Smart5Grid

Demonstration of **5G** solutions for **SMART** energy **GRID**s of the future
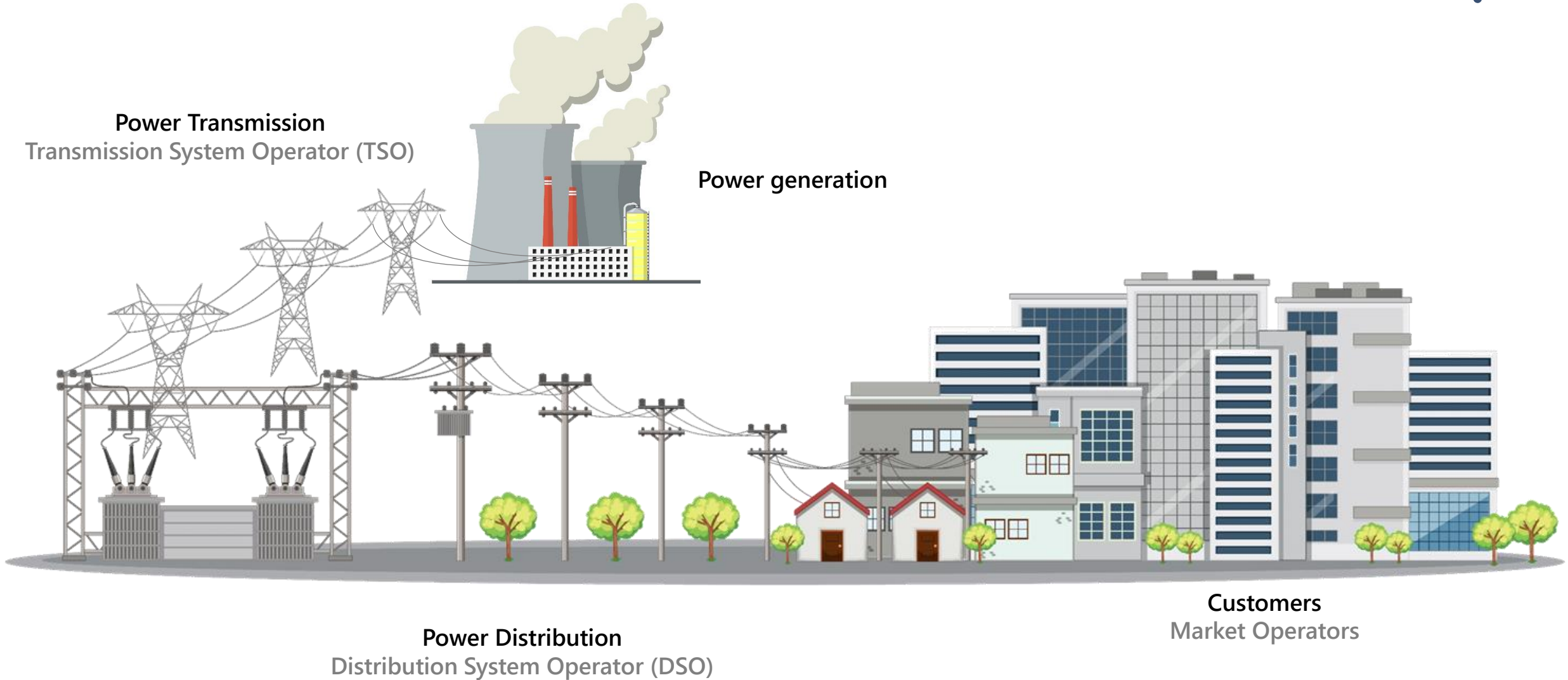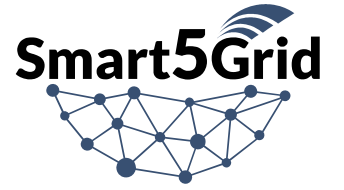
5G PPP
The 5G Infrastructure Public Private Partnership

Energy Vertical
Traditional grid

Smart5Grid

Power Transmission
Transmission System Operator (TSO)

Power generation

Power Distribution
Distribution System Operator (DSO)

Customers
Market Operators

Energy Vertical
Smart grid

Smart5Grid

High Voltage grid

Medium Voltage grid

Low Voltage grid

Aggregator

Aggregator

Country border

Power generation

Power Transmission
Transmission System Operator (TSO)

Power Distribution
Distribution System Operator (DSO)

Customers
Market Operators

How we arrived here today?

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

Smart5Grid

Specific vertical sector

Open Source repository

NetApps

50% of SMEs

Third party markets

Structure of the project
Overall project plot

Smart5Grid

Automatic Validation and Verification framework

Roadmap for third party experimentation

Use cases

Market analysis, business models and exploitation

Kick-Off

Technology Readiness Evolution for NetApps Development

Impact creation

Finalization of goals and results

Integrated 5G network facility and open repositories

Open 5G Platform Architecture and Technical requirements

Four advanced 5G real-life demonstrators

Liaison and Interaction with 5G-PPP Program

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)
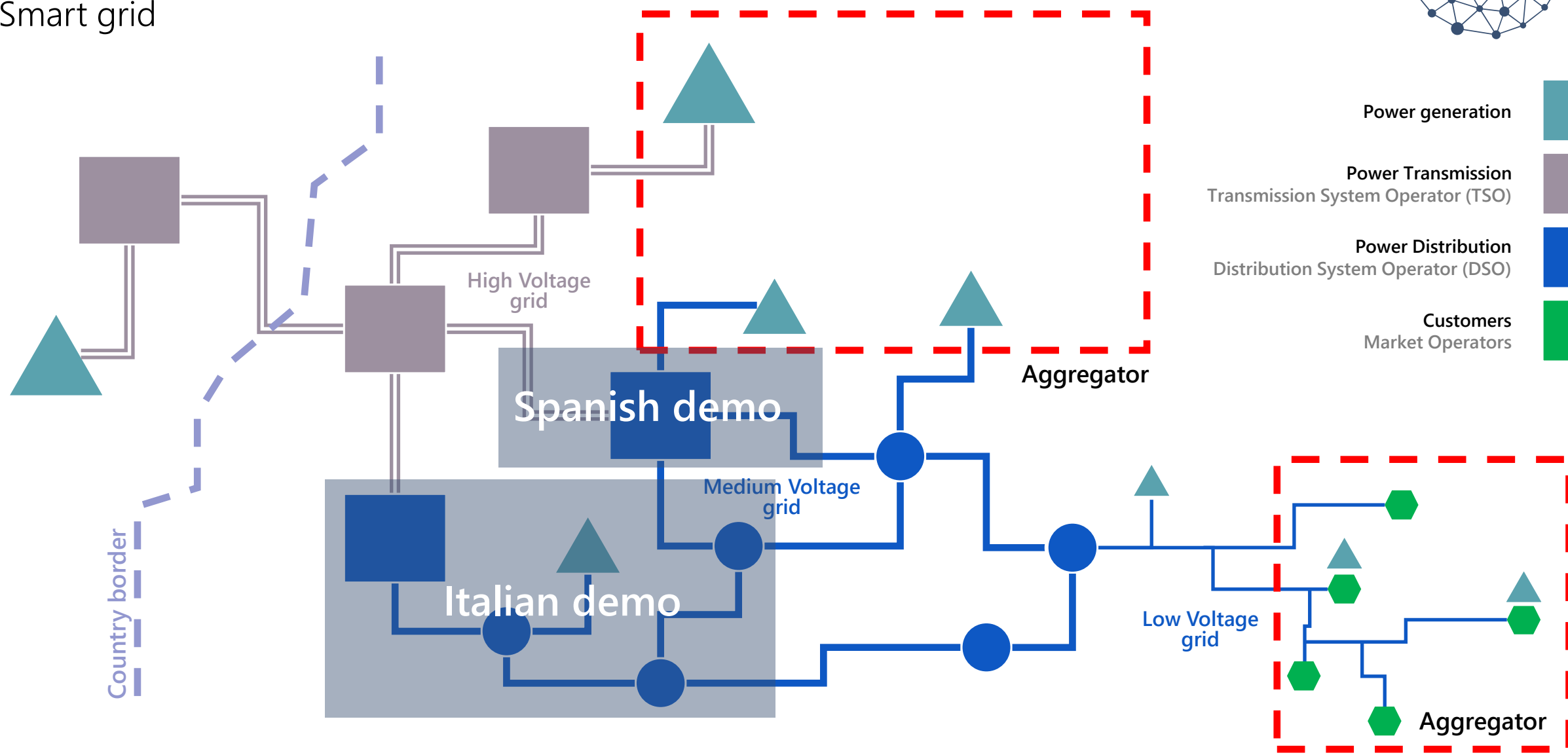Millisecond Level Precise Distribution Generation Control

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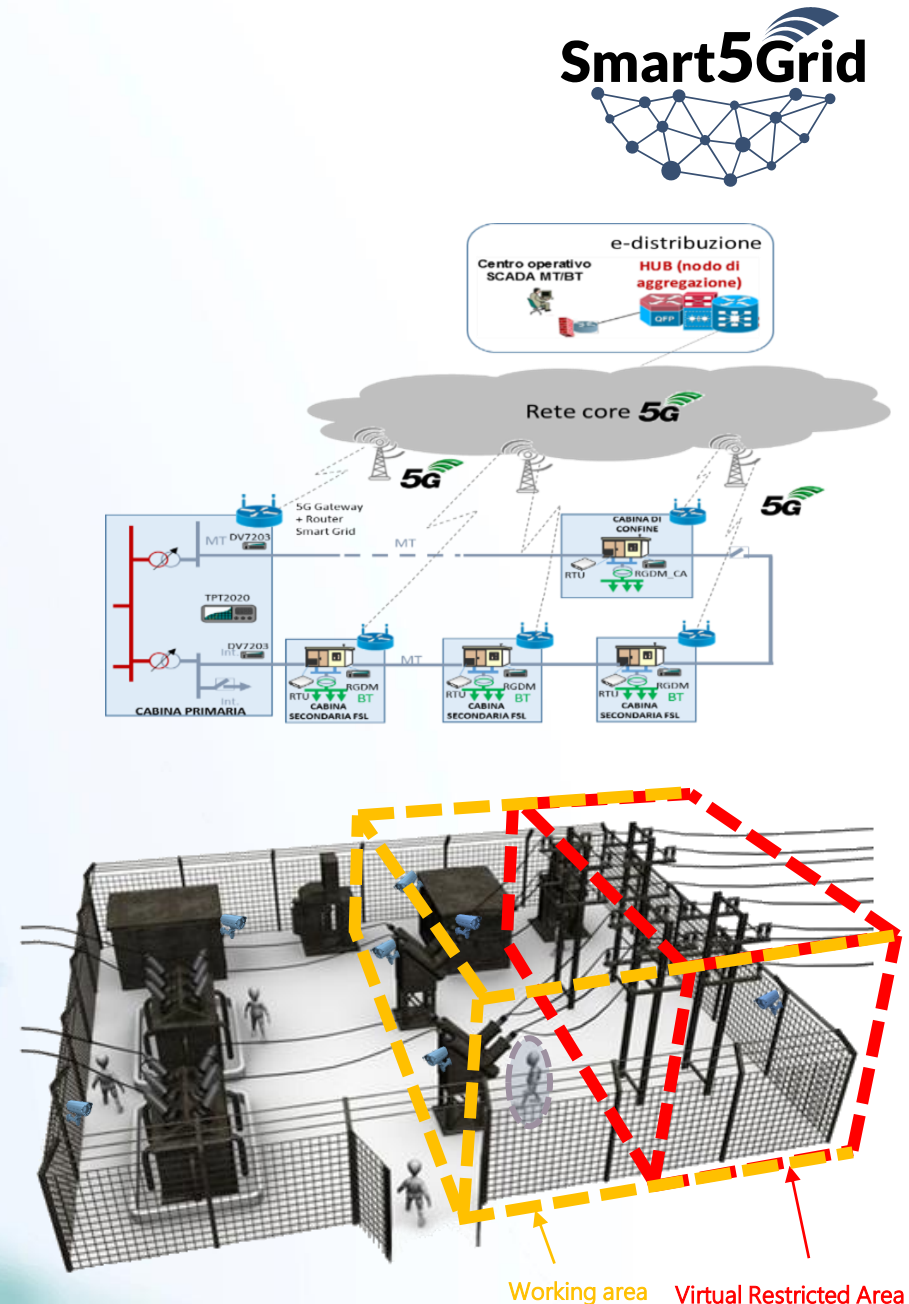Real-time Wide Area Monitoring

Energy Vertical
Smart grid

Smart5Grid

High Voltage grid

Spanish demo

Italian demo

Medium Voltage grid

Aggregator

Low Voltage grid

Aggregator

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Italian and Spanish demos

Smart5Grid

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.
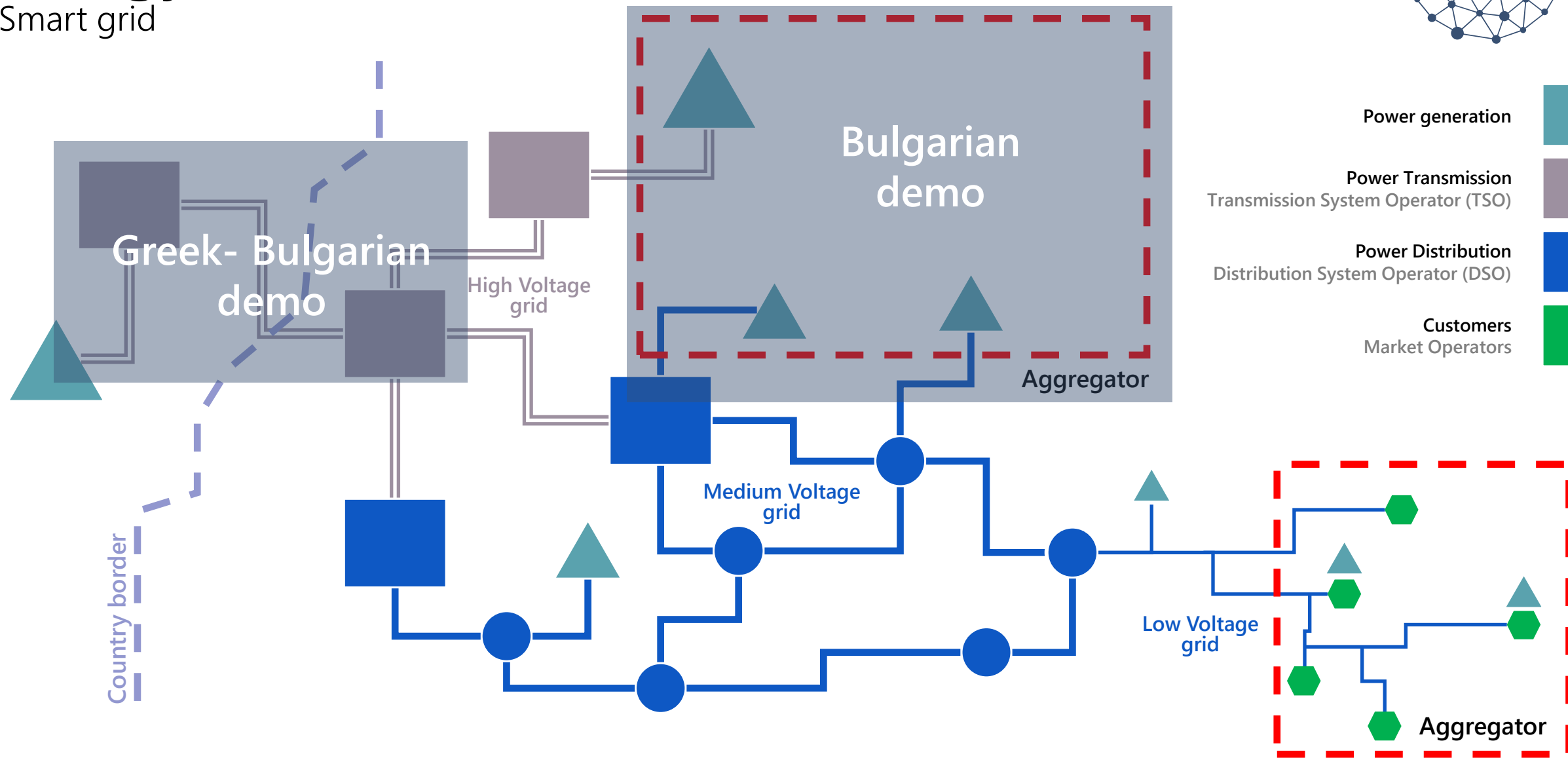

UC2 (DSO - Safety) Remote Inspection of Automatically Delimited Working Areas at Distribution Level

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.
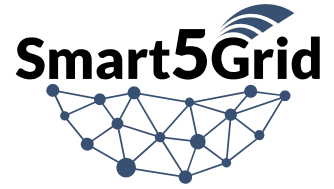

Working area   Virtual Restricted Area

Energy Vertical
Smart grid

Smart5Grid

Bulgarian demo

Greek- Bulgarian demo

High Voltage grid

Aggregator

Country border

Medium Voltage grid

Low Voltage grid

Aggregator

Power generation

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Market Operators

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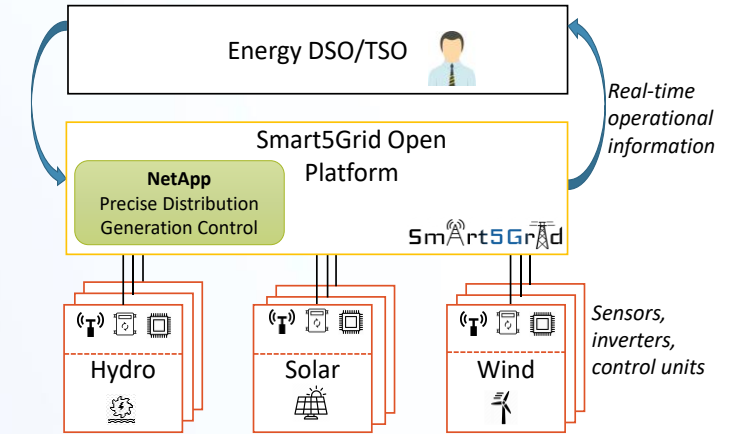
UC4 (TSO-TSO) Real-time Wide Area Monitoring

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.
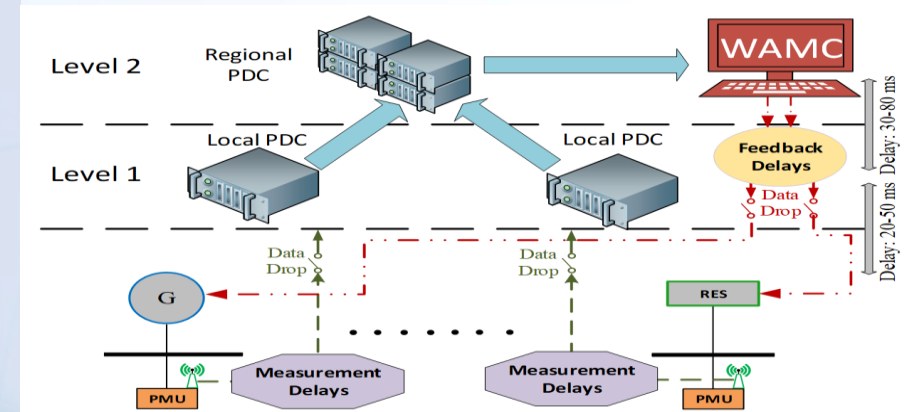
Consortium Composition
24 partners, 2 Linked Third-parties, 13 SMEs

Coordinator

TELCOs

Tech Companies

Universities/Research institutions

DSOs

TSOs

(Linked third-parties of Enel GI&N)

SMEs

Conclusions
Main project elements and expected results

Smart5Grid

Open NetApp
repository

Automatic Validation
and Verification
framework

Four advanced
5G real-life
demonstrators

Roadmap for
third party
experimentation

Liaison and Interaction
with 5G-PPP Program

Impact creation
and exploitation

Thank you!

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