

# ISGAN International Smart Grid Action Network Virtual Learning Webinar

**Approaching 5G-based Edge-Cloud Computing  
Fostering the digital transition of the energy industry**

22. 02. 2024,  
Online Webinar



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# ISGAN in a Nutshell



ISGAN is the short name for the *International Energy Agency (IEA) Technology Collaboration Programme (TCP)* for a Co-operative Programme on Smart Grids (ISGAN – *International Smart Grids Action Network*).

It is also an initiative of the *Clean Energy Ministerial (CEM)* and was formally established at CEM2 in Abu Dhabi, in 2011 as an Implementing Agreement under a framework of the *International Energy Agency (IEA)*.

The *International Smart Grid Action Network (ISGAN)* creates a strategic platform to support high-level government attention and action for the accelerated development and deployment of smarter, cleaner electricity grids around the world.

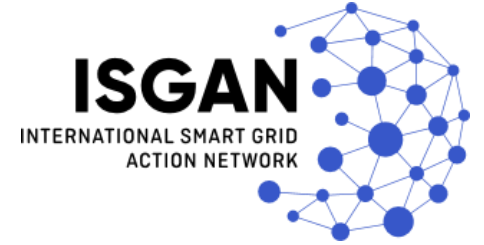


# ISGAN in a Nutshell

ISGAN currently consists of 27 Contracting Parties. Their nominated representatives form the Executive Committee headed by the Presidium, assisted by two co-Secretariats and the Operating Agent of ISGAN.



# ISGAN Vision

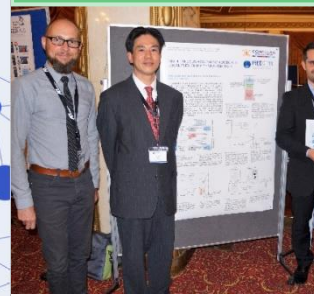
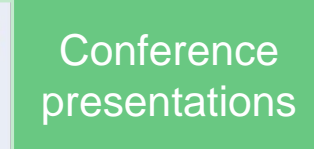
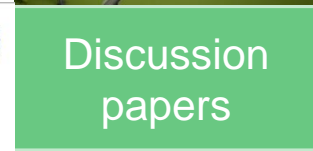
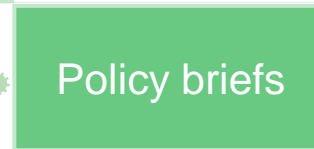
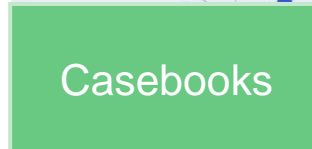


ISGAN's vision is to accelerate progress on key aspects of smart grid policy, technology, and investment through voluntary participation by governments and their designees in specific projects and programs. Its activities center foremost on those aspects of the smart grid where governments have regulatory authority, expertise, convening power, or other leverage, focusing on five principal areas:

- Policy standards and regulation
- Finance and business models
- Technology system development
- Workforce skills and knowledge
- Users and consumers engagement

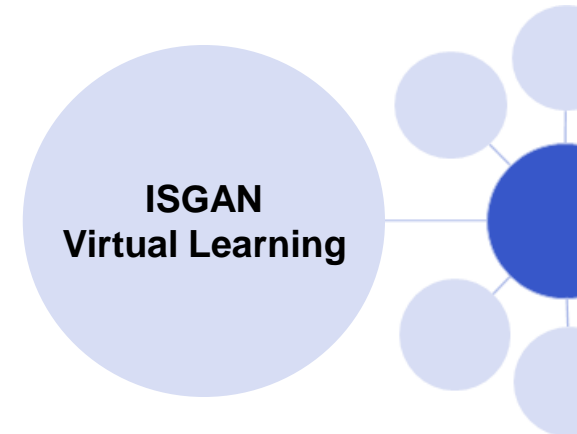
ISGAN facilitates dynamic knowledge sharing, technical assistance, peer review and, where appropriate, project coordination among its Contracting Parties.

# ISGAN Value proposition



# ISGAN Virtual Learning

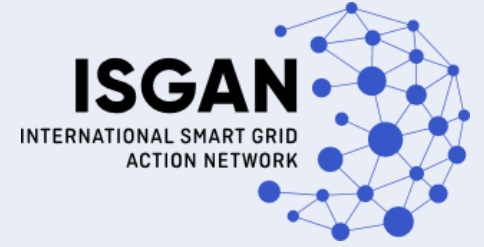
- Offer the ISGAN community of high level engineers and decision makers a means of rational and efficient continuous technical skills complement and update in the field of smart grids
- ISGAN Virtual Learning proposes e-learning core modules dealing with the entire value chain of smart grid
- Fundamentals and further reading modules are also provided as appendices
- Webinars organized every two months or co-hosted with the Clean Energy Solutions Center



Operating Agent



# Title of the webinar



Brief description of the webinar

The speakers:

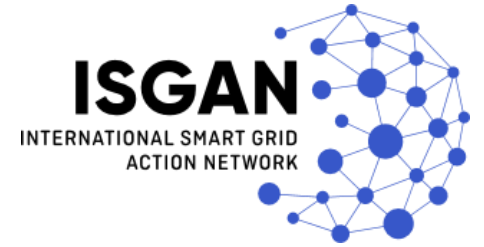
- Daniele Porcu, EU Project coordinator, Enel Grids

Please, use the **Q&A tool** to pose questions, the speakers will answer at the end of the presentation.

The recording will be available through the **ISGAN YouTube channel**.

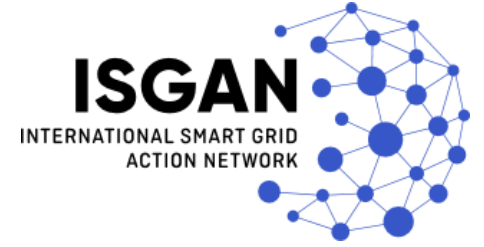
# Agenda

- Approaching the 5G-based edge-cloud computing
- The Network Application concept
- Smart5Grid project and approach
- A concrete use case: grid stability monitoring at cross-country level
- Opportunity for developers





# Energy transition



## Smart Grids

## Islanding

## Flexibility

# Digitalisation

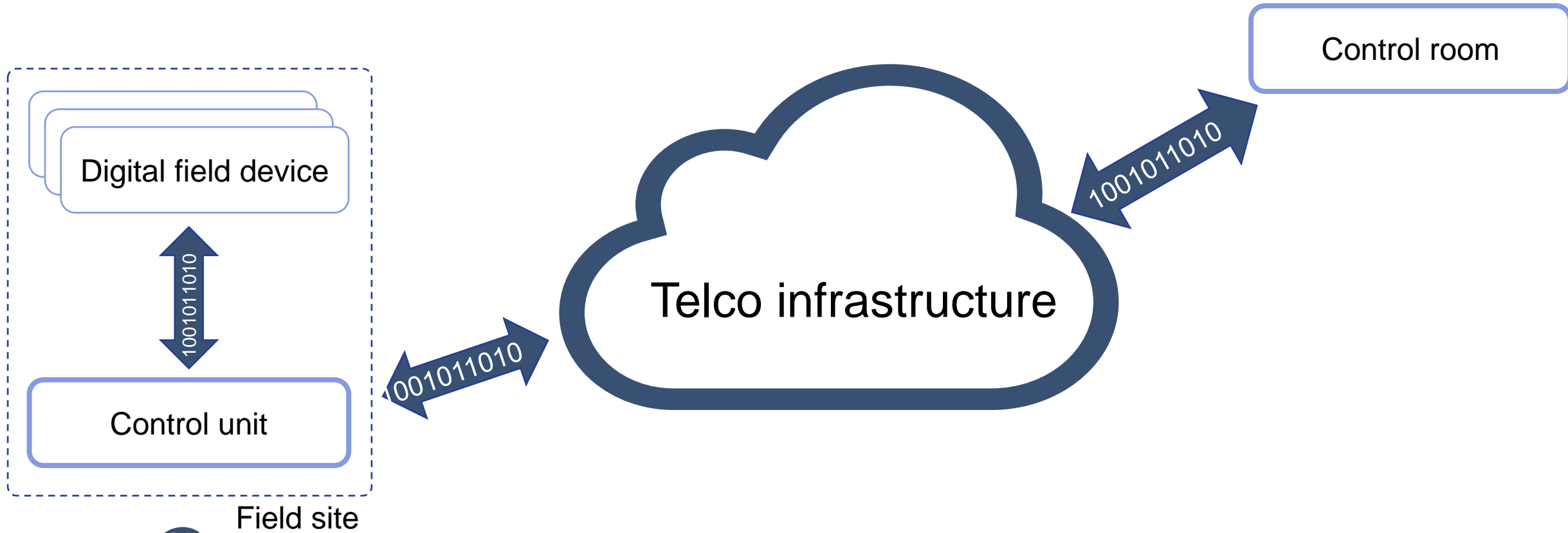
## Distributed generation

## Energy Storage



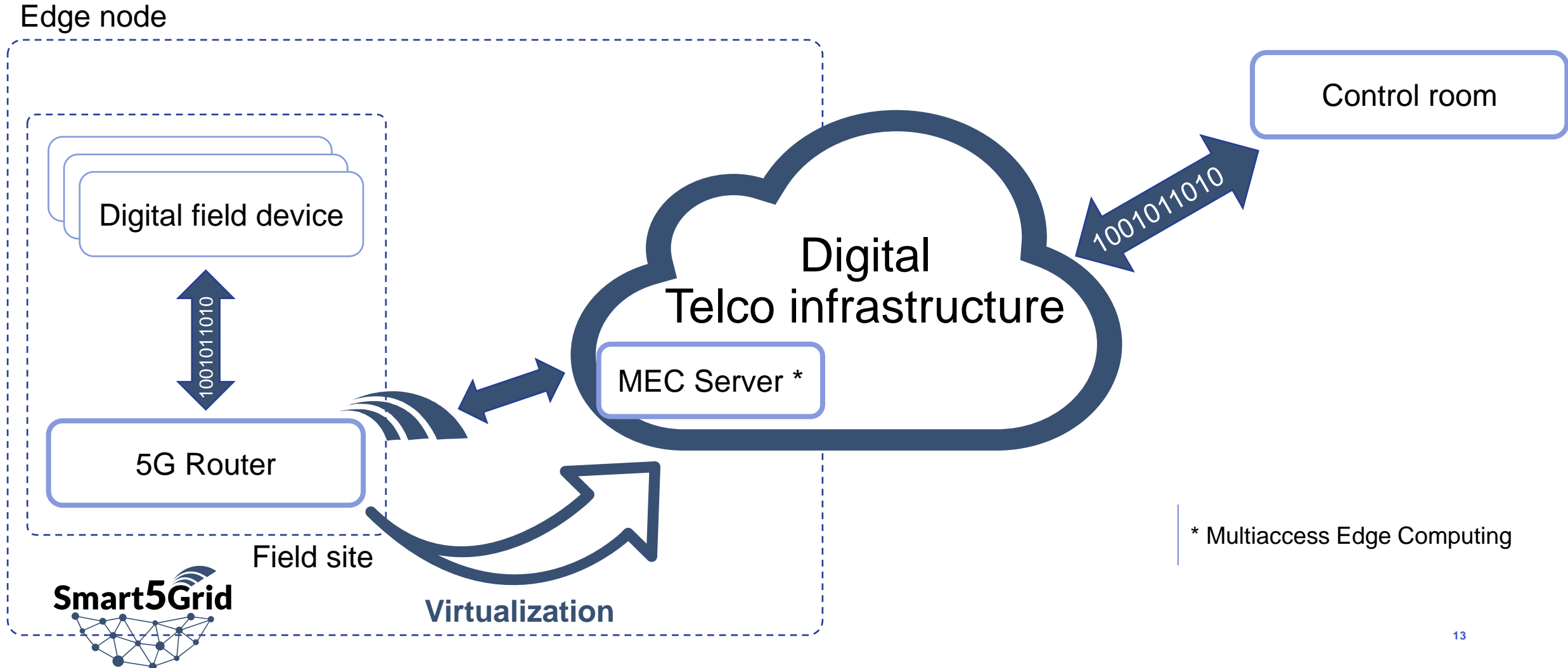
# Digitalisation: what kind?

# Actual telecommunication model



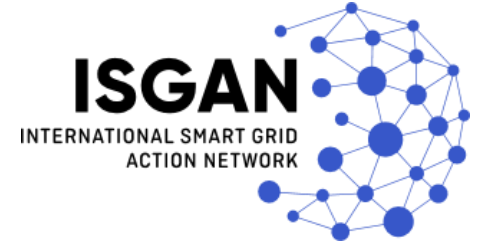
# 5G-based cloud edge computing

# Digital telco paradigm shift



\* Multiaccess Edge Computing

# Smart5Grid overall concept



**Smart5Grid**  
Open Experimental 5G Platform

Platform layer

Virtualization/Telco layer

Network App

Energy layer



Network App definition,  
modeling and implementation

Network Applications'  
Open Service Repository

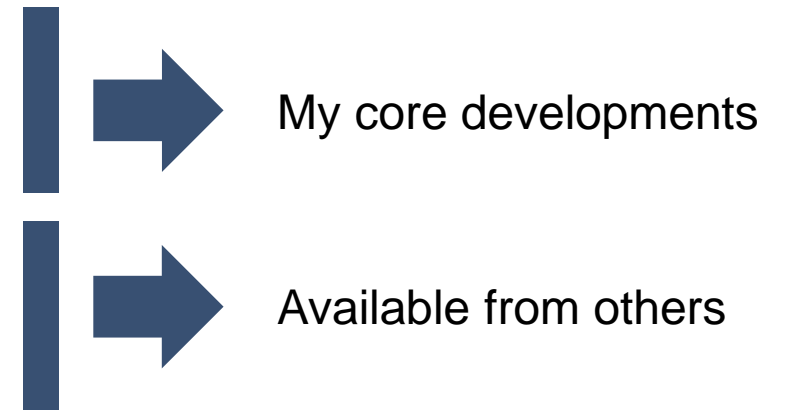
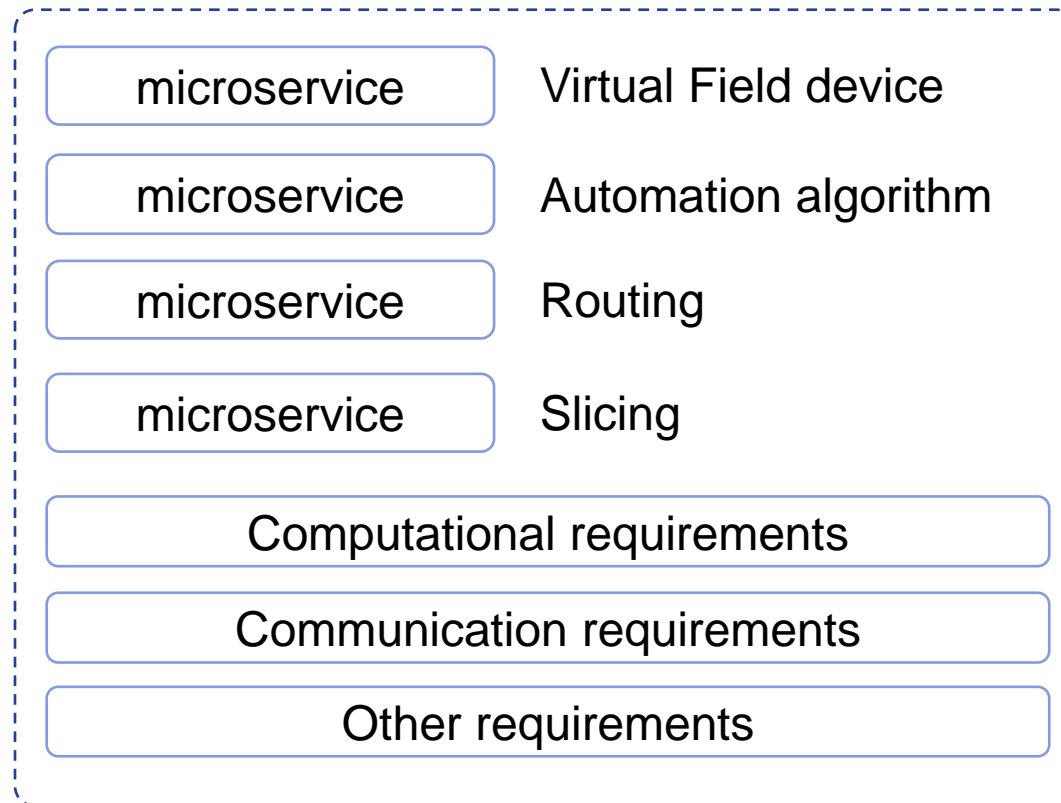
V&V Framework  
(Validation and Verification)



# Network Applications: a way to simplify the 5G complexity

# A simple Network Application

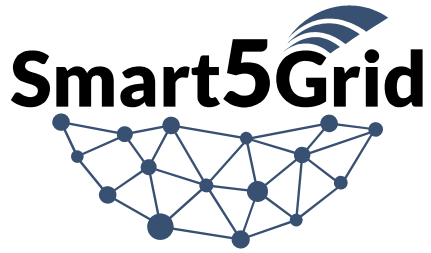
## Network App Descriptor





## Smart5Grid in a nutshell





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

The **Smart5Grid** project aims to investigate the potential of 5G-based Edge-Cloud Computation in the Energy industry, by introducing the concept of **Network App** for simplifying the 5G Complexity. The project testbeds **are now available** for third-parties' experimenters, fostering the creation of a new market-segment for Network Apps.

## GENERAL INFORMATION

### THE CONSORTIUM

24 EUROPEAN  
PARTNERS  
(50% SMEs)  
COVERING  
7 EU STATES

### DURATION

**3 YEARS**  
(+4 MONTHS)  
TERMINATING ON  
**APRIL'24**

### TOTAL BUDGET

**8M€**



# the Smart5Grid Consortium

## Coordinator



## TELCOs



VIVACOM

GROUP OF COMPANIES

## SMEs



EIGHTBELLS  
Independent Research & Consultancy



NEARBY  
COMPUTING

## Tech Companies



## Universities/Research institutions



## DSOs



## TSOs



\*Linked third-parties of Enel Grids





# IP monitoring for Smart Grids

Italian Demo | Olbia



# Power plant operators' safety monitoring

Spanish Demo | Barcelona



# Distributed generation management

Bulgarian Demo | (Southern region)

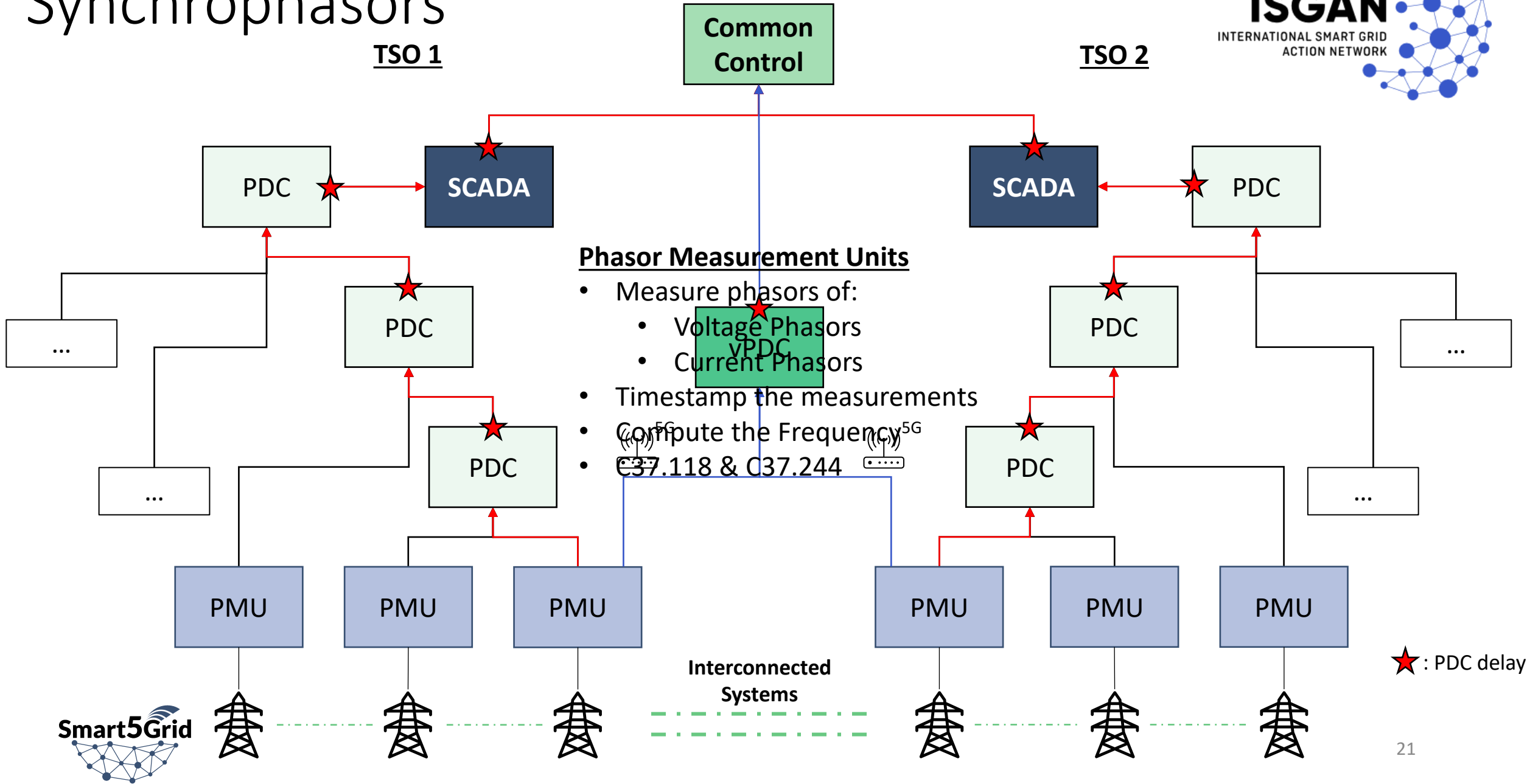


# Cross border frequency control

Greek-Bulgarian Demo | (Cross-border)



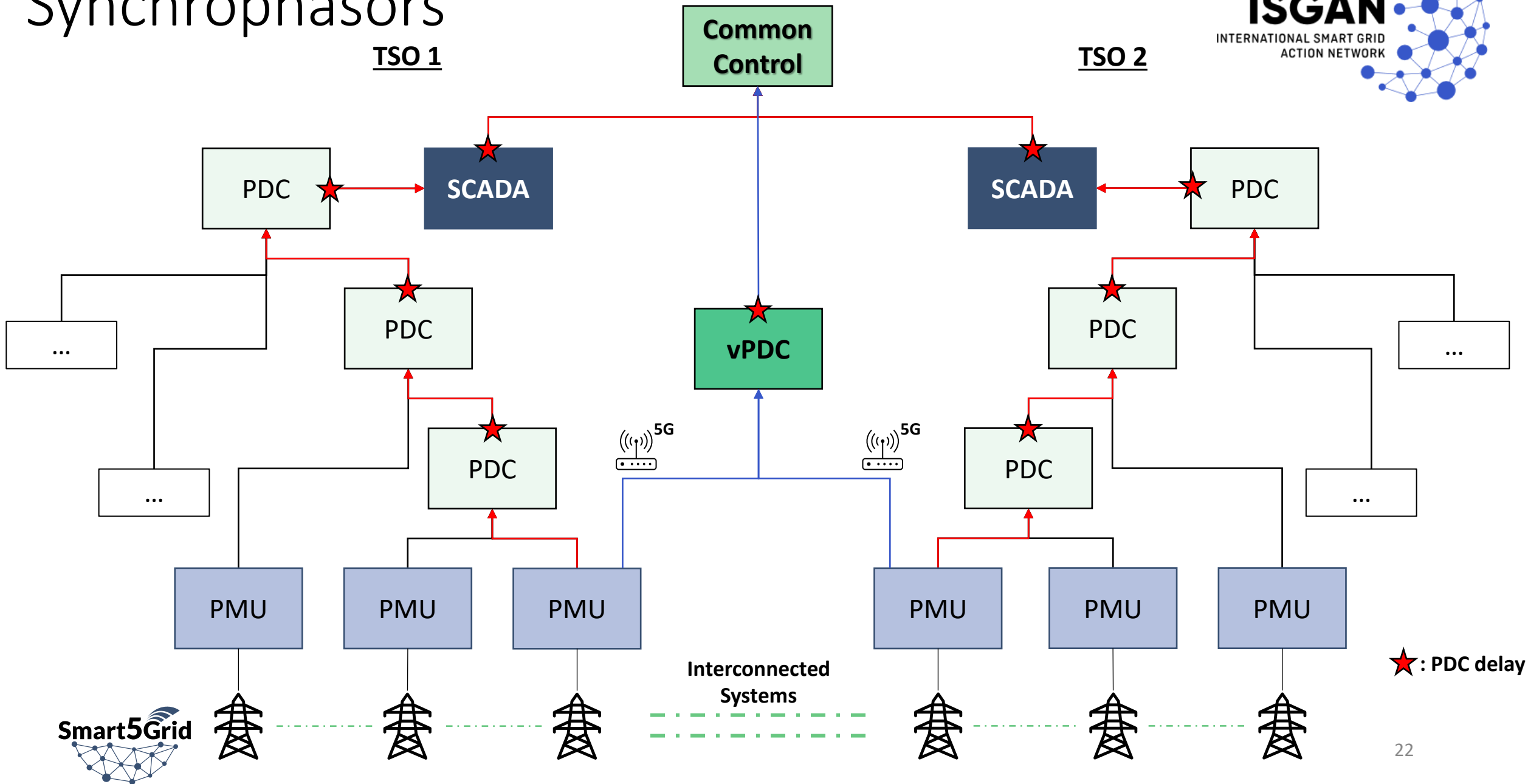
# Synchrophasors



## Phasor Measurement Units

- Measure phasors of:
  - Voltage Phasors
  - Current Phasors
- Timestamp the measurements
- Compute the Frequency<sup>5G</sup>
- C37.118 & C37.244

# Synchrophasors



# Key features of Network Apps

## Fostering the integration of the Core Network features

- Simplifying 5G complexity
- Focus on the core developments
- Combining multiple microservices to realize complex applications

## Orchestration and operation

- Centralized management
- Scalability and replicability
- Leveraging on a flexible infrastructure

## Accelerating the implementation

- Open Service Repository as a single access point for developers
- Integrated Verification and Validation feature for test automation

Smart5 Grid





**Our testing  
platform is  
open for you!**





**build and test  
your own  
Network App**



# all the tools you need are here!



## OSR

Open Service Repository



## V&V

Verification and Validation



## Contact Desk

Remote support for developers



# Webinar Q&A

## Approaching 5G-based Edge-Cloud Computing

### Fostering the digital transition of the energy industry

Daniele Porcu, Enel Grids: [daniele.porcu@enel.com](mailto:daniele.porcu@enel.com)



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



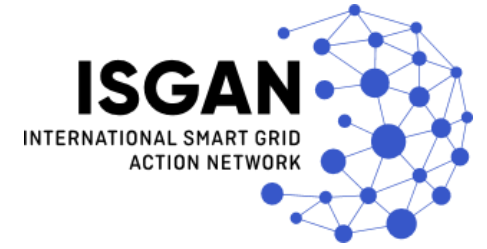
The Smart5Grid project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101016912



## Final remarks

# Conclusions

Main project elements and key results



Open Service  
Repository



NFV automatic testing  
and validation  
framework



Four advanced  
5G  
real-life  
demonstrators



Roadmap for  
third party  
experimentation



Contact support  
desk



Liaison and Interaction  
with 5G-PPP Program





**Get ready!!**

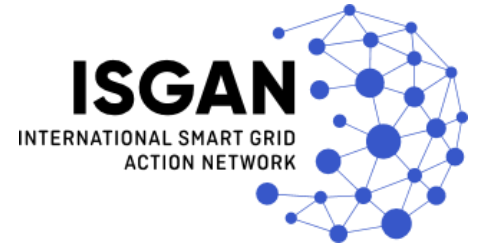
**Final event on  
April the 9<sup>th</sup>**

**Join us in Brussels!**





Join us!  
Follow us!  
Like us!



[smart5grid.eu]



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# Approaching 5G-based Edge-Cloud Computing Fostering the digital transition of the energy industry

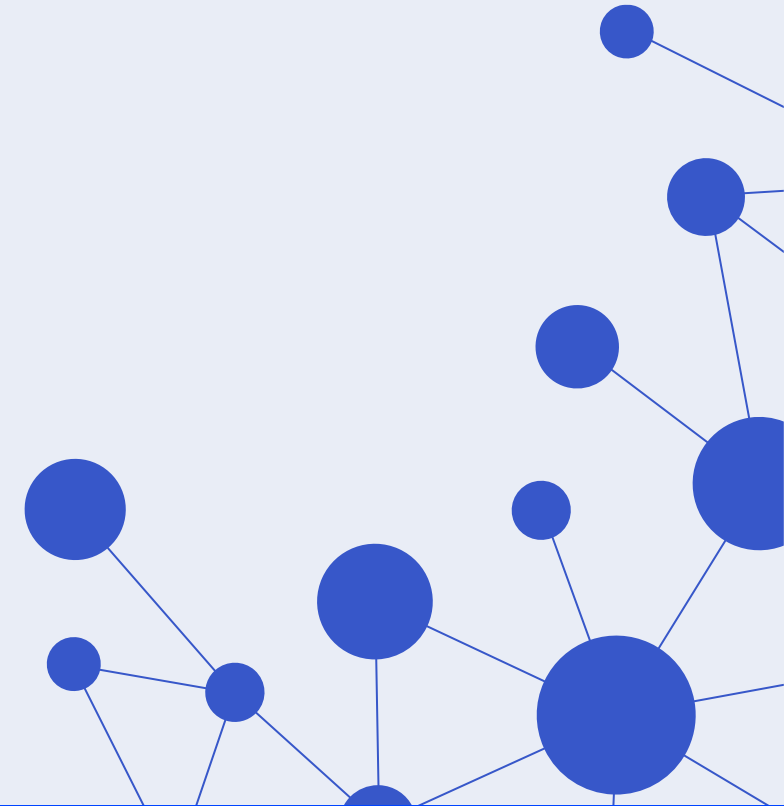
Daniele Porcu, Enel Grids: [daniele.porcu@enel.com](mailto:daniele.porcu@enel.com)



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

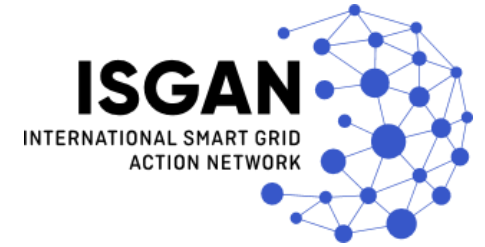


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# Virtual learning webinar: Approaching 5G-based Edge-Cloud Computing Fostering the digital transition of the energy industry



## The need

Smart Grids needs a reliable and performing digital layer



## A promising technology

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



## But...

The complexity of such integration is a barrier, but Smart5Grid project proposes an innovative approach



## Our solution

We are able to provide a novel concept of Network Application to simplify the 5G complexity



## Let's make it easy!

Our set of tools can facilitate the access to this technology, fostering the creation of a new market segment for digital services



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