



Smart Grid Projects of Common Interest

#smartPCI

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- 1 Regulation**
- 2 Documents**
- 3 Projects**
- 4 Reasons**

Regulation (EU) No. 347/2013

- Introduces 12 priority corridors and areas including **Smart Grids deployment** → **Smart Grid Regional Group**
- Defines **Smart Grid** as...
a network **efficiently integrating** the **behaviour and actions of all users** connected to it (generators, consumers and those that do both) in order to ensure an **economically efficient, sustainable** electricity system with **low losses** and high **quality and security** of supply and **safety**

Regulation (EU) No. 347/2013

1. Meet general criteria – Article 4.1

- ✓ **Necessity** for the smart grids deployment priority area
- ✓ Overall **benefits** outweigh its costs
 - *Cost-Benefit Analysis*
- Geographic criterion
 - Directly **crosses a border** of two Member States or one Member state and EEA country
 - or**
 - Has a **significant cross-border impact** (Annex IV.1)

Regulation (EU) No. 347/2013

Significant cross-border impact – Annex IV.1(e)

- ✓ Equipment and installations at high-voltage and medium-voltage level designed for a **voltage of 10 kV or more**
- ✓ By its impact it involves **TSOs and DSOs** from at least two Member States
 - ✓ which together cover at least **50 000 users**
 - ✓ in a consumption area of at least **300 GWh/year**
 - ✓ at least **20 %** originate from renewable energy sources

Regulation (EU) No. 347/2013

2. Meet specific criteria – Article 4.2(c)

- ✓ **integration and involvement** of network users with new technical requirements with regard to their electricity supply and demand;
- ✓ **efficiency and interoperability** of electricity transmission and distribution in day-to-day network operation;
- ✓ network **security, system control and quality** of supply;
- ✓ optimised **planning** of future cost-efficient network investments;
- ✓ **market functioning** and customer services;
- ✓ **involvement** of users in the management of their energy usage;

Regulation (EU) No. 347/2013

3. Receive implementation support

- Projects of common interest are eligible to receive
 - Union **financial assistance for studies** and,
 - under certain conditions, **for works in the form of grants**
 - or in the form of **innovative financial instruments**.

This will ensure that tailor-made support can be provided to those projects of common interest which are not viable under the existing regulatory framework and market conditions.

- Towards the National Regulatory Authority: Projects of common interest included on the Union list **shall become an integral part of the relevant regional investment plans and of the relevant national 10-year network development plans** and other national infrastructure plans concerned, as appropriate.

Papers to understand Smart Grid PCIs



JRC SCIENTIFIC AND POLICY REPORTS

Evaluation of Smart Grid projects within the Smart Grid Task Force Expert Group 4 (EG4)

Application of the Assessment Framework for Energy Infrastructure Projects of Common Interest in the field of Smart Grids

Vincenzo Giordano, Joint Research Centre
Julija Vasiljevska, Joint Research Centre
Silvia Vitello, Joint Research Centre

Constantina Filiou, DG Energy
Sebastian Gras, DG Energy
Marija Mrdeza, DG Energy
2013



Joint
Research
Centre



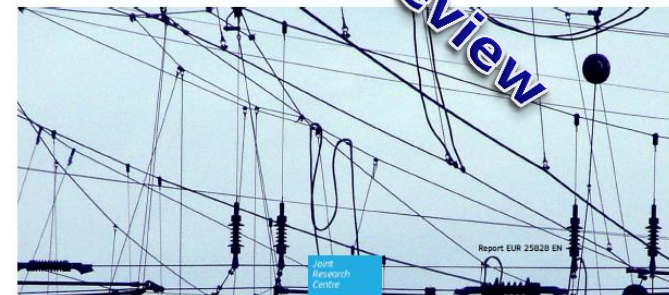
JRC SCIENCE AND POLICY REPORTS

DEFINITION OF AN ASSESSMENT FRAMEWORK FOR PROJECTS OF COMMON INTEREST IN THE FIELD OF SMART GRIDS

Under the EC "Proposal for a regulation of the European Parliament and of the Council on guidelines for trans-European energy infrastructure"

Vincenzo Giordano
Silvia Vitello
Julija Vasiljevska

Under review



Joint
Research
Centre

Report EUR 25828 EN

Green-Me

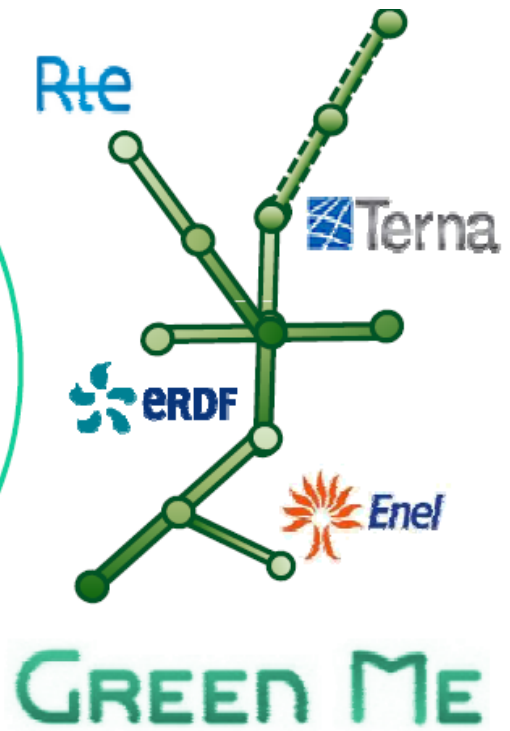
DSOs needs

- Voltage control**
- Quality of service**
- Resilience**

TSOs needs

- Increased observability** from the distribution network
- greater **involvement of RES and DG** in the management of the electrical system

Towards an integrated network management



Green-Me

RES forecast

- ✓ Advanced aggregated forecasting of RES generation connected to the distribution grid

RES integration

- ✓ Realization of an advanced control system communicating with the renewable generators

Asset management

- ✓ Digital monitoring of MV cables to optimize the life span of assets



Power flow management

- ✓ Innovative solutions to improve the management of active and reactive power flows

Storage

- ✓ Use of storage in primary substation in order to obtain a more predictable load profile at the DSO-TSO interface

Increased interaction Between TSO – DSO & TSO-TSO

- ✓ Modulation of power generation and loads
- ✓ Optimization of the cross-border power flows

North Atlantic Green Zone

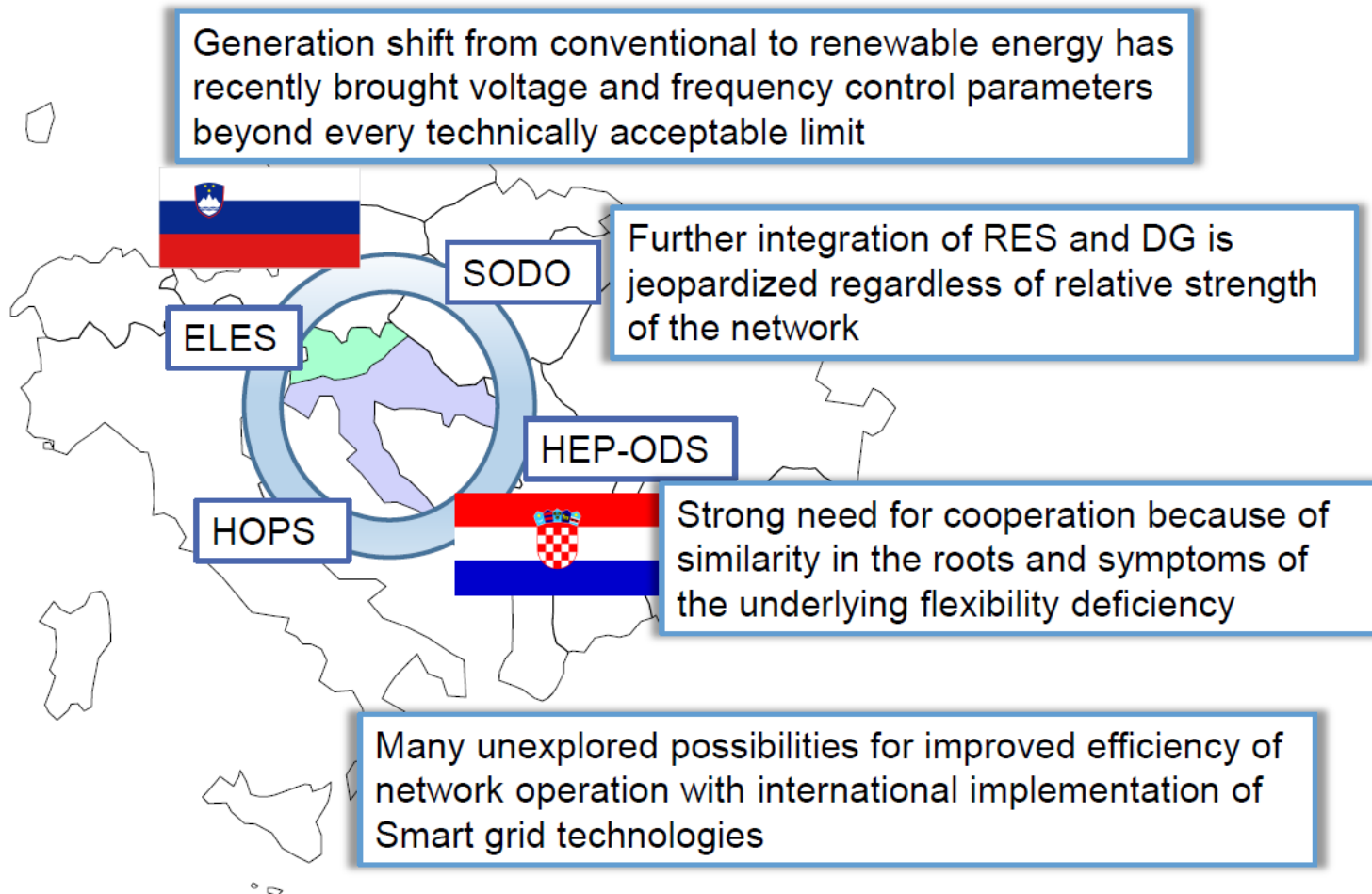
- Project will implement Smart Grid technologies on an infrastructural scale
- Marriage of intelligent electrical networks, high-speed communications and IT, coupled with increased cross-border connectivity

Objectives

- Mitigate the technical challenges presented by increasing distributed renewable generation penetration levels
- Improve continuity and security of supply
- Reduce losses and deliver energy efficiencies
- Increase cross-border connectivity and System Operator collaboration

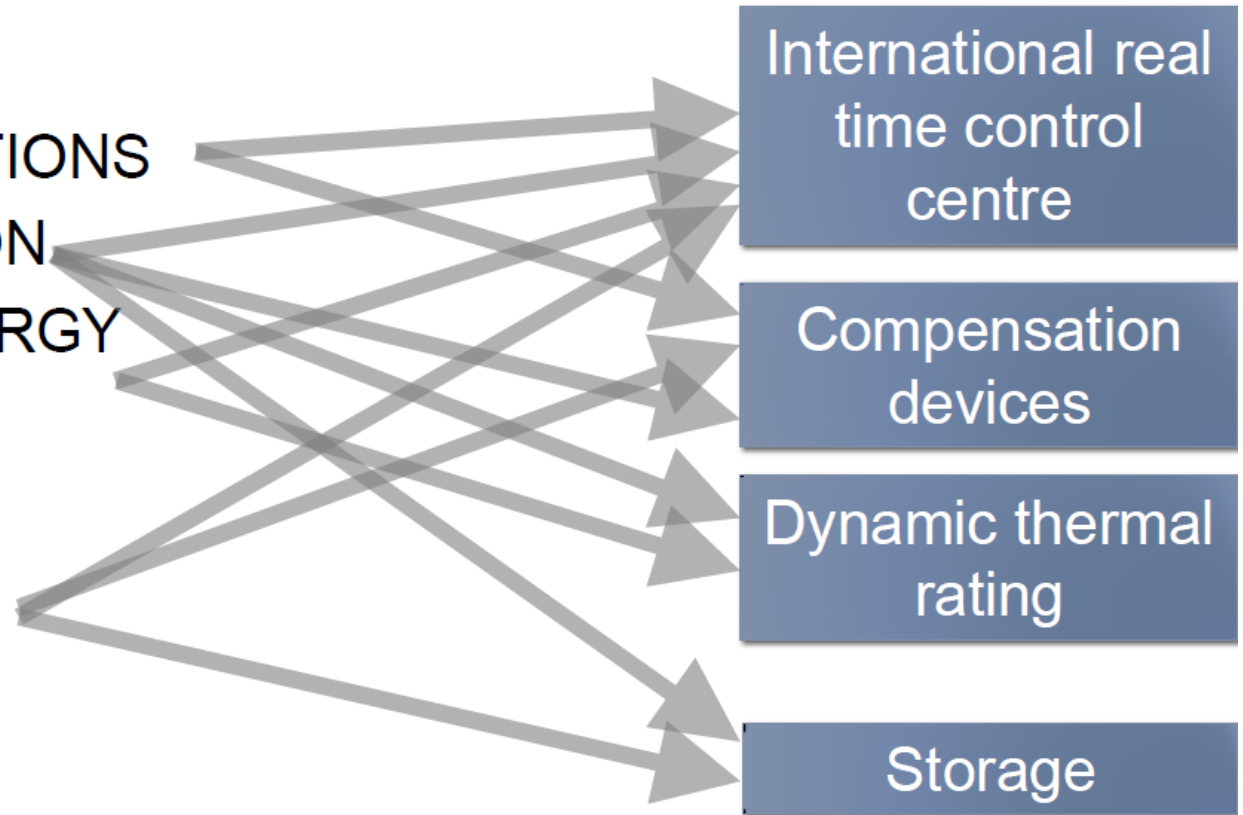


SINCRO.GRID



SINCRO.GRID

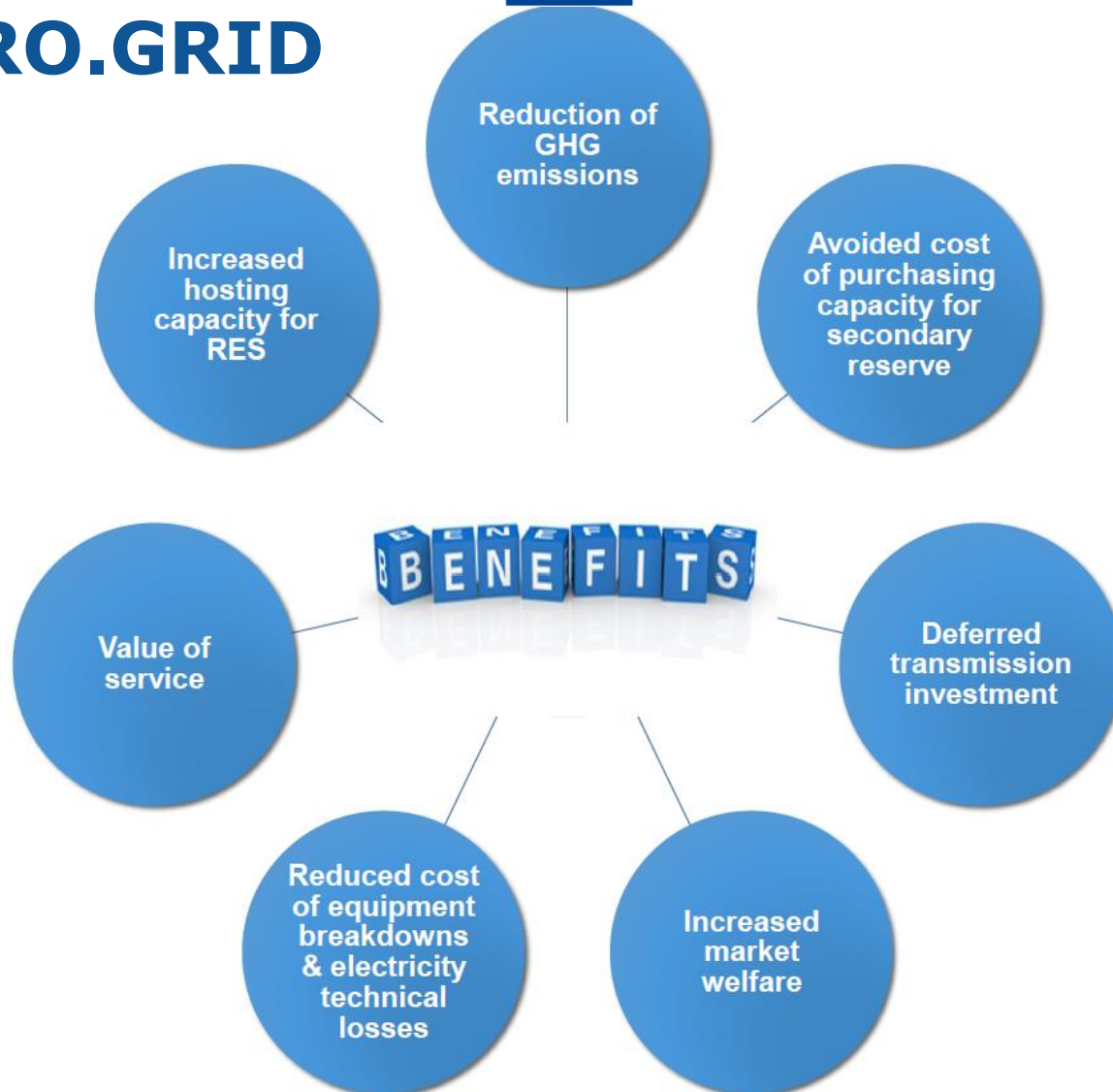
- VOLTAGE DEVIATIONS
- RES INTEGRATION
- INCREASED ENERGY TRANSFER
- BALANCING AND POWER FLOW MANAGEMENT





European
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SINCRO.GRID



SINCRO.GRID

Assessment of FNPV and investment costs

Investment costs	FNPV
88,5 M€	-53,0 M€

Societal NPV of the SINCRO.GRID project

	Low	Mid	High
Slovenia	23.939.604	96.559.925	106.702.030
Croatia	14.493.454	59.873.923	86.656.680
Neighboring countries	11.020.545	79.954.548	183.983.206

Connecting Europe Facility 2014-2020



Budget 5.35 billion Euro in Energy

1. Grants for Studies – up to 50% co-financing
2. Grants for Works – up to 50% co-financing (exceptionally 75%)
3. Financial instruments (debt, hybrid, equity) – also for cooperate financing
4. Accelerated planning and permit granting



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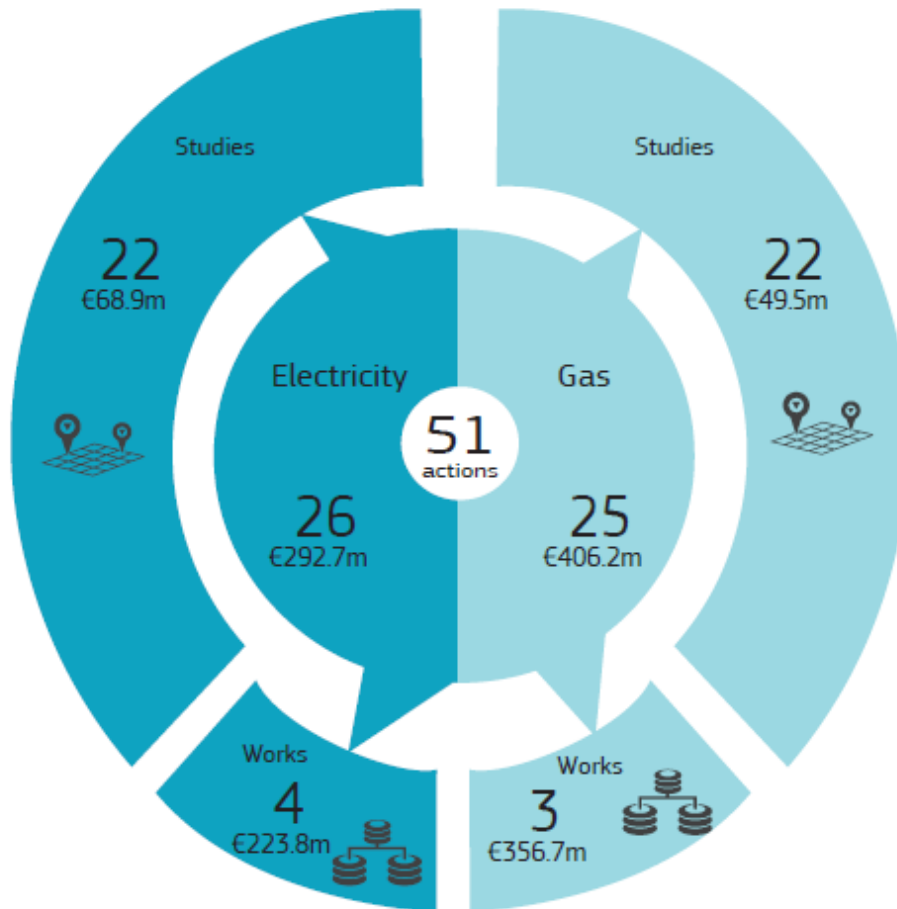
BACKUP

Table 1 North Atlantic Green Zone: evaluation of project impact against the first policy criterion

Policy Criteria

Level of sustainability	Project impact	
<p>KPI^a₁ Reduction of Green House Gas Emissions</p>	<p>KPI was positively assessed to 311.6 kg/MWh. NAGZ is expected to reduce the CO2 emissions, due to:</p> <ul style="list-style-type: none"> • Energy savings as a result of CVR, 20 kV conversion, dynamic sectionalisation • Increased planned RES generation (relative to the BaU scenario) and additional RES connection to the 38 kV and 110 kV network due to variable access provision. <p>Key assumption: Wind curtailment reduction from 25% (BaU) to 6% (SG scenario).</p>	
<p>KPI^b₁ Environmental impact of electricity grid infrastructure</p>	<p>The projects is expected to have positive environmental impact due to reduced needs of overhead lines, mainly through:</p> <ul style="list-style-type: none"> • Increase of energy efficiency (via CVR, dynamic sectionalisation and 20 kV network conversion) • Increased MV network capacity through 20 kV network conversion • Transmission network and generation capacity deferral • Deployment of next generation amorphous core transformers (low noise pollution). 	

Connecting Europe Facility 2014 and 2015



- Three calls for proposals were launched between 2014 and 2015 under the CEF Energy programme
- In 2014 and 2015, 54 proposals were selected for funding for a total amount of €796.6 million.
- 51 grant agreements were signed for a total amount of €700 million CEF funding and another grant agreement will be signed early 2016.