Smart5Grid

'Demonstration of 5G solutions for SMART energy GRIDs of the future'

NEWSLETTER
ISSUE #13

JANUARY – APRIL 2024

5G PPP
The 5G Infrastructure Public Private Partnership

ISSUE HIGHLIGHTS

➢ **Issue Highlights**

➢ **Communication & Dissemination Activities**

➢ **Upcoming Deliverables**

INSIDE THIS ISSUE

The 13th and final issue of Smart5Grid Newsletter presents the project's activities during the final period of the project (January-May 2024). Among other dissemination and communication activities this specific issue focuses on the Final Event which took place on the 9th of April in Burssels, Belgium.

n numbers, the activities of Smart5Grid during this 4 month period are:

➢ **1 Final Event**
➢ **2 Presentations in Events**
➢ **1 Participation in Workshop**
➢ **1 Participation in Webinar**
➢ **1 Plenary Meeting**
➢ **1 Publication and 1 5G PPP White Paper**
➢ **1 Press Release**
➢ **18 Articles**
➢ **5GPPP/6GSNS News**

Coordinator	TELCOs	SMEs
enel	W3 WINDTRE, OTE GROUP OF COMPANIES, VIVACOM	ubiwhere, Entra Energy

TSOs	Tech	
αδμηε, ECO ЕАД	Atos, eng, gridspertise accelerating your electric future, Hewlett Packard Enterprise	axon logic, SIDROCO, INFOLYSIS, NEARBY COMPUTING, STAM MASTERING EXCELLENCE, nosia

DSOs	Universities/Research	
e-distribuzione*, e-distribución*	i2cat, HELLENIC REPUBLIC National and Kapodistrian University of Athens EST. 1837, University of Cyprus KOIOC	SETECHCO, UBITECH digitizing energy, SC

* Linked third-parties of Enel Grids

Smart5Grid FINAL EVENT

On the 9th of April, the Smart5Grid Final Event took place in Brussels as an open invitation event.

Following the agenda, the event began with an overview of the electric energy industry and the need for digitalization. Modern smart grids require a robust and reliable digital communication infrastructure to function effectively. The discussion then moved to the challenges of telco infrastructure and the sustainability issues in completing the rollout of 5G Cores. In this context, we introduced the concept of Network Applications, an extension of the virtualization paradigm designed to simplify the development of software artifacts for edge deployment. The Smart5Grid platform's facilitation tools enable software developers to easily access 5G-based virtualization technology, accelerating the development and testing of Network Applications. Partners, also showcased our four valuable real-life pilots, demonstrating how Network Applications support various use cases and, when deployed at the edge, contribute to the verification of 5G-PPP KPIs.

At the end of the day, a roundtable discussion allowed us to draft our preliminary conclusions, summarized here around some of the key concepts discussed:

1. **Why 5G**? At first sight, it can be easy to think that the main advantage provided by 5G is represented by the **major speed and stability of the connection signal**, with respect to 4G and already existing technologies. If on one hand this is undeniable, on the other hand the paradigm shift introduced by 5G and API standardization process must be highlighted. Indeed, standardized API design is a key factor in making APIs that can be maintained and used in an easier way, giving

the opportunity for developers to interact with the core functionalities. This access is surely not simple, but instead quite specific: in this sense **Network Apps**, namely *a set of services that provides certain functionalities to verticals and their associated use cases*, represent a tool to facilitate the access to a wider part of developers, allowing them to focus on their specific business goals, while finding the other specific components for the 5G core interactions ready to use.

2. **5G core implementation**: looking at the pan-European scenario, the progress of 5G core implementation is far behind expectations. Being out of the project scope, but rather a pre-requirement for the implementation, the financial sustainability of the Telco infrastructure for implementing the Stand-alone core could be a major obstacle to the implementation of the Smart5Grid paradigm. Besides this, when the connection goes in a cross-border dimension (as experienced in the Greek-Bulgarian pilot), we faced with higher delays introduced by the long pathway needed to connect the two countries, while internet connections are relying on private cables to reduce such delay. If a reliable digital layer is needed for smart grids to enable the energy transition paradigm, a rationalization of the pan-European backbone, as done for highways, railways, and transmission energy grids, could foster the transition for a full digitalization of all industrial sectors and enabling them for a more rational usage of energy too.

3. **Orchestration**: it represents, as an implicit assumption, the main feature for the Network Apps execution; the orchestration could be meant as a framework which gathers the set of architectural elements in charge of supervising and coordinating the operations and lifecycle of the telecommunication network's virtualized communication/storage/computing resources, VNFs, and services. As an extension to the orchestration paradigm, the Network App descriptor designed by Smart5Grid is providing some more specific elements (such as the computational and the communications requirements) that are enriching the actual features and capabilities of MANO frameworks.

4. **Private networks**: a quite promising segment is represented by the private implementations, for localized applications. In general, the Smart5Grid project has demonstrated that, if on one hand the technology is ready for a wide scale implementation through public Telco infrastructures, on the other hand, as previously commented, the industry is not that ready. A possible mitigation action to deploy this technology effectively and concretely is represented by a blend of the existing public infrastructure (including land lines, fiber, and radio/wireless) with the private 5G installations. While the big players on Telco industry are struggling to find resources to support the transition to 5G Stand-Alone cores, the private 5G facilities could be a viable pathway for implementing such advanced virtualization paradigm.

5. **Network Apps**: while the project correctly demonstrated that Network Apps can facilitate the approach to virtualization, a standard model is far from being implemented. The 9 projects from the *ICT-41-2020 – 5G PPP* call propose different approaches and architectures; so far, there is not a convergence for these models as almost all projects are concluded. On our opinion, this could be a good challenge to be achieved in 6G projects, where a new project could analyze the different models and define a unique standard. In the meanwhile, as the
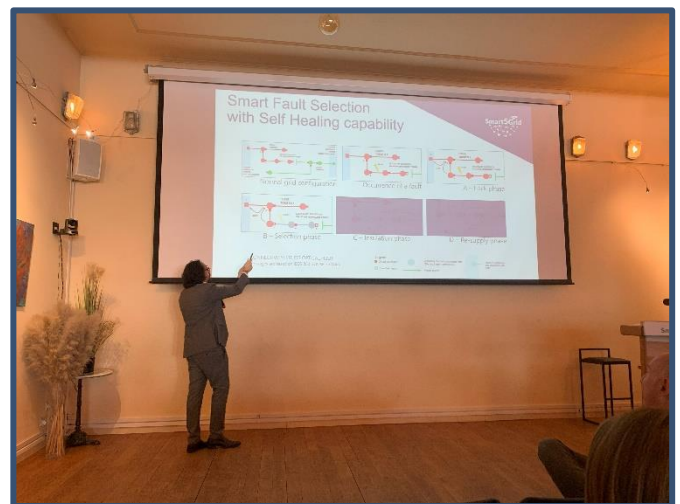
Smart5Grid model is agnostic to the vertical, it has good chances to be implemented transversally in several industrial applications, with a high chance to succeed.

From a general point of view, it can be highlighted that all the 4 pilots of the project have been successfully implemented and showcased among the industry relevant stakeholders, reaching considerable results, and demonstrating the potential of 5G and edge-cloud computing in multiple areas of the energy sector, such as **remote monitoring and control, automation, device virtualization,** and **safety**. Besides this, the variety of possible further implementations is quite wide, as the proposed architecture is enabling novel approaches like distributed computation and could support specific needs for localized sporadic applications such as augmented reality for remote assistance, local drones' control (autonomous flight), image and 3d recognition for local components' fault detection and so on.

During last 40 months, the project has involved a wide variety of partners, in terms of different nationalities, domain of expertise and type of companies engaged (energy and telco companies, SMEs, universities); the strong cooperation provided by the people involved in the implementation has been a fundamental element for a correct project execution, and in particular difficult situations it has enabled a successful resolution in an efficient way.

The event has been recorded and will be made available in the project's [YouTube channel](#).

We would like to express our sincere appreciation to all the guests and participants for their presence and engagement at our Final Event. Your participation was invaluable and greatly contributed to the event's success!

Communication & Dissemination Activities

Events/Workshops

International Smart Grid Action Network Webinar

On the 22nd of February and in the context of the webinar **'Approaching 5G-based Edge-Could Computing: Fostering the digital transition of the energy industry'** our Project Coordinator, Daniele Porcu, talked about the Network Applications concept through the Smart5Grid project and Smart5Grid platform which automatically validates and verifies those applications, fostering the creation of a new ecosystem of device virtualization experts. The webinar was organised by **ISGAN** (International Smart Grid Action Network) and more than 100 people had registered.

The target audience was, system operators, O&M experts, Technology experts and researchers, System integrators, Junior engineers and students, SMEs and technologic start-ups, device manufacturers for power plants automation (production, transmission, distribution)

Key Messages:

- 5G offers the opportunity to interact with the Core Network to provide services.

- The complexity of such integration is a barrier, but Smart5Grid project proposes an innovative approach.
- We are able to provide a novel concept of Network Application to simplify the 5G complexity.
- Our set of tools can facilitate access to this technology, fostering the creation of a new market segment for digital services: they are open for everyone who wants to learn more!

For more information click about ISGAN => https://www.iea-isgan.org/

ENEEC Event

On February 22, 2024, the Engineering Students of the University of Aveiro organized ENEEC, a networking event designed to foster connections with companies. During the event, Hélio Simeão from Ubiwhere presented Smart5Grid, highlighting the opportunities for students to interact with experts in the energy, software, and telecom sectors, particularly in the context of grid modernization using technologies like 5G and edge computing. Students also had the chance to explore topics such as Network Applications by registering on the Open S5G Platform and familiarize themselves with industry standards like 3GPP/ETSI.

5GASP Project Workshop

The *'5G Innovations for Verticals'* workshop was held in Athens, Greece, on March 14th, as the final public event of the 5GASP project. This workshop gathered partners from ICT-41 projects, including *5G-IANA*, *5G-Epicentre*, and *Smart5Grid*, along with some external guests from Greece. The aim was to bring together ICT-41 projects to discuss their progress, technological advancements, and outcomes.

 In this context, Dimitrios Brodimas from IPTO partner presented the Smart5Grid project, with a focus on Use Case 4: Real-time Wide Area Monitoring. Additionally, IPTO participated in a roundtable discussion with representatives from the other ICT-41 projects to review the objectives they had accomplished.

Smart5Grid Webinar

On the 19th of April 2024, Smart5Grid project organised a webinar, to explore how Open APIs revolutionize mobile application development by simplifying access to Telco networks, entitled *'Open APIs: Simplifying Telco Network Access for Mobile Applications'*. We would like to thank Dr. Andres Cardenas Cordova, from i2CAT partner for the insightful presentation. You can watch the full video in our YouTube Channel here

Smart5Grid Publication

- *'Testing Plan Description & Field Measurements for Real-Time Wide Area Monitoring of Interconnected Power Systems in the Smart5Grid Project',* Rantopoulos M., et al., in Proc. of the Artificial Intelligence Applications and Innovations (AIAI), Corfu, Greece, June 2024 (Accepted).

5GPPP Paper

Smart5Grid Project contributed to the following 5GPPP paper:

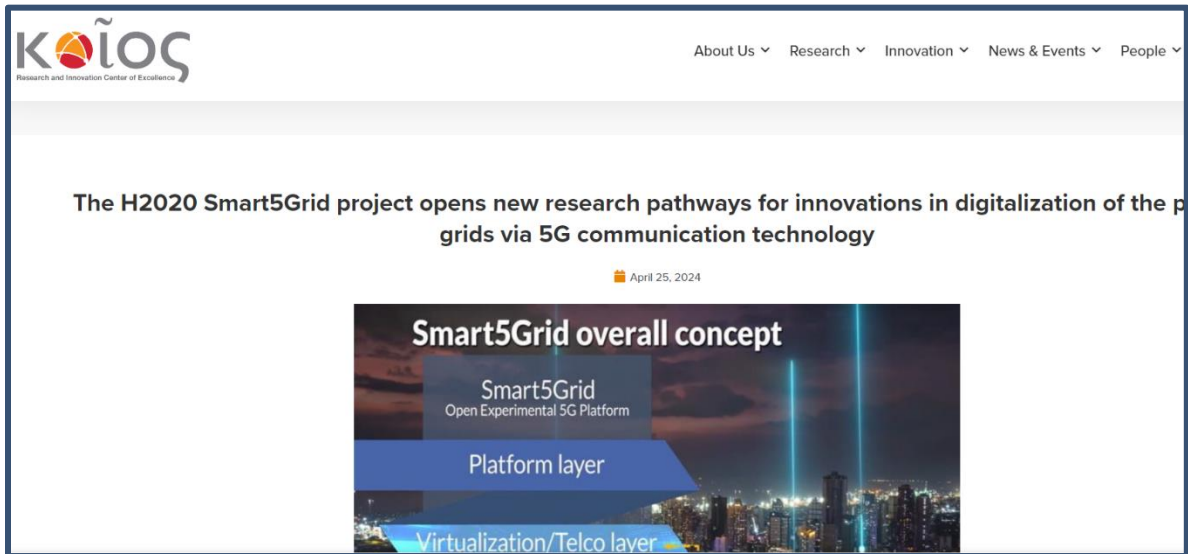- 5GPPP, 5G Infrastructure PPP Trials and Pilots Summary Brochure, April 2024

Press Releases

Following the completion of the project, the following Press Release and Articles in online magazines were issued as a means of communication:
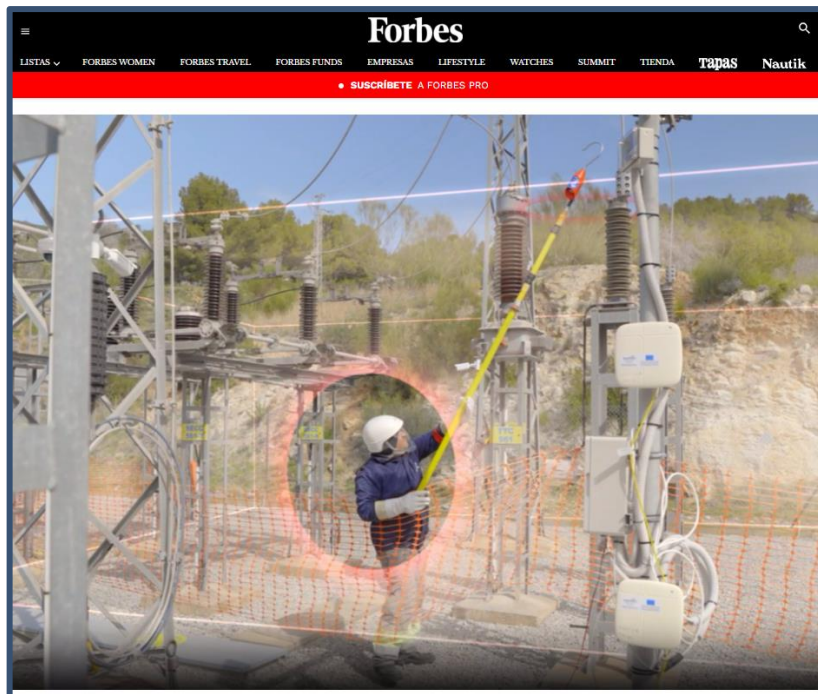
Press Release:

1. https://www.kios.ucy.ac.cy/the-h2020-smart5grid-project-opens-new-research-pathways-for-innovations-in-digitalization-of-the-power-grids-via-5g-communication-technology/

Articles

1. https://www.lavanguardia.com/ciencia/20240513/9637793/endesa-combina-5g-ia-mejorar-seguridad-trabajadores-mantenimiento-redes-ep-agenciaslv20240513.html
2. https://www.europapress.es/economia/energia-00341/noticia-endesa-combina-5g-ia-mejorar-seguridad-trabajadores-mantenimiento-redes-20240513111318.html
3. https://www.elnacional.cat/ca/tecnologia/endesa-combina-5g-ia-permetre-seus-operaris-treballin-manera-mes-segura_1215258_102.html
4. https://www.merca2.es/2024/05/14/endesa-mejora-seguridad-red-5g-ia-1671969/
5. https://www.bolsamania.com/noticias/empresas/economia--endesa-combina-el-5g-y-la-ia-para-mejorar-la-seguridad-de-sus-trabajadores-en-el-mantenimiento-de-las-redes--16764588.html
6. https://forbes.es/economia/460304/endesa-combina-el-5g-y-la-ia-para-mejorar-la-seguridad-de-sus-trabajadores-en-el-mantenimiento-de-las-redes/
7. https://elperiodicodelaenergia.com/endesa-combina-5g-ia-mejorar-seguridad-trabajadores-mantenimiento-redes/
8. https://www.servimedia.es/noticias/endesa-combina-ia-5g-para-mejorar-seguridad-trabajadores-proyecto-smart5grid/1410157835
9. https://www.diariosigloxxi.com/texto-ep/mostrar/20240513111317/endesa-combina-5g-ia-mejorar-seguridad-trabajadores-mantenimiento-redes
10. https://thecorner.eu/news-spain/spain-economy/endesa-unites-possibilities-of-5g-and-artificial-intelligence-as-allies-to-prevent-workplace-accidents/114562/
11. https://www.pressdigital.es/articulo/economia/2024-05-13/4830119-endesa-combina-5g-ia-mejorar-seguridad-trabajadores-manten
12. https://www.cio.com/article/2104165/endesa-conjuga-ia-y-5g-para-robustecer-la-seguridad-de-los-trabajadores-2.html

13. https://www.innovaspain.com/smart5grid-endesa-trabajadores/
14. https://consensodelmercado.com/
15. https://cronicadecantabria.com/cr/endesa-combina-el-5g-y-la-ia-para-mejorar-la-seguridad-de-sus-trabajadores-en-el-mantenimiento-de-las-redes-3/
16. https://www.sumindustria.es/NoticiasNovedades/VerNoticia/14405
17. https://broker.norbolsa.com/NASApp/norline/SesionServlet?PNBORG=E&PNBFMT=html&PNBNOT=20240513111318&PNBVEW=2&PNBIDI=es&PNBINS=9573&PNBSTR=OSTSFR00&PNBPOR=pc1a&PNBMEN=0&PNBOPE=NOTDET00
18. https://consensodelmercado.com/es/ibex-35/noticias/endesa-une-las-posibilidades-del-5g-y-la-inteligencia-artificial-como-aliadas-para-prevenir-los-accidentes-laborales

4ᵗʰ Plenary Meeting

On April 10ᵗʰ, following the Final Event, Smart5Grid partners convened for an one-day meeting in Brussels, Belgium. The purpose of the meeting was to finalize the project's last activities, including the completion of final deliverables, and to discuss the project closure and its results. We would like to extend our gratitude once again to all the partners for their dedication to the project and the outstanding teamwork demonstrated over the 40 months of the project's duration.

5GPPP/6GSNS ACTIVITIES

5GPPP/6GSNS Newsletter

- ➢ **5GPPP January 2024 https://5g-ppp.eu/newsletter-32-january-2024/**
- ➢ **5GPPP April 2024 https://5g-ppp.eu/newsletter-33-april-2024/**
- ➢ **6G SNS January 2024 https://smart-networks.europa.eu/sns-ju-january-2024-newsletter/**
- ➢ **6G SNS April 2024 https://smart-networks.europa.eu/sns-ju-april-2024-newsletter/**

5GPPP/6GSNS Newsflash

- ➢ **5GPPP January 2024 https://5g-ppp.eu/newsflash-october-2023/**
- ➢ **6G SNS January 2024 https://smart-networks.europa.eu/sns-ju-january-2024-newsflash/**
- ➢ **6G SNS February 2024 https://smart-networks.europa.eu/sns-ju-february-2024-newsflash/**
- ➢ **6G SNS March 2024 https://smart-networks.europa.eu/sns-ju-march-2024-newsflash/**
- ➢ **6G SNS April 2024 https://smart-networks.europa.eu/sns-ju-april-2024-newsflash/**

Deliverables

13 Deliverables were submitted at the end of April.

All public Smart5Grid deliverables are available for downloading at Smart5Grid website:

https://smart5grid.eu/dissemination-activities/deliverables/

We will continue to be active on social media and our website so follow us to stay updated for related news!