



European Research Infrastructure supporting Smart Grid Systems Technology Development, Validation and Roll Out

Work Package 6

NA2 - Dissemination, Communication and International Collaboration

Deliverable D6.3

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Abbreviations

<i>AC</i>	Alternating Current
<i>DC</i>	Direct Current
<i>DG</i>	Distributed Generation
<i>DNO</i>	Distribution Network Operator
<i>DSO</i>	Distribution System Operator
<i>EERA JP SG</i>	European Energy Research Alliance Joint Programme on Smart Grids
<i>EU</i>	European Union
<i>HIL</i>	Hardware-in-the-Loop
<i>ICT</i>	Information and Communication Technology
<i>ISGAN</i>	<i>International Smart Grid Action Network</i>
<i>JP</i>	Joint Programme
<i>JRA</i>	Joint Research Activities
<i>LV</i>	Low Voltage
<i>MV</i>	Medium Voltage
<i>NA</i>	Networking Activities
<i>NCP</i>	National Contact Point
<i>NSGL</i>	National Smart Grid Laboratory
<i>R&D</i>	Research and Development
<i>RES</i>	Renewable Energy Sources
<i>RI</i>	Research Infrastructure
<i>SIRFN</i>	<i>Smart Grid International Research Facility Network</i>
<i>SG</i>	Smart Grids
<i>SGAM</i>	Smart Grids Architecture Model
<i>TA</i>	Trans-national Access
<i>TSO</i>	Transmission System Operator
<i>TU</i>	Technical University

Executive Summary

This report outlines the collaboration activities, undertaken by the ERIGrid consortium, with international and national Research and Development (R&D) projects, initiatives, networks, and platforms in the field of smart grids. These have been planned and performed during the second year of the ERIGrid project. Cooperation with 15 EU-funded (FP7 and H2020) projects, 3 national projects, 7 networks, 2 platforms, and one initiative, all are dealing with different aspects of smart grids, has been established since the project start. The main collaboration activities in this period have covered several topics in the scope of testing and validation methods, needs and requirements of the research infrastructures, real-time simulation and Hardware-in-the-Loop (HIL) testing, co-simulation, scenarios/use cases/test cases, power system operation and protection, TSO/DSO collaboration, ICT/cyber-security and metrology. This collaboration and information exchange, realised through email exchange, webinars, joint events (e.g., workshops) and joint papers, was planned and described within the ERIGrid NA2 work package “Dissemination, Communication and International Collaboration”.

1 Introduction

1.1 International and National Collaboration as an Objective of ERIGrid Project

The integration of Renewable Energy Sources (RES) into the power system has increased over the past years. This has introduced further complexity into the electric power system. The increased availability of advanced automation and communication technology, along with novel intelligent solutions for system operation has transformed the traditional power system into a cyber-physical energy system, which is called a smart grid. The research activities so far have mainly focused on validating certain aspects of the smart grid. Until now, a holistic and integrated approach for analysing and evaluating such complex system has not yet been developed. The ERIGrid project aims to support the technology development and roll out of smart grid approaches, solutions and concepts in Europe by addressing the aspect of system validation for smart grids and developing common methods, concepts and procedures by integrating eighteen European research centres and institutions with outstanding research infrastructures [1] .

In order to address the gaps within smart grid evaluation approaches, the current testing and evaluation methods that are being developed and used for relevant research activities should be identified and analysed. In addition, it is necessary that the holistic approach for system evaluation, which has been developed by ERIGrid project, is validated for different applications in relevant ongoing research activities in the scope of smart grids. In this regard, one of the objectives of the ERIGrid project is to create synergies with such R&D activities within the framework of the Networking Activities (NA) in the project.

1.2 Purpose and Scope of the Document

The purpose of this document is to summarize the progress of the collaboration activities that were planned and carried out within the ERIGrid NA2 work package “Dissemination, Communication and International Collaboration”, during the second year of the project. The information provided in this document was gathered through a questionnaire circulated to all ERIGrid partners. These exchange activities are realised through regular contact in form of webinars, newsletters, emails exchange, joint papers, and joint physical meetings and workshops.

In addition to collaboration activities, a short description and an overview of each international/national project, initiative, network, or platform is provided. Additionally, the contact persons who led these collaboration activities have been mentioned.

1.3 Structure of the Document

This document is organised as follows: Section 2 provides information about the performed, ongoing and planned collaboration activities with relevant smart grid project consortia. In addition, short descriptions of these projects are provided. Section 3 describes collaboration activities with international initiatives, networks, and platforms dealing with relevant activities for ERIGrid. Finally, a conclusion of the report is provided in Section 4.

2 Collaboration and Information Exchange with relevant European and National Projects

2.1 European Projects

The following table provides a brief overview of European projects that have been in cooperating with ERIGrid during the second year of the project or have the potential of performing collaboration activities with the project in the near future.

Table 1: List of European projects

ID No.	Name	Funding Framework	Website	ERIGrid Partners involved	ERIGrid Contact Persons	Project Contact Persons
01	ELECTRA IRP	FP7	http://www.electrairp.eu/	Yes	Thomas Strasser (AIT) Kari Mäki (VTT) Evangelos Rikos (CRES) Ron Brandl (IWES) Emilio Rodríguez (TECNALIA) Ata Khavari, Maria Sosnina (DERlab)	Luciano Martini (RSE) Maria Nuschke (IWES) Thomas Strasser (AIT) Emilio Rodríguez (TECNALIA) Graeme Burt (UST)
02	SPARKS	FP7	http://project-sparks.eu/	Yes	Thomas Strasser, Cyndi Moyo (AIT)	Paul Smith (AIT)
03	SmartNet	H2020	http://smartnet-project.eu/	Yes	Thomas Strasser (AIT) Carlo Sandroni, Marco Rossi (RSE) Julia Merino (TECNALIA)	Gianluigi Migliavacca, Marco Rossi (RSE) Carlos Madina (TECNALIA)
04	SmarterEMC2	H2020	http://www.smarteremc2.eu/	Yes	Panos Kotsampopoulos (ICCS-NTUA)	Aris Dimeas (ICCS-NTUA)
05	NOBEL GRID	H2020	http://nobelgrid.eu/	Yes	Panos Kotsampopoulos (ICCS-NTUA)	Aris Dimeas (ICCS-NTUA)
06	MIGRATE	H2020	http://www.h2020-migrate.eu/	Yes	Peter Palensky (TUD)	Jose Rueda (TUD)
07	SALVAGE	SmartGrids ERA-Net	http://www.salvage-project.com/	Yes	Oliver Gehrke, Kai Heussen (DTU)	Oliver Gehrke (DTU)
08	SmILES	H2020	https://www.ecria-smiles.eu/	Yes	Oliver Gehrke (DTU) Edmund Widl (AIT)	Elisa Gil Bardaji (KIT)
09	TwinPV	H2020	http://twinpv.eu/	Yes	Kai Heussen (DTU) Thomas Strasser (AIT)	Helfried Brunner (AIT) Henrik Bindner (DTU)
10	CloudGrid	H2020	http://www.eranet-cloudgrid.eu/	No	Merkebu Zenebe Dega (SIN)	Elisabetta Tedeschi (NTNU)
11	STORY	H2020	http://horizon2020-story.eu/	Yes	Kari Mäki (VTT)	Mia Ala-Juusela (VTT)
12	beSCIENCED	H2020	http://be-scienced.eu/	No	Thomas Strasser (AIT)	Munir Merdan (PRIA)
13	OpenUP	H2020	http://openup-h2020.eu/	Yes	Thomas Strasser (AIT)	Vignoli Michela (AIT)
14	RICH	H2020	http://www.rich2020.eu/	No	Thomas Strasser (AIT)	Manfred Halver (FFG)
15	RISCAPE	H2020	http://riscape.eu/	No	Thomas Strasser (AIT)	Jari Kaivo-oja (UTU)

2.1.1 ELECTRA IRP: European Liaison on Electricity Committed Towards long-term Research Activity - Integrated Research Programme

Funding Framework: FP7

Coordinator: RSE (Italy) - Luciano Martini (luciano.martini@rse-web.it)

Website: <http://www.electrairp.eu>

Contact persons on behalf of the ERIGrid Consortium: Thomas Strasser (AIT), Kari Mäki (VTT), Evangelos Rikos (CRES), Ron Brandl (IWES), Emilio Rodríguez (TECNALIA), Ata Khavari (DERlab) and Maria Sosnina (DERlab)

Contact persons on behalf of the ELECTRA Consortium: Luciano Martini (RSE) and Maria Nuschke (IWES), Thomas Strasser (AIT), Emilio Rodríguez (TECNALIA), Graeme Burt (UST)

Project duration: 12.2013 - 11.2017

Project description:

The wholesale deployment of Renewable Energy Resources (RES) connected to the network at all voltage levels will require radically new approaches for real time control that can accommodate the coordinated operation of millions of devices of various technologies at many different scales and voltage levels dispersed across the EU grid. ELECTRA IRP addresses this challenge and aims to establish and validate proofs of concept that utilise flexibility from across traditional boundaries in a holistic fashion. The ELECTRA IRP consortium is working towards developing and testing a new control architecture for the power system, based on concurrent decentralised controls of portions of the grid, named cells. The Web-of-Cells (WoC) architecture aims to improve the management of the distributed energy resources and use of their flexibility to provide for a dynamic power balance that is closer to its equilibrium value than a conventional central control scheme. [2]

Collaboration activities:

Several ERIGrid partners are also involved in the FP7 ELECTRA IRP project. This makes the collaboration activities easier and facilitates the mutually beneficial exchange of information between these two EU-funded projects.

During the last year, several collaboration activities have either been planned or carried out. The activities are as follows:

- Information exchange regarding the needs and requirements of research infrastructures in order to perform different types of experiments.
- The Research Infrastructure (RI) capabilities and the methodologies for systems testing elaborated by the ERIGrid consortium as well as the developed holistic testing methodology will constitute an input for experiments planned within ELECTRA IRP.
- There was a joint exhibition (ELECTRA/ERIGrid) booth at CIRED 2017 conference (Glasgow, UK). Both projects disseminated their activities and promoted their researcher exchange program and TA opportunities to the visitors of the booth.
- A workshop on “Designing and validating future intelligent electric power systems” was co-organised in Kassel (Germany) by ERIGrid, ELECTRA IRP, EERA JP Smart Grids, SIRFN, DERlab and Fraunhofer IWES. The event garnered attention of participants (over 70) from multiple networks and enabled fruitful exchange of ideas on the crossroads of objectives in each project and network.
- The ELECTRA IRP consortium has the option to access ERIGrid testing facilities for implementation and evaluation of the developed control strategies within the Trans-national Ac-

cess (TA) activities.

- Similarly, the researcher exchange programme offered by ELECTRA IRP is open to the ERIGrid partners.

2.1.2 SPARKS: Smart Grid Protection against Cyber Attacks

Funding Framework: FP7

Coordinator: AIT (Austria) - Paul Smith (Paul.Smith@ait.ac.at)

Website: <http://project-sparks.eu/>

Contact persons on behalf of the ERIGrid Consortium: Thomas Strasser, Cyndi Moyo (AIT)

Contact persons on behalf of the SPARKS Consortium: Paul Smith (AIT)

Project duration: 04.2014 - 03.2017

Project description:

The SPARKS project aims to provide innovative solutions in a number of ways including approaches to risk assessment and reference architectures for secure smart grids. The project will make recommendations regarding the future direction of smart grid security standards. Furthermore, key smart grid technologies will be investigated, such as the use of big data for security analytics in smart grids and novel hardware-supported approaches for smart meter (gateway) authentication. All of these contributions and technologies will be assessed from a societal and economic impact perspective and evaluated in real-world demonstrators. [3]

Collaboration activities:

The AIT research institute, as the coordinator of both the ERIGrid and the SPARKS project, ensured interaction between the projects, through organisation of joint meetings and information exchange by emails. As an outcome of these activities, the Information and Communication Technology (ICT)/cybersecurity-related assessment methods developed within the SPARKS project were provided to the ERIGrid JRA2¹ work package.

2.1.3 SmartNet: Smart TSO-DSO interaction schemes, market architectures and ICT Solutions for the integration of ancillary services from demand side management and distributed generation

Funding Framework: H2020

Coordinator: RSE (Italy) - Gianluigi Migliavacca (Gianluigi.Migliavacca@rse-web.it)

Website: <http://smartnet-project.eu>

Contact persons on behalf of the ERIGrid Consortium: Thomas Strasser (AIT), Carlo Sandroni, Marco Rossi (RSE), Julia Merino (TECNALIA)

Contact persons on behalf of the SmartNet Consortium: Gianluigi Migliavacca, Marco Rossi (RSE), Carlos Madina (TECNALIA)

Project duration: 01.2016 - 12.2018

¹ JRA2: "Co-Simulation based Assessment Methods" work package in ERIGrid project

Project description:

SmartNet aims to compare different architectures for optimised interaction between Transmission System Operators (TSOs) and Distribution System Operators (DSOs) in managing the purchase of ancillary services (reserve and balancing, voltage regulation and congestion management) from subjects located in the distribution segment. [4]

Collaboration activities:

As an outcome of information exchange between the projects, ERIGrid accessed a list of use cases focused on the ancillary services in electricity systems. This provided support in selection of the ERIGrid focal use cases. In particular, the future scenario considered within SmartNet coincides with the ERIGrid system configuration of “vertical integration” which deals with a TSO/DSO collaboration. In addition, SmartNet has a dedicated task in which the practical concepts of TSO/DSO coordination will be implemented in a laboratory (more specifically, the SmartEST laboratory at AIT) and for which the procedures, nomenclature, concepts and methods investigated in ERIGrid will be applied.

2.1.4 SmarterEMC2: Smarter Grid: Empowering SG Market ACTors through Information and Communication Technologies

Funding Framework: H2020

Coordinator: Intracom Telecom (Greece) - labil@intracom-telecom.com

Website: <http://www.smarteremc2.eu/>

Contact persons on behalf of the ERIGrid Consortium: Panos Kotsampopoulos (ICCS-NTUA)

Contact persons on behalf of the SmarterEMC2 Consortium: Aris Dimeas (ICCS-NTUA)

Project description:

SmarterEMC2 implements ICT tools that support the integration of consumers through demand response services and the integration of Distributed Generation (DG)/RES through virtual power plants. These tools take into account the Smart Grids Architecture Model (SGAM) as well as the future structure of the distribution network as described by the relevant EU bodies and organisations. The project explores whether the existing telecommunication infrastructure is sufficient to support the emerging business models and smart grid services on a mass scale. In addition, the project supports standardisation activities by proposing adaptation to data models of market-oriented and field-level standards. [5]

Collaboration activities:

There was some knowledge exchange on the current state of the art activities in the field of co-simulation of power systems and ICT through physical meetings. The ERIGrid project gained useful information and experience especially on the two mentioned topics.

2.1.5 NOBEL GRID: New Cost Efficient Business Models for Flexible Smart Grids

Funding Framework: H2020

Coordinator: ETRA I+D (Spain) - Lola Alacreu Garcia (lalacreu.etra-id@grupoetra.com)

Website: <http://nobelgrid.eu/>

Contact persons on behalf of the ERIGrid Consortium: Panos Kotsampopoulos (ICCS-NTUA)

Contact persons on behalf of the NOBEL GRID Consortium: Aris Dimeas (ICCS-NTUA)

Project duration: 01.2015 - 06.2018

Project description:

NOBEL GRID will offer innovative solutions for all the actors of the smart grid in order to create more secure and stable smart grids as well as cleaner and affordable energy. Additionally, to facilitate an efficient implementation of these solutions, the project will work on the analysis of new business models as well as improvements in legislation and regulation in the field of smart grids. [6]

Collaboration activities:

There has been an exchange of information through physical meetings on topics like power/control Hardware-in-the-Loop (HIL) and advanced component/system testing among two projects.

2.1.6 MIGRATE: Massive InteGRATION of power Electronic devices

Funding Framework: H2020

Coordinator: TenneT (Germany) - Andreas Menze (migrate@tennet.eu)

Website: <https://www.h2020-migrate.eu/>

Contact persons on behalf of the ERIGrid Consortium: Peter Palensky (TUD)

Contact persons on behalf of the MIGRATE Consortium: Jose Rueda (TUD)

Project duration: 01.2016 - 12.2019

Project description:

The aim of MIGRATE is to find solutions for the technological challenges that the grid is currently and, also especially in the future will be faced with, in particular with the increasing share of renewable energy which is integrated into the grid. The project will try to develop new approaches, paving the way for the implementation of power electronic devices on a large scale. [7]

Collaboration activities:

Several potential use cases that can be tested within the ERIGrid project have been acquired from the MIGRATE project.

2.1.7 SALVAGE: Cyber-phySicAl security for Low-VoltAGE grids

Funding Framework: SmartGrids ERA-Net

Coordinator: DTU (Denmark) - Oliver Gehrke (olge@elektro.dtu.dk)

Website: <http://www.salvage-project.com>

Contact persons on behalf of the ERIGrid Consortium: Oliver Gehrke, Kai Heussen (DTU)

Contact persons on behalf of the SALVAGE Consortium: Oliver Gehrke (DTU)

Project duration: 04.2014 - 03.2017

Description:

The purpose of the SALVAGE project is to develop better support for managing and designing a secure future smart grid. This approach includes cybersecurity technologies dedicated to power grid operation as well as support for the migration to future smart grid solutions, including the legacy of ICT that necessarily will be part of it. The further objective is to develop cybersecurity technology and methodology optimised with the particular needs and context of the power industry, something that is to a large extent lacking in best practices and technologies for cybersecurity today. More precisely, the focus of the project will be on smart grids with many small distributed energy resources, in particular Low Voltage (LV) substation automation systems and LV distribution system. [8]

Collaboration activities:

ERIGrid collects some cyber-physical security use cases defined in the SALVAGE project. There is also an information exchange about co-simulation set-ups between the projects.

2.1.8 SmILES: Smart Integration of Energy Storages in Local Multi Energy Systems for maximising the Share of Renewables in Europe's Energy Mix

Funding Framework: H2020

Coordinator: KIT (Germany) - Elisa Gil Bardaji (elisa.gil@kit.edu)

Website: <https://www.ecria-smiles.eu/>

Contact persons on behalf of the ERIGrid Consortium: Oliver Gehrke (DTU) and Edmund Widl (AIT)

Contact persons on behalf of the SmILES Consortium: Elisa Gil Bardaji (KIT)

Project duration: 12.2016 - 11.2019

Project description:

The SmILES project aims to obtain fundamental knowledge about linking and optimising heterogeneous energy carriers and systems including storage and renewable energy technologies. It will also develop and disseminate guidelines for modelling, simulating and optimising such systems.

Collaboration activities:

SmILES tries to generate common simulation test cases which can be simulated by different partners with different simulation tools as well as be distributed to the general public. This is different from ERIGrid's approach to simulation in JRA2² (building a joint simulation platform) but very similar to ERIGrid's approach to laboratory testing (JRA3³ and JRA4⁴) which recognizes that experiments must be adapted to the capabilities of the individual laboratories. Due to this obvious similarity of the challenge (despite the different application area), SmILES decided to adopt the holistic testing methodology developed and described by ERIGrid NA5⁵, as well as the ERIGrid terminolo-

² JRA2: "Co-Simulation based Assessment Methods" work package in ERIGrid project

³ JRA3: "Integrated Laboratory-based Assessment Methods" work package in ERIGrid project

⁴ JRA4: "Implementation and Demonstration of Use Cases/ Scenarios in the Integrated Research Infrastructure(s)" work package in ERIGrid project

⁵ NA5: "Holistic System Integration and Testing Procedure" work package in ERIGrid project

gy developed in JRA1⁶. SmILES has also used an adapted version of the ERIGrid use case template to generate its own use cases. This is described in the SmILES deliverable D3.1 (July 2017).

ERIGrid will benefit from the feedback on the application (and applicability) of the ERIGrid testing methodology within the framework of another project, i.e. information on how generally applicable it is. In the longer term, as SmILES starts doing actual simulations, both projects can contribute to the refinement of the NA5 methodology based on practical experiences obtained.

SmILES benefits by not having to reinvent the wheel. Adopting ERIGrid terminology and methods allowed SmILES to skip the alignment phase which took 6 to 12 months in the beginning of ERIGrid.

2.1.9 TwinPV: Stimulating scientific excellence through twinning in the quest for sustainable energy

Funding Framework: H2020

Coordinator: University of Cyprus (Cyprus) - George E. Georghiou (geg@ucy.ac.cy)

Website: <http://twinpv.eu/>

Contact persons on behalf of the ERIGrid Consortium: Kai Heussen (DTU), Thomas Strasser (AIT)

Contact persons on behalf of the TwinPV Consortium: Helfried Brunner (AIT), Henrik Bindner (DTU)

Project duration: 01.2016 - 12.2018

Project description:

TwinPV aims to achieve enhancement of the research field of photovoltaics (PV) and grid integration in smart grids at the University of Cyprus (UCY) through linking effectively with the Austrian Institute of Technology (AIT) and the Technical University of Denmark (DTU). The objectives, which are directly-related to the defined field, are: to increase the research and innovation (R&I) output of UCY, to strengthen its networking capabilities, to boost its success rate in research funding bids, to tie academia & industry in Cyprus, to achieve sustainable synergies with AIT/DTU, to strengthen EU-Mediterranean research links, and to contribute to the reversal of poor R&I indicators of Cyprus. This joint venture aims to also benefit AIT/DTU by way of accessing new markets in Sunbelt countries, use of Cyprus as a test-bed for new smart-grid technologies, and resource-sharing. To this end, effective twinning activities with the two world-leading research institutions are proposed. These are grouped into targeted case studies and include: experts' visits, scientific exchanges, training, webinars, workshops, joint PhD summer schools, and networking initiatives with local & European industry/SMEs. The methodology is set as a systematic means of achieving the impact metrics set through cross-fertilization of knowledge & skills. [9]

Collaboration activities:

A training course module for the TwinPV summer school in DTU was created and held where results from ERIGrid were presented. The TwinPV partners gained information about the state of the art test design approach developed in ERIGrid. On the other hand, ERIGrid will benefit through the dissemination of the holistic testing approach and development of the training course modules.

⁶ JRA1: "Use Case/Scenario Identification, Analysis and Selection" work package in ERIGrid project

2.1.10 CloudGrid: Transnational Cloud for Interconnection of Demonstration Facilities for Smart Grid Lab Research and Development

Funding Framework: H2020

Coordinator: STRI AB (Sweden) - Emil Hillberg (emil.hillberg@stri.se)

Website: <http://www.eranet-cloudgrid.eu/>

Contact persons on behalf of the ERIGrid Consortium: Merkebu Zenebe Degefa (SIN)

Contact persons on behalf of the CloudGrid Consortium: Elisabetta Tedeschi (NTNU)

Project duration: 03.2016 - 03.2019

Project description:

The goal of the CloudGrid project is to provide recommendations and strategies to meet the challenges of the future power system, to facilitate a larger amount of intermittent renewable generation together with less nuclear production while providing a secure and reliable electrical power supply. [10]

Collaboration activities:

The projects jointly organized the 'International Smart Grid Laboratory Workshop' held in Trondheim, Norway. The aim of the workshop was to give input for the further development of the National Smart Grid Laboratory (NSGL), to discuss knowledge and data sharing of tests and use cases, and to inform researchers and students about smart grid laboratory mobility opportunities in ERIGrid. As a result, there is an approved project from partners in the CloudGrid project submitted to the ERIGrid transnational access program and will be hosted at the NSGL (by the end of 2017).

2.1.11 STORY: Creating the future of energy storage

Funding Framework: H2020

Coordinator: VTT - Mia Ala-Juusela (mia.ala-juusela@vtt.fi)

Website: <http://horizon2020-story.eu/>

Contact persons on behalf of the ERIGrid Consortium: Kari Mäki (VTT)

Contact persons on behalf of the STORY Consortium: Mia Ala-Juusela (VTT)

Project duration: 05.2015 – 04.2020

Project description:

STORY aims to demonstrate and evaluate innovative approaches for energy storage systems. The challenge is to find solutions that are affordable and secure, and to ensure an increased percentage of self-supply. The project consists of eight different demonstration cases each with different local / small-scale storage concepts and technologies, covering industrial and residential environments. [11]

Collaboration activities:

There is a potential for information exchange especially on use cases and test cases between the projects.

2.1.12 beSCIENCEd: Bringing science and research directly to the young people

Funding Framework: H2020

Coordinator: Practical Robotics Institute Austria - Munir Merdan (merdan@pria.at)

Website: <http://be-scienced.eu/>

Contact persons on behalf of the ERIGrid Consortium: Thomas Strasser (AIT)

Contact persons on behalf of the beSCIENCEd Consortium: Munir Merdan (PRIA)

Project duration: 04.2016 - 11.2017

Project description:

The main goal of beSCIENCEd is to bring the general public and especially young people closer to the exciting world of research and to show that science is fun and accessible for everyone. Scientists from most of highly significant research institutions in Vienna participate in the event and present their recent research results in order to generate enthusiasm among young people for science and research. A focus is laid on the fields of science, technology, engineering and mathematics and the exiting topics cover informatics, mobility, energy, construction, biology, chemistry, mathematics, and automation. [12]

Collaboration activities:

ERIGrid organized a stand with some live demos (lab coupling approach JaNDER) at the European Researcher's Night on September 29, 2017 in Vienna (represented by beSCIENCEd project).

2.1.13 OpenUP: OPENing UP new methods, indicators and tools for peer review, impact measurement and dissemination of research results

Funding Framework: H2020

Coordinator: Public Policy and Management Institute - Vilius Stanciauskas (vilius@ppmi.lt)

Website: <http://openup-h2020.eu/>

Contact persons on behalf of the ERIGrid Consortium: Thomas Strasser (AIT)

Contact persons on behalf of the OpenUP Consortium: Vignoli Michela (AIT)

Project duration: 06.2016 - 11.2018

Project description:

Open Access and Open Scholarship have revolutionized the way scholarly artefacts are evaluated and published, while the introduction of new technologies and media in scientific workflows has changed the "how and to whom" audience that science is communicated to, and how stakeholders interact with the scientific community. OpenUP addresses key aspects and challenges of the currently transforming science landscape and aspires to come up with a cohesive framework for the review-disseminate-assess phases of the research life cycle that is fit to support and promote Open Science. [13]

Collaboration activities:

ERIGrid participated in an OpenUP survey through an interview related to the open science. Experiences from the ERIGrid dissemination and communication strategy have been provided to the OpenUP project. ERIGrid is planning to apply key findings of the OpenUP project for future dissemination and communication activities.

2.1.14 RICH: Research Infrastructures Consortium for Horizon 2020

Funding Framework: H2020

Coordinator: Agenzia Per La Promozione Della Ricerca Europea - Monique Bossi (bossi@apre.it)

Website: <http://www.rich2020.eu/>

Contact persons on behalf of the ERIGrid Consortium: Thomas Strasser (AIT)

Contact persons on behalf of the RICH Consortium: Manfred Halver (FFG)

Project duration: 12.2014 - 11.2018

Project description:

The National Contact Points (NCP) perform valuable services in guiding and supporting national applicants in preparing proposals for Horizon 2020 funding. We expect that through an enhanced transnational cooperation and networking between National Contact Points for research infrastructures, a higher quality of their consulting services and thus of proposals and projects can be achieved. Therefore, the specific objective of RICH is to facilitate trans-national co-operation between NCPs for research infrastructures with a view towards identifying and sharing good practices and raising the general standard of support to programme applicants, taking into account the diversity of actors that make up the constituency of the Research Infrastructures Part. [14]

Collaboration activities:

ERIGrid coordinator AIT had several discussions with RICH partner FFG about experiences and lessons learned from RI projects. Moreover, the RICH project is supporting ERIGrid in the dissemination of TA calls. AIT also provided insights about the RI SmartEST lab to RICH members.

2.1.15 RISCAPE: European Research Infrastructures in the International Landscape

Funding Framework: H2020

Coordinator: University of Helsinki - Ari Asmi (ari.asmi@helsinki.fi)

Website: <http://riscape.eu/>

Contact persons on behalf of the ERIGrid Consortium: Thomas Strasser (AIT)

Contact persons on behalf of the RISCAPE Consortium: Jari Kaivo-oja (UTU)

Project duration: 01.2017 - 12.2019

Project description:

RISCAPE will provide systematic, focused, high quality, comprehensive, consistent and peer-

reviewed international landscape analysis report on the position and complementarities of the major European research infrastructures in the international research infrastructure landscape. [15]

Collaboration activities:

ERIGrid coordinator AIT participated in the “European and International Energy Research Infrastructures Workshop” which was organized by the RISCAPE consortium in July 2017 in Brussels. Experiences and lessons learned from the ERIGrid project (with focus on TA activities) have been shared with RISCAPE.

2.2 National Projects

The following table provides a brief overview of national projects, which have been in cooperation with ERIGrid during the second year of the project or have the potential of being involved in collaboration activities with the project in the near future.

Table 2: List of national projects

ID No.	Name	Country	Website	ERIGrid Partners involved	ERIGrid Contact Persons	Project Contact Persons
1	HEILA	Finland	N/A	Yes	Anna Kulmala (VTT)	Pertti Järventausta (TUT)
2	OpenNES	Austria	http://www.ait.ac.at/departments/energy/smart-grids/smart-grids-projects/opennes/	Yes	Thomas Strasser, Filip Prösti Andrén (AIT)	Thomas Strasser, Filip Prösti Andrén (AIT)
3	MESSE	Austria	https://www.salzburgresearch.at/en/projekt/messe/	Yes	Filip Prösti Andrén, Thomas Strasser (AIT)	Filip Prösti Andrén, Thomas Strasser (AIT)

2.2.1 HEILA: Integrated business platform for distributed energy resources

Country: Finland

Coordinator: Tampere University of Technology, Pertti Järventausta

Contact persons on behalf of the ERIGrid Consortium: Anna Kulmala (VTT)

Contact persons on behalf of the HEILA Consortium: Pertti Järventausta, (TUT)

Project description:

The aim of the project is to develop an extensive business development platform, which is globally remarkable from the functionality point of view. The platform is based on the integration of laboratories and simulation environments of VTT and universities (i.e. TUT and LUT). The platform includes also real life pilots (e.g. LVDC microgrid in Järvi-Suomen Energia Oy, energy self-sufficient microgrid in Marjamäki region, Green Campus of LUT) for developing and testing the functions needed in the management of future energy system. One essential target is to build a virtual microgrid which is based on several physical microgrids located all over the Finland.

Collaboration activities:

There is a potential for information exchange between two projects. Specifically, some solutions regarding facility interfacing can be shared.

2.2.2 OpenNES: Open and Interoperable ICT Solution for Integration of ReNewables

Country: ICT of the Future (Austria)

Coordinator: AIT - Thomas Strasser (Thomas.Strasser@ait.ac.at)

Website: <http://www.ait.ac.at/departments/energy/smart-grids/smart-grids-projects/opennes/>

Contact persons on behalf of the ERIGrid Consortium: Thomas Strasser, Filip Prössl Andrén (AIT)

Contact persons on behalf of the OpenNES Consortium: Thomas Strasser, Filip Prössl Andrén (AIT)

Project duration: 10.2014 - 09.2017

Project description:

The OpenNES projects aims to provide an open and interoperable ICT solution for the integration of renewables. [16]

Collaboration activities:

As mutual activities, several joint workshops have already taken place and as a result, DER controller architectures will be provided to the ERIGrid project for testing. The OpenNES project will benefit from the developed validation and testing approaches in the framework of the NA5 work package of the ERIGrid project.

2.2.3 MESSE: Model-based Engineering and Validation Support for Cyber-Physical Energy Systems

Country: ICT of the Future (Austria)

Coordinator: Salzburg Research - Christof Brandauer (christof.brandauer@salzburgresearch.at)

Website: <https://www.salzburgresearch.at/en/projekt/messe/>

Contact persons on behalf of the ERIGrid Consortium: Filip Prössl Andrén, Thomas Strasser (AIT)

Contact persons on behalf of the MESSE Consortium: Filip Prössl Andrén, Thomas Strasser (AIT)

Project duration: 10.2017 - 11.2019

Project description:

The massive deployment of distributed generators from renewable sources in recent years has led to a fundamental paradigm shift in terms of planning and operation of the electric power system. MESSE develops of a concept for a model-based engineering and validation support system, covering the overall engineering process for smart grid applications – from use case design to validation and deployment. [17]

Collaboration activities:

MESSE and ERIGrid are planning to exchange common ideas as well as validation and testing scenarios.

3 Collaboration and Information Exchange with Networks, Platforms, and Initiatives

The following table provides a brief overview of initiatives, networks and platforms, which have been in cooperation with ERIGrid during the second year of the project or have the potential of performing collaboration activities with the project in the near future.

Table 3: List of networks, platforms, and initiatives

ID No.	Name	Type	Website	ERIGrid Partners involved	ERIGrid contact persons	Network/ Initiative/ Platform Contact Persons
1	EERA JP Smart Grids	Network (EU)	http://www.eera-set.eu/eera-joint-programmes-jps/smart-grids/	Yes	Thomas Strasser (AIT) Evangelos Rikos (CRES) Ron Brandl (IWES)	Luciano Martini (RSE) Maria Nuschke (IWES) Mihai Calin (DERlab) Ángel Díaz (TECNALIA)
2	IEEE Task Force "Real-Time Simulation of Power and Energy Systems"	Network (international)	N/A	Yes	Ron Brandl (IWES) Georg Lauss, Thomas Strasser (AIT)	Omar Faruque (CAPS) Georg Lauss (AIT)
3	IEEE WG P2004	Network (international)	https://standards.ieee.org/develop/project/2004.html	Yes	Ron Brandl (IWES) Georg Lauss, Thomas Strasser (AIT) Erik de Jong (DNV GL)	Michael Steurer (FSU) Georg Lauss (AIT) Blake Lundstrom (NREL)
4	IEA ISGAN/SIRFN	Network (international)	http://www.sirfn.net/	Yes	Roland Bründlinger (AIT) Kari Mäki (VTT) Erik de Jong (DNV GL) Carlo Sandroni (RSE) Ron Brandl (IWES) Mihai Calin (DERlab)	PhilippStrauss (DERlab) Diana Strauss-Mincu (DERlab) Maurizio Verga (RSE)
5	MEAN4SG	Network (EU)	http://www.mean4sq-itn.eu/	Yes	Ian Gilbert (Ormazabal) Graeme Burt (UST)	Eduardo Cembrano (Foundation CIRCE) Andrew Roscoe (UST)
6	EPSRC Centre for Doctoral Training	Network (UK)	N/A	Yes	---	---
7	DERlab network	Network (EU)	http://der-lab.net	Yes	Mihai Calin, Ata Khavari, Maria Sosnina (DERlab) Thomas Strasser (AIT)	Diana Strauss-Mincu, Mihai Calin (DERlab) Roland Bründlinger (AIT) Graeme Burt (UST)
8	FUTURED	Platform (Spain)	http://www.futured.es/	Yes	Iñaki Orue (Ormazabal) Emilio Rodríguez (TECNALIA)	Enrique Morgades (FUTURED) Ángel Díaz (TECNALIA)
9	openKONSEQUENZ	Platform (Germany)	http://www.openkonsequenz.de/	Yes	Davood Babazadeh (OFFIS)	-
10	Smart Grid Campus	Initiative	N/A	Yes	Van Hoa Nguyen (GINP)	Yvon Besanger (GINP) Quoctuan Tran (CEA)

3.1 Networks

3.1.1 EERA JP SG (Joint Programme on Smart Grids)

Type: Network (EU)

Coordinators: RSE (Italy) and ENEA (Italy) - secretariat@eera-set.eu

Website: <http://www.eera-set.eu/eera-joint-programmes-jps/smart-grids/>

Contact persons on behalf of the ERIGrid Consortium: Thomas Strasser (AIT), Evangelos Rikos (CRES) and Ron Brandl (IWES)

Contact persons on behalf of the network: Luciano Martini (RSE), Maria Nuschke (IWES), Mihai Calin (DERlab), Ángel Díaz (TECNALIA)

Focus area:

The Joint Programme (JP) on smart grids is coordinated by RSE and ENEA from Italy by means of an extended cross-disciplinary cooperation involving many R&D participants with different and complementary expertise and facilities. It aims to address one of the most critical areas directly related to the effective acceleration of smart grid development and deployment in a medium- to long-term research perspective. [18]

Collaboration activities:

During the last year, a strong collaboration with EERA JP SG has been maintained. Several collaboration activities have been done as following:

- The ERIGrid consortium is regularly informed about EERA/EU-related activities, publications, etc.
- A workshop on “Designing and validating future intelligent electric power systems” was co-organised in Kassel (Germany) by ERIGrid, ELECTRA IRP, EERA JP Smart Grids, SIRFN, DERlab and Fraunhofer IWES. The event garnered attention of participants (over 70) from multiple networks and enabled fruitful exchange of ideas on the crossroads of objectives in each project and network.
- Through EERA JP SG, the ERIGrid project and the TA opportunities are advertised to a substantial number of European and international stakeholders.
- There will be an opportunity for external users related to EERA to access the ERIGrid facilities and benefit from the harmonised testing procedures on the topics that ERIGrid covers.
- EERA JP SG will get insights from ERIGrid testing methodology developments and the results of investigations about RI needs.

3.1.2 IEEE Task Force "Real-Time Simulation of Power and Energy Systems"

Type: Network (international)

Coordinator: Center for Advanced Power Systems - CAPS, Florida State University (USA), Omar Faruque (faruque@caps.fsu.edu)

Contact persons on behalf of the ERIGrid Consortium: Ron Brandl (IWES), Georg Lauss, Thomas Strasser (AIT)

Contact persons on behalf of the network: Omar Faruque (CAPS), Georg Lauss (AIT)

Focus area:

The focus area of the network is to create a general framework of the use of real-time simulation techniques and recommendation for their use in hardware-in-the-loop approaches.

Collaboration activities:

The outcome of the task force will be a set of instructions and recommendations for real-time simulations. Several ERIGrid work packages (JRA 2, 3 and 4) will directly benefit from the results coming from the task force. The network will benefit from the dissemination of developed real-time simulation approaches through the ERIGrid consortium.

3.1.3 IEEE WG P2004: IEEE Working Group “Recommended Practice for Hardware-in-the-Loop Simulation Based Testing of Electric Power Apparatus and Controls”

Type: Network (international)

Website: <https://standards.ieee.org/develop/project/2004.html>

Coordinator: Florida State University (USA), Michael Steuerer - steuerer@caps.fsu.edu

Contact persons on behalf of the ERIGrid Consortium: Ron Brandl (IWES), Georg Lauss, Thomas Strasser (AIT), Erik de Jong (DNV GL)

Contact persons on behalf of the network: Michael Steuerer (FSU), Georg Lauss (AIT), Blake Lundstrom (NREL)

Focus area:

The working group provides established practices for the use of the method of Hardware-in-the-Loop Simulation based Testing of Electric Power Apparatus and Controls. It is intended to be generically applicable in synergy (in conjunction) with any specific testing standard (if applicable). [19]

Collaboration activities:

There is a potential to have information exchange. One of the tasks in ERIGrid JRA3 deals with standardized approaches of HIL-based testing. Therefore, ERIGrid will benefit from recommendations and publications of this working group and vice versa.

3.1.4 IEA ISGAN/SIRFN: IEA International Smart Grid Action Network/Smart Grid International Research Facility Network

Type: Network (international)

SIRFN Operating Agent: DERlab - office@der-lab.net

Website: <http://www.sirfn.net/>

Contact persons on behalf of the ERIGrid Consortium: Roland Bründlinger (AIT), Kari Mäki (VTT), Erik de Jong (DNV GL), Carlo Sandroni (RSE), Ron Brandl (IWES), Mihai Calin (DERlab)

Contact persons on behalf of the network: Philipp Strauss (DERlab), Diana Strauss-Mincu (DERlab), Maurizio Verga (RSE)

Focus area:

The ISGAN Annex 5 called Smart Grid International Research Facility Network (SIRFN) gives the participating countries the ability to evaluate pre-competitive technologies and systems approaches in a wide range of smart grids implementation use cases and geographies using common testing procedures. Research within each individual member country will derive the value of the unique capabilities and environments of the other partner nations. Data from these tests will be made publicly available to the smart grid community to accelerate the development of smart grid technologies and systems and enabling policies. [20]

Collaboration activities:

As project partner DERlab is the operating agent of SIRFN and several other project partners are actively involved in the research topics. Strong collaboration was established and will be maintained through the entire duration of the project. Some of the collaboration activities are mentioned below:

- Information exchange on validation and testing requirements (e.g., test protocols for advanced interoperability functions of DER, power system testing and advanced laboratory testing methods) will provide useful information especially for ERIGrid JRA3 activities (HIL and harmonised laboratory-based system integration testing procedures).
- The ERIGrid consortium gets to know international perspectives and ideas for the topics of the project by having direct access to SIRFN results.
- ISGAN and SIRFN members will get insights from ERIGrid testing methodology developments.
- A workshop on “Designing and validating future intelligent electric power systems” was co-organised in Kassel (Germany) by ERIGrid, ELECTRA IRP, EERA JP Smart Grids, SIRFN, DERlab and Fraunhofer IWES. The event garnered the attention of participants (over 70) from multiple networks and enabled fruitful exchange of ideas on the crossroads of objectives in each project and network.
- There is the opportunity for external users related to ISGAN/SIRFN to access the ERIGrid research facilities in the framework of trans-national activities.

3.1.5 MEAN4SG: Metrology Excellence Academic Network for Smart Grids

Type: Network (EU H2020)

Coordinator: Julio J. Melero (Foundation CIRCE) - melero@fcirce.es

Website: <http://www.mean4sg-itn.eu>

Contact persons on behalf of the ERIGrid Consortium: Ian Gilbert (Ormazabal), Graeme Burt (UST)

Contact persons on behalf of the network: Eduardo Cembrano (Foundation CIRCE), Andrew Roscoe (UST)

Focus area:

The MEAN4SG network aims to educate 11 young researchers in the smart grids metrology field by constructing a sustainable training network gathering the whole innovation value chain. The overall MEAN4SG research programme tackles the main research challenges in the smart grids metrology field identified by the European R&D community [21]:

- Power quality analysis
- Smart grids modelling and management

- Advanced monitoring through phasor measurement units applications
- Smart cable diagnosis

Collaboration activities:

There has been collaboration in the development of a PhD workshop between the projects. The workshop will take place in January 2018 at the University of Strathclyde. Both projects will benefit from a wider dissemination of their progress through the workshop. The scope of ERIGrid will be increased as far as metrology aspects for Smart Grids testing are concerned. Furthermore, there will be a possibility for researchers in the MEAN4SG network to get access to smart grid laboratories provided by ERIGrid partners through the TA opportunity.

3.1.6 EPSRC Centre for Doctoral Training in Future Power Networks & Smart Grids

Type: Network (UK)

Focus area:

Two of the UK's leading research institutions for power systems, the University of Strathclyde and Imperial College London, have combined their expertise and world-class facilities to establish a centre that will address this global energy challenge. It has been designed to produce world-leading engineers with the cross-disciplinary expertise needed to help realise the future low carbon smart grid.

Collaboration activities:

There have been joint physical meetings and activities relevant for PhD students. There is a potential for collaboration activities through the TA opportunity, especially in the field of HIL testing. The researchers from the network can develop their skills in testing environment. Additionally, the EPSRC centre can network with ERIGrid partners and other early career researchers at ERIGrid training and educational events.

3.1.7 DERlab: European Distributed Energy Resources Laboratories e.V.

Type: Network (international)

Website: <http://der-lab.net>

Coordinator: DERlab e.V., Diana Strauss-Mincu

Contact persons on behalf of the ERIGrid Consortium: Mihai Calin, Ata Khavari, Maria Sosnina (DERlab), Thomas Strasser (AIT)

Contact persons on behalf of the network: Diana Strauss-Mincu, Mihai Calin (DERlab), Roland Bründlinger (AIT), Graeme Burt (UST)

Focus area:

DERlab is an association of leading laboratories and research institutes in the field of distributed energy resources (DER) equipment and systems. The association develops joint requirements and quality criteria for the connection and operation of (DER) and strongly supports the consistent development of DER technologies. DERlab offers testing and consulting services for distributed generation (DG) to support the transition towards more decentralised power systems. [22]

Collaboration activities:

The DERlab association is, on one hand, a core member of the ERIGrid consortium and is actively participating in NA and JRA activities. On the other hand DERlab provides a network of more than 30 partners as potential ERIGrid stakeholders (some of the network partners are also core members of ERIGrid). Various interactions on NA, JRA and TA activities are planned.

3.2 Platforms**3.2.1 FUTURED**

Type: Platform (Spain)

Technical secretary: Enrique Morgades (FUTURED) (secretaria@futured.es)

Website: <http://www.futured.es>

Contact persons on behalf of the ERIGrid Consortium: Iñaki Orue (Ormazabal), Emilio Rodríguez (TECNALIA)

Contact persons on behalf of the platform: Enrique Morgades (FUTURED), Ángel Díaz (TECNALIA)

Focus area:

The Spanish Technological Platform of Electrical Grids FUTURED was created for the purpose of integrating all of the agents involved in the electricity sector to define and promote strategies at the national level, in order to allow the consolidation of a much more advanced network capable of responding to the challenges of the future. [23]

Collaboration activities:

There will be dissemination of ERIGrid activities about the RI technological capabilities within the platform. Closer interaction will take place between ERIGrid and the Research Infrastructures Working Group titled FUTURED, which is in charge of the promotion of the facilities in Spain. In addition to the holistic testing and validation procedures developed in ERIGrid and being potentially used by FUTURED associates, the TA appears to be a promising mechanism for collaboration.

3.2.2 openKONSEQUENZ

Type: Platform (Germany)

Website: <http://www.openkonsequenz.de>

Contact persons on behalf of the ERIGrid Consortium: Davood Babazadeh (OFFIS)

Focus area:

The openKONSEQUENZ is a platform for developed, open, modular and secure software with the goal to operate energy and water networks based on harmonised processes. [24]

Collaboration activities:

There is information exchange on common practical applications and challenges.

3.3 Initiatives

3.3.1 Smart Grid Campus

Type: Initiative

Coordinator: CEA (France)

Contact persons on behalf of the ERIGrid Consortium: Van Hoa Nguyen (GINP)

Contact persons on behalf of the initiative: Yvon Besanger (GINP), Quoctuan Tran (CEA)

Focus area:

The focus area of Smart Grid Campus is to create an interoperable research platform on smart grid in the Rhone-Alpes region.

Collaboration activities:

There has been information exchange among the partners of Smart Grid Campus and ERIGrid, mainly done by GINP and CEA. The information is mainly about technical insights into new cloud approaches for interoperability among smart grid platforms. Besides, Smart Grid Campus will benefit from the technical development of advanced testing methods specifically co-simulation and Hardware-in-the-loop.

4 Conclusions and Outlook

This report summarises the ERIGrid partners' collaborations that have been planned and performed with other international / national R&D projects, initiatives, networks, and platforms on the topics relevant to ERIGrid activity domains during the second year of the project. These networking activities were planned in the ERIGrid NA2 "Dissemination, Communication and International Collaboration" work package. The means of information exchange and joint activities was carried out through the exchange of emails, webinars, joint events like workshops, and joint papers.

During the last year, the ERIGrid partners have established lines of communication and cooperation with participants of 15 EU funded (FP7 and H2020) projects, 3 national projects, 7 networks, 2 platforms, and one initiative, all of which are all dealing with different aspects of smart grids. The topics of these activities are indicated for each project/initiative/network/platform in Table 4. The table shows that the performed collaboration activities cover all the main aspects of ERIGrid project. The activities have been focused on: testing and validation methods, needs and requirements of the research infrastructures, real-time simulation and Hardware-in-the-Loop (HIL) testing, scenarios/use cases/test cases, power system operation, TSO/DSO collaboration and ICT/cyber-security.

Table 4: Topics of collaboration activities with relevant projects, networks, initiatives and networks

<i>Topic of the collaboration activities</i>	Testing and validation methods	Needs and requirements of research infrastructures	Co-simulation	Real-time simulation and Hardware-in-the-Loop (HIL) testing	Multi-lab testing	Scenarios / Use cases / Test cases	Power system operation	Power system protection	TSO/DSO collaboration	ICT / Cyber-security	Metrology	Dissemination, Communication, and Exploitation
<i>Project / Initiative / Network / Platform</i>												
ELECTRA IRP		X		X	X	X	X					X
SPARKS		X				X				X		
SmartNet		X				X	X		X			
SmarterEMC2			X							X		
NOBEL GRID	X			X								
MIGRATE	X					X						
SALVAGE			X			X				X		
SmILES	X					X						
TwinPV	X					X						
CloudGrid					X							
STORY						X						
beSCIENCEd												X
OpenUP												X
RICH												X
RISCAPE		X										X
HEILA	X	X			X	X						
OpenNES	X					X	X					
MESSE	X					X					X	
EERA JP Smart Grids			X	X		X	X		X	X		X
IEEE Task Force "Real-Time Simulation of Power and Energy Systems"	X			X								

<i>Topic of the collaboration activities</i>	Testing and validation methods	Needs and requirements of research infrastructures	Co-simulation	Real-time simulation and Hardware-in-the-Loop (HIL) testing	Multi-lab testing	Scenarios / Use cases / Test cases	Power system operation	Power system protection	TSO/DSO collaboration	ICT / Cyber-security	Metrology	Dissemination, Communication, ad Exploitation
<i>Project / Initiative / Network / Platform</i>												
IEEE WG P2004	X	X		X								
IEA ISGAN /SIRFN	X	X		X								X
MEAN4SG		X						X			X	
EPSRC Centre for Doctoral Training in Future Power Networks & Smart Grids						X	X	X	X	X		
DERlab	X	X			X	X						X
FUTURED	X						X		X			
openKONSEQUENZ						X	X		X	X		
Smart Grid Campus	X		X	X						X		

The mentioned activities have already delivered or are expected to provide mutual benefits and inputs for both sides of the collaborations. The most important points are highlighted as follows:

- ERIGrid partners acquired information about the research infrastructures needs and requirements as well as approaches and methodologies for power/control Hardware-in-the-Loop (HIL) testing and co-simulation for performing different types of tests in the scope of smart grids.
- ERIGrid shared the developed holistic testing methodology as the main outcome of NA5 work package with several stakeholders and experts in the relevant fields and received feedback. This methodology has been also applied in several experiments in the other projects. This will help the consortium to improve the methodology based on the practical experiences obtained for the future.
- There was a joint exhibition (ELECTRA/ERIGrid) booth at CIRED 2017 conference (Glasgow, UK). Both projects, disseminated their activities and promoted their researcher exchange program and TA opportunities to the visitors of the booth.
- ERIGrid, together with some other projects and networks, organised a workshop on “Designing and validating future intelligent electric power systems” in Kassel (Germany). In this workshop, the consortium received feedback on its latest achievements from the experts in the relevant fields.
- There will be an opportunity for the external users, active in similar projects, to access the ERIGrid facilities and benefit from the harmonised testing procedures on the topics that the project covers.
- ERIGrid will co-organise a PhD workshop in January 2018 at the University of Strathclyde.

With all this in mind, it can be concluded that successful cooperation with several ongoing international/national activities on smart grids has been achieved within the second year of the project. This progress will be used to stimulate further improvements of the methodologies developed within the project and increase the visibility of the TA opportunity offered by the project.

As detailed in this report, the established collaboration activities will continue and several activities have been planned to be performed such as information exchange on the topics that the consortium will deal with during the next year of the project (e.g., tools and methodologies for HIL testing, co-simulation and multi-lab testing). Additionally, there is a high possibility of organising joint events during this period with the other projects, networks, initiatives and platforms mentioned in this report in order to facilitate a better information exchange.

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