



# PANTERA project: A Pan-European Technology Energy Research Approach



**EIRIE**  
smart grids

EUROPEAN INTERCONNECTION  
FOR RESEARCH INNOVATION &  
ENTREPRENEURSHIP

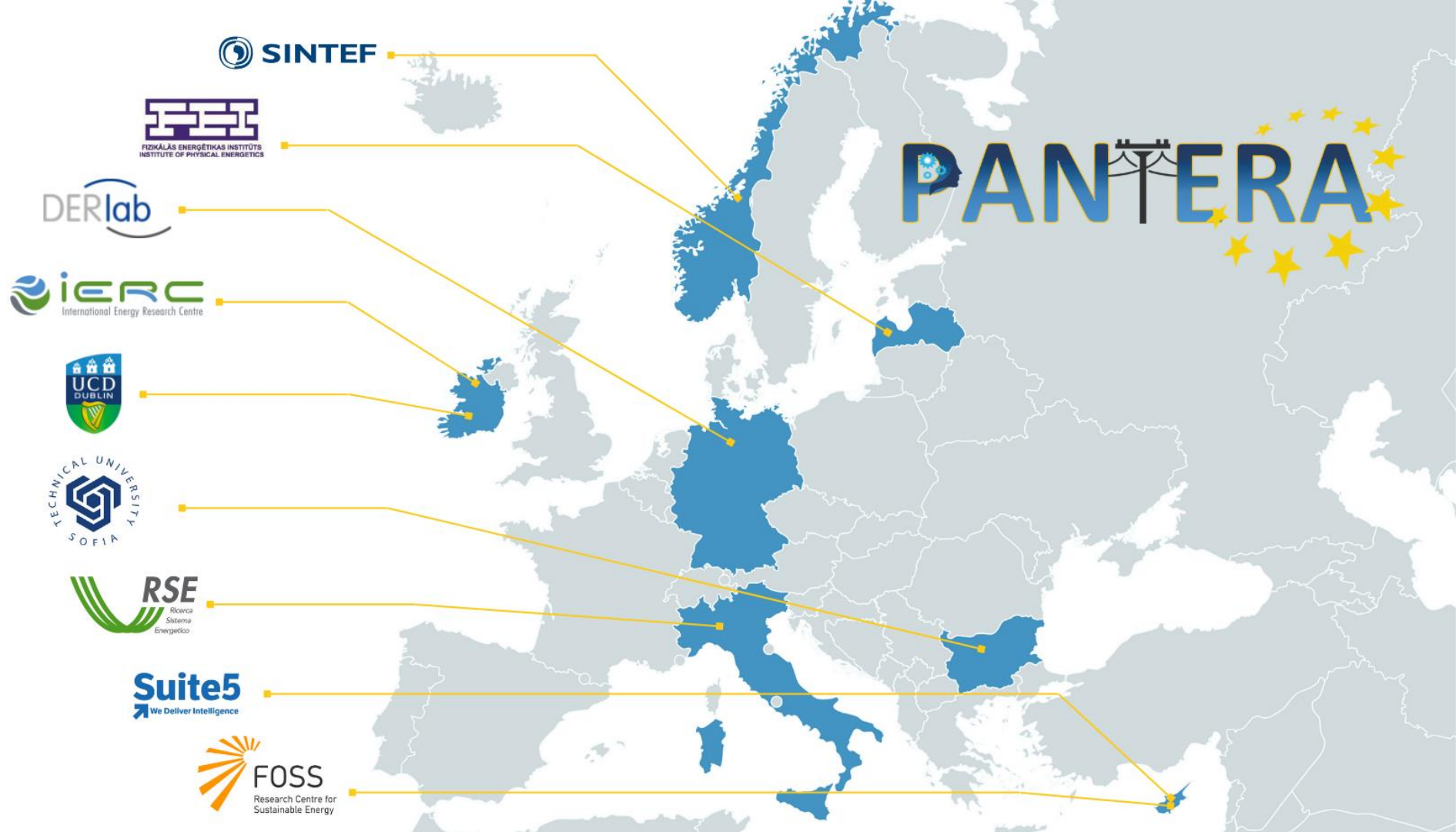


# General information



- \* Type of Action: Coordination and Support Actions (CSA)
- \* Duration: 48 months
- \* Starting date: 1 January 2019
- \* Total Budget: 3.9 Million Euro
- \* Coordinator: FOSS University of Cyprus





## The PANTERA consortium on a map



# Why PANTERA?

Europe wants coordinated steps forward to achieve the Energy Transition in meeting climate change needs.

The smartening of the grid infrastructure has taken by storm the traditionally slow moving electrical industry in the last decade.

PANTERA steps in to raise awareness, participation, effectiveness, full use of EU resources and as a result :

 **Strengthen the involvement of the European industry and sharing of benefits achieved.**



**To ensure sustainable, secure and affordable energy supplies in the European Union, a fully integrated grid and energy market is required.**

This is why PANTERA is identifying and implementing initiatives aimed at raising the participation of all EU countries in the needed R&I for developing technologies, systems and markets in support of the common energy market and the energy transition.

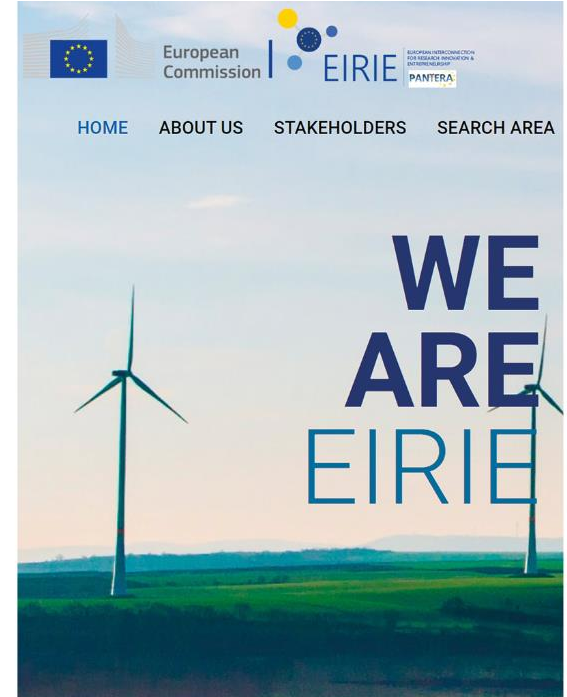
**The project's main goal  
is to bridge the gaps in  
research and  
innovation in the  
energy field that exist  
between EU Member  
States.**

Our mission is to become the single  
point of reference for smart grids in  
Europe, through the EIRIE platform.



# To do so, PANTERA developed two main instruments:

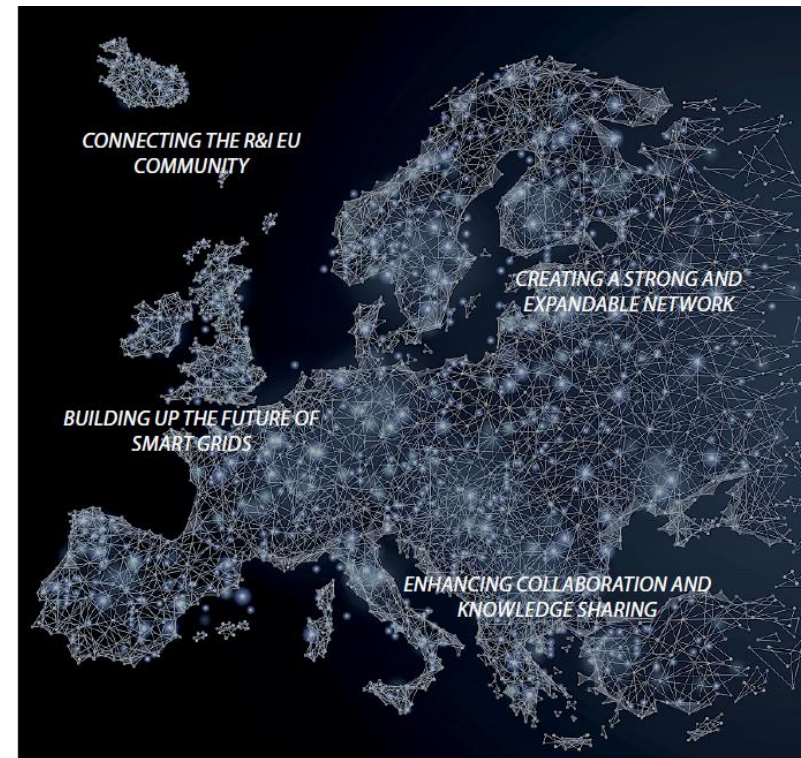
- 01 **Regional Desks**, an important mechanism that will support the PANTERA activities at regional level.
- 02 **The EIRIE (European Interconnection for Research Innovation & Entrepreneurship) multi-functional collaborative platform**





# PANTERA Regional Desks

- Fully aligned with the national/regional research and innovation strategy for smart specialisation (RIS3) in content and approach.
- Link research and innovation with the regional priorities and competences in close cooperation with local actors.
- Link regions and local assets and capabilities to external sources of knowledge and value chains.
- Understand the local context and propose best practices that can be applicable for designing policies and strategies for regional and national goals.





# The 6+1 Approach: Closer to local stakeholders

- **Six PANTERA Regional Desks** targeting countries which appear to have a lower rate of smart grid investment
- **One best-practice Desk** elaborating on gathering and systemising good experiences in projects and R&I governance from more successful countries.



# What is EIRIE?



**EIRIE**  
smart grids

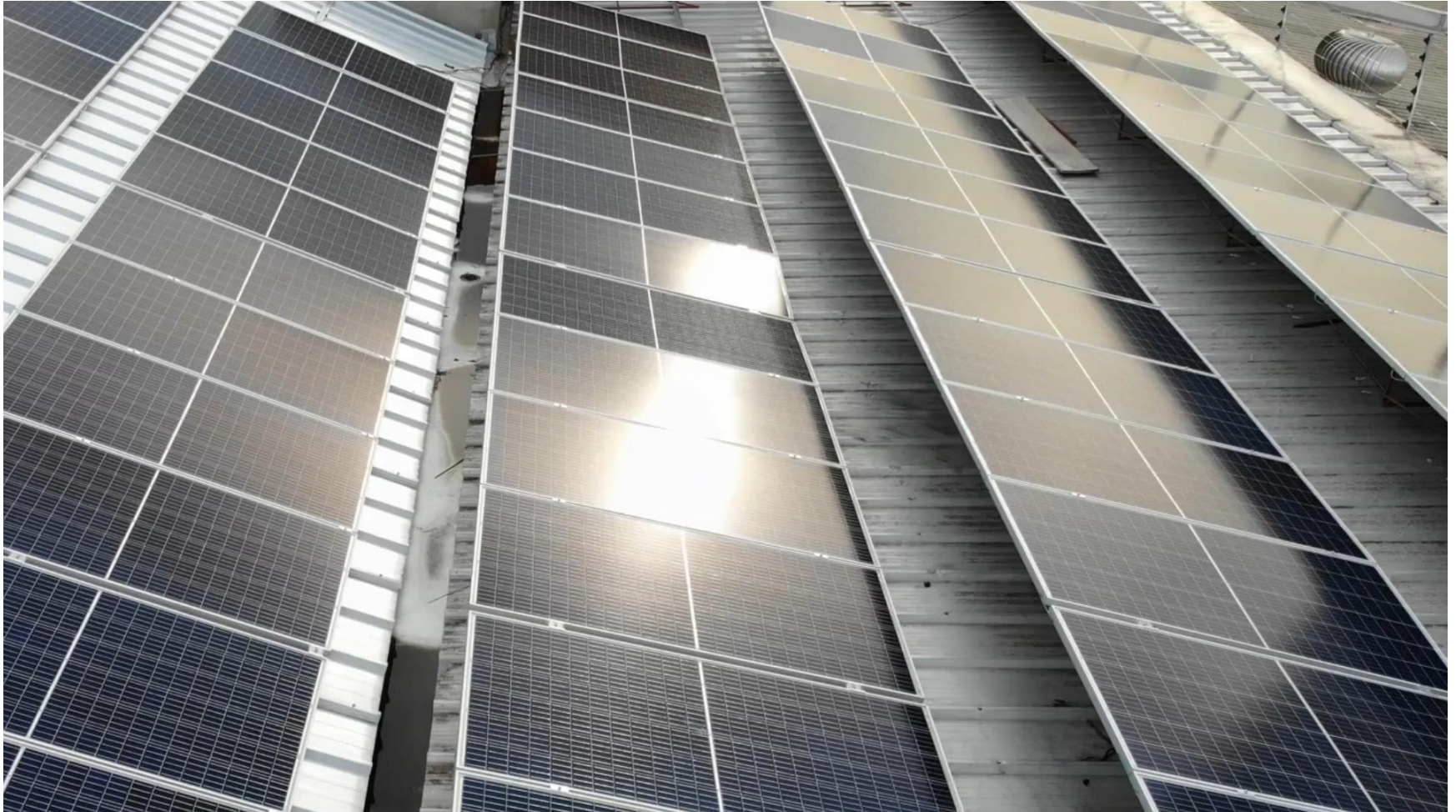
EUROPEAN INTERCONNECTION  
FOR RESEARCH INNOVATION &  
ENTREPRENEURSHIP



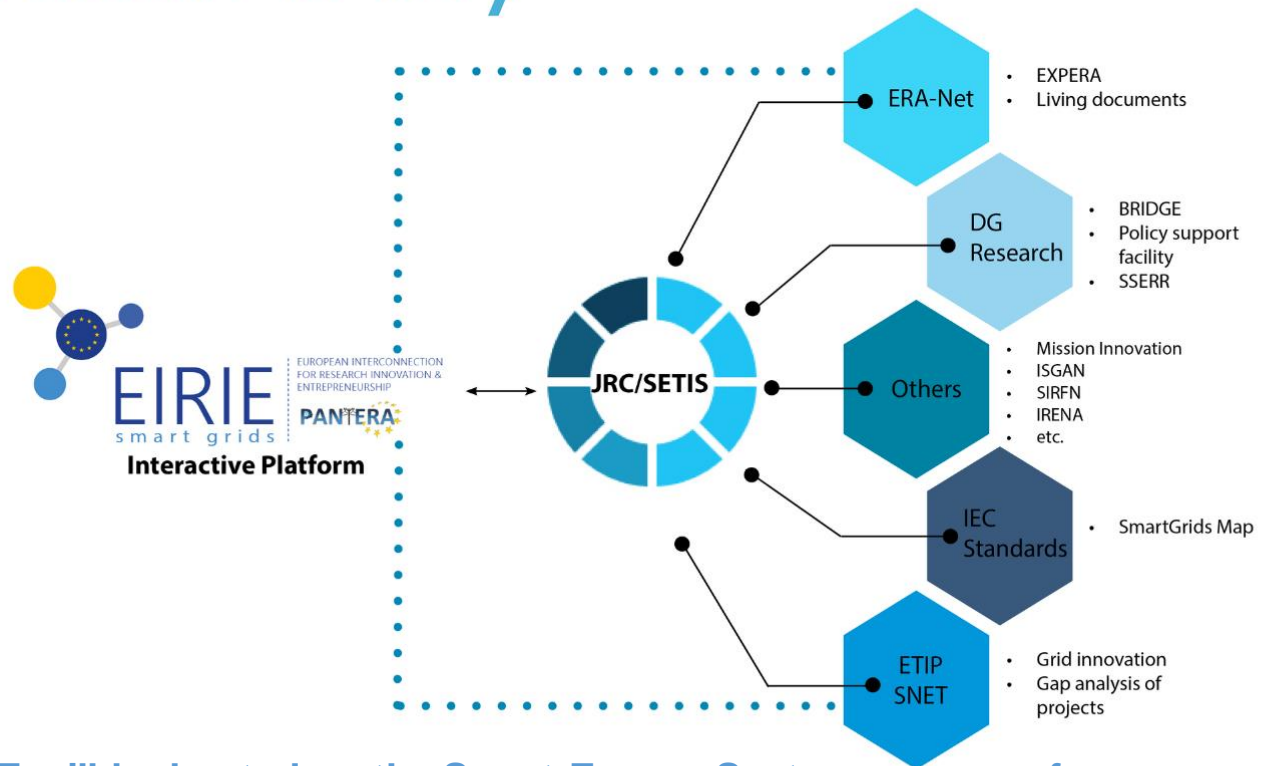
EIRIE will help bridge the gaps that currently exist in the energy field in Europe between Member States, by bringing together the attractiveness of successful partnerships being national, regional or European.



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.



# Collaboration is key



➔ EIRIE will be hosted on the Smart Energy System servers of JRC and sustainability is guaranteed by DG Ener through a dedicated Service contract to take over from the PANTERA consortium on completion of the 4 years



# 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,



# Key functionalities

## Data Area, with search and linking functions:

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

## Information area, with search and linking functions:

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

## Knowledge area, with search and linking functions:

- Living documents





# PANTERA education/training




The EIRIE platform hosts more than 30 education/training courses



Let us have a tour on EIRIE Training/Education  
area

[www.eirie.eu](http://www.eirie.eu)





European Commission

HOME ABOUT US STAKEHOLDERS SEARCH AREA COLLABORATION PROJECT REPORTING NEWS AND EVENTS TRAINING / EDUCATION

Programmes

**WE ARE**

**EIRIE** EUROPEAN INTERCONNECTION FOR RESEARCH INNOVATION & ENTREPRENEURSHIP PANTERA

It is EIRIE's vision to create, through this multi-functional collaborative platform, a reference operational point to **unify European activity**, incentivize further **investments in smart grids** and support **access to exploitable results** that will enable further **cooperation** and bridge the existing gaps.



**Community of stakeholders**



**Sustainability and collaboration**



**Collaborative multi-dimensional platform**





One could search for course by title or description

## Programmes

- Any -

- Any -

- Any -

- Any -

- Any -

- Any -

- Any -

**SEARCH**

Last update: 06. Jul 2021

### DC Microgrids

Technology Terminal Grids Networks System Energy Distributed Technology Network Denmark

DC distribution and transmission systems are a clear trend in electrical networks.

Last update: 06. Jul 2021

### AC Microgrids

Technology Terminal Grids Networks Energy Distributed Technology Network Denmark

A Microgrid can be defined as a part of the grid with elements of prime energy movers, power electronics converters, distributed energy storage systems

## Programmes

Title/Description

Location Organization

- Any - - Any -

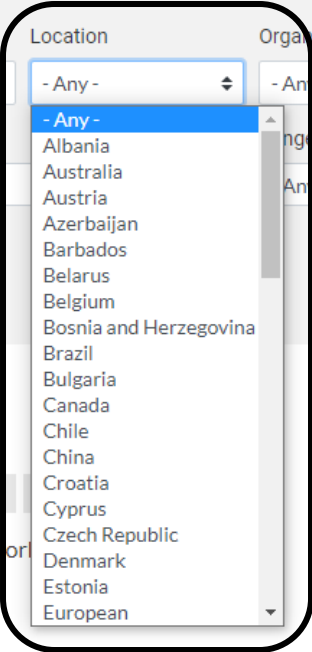
Technology Mode

- Any - - Any -

SEARCH

Number of Trainees Thematic

- Any - - Any -



One could search for course by location

Last update: 06. Jul 2021

### DC Microgrids

Technology Terminal Grids Networks System Energy Distributed Technology

DC distribution and transmission systems are a clear trend in electrical network

Last update: 06. Jul 2021

### AC Microgrids

Technology Terminal Grids Networks Energy Distributed Technology Network Denmark

A Microgrid can be defined as a part of the grid with elements of prime energy movers, power electronics converters, distributed energy storage systems



One could search for course by organisation/university

## Programmes

Title/Description	Location	Organization		
<input type="text"/>	- Any -	- Any -		
Technology	Mode	EQF	Range of Trainees	Thematic
- Any -	- Any -	- Any -	- Any -	- Any -
<input type="button" value="SEARCH"/>				

Last update: 06. Jul 2021

### DC Microgrids

Technology Terminal Grids Networks System Energy Distributed Technology Network Denmark

DC distribution and transmission systems are a clear trend in electrical networks.

Last update: 06. Jul 2021

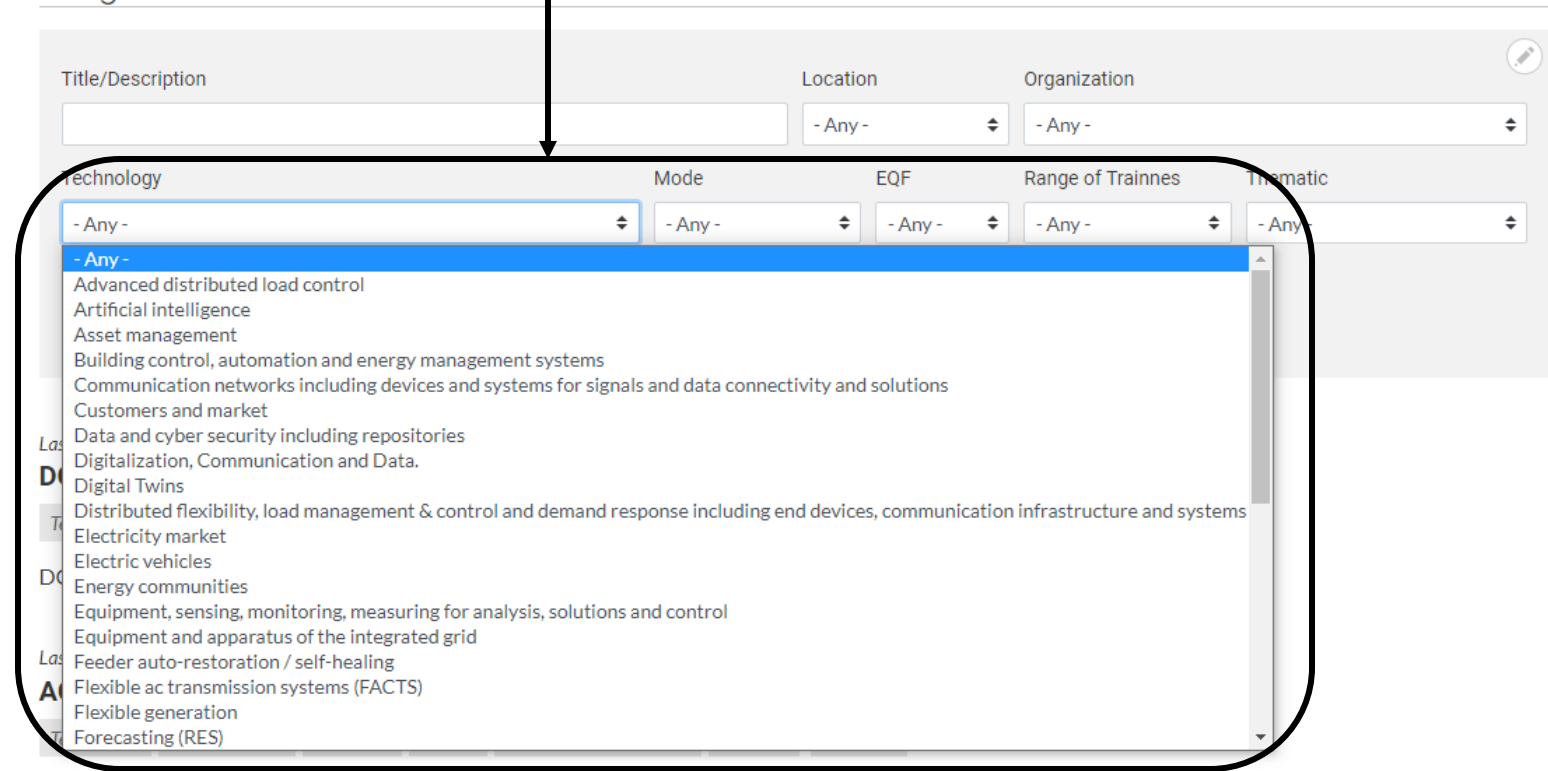
### AC Microgrids

Technology Terminal Grids Networks Energy Distributed Technology Network Denmark

A Microgrid can be defined as a part of the grid with elements of prime energy movers, power electronics converters, distributed energy storage systems

One could search for course by selecting one of the technologies

## Programmes



Title/Description Location Organization

Technology Mode EQF Range of Trainees Thematic

- Any -
- Any -
- Advanced distributed load control
- Artificial intelligence
- Asset management
- Building control, automation and energy management systems
- Communication networks including devices and systems for signals and data connectivity and solutions
- Customers and market
- Data and cyber security including repositories
- Digitalization, Communication and Data.
- Digital Twins
- Distributed flexibility, load management & control and demand response including end devices, communication infrastructure and systems
- Electricity market
- Electric vehicles
- Energy communities
- Equipment, sensing, monitoring, measuring for analysis, solutions and control
- Equipment and apparatus of the integrated grid
- Feeder auto-restoration / self-healing
- Flexible ac transmission systems (FACTS)
- Flexible generation
- Forecasting (RES)

A Microgrid can be defined as a part of the grid with elements of prime energy movers, power electronics converters, distributed energy storage systems

## Programmes

Title/Description	Location	Organization		
<input type="text"/>	- Any -	- Any -		
Technology	Mode	EQF	Range of Trainees	Thematic
- Any -	- Any - - Any - Face to Face Blended MOOC Others	- Any -	- Any -	- Any -

**SEARCH**

One could search for course by mode

Last update: 06. Jul 2021

### DC Microgrids

Technology Terminal Grids Networks System Energy Distributed Technology Network Denmark

DC distribution and transmission systems are a clear trend in electrical networks.

Last update: 06. Jul 2021

### AC Microgrids

Technology Terminal Grids Networks Energy Distributed Technology Network Denmark

A Microgrid can be defined as a part of the grid with elements of prime energy movers, power electronics converters, distributed energy storage systems



## Programmes

Title/Description

Location

- Any -

Organization

- Any -

Technology

- Any -

Mode

- Any -

EQF

- Any -

- 5
- 6
- 7
- 8

Range of Trainees

- Any -

Thematic

- Any -

**SEARCH**

One could search for course by EQF level

Last update: 06. Jul 2021

### DC Microgrids

Technology Terminal Grids Networks System Energy Distributed Technology Network Denmark

DC distribution and transmission systems are a clear trend in electrical networks.

Last update: 06. Jul 2021

### AC Microgrids

Technology Terminal Grids Networks Energy Distributed Technology Network Denmark

A Microgrid can be defined as a part of the grid with elements of prime energy movers, power electronics converters, distributed energy storage systems

## Programmes

Title/Description	Location	Organization		
<input type="text"/>	- Any -	- Any -		
Technology	Mode	EQF	Range of Trainees	Thematic
- Any -	- Any -	- Any -	- Any -	- Any -
<input type="button" value="SEARCH"/>				

Last update: 06. Jul 2021

### DC Microgrids

Technology Terminal Grids Networks System Energy Distributed Technology Network Denmark

DC distribution and transmission systems are a clear trend in electrical networks.

Last update: 06. Jul 2021

### AC Microgrids

Technology Terminal Grids Networks Energy Distributed Technology Network Denmark

A Microgrid can be defined as a part of the grid with elements of prime energy movers, power electronics converters, distributed energy storage systems

One could search for course by number of trainees

## Programmes

One could search for course by Thematic

Thematic

- Any -
- Any -
- Social Community
- Technology
- Protection
- Terminal Grids
- Networks
- System
- Maritime
- Energy
- Production
- Communication
- Enviroment
- Economic
- Distributed Technology
- Education
- Network

Last update: 06. Jul 2021

### DC Microgrids

[Technology](#)
[Terminal Grids](#)
[Networks](#)
[System](#)
[Energy](#)
[Distributed Technology](#)
[Network](#)
[Denmark](#)

DC distribution and transmission systems are a clear trend in electrical networks.

Last update: 06. Jul 2021

### AC Microgrids

[Technology](#)
[Terminal Grids](#)
[Networks](#)
[Energy](#)
[Distributed Technology](#)
[Network](#)
[Denmark](#)

A Microgrid can be defined as a part of the grid with elements of prime energy movers, power electronics converters, distributed energy storage systems

Let us try an example to search for Hydrogen  
course

[www.eirie.eu](http://www.eirie.eu)



## Programmes

Title/Description	Location	Organization			
<input type="text" value="Hydrogen"/>	<input type="text" value="- Any -"/>	<input type="text" value="- Any -"/>			
Technology	Mode	EQF	Range of Trainees	Thematic	
<input type="text" value="Power to gas"/>	<input type="text" value="- Any -"/>	<input type="text" value="- Any -"/>	<input type="text" value="- Any -"/>	<input type="text" value="- Any -"/>	





The search engine will come back with a list of courses  
focusing on Hydrogen

*Last update: 06. Jul 2021*

## Hydrogen as Energy Vector

Energy

Spain



By clicking on the course, more information will be provided

The course provides the fundamentals of the hydrogen technology, using it as a way to store energy.

## Hydrogen as Energy Vector

Hydrogen Electrolyser Hydrogen storage Fuel Cell

The course provides the fundamentals of the hydrogen technology, using it as a way to store energy. Hydrogen production methods are presented, but more special attention is paid to electrolysis as a mean for producing hydrogen from renewable energies. Hydrogen storage methods are described and it is explained process of electrical energy generation from hydrogen by using fuel cell technology.

### Learning Objectives:

- Understanding industrial electrolysis processes
- Capacity of sizing an electrolyzer
- Capacity of sizing the storage system
- Understanding electricity generation through the use of fuel cells
- Ability to select and size a fuel cell

Below are details of the approximate weekly dedication of each lesson in hours, taking into account the visualization of the videos and the realization of the quizzes associated with each unit.

### Week 1 (3 hours):

- Lesson 1: Hydrogen overview
- Lesson 2: Hydrogen production ways

### Week 2 (5 hours):

- Lesson 3: Hydrogen production by electrolysis technology

### Week 3 (2 hours):

- Lesson 4: Hydrogen storage technology

### Week 4 (3 hours):

- Lesson 5: Fuel cell technology

### Week 5 (3 hours):

- Lesson 6: Fuel cell applications

### Week 6 (3 hours):

- Lesson 7: Voltage generation in a fuel cell

### Week 7 (4 hours):

- Lesson 8: Polymer electrolyte membrane fuel cell

[Visit the course page](#)



EQF: 7

Is Training Provider: Yes

Mode: Blended

Range of Trainees: 21-100

 UNIVERSITAT POLITÈCNICA DE VALENCIA  
 València  
 Spain

Technology

Power to gas

Thematic

Energy

More information about the course & its structure

By clicking on the link, you could visit the course website

**COURSE**  
**Hydrogen as an Energy Vector** ⚙️

COURSE INFO

👤 Carlos Sánchez 📅 Self-Paced 🕒 7 Weeks 💰 Free

ENROL TRANSLATION ▾

Virtual Classroom: 🗣️ 📺 🐦

COURSE OVERVIEW

A Introduction Hydrogen as an Energy Vector

Watch later Share

**HYDROGEN AS AN ENERGY VECTOR**

Watch on YouTube




Help

# EIRIE Search Projects



European Commission | EIRIE smart grids

HOME ABOUT US STAKEHOLDERS SEARCH AREA COLLABORATION PROJECT REPORTING NEWS AND EVENTS TRAINING / EDUCATION

## WE ARE EIRIE

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.

### Community of stakeholders

EIRIE is 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...

### Sustainability and collaboration

Developing an effective and efficient collaborative platform is crucial, but assuring its sustainability after the project ending is a priority. To do so, we have established collaboration with important...

### Collaborative multi-dimensional platform

Through the EIRIE platform, we aim at reaching the R&I community from all Member states in Europe, by bringing together data, information, knowledge and lessons learned from successful projects.

# EIRIE Smart Grid Projects mapping



Browser navigation bar showing the URL [ses.jrc.ec.europa.eu/eirie/en](https://ses.jrc.ec.europa.eu/eirie/en). The top navigation menu includes: Manage, Shortcuts, Tasos, Content, Structure, Appearance, Extend, Configuration, People, Reports, and Help.

Header section featuring the European Commission logo, the EIRIE logo, and a navigation menu with the following items: HOME, ABOUT US, STAKEHOLDERS, SEARCH AREA, COLLABORATION, PROJECT REPORTING, NEWS AND EVENTS, and TRAINING / EDUCATION.

## WE ARE EIRIE

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.



### Community of stakeholders

EIRIE is 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, standardisation



### Sustainability and collaboration

Developing an effective and efficient collaborative platform is crucial, but assuring its sustainability after the project ending is a priority. To do so, we have established collaboration with important



### Collaborative multi-dimensional platform

Through the EIRIE platform, we aim at reaching the R&I community from all Member states in Europe, by bringing together data, information, knowledge and lessons learned from successful projects



# Get in touch



<https://pantera-platform.eu/>



[www.eirie.eu](http://www.eirie.eu)

or

<https://ses.jrc.ec.europa.eu/eirie/en>