INTEGRATED SMART GRID CROSS-FUNCTIONAL SOLUTIONS FOR OPTIMIZED SYNERGETIC ENERGY DISTRIBUTION, UTILIZATION STORAGE TECHNOLOGIES

Issue 4 - Jul. 2019

www.integridy.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 731268.

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EDITORIAL

Dear reader,

We are happy to announce this forth issue of the inteGRIDy newsletter. The previous editions served as project introduction and scenario setting for us to explain our goals and expected impact, the early achievements in terms of architecture proposal and business modelling early activities and a description of our framework building process.

In this period, inteGRIDy partners focused on the finalization of tool development and adaptation to inteGRIDy framework requirements. Additionally, they worked on the initiation of the integration process. It is time for us to prove inteGRIDy tools are interoperable and able to work seamlessly together, as they were conceived to do so. Moreover, the pilot deployment process has gained momentum. With all inteGRIDy tools ready, all the hardware and equipment is being installed and deployed now to enable the validation process.

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inteGRIDy pilots are still testing the framework and first results are already available! This newsletter issue introduces the achievements in the Italian pilot supported by our colleagues from ASM Terni. This pilot exploits a rural microgrid and represents a good opportunity in providing improved electric service reliability and better power quality to the end customers.

Furthermore, this issue keeps introducing inteGRIDy partners: Universita degli Studi di Roma La Sapienza (UNIROMA1), Siveco Romania (SIVECO), Innovation Energie Durable Societe Nouvelle (INNED/SOREA), Politecnico de Milano (POLIMI) and Systems Sunlight Industrial & Commercial Company of Defensive, Energy, Electronic and Telecommunications Systems (SUNLIGHT). To conclude, news on past and future events are also shared with our readers.

OVERVIEW

integrated Smart **GRID** Cross-Functional Solutions for Optimized Synergetic Energy Distribution, Utilization Storage Technologies

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 731268

Topic: LCE-02-2016 - Demonstration of smart grid, storage and system integration technologies with increasing share of renewables: distribution system

Objective: inteGRIDy is integrating existing technologies to implement a **smart grid distribution platform** which offers **"smart grid energy services"** for low voltage (LV) and medium voltage (MV) networks. In business to business (B2B), business to consumer (B2C) and business to business to consumer (B2B2C) market contexts.

Duration:	Jan 2017 to Dec 2020
Partners:	30
Countries:	10 (Cyprus, France, Greece, Italy, Portugal, Rumania, Spain, United Kingdom)
Pilots:	10
Total Budget:	15.840.275 €
EU Grant:	12.329.013 €
Coordination entity:	Atos

PARTNERS

As the project consortium comprises 30 partners, several newsletters are used to formally present them all.

SAPIENZA UNIVERSITÀ DI ROMA

www.uniroma1.it

Italy

UNIVERSITA DEGLI STUDI DI ROMA LA SAPIENZA (UNIROMA1)

Sapienza" University (UNIROMA1), which was founded in 1303 in Rome, is one of the oldest universities in the world and one of the top performer in international university rankings. The research unit involved in the proposal is with the Dept of Astronautics, Electrical and Energetics Engineering of the Civil and Industrial Engineering Faculty. The members of the research unit have an extensive experience in network studies related to planning, design, operation and protection of transmission and distribution networks; as well as in developing of simulation models for static and dynamic studies related to the integration of distributed generation, demand response, storage systems and EV charge systems in smart and micro grids during normal operation or fault conditions.

UNIROMA supports ASM with the inteGRIDy pilot by developing a new model of Smart Grid in which one or more micro grids are connected and controlled by the DSO's SCADA system.

SIVECO ROMANIA (SIVECO)

www.siveco.ro

Romania

SIVECO Romania SA is a private shareholder company, established in 1992, with over 800 employees, located in Bucharest, Romania. During its twenty-two years of existence, SIVECO has become one of the most important Romanian providers and software integrators of Enterprise Resource Management License and Maintenance, eLearning, eGovernment, eHealth, eBusiness, eAgriculture, eCustoms solutions and turnkey projects acting both on the internal and international markets.

In inteGRIDy, SIVECO participates in all stages of the solution development, starting with the analysis of use case requirements, the definition of the Conceptual Architecture - Functional & Technical Specifications, and is the main technical partner leading the integration of the sub-components. SIVECO also takes part in the Back-end Platform demonstration and evaluation activities: Ploiesti Pilot aims at ensuring a Demand Response (DR) system where building energy management and control systems can operate based on critical peak pricing or other DR programs that could be implemented as part of the Energy Integrated Information System (EIIS).

SOREA Energies and Communications (SOREA)

www.sorea-maurienne.fr

France

SOREA is a local Energy Utility/ Retailer and DSO operating in the Maurienne Valley area in France. SOREA is active in electricity production and distribution and operates its own grid with hydropower and photovoltaic production. The grid supplies 15,000 customers (counters), private people and industry in the Maurienne Valley in France, near the Italian border.

SOREA distributes over 140 GWh of electricity every year, with peak demand of 42 MW (peak power period). 35% of the total annual electricity is produced by renewables, namely PVs and small hydro plants, with the aim to reach 60% in 2020 and 100% in 2030. SOREA supplies more than 14,000 private people (houses and buildings). As an energy supplier to private people, SOREA has to help its customers to better control and try to reduce their energy consumption SOREA has to permanently improve the quality of its grid and supply services by testing and adding new devices or equipment and through new services to customers. An important objective of SOREA is to increase the part of renewable energies from the present 35% (mean annual value) to more than 60% within 4 years. This also requires a better use of energy and a reduction of the energy consumption.

SOREA is also a player in the development of clean transports, including EVs or hydrogen cars and busses, particularly in the Maurienne Valley in connection with the ski resorts.

POLITECNICO DE MILANO (POLIMI)

www.energia.polimit.it

Italy

The Politecnico di Milano is the largest technical university in Italy, with about 40,000 students. It offers undergraduate, graduate and higher education courses in engineering, architecture and design. Founded in 1863, it is the oldest university in Milan. In particular, the Department of Energy, born on January 1st, 2008, is a structure created under the impulse of professors and researchers previously belonging to four departments traditionally related to the energy sector.Mission of Department of Energy to push forward technical and scientific competences in the energy sector is achieved by means of high-level education, fundamental and applied research, technology transfer to industry.

The main role of Politecnico di Milano within the project is related to the deployment of the distribution grid optimization framework, by assisting the other partners during the integration of the available tools in the experimental architecture taking care suitably of the electrical grid needs and constraints, and in the following coordination of the large scale pilot use cases realization.

SYSTEMS SUNLIGHT INDUSTRIAL & COMMERCIAL COMPANY OF DEFENSIVE, ENERGY, ELECTRONIC AND TELECOMMUNICATIONS SYSTEMS (SUNLIGHT)

www.systems-sunlight.com

Greece

SYSTEMS SUNLIGHT S.A. has a long-lasting and successful worldwide presence in the energy storage and power supply sectors. It operates in the market for three decades and ranks among the world's top manufacturers of energy products and systems, being specialized in design, production and distribution of Energy Storage Systems for industrial, consumer and advanced applications, Energy Power Systems, Green Energy Systems and Energy-related.

SUNLIGHT contributes to inteGRIDy by providing its industrial Renewable Energy park at Xanthi, Greece where an islanded RES-powered autonomous grid operates with battery and hydrogen storage in order to improve the energy and resources efficiency within the factory. The existing control and automation infrastructure is extended to allow DR mechanisms to be locally applied and to improve the distribution of the energy among the nodes of the grid using smart and enhanced Energy Management Strategies and Model Predictive Control methods. Also part of its fleet of MHE EV is integrated to the islanded grid to provide a case where dynamically changing charging requirements are necessary, at the factory operated 24/7 having 3 shifts where MHE EVs are used. Additionally, SUNLIGHT supports the Thessaloniki (Greece) and Barcelona (Spain) pilots with its integrated energy storage systems.

KEY ACHIEVEMENTS

TERNI PILOT PROGRESS

TREK Consulting SA, **Angelina Katsifaraki.**

SOREA Energies & Communications, **Romain Chomaz**.

ASM Termi, **Tommaso Bragatto**.

The pilot site is a farm called "Il Moggio" located in Terni municipality, which at present a stand-alone grid already in operation. "Il Moggio" microgrid comprises a significant amount of distributed generation: a 30 kWp rated PV plant, two 31 kVA – 25 kWt biomass Combined Heat Power (CHP) generators; in addition, electric storage consists of 50 lead batteries responsible for managing distributed generators without curtailments. The CHP generators are a pillar of this pilot since they enable standalone operation.

The flexibility of the microgrid will be exploited with the aim to find a trade-off between the DSO needs and the rural microgrid economic and technical constraints. By means of hardware equipment and software tools that the inteGRIDy technology providers makes available in the pilot site, it is possible to demonstrate the application of a hybrid cooperative business model between the DSO and the microgrid's actors. Indeed, the DSO will be able to exploit the microgrid flexibility to improve stability and reliability of the distribution network without ignoring the needs of microgrid owner in terms of business operation and energy requirements (electric and thermal needs).

Terni pilot will demonstrate that the integrated tools will estimate both energy production and energy consumption, in compliance with local constraints imposed by production processes, a "flexibility as a service" business model will be put in place and validated.

The visualisation and optimization tool provided for the Terni pilot is the **Multi-carrier hub Optimisation Engine** tool that puts at disposal of the microgrid manager a GUI showing the most relevant power profiles, price trends and process parameters. Moreover, it provides a dashboard aimed at displaying microgrid data, both historical as well as real-time ones, to the DSO.

EVENTS

ATEE 2019

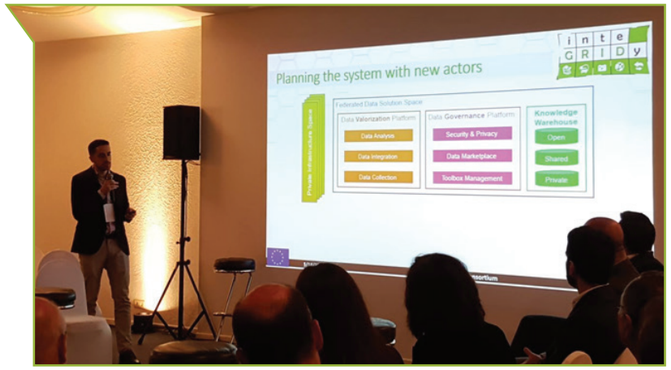
(Bucharest, March 28th-30th, 2019)

ATEE 2019 took place in Bucharest (Romania) from 28 to 30 of March. This event is the forum that stimulates active and effective exchange of information between researchers in various areas of theoretical and applied electrical engineering. Key leaders from private and state owned companies involved in will also be in attendance. InteGRIDY was represented by our colleagues Oitilia Bularca (SIVECO) and Ana-Maria Dumitrescu (University Politechnica of Bucharest) who submitted the paper "Conceptual assessment of smart meters compatibility levels".

INTEGRIDY AT INNOGRID 2019

(Brussels, May 14th, 2019)

Javier Valiño, our project coordinator, presented the inteGRIDy project during the slot "Innovation for the physical grid: New technologies and grid planning" in the new edition of the InnoGrid conference in Brussels. Futhemore, an inteGRIDy poster was exhibited during the whole event easing the conference participants to be informed about the



project to objectives, pilots and outcomes.

SUSTAINABLE PLACES CONFERENCE

(Cagliari, 5th-7th June, 2019)

Sustainable Places Conference tooks place in Cagliari (Italy) from 5 to 7 of June to provide a platform for the dissemination of research, the conduct of workshops, EU project clustering and networking between stakeholders of all types Our colleague Justice Abgo (Siemems UK) participated in the event presenting the business models defined

for the pilot in the Isle of Wight (UK).

EEEIC 19 CONFERENCE: INTEGRIDY PAPER

(Genoa, 11th-14th June, 2019)

The 19th International Conference on Environment and Electrical Engineering was held in Genoa, Italy. IEEE EEEIC is an international forum for the exchange of ideas and information on energy systems both today and in the future. Our colleague Giuseppe Paterno from ENGINEERING presented there the paper titled "Smart ICT Framework for the Intelligent Management of Different Modern Energy Systems", prepared jointly by ENG, ATOS, CERTH,

AIGUASOL and VPS. We are very proud of announcing that the audience showed wide interest and gave us the chance to highlight some strength points of the inteGRIDy work.

INTEGRIDY PLENARY MEETINGS

Since the previous newsletter, two inteGRIDy plenary meetings took place. On 20th-21st February 2019, CERTH hosted the 5th Plenary Meeting and General Assembly in Thessaloniki (Greece), meanwhile on 10th-11th July our UCP colleagues organised the 6th Plenary Meeting and General Assembly in Lisbon (Portugal).These events gave all consortium partners the chance to discuss together the project progress, giving special focus on the development of the small-scale and large-scale pilots and the preparation of next project review meeting.

EUROPEAN UTILITY WEEK

(Paris, 12th-14th November 2019)

Do not miss the chance to visit the booth that the inteGRIDy project will have in the European projects area of the European Utility Week 2019. In 2019, European Utility Week and POWERGEN Europe will combine to offer an end-to-end European energy experience for the whole energy supply chain, under one roof. This event offers the environment for all key players in the smart energy ecosystem to come together and discuss European strategy to achieve a smooth transition towards a low carbon energy supply.

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