



# Increase the Resilience and Security of the energy system

SET-Plan A4 IWG

SET Plan Symposium on interoperability  
Vienna 30 January 2019



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Co-chairs TWG4

# 10 Key Actions of the SET – PLAN



## Energy Union

Research, Innovation and Competitiveness Priorities

### SET-Plan 10 Key Actions

No1 in Renewables



1 Performant renewable technologies integrated in the system

2 Reduce costs of technologies

Consumers in the Energy System



3 New technologies & services for consumers

4 Resilience & security of energy system

Efficient Energy Systems



5 New materials & technologies for buildings

6 Energy efficiency for industry

Sustainable Transport



7 Competitive in global battery sector and e-mobility

8 Renewable fuels and bioenergy

Carbon Capture Utilisation and Storage



9 Carbon Capture Storage / Use

Nuclear Safety



10 Nuclear safety

- 10 Key Actions (2015)
- Declarations of Intent“ (2016)
- Member States and Stakeholders

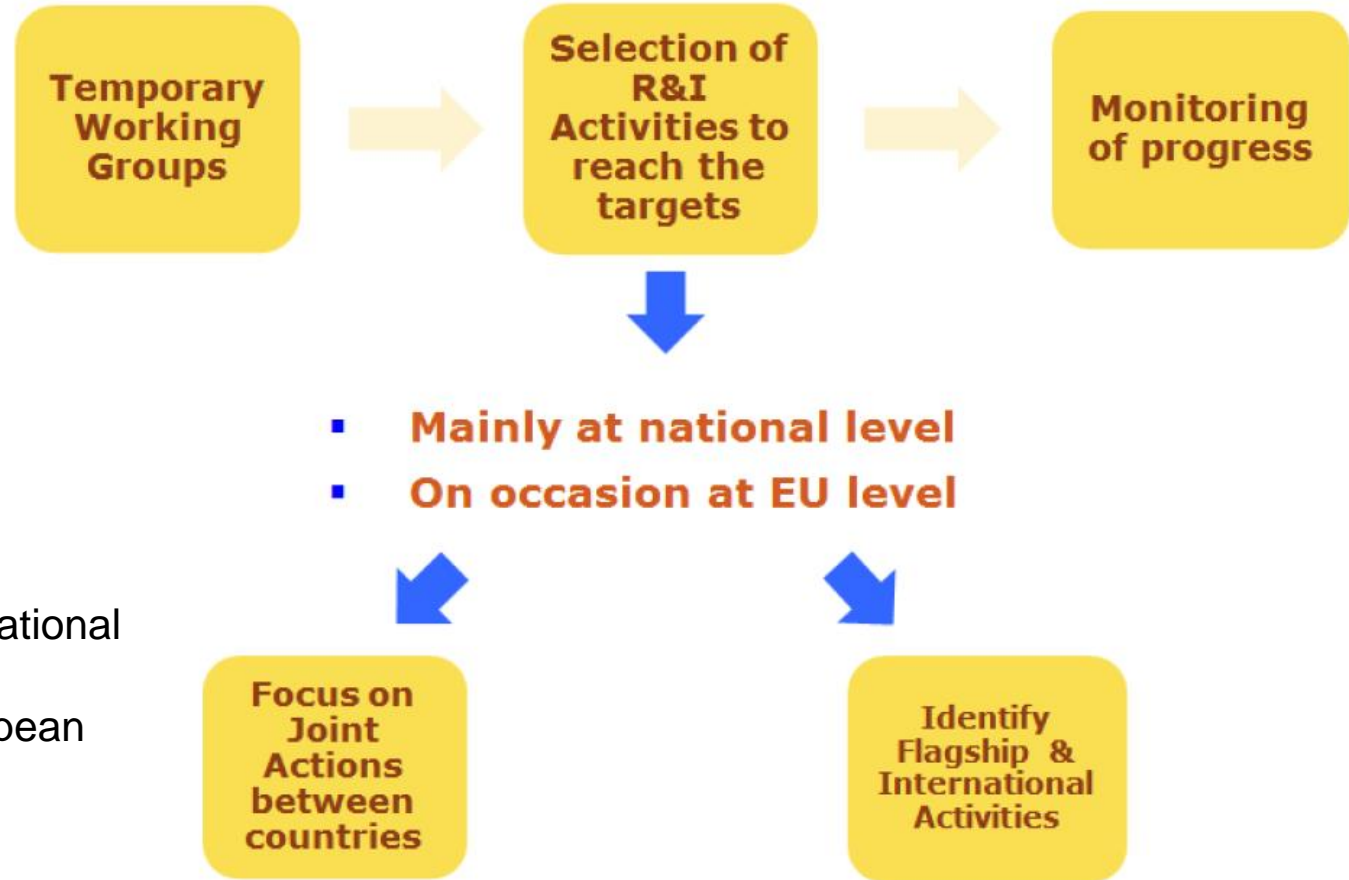
# Background



- Actuation of the **European Stakeholders Declaration for Action 4** "Increase the resilience and security of the energy system" (19 November 2016).
- Consensus of 15 countries **R&I actions to be implemented in coordination**, in order to achieve the challenging targets set in the Declaration
- Extensive **interactions** with the main stakeholders of the European energy system (e.g. several ETIPs, associations, experts etc.)



# Objectives of the joint effort



- Better Alignment of national programmes
- Coordination of European National Research & Innovation



- transnational
- national
- regional
- Industry
- research
- academia
- need owners

# Targets



01

**OBSERVABILITY AND  
CONTROLLABILITY OF MV-  
LV SYSTEMS**

02

**MANAGE LOAD PROFILE  
BY DEMAND RESPONSE  
AND CONTROL**

03

**FLEXIBILITY OF ALL TYPES  
OF GENERATION**

04

**REDUCE COSTS OF  
STORAGE SOLUTIONS**

05

**INTEGRATE DIFFERENT  
HEATING AND COOLING  
SOURCES AT #°T**

06

**MIX OF SOLUTIONS TO  
REDUCE RES VARIABILITY**

07

**MULTI-DIMENSIONAL  
LOCAL SYSTEMS FOR  
ENERGY COMMUNITIES**

08

**SMART SERVICE CO-  
CREATION FRAMEWORKS  
TO DEVELOP LOCAL AND  
REGIONAL VALUE CHAINS**

# SET-Plan Action 4 Implementation Plan (2)



## Innovation Activities

### Crosscutting Initiatives



Establish innovation environments for the development of smart services



Provide innovation frameworks to develop attractive services, creating value for the participants in the power system and allowing for participation in pan-European value chains.



Provide co-creation frameworks to develop attractive services, creating value for the participants in the energy system and allowing for participation in the development of local and regional value chains



Develop and implement solutions to increase observability and controllability in the energy system.

### Flagship Initiative 1:



Develop an optimized European power grid



Develop and implement solutions and tools to manage the load profile by demand response and control, in order to optimise use of the grid and defer grid investments.



Develop and implement solutions to increase flexibility of all types of generation including RES capable of supplying grid services and new/retrofitted flexible thermal power plants.



Reduce the cost of all energy storage solutions contributing to the minimisation of the overall system costs.

### Flagship Initiative 2:



Develop integrated local and regional energy systems



Develop heating and cooling systems that are able to locally integrate energy from different sources of different temperature levels. – Low temperature DH – Flexibility of DH



Develop innovative mix solutions that will reduce variability by combining multi low carbon solutions . RES integration at regional level – Multi dimensional local energy systems

Link:  
[SET-Plan Action 4 Implementation Plan](#)

# Innovation environments



## Crosscutting Initiatives



Establish innovation environments for the development of smart services



Provide innovation frameworks to develop attractive services, creating value for the participants in the power system and allowing for participation in pan-European value chains.



Provide co-creation frameworks to develop attractive services, creating value for the participants in the energy system and allowing for participation in the development of local and regional value chains

- WAYS OF CONDUCTING THE PILOTS/EXPERIMENTS
- REGULATORY AND MARKET ENVIRONMENTS TO FOSTER INNOVATION
- FROM LOCAL TO PAN-EUROPEAN APPROACH

**ACTIVITIES AND APPROACHES OFFERED TO THE ETIP SNET AS PROPOSALS**  
**(APPROACH ADOPTED IN ERA-NET – RegSys)**



# LOCAL ENERGY SYSTEMS



## Multi-dimensional local energy system

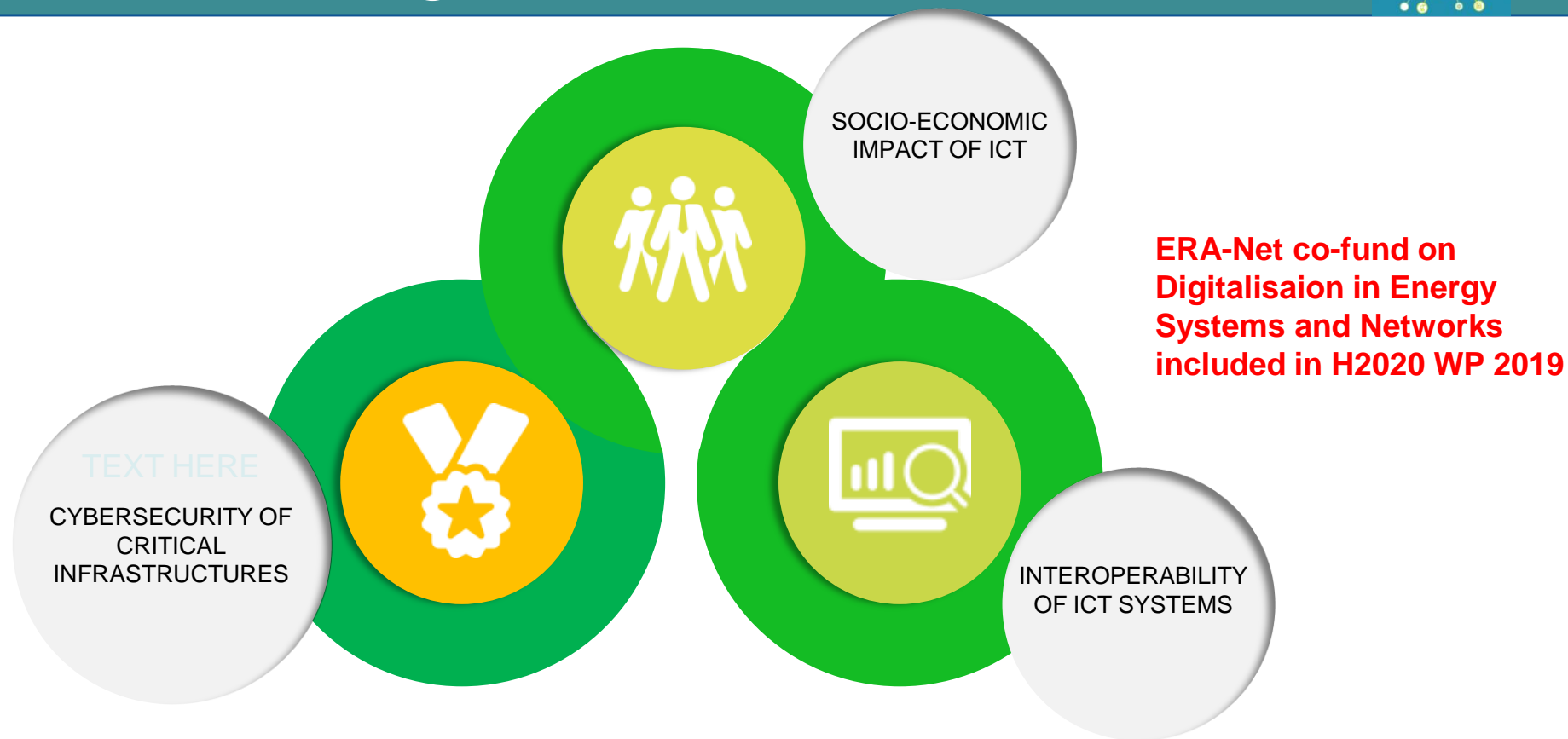
A4-IA2.2-5 **Families of living labs** to develop technology-service systems for direct use of PV energy on an aggregated level of multifamily buildings, districts or communities.



co-creation  
frameworks for  
participation in the  
development of  
local and regional  
value chains

A4-IA2.3-1 **Innovation environments** for the development of smart energy services in collaboration with ICT providers

# Overarching initiatives ICT



# Flagship initiative 1



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## Flagship Initiative 1: Develop an Optimised European Power Grid

Enabling the appropriate level of reliability, resilience and economic efficiency, while integrating variable renewables, such as wind and solar generation by providing increased flexibility thanks to innovative technologies enhancing customer participation, integrating better storage, making the best use of connections with other networks (e.g. heat and cold, transport) and optimising the use of flexible sustainable combined power and heat generation.

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- FOCUS ON POWER SYSTEM **PLANNING AND OPERATION**
- CONSIDERS **INTERACTION** WITH OTHER ENERGY VECTORS
- OBJECTIVES: **RELIABILITY, RESILIENCE, EFFICIENCY**
- ADDRESSES **INTEGRATION OF R.E.S. AND RELATED FLEXIBILITY** ISSUES
- CENTERS ON **CUSTOMERS' NEEDS**
- CONSIDERS **ENERGY STORAGE** AS KEY TO SUCCESS

**SUBSET OF THE OBJECTIVES OF THE ETIP SNET I.P. OF HIGHER URGENCY FOR M.S.**

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# Flagship 1: Power grid



## Flagship Initiative 1:



Develop an optimized European power grid



Develop and implement solutions to increase observability and controllability in the energy system.



Develop and implement solutions and tools to manage the load profile by demand response and control, in order to optimise use of the grid and defer grid investments.

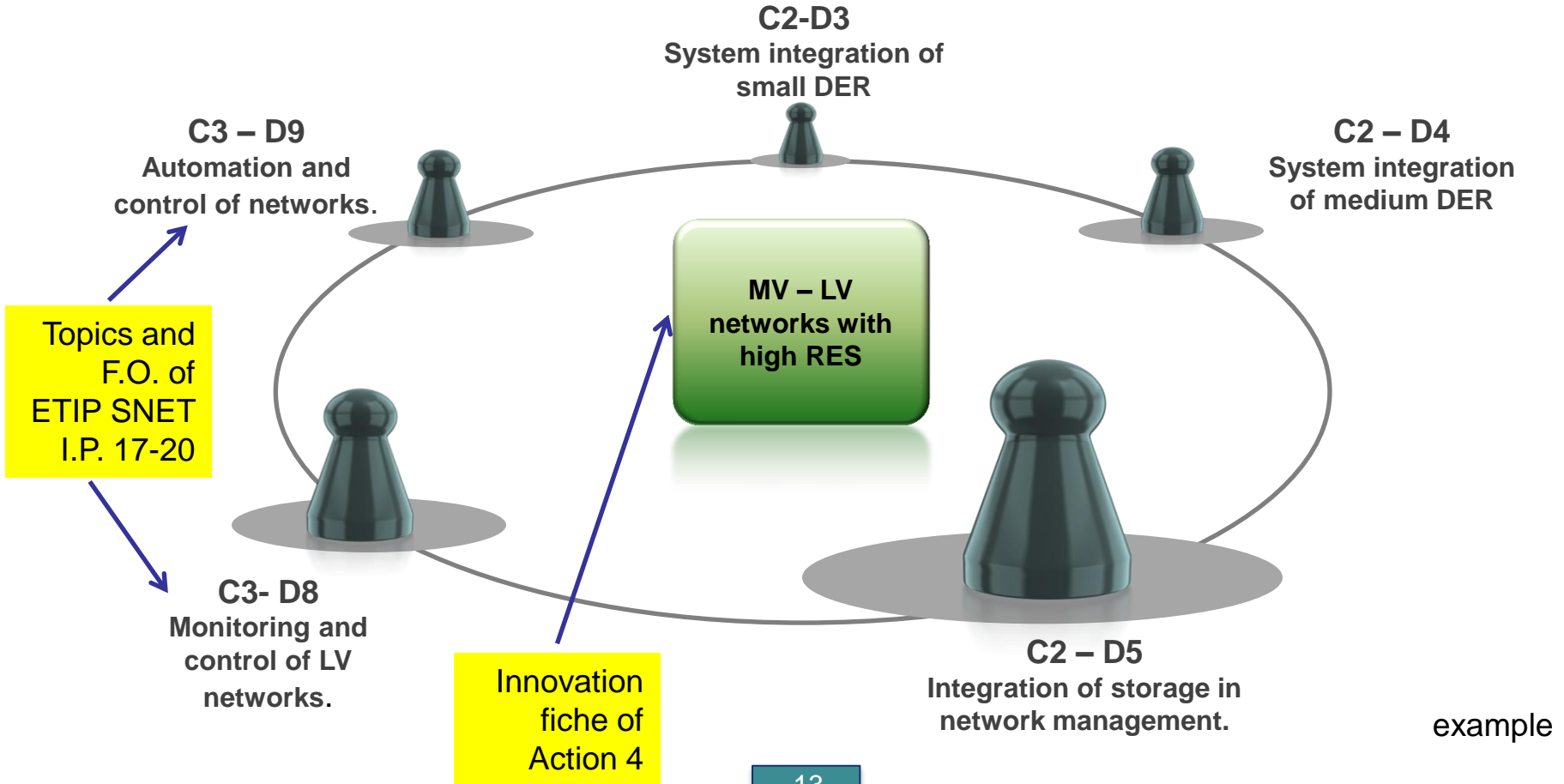


Develop and implement solutions to increase flexibility of all types of generation including RES capable of supplying grid services and new/retrofitted flexible thermal power plants.



Reduce the cost of all energy storage solutions contributing to the minimisation of the overall system costs.

# A strong relation to ETIP SNET



# Flagship 2: local energy systems



## Flagship Initiative 2:



Develop integrated  
local and regional  
energy systems



Develop heating and cooling systems that are able to locally integrate energy from different sources of different temperature levels. – Low temperature DH – Flexibility of DH



Develop innovative mix solutions that will reduce variability by combining multi low carbon solutions. RES integration at regional level – Multi dimensional local energy systems

# Flagship initiative 2



- FOCUS ON **LOCAL INTEGRATED ENERGY NETWORKS**
- ADDRESSES **SUBSIDIARITY – BOTTOM-UP APPROACH**
- FROM LOCAL TO PAN-EUROPEAN APPROACH
- RESPONSIBILITY SHARING – LOOKING AT **SOCIETAL TRANSFORMATION**
- ADDRESSING MORE CLOSELY THREE LAYERS: **TECHNOLOGY, MARKETS - CONSUMERS**

**ACTIVITIES AND APPROACHES OFFERED TO THE ETIP SNET AS PROPOSALS FOR CONSIDERATION – MOSTLY ON INTEGRATED – LOCAL – USER CENTRIC (APPROACH ADOPTED IN ERA-NET – RegSys)**

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## Flagship Initiative 2: Develop Integrated Local and Regional Energy Systems

that make it possible to efficiently provide, host and utilise high shares of renewables, up to and beyond 100% in the local or regional supply by 2030, enabling regions and local communities to realise their high sustainable energy ambitions. They shall provide tailor-made solutions that meet the local and regional requirements and demand. At the same time they shall link to a secure and resilient European energy system, enabling the participation in inter-regional exchange of energy as well as in sharing responsibility to maintain the overall system, considering a sustainable use of local and global resources.

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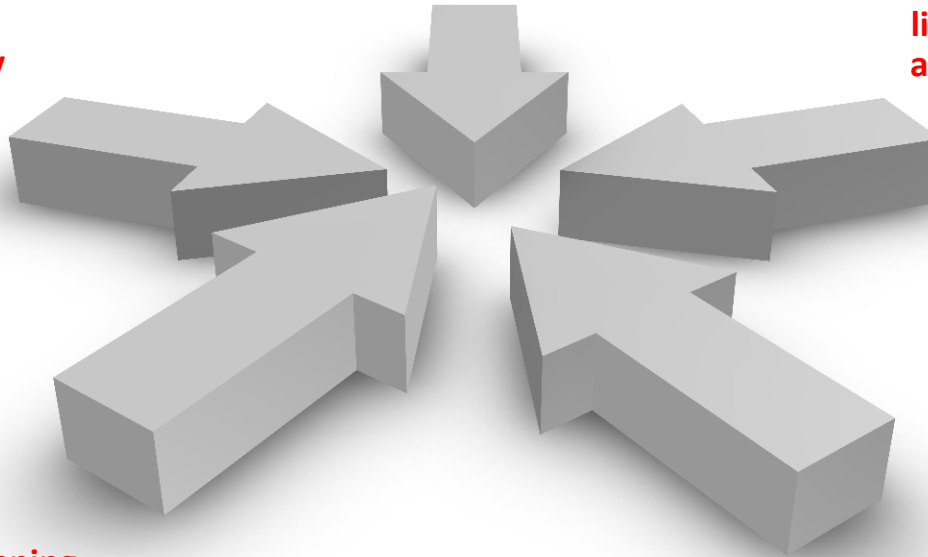
# RES integration at regional level



**A4-IA2.2-1 Transnational **joint programming platform** on smart, integrated, regional energy systems.**

**A4-T2.2-1: RES integration at regional and local levels, **including different energy vectors**.**

**A4-IA2.2-2 Creating and linking **living labs for integrated local and regional** energy systems .**



**A4-IA2.2-4 **Optimised planning, managing and monitoring** of integrated regional energy systems**

**A4-IA2.2-3 Cross-linking of **large demonstration projects****



# Innovation Action A4-IA0-5 (I)



## PROCESS CHAIN FOR INTEROPERABILITY OF ICT SYSTEMS

Implement a methodology in conformance with SGAM/M490 and ISO/TR 28380 to achieve interoperability of electronic data exchanges in heterogeneous energy-related ICT systems

### PARTICIPATIVE

- Implement and establish a transnational vendor-neutral, cooperative and participatory process to achieve interoperability of ICT-systems in European smart energy systems.

### EFFICIENT

- Adapt an existing open source interoperability test platform to the needs of the energy sector

### VALIDATED

- European **interoperability test events** ("Connectathon Energy") to test interoperability of ICT-components for conformance with existing standards as well as for interoperability among systems by different manufacturers



## PROCESS CHAIN FOR INTEROPERABILITY OF ICT SYSTEMS

**Support a European interoperability initiative, i.e. by implementing and establishing an existing methodology to achieve interoperability of electronic data exchange in the European energy sector.**

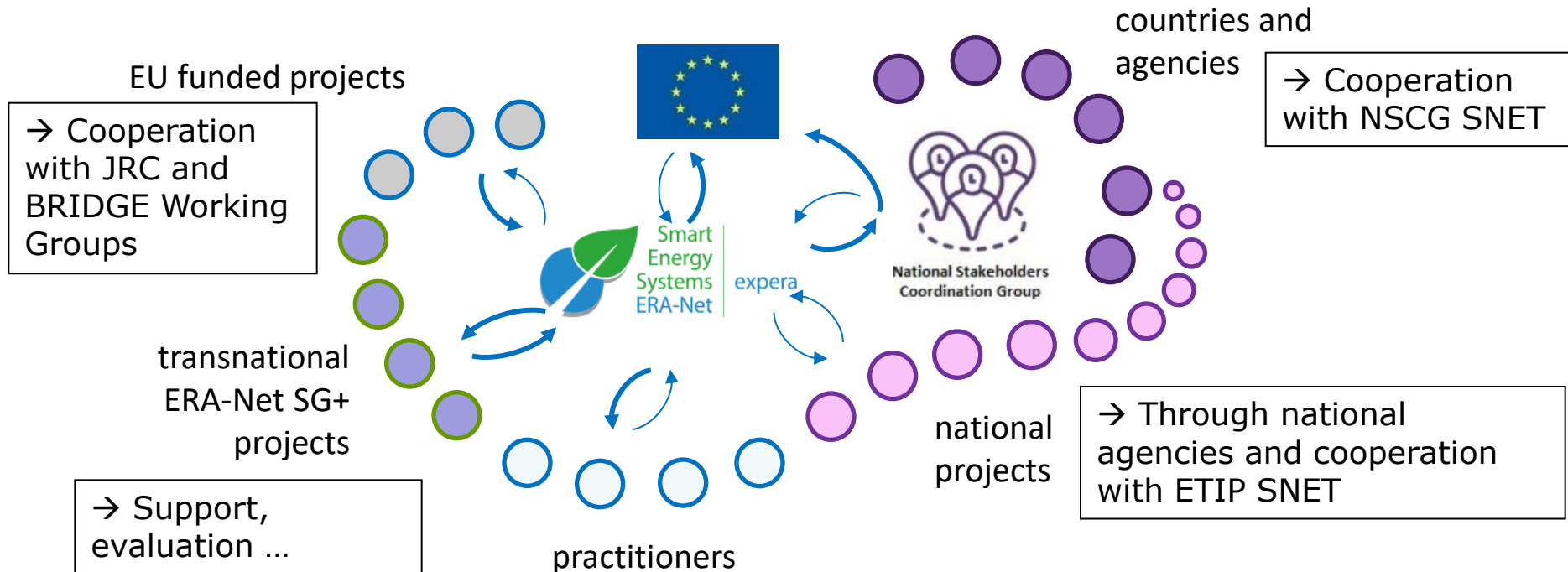
- Coordinate national stakeholders' participation in transnational technical and planning committees;
- Support the development of interoperability profiles based on real world use cases and existing standards;
- Provide information to relevant stakeholders on how to develop technical frameworks;
- Adapt the existing test platform to ensure the interoperability of ICT components in the energy sector;
- Work to increase stakeholders' awareness of competitive advantages of interoperable solutions in smart grid development.



# The collaboration environment



# Knowledge Community linking the worlds



Registered Members: 372

- Experts: 277
- Followers: 82

Projects in repository: 206

- **import of project passports**
- ERA-Net SG+ projects: > 20
- Important EU projects: > 20
- National projects > 150  
(mainly CH and DE)
- (JRC database to be imported : > 1.000)

- Living Documents: 46 of 60 chapters born
- Members registered for WGs: 73
  - System Architecture & Modelling: 36
  - Regulatory & Market Development: 26
  - Consumer & Citizen Involvement: 28
  - Storage and Cross Energy: 30
  - Interoperability & Standardisation: 36

Numbers as of February  
2017

# Digital EXPERA Platform as Workspace



BROWSE PAGE

EDIT EXPERT PROFILE CONTACT TERMS OF USE IMPR



LIVING DOCUMENTS RESULTS WORKING GROUPS PROJECTS EXPERTS EVENTS NEWS SETPLAN A4 ENERGIE & IKT EXCHANGE

REPOSITORY FOR  
GENERAL NSCG AND  
SET-PLAN DOCUMENTS

REPOSITORY FOR WG 4  
SPECIFIC DOCUMENTS

EDIT LINKS

## Workspace for national stakeholders and SET Plan Action 4

This section of expera serves as a work space for the member states led activities in SET-Plan Action 4 – Energy Systems. Particularly it provides a repository and living document for the SET-Plan Steering Group Temporary Working Group for Action 4 (TWG A4) as well as for the National Stakeholder Coordination Group (NSCG). This page and all its sub-pages are only accessible for registered members of TWG A4 and NSCG. The maintenance of this workspace within expera is provided by the Austrian Ministry of Transport, Innovation and Technology (bmvit) in the course of its co-chairmanship of the TWG A4 and chairmanship of the NSCG.

[Repository for NSCG SNET](#)  
[Repository for TWG A4](#)

## Implementation Plan TWG A4

### Living Documents:

Chapter 1,2: Intro & Overarching Goals  
Chapter 3: Innovation Targets  
Chapter 4: Elaboration on Innovation Targets  
Chapter 5: Overview of the Proposed Innovation Activities

Annex 1a: Innovation Activities IA0 - "Crosscutting Activities"  
Annex 1b: Innovation Activities IA1 - "Develop an Optimised European Power Grid"  
Annex 1c: Innovation Activities IA2 - "Develop Integrated Local and Regional Energy Systems"  
Annex 2: Stakeholder Declaration  
Annex 3: Countries and Stakeholders  
Annex 4: Ongoing R&I Activities

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### Important Links

[SET-Plan \(EC\)](#)  
[SET-Plan Action 4 \(SETIS\)](#)  
[SET-Plan A4 Implementation Plan online](#)  
[ETIP SNET](#)  
[ERA-Net Smart Energy Systems](#)

[Link to SET-Plan Action 4 Workspace](#)

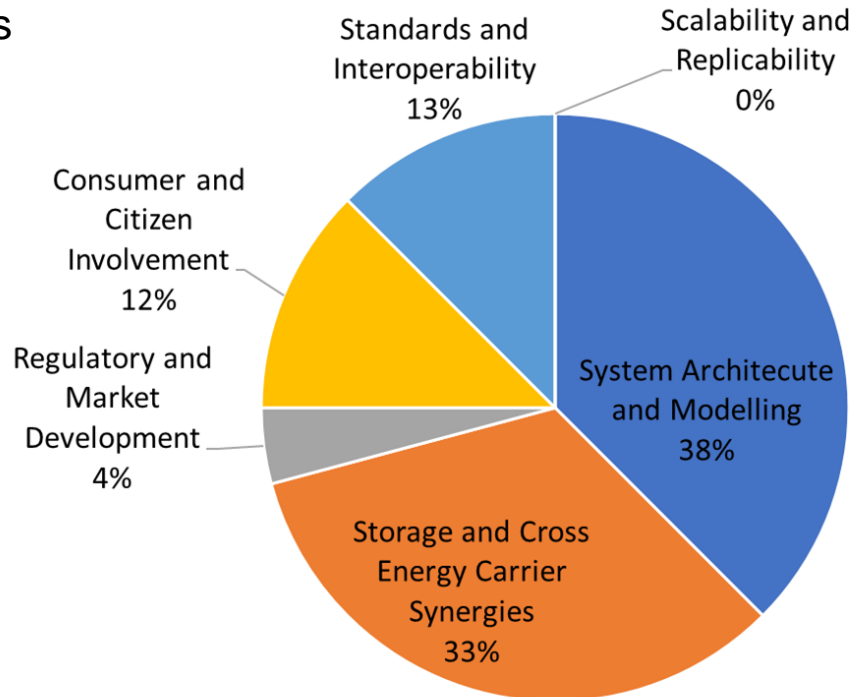
# living documents



- System Architecture and Modelling
- Storage and Cross Energy Carrier Synergies
- Consumer and Citizen Involvement
- Regulatory and Market Development
- Standards and Interoperability
- Scalability and Replicability

- 10 chapters („questions“) each
- consolidated knowledge
- process to discuss with experts

## Contributions to Living Documents





Grazie

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