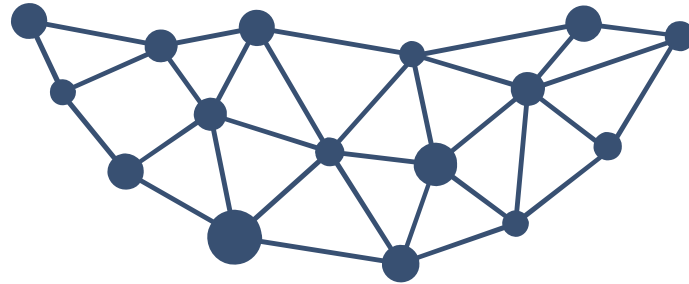


Smart5Grid



Demonstration of **5G** solutions for
SMART energy **GRIDS** of the future



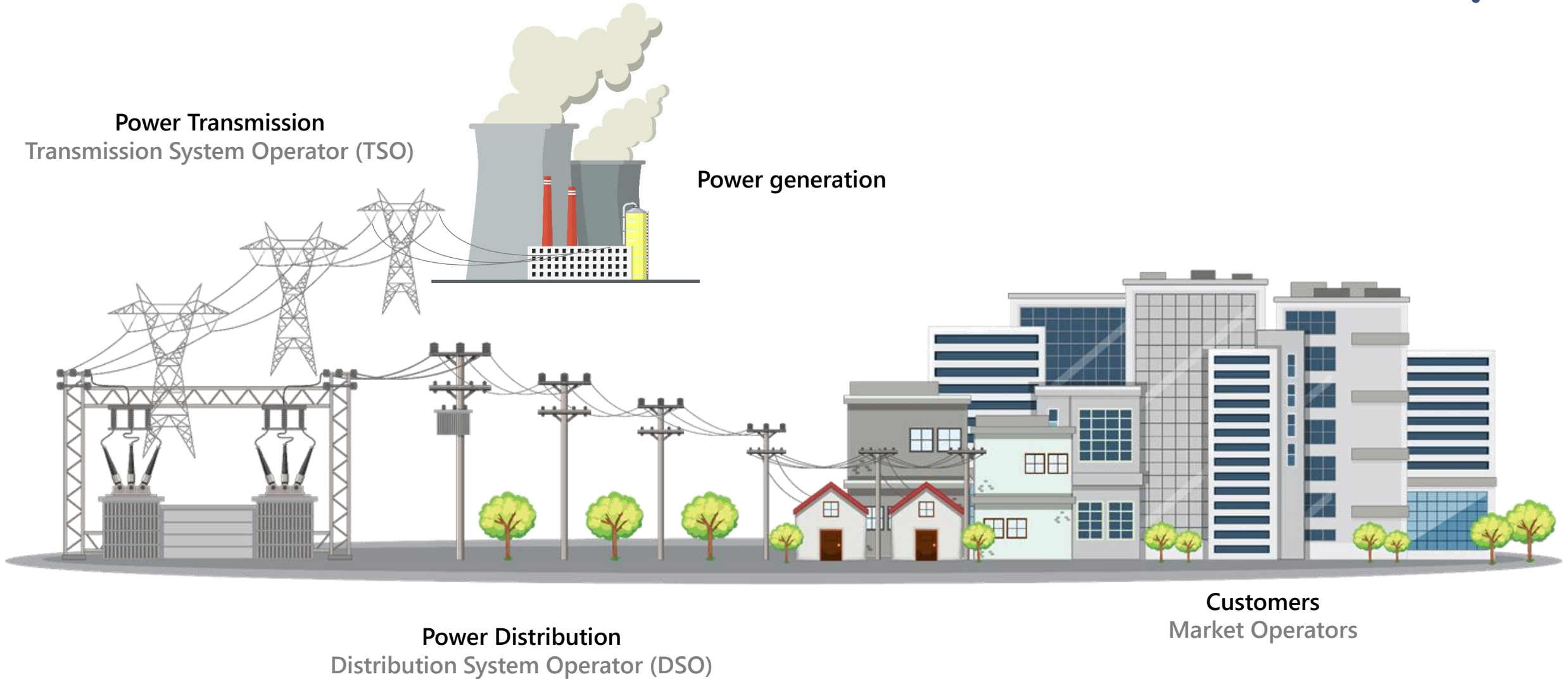
The 5G Infrastructure Public Private Partnership

This project has received funding from
the European Union's *Horizon 2020*
research and innovation programme
under grant agreement n° 101016912



Energy Vertical

Traditional grid



Power Transmission
Transmission System Operator (TSO)

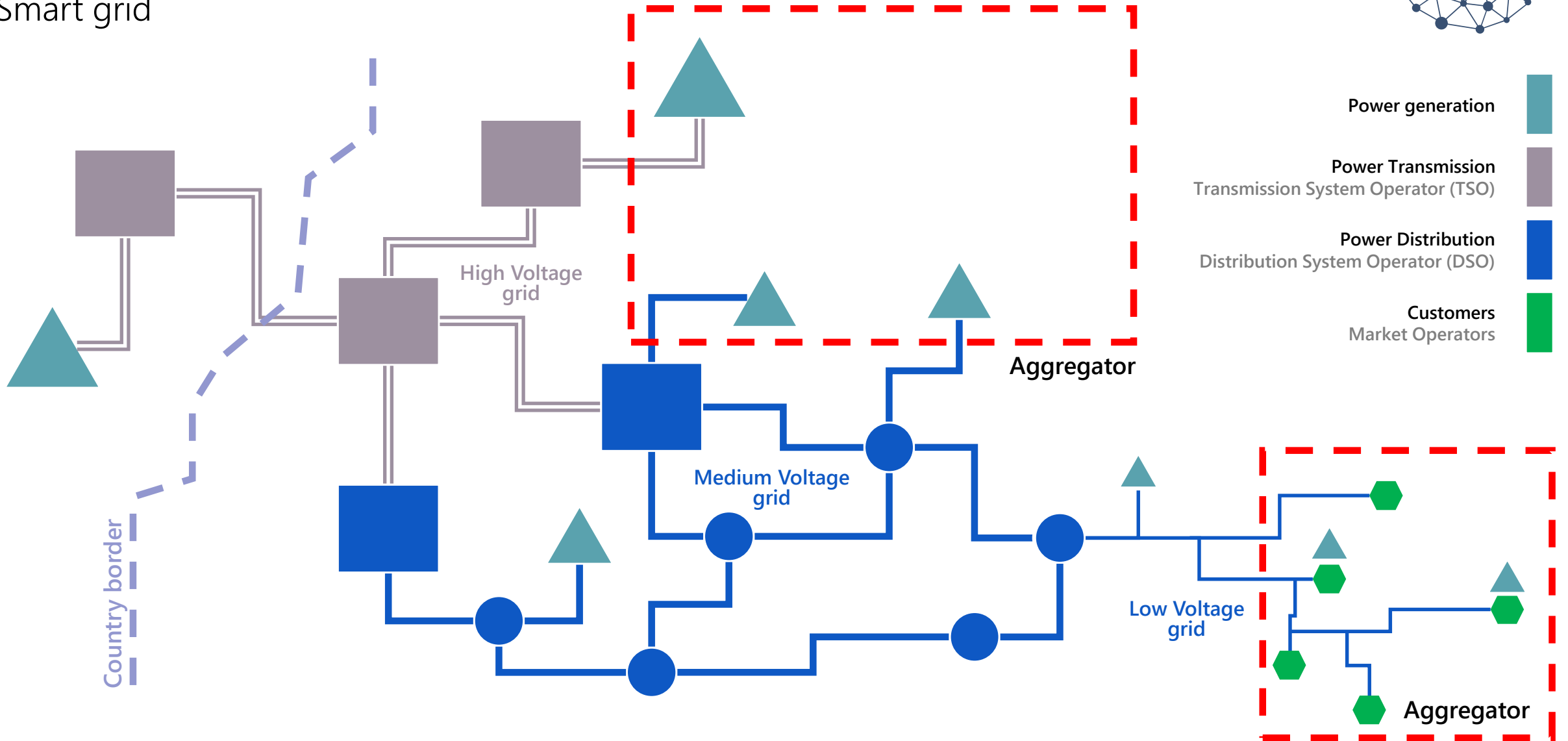
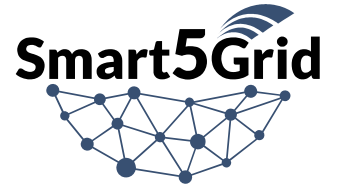
Power generation

Power Distribution
Distribution System Operator (DSO)

Customers
Market Operators

Energy Vertical

Smart grid



How we arrived here today?

H2020 ICT-41-2020 Call for proposal: challenges, scope and impact



Specific vertical sector

Open Source repository

NetApps

50% of SMEs

Third party markets

Structure of the project

Overall project plot



Objective #1

To specify the critical architectural and technological enhancements from **previous 5G PPP Phases** needed to fully enable an **open experimental platform** for the **Energy vertical**

Objective #2

To design, deploy, operate, and evaluate in real world conditions the **baseline system architecture** and **interfaces** for the provisioning of an integrated, open, cooperative, and **fully featured 5G network platform, customised for smart energy distribution grids**

Objective #3

To develop an **open NetApp repository**. In conjunction with the 5G network facility, the **Open Service Repository** will have access to network resources and it will be used to develop and accommodate NetApps, providing rapid access and execution environment to **developers, third parties, and SMEs** from the energy vertical sector

Objective #4

To develop **high-performance NetApps** that will support the ambitious Smart5Grid energy-oriented use cases

Objective #5

To provide a Validation and Verification (V&V) experimentation framework for NetApp **automatic testing, certification, and integration**

Objective #6

To realise **four advanced 5G real-life demonstrations** over a wide set of energy related use cases. To exhibit that performance has been conforming to **5G PPP KPIs**

Objective #7

To conduct a **market analysis** and to establish new business models. Detailed techno-economic analysis and road mapping towards exploitation and commercialisation by industry partners and **SMEs** are also of high priority for the project

Objective #8

To ensure **maximisation of Smart5Grid impact** to the **realisation** of the **5G vision** by establishing close liaison and synergies with 5G PPP Phase-2 and 3 projects and the 5G PPP. To pursue extensive dissemination and communication activities, as well to assess the perceived impact from the stakeholders and the wider community

Demonstration of 5G solutions for
SMART energy GRIDS of the future

Smart5Grid

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



GENERAL INFORMATION

THE CONSORTIUM

24 EUROPEAN
PARTNERS
COVERING
7 EU STATES

DURATION

3 YEARS

TOTAL BUDGET

8M€



Consortium Composition

24 partners, 2 Linked Third-parties, 13 SMEs



Coordinator



TELCOs



GROUP OF COMPANIES

SMEs



EIGHTBELLS
Independent Research & Consultancy



NBYCOMP
NearbyComputing

Tech Companies



Universities/Research institutions



DSOs



TSOs



(Linked third-parties of Enel GI&N)

Main expected outcomes

and opportunities



- Open NetApp Repository
- Test and validation facility



Italian Demo | Olbia
Automatic Power Distribution Grid Fault Detection



Spanish Demo | Barcelona
Remote Inspection of Automatically Delimited Working Areas at Distribution Level



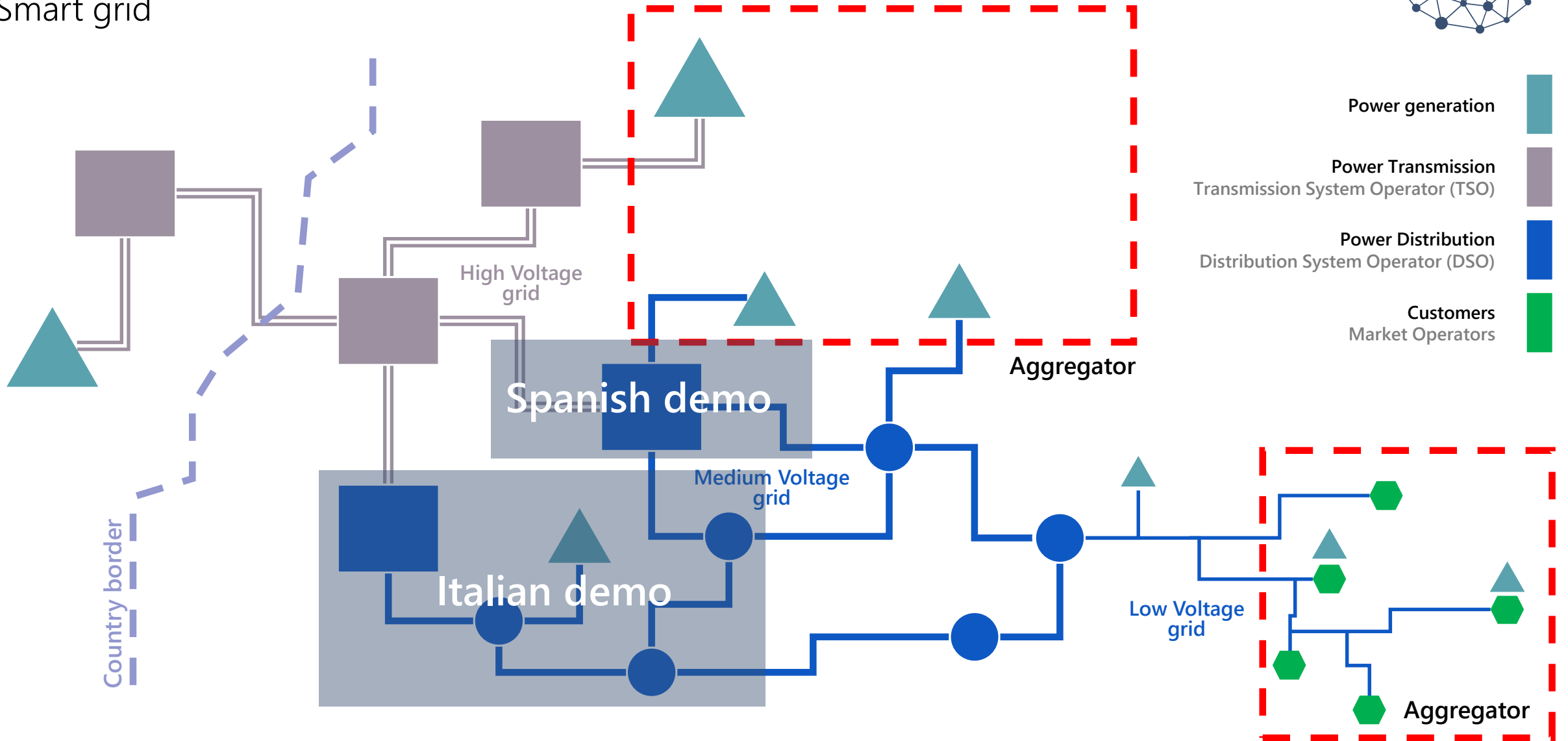
Bulgarian Demo | (Southern region)
Millisecond Level Precise Distribution Generation Control



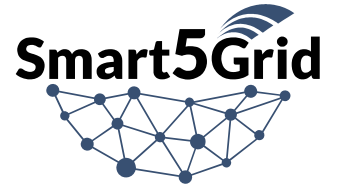
Bulgarian-Greek Demo | (Cross-border)
Real-time Wide Area Monitoring

Energy Vertical

Smart grid

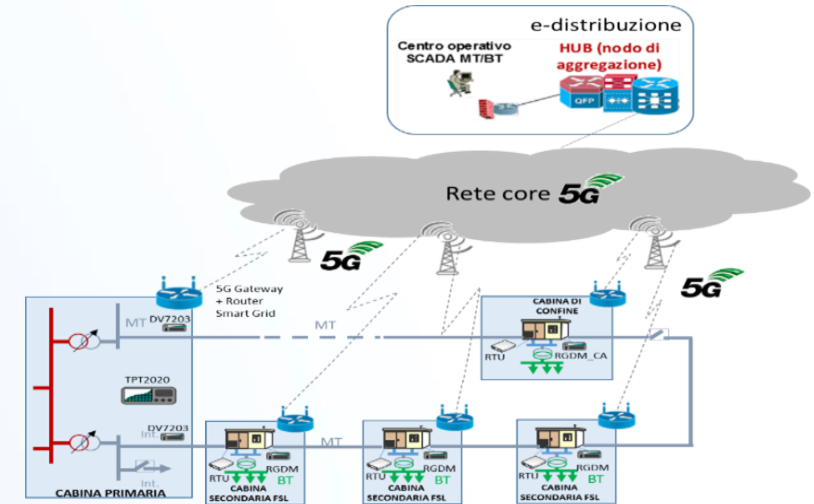


Italian and Spanish demos



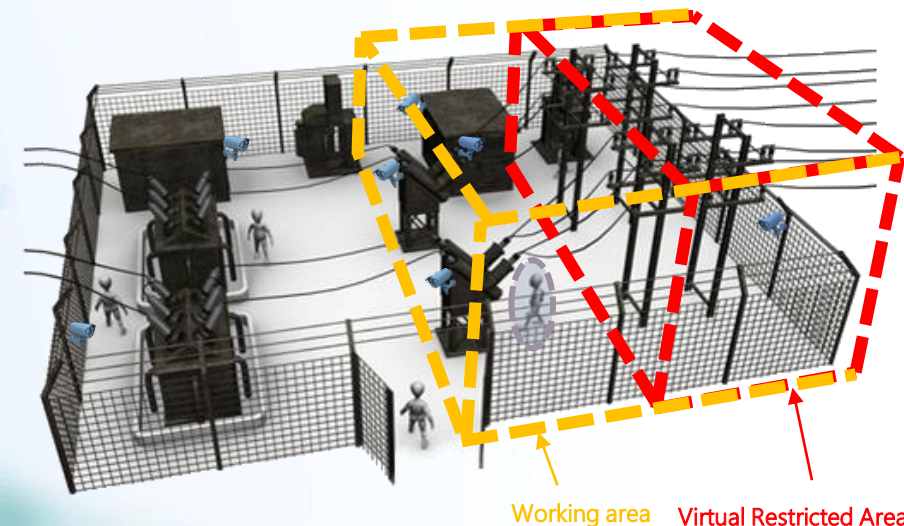
UC1 (DSO - Operations) Automatic Power Distribution Grid Fault Detection

E-Distribuzione developed the most advanced grid automation system, that is able to reconfigure the grid during an outage, minimizing the number of affected customers. This system will be tested using the 5G infrastructure in a real life environment.



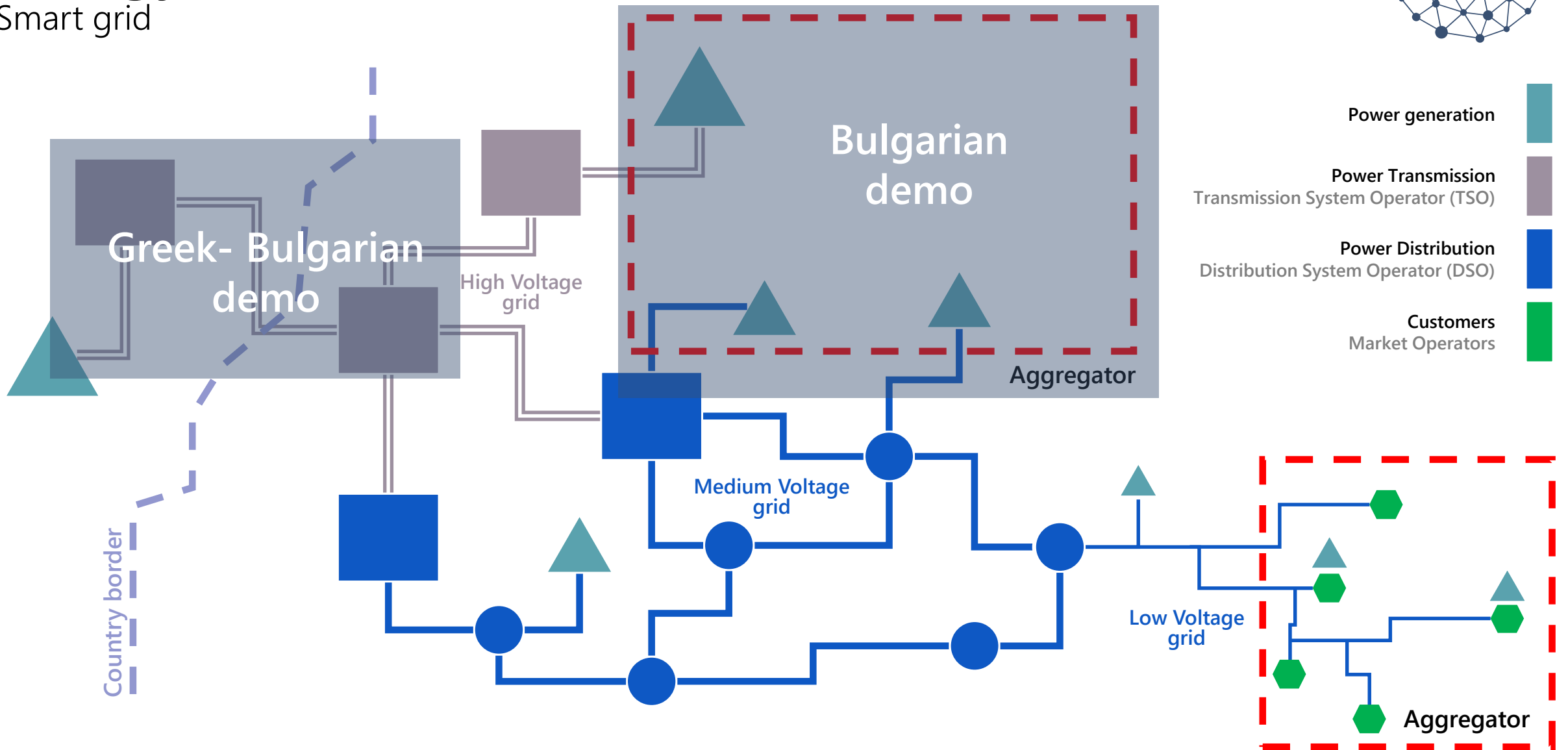
UC2 (DSO - Safety) Remote Inspection of Automatically Delimited Working Areas at Distribution Level

A system for monitoring the safety of people working in a power plant will be implemented using a private 5G facility. High resolution 3D sensors combined with AI will support workers during maintenance, avoiding to reach live parts of the power plant.



Energy Vertical

Smart grid

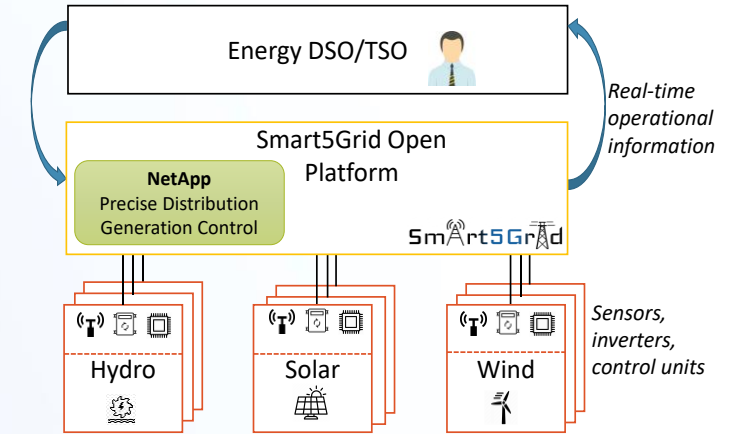


Bulgarian and Greek demos



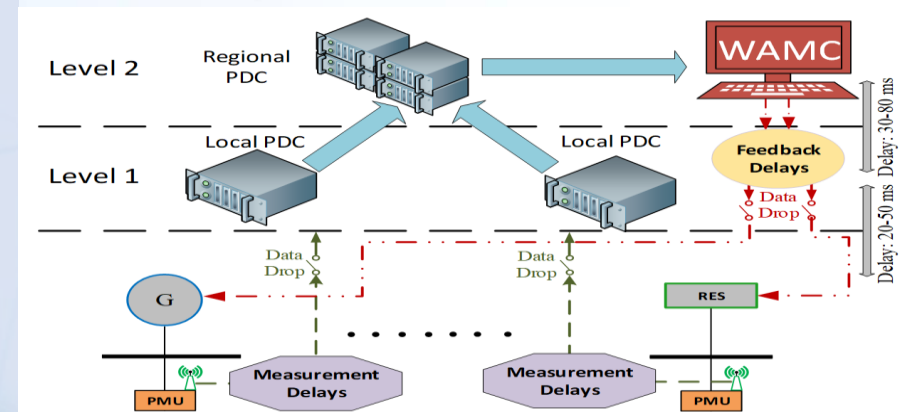
UC3 (Aggregator) Millisecond Level Precise Distribution Generation Control

Smart5Grid will enable the connection of thousands of Medium Voltage (MV) and High Voltage (HV) level decentralised RESs units and their inverters, to a platform with installed 5G communication protocols, which will allow their aggregation and control in millisecond rates



UC4 (TSO-TSO) Real-time Wide Area Monitoring

Smart5Grid aims to demonstrate the 5G virtual PDC capabilities for serving the Wide Area Monitoring of end-to-end electricity networks: from Distributed Energy Resources at Medium Voltage level operated by DSOs, to High Voltage level operated by TSOs, as well as inter-TSO cross border Regional Security Coordination.



Conclusions

Main project elements and expected results



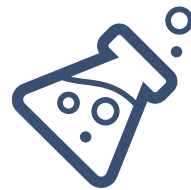
Open NetApp
repository



NFV automatic testing
and validation
framework



Four advanced
5G real-life
demonstrators



Roadmap for
third party
experimentation



Liaison and Interaction
with 5G-PPP Program



Impact creation
and exploitation

Follow us!

Check out our channels



[smart5grid.eu]



Thank you!



Daniele Porcu

Project Coordinator

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