

# SET-Plan Conference 2010

3th-4th of june 2010, Madrid, Spain

**Spanish Presidency  
of the European Union**

## EERA Joint research Programme “Smart Grids”

JP Co-ordinators:

Luciano Martini, Giorgio Graditi  
(ERSE - ENEA)



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2010.es



# Introduction

## BACKGROUND

The **electricity grid is instrumental** to integrate up to 35% renewable electricity in a seamless way and operate along the "smart" principle, effectively matching supply and demand by 2020

from the  
**SET- Plan  
Roadmap**

## THE PROBLEM

- The structure and the management of present **electricity grid** are not adapted for the deployment of low-carbon energy technologies (mono-directional flow, lack of distributed control, etc.)
- The European **electricity grid is progressively ageing** and huge investments are needed to modernize it

## THE SOLUTION: SMART GRIDS

- **Smart Grids** constitute the **evolution of electricity grids** to make them fit for the low-carbon energy technologies and energy saving measures
- Smart Grids include evolutionary network technologies integrated with a data information and communication layer for the necessary automation, protection and control

As a  
support to  
**the SET- Plan**

## THE JOINT RESEARCH PROGRAMME

- **International research** on Smart Grids is lacking coordination and much fragmented and/or duplicated
- Major European Research centres have agreed to coordinate efforts on the **Programme on Smart Grids** to develop and test the necessary advanced control and control structures to ensure their deployment in a medium to long term

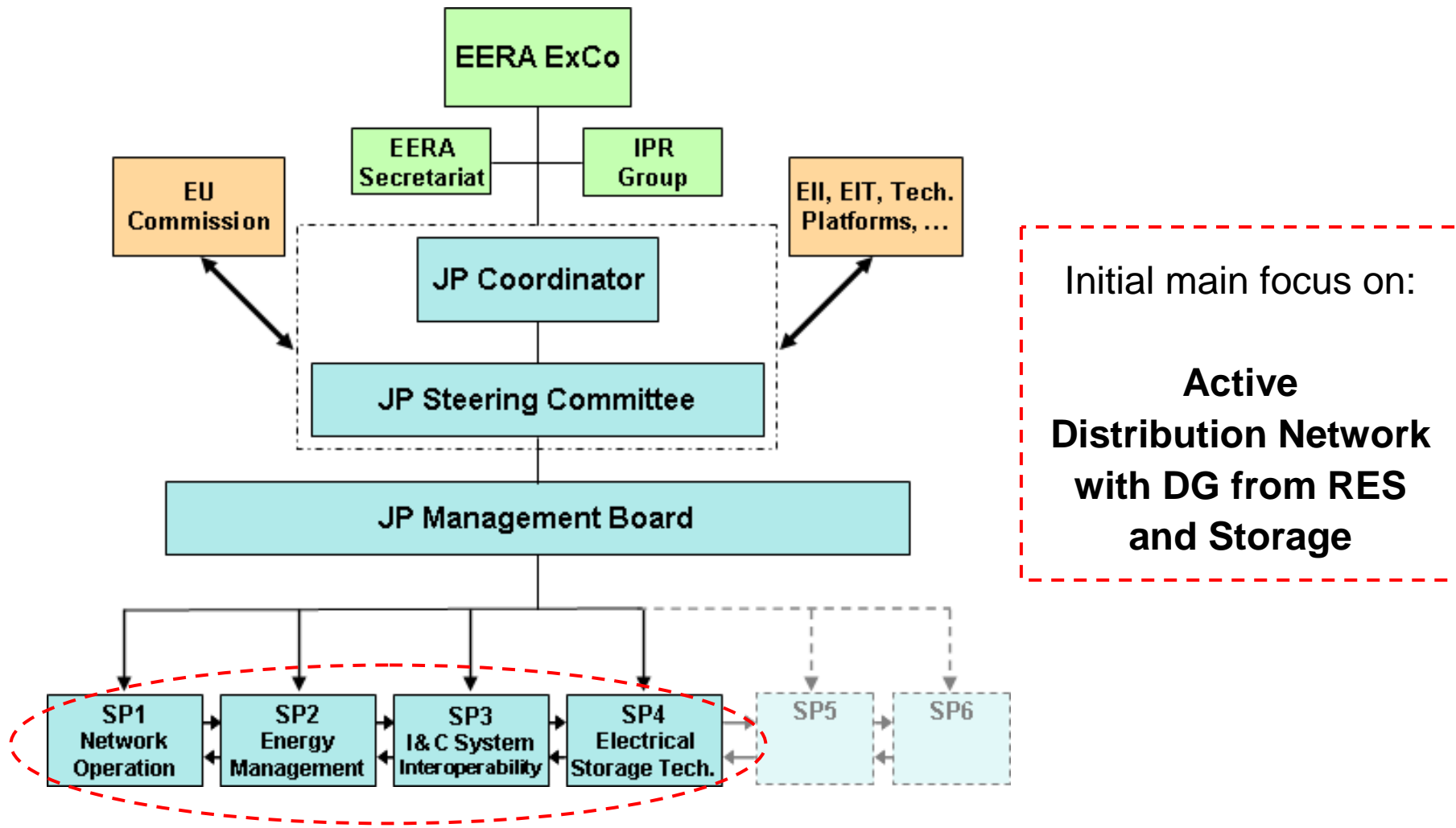
In line with  
**the EERA  
objectives**

## JP on Smart Grids














4 June 2010, Madrid

# Structure of the Joint Programme

## General structure



# Participants

Participants Name	Short Name	Country	Role	Human Resources
ERSE Spa	ERSE	Italy	JP coordinator	
ENEA	ENEA	Italy	JP coordinator	
Energy Research Centre of the Netherlands	ECN	The Netherlands	SP leader	
RISOE DTU	RISOE	Denmark	SP leader	
VITO	VITO	Belgium	SP leader	
Technical Research Centre of Finland	VTT	Finland	SP leader	
Austrian Institute of Technology	AIT	Austria	Task leader	
Fraunhofer Institute for Wind Energy and Energy Systems Technology	IWES	Germany	Task leader	
EC Joint Research Centre Institute for Energy	JRC-IE	The Netherlands	Task leader	
LABEIN TECNALIA	LABEIN	Spain	Task leader	
LABORELEC	LABORELEC	Belgium	Task leader	
SINTEF	SINTEF	Norway	Task leader	
TUBITAK	TUBITAK	Turkey	Task leader	
<b>Total Effort:</b> (person years / year)				<b>&gt; 52.5</b>

**13 Participants from 10 different Countries**

**11 Participants above the threshold:  $\geq 3-5$  man years / year**

A significant **effort increase** of about **25 – 30%** is expected by beginning 2011

Moreover, potential **new participants** from UK, CZ, ES, NL, ...



# Sub Programmes in detail

	Activity	Outcomes by Apr. 2011	
SP 1 / <b>Network Operation</b>	Development of a “primary” control in presence of high penetration of DER	<ul style="list-style-type: none"> <li>- Choice of effective new control structure, and</li> <li>- of emergency situations and control actions for new control structure</li> </ul>	SP leader: <b>ECN</b> Nr of participants: <b>11</b> Nr of countries: <b>10</b>
SP 2 / <b>Energy Management</b>	Optimization of network energy management in presence of DER	<ul style="list-style-type: none"> <li>- Compilation of existing models including their capabilities and identification of extensions</li> </ul>	SP leader: <b>RISOE</b> Nr of participants: <b>9</b> Nr of countries: <b>8</b>
SP 3 / <b>Information and Control System Interoperability</b>	Evaluation of interoperability issues in control system applications	<ul style="list-style-type: none"> <li>- Terminology</li> <li>- Control Systems Interoperability in the US and in Europe: commonalities and differences</li> </ul>	SP leader: <b>VITO</b> Nr of participants: <b>13</b> Nr of countries: <b>10</b>
SP 4 / <b>Electrical Storage Technologies</b>	Existing and future promising ESS technologies	<ul style="list-style-type: none"> <li>- Report on ESS technologies for grid applications</li> </ul>	SP leader: <b>VTT</b> Nr of participants: <b>10</b> Nr of countries: <b>8</b>

# Committed Resources

**SP 1 / Network  
Operation**

**≥165 person months / year**

SP leader: **ECN**  
Nr of participants: **11**  
Nr of countries: **10**

**SP 2 / Energy  
Management**

**≥140 person months / year**

SP leader: **RISOE**  
Nr of participants: **9**  
Nr of countries: **8**

**SP 3 / Information  
and Control System  
Interoperability**

**≥160 person months / year**

SP leader: **VITO**  
Nr of participants: **13**  
Nr of countries: **10**

**SP 4 / Electrical  
Storage  
Technologies**

**≥175 person months / year**

SP leader: **VTT**  
Nr of participants: **10**  
Nr of countries: **8**

# Important JP Steps

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## Year 2010:

EERA ExCo Meeting – JP Evaluation Session  
FZ Jülich premises, Jülich, Germany, Jan. 26, 2010

**JP Approval & Launch**

EC – EERA “JP on Smart Grids” Meeting  
EC Brussels, March 9, 2010

**1<sup>st</sup> Harmonization meeting**

Task and sub-Task final revision  
All participants (SP & Task Leaders)

**JP final tuning**

“5th Smart Grids Workshop” & Kick-off Meeting  
TUBITAK premises, Ankara, Turkey, May 4-6, 2010

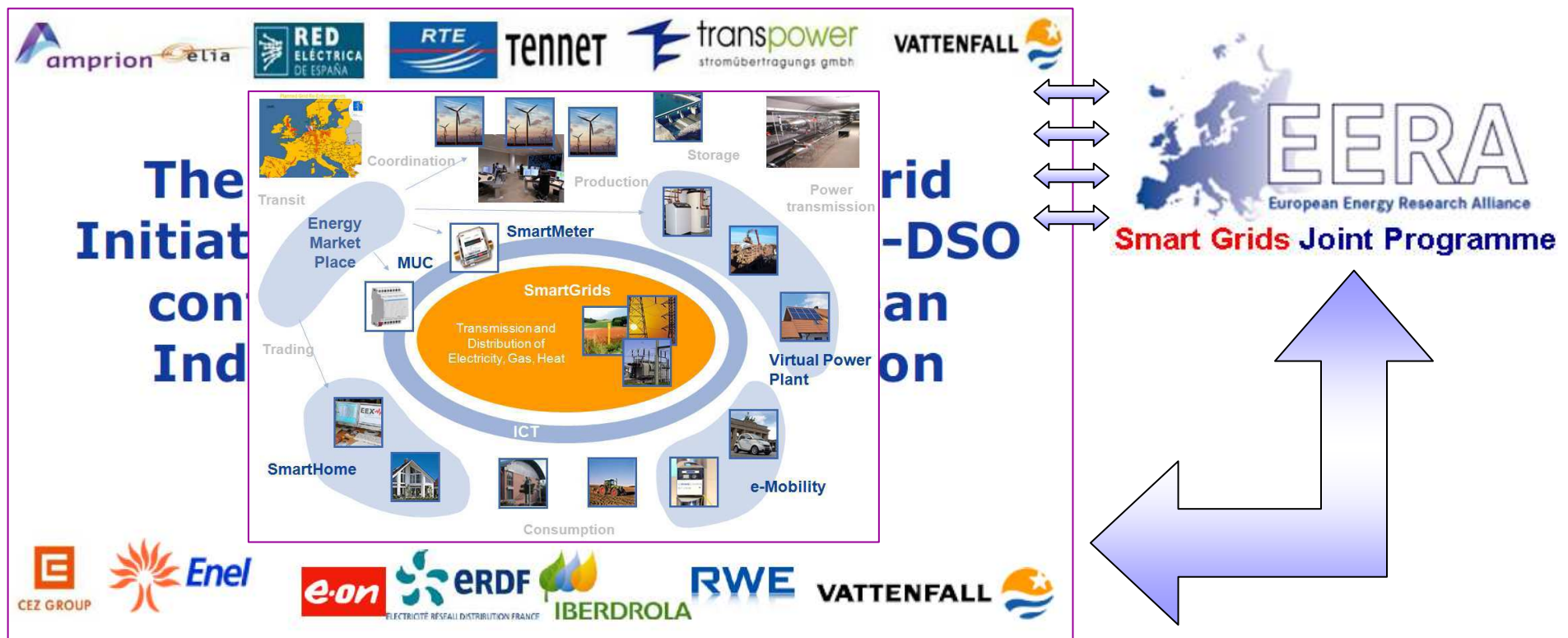
**R&D activities start**

**EC SET-Plan Summit Conference**  
Madrid, Spain, June 3-4, 2010

**Official JP launch**

# Relations with the EIs (1 of 3)

The EERA JP on **Smart Grids**, which brings together key European research organizations, is actively working to align specific R&D activities to the needs of the **SET-Plan** priorities and to harmonize them with **EEGI**.



## Relations with the EIs (2 of 3)

The JP on Smart Grids will interact with the different Actors / Organizations in the field of Smart Grids and in particular :

**The European Industrial Initiative on Electricity Grids (EEGI)** is considered as the main stakeholder for the results of this JP, even if the JP will maintain its complete independence and self decision capability.

As an initial example of this cooperation, a consolidated version of the JP doc has been sent to EC and then forwarded to EEGI for comments:

- Joint **EC – EERA JP** meeting (9 April, 2010, Brussels)
- Bilateral meetings (April and May 2010)
- Follow up discussion (ongoing & permanent)

### Main Outcome:

- Preliminary document trying to define the needed -  
**EERA JP on Smart Grids interactions and relationship with EEGI**

## Relations with the EIs (3 of 3)

### Relation between the action programs of European Electricity Grids Initiative (EEGI) and the European Energy Research Alliance (EERA)

It is anticipated that three types of relation will be identified:

➤ **Long term (breakthrough) technologies and methods**

Considered in the **EERA JP program** and not specifically addressed in the present EEGI program.

➤ **Short term – demonstration ready technologies and methods**

Considered in the **EEGI RD&D program** and not considered in the EERA JP or representing consolidated or state-of-the-art starting point for further developments.

➤ **Medium term technologies and methods**

Considered **in both** the EEGI RD&D program and the EERA JP program.

# Important Upcoming Activities

## From the Workshop AGENDA of last JP meeting 4-5 May, 2010

4. JP and SP finalization in view of the R&D activity start:
  - ✓ a) SP1 – SP4: Revision of Partner human resource commitments in the different Tasks and sub-Tasks trying to maximize their effort on some selected activities
  - ✓ b) Identification of “critical” Tasks from the allocated human resources point of view
  - ✓ c) Revision of Deliverables to be achieved in the first **12-month** period
5. Expected Collaboration and Synergy among partners in the different SPs: Discussion about internal rules and procedures to effectively start the already planned collaborative R&D activity
6. Pre-condition and procedure to be adopted by the JP in including new members
7. Dissemination, updated JP news, JP web site (EERA newsletter, SETIS-JRC)

# Important Upcoming Activities

**First Deliverables to be accomplished by the JP Smart Grids: April 2011**

Deliverable	Title	Measurable Objectives	Project Month
<b>SP1: Network Operation</b>			
D1.1	Developing and choosing effective new control structures	Choice of effective new control structure	12
D1.3	Emergency situations and Micro grids	Choice of emergency situations and applicable control actions for the new control structure	12
<b>SP2: Energy Management</b>			
D2.1	Simulation and analysis models	Compilation of existing models including their capabilities and identification of extensions	12
<b>SP3: Information and Control System Interoperability</b>			
D3.1	US and Europe comparison on system interoperability	Report describing Control Systems Interoperability in the US and in Europe: commonalities and differences	12
<b>SP4: Electrical Storage Technologies</b>			
D4.1	Existing and future promising ESS technologies	Report on ESS technologies	12



# Important Upcoming Activities

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**EC – EEGI – EERA “JP on Smart Grids” Meeting**  
EC Brussels, June, 2010 (tbd)

**1<sup>st</sup> Joint meeting**

**SP Technical WEB and face-to-face Meetings**  
All SP participants, June & July, 2010

**SP R&D activities**

**New Participant incorporations**

**New JP resources**

**“6th Smart Grids Workshop”**  
SINTEF premises, Trondheim, Norway, Sept 29-30, 2010

**SP assessment**

**“7th Smart Grids Workshop”**  
LABEIN or ERSE premises, Feb. 18-19, 2011

**Deliverables finalization**

**Release of first Nr. 5 Deliverables**  
30 April 2011

# Important Upcoming Activities



**Effective Use of the**

**Strategic Research Infrastructures**

**available within the JP**

**JP on Smart Grids**

4 June 2010, Madrid

**Thank you for your attention**

