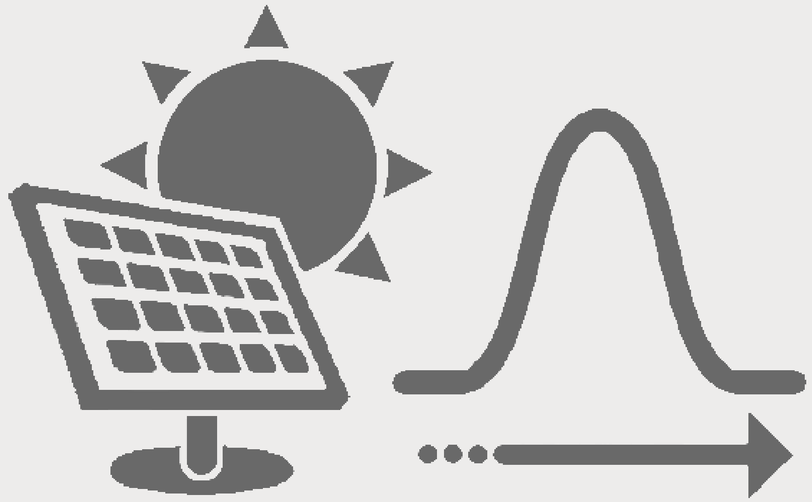
FOSS experience in EU funded collaboration opportunities

Chrysanthos Charalambous
PV Technology Laboratory
FOSS Research Centre for Sustainable Energy
University of Cyprus

FOSS
Research Centre for Sustainable Energy

Outline

- Our vision
- FOSS in a Nutshell
- Research – Projects participation
- Benefits of participating in EU funded projects
- Collaboration between research industry and government



FOSS
Research Centre for
Sustainable Energy

Our Vision

Establish a **regional** Research and Innovation hub of excellence which will generate novel ideas, provide a strong stimulus for interdisciplinary co-operation and be an internationally respected, state-of-the-art training and education centre.

FOSS
Research Centre for Sustainable Energy

FOSS in a Nutshell

Overall

- State-of-the-art Infrastructure
- World-class research
- Critical mass of trained people

Collaborations

- Industry
- Europe
- MENA
- Local/National

Activities

- Research
- Education and Training
- Industry Services

Research Areas

- Renewables (Solar energy)
- Smart Grids
- Integrated Solutions
- Grid integration
- Smart Cities
- Storage
- Novel Applications

FOSS
Research Centre for
Sustainable Energy

FOSS Highlights

Participation/coordination in **over 80 national/international research projects**

Research funding of 20 million euros over the past 6 years

Research quality/awards at international conferences

Over 400 research publications

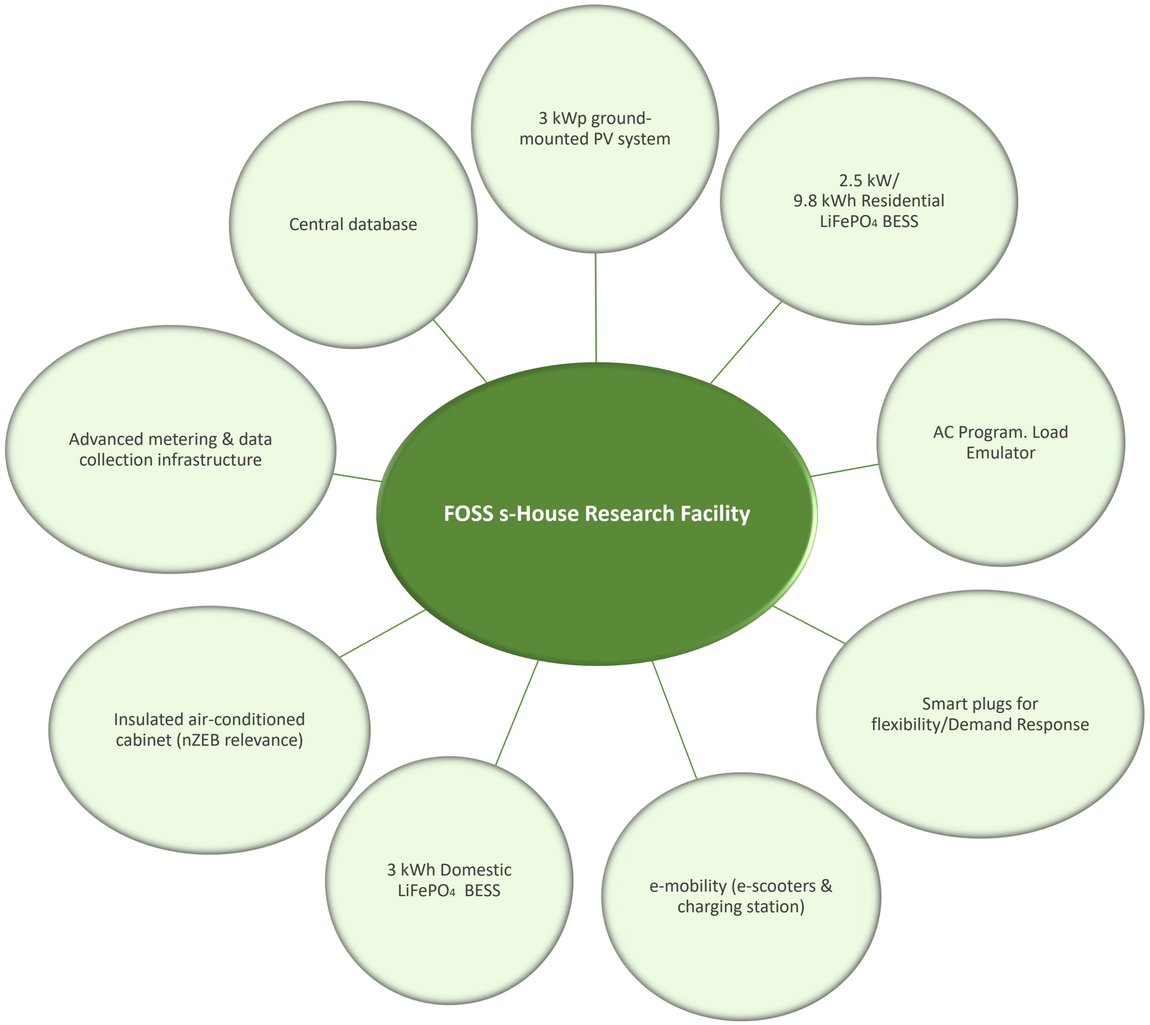
Comprises of over 50 people

ADVANTAGE AUSTRIA WKO

FOSS
Research Centre for
Sustainable Energy

University of Cyprus
PV Technology

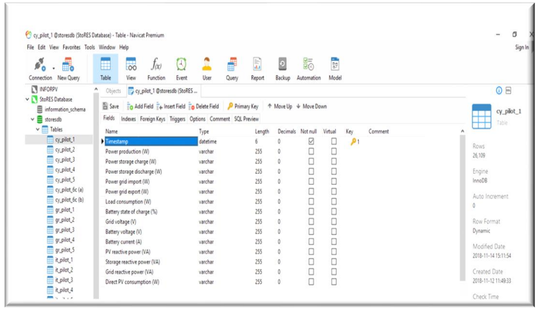
FOSS s(ustainable)-House Research Facility











Benefits of participating in EU funded projects

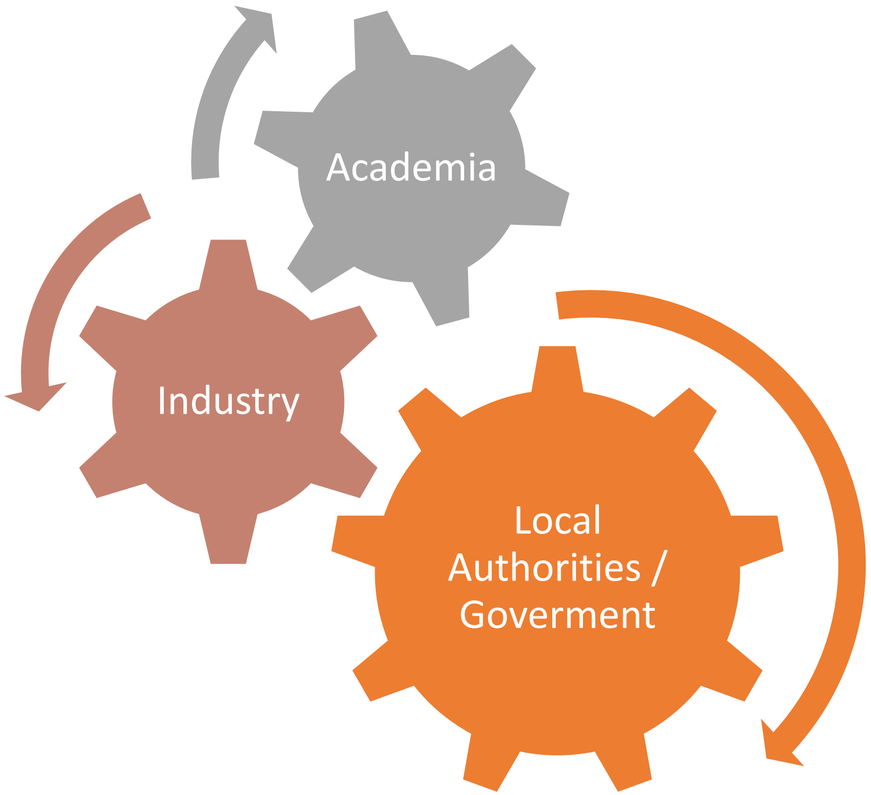
- **Financial benefits - Funding from European funding instruments**
- **Anticipate emerging technologies and undertake R&D&I activities**
- **New business opportunities**
- **Active role in EU initiatives, standards and regulation**
- **Enter international markets and access to new partners and customers**
- **Develop own technologies and join the experts of the same field**

Collaborations

Selection of the appropriate partners to win a proposal but also for the successful completion of the project

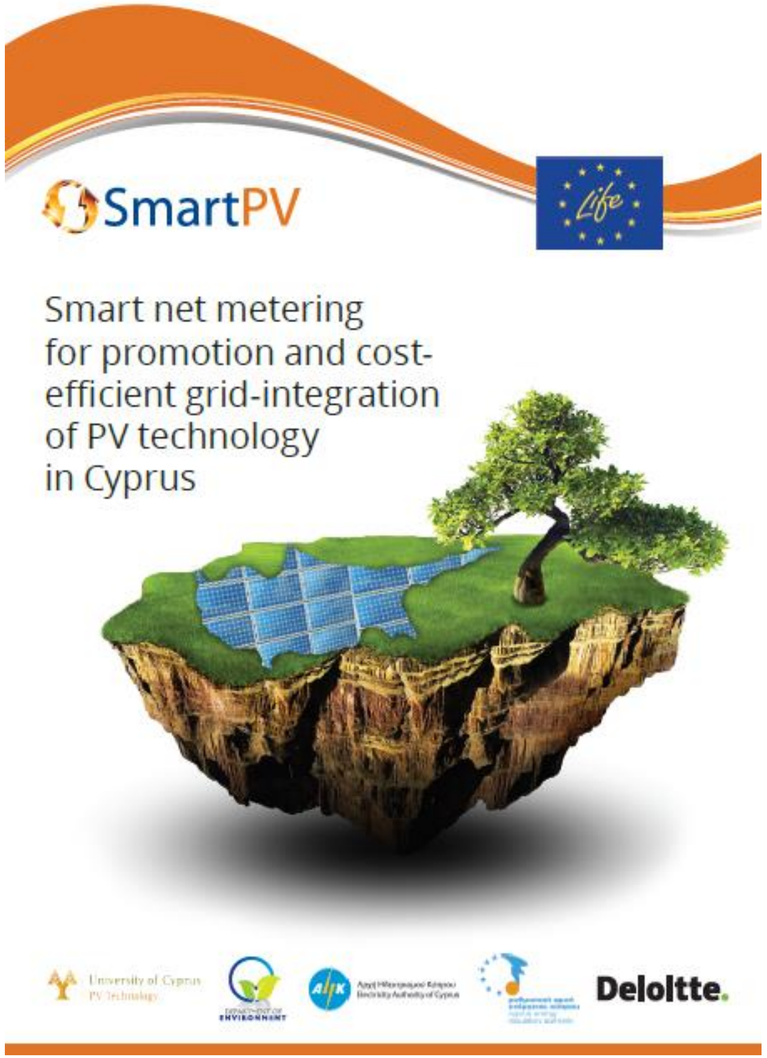
Collaboration of academic and research institutions with local industry to research and develop innovative technologies to serve local needs

Cooperation with the local authorities and government departments in order to host demo sites and pilots



Examples

Exterior Perspective View



Call for action

Register to brokerage Events:

Matchmaking Event on Horizon Europe upcoming calls

National Contact Points

Partner search announcements (Funding & tenders (europa.eu))

Thank you for your attention

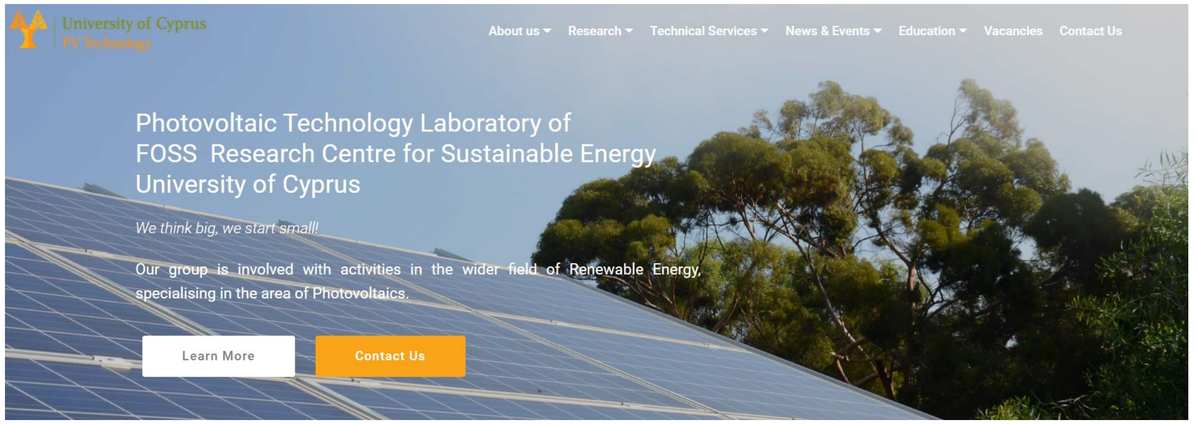
Chrysanthos Charalambous

PV Technology Laboratory
FOSS Research Centre for Sustainable Energy
University of Cyprus

charalambous.chrysanthos@ucy.ac.cy

More information…

http://pvtechnology.ucy.ac.cy/



www.foss.ucy.ac.cy
www.pvtechnology.ucy.ac.cy

@PVLab_FOSSUCY @PVLabFOSSUCY PV Technology, FOSS Research Centre for Sustainable Energy @fossucy

INVEST NOW

INNOVATE TODAY

BUILD THE FUTURE

Let’s build the First Local Green Deal in Romania!

Măgurele Science Park Association

MSP
MAGURELE SCIENCE PARK

Hello! :)

We crate the future by investing in

EDUCATION | RESEARCH | BUSINESS

What we do?

Building a community

- Research Development and Innovation
- Entrepreneurship
- Education

How we do it?

- **Promoting** Business and Research offers
- **Trainings** and **Mentoring programs** for Entrepreneurs, Researchers and Students
- **Matchmaking** by MSP
- **EDUHUB**

#SME4GREEN

Funded by
the European Union

Project Objectives

- Creation of **the first Local Green Deal** in Ilfov (Romania);
- **Stimulating cooperation** between local administrations, business environment and civil society in order to solve the biggest local challenges related to the ecological transition.

Milestones

October 2022: Publishing an analysis of the current legislative framework and strategic documents

April 2023: Creation of a Local Steering Group

April-September 2023: Creation Workshops

May-October 2023: SMEs capacity building programs

September 2023: Signing and implementing a Local Green Deal

#SME4GREEN

Funded by the European Union

PROJECT RESULTS

SME4GREEN in numbers

2 / national workshops

2 / international workshops

20 / SMEs participating in capacity building programs

40 / stakeholders to sign the Local Green Deal

100% / SMEs informed about EU funding sources for the ecological transition

#SME4GREEN

Funded by the European Union

The Benefits of participation in EU funded projects

01.

Build partnerships

- Find new domestic and international partners
- Become part of an European value chain
- Work with other experts to complete your solution/idea

02.

Develop your business

- Develop new processes/ technologies/ products
- Enter international markets

03.

Stay competitive

- Positive PR and Visibility
- Early access to R&D pilot sites
- Contribute to solve bigger challenges

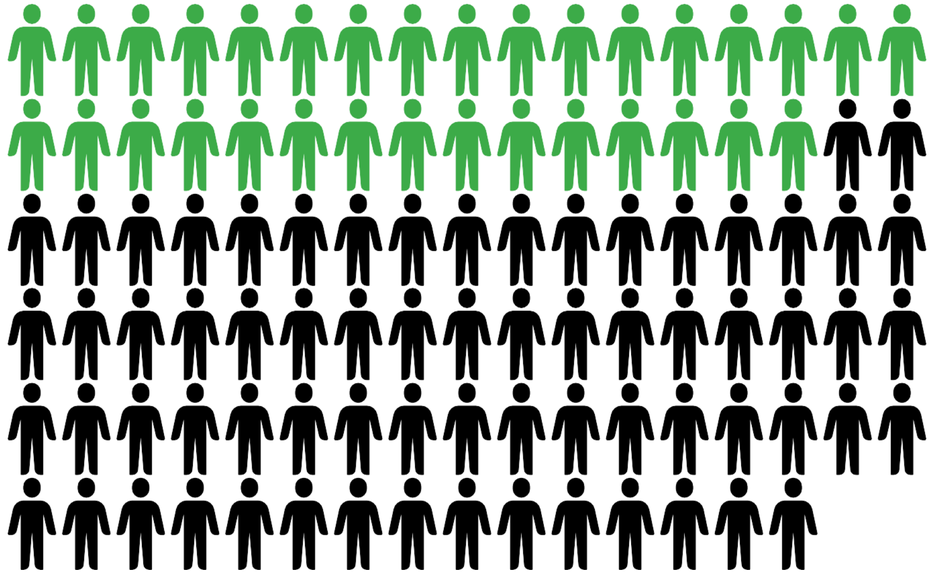
#SME4GREEN

Funded by the European Union

Get involved in the development process, make your voice heard!

Do you have **suggestions** on what the Local Green Deal of the Bucharest-Ilfov region should look like and what it should contain?

Do you want to participate in the mentoring programs or benefit from the workshops within the project? Aplly to this Open Call.



Write us an email at **andrei.groseanu@magurelesciencepark.ro** or you can get in touch with us on Facebook: **facebook.com/MagureleSciencePark/.**

#SME4GREEN

Funded by the European Union

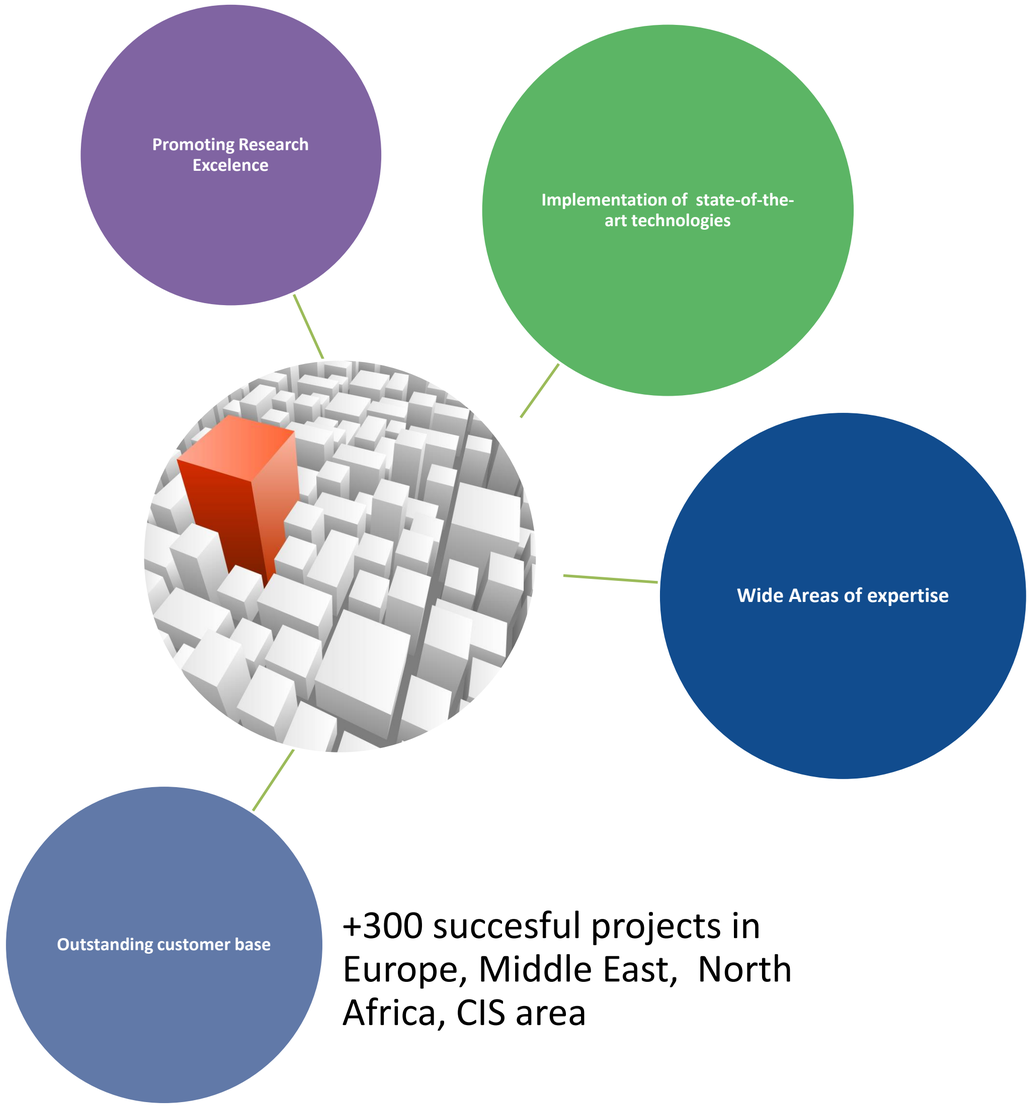
SIMAVI best practices in EU funding opportunities

Monica Florea

Head of Unit European Projects Department

monica.florea@simavi.ro

SIMAVI Business Card



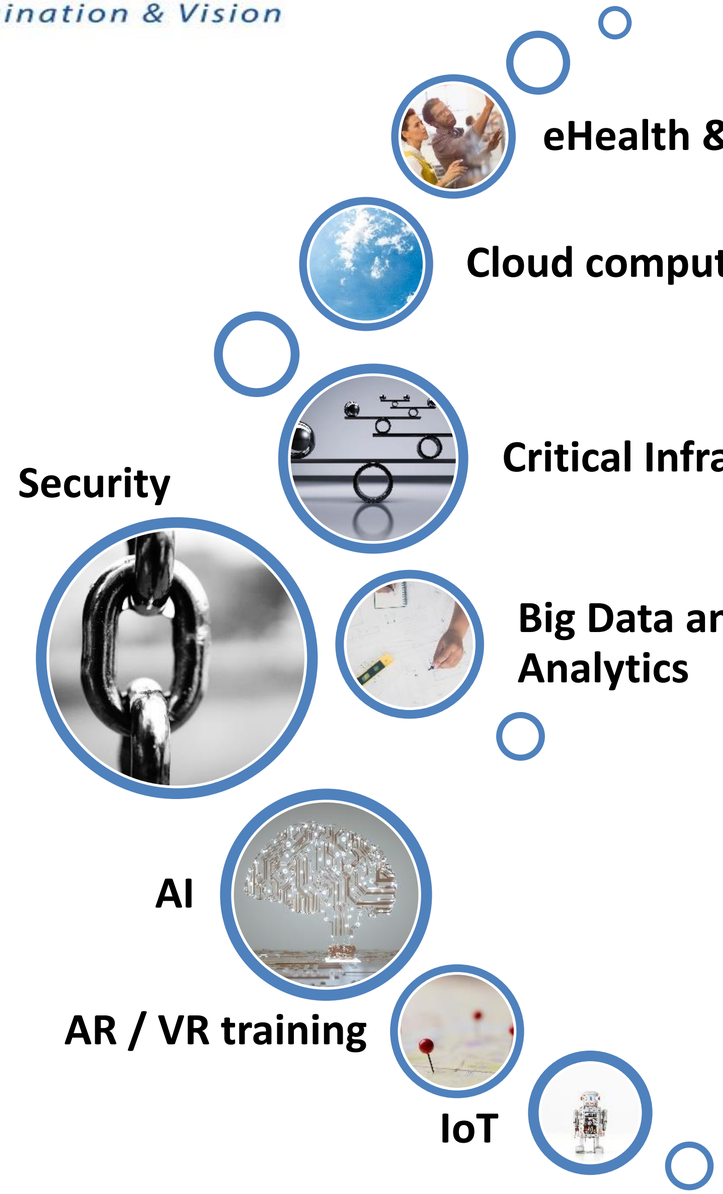
+300 succesful projects in Europe, Middle East, North Africa, CIS area

SIMAVI is a software SME focusing on:

- eLearning & Training
- eHealth
- Security
- Energy
- Industry 4.0
- eCustoms
- eGovernment
- eAgriculture
- Customized Applications
- EAS
- Research & Development Projects

  Over 60 H2020 & Horizon Europe projects

SIMAVI overview



Competences

- ✓ **Software Tools & Platform development**
- ✓ **User Experience & Journey Design**
- ✓ **Integration and interoperability**
- ✓ **Digital Content development & eTraining**
- ✓ **Pilot deployment and implementation in Eastern Europe**, by engaging key partners: (1) **City municipalities & Public Authorities**; (2) **Ports & Airports**; (3) **Hospitals;**(4) **Industry 4.0**; (5) **Energy DSO/TSO**; (6) **LEAs**; (7) **NGOs & Clusters**; (8) **R&D Organizations** and Universities; (9) **Ministries**
- ✓ **Experience in running over 45 H2020 projects** (as coordinator and partner)
- ✓ **Starting 14 Horizon Europe projects** (as coordinator and partner), 2 ISF, 1 Erasmus+

Energy & Mobility

Solutions & Experience

- ✓ EIIS (Energy Integrated Information System) application
- ✓ Heatmaps to represent vulnerable components or malware/intrusion activity
- ✓ Dashboard and attack graphs displaying how an intruder can traverse a network of nodes through vulnerabilities
- ✓ Architecture for small and medium distribution system operators (DSOs)
- ✓ IoT Platform
- ✓ Predictive analytics tool – for downtime, failure, critical events
- ✓ Data collection tool from IoT & sensors
- ✓ Cyber security in energy sector
- ✓ Integrated Smart GRID Cross-Functional Solutions
- ✓ End-user Communication platform
- ✓ Dark web monitoring tool (MT)
- ✓ SIEM (System Information Event Management)

REFERENCES

ENERGY SHIELD

[Coordinator SIMAVI]

FlexiGrid

inteGRIDy

CyberSEAS

Cybersecurity & Security

Solutions & Experience

- ✓ Real-time Early Detection and Alerting Framework for Operation Control Systems
- ✓ Social Media Data Acquisition Engine
- ✓ Multimedia Analysis for Crime prevention and Investigation
- ✓ Physical threat response Optimization (PTRO)
- ✓ Cybersecurity framework
- ✓ Operational cyber security risk management platforms
- ✓ Crowdsourcing and mobile apps monitoring
- ✓ Mobile application for on Field guidance
- ✓ Stream data collector and Big Data integration platform with real-time alerts
- ✓ Prediction & Visual Intelligence
- ✓ Biometric data integration & analysis
- ✓ Data Fusion Tool
- ✓ Real time analytics for triggering alerts and border events monitoring
- ✓ 3D-visualisation of early warnings and early warning module
- ✓ XR Training dedicated to LEAs, First Responders and Cybersecurity experts

REFERENCES

BORDERUAS [Coordinator SIMAVI]

ODYSSEUS [Coordinator SIMAVI]

TeamaWare [Coordinator SIMAVI]

REDALERT [Coordinator SIMAVI]

CC-DRIVER

MAGNETO

ECHO

SECANT

CONNEXIONS

CREST

PREVISION

IMPETUS

SPEECHXRays

SIMARGL

SMILE SMart mobiLity at the European land borders

ISOLA

S&R

ENSURESEC

METICOS

Green Deal & Environmental Monitoring

Solutions & Experience

- ✓ Toolbox for decision support and adaptive control of air quality monitoring
- ✓ Soil Pollution monitoring
- ✓ Platform that cater to the demands of efficient resource utilization and provide protection against threats of wildfires encountered globally
- ✓ Integrated toolkit for intelligent management of processes, ethics and technology for Urban Safety
- ✓ ICT framework for urban water sector
- ✓ AI based DSS for optimizing forest management decisions for a low-carbon, climate resilient future in Europe
- ✓ ECOSUNT – Efficient solutions for waste management
- ✓ Support large-scale demonstrators of how systemic upscaling and replication of best practice ecosystem restoration can be deployed at regional, national and cross-border levels, focusing on degraded terrestrial, freshwater, coastal or marine ecosystems, responding to relevant restoration goals enhancing biodiversity;
- ✓ Support on adapting, integrating and demonstrating innovative methods (technological, non-technological, social and governance, including sustainable financing) on upscaling ecosystem.

REFERENCES

FLOOD-serv
[Coordinator SIMAVI]

Industry 4.0

Solutions & Experience

- ✓ Development of ICT platforms – WhiteGoods Platform, Automotive Platform and collaborative Private Cloud Platform
- ✓ AI based decision support systems for manufacturing
- ✓ AI-Analytics Designer targeted at sustainable consumption patterns
- ✓ Enhanced Cognitive Twin
- ✓ Maintenance scheduler
- ✓ Manufacturing management component
- ✓ Process modelling and Knowledge graphs
- ✓ AR based inspection and maintenance tool
- ✓ Predictive analytics tool – for downtime, failure, critical events
- ✓ Data collection tool from IoT & sensors
- ✓ Cybersecurity solutions (data encryption, authentication, authorization)
- ✓ Mobile apps
- ✓ Network management for existing/emerging IoT/5G/6G technologies
- ✓ Open repository for knowledge transfer and data sharing

REFERENCES

KYKLOS 4.0

Circ Thread

ZERO DEFECTS Manufacturing Platform ZDMP

ReCiPSS

FACTLOG

NEMO

MatCHMaker

eAgriculture

Beneficiary: **Payment and Intervention Agency for Agriculture**

Integrated Administration and Control System (IACS)

Figures and Facts:

The system ensures consistency and compatibility between national schemes for farmers, covering:

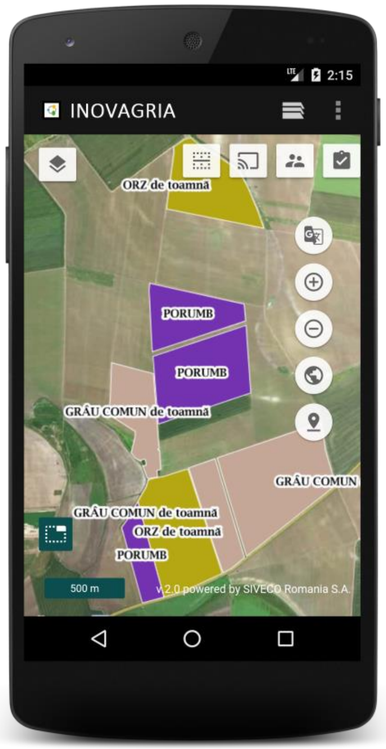
- **944 076 unique applications submitted for a yearly campaign**
- **34,55 million agricultural physical blocks, for all schemes required**
- **1,45 million farmers in the database**
- **Over 13,4 billion EUR paid**
- **Over 83 million operations performed in the APIA's information system**

Organizational structure:

- **42** county centres
- **5,000** internal users
- **+900,000** beneficiaries

INOVAGRIA – farm management system

The software created for farmers, for managing the activity of an agricultural, vegetable or animal farm



The possibility of integration with ERP software or other existing solutions

Integrated solution with existing electronic systems on agriculture

Increasing the profit

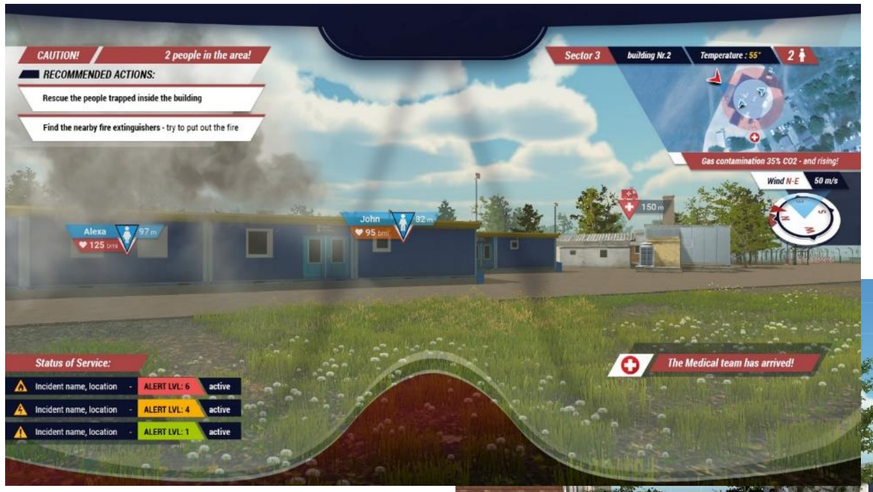
Affordable solution and mobile environments: tablet, Smartphone

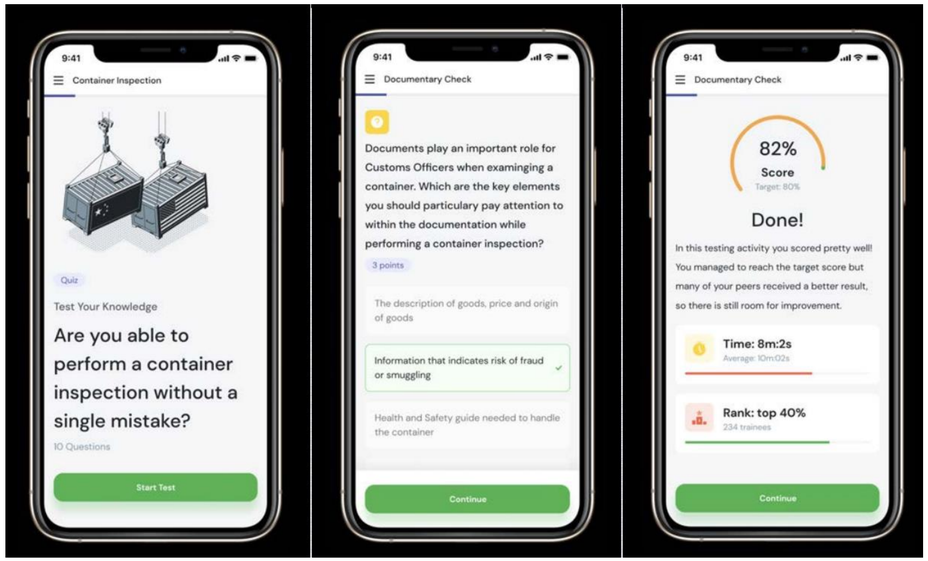
- Identification of material and fuel losses
- Crops evolution registration
- Assessment of the water in case of drought and irrigation works necessary
- Identification of land with low production
- The characteristics of the soil by fertilization history

eLearning & eTraining

AR/VR

We create customised Augmented Reality/Virtual Reality applications that can emulate any technical environment for training





Mobile Learning

We create mobile learning applications designed to support learners with knowledge support at the point of need

eLearning & eTraining

Solutions & Experience

- ✓ Augmented cultural heritage inclusion and accessibility
- ✓ One-stop-shop and open marketplace for XR applications for learning, training and education
- ✓ eLearning platform dedicated to Training & Awareness
- ✓ Authoring tools for realistic simulations
- ✓ Interactive & educational games development
- ✓ Complex virtual laboratories with 3D immersive
- ✓ Single API interface to interact with different VR devices
- ✓ Rich AR content
- ✓ Deeply interactive apps that intelligently interact with any real-world environment
- ✓ Deployment across multiple mobile and wearable AR/VR devices

REFERENCES

2hift [Coordinator SIMAVI]

XR4ED

beaconing

PALAEMON

ISOLA

S&R

LAW-GAME

newton

3D Pathology

eHealth

Solutions & Experience

- ✓ Tele-monitoring & Tele-rehabilitation applications
- ✓ AI based DSS to foster evidence-based pain relief methods in the treatment and alleviation of cancer pain
- ✓ integrated, scalable and interactive care ecosystem to promote quality of life for elderly people
- ✓ Multisource real-world clinical information access and integration framework
- ✓ VR Assistant / AR/VR Training
- ✓ Application for healthcare professionals and carers
- ✓ Toolbox for decision support and adaptive control of air quality monitoring
- ✓ ML Anomaly Detection Component and NLP services
- ✓ Implement clustering & classification algorithms
- ✓ Serious Games for brain training
- ✓ Personalized platforms & AI-based DSS
- ✓ Diagnostic support tools
- ✓ Monitoring solution for elderly people

REFERENCES

vCare – Virtual Coaching Activities for Rehabilitation in Elderly

MES-CoBraD

InteropEHRate – EHR in people's hands across Europe

SPHINX

DEEPHEALTH

PROCare4Life

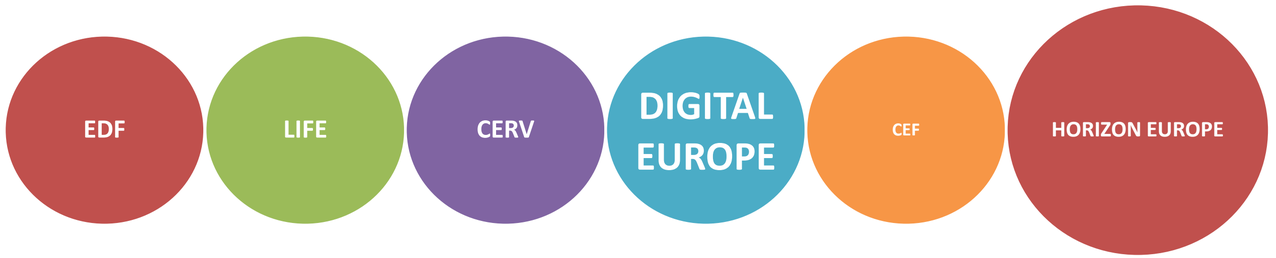
LETIT FLOW

BRAIN@home

Follow.Me

PAINLESS – Pain Relief in Cancer

EU R&D Programs of interest



1. Health
2. Culture, Creativity and Inclusive Society
3. Civil Security for Society
4. Digital, Industry and Space
5. Climate, Energy and Mobility
6. Food, Bioeconomy, Natural Resources, Agriculture and Environment

R&D projects highlights

Consortium

- ✓ Research institutions
- ✓ Universities
- ✓ SMEs
- ✓ Industry
- ✓ NGOs, Associations, Standardization bodies
- ✓ End user organizations:
  - ✓ DSOs/TSOs
  - ✓ City municipalities & Public authorities
  - ✓ Hydropower plants
  - ✓ Smart buildings
  - ✓ etc

Expertise

- ✓ Innovative ideas
- ✓ Top-level Research
- ✓ Innovative solutions
- ✓ Prototypes
- ✓ Access to research data
- ✓ Data protection & ethics
- ✓ R&D projects writing expertise
- ✓ Dissemination & Networking
- ✓ Knowledge sharing among partners & projects
- ✓ Exploitation and commercialization

SIMAVI
Software Imagination & Vision

European Affiliations

AIOTI
Alliance for Internet of Things Innovation

bridge
HORIZON 2020

BDV
BIG DATA VALUE ASSOCIATION

CyberEPES CLuster

PATROMIL

The Romanian Business Association of the Military Technique Manufacturers

Thank you!

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SUPEERA

Support to the coordination of national research and innovation programmes in areas of activity of the European Energy Research Alliance

Panel discussion