



INTERPLAN INTEgrated opeRation PLAnning tool towards the Pan-European Network

Work Package 7

Dissemination, communication and exploitation

Deliverable D7.3

Progress report on the cooperation with national and international projects and initiatives (first year)

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Abbreviations

<i>AIT</i>	Austrian Institute of Technology
<i>API</i>	Application Programming Interface
<i>BESS</i>	Battery Energy Storage System
<i>CIM</i>	Common Information Model
<i>CO</i>	Cell Operator
<i>DER</i>	Distributed Energy Resource
<i>DERlab</i>	European Distributed Energy Resources Laboratories
<i>DG</i>	Distribution Grid
<i>DR</i>	Demand Response
<i>DSO</i>	Distribution System Operator
<i>ENTSO-E</i>	European Network of Transmission System Operators for Electricity
<i>ELECTRA IRP</i>	European Liaison on Electricity Committed Towards long-term Research Activity Integrated Research Programme
<i>EMS</i>	Energy Management System
<i>ENEA</i>	Italian National Agency for New Technologies, Energy and Sustainable Economic Development
<i>EU</i>	European Union
<i>GHG</i>	Greenhouse Gas
<i>HMI</i>	Human Machine Interaction
<i>ICT</i>	Information and Communication Technology
<i>IEC</i>	International Electrotechnical Commission
<i>IEE</i>	Fraunhofer Institute for Energy Economics and Energy System Technology,
<i>IEn</i>	Institute of Power Engineering
<i>INEA</i>	Innovation and Networks Executive Agency
<i>IoT</i>	Internet of Things
<i>JP</i>	Joint Program
<i>PC</i>	Project Coordinator
<i>PV</i>	Photovoltaics
<i>R&D</i>	Research and Development
<i>RES</i>	Renewable Energy System
<i>SC</i>	Steering Committee
<i>SET-Plan</i>	Strategic Energy Technology Plan
<i>ToU</i>	Time of Use
<i>TSO</i>	Transmission System Operator
<i>UCY</i>	University of Cyprus
<i>VA</i>	Visual Analytics

<i>VPP</i>	Virtual Power Plant
<i>WoC</i>	Web of Cells
<i>WP</i>	Work Package

Executive Summary

Deliverable D7.3 reports the collaborative activities with international and national research and development (R&D) projects, initiatives, networks, and platforms in the field of smart grids, which have been planned and performed during the first year of the INTERPLAN project. During this period, a cooperation with four EU funded projects, one National project, four European Programmes, one international network and one global initiative, which all are dealing with different aspects of smart grids, has been established.

Most collaborative activities in this period focus on possible use cases, challenges and project requirements. They have already brought various benefits and inputs like the definition of INTERPLAN project requirements and use cases, the identification of possible synergies and joint opportunities with regard to use cases, requirements for DSO/TSO interactions and regulatory aspects, and the consideration of INTERPLAN as a reference project for the National Technological Energy Cluster of Italy. Furthermore, valuable feedback on INTERPLAN's intermediary results has been received.

1 Introduction

The goal of the INTERPLAN project is to provide an INTEgrated opeRation PLANning tool towards the pan-European network, to support the European Union in reaching the expected low-carbon targets, while maintaining the network security. The project aims to generate grid equivalent models as a growing library able to cover all relevant system connectivity possibilities occurring in the real grid by addressing operation planning issues at all network levels (transmission, distribution and TSO-DSO interfaces). The chosen top-down approach leads to an "integrated" tool, both in terms of voltage levels, going from high voltage down to low voltage up to end user, and in terms of building a bridge between static, long-term planning and considering operational issues by introducing controllers in the operation planning. Proper cluster and interface controllers are developed to intervene in presence of criticalities, by exploiting the flexibility potentials throughout the grid.

To facilitate the work targeted through the project, it is necessary to identify the current policies, regulations and practices in the Member Countries and relate these to the needs of the grid to merge with the specific characteristics of the emerging technologies: distributed intermittent RES, storage systems, EVs including smart charging, and DR. These findings will be then assigned to the required system functionalities, and related to possible scenarios that have been put forward in other projects and are identified in WP3. These scenarios are to be finalized in WP3 and used in WP4 and 5 to develop the targeted solutions of INTERPLAN for effectively handling the above referred emerging technologies. This process will lead us to real shortcomings that today the industry is facing, which will gradually grow into substantial limitations that will hinder the optimal development of the grid and its effective operation in the day-to-day work of system operators.

1.1 Purpose of the Document

The purpose of deliverable D7.3 is to summarize the progress of the collaborative activities that have been planned and performed during the first year of the INTERPLAN project within WP7 "Dissemination, communication and exploitation". During the project duration the collaborations will be fostered and monitored. An updated version of deliverable D7.3 is planned for the second and third year of INTERPLAN to document the status of the networking activities. The provided information in this document were gathered through a questionnaire circulated between all INTERPLAN partners. The exchange activities are realised through regular contacts with consortia of relevant smart grid projects in form of webinars, newsletters, email exchange, joint papers, meetings and workshops. The cooperation fosters the establishment of liaisons with relevant international initiatives, networks and platforms dealing with similar topics. DERlab ensures a close contact with relevant academia, industry and research institutes from Europe and the US via its networks. In addition to the collaborative activities, a short description and an overview of each international/national project, initiative, network, and platform is provided. Moreover, relevant contact persons and representatives of each side are being introduced.

1.2 Structure of the Document

This document is organised as follows: Section 2 provides information about the performed, ongoing and planned collaborative activities with relevant smart grid projects' consortia. In addition, short descriptions of these projects are provided. Section 0 describes collaborative activities within international initiatives, networks, and programmes dealing with relevant activities for INTERPLAN. Finally, a conclusion of the report is provided in Section 4.

2 Collaboration and Information Exchange with relevant European and National Projects

The following table provides a brief overview of the R&D projects which have been in cooperation with INTERPLAN during the first year of the project or have the potential of performing collaborative activities with the project in near future.

Table 1: List of European and national projects

ID No.	Name	Funding Framework	Website	INTERPLAN Contact Persons	Project Contact Persons
1	ELECTRA IRP	FP7	http://www.electrairp.eu/	Giorgio Graditi (ENEA), Marialaura Di Somma (ENEA), Venizelos Efthymiou (UCY), Michał Kosmecki (IEn)	Luciano Martini (RSE)
2	NOBEL GRID	H2020	http://nobel-grid.eu/	Ata Khavari (DERlab)	Alma Solar (Alginet)
3	TDX-Assist	H2020	http://www.tdx-assist.eu/	Jan Ringelstein (Fraunhofer IEE), Giorgio Graditi (ENEA), Viviana Cigolotti (ENEA)	Frank Marten (Fraunhofer IEE), Hugo Morais (EDF)
4	MAGNITUDE	H2020	https://www.magnitude-project.eu/	Giorgio Graditi (ENEA), Viviana Cigolotti (ENEA)	Sandrine Charouset (EdD)
5	SysDL 2.0	German Federal Ministry for Economic Affairs and Energy	https://www.sysdl20.de/	Jan Ringelstein (IEE)	Martin Braun (University of Kassel), Sebastian Wendevon Berg (University of Kassel)

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

Type - Country: Project - European

Funding Framework: FP7

Coordinator: RSE

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

Project duration: 11.2013 - 02.2018

Contact persons on behalf of INTERPLAN: Giorgio Graditi (ENEA), Marialaura Di Somma (ENEA), Venizelos Efthymiou (UCY), Michał Kosmecki (IEn)

Contact persons on behalf of ELECTRA IRP: Luciano Martini (RSE)

Description: The objective of this project is to develop distributed control schemes to balance (frequency) and voltage control in the power system of 2030+. A new grid control scheme, called Web-of-Cells (WoC) is proposed to enable a decentralized (local) control of the grid. In this WoC architecture, the power grid is divided into grid areas, i.e., Cells, which can provide local balancing and voltage control based on the main concept of solving local problems locally. Each Cell has an assigned Cell Operator (CO), who is responsible for real-time reserves activation and dispatching in its own Cell (i.e., assuming responsibility similar to former TSO responsibility in its Control Area).

Collaboration activities: There was an exchange of information through project reports on definition of one of the INTERPLAN use cases dedicated to the frequency control.

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

Type - Country: Project - European

Funding Framework: H2020

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

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

Project duration: 01.2015 - 06.2018

Contact persons on behalf of INTERPLAN: Ata Khavari (DERlab)

Contact persons on behalf of NOBEL GRID: Alma Solar (Alginet)

Description: NOBEL GRID will offer innovative solutions for all relevant actors 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.

Collaboration activities: There has been an exchange of information through project reports on definition of project requirements and use cases.

2.3 TDX-Assist: Coordination of Transmission and Distribution data eXchanges for renewables integration in the European marketplace through Advanced, Scalable and Secure ICT Systems and Tools

Type - Country: Project – European

Funding Framework (if applicable): H2020

Coordinator: Brunel University London – Gareth Taylor

Website: <http://www.tdx-assist.eu/>

Project duration: 10.2017 - 9.2020

Contact persons on behalf of INTERPLAN: Jan Ringelstein (IEE), Giorgio Graditi (ENEA), Viviana Cigolotti (ENEA)

Contact persons on behalf of TDX-Assist: Frank Marten (IEE), Hugo Morais (EDF), Prof. Gareth Taylor (Brunel University London)

Description or focus area: TDX-Assist focuses on TSO-DSO interoperability which is currently established by ENTSO-E through implementation of the Common Grid Model Exchange System. The project considers business processes with participation of TSOs, DSOs, and other market actors (Aggregators, DG operators etc.). The project aims at defining interface specifications for highly automated information exchange between these actors. The work is based on a thorough use case analysis. Implementation of the interfaces is based on the CIM standard (IEC 61970 / IEC 61968 / IEC 62325). To this end, a part of the project is to develop proposals for extension of the standards in form of CIM profiles. Also, a suite of ICT protocols and a role-based access control method that accommodates unbundling processes are in the focus. The project aims at demonstrating results in Slovenia, Portugal and France in order to achieve a proof-of-concept.

Collaboration activities: Since the IEE contact person is actively participating in TDX-Assist and INTERPLAN, there was information exchange by project meetings, reports and daily work with reference to use cases, requirements for TSO/DSO data exchange, and regulatory aspects. Moreover, there was an exchange of information for identifying possible synergies and joint opportunities during the "H2020 Smart Grids and Storage projects clustering workshop" organized by INEA in October 2018 in Brussels.

2.4 MAGNITUDE - Bringing flexibility provided by multi energy carrier integration to a new MAGNITUDE

Type - Country: Project - European

Funding Framework: H2020

Coordinator: Électricité de France

Website: <https://www.magnitude-project.eu/>

Project duration: 10.2017 - 03.2021

Contact persons on behalf of INTERPLAN: Giorgio Graditi (ENEA), Viviana Cigolotti (ENEA)

Contact persons on behalf of MAGNITUDE: Sandrine Charousset (EdD)

Description: MAGNITUDE addresses the challenge to raise flexibility in electricity systems, by increasing the synergies between electricity, heating/cooling, gas networks and associated systems. MAGNITUDE will bring technical solutions, market designs and business models, to be integrated into ongoing policy discussions. MAGNITUDE will define technological and operational means to maximise flexibility provision to electricity network. It will identify the regulatory framework to bring such a flexibility service to the energy markets and will provide enhanced market designs and related business mechanisms. MAGNITUDE is built upon seven real life case studies of multi energy systems, located in different European countries, under different regulatory and geopolitical environments and with different technological development levels. MAGNITUDE results will define policy strategies and recommendations in a pan-European perspective. Achievements will be spread among stakeholders to raise awareness and foster higher collaboration among the electricity, heating and gas sectors to achieve the common goal of a less carbon intensive, yet reliable energy system.

Collaboration activities: There was an exchange of information for identifying possible synergies and joint opportunities during the "H2020 Smart Grids and Storage projects clustering workshop" organized by INEA on October 2018 in Brussels.

2.5 SysDL 2.0: Coordination of Transmission and Distribution data eXchanges for renewables integration in the European marketplace through Advanced, Scalable and Secure ICT Systems and Tools

Type - Country: Project – German

Funding Framework: Funding initiative "Future electric power networks" ("Zukunftsfähige Stromnetze"), German Federal Ministry for Economic Affairs and Energy

Coordinator: ENSO Netz GmbH

Website: <https://www.sysdl20.de/>

Project duration: 10.2014 - 03.2018

Contact persons on behalf of INTERPLAN: Jan Ringelstein (IEE)

Contact persons on behalf of SysDL: Martin Braun, Sebastian Wende-von Berg (University of Kassel)

Description or focus area: SysDL 2.0 considers the research question of how distribution grids with high share of renewable generation can contribute to system ancillary services. Such services, e.g. voltage and frequency control, are essential for stable grid operation and high quality of supply. Contributions to ancillary services are historically provided by conventional power plants connected to the transmission grid, which are more and more replaced by renewable generators connected at the distribution grid level. Hence, operation of distributed generators, loads, storages and grid assets needs to be intelligently controlled such that they can provide contributions to ancillary services at the DSO-TSO connection points. In SysDL 2.0, according control schemes were developed and evaluated through simulations. A specific goal of the project was to enable decentralized generators to contribute to DSO and TSO grid voltage stability by controlled provision of reactive power. This was demonstrated in a field test at two DSOs, ENSO NETZ and MITNETZ Strom by the use of wind power plants as controllable generators.

Collaboration activities: There was information exchange by project reports mainly with reference to the use cases.

3 Collaboration and Information Exchange with Initiatives, Networks and Platform

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

Table 2: List of networks, platforms, and initiatives

ID No.	Name	Type	Website	INTER-PLAN contact persons	Net-work/ Initiative/ Platform Contact
1	EERA JP Smart Grids	Program (European)	http://www.eera-set.eu/eera-joint-programmes-jps/smart-grids/	Giorgio Graditi (ENEA), Maria-laura Di Somma (ENEA), Venizelos Efthymiou (UCY), Michał Kosmecki (IEn), Helfried Brunner (AIT)	Luciano Martini (RSE)
2	Mission Innovation (Innovation Challenge #1 on Smart Grids)	Initiative (global)	http://mission-innovation.net/our-work/innovation-challenges/smart-grids-challenge/	Giorgio Graditi (ENEA), Helfried Brunner (AIT)	Luciano Martini (RSE)
3	DELTA	Program (European)	https://ec.europa.eu/inea/en/horizon-2020/projects/h2020-energy/grids-storage/delta	Venizelos Efthymiou (UCY)	Ian Cole (UCY)
4	Erigenia	Program (European)	https://standards.ieee.org/develop/project/2004.html	Venizelos Efthymiou (UCY)	Konstantinos Oureilidis
5	inteGRIDy	Program (European)	http://www.integridy.eu/	Venizelos Efthymiou (UCY)	Vasilis Mahamid (UCY)
6	DERlab e. V.	Network (international)	http://derlab.net	Michał Kosmecki (IEn)	Ata Khavari (DERlab), Marios

					Maniatopoulos (ICCS/NTUA), Panos Kotsampopoulos (ICCS/NTUA)
7	National Technological Energy Cluster	Italy	http://www.enea.it/en/news-enea/news/energy-research-and-industry-alliance-for-innovation-made-in-italy	Giorgio Graditi (ENEA), Marialaura Di Somma (ENEA)	Gian Piero Celata (ENEA)

3.1 European Energy Research Alliance Joint Programme on Smart Grids (EERA JP SG)

Type - Country: Program - European

Coordinator: RSE and ENEA

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

Project duration: The Joint Program on Smart Grids was officially launched at the SET Plan Conference in Madrid (3-4 June 2010)

Contact persons on behalf of INTERPLAN: Giorgio Graditi (ENEA), Marialaura Di Somma (ENEA), Venizelos Efthymiou (UCY), Michał Kosmecki (IEn), Helfried Brunner (AIT)

Contact persons on behalf of EERA JP SG: Luciano Martini (RSE)

Description: This Joint Program is coordinated by RSE and ENEA from Italy and involves many Research and Development (R&D) participants with different and complementary expertise and facilities. Its objective is to address medium- to long-term research perspectives in the most critical areas directly related to the effective acceleration of smart grid development and deployment in Europe through an extended cross-disciplinary cooperation.

Collaboration activities: During the Steering Committee (SC) meetings of EERA JP SG held in 2018, specific sessions dedicated to information sharing and updates about INTERPLAN project have been organised with the aim to receive feedback from the SC members on the achieved intermediary project results of INTERPLAN. In detail, during the first year, the collaboration activity was mostly based on WP2 “Technical assessment and regulatory status of the European electricity grid” activities to collect information from the SC participants’ countries related to:

- Shortcomings in current national practices in developing and operating emerging grids
- National practices, which are worthy of picking up, to extend and replicate the employment of emerging technologies such as intermittent RES, storage and flexible demand response

So far, INTERPLAN was part of discussions during the following EERA JP SG meetings:

- 29th EERA JP SG Steering Committee Meeting, Copenhagen, May 2018
- 30th EERA JP SG Steering Committee Meeting, Nice, September 2018.

3.2 Mission Innovation (Innovation Challenge #1 on Smart Grids)

Type - Country: Initiative - Global

Coordinators of the Innovation Challenge #1 on Smart Grids: Italy, China, India

Website: <http://mission-innovation.net/our-work/innovation-challenges/smart-grids-challenge/>

Project duration: Mission Innovation was announced on November 2015, as world leaders came together in Paris to undertake ambitious efforts to address climate change issues.

Contact persons on behalf of INTERPLAN: Giorgio Graditi (ENEA), Helfried Brunner (AIT)

Contact persons on behalf of Mission Innovation (Innovation Challenge #1 on Smart Grids): Luciano Martini (RSE)

Description: Mission Innovation (MI) is a global initiative of 23 countries and the EU which aims to accelerate the global clean energy innovation. As part of the initiative, participating countries have committed to double their governments' clean energy research and development (R&D) investments over five years, while encouraging greater levels of private sector investment in transformative clean energy technologies. These additional resources will dramatically accelerate the availability of advanced technologies, in order to define a future global energy mix that is clean, affordable, and reliable. MI consists of eight Innovation Challenges, aimed at catalysing the global research efforts in areas that could provide significant benefits in reducing GHG emissions, increasing energy security, and creating new opportunities for clean economic growth. Among these challenges, Innovation Challenge #1 is dedicated to smart grids development and has the goal to enable future grids that are powered by affordable, reliable and decentralised renewable electricity systems.

Collaboration activities: There has been information sharing about INTERPLAN project with the Italian members participating to MI Innovation Challenge #1 on Smart Grids. Due to the consistency of the project's objectives with the Smart Grid Challenge Priorities, these have been used to define the general project's requirement

3.3 Future tamper-proof Demand rEsponse framework through seLf-configured, self-opTi-mized and collABorative virtual distributed energy nodes (DELTA)

Type - Country: Program - European

Funding Framework: H2020

Coordinator: Ethniko Kentro Erevnas Kai Technologikis Anaptyxis

Website: <https://ec.europa.eu/inea/en/horizon-2020/projects/h2020-energy/grids-storage/delta>

Project duration: 05.2018 – 04.2021

Contact persons on behalf of INTERPLAN: Venizelos Efthymiou (UCY)

Contact persons on behalf of DELTA: Ian Cole (UCY)

Description: DELTA proposes a management platform that distributes parts of the aggregator's intelligence into lower layers of its architecture in order to establish a more easily manageable and computationally efficient DR solution. This approach aims to introduce scalability and adaptiveness into the aggregator's DR toolkits. The DELTA core engine will be able to adopt and integrate multiple strategies and policies provided from its administrative stakeholders, making it an authentic modular and future-proof solution. DELTA is expected to deliver a fully autonomous architectural design, enabling end-users to escape the hassle of responding to complex price or incentive-based signals. DELTA aims to support active, aware and engaged prosumers, based on novel award schemes, a social collaboration platform and personalised user interfaces. Furthermore, DELTA proposes and implements novel multi-agent based, self-learning algorithms to enable aggregation, segmentation and coordination of several diverse clusters, consisting of supply and demand assets. To this end, a matchmaking engine will facilitate real-time DR flexibility activation between prosumers, in order to satisfy the aggregator's portfolio self-balancing needs and deliver services to market or grid-related stakeholders. Finally, the DELTA framework aims to set the milestone for data security in future DR applications. I will not only implement novel block-chain methods and authentication mechanisms, but also make use of smart contracts which would further secure and facilitate aggregators-to-prosumers transactions.

Collaboration activities: There has been an exchange of information through project reports on definition of project requirements and use cases.

3.4 Enabling rising penetration and added value of photovoltaic generation by implementation of advanced storage systems (Erigenia)

Type - Country: Program - European

Funding Framework: SOLAR-ERA.NET

Coordinator: UCY

Website: <http://www.solar-era.net/>

Project duration: 01.2018 – 12.2020

Contact persons on behalf of INTERPLAN: Venizelos Efthymiou (UCY)

Contact persons on behalf of Erigenia: Konstantinos Oureilidis (AUTH)

Description: The objective of the Erigenia project is to enable high PV penetration and to utilize its potential value in the energy system by developing a local and central energy management system (EMS) that will combine PV with battery energy storage systems (BESS). The project will match the technical requirements imposed by the distribution system operators (DSO) with the upcoming new market regulations, capitalizing on the positive effects of PV and BESS combination. In addition, a tool for intra-hour energy forecasting will be developed and integrated into the EMS to provide a more accurate and reliable operation plan for the DSO. The proposed work is expected to have significant impact on the further penetration of PV, given that the existing grid infrastructure will be utilized in a more efficient way, by increasing the hosting capacity and hence deferring grid reinforcement. By promoting grid-friendly self-consumption of PV generation, grid congestion issues will be avoided. Since the EMS will increase the predictability of power usage, the current expensive power reserves will be replaced by the local EMS control strategies of the combined PV and BESS EMS. Furthermore, the users will take advantage of the provided flexibility in order to lower their cost of

electricity, by gaining from the new upcoming policies of Time of Use (ToU) and dynamic tariffs. Finally, a versatile algorithm capable of estimating the optimum size of BESS and PV to meet all the needs of prosumers will also be developed. Field trials will take place in Cyprus (domestic EMS) and Turkey (community EMS) and novel or more effective ancillary services will be provided to the network operators (e.g. power smoothing, voltage regulation). Finally, the economic impact of the proposed solutions will be quantified. The proposal is fully in line with the SET plan and Solar Energy Industrial Initiative objectives for effective integration of solar energy technologies in the energy system.

Collaboration activities: There has been an exchange of information through project reports on definition of project requirements and use cases.

3.5 Demonstration of smart grid, storage, and system integration technologies with increasing share of renewables (inteGRIDy)

Type - Country: Program - European

Funding Framework: H2020-LCE-02-2016 Innovation Action

Coordinator: Atos Spain S.A.

Project duration: 01.2017 – 12.2020

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

Contact persons on behalf of INTERPLAN: Venizelos Efthymiou (UCY)

Contact persons on behalf of inteGRIDy: Vasilis Mahamid (UCY)

Description: inteGRIDy aims to integrate cutting-edge technologies, solutions and mechanisms in a Framework of replicable tools to connect existing energy networks with diverse stakeholders, which will facilitate the optimal and dynamic operation of the Distribution Grid (DG), fostering the stability and coordination of distributed energy resources and enabling collaborative storage schemes within an increasing share of renewables. To this end, inteGRIDy innovation will be built upon the integration of existing smart-metering/automation systems of the distribution network infrastructures, together with intelligent IoT infrastructure, enabling interoperability through a standardized API layer interface and efficient data collection and monitoring of grid's distributed assets.

Novel modelling and profiling mechanisms will be employed to allow the creation of network topology models, DR models revealing the available elasticity/flexibility of prosumers, together with battery cycling and charging profiles. These models will be the basis for the utilization of predictive algorithms and forecasting tools in order to enable dynamic scenario-based simulation and multi-level forecasting engine to for satisfy the conflicting demand and supply of energy in real-time, towards an optimised decision making. On top of all, powerful and efficient visual analytics (VA) and end-user applications, using novel human machine interaction (HMI) techniques will be delivered. Furthermore, by the finalization of the program, innovative business models will be delivered, to provide important tools for the energy market by dynamically involving DR strategies and allowing new energy market entrants to participate in the DG's operations.

Collaboration activities: There has been an exchange of information through project reports on definition of project requirements and use cases.

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

Type - Country: Network - International

General manager: Diana Strauss-Mincu

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

Contact persons on behalf of INTERPLAN: Michał Kosmecki (IEn)

Contact persons on behalf of DERlab e. V.: Ata Khavari (DERlab), Marios Maniatopoulos (ICCS/NTUA), Panos Kotsampopoulos (ICCS/NTUA)

Description: 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

Collaboration activities: A questionnaire was circulated among members of DERlab association, which are mainly spread over Europe, in order to consult with them about:

- Shortcomings in current national practices in developing and operating emerging grids
- National practices, which are worthy of picking up, to extend and replicate the employment of emerging technologies such as intermittent RES, storage and flexible demand response

3.7 National Technological Energy Cluster

Type - Country: Italian - Network

Funding Framework: Italian Government

Coordinator: ENEA

Website: <http://www.enea.it/en/news-enea/news/energy-research-and-industry-alliance-for-innovation-made-in-italy>

Project duration: Born in 2016

Contact persons on behalf of INTERPLAN: Giorgio Graditi (ENEA), Marialaura Di Somma (ENEA)

Contact persons on behalf of the National Technological Energy Cluster: Gian Piero Celata (ENEA)

Description: The National Technological Clusters are open and inclusive networks comprising major national public and private subjects operating in industrial research, training and education and technological transfer. These include companies, universities, public and private research institutions, start-up incubators and other players active in the innovation sector. Each cluster focuses on a specific technology and application area deemed to be strategic for Italy, constituting its most authoritative interlocutor in terms of competences, knowledge, structures and potentials.

The National Technological Energy Cluster monitors prioritized technological areas such as smart grids, on which the Government plans to concentrate the efforts of industrial research policies. Among the most important members of the Cluster, there are industrial companies as ENI, ENEL with e-distribuzione and TERNA and General Electric, as well as research and academic bodies as CNR, RSE, and the inter-universities EnSIEL and ENEA, which acts as the coordinator.

Collaboration activities: Due to the fully consistency of the project's objectives with the key technological roadmap identified by the National Technological Energy Cluster, INTERPLAN project was identified as one of the reference projects to be considered in the three-year action plan defined by the Cluster.

4 Conclusion and Outlook

This report summarises planned and performed collaborations of the INTERPLAN partners with other international and national R&D projects, initiatives, networks, and platforms on the topics relevant to the INTERPLAN activity domain. These networking activities are part of the INTERPLAN work package “Dissemination, communication and exploitation” (WP7). For this information exchange and joint activities mainly emails exchange, webinars, joint events like workshops, and joint papers are used.

During the first project year, the INTERPLAN partners have been in touch and cooperated with participants of four EU funded projects (FP7 and H2020), one national project, four European Programs, one international network, and one global initiative, which are all dealing with different aspects of smart grids. These activities have already brought (or are expected to bring) various benefits and inputs for both sides of the collaborations. The most important ones are highlighted in the following:

- Definition of INTERPLAN project requirements and use cases on the basis of project reports
- Identification of possible synergies and joint opportunities with regard to use cases, requirements for DSO/TSO interactions and regulatory aspects between INTERPLAN and the European project TDX-Assist
- Consideration of INTERPLAN as a reference project for the National Technological Energy Cluster of Italy. The project will be addressed within the three-year action plan defined by this Cluster.
- Received feedback from the Steering Committee (SC) meetings of EERA JP SG as well as DERlab members on the intermediary results achieved in INTERPLAN. Especially with focus on WP2 “Technical assessment and regulatory status of the European electricity grid” of INTERPLAN, valuable information was collected with regards to:
 - Shortcomings in current national practices in developing and operating emerging grids
 - National practices to extend and replicate the employment of emerging technologies such as intermittent RES, storage and flexible demand response.
- Information exchange between INTERPLAN and the Italian members of MI Innovation Challenge #1 on Smart Grids, which have been used to define the general requirements of INTERPLAN

Considering the results so far, it is concluded that successful cooperation with several ongoing international/national activities has already been achieved within the first year of the project.

For the next cooperation activity period, the activity domain will be expanded by interacting with ongoing research activities beyond the ones in which involves INTERPLAN partners, in order to gain a broader perspective. This will be realised by further dissemination activities such as planned INTERPLAN workshop and exhibition booth at European Utility Week 2018¹. Among the various planned networking activities, a strong cooperation is foreseen with MI Innovation Challenge #1 on

¹ <https://www.european-utility-week.com/>

smart grids through organizing of workshops and meetings by participation of some INTERPLAN partners. It is also planned to establish a collaboration link with H2020 initiative².

² <https://www.h2020-bridge.eu/>

5 Annex

5.1 List of Tables

Table 1: List of European and national projects 9
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