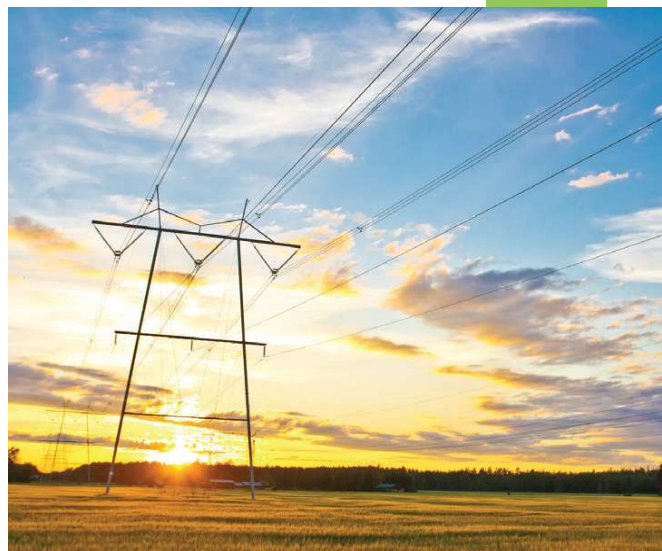




# EERA

## European Energy Research Alliance

[www.eera-set.eu](http://www.eera-set.eu)



EERA is an official part of the EU SET-Plan.

<http://setis.ec.europa.eu/>

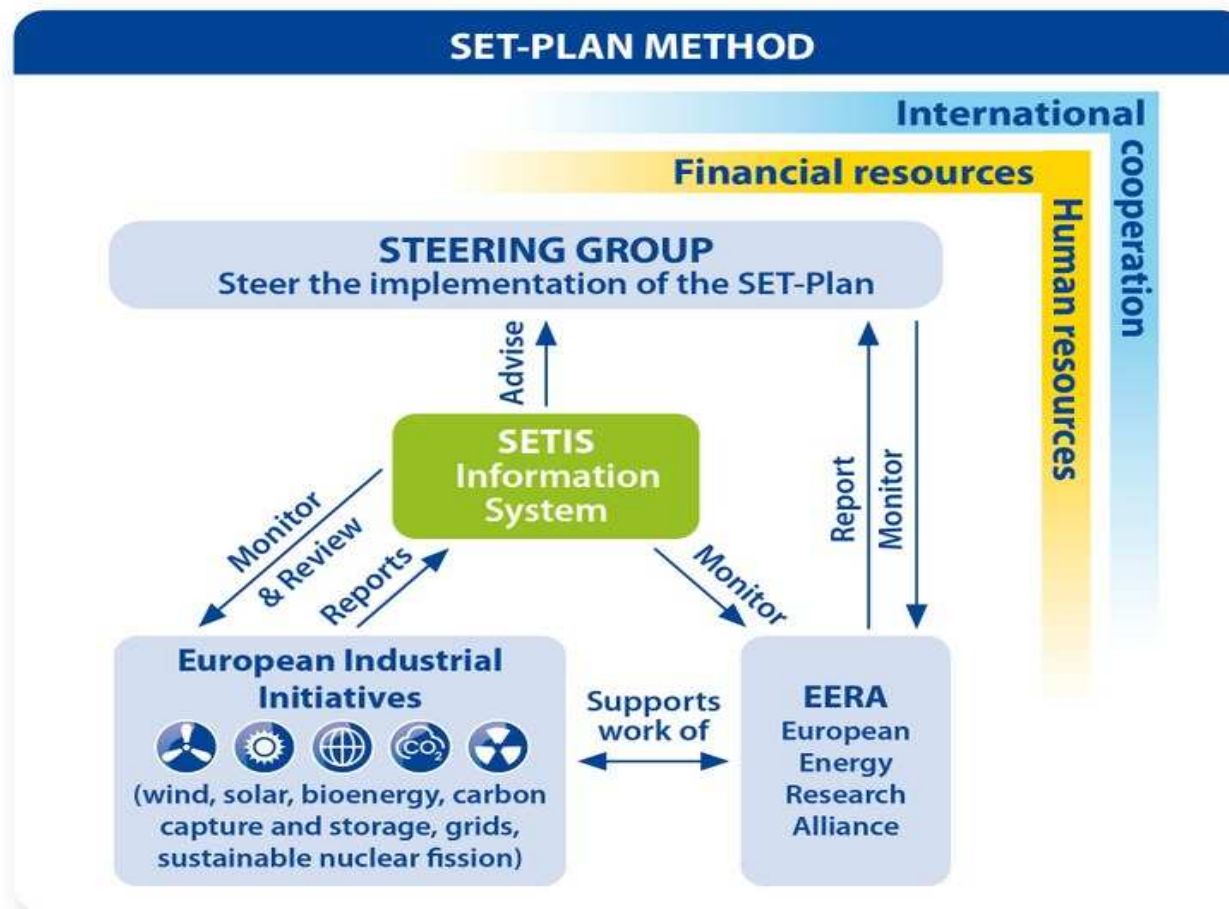
# Strategic Energy Technology Plan

- The European Strategic Energy Technology Plan (SET-Plan) aims to accelerate the development and deployment of low-carbon technologies. It seeks to improve new technologies and bring down costs by co-ordinating research and helping to finance projects.
- The SET-Plan promotes research and innovation efforts across Europe by supporting technologies with the greatest impact on the EU's transformation to a low-carbon energy system. It promotes cooperation amongst EU countries, companies, research institutions, and the EU itself.

# The bodies involved in SET Plan

- **SET-Plan Steering Group** - The EU Steering Group on Strategic Energy Technologies consists of high-level representatives from EU countries, as well as Iceland, Norway, Switzerland, and Turkey. The SET-Plan Steering Group coordinates the implementation of the SET-Plan and promotes joint initiatives between groups of EU countries and the EU.
- **European Industrial Initiatives** - Ells bring together EU countries, industry, and researchers in key areas. They promote the market uptake of key energy technologies by pooling funding, skills, and research facilities.
- **European Energy Research Alliance** - EERA aims to accelerate new energy technology development through working together on pan-European programmes. Research institutes and universities participating in EERA jointly identify these programmes, coordinate research efforts, and share information.
- **SET-Plan Information System** - The EU's SETIS provides information on the state of low-carbon technologies. It also assesses the impact of energy technology policies, reviews the costs and benefits of various technological options, and estimates implementation costs. This information is useful for the European Industrial Initiatives, private companies, trade associations, the European Energy Research Alliance, international organisations, and financial institutions.

# EERA in the SET-Plan



# The European Energy Research Alliance

**EERA** - was founded to

- accelerate energy technology development
- support of the SET-Plan.

This is done by

- enhancing cooperation across Europe
- creation and implementation of different thematic Joint Programmes (JPs)
- resources and research activities of participants

# About EERA

- **A public research alliance**

- **A cornerstone of the Strategic Energy Technology Plan (SET-Plan)**

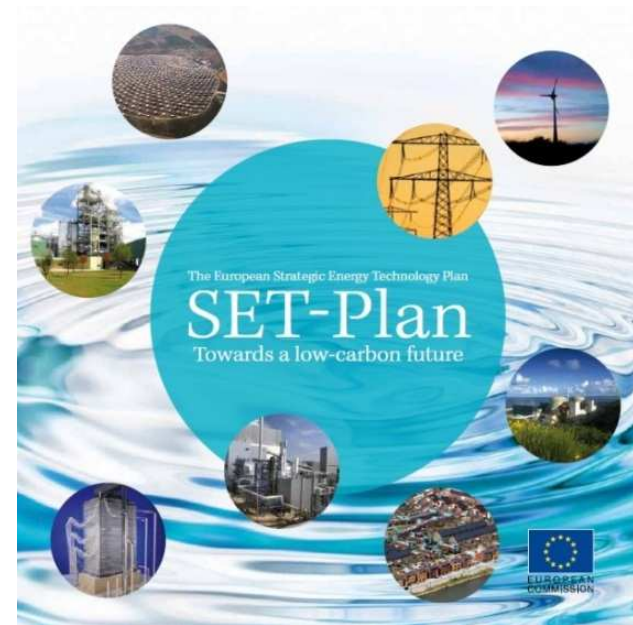
- **Bringing together 250 research organisations**

- **Working together in 15 Joint Programmes**

- **Collaborating with European Industry**

- **With global outreach**

- **And aligning national research**





# A short history of EERA

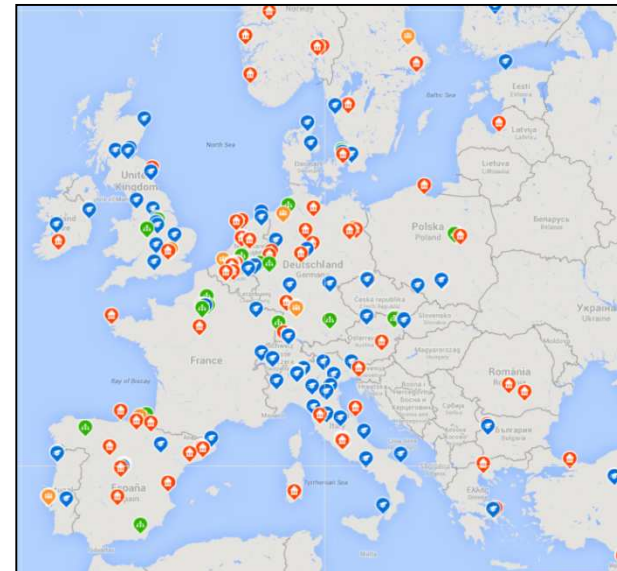
EERA 2008



EERA founded

ExCo extended to 15

EERA 2014



EERA AISBL established

2008

2010

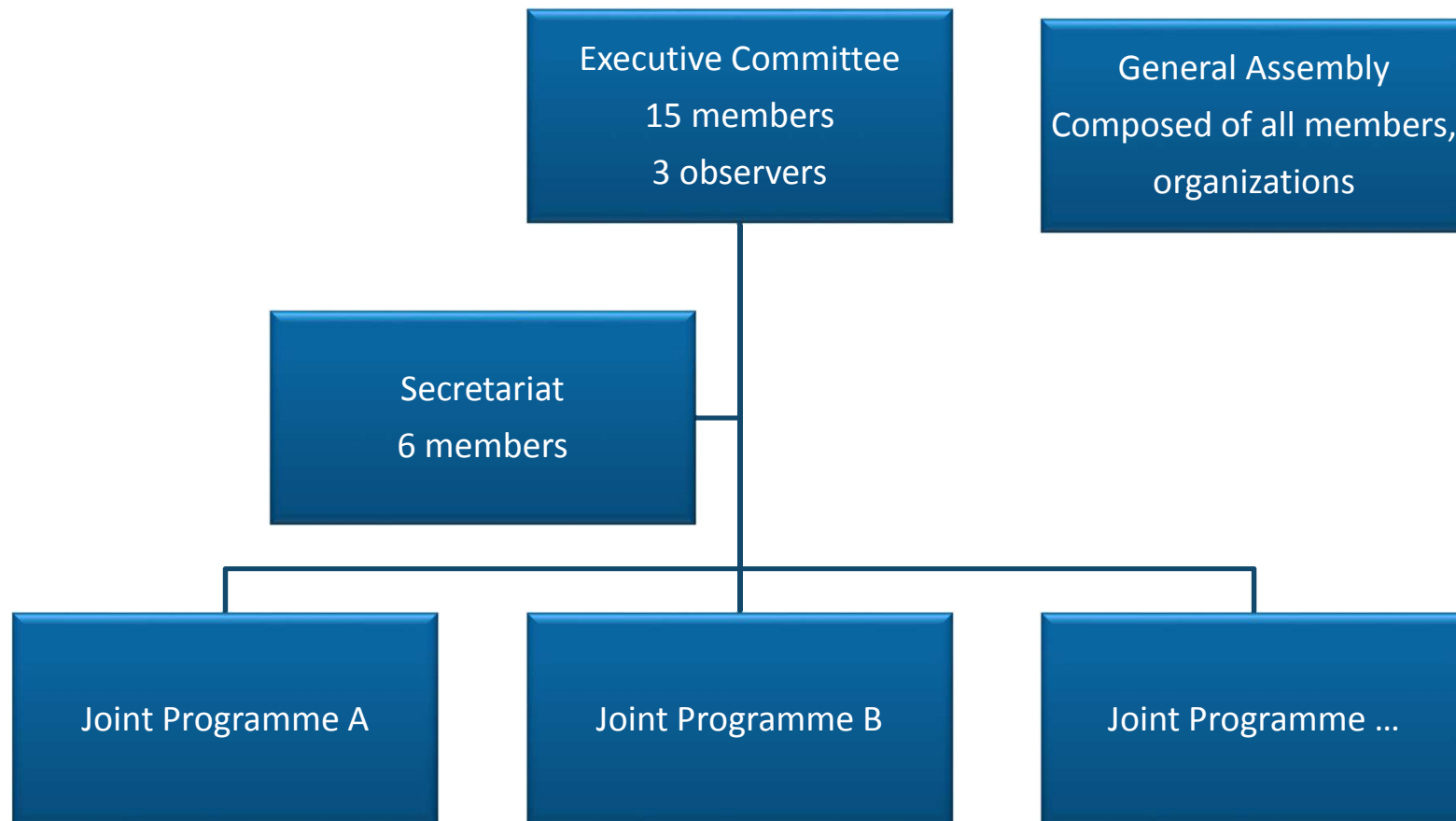
2012

2014

First EERA JPs launched

15th EERA JP launched

# Governance structure





# EERA governance

## 4 levels of governance

EERA General  
Assembly

- Supreme governing body of the Association
- Approval of the EERA budget and annual accounts
- Fora for discussing activity plan of the Association

EERA Executive  
Committee

- Governance and oversight of EERA
- Relations with EU Commission and Member States on EERA policy and development

The EERA Secretariat

- Day to day management of EERA
- Support and liaise with all EERA bodies and the European Commission

The EERA Joint  
Programmes

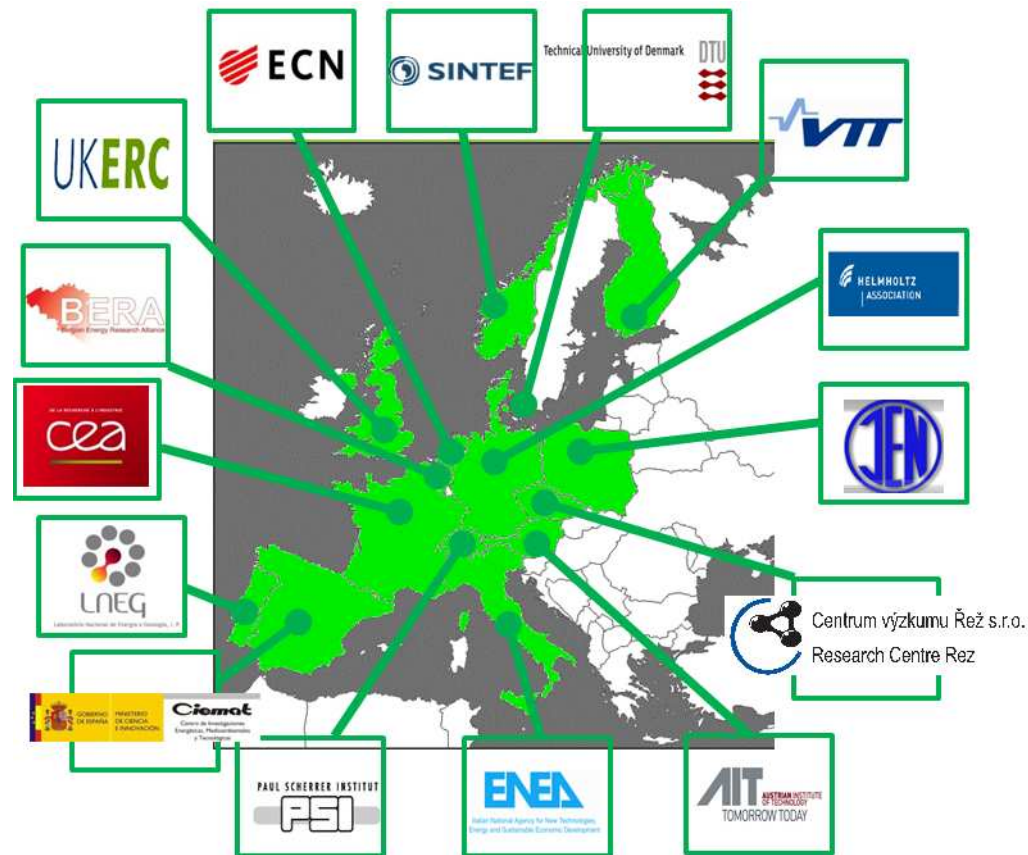
- Management of the individual EERA JPs
- Technology/field specific liaising with the European Commission and SET-Plan stakeholders
- Technology specific links to Member States

# 15 EERA Executive Committee Members

ExCo  
observers



+ KIC-  
InnoEnergy



# EERA has 15 Joint Programmes

## JPs launched in 2010

- Bioenergy  $\approx 327^*$
- CCS  $\approx 361^*$
- Geothermal  $\approx 408^*$
- Mat. For Nucl.  $\approx 198^*$
- Wind Energy  $\approx 162^*$
- Smart Grids  $\approx 144^*$
- PV  $\approx 162^*$

## JPs launched in 2013

- Environmental, economic and social impact “E3S”  $\approx 194^*$
- Shale gas  $\approx 181^*$

## JPs launched in 2011

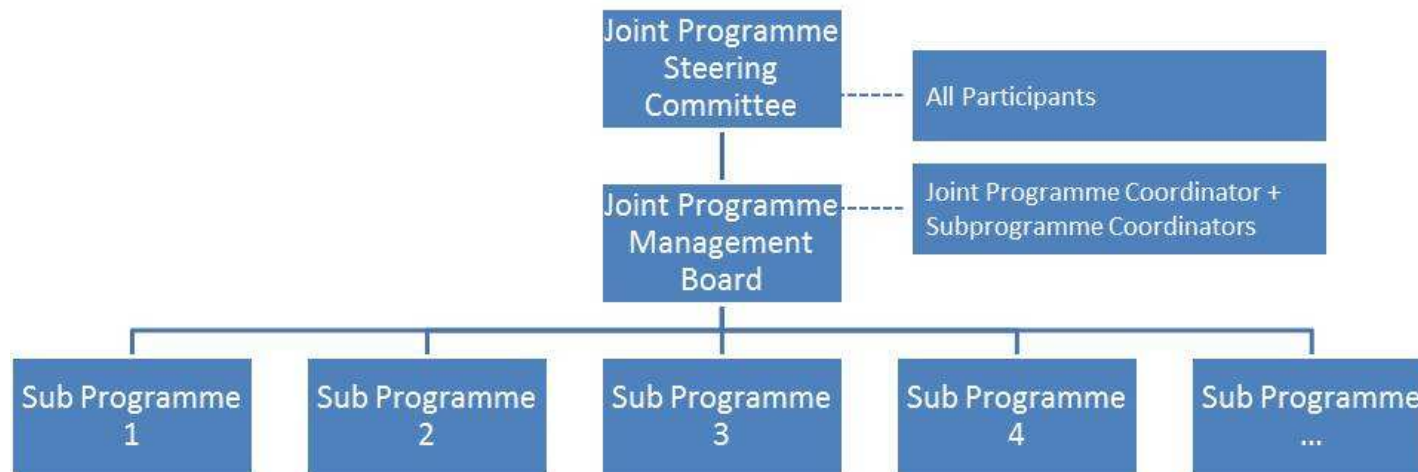
- AMPEA  $\approx 522^*$
- CSP  $\approx 132^*$
- Energy Storage  $\approx 430^*$
- FC&H2  $\approx 160^*$
- Ocean Energy  $\approx 45^*$
- Smart Cities  $\approx 212^*$

## JPs under development

- Energy Efficiency in Industrial Processes
- Energy Systems Integration

\*FTEs (Full-time equivalent)

# Joint Programme governance structure



# Joint Programming principles

What kind of cooperation can be foreseen?

- Harmonisation of research programmes
  - Exchange of information
  - Exchange of personnel
  - Common strategy to tackle (new) research questions
    - Too many topics for a single institute
    - Avoid duplication, ensure complementary of programmes
    - Agree on who does what (and share results)
- Facilities
  - Sharing of facilities
  - Building new joint facilities
    - Owned by multiple institutes

**Insufficient for EERA**

**A breakthrough**

# Joint Programme basics

Long-term  
strategy and  
work plan

Agreed  
Description  
of Work

Agreed  
Objectives  
and  
Milestones

Agreed  
Division of  
Tasks

Joint Programme Steering  
Committee

Joint Programme  
Management Board

*Example from  
JP Bioenergy*

Sub programme 1  
Thermo-Chemical

Bioenergy  
carriers

Conversion  
processes

Downstream  
processing

Generic

Sub programme 2  
Sugar platform

Biomass  
deconstruction

Cell factories &  
enzymes

Piloting

Sub programme 3  
Algae platform

Microalgae

Macroalgae

Sub programme 4  
Cross-cutting

Agro feedstocks

Forest  
feedstocks

Sustainability  
certification

Bioenergy  
system studies

Sub programme 5  
Stationary  
bioenergy

Domestic  
heating/cooling

Industrial CHP

Utility multifuel  
operation

# Examples of JPs

## JP Bioenergy

Coordinated by Juan Carrasco, CIEMAT (ES)

34 partners from 15 EU countries

- 5 sub-programmes
- Joint report with European Industrial Bioenergy Initiative on long-term R&D needs for bioenergy
- International cooperation with Latin-America (Sugar platform)



## JP Smart Grids

Coordinated by Luciano Martini, RSE s.p.a. (Italy)

36 partners from 16 EU countries

- 5 sub-programmes
- Coordination of the research with stakeholders including ENTSO-E, EDSO4SG, EEGI and ETP SG
- International collaboration: USA, China, Australia, Japan, IEA, ITU
- And:

Smart Grids IRP





# Fuel Cells and Hydrogen (1)

## BACKGROUND

- acceleration and harmonisation of long-term research on fuel cells and electrolyzers in Europe

- **Members:**

[CEA](#) (FR), [CIEMAT](#) (ES), [CNR](#) (IT), [CNRS](#) (FR), [DLR](#) (DE), [ENEA](#) (IT), [IMPPAN](#) (PL), [JRC](#) (EU), [POLITO](#) (IT), [SINTEF](#) (NO), [FZ-Jülich](#) (DE), [Technical University of Denmark – DTU](#) (DK), [Delft University of Technology – TUD](#) (NL), [UKERC](#) (UK), [VTT](#) (FI)

- **New applicants in progress:**

[BERA](#) (BE), [CNH2](#) (ES), [CSIC](#) (ES), [CUTEC](#) (DE), [EMPA](#) (CH), [IFE](#) (NO), [LNEG](#) (PT), [PSI](#) (CH), [TECNALIA](#) (ES), [University of Constanta – OVIDIUS](#) (RO)

# Joint Programme on FC and H2 technologies Sub-programmes (1)

## **Sub-programme 1: Electrolytes, coordinated by Deborah Jones, CNRS (FR)**

- Development of new generations of high-performance, low cost and durable electrolyte materials for low and high temperature fuel cells and electrolyzers

## **Sub-programme 2: Catalysts and Electrodes, coordinated by Luis Colmenares, SINTEF (NO)**

- Development of a new generation highly active, low cost and durable catalyst/electrode

# Joint Programme on FC and H2 technologies Sub-programmes (2)

## **Sub-programme 3: Stack Materials and Design, coordinated by Josef Mertens, FZ Jülich (DE)**

- Improving cost effective manufacturing of 'robust' stacks
- i.e. rapidly thermally and load cycled and toleration of vibration, transient operation, fuel and air impurities etc.

## **Sub-programme 4: Systems, coordinated by Jari Kiviaho, VTT (FI)**

- Developments on system and component level
- Includes development of innovative fuel cell system concepts
- Component targets: decreased costs, prolonged life-time and availability of components

# Joint Programme on FC and H2 technologies Sub-programmes (3)

## **Sub-programme 5: Modelling, Validation and Diagnosis, coordinated by Valentina Vetere, CEA (FR)**

- Achieving better understanding of the degradation mechanisms in the relationships with operating conditions
- Includes also a more detailed development of mathematical description of phenomena to be used in the prediction of whole performances and lifetime.

## **Sub-programme 6: H2 - Production and Handling, coordinated by Robert Steinberger-Wilckens, University of Birmingham (UK)**

- Research and development of cost effective and efficient non-electrochemical hydrogen production methods
- Improvement of materials, identification of superior novel materials, optimising materials processing, developing new
- break-through designs for hydrogen production systems

# JP Fuel Cells and Hydrogen Technologies –visions and objectives

- The general objective of the JP FCs&H2 is to align medium to long term pre-competitive research activities at EERA institutes and associated institutions to create a technical-scientific basis for further improvement of Fuel Cells and Hydrogen technologies. The JP will align and explore synergies with (i) the research grouping N.ERGHY1 , (ii) the European public-private partnership FCH Joint Undertaking, and (iii) other JPs. Most of the partners involved in the present JP are also members of FCH –JU. The initial focus of JP FCs&H2 is fuel cells and electrolyzers. When the JP work has commenced, complementary technologies/topics (i.e. new subprogrammes) will be added as appropriate, taking into consideration other on-going and planned EERA joint programmes.
- **Number participants and associates: 20** in total; 16 participants and 4 associates from **11 European Countries, 157 person - year per year** committed

# Why a Joint Programme on Fuel Cells and Hydrogen Technologies?

- Fuel Cells and Hydrogen are explicitly mentioned in the SET-plan as part of key technologies to reach the renewable energy and emission reduction goals set for 2020 and 2050. The technologies are attractive because of their high efficiency (heat and power), low environmental impact, and modularity. Over the last 5 years, significant technological progress has been made. However, there is a consensus in industry and academia that significant long term research is still needed to realize the currently foreseen commercialisation of passenger vehicles from 2020 and to start fuel cell commercialisation in the field of stationary applications (both micro CHP and CHP for residential/decentralised power plants).

# Cooperation with industry

EERA supports European industry in strengthening competitiveness and creation of jobs

## JP level cooperation

EERA JPCs liaise regularly with existing EIs/participate in meetings

Companies as associate participants

## Project level cooperation

Individual companies/sector organisations are project partners in EERA IRP

The Industrial Initiatives within the SET-Plan are:

- ▶ Wind ([The European Wind Initiative](#))
- ▶ Solar ([The Solar Europe Initiative - photovoltaic and concentrated solar power](#))
- ▶ Electricity Grids ([The European Electricity Grid Initiative](#))
- ▶ Carbon Capture & Storage ([The European CO2 Capture, Transport and Storage Initiative](#))
- ▶ Nuclear Fission ([The Sustainable Nuclear Initiative](#))
- ▶ Bio-energy ([The European Industrial Bioenergy Initiative](#))
- ▶ Smart Cities ([Energy Efficiency - The Smart Cities Initiative](#))

plus

- ▶ Fuel Cells and Hydrogen ([Joint Technology Initiative](#))
- ▶ Nuclear Fusion
  - ▶ [ITER](#) (International)
  - ▶ [F4E](#) (Community)



**MATISSE IRP**





# Examples of International Cooperation

## US/CANADA

- AMPEA
- Ocean Energy
- Fuel Cells/H<sub>2</sub>
- Smart Grids
- Geothermal
- Mat. Nuclear
- Solar PV
- CCS
- Energy Storage

## BRAZIL

- Bioenergy
- Smart Cities
- Energy Storage

## CHILE

- Energy Storage

## COLUMBIA

- Energy Storage

## VENEZUELA

- Energy Storage

## ISRAEL

- Energy Storage

## SOUTH AFRICA

- CCS

## RUSSIA

- Smart Cities
- Nuclear Mat.

## INDIA

- Smart Cities
- Energy Storage

## LAOS

- Energy Storage

## MALAYSIA

- Energy Storage

## SINGAPORE

- Ocean Energy

## JAPAN

- Geothermal
- Smart Grids
- Solar PV
- Fuel Cells/H<sub>2</sub>
- Energy Storage
- Nuclear Mat.

## CHINA

- Smart Cities
- Solar PV
- CCS
- Energy Storage
- Nuclear Mat.

## SOUTH KOREA

- Fuel Cells/H<sub>2</sub>
- Ocean Energy
- Energy Storage
- Nuclear Mat.

## TAIWAN

- Ocean Energy

## AUSTRALIA

- CCS
- Energy Storage

## NEW ZEALAND

- Geothermal

# How to become a member in EERA AISBL?

Membership in the EERA AISBL requires actions both from existing and new members

## Process for becoming a member in EERA AISBL

Recommendation from at least one JP

- Apply for the membership online
- Decision within 3 months
- Pay the annual membership fee after receiving the bill to confirm the membership

More information [application@eera-set.eu](mailto:application@eera-set.eu)

# EERA AISBL membership fee

Membership in the EERA AISBL includes a membership fee

## EERA membership fee

Full members  
3000 €  
(incl. umbrella org.)

Associate  
members 1000 €

EERA ExCo  
members  
8000 €

The membership fee is *in addition* to JP fees

# Benefits of EERA

## For JP participants

- Liaise with excellent research organizations
- Access to pool of researchers for exchange, facilities for joint use
- Set-up of joint projects
- Be part of a strong network towards MS, EU and industry

## For the European Commission

- Sparring partner in developing research agenda for the SET-Plan
- Increasing effectiveness of national R&D efforts
- Support for international collaboration

## For Member States

- Opportunity to find the best partners for bilateral or multilateral projects in support of national interests
- Promoting national success in H2020

# Questions? Comments?

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- [dusan.stric@cvrez.cz](mailto:dusan.stric@cvrez.cz)

For more information see:

<http://www.eera-set.eu>