Integrated Approach in the Management and Operation of Electricity Transmission and Distribution Networks

30th of April 2020

ONLINE VIDEOCONFERENCE

SOGNO, WISEGRID, PHOENIX, CROSSBOW, EDDIE and DEFENDER Projects

Stakeholders Consultation Event

PLEASE NOTE – VIDEO-CONFERENCE RULES:

1. **MICROPHONES MUTED**
   - ✓ The Host will enable Microphones for Speakers and Panellists when appropriate
2. **VIDEO** will be ON only for KeyNote Speakers, Speakers and Panellists
   - ✓ Everyone else please keep your videos OFF
3. **CHAT** will be Enabled ONLY during Panel sessions so that Participants can place their questions)
   - ✓ 'Raise Hand' feature will not be used (it will be Disabled)
4. **BREAK**
   - ✓ 10' Break After Panel 1
   - ✓ SOGNO and WISEGRID videos will be shown during the break (optional attendance)
5. **Participants QUESTIONS**
   - ✓ Participants will be able to place questions via CHAT during Panels session
   - ✓ Questions to be send to the Host, via CHAT
6. **TIMER**
   - ✓ A timer will be shown during each session and presentation
7. **RECORDING**
   - ✓ The Video-Conference will be recorded and will be made available upon request

WELCOME AND INTRODUCTION

Objectives of the Event

Mihai PĂUN
Vice-President
Romanian Energy Center

ROMANIAN ENERGY CENTER (CRE)

- **The Romanian Energy Center is a non-governmental and non-profit Association representing the interest of state-owned and private companies operating in the Romanian Energy Market, in relation with EU and National Institutions → Since 2011 in Brussels and Bucharest**

- **Active in all relevant areas including: electricity, oil and gas, coal, renewables, energy equipment and services plus R&D&I, and Legal assistance**

- **CRE contributes to the European and National decision-making process, promotes infrastructure investments and supports the transition to a decarbonized energy system**

- **Position Papers - Romanian and European Energy Policy Consultations**

INNOVATION – EUROPEAN PROJECTS IMPLEMENTATION

CRE Romanian Energy Center

IMPLEMENTED

SUCCESS - Securing Critical Energy Infrastructures

Renewables in a Stab Electric Grid

Enabling Smart Energy a a Service via 5G Mobile Network advances

ONGOING PROJECTS

Wide scale demonstration of Integrated Solutions and business models for European smart GRID

Electrical Power System's Shield against complex incidents and extensive cyber ar privacy attacks

Service Oriented Grid for the Network of the Future

TRansmission system enhancement of regloNal borders by means of IntelligenT market technologY

CROSS BOrder management of variable renewable energies and storage units enabling a transnational Wholesale market

Education for Digitalisation of Energy

EVENT OBJECTIVES

CRE
Romanian Energy Center

- **Consultation with Stakeholders on the Preliminary Results on Electricity T&D grid operation, regulation, standardization, as well as New Solutions and Services proposed to TSOs and DSOs for improving the operation and security of the electricity grid trough Digitalisation**

- **Dissemination of the Projects Solutions for the Management of Variable Renewable Energies and Storage Units enabling more Secure Smart Grid**

- **Presentation of integrated solutions and Business Models for the integration of more RES into the European Smart Grid with increased protection and fast mitigation of the Cyber-Attacks against assets and the Networks of the Future**

- **Identify synergies within EU H2020 Projects on Electricity T&D**

- **Consolidating the European dimension of Innovation and Development in the Energy Sector**

PROGRAM

CRE
Romanian Energy Center

Integrated Approach in the Management and Operation of Electricity Transmission and Distribution Networks

SOGNO, WISEGRID, PHOENIX, CROSSBOW, EDDIE and DEFENDER Projects

- Key Notes

- Session I – Innovative T&D Solutions and ICT Services for Grid Operators
  - Panel Discussion – The role of TSOs and DSOs for securing the Smart Grid towards up to 100% Renewables

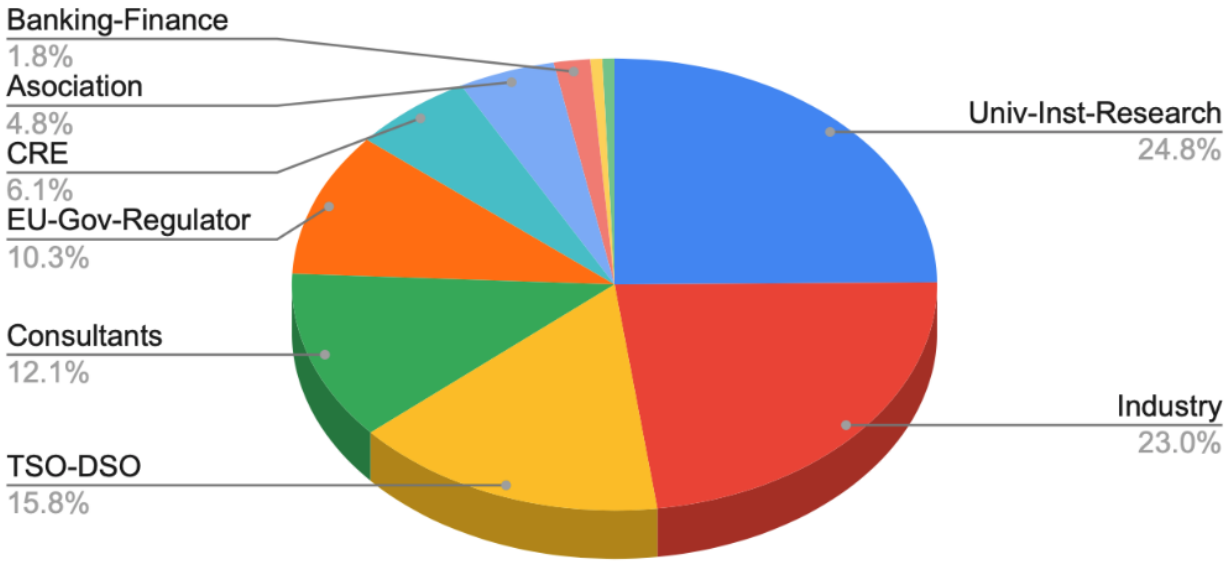
- Session II – Developments in the Standardization for the Power Sector
  - Panel Discussion – The role of Regulation and Standardization and the Potential Impact in the Power Sector

PARTICIPANTS

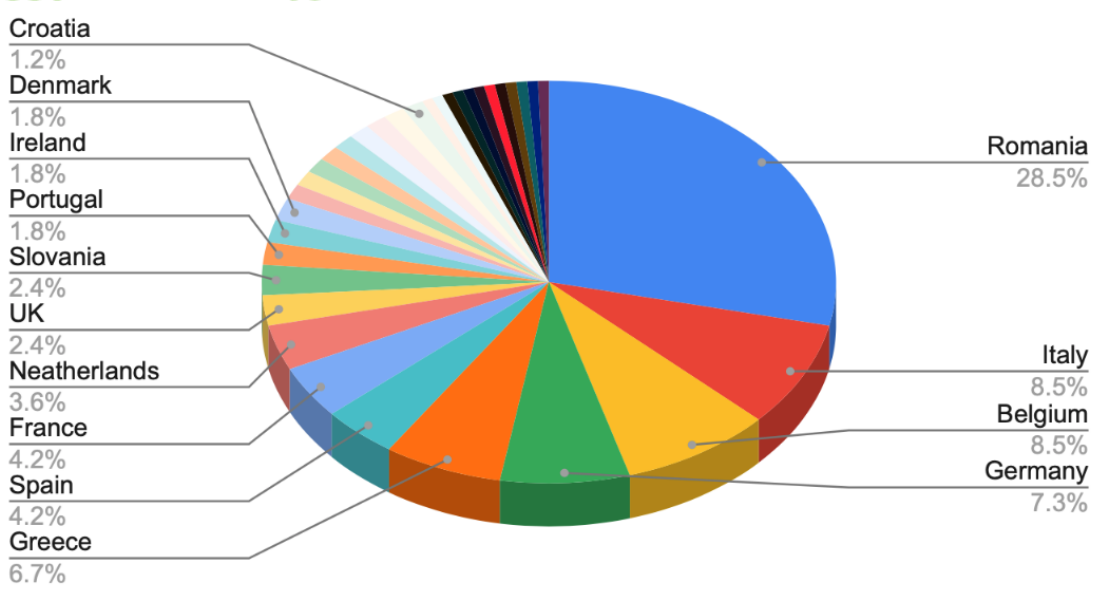
CRE
Romanian Energy Center

180 Registrations – 35 Countries

By Sector



By Country



Over 120 Organizations

Iulian IANCU
President
Committee for Industries and Services,
Romanian Parliament

KEYNOTE ADDRESS

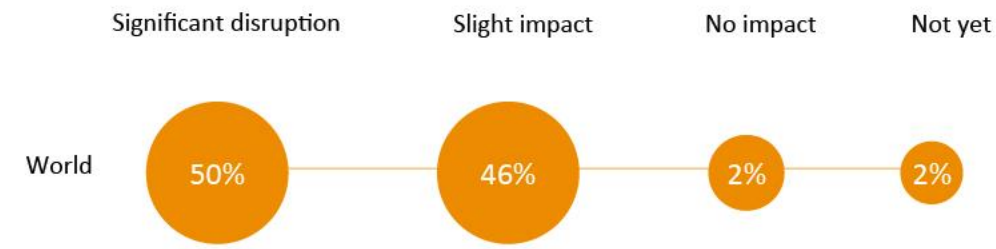
Ensuring Clean and Secure Energy for all European Citizens

What will energy’s future look like?

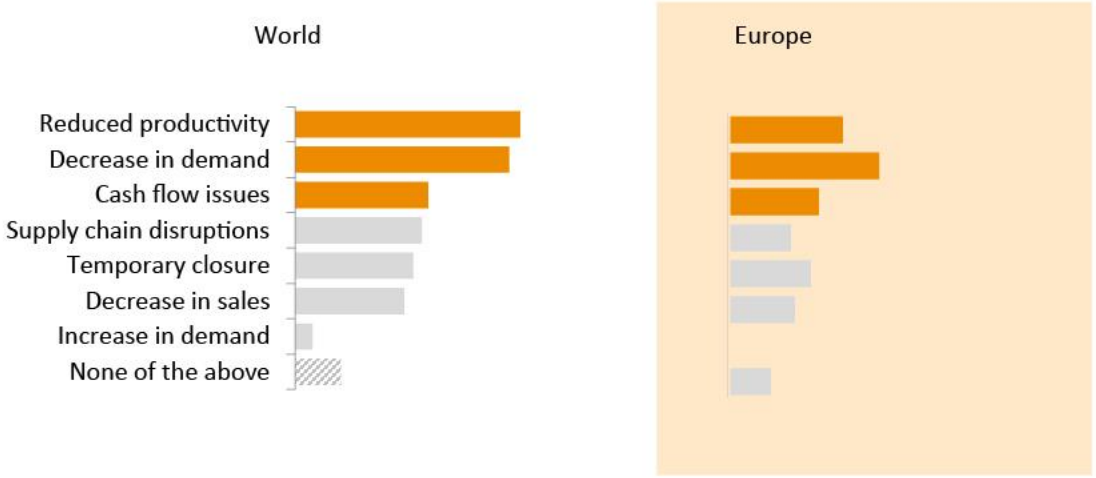
Iulian Iancu - President of the Romanian National Committee of World Energy Council

Global vs Europe: Immediate impact

Has your organisation been affected by the COVID-19?



If yes, how has your organisation been affected?



Among all respondents from Europe over **95% had been already affected** by the COVID-19 pandemic crisis, with third of it experiencing **significant disruption**.

The **most critical areas impacted** are:

- Reduced productivity
- Decrease in demand
- Cash flow issues

Other impacted areas include: business development stopped and delay in projects due to cancelled meetings, significant changes in daily operations, and enforcement of "teleworking" protocol.

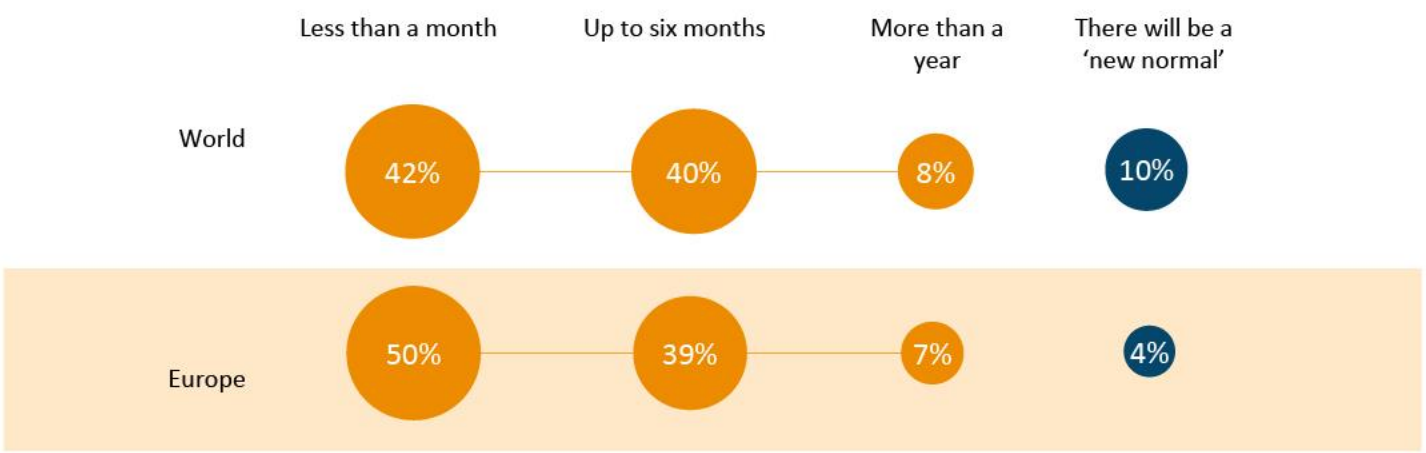
The top **three concerns** relate to the most impacted areas and include:

- Employees welfare
- Demand reduction
- Cash flow

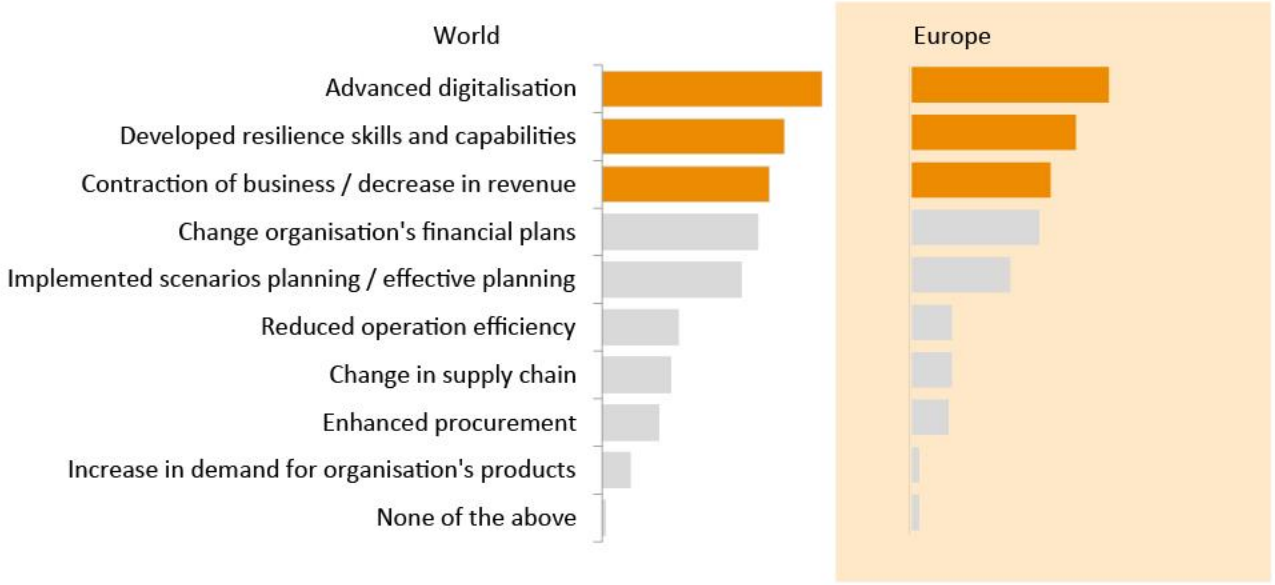
Other areas of concern include: project delays, securing production processes in critical areas (e.g. nuclear), communication with clients, security and stability of operations, and the inability of customers to pay bills.

Global vs Europe: Long-term impact on organisations

How long would it take for your organisation to get back to normal if the measures were lifted today?



How do you think COVID-19 will affect your organisation in the long-term (> 12 months)?



WORLD ENERGY COUNCIL

50% of respondents expect to get back to business-as-usual in **less than a month** if the restriction measures were lifted today following the resolution of pandemic. A further **just under 40%** expect to recover **within six months.**

While around **5%** expect that it will be a no way to return to business-as-usual, and there will be a **'new normal'**.

For specific sectors, e.g. TSO, the return to normal depends on others, in case of liquidity issues adjustments to the tariffs will be needed.

The top three anticipated **long term changes** are:

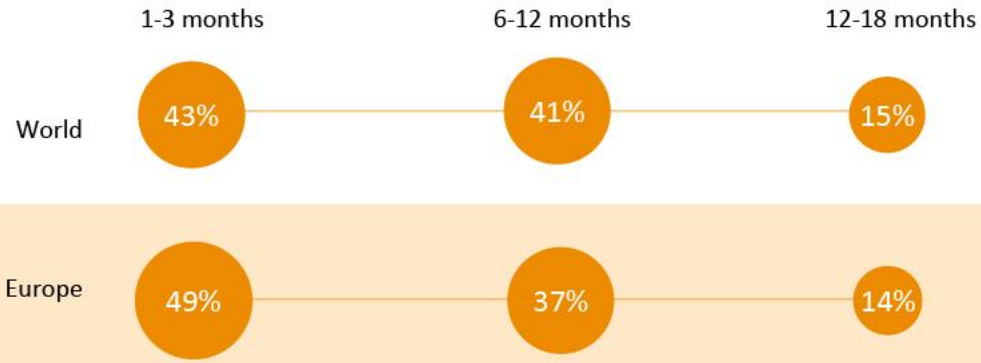
- Advanced digitalisation
- Better developed resilience skills and capabilities
- Contraction of business and decreased revenues

Being able to maintain operations with staff working remotely through digital is likely to be a long-term benefit from the crisis response and affect corporate operational cultures more deeply, while the enhanced resilience capabilities should lead to better planning and preparedness. Reduced business and revenues will affect corporate financial plans.

Further **erosion of electricity market**, increased volatility in transmission grids, and decrease of security of supply are expected by some respondents.

Global vs Europe: Impact on Energy systems (1/2)

When will the current measures in your country have their greatest impact on energy systems?



How long will it take for society to come back to normal after the peak?

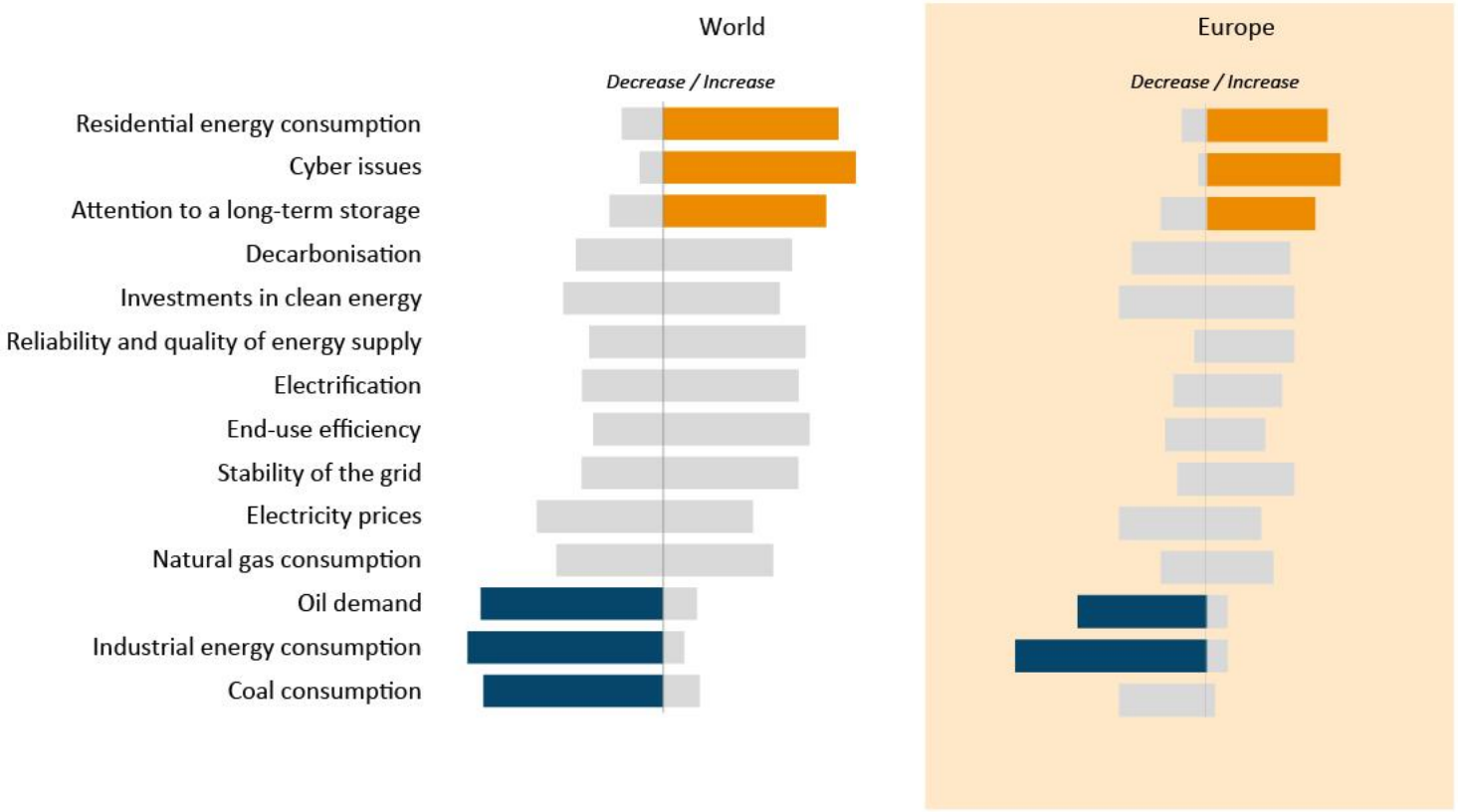
Almost **90**% of respondents in **Europe** expect that the major impact on energy system to be in next 1-3 months or 6-12 months. This is similar to global perspective.

After peak disruption, most of regions **do not expect to get back to normal quickly**.

15% of respondents in **Europe** see that there will not be a return to business as usual, rather regions will need to adapt to a 'new normal'.

Global vs Europe: Impact on Energy systems (2/2)

What will be the major long-lasting impacts (over 12 months) on energy systems in your country?



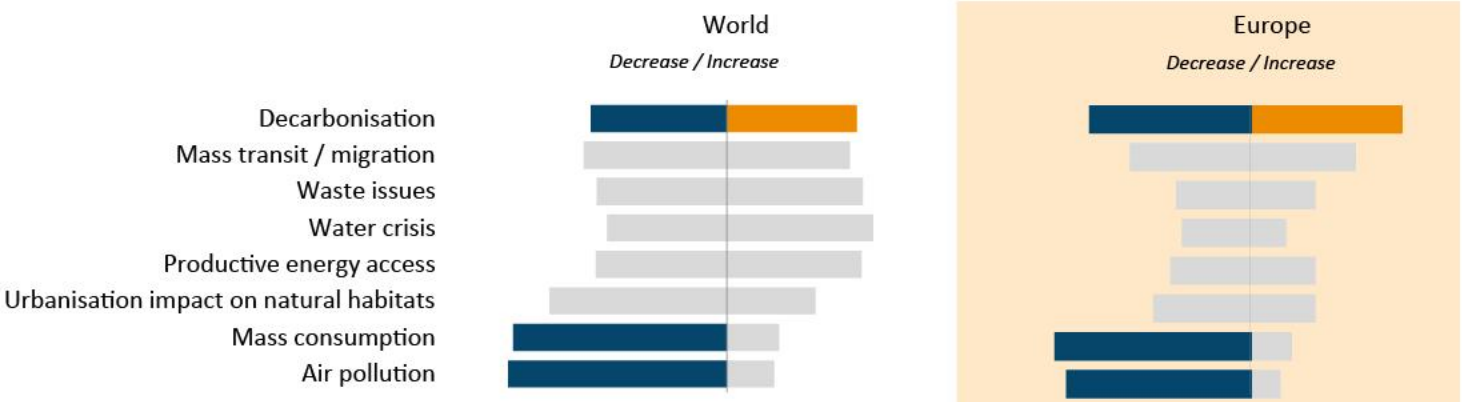
Changes in electricity demand patterns – increase in residential electricity use, decrease in industrial use and lower daily demand loads – is seen as a major impact on energy systems across all regions.

Attention to long term storage solutions and decarbonisation is indicated as major long term implications across all regions, and in Europe.

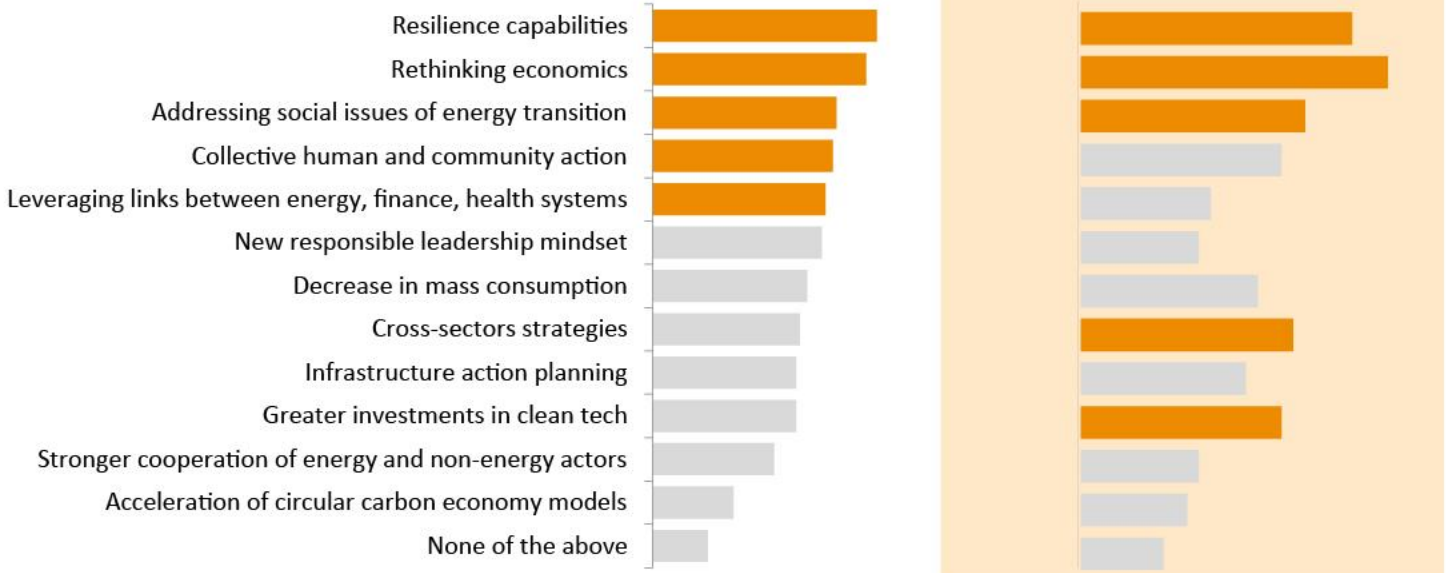
Decrease in oil demand is mentioned by respondents in almost all regions, including Europe. The implication of low / negative oil prices might bring structural implications in energy systems and communities.

Global vs Europe: Environment & energy transition

What will be the major long-lasting impacts (over 12 months) on environment in your country?



In your opinion, could COVID-19 be a pivot point for accelerating energy transition and if so, what would be top three factors in reshaping it?



WORLD ENERGY COUNCIL

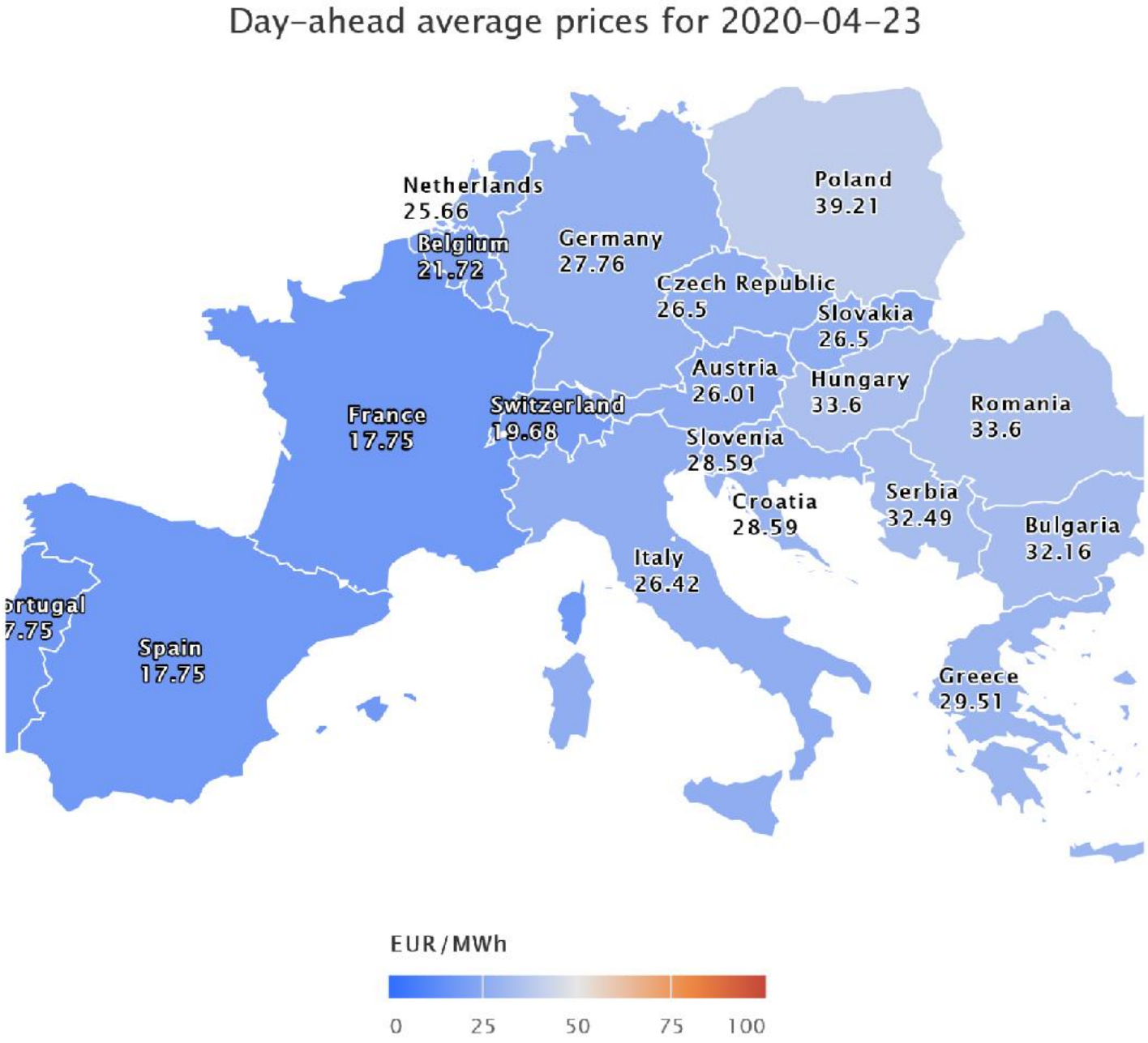
As COVID-19 crisis impacts all activities it is expected there will also be benefits of **reduced pollution and mass consumption** across all regions.

There are, however, split views on the **outlook for decarbonisation** of energy systems within regions and in Europe as well.

Some respondents anticipate potential delay as governments respond to pressures to restart growth by rolling back action on climate goals. Others anticipate, however, that crisis will accelerate decarbonisation as governments increase direct investment to energy systems.

Responses also suggest that the impacts of and responses to the COVID-19 crisis might be a game changer in energy transition – emphasising the need for **resilience** and dealing with the **social issues** of energy transition.

European respondents indicate also importance of **cross-sector strategies** and greater **investments in clean technologies and vectors**.



Europe is divided into two, which demonstrates the following:

- There is no unique voice in energy;
- There is no prioritization of interconnection projects;
- European power demand appears to have found its bottom;
- The importance of the single energy market in Europe.

Thank you!

- Romanian National Committee of World Energy Council
- B-dul Lacul Tei, nr. 1-3
  București, Sector 2, 020371
  +40372-821-475
  +40372-821-476
  secretariat@cnr-cme.ro

KEYNOTE ADDRESS

A Stable and Smart Grid with High RES - Key Enablers for the European Green Deal

Manuel SÁNCHEZ-JIMENEZ
Team Leader Smart Grids
DG ENER, European Commission

A Stable and Smart Grid with High RES - Key enablers for the European Green Deal

30th of April 2020

ONLINE VIDEOCONFERENCE

Dr. Manuel Sánchez

Team Leader for Smart Grids

Directorate for Internal Market – Unit for retail markets

European Commission - DG Energy

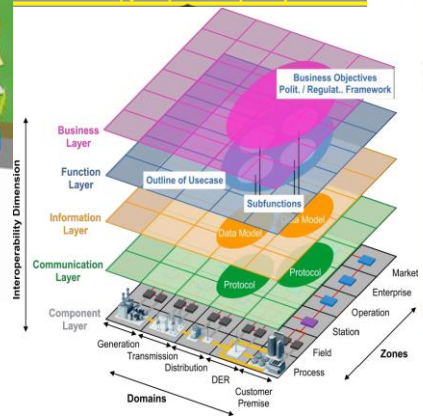
European Commission

The European Green Deal

COM(2019) 640 final of 11 December 2019, at https://ec.europa.eu/info/publications/communication-european-green-deal_en

European Commission

Energy System Integration strategy
Significant challenges ahead



Strong interconnectors and market coupling to Europe

+

Coherent energy systems, cooperation between gas, electricity, heat and transport

+

Intelligent energy using smart grid, gas fired CHP units and flexible demand

+

Gas storage

Conversion of electricity to gas (P2G) for quantitative storage for later use in CHP units to new electricity production

European Commission

Final remarks

- **The Green Deal** set up the policy and instruments to transform EU's economy for a sustainable future.
- **Smart Grids** are key for the transition towards the **Energy System Integration strategy.**
- Smart Grids are about the **digital transformation of the energy sector.**
- The **CEP represents the framework towards this energy system transformation**, **which is not happening automatically.**

Looking ahead towards a **clean, affordable and secure European energy**, the deployment of Smart Grids calls for:

- accompanying actions to develop and implement **clear procedures for access to data, interoperability requirements, cybersecurity and synergies** with other sectors
- **investments on new data processing infrastructures** for flexibility services which guarantee cost-effective investments and add value to **both grid operators and users**
- **research and innovation on power electronic** technologies to overcome physical restrictions and **emerging disruptive technologies** for further integrate distributed energy resources
- **Updated traditional human resources** and create **new 'digital' skills at all levels**

Thank you

manuel.sanchez-jimenez@ec.europa.eu

European Commission

SESSION 1

INNOVATIVE T&D SOLUTIONS AND ICT SERVICES FOR GRID OPERATORS

30th of April 2020

ONLINE
VIDEOCONFERENCE

SESSION 1

INNOVATIVE T&D SOLUTIONS AND ICT SERVICES FOR GRID OPERATORS

CHAIR

Mihai PĂUN
Vice-President
Romanian Energy Center

SOGNO
Service Oriented Grid for the Network of the Future

Main results and achievements

Fiona WILLIAMS
Project Coordinator
SOGNO Project

SOGNO

Service Oriented Grid for the Network of the Future

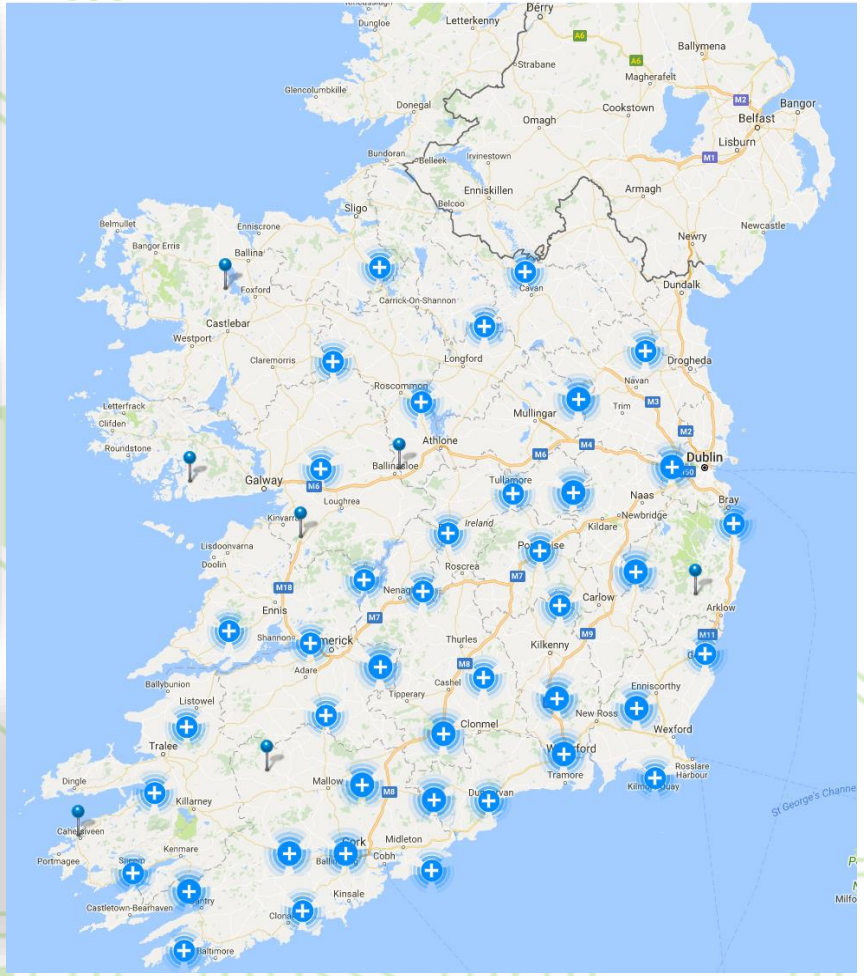
Challenge Scenario: Storm Ophelia in Ireland (2017)

Hurricane Ophelia damage: Ireland could be without power and water for more than a WEEK

EXPRESS

Transport and power disruption continues as Storm Ophelia moves on

The Guardian International edition

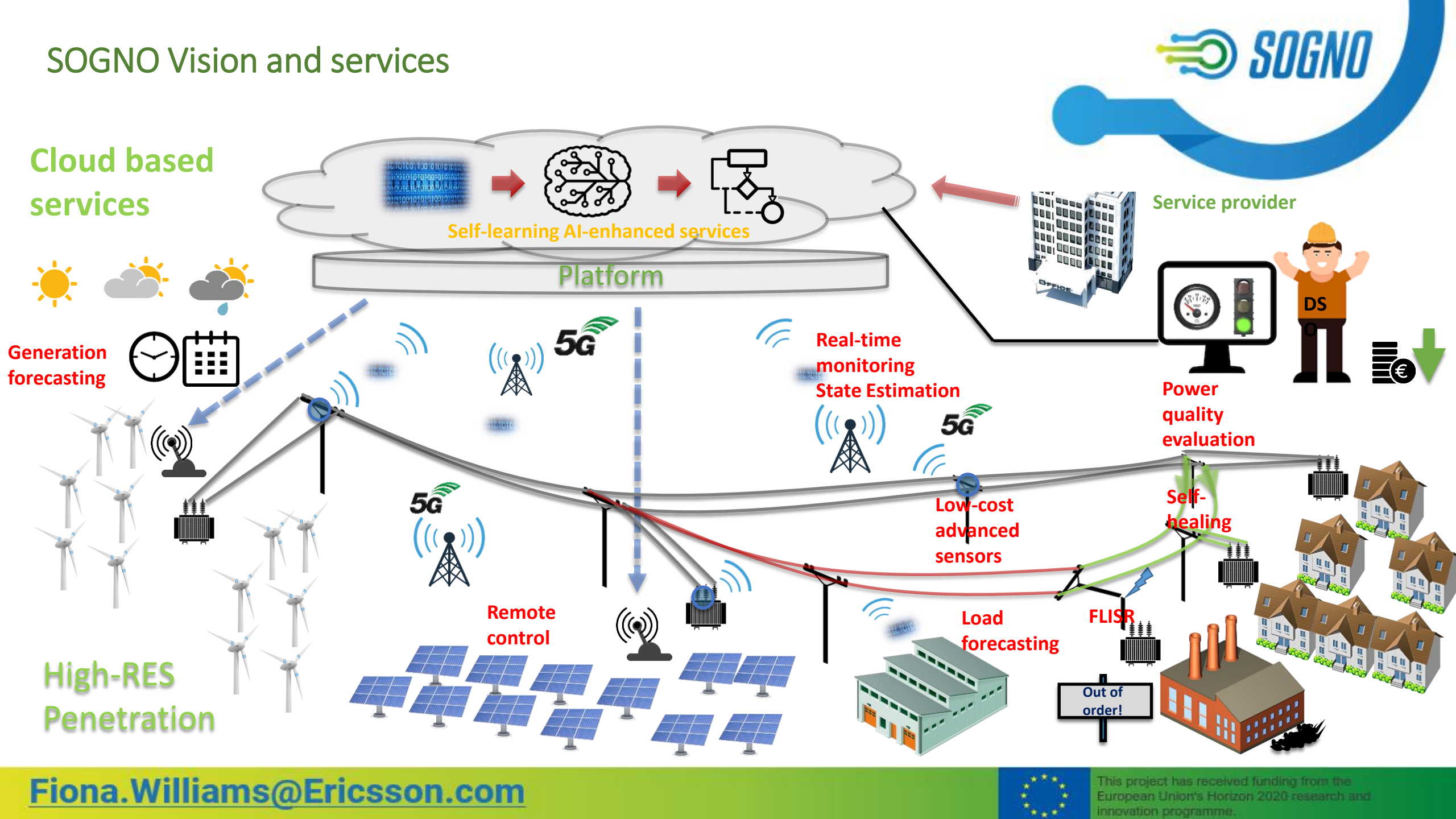


- *5.500 damaged overhead lines!*
- *385.000 homes and businesses with no electricity!*
- *665.6 million customer minutes of service were lost!*

Fiona.Williams@Ericsson.com

This project has received funding from the European Union's Horizon 2020 research and innovation programme.

SOGNO Vision and services



Fiona.Williams@Ericsson.com

This project has received funding from the European Union's Horizon 2020 research and innovation programme.

Prof. Antonello MONTI
Technical Director
SOGNO Project

Marco PAU
Project Manager
RWTH

SOGNO
Services and Solutions

LIVE Demonstration

- ✓ **State Estimation – SE**
- ✓ **Power Control – PC**
- ✓ **Fault Location Isolation & Service Restoration – FLISR**
- ✓ **Load & Generation Forecasting - LGF**

Service Oriented Grid for the Network of the Future

Prof. Antonello Monti

RWTH Aachen University

SOGNO pillars

SOGNO services ingredients

SENSORS AND MEASUREMENTS

LoCO PMU
A-PMU

CLOUD VIRTUALIZATION OF SUBSTATION INTELLIGENCE

ViSA
(SE, PC, PQ, FLISR and LGP services)

5G WIRELESS COMMUNICATION

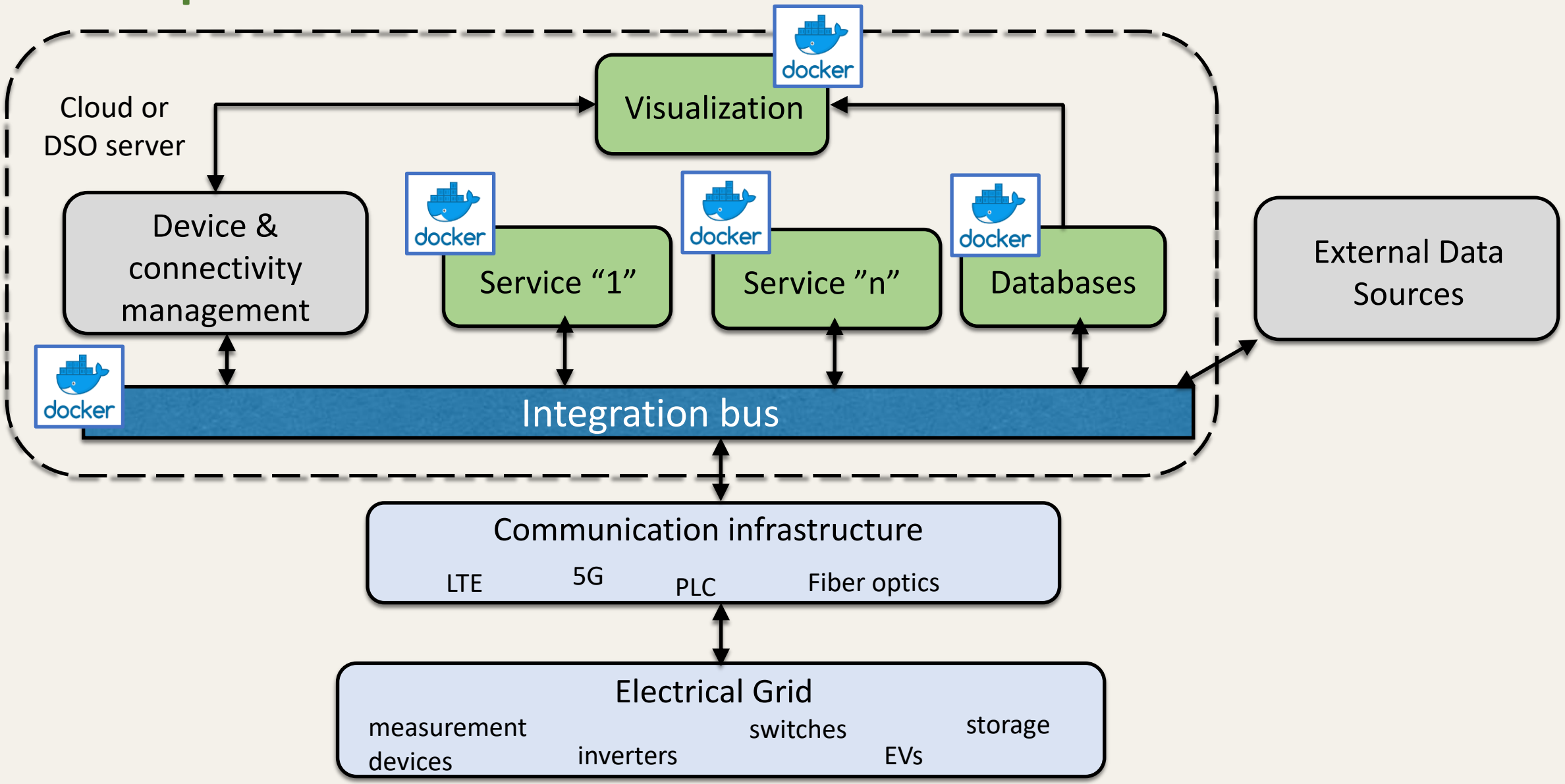
Lab tests with Ericsson BS SDRs

DATA ANALYTICS BASED ON DEEP LEARNING

SE, FLISR and LGF services using machine learning

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 774613.

SOGNO platform



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 774613.

Disruptive changes spurred by the SOGNO Solution

Conventional approach

- Access to system automation and awareness functions through installation of monolithic software to an existing SCADA system
- Centralised product procurement from one of few established ADMS providers

Distribution Network Management System

Legacy System (SCADA)
incl. service modules

Measurement Devices

Single vendor product procurement

DSO Utility

Multiple vendor service procurement

SOGNO-trialled approach

- Flexible access to system automation and awareness functions via remotely- or self-hosted IOT platforms
- Decentralised service procurement from one or more providers without vendor lock-in

Distribution Network Management System

Open Cloud-based Platform

OR

DSO Technical Platform

Service Modules
- Power Control
- FLISR
- State Estimation
- ...

Multiple Algorithm Implementers

Measurement Devices

Multiple suppliers of measurement devices

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 774613.

Changes in the regulatory framework support the SOGNO vision

"The situation today"

Supporting CAPEX:

Incentives for investments in physical assets

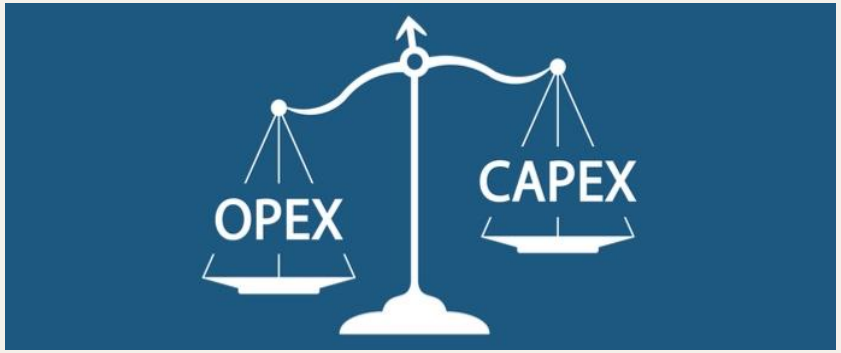
OPEX – "Cost of Services" not supported at all

CAPEX – "Cost of Investments" not properly supported: development of the network in order to respond to "peak values"

TOTEX approach

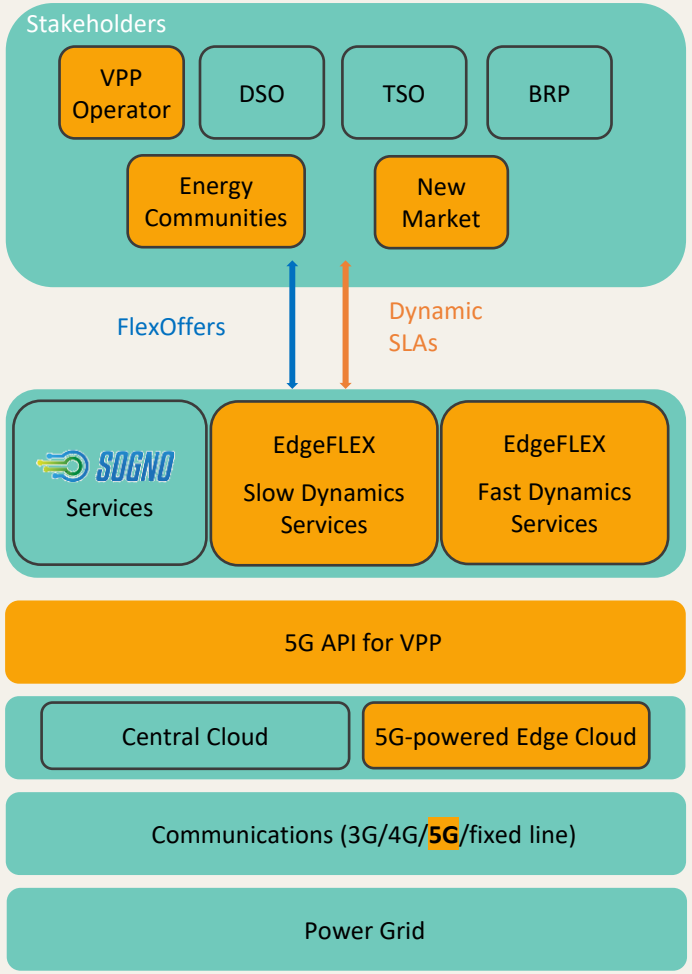
EC recommendation from "Winter package": The Regulatory framework to support **OPEX –**

cost of services



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 774613.

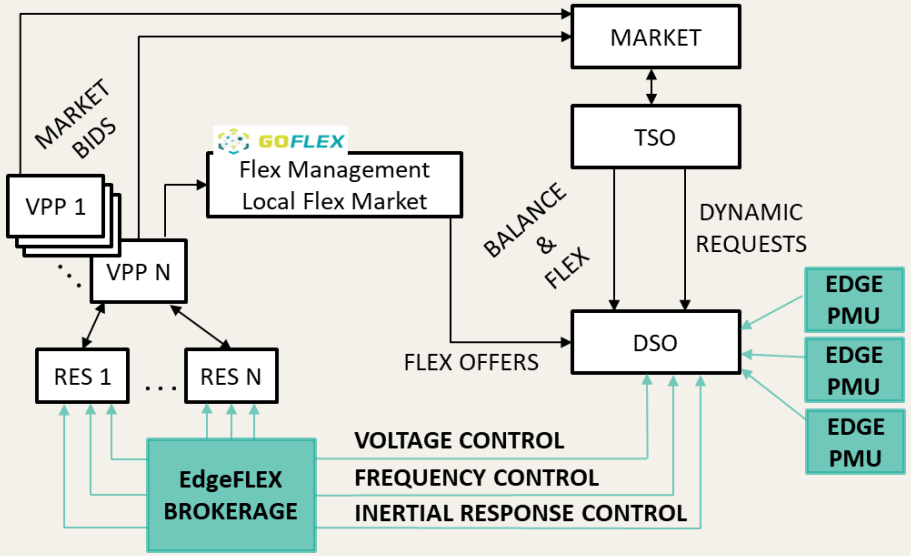
Extension of SOGNO platform in EdgeFlex



- Building upon SOGNO platform architecture, EdgeFLEX will extend the stakeholders' group, especially aiming at **Virtual Power Plants** and **Energy Communities**.

- EdgeFLEX will enable **Slow and Fast dynamics services**
  - Phasor-driven Voltage Control
  - Frequency Control
  - Inertia Provision
  - VPP assets optimization

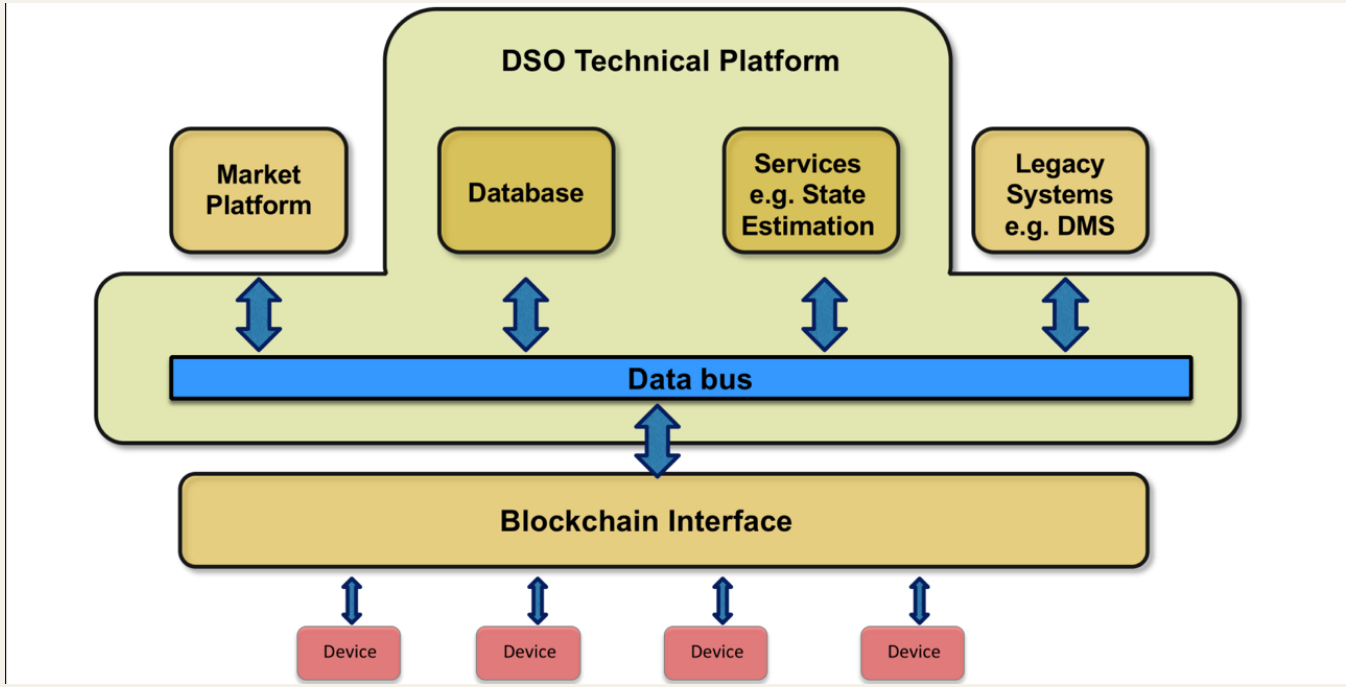
- EdgeFLEX will foster a **local energy and flexibility market** where all involved actors will contribute in actively manage and operate the power grid



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 774129.

Extension of SOGNO platform in PlatOne

- PlatOne solutions builds on the same data bus and architecture defined in SOGNO and it keeps the link to legacy DMS
- Two major extensions:
  - Option of a blockchain interface for direct customer involvement
  - Development of a specific interface for Market Platforms



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 774613.

Álvaro NOFUENTES PRIETO
WISEGRID
Project Coordinator

WISEGRID
Wide Scale Demonstration of Integrated Solutions and Business Models for European Smart Grids

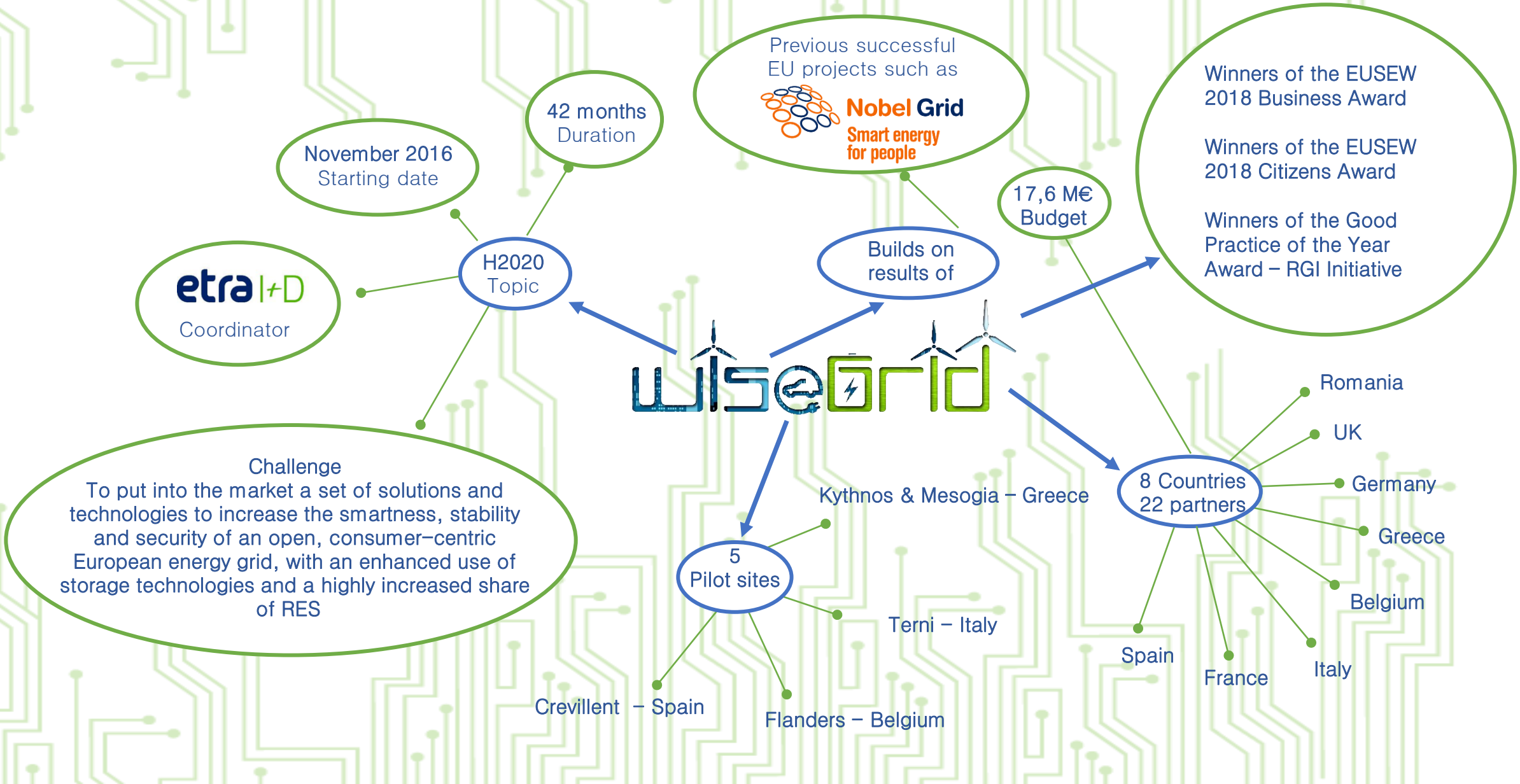
✓ **Technological Solutions and Pilot Sites Results**

WISEGRID

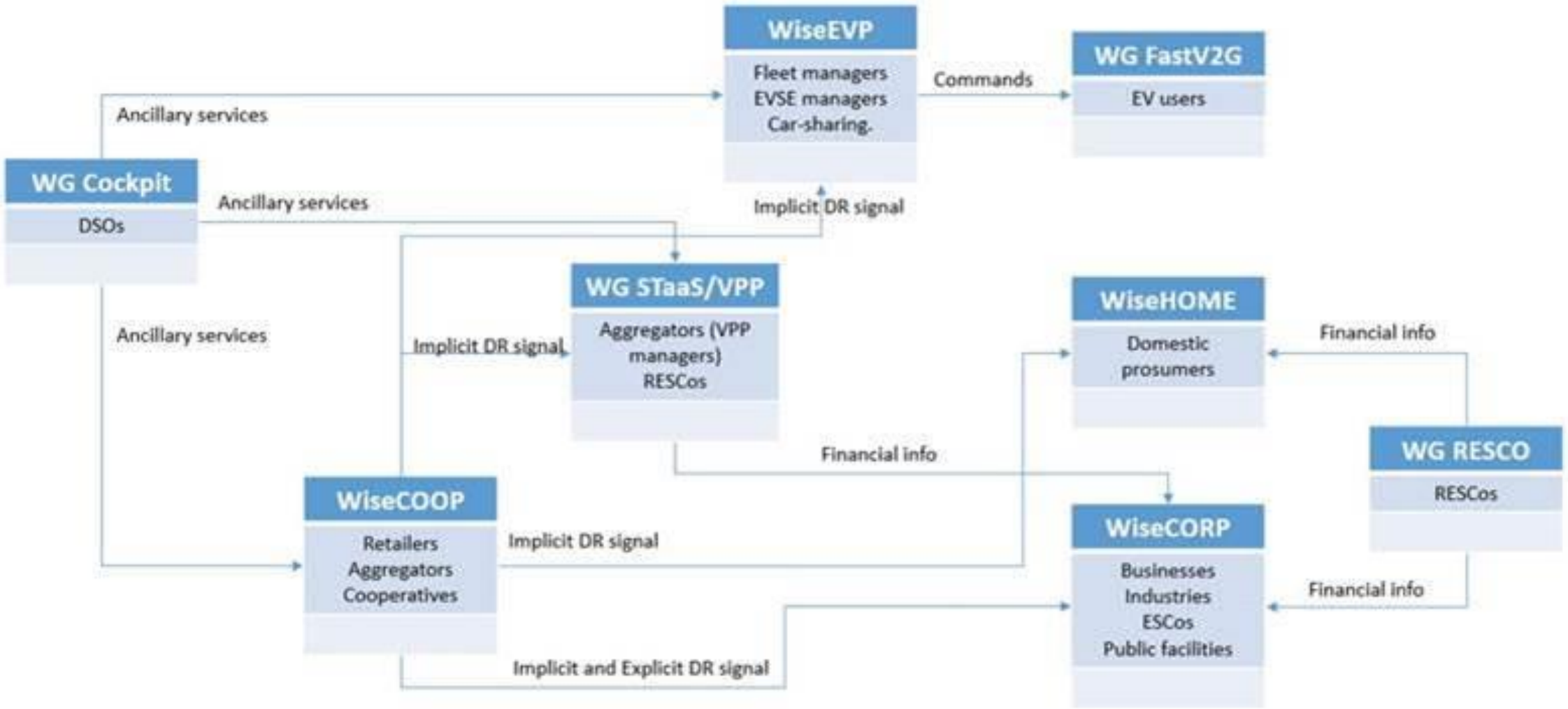
30th of April 2020

ONLINE
VIDEOCONFERENCE

ETRA I+D/ Álvaro Nofuentes


Previous successful EU projects such as
Nobel Grid
Smart energy for people
42 months
Duration
November 2016
Starting date
17,6 M€
Budget
Winners of the EUSEW 2018 Business Award
Winners of the EUSEW 2018 Citizens Award
Winners of the Good Practice of the Year Award – RGI Initiative
H2020
Topic
etra I+D
Coordinator
Builds on results of
wiseGrid
Challenge
To put into the market a set of solutions and technologies to increase the smartness, stability and security of an open, consumer-centric European energy grid, with an enhanced use of storage technologies and a highly increased share of RES
5
Pilot sites
Kythnos & Mesogia – Greece
Terni – Italy
Crevillent – Spain
Flanders – Belgium
8 Countries
22 partners
Romania
UK
Germany
Greece
Belgium
Italy
France
Spain


WG Cockpit
WG IOP
WiseHOME
WiseCOOP
WiseCORP
WG STaas/VPP
WG RESCO
Retailer
WG FastV2G
WiseEVP


WiseEVP
Fleet managers
EVSE managers
Car-sharing.
Commands
WG FastV2G
EV users
Ancillary services
WG Cockpit
DSOs
Ancillary services
Implicit DR signal
WG STaaS/VPP
Aggregators (VPP managers)
RESCos
Ancillary services
Implicit DR signal
WiseHOME
Domestic prosumers
Financial info
WG RESCO
RESCos
Financial info
WiseCOOP
Retailers
Aggregators
Cooperatives
Implicit DR signal
WiseCORP
Businesses
Industries
ESCos
Public facilities
Financial info
Implicit and Explicit DR signal

WG Cockpit

WiseHOME

WiseCORP

WG Fast V2G

WiseEVP

WiseCOOP

WG STaaS/VPP

WG RESCO

Main achievements of WiseGRID

- Development of the 9 tools.
- Integration of 9 the tools in the same framework.
- Deployment of the 9 tools in the different pilot sites.
- Demonstration of the 9 tools in the Pilot Sites.
- Study of the energy regulatory framework of EU-27countries (+UK).
- Definition of the Business models.
- Market analysis.
- Establishment of the methodology for validating the project.
- Performance of citizen engagement workshops in the 5 pilot sites.
- Work on standardization via CEN/CENELEC Workshop (CWA).

Thank you!

www.grupoetra.com

This project has received funding from the European Union's Horizon 2020 research and innovation programme under the grant agreement No 731205.

PHOENIX

The European Smart Grid with increased protection and fast mitigation of cyber-attacks against assets and networks of the future

Farhan SAHITO
PHOENIX
Project Coordinator

Electrical Power System's Shield against complex incidents and extensive cyber and privacy attacks

Stakeholders Consultation Event

and synergies within the European H2020 Projects SOGNO, WISEGRID, PHOENIX, CROSSBOW and DEFENDER

Farhan Sahito

Project Coordinator

Capgemini Technology Services, France

30 April 2020

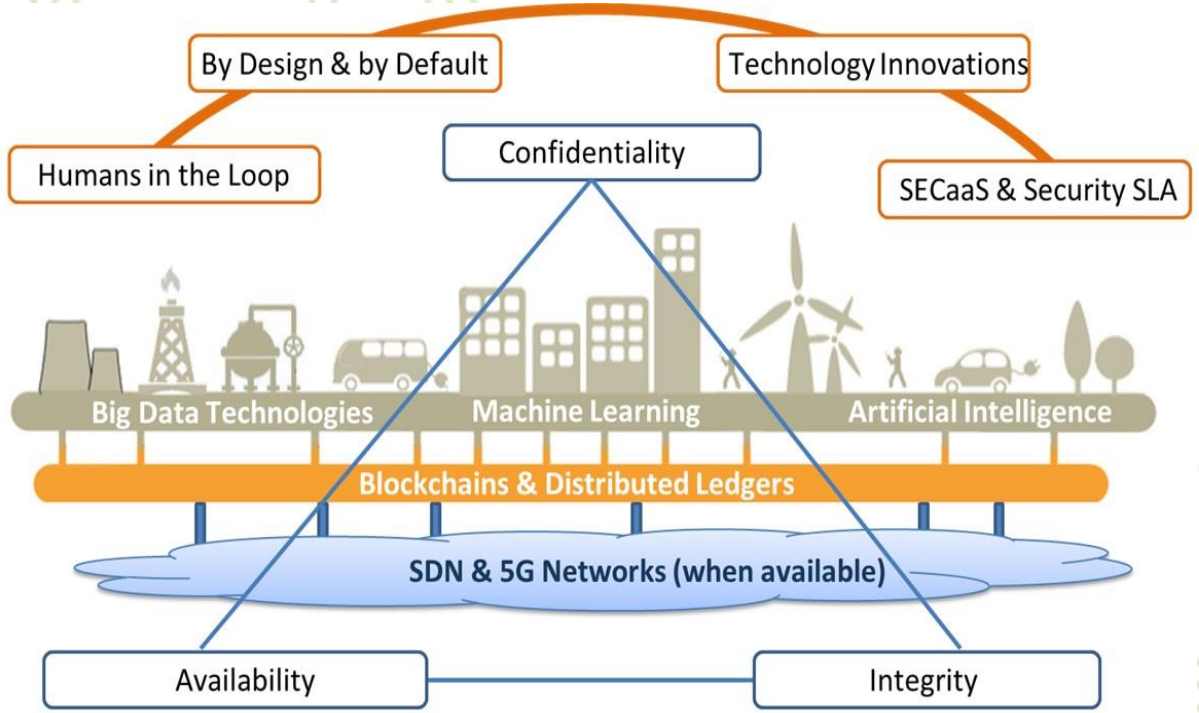
Project Facts and Objectives

- Funding: **EUR 8 million**
- Duration: **36 months (1-Sep-2019 to 30-Aug-2022)**

Strategic Objectives:

Protection of the Electrical Power and Energy System (EPES) via ***prevention***, ***early detection*** and ***fast mitigation*** of cyber-attacks while protecting the data privacy by design and by default.

- Strengthen EPES cybersecurity preparedness
- Coordinate EPES cyber incident discovery, response and recovery
- Accelerate research and innovation in EPES cybersecurity



PHOENIX Key Challenges, Pillars and Technologies

The Consortium: 24 Partners from 11 countries

Coordinator

Capgemini

End Users

ASM Terni S.p.A.
BFP
Emotion
Elektro Ljubljana
BTC City
DELGAZ grid
e.on
TRSC Testing Research & Standards Center
CRE Romanian Energy Center
TELETRANS
Transelectrica

Industry

THALES
SingularLogic
DNV·GL
INTRASOFT INTERNATIONAL
ISKRAEMECO
Atos

SMEs

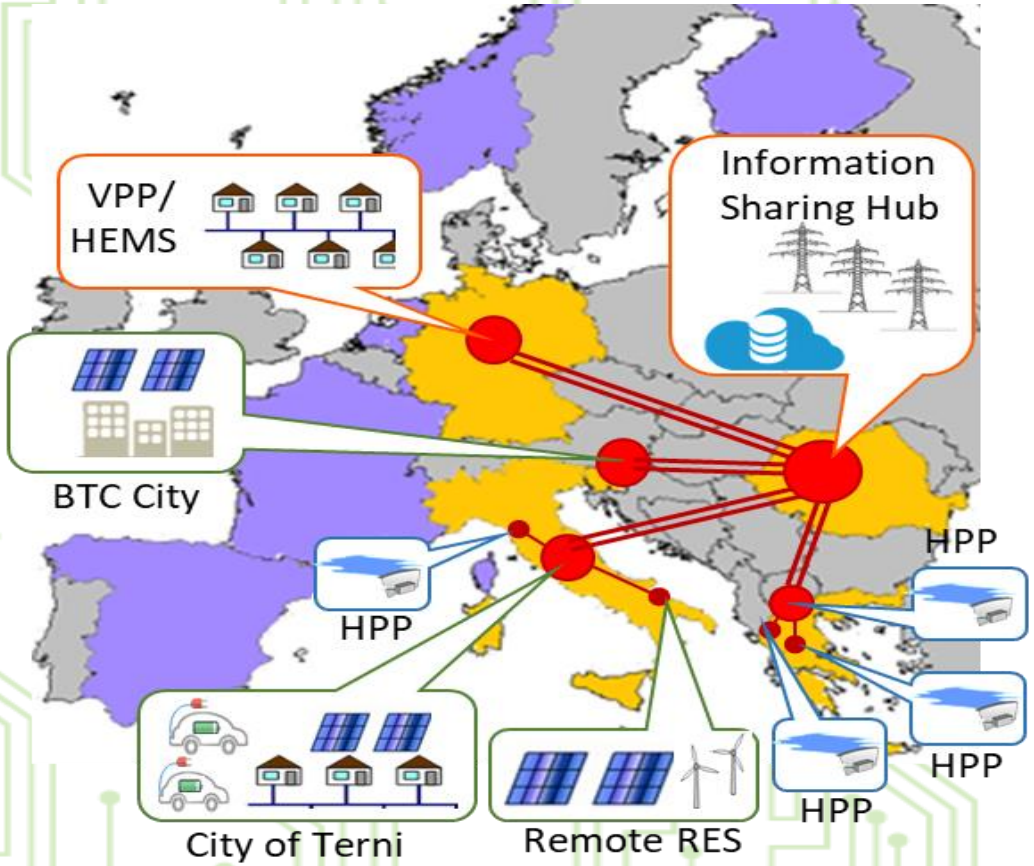
Cyberethics Lab. Responsible Research & Innovation
SYNELIXIS
COMSENSUS

Research Institutes

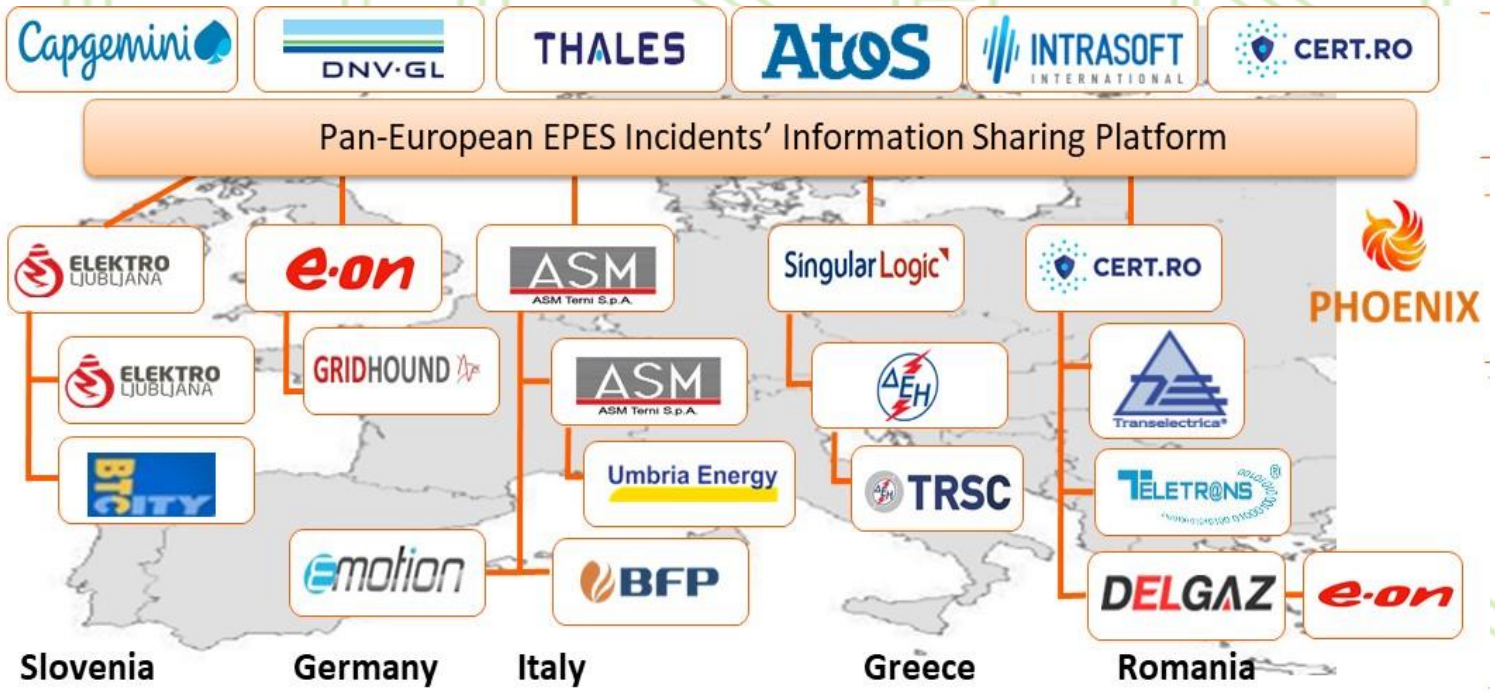
A?
E.ON Energy Research Center | RWTH AACHEN UNIVERSITY

PHOENIX Large Scale Pilots (LSPs)

PHOENIX will involve real-world scenarios to validate the effectiveness of PHOENIX across **5 European Large Scale Pilots (LSP)** in Italy, Germany, Slovenia, Greece and Romania involving the complete end-to-end generation, transmission, distribution and prosumption value chain. Beyond the individual LSPs, ***cascading effects even to other critical infrastructures*** will be simulated and ***cross-border security and privacy*** sites will be tested and validated.



PHOENIX Pan-European I2SP Platform



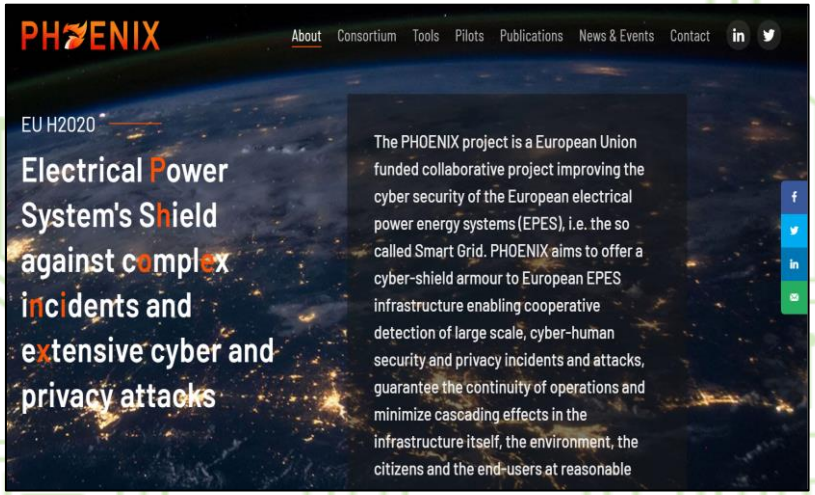
Collect and share incidents' information and trained ML models without the need to share sensitive information across EPES operators and CERTs.

PHOENIX Expected Results

- A holistic EPES security & privacy protection framework, including:
  - 5G/ inter-DLT secure & traceable communications,
  - Situation Awareness, Perception & Comprehension based on privacy-preserving federated ML/zero knowledge verification,
  - Traceable/near real-time synchronized incidents information sharing platform (I2SP),
  - GDPR Privacy Protection Toolkit,
  - Innovative Security & Privacy as a service business model

Project Progress

- **Project Website:** Available at www.phoenix-h2020.eu, the phoenix project website offers project information, news, events information, blogs, publications, newsletters and integration with social media handles
- **Press Release:** Multiple websites have released news on the project. Some of them are:
  - Le Monde Informatique.fr, Nov 27 : Capgemini pilots the european cybersecurity project Phoenix
  - Global Security Mag, Nov 26: Capgemini Coordinates Phoenix cybersecurity project
  - Cercle Finance, Nov 26: Capgemini: coordination of Phoenix cybersecurity project
  - Zone Bourse, Nov 26: Capgemini: coordination of Phoenix cybersecurity project
- **Dissemination Events:** PHOENIX has been presented at multiple events such as CENT-RO, The World Bank, Balkans Digital Highway Workshop, Mediterranean Security Event 2019, European Utility Week 2019, ENISA, EE-ISAC Plenary & Training etc, Analyst and Advisors' day at Capgemini etc



Project Progress

- **Newsletters and Brochure :** Quarterly newsletters with project progress, relevant events and latest blogs are published on the project website. The first project brochure has been designed as well.
- **Social Media:** LinkedIn (www.linkedin.com/company/phoenix-h2020) and Twitter (twitter.com/H2020Phoenix) handles for the project have been set up, and regular project updates are shared on the same

PHOENIX

Electrical Power System's Shield against complex incidents and extensive cyber and privacy attacks

Newsletter no. 2 – December 2019 - January, February 2020.

Description and Benefits

PHOENIX is a Horizon 2020 collaborative project, co-funded by the European Union.

It focuses on the protection of the European end-to-end European Electrical Power Energy systems (EPES) via early detection and fast mitigation of cyber-attacks against their assets and networks from human activities, while protecting the utilities and end-users' privacy from data breaches by design. The consortium is coordinated by Capgemini Technology Systems and brings together 24 partners from 11 EU Countries.

The challenge of the project is to provide a cyber-shield armour to European EPES to survive coordinated, large scale cybersecurity and privacy incidents; guarantee the continuity of operations and minimize cascading effects in the infrastructure itself, the environment and the end-users at reasonable cost.

H2020 PHOENIX Project At a glance

Title: Electrical Power Energy System's (EPES) Shield against complex incidents and extensive cyber and privacy attacks
Type of action: Innovation Action
Topic: SU-DS04-2018-2020 Grant Number: 832989
Total Cost: € 10 999 208,21
EC Contribution: € 7 995 004,25
Start Date: 01/09/2019
End date: 31/08/2022
Duration: 36 months
Project Web Site: www.phoenix-h2020.eu
Key Words: Cybersecurity, Energy, EPES Project
Coordinator: CAPGEMINI

Project Objectives

1. Strengthen EPES cybersecurity preparedness
2. Coordinate cyber-incident discovery, sharing & response
3. Accelerate research & innovation in EPES cybersecurity via DevSecOps and innovative ML-based technologies.

Concept and approach

PHOENIX focuses on the protection of the European EPES via:
(i) Cybersecurity & Data Privacy by design and by innovation, (ii) cross-country Cybersecurity Information Sharing, realising NIS Directive (iii) realistic exploitation, penetration testing and verification/certification methodologies and procedures and (iv) validation in 5 real-life Large-Scale Pilots (LSP) across Europe. To know more about the LSPs, visit PHOENIX Pilot Sites.

PHOENIX NEWSLETTER FEBRUARY 2020

PHOENIX second plenary meeting

The second plenary meeting of PHOENIX was successfully held at INTRASOFT International SA at Athens, Greece on 4th and 5th Feb 2020. The meeting was attended by the consortium partners and the EU Commission Project Officer. The two days saw interesting presentations and discussions about PHOENIX platform architecture, underlying technologies and the upcoming real-life large scale pilots.

During the initial phase of the project, a major effort by the partners has been placed in analyzing comprehensively the cyber threats associated with the European EPES (Electrical Power and Energy System). This work item is close to being completed. Simultaneously, the design of the various parts in the architecture of the PHOENIX platform have been initiated in the associated work packages. However, the intensity of the design efforts will increase significantly in the near future as the project progresses steadily towards its goals.

Presence in Impact Creation Events

Capgemini Analyst and Advisor Day
Capgemini 147, Issy, Paris, December 4, 2019

The PHOENIX project objectives, expected impact and technology were introduced by Dr. Farhan Sahito (Project Coordinator, Capgemini) and Wafa Ben Jaballah (Thales Group) to the attendees of Capgemini annual Analyst and Advisor Day at Capgemini 147, Issy Les Moulineaux, France on 4 Dec 2019. The event was attended by 31 analysts and advisors from 21 different

Secure Societies "Project to Policy" Kick-Off Seminar
Brussels, January 31, 2020

The PHOENIX project was invited to present at the first Secure Societies "project to policy" kick-off seminar organized by REA B4, together with DG CNECT and DG HOME at Brussels on 31 Jan 2020. With an aim to understand the relevant policy drivers and integrate them into the project from the start, Dr. Farhan Sahito presented a view into how PHOENIX will contribute to the implementation of EU policies.

For more details contact:

Farhan Sahito
Project Coordinator
Capgemini Technology Services, France
farhan.sahito@capgemini.com

PHOENIX Admin Team
phoenix-info.fr@capgemini.com

Join Us

@H2020Phoenix
/phoenix-h2020/
https://phoenix-h2020.eu/

Phoenix

Phoenix

EU H2020
Electrical Power System's Shield against complex incidents and extensive cyber and privacy attacks

The project has received funding from the European Union's Horizon2020 research and innovation programme under grant agreement N°832989. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Thank You !

PANEL DISCUSSION

The role of TSOs and DSOs for securing the Smart Grid towards up to 100% Renewables

30th of April 2020

ONLINE
VIDEOCONFERENCE

Moderator:

Mihai PĂUN
Vice-President
Romanian Energy Center

Panelists:

Corina POPESCU
CEO
ELECTRICA

Roberto ZANGRANDI
Secretary General
E.DSO for Smart Grids

Bas KRUIMER
Business Director Intelligent Networks & Communication
DNV GL Netherlands

Nikos HATZIARGYRIOU
Vice-Chair
ETIP-SNET

Silvia VLĂSCEANU
General Director
ACUE

Miguel Angel SÁNCHEZ-FORNIÉ
EDDIE Project Coordinator
COMILLAS

Mirela DIMA
Director
Regulatory Affairs
CEZ Romania

Valeriu BINIG
Director
Regulatory and Antitrust
ENEL Romania

The role of TSOs and DSOs for securing the Smart Grid towards up to 100% Renewables

Discussion Topics:

- ✓ **Business Models for RES integration with increased protection and fast mitigation of the cyber-attacks against assets and the networks of the future;**
- ✓ **The Role of Education for Digitalizing the Power Sector;**
- ✓ **Edge Cloud and Artificial Intelligence Based Solutions for Grid Services;**
- ✓ **Potential Regulatory Measures to:**
  - ➢ **Enabling the Development and Implementation of New Innovative Services and Solutions and to**
  - ➢ **Ensuring Optimal Operation of Critical Power Infrastructure**

QUESTION 1:

May the Increasing of efficiency in operating the Electricity Distribution Networks by integrating New Innovative Services (e.g. State Estimation, Fault Location & Service Restauration, Load and Generation Forecasting) be a viable alternative to Investments in Network Development?

QUESTION 2:

What are the most appropriate Regulatory Measures for properly supporting and facilitating the development and the use of the New Services previously mentioned?

What are the main obstacles preventing the integration of these New Services, and what is the most appropriate way forward?

QUESTION 3:

What can DSOs and TSOs do to facilitate the implementation of the adequate measures providing added value and creating an impact in the Management and the Operation of the Electricity T&D Network?

QUESTION 4:

What is the role of Education for Digitalizing the Power Sector?

Current European Initiatives?

QUESTION 5:

How can the TSOs and DSOs ensure the increased protection and mitigation of the Cyber-Attacks?

What is the Role of the European and National Associations?

Business Models for high RES Integration with increased protection?

QUESTIONS AND DEBATE

10’

30th of April 2020

ONLINE
VIDEOCONFERENCE

BREAK

SOGNO and WISEGRID VIDEOS

10’

30th of April 2020

ONLINE
VIDEOCONFERENCE

SESSION 2

DEVELOPMENTS IN THE STANDARDIZATION FOR THE POWER SECTOR

30th of April 2020

ONLINE
VIDEOCONFERENCE

CHAIR

Cristian COLŢEANU
Director Strategy &
International Affairs
Romanian Energy Center

SESSION 2

DEVELOPMENTS IN THE STANDARDIZATION FOR THE POWER SECTOR

KEYNOTE ADDRESS

THE ROLE OF ACER IN ADAPTING THE EXISTING MARKET RULES TO NEW EMERGING MARKET REALITIES

Bogdan CHIRIŢOIU
Member of the Board
ACER

Ioannis VLACHOS
Project Manager
ICCS

STANDARDIZATION OF BLOCKCHAIN TECHNOLOGIES IN THE POWER SECTOR

Roles and Development Directions

CRE
Romanian Energy Center

Status Update of Standards in Blockchain and Energy in Europe

30th of April 2020

ONLINE
VIDEOCONFERENCE

IOANNIS VLACHOS, PhD

About Me

National Technical University of Athens, Greece
Senior Researcher on Smart Grids

European Technology & Innovation Platform Smart Networks for Energy Transition
WG4 Member – Blockchains, Big Data, and Cybersecurity

CEN-CENELEC Focus Group on Blockchain and Distributed Ledger Technologies
Member

Blockchain Initiatives in Europe

European Parliament

Distributed ledger technologies and blockchains: building trust with disintermediation

European Parliament resolution of 3 October 2018 on distributed ledger technologies and blockchains: building trust with disintermediation (2017/2772(RSP))

Blockchain Initiatives in Europe

European Telecommunications Standards Institute
Industry Specification Group on Permissioned Distributed Ledger (ISG PDL)

CIRED
Blockchain WG 2018-6

ETIP Smart Networks for Energy Transition
WG4: Digitization of the Electrical System and Customer Participation

CEN-CENELEC
Focus Group on Blockchains and Distributed Ledger Technologies

EU Blockchain Observatory and Forum

CIRED Blockchain WG 2018-6

CIRED Blockchain WG 2018-6

The Working Group investigates:

- projects using blockchain for the distribution system operation sector (in fields like maintenance management, engineering projects, customers relations, new services, etc.);
- challenges presented by transactive energy, role of DSOs in the implementation of such marketplaces, market models and business models of transactive energy and associated opportunities and challenges for DSOs; and
- possible contribution of blockchain in the development of transactive energy.

Results of the Working Group should allow to better understand the issues related to **transactive energy** as well as DSOs might expect from **blockchain technology** and how it can facilitate the development of new services.

ETIP Smart Networks for Energy Transition

ETIP SNET WG4

- The full digitalization of both the transmission and the distribution networks with new ICT infrastructures Cybersecurity issues linked to Use of big data, IoT and High Performances Computing;
- ICT infrastructures and technologies that will allow the involvement of the end customers and the retail market players;
- The retail electricity markets empowering customers (favorable environment to choose electricity suppliers and to better control consumptions through new services provided by new market players);
- The Improvement of public awareness of long-term energy challenges and the need to build and protect transmission infrastructure to increase the social benefit of energy use.
- Cybersecurity and **blockchain** technologies

CEN-CENELEC Focus Group on Blockchains and Distributed Ledger Technologies

CEN-CENELEC FG-BDLT

Objectives

- Identify potential specific European standardization needs, notably in **support to the current standardization activities being developed in ISO/TC 307 "Blockchain and DLT"**.
- To prepare an **overview for the stakeholder community on suitable standards already available or in preparation**, to meet specific European needs in Blockchain and DLT
- Where no suitable standards exist, to **define best ways to provide them in preference internationally but if necessary at European level**, and make recommendations accordingly
- To identify and **give due consideration to any relevant specific issues linked to European legislation or policy and/or innovation/research projects** impacting the subject

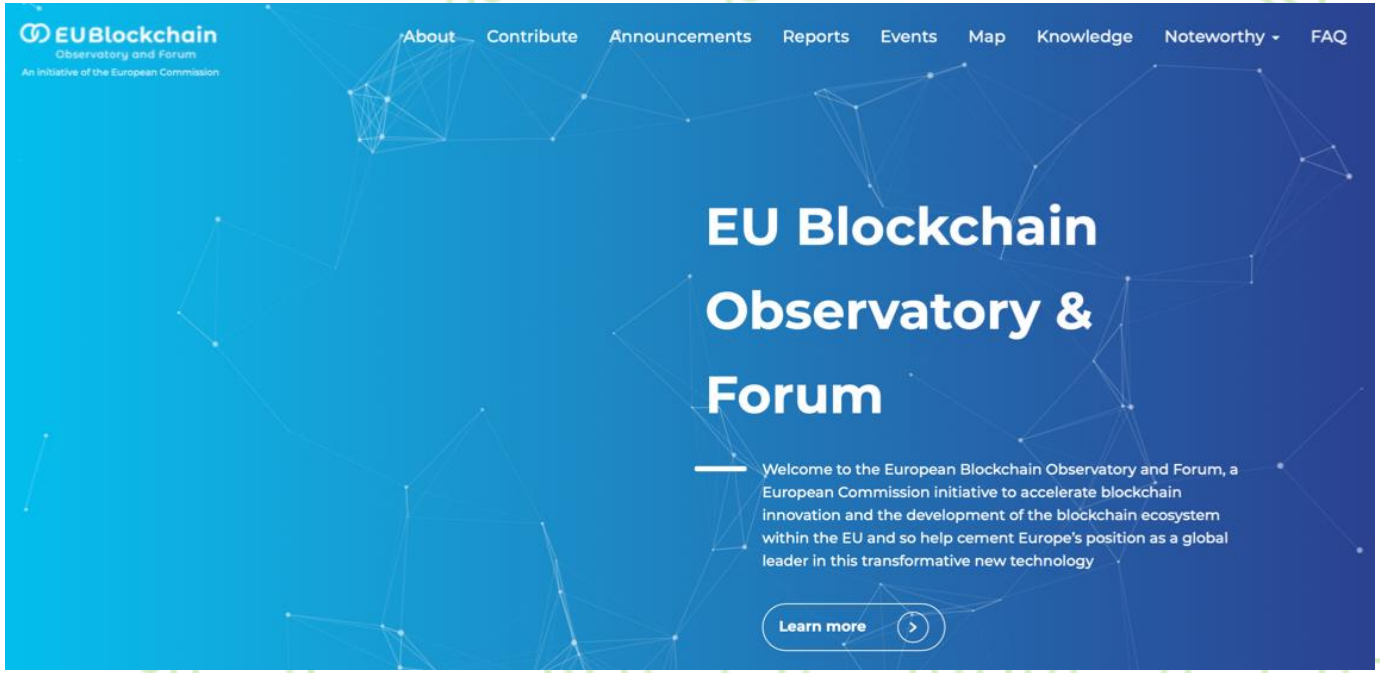
CEN-CENELEC FG-BDLT Recommendations

FG DLT Recommendation #4

- **R4-1:** For the **energy** decentralization and transition, IoT solutions based on Blockchain should be further explored; standardization work should also address the issue of energy consumption during the processes, with the aim to limit interactions between IoT devices to the minimum needed.
- **R4-2:** Standardization bodies to address **energy** management, which is especially important for Europe considering the new European legislative context (Clean Energy Package).

EU Blockchain Observatory and Forum

EU Blockchain Observatory and Forum

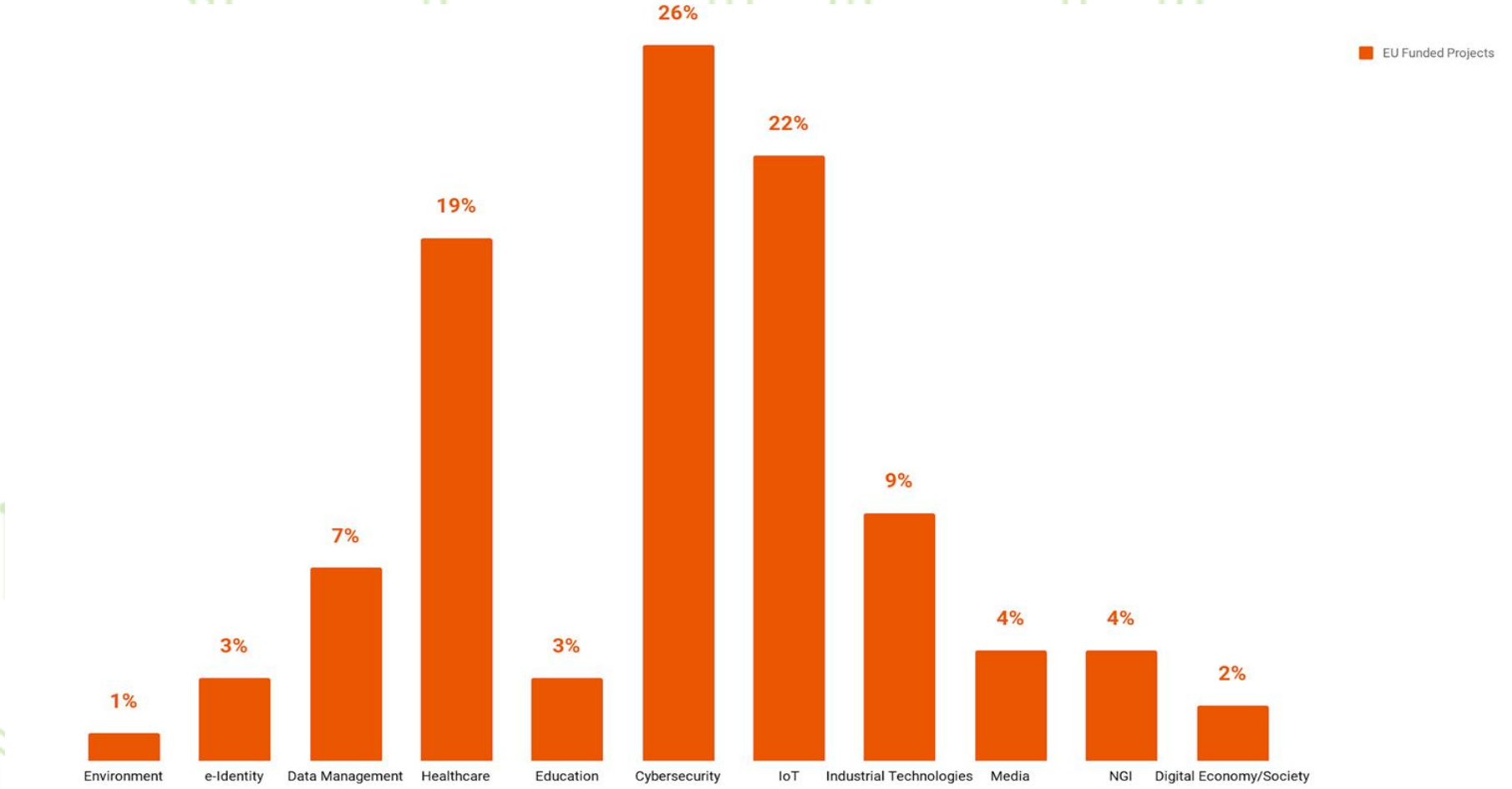


Mission

- Monitor blockchain initiatives in Europe
- Produce a comprehensive source of blockchain knowledge
- Create an attractive and transparent forum for sharing information and opinion
- Make recommendations on the role the EU could play in blockchain

Horizon2020 Framework

EU-Funded Project in Blockchain Technology



H2020 Blockchain-related Energy Projects

Key concepts

- **Demand Response**
- **Flexibility Markets**
- **P2P Energy Trading**
- **Guarantees of Origin**

Thank you!

email yiannis.vlachos@gmail.com
linkedin https://www.linkedin.com/in/ioannisvlachos/
twitter @ivlacho

IMPACT OF THE RESULTS AND PROPOSALS OF EU FUNDED PROJECTS ON THE STANDARDIZATION ACTIVITIES

SOGNO and CROSSBOW

Dan PREOŢESCU
Project Manager
Romanian Energy Center

IMPACT of the RESULTS and PROPOSALS of EU FUNDED PROJECTS on STANDARDIZATION – SOGNO and CROSSBOW

30th of April 2020

ONLINE
VIDEOCONFERENCE

ROMANIAN ENERGY CENTRE / DR. DAN PREOTESCU

CROSS BOrder management of variable renewable energies and storage units enabling a transnational Wholesale market - CROSSBOW

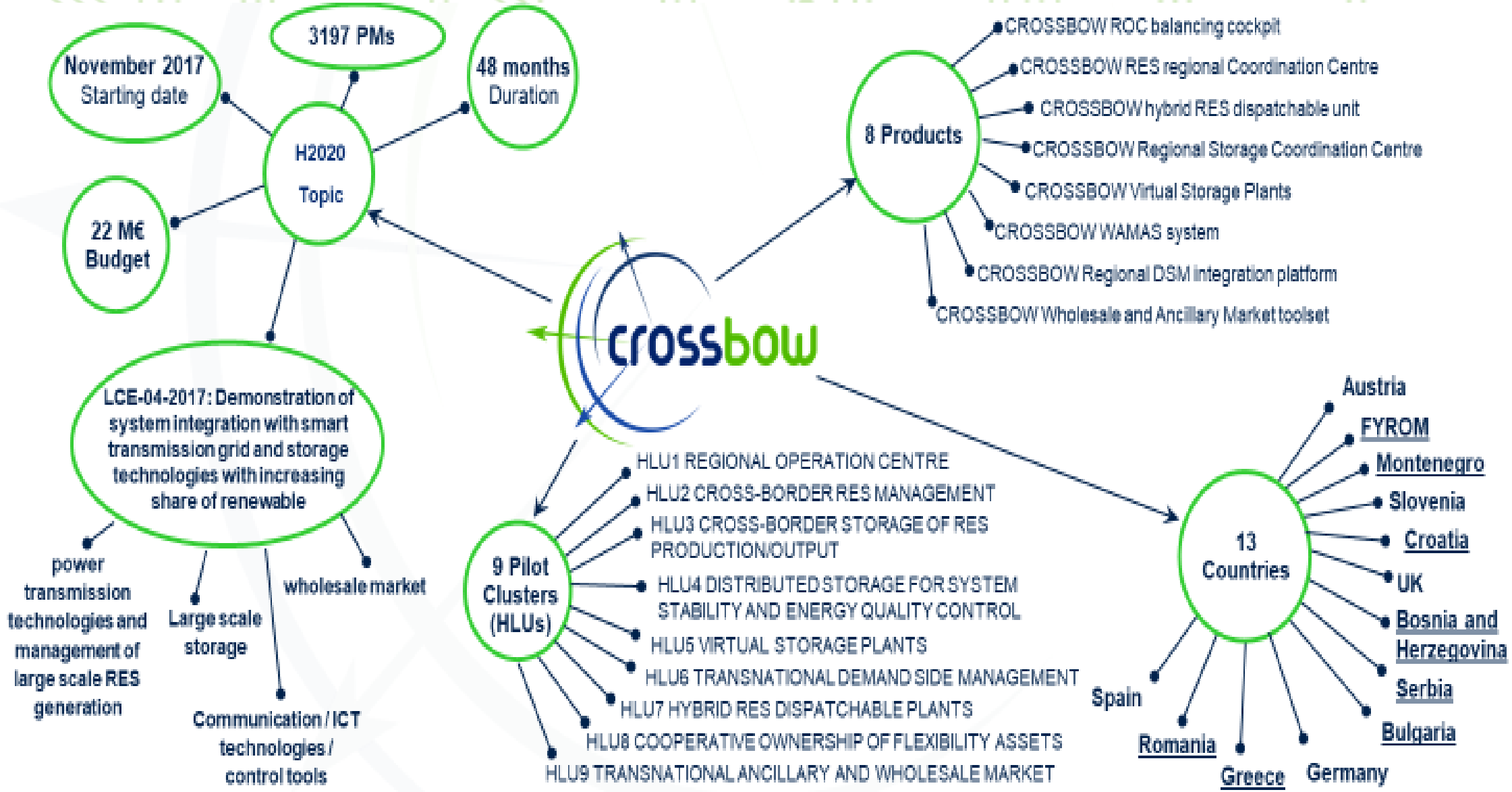
MAIN OBJECTIVES

- Providing support for increasing the integration of RES in the power systems of the future.
- Providing support for increasing the electricity market integration at European level.
- Promoting and supporting the cooperation of the TSOs and/or DSOs at regional level.

CONSORTIUM

- 8 TSO
- 1 DSO
- 1 RSC
- 2 (+1) Large producers
- 5 (+1) Universities
- 6 Industrial partners
- 1 Industrial Association

PROJECT STRUCTURE AND PRODUCTS



IMPACT ON STANDARDIZATION

- How the regulatory framework and standardization framework may support/complete each other?
- New standards or upgrading/updating the existing ones?
- Standards at European level: pro's and con's.

CRE
Romanian Energy Center

THANK YOU FOR YOUR ATTENTION !

STANDARDIZATION CHALLENGES IN ENERGY CRITICAL INFRASTRUCTURE

DEFENDER experiences

Denis ČALETA
President of the Board
Institute for Corporate Security Studies

STANDARDIZATION CHALLENGES IN ENERGY CRITICAL INFRASTRUCTURE – DEFENDER EXPERIENCES

30th of April 2020

ONLINE
VIDEOCONFERENCE

Dr. Denis Caleta

President of the Board

Institute for Corporative Security Studies (Slovenia)

DEFENDER identity card

- **Call Identifier**: H2020 CIP-2016-2017-1
- **Title:** ***Defending the European Energy Infrastructures***
- **Starting Date:** 1 May 2017
- **Action Type***: Innovation Action*
- **Duration**: *36 months (Closing Date: 30/4/2020)*
- **EU Contribution**: 6.790.837,50 €
- **Partners**: **18** (from **9** countries)
- **Country coverage**: *Italy, Greece, France, Romania, Germany, Slovenia, Portugal, UK, Israel*
- **Website:** *http://defender-project.eu/*

ICT Service & Technology providers

- ENGINEERING SingularLogic SIEMENS *(ICT)*
- THALES *(Security)*
- POWER OPS Venaka Media Fr. Frucht Systems Ltd. UNINOVA *(SME - Solution Provider)*
- e-lex STUDIO LEGALE (Data Privacy/Protection Enforcement))

R&D/Academy

- E.ON Energy Research Center | RWTH AACHEN UNIVERSITY JSI ICS INSTITUTE FOR CORPORATIVE SECURITY STUDIES

Stakeholders

- ASM ASM Terni S.p.A. *(Electricity Network and Distribution Sys Operator*
- ENGIE *Electricity Supplier, Bulk Generation*
- BFP *Electricity Supplier, Wind Farm*
- ELES *Electricity Network and Transmission Sys Operator*
- Law Enforcement Agency

DEFENDER contribution to EU policy goals

- Analysis of **new and future** complex threats to CEI
- Analysis of **selected scenarios** of threats to CEI (attack tree method evaluation)
- Analyses of processes and procedures that address certain **security gaps** in the field of physical and cyber security including human in the loop approach)
- Analysis of **interdependency** between CEI and other CI sectors
- Establishment of DEFENDER Critical Energy Infrastructure Security Stakeholders Group (**CEIS-SG**) (exchanging best practices, new knowledge and developments)

Standardization: ongoing Work and Potential Impact

- Impact on Standards focusing on **information security** (family of ISO 27000) guidelines and threats assessment for **industrial system control** (incl. SCADA) (IEC 62443, NIST 800-82) guidelines
- incorporating **physical and human aspects/threats into combined threat assessment and vulnerability management (attack trees)** (Human in the loop) with a view to provide comprehensive approach for protection of CEI
- Potential impact/liaison with ENTSO-e procedures (e.g. Network Code on Operational Security)
- Standards targeting **technical security systems** (cameras, sensors, security centres)
- Input to potential standards (communication protocols and data exchange)
  - among **power network operators and LEAs**
  - TSOs vs National-level CERTs (ENISA) and EE-ISAC
- Drone related regulation - "*Policy recommendations on drones operations*" (expertise and the competence on the legal aspects, limitations related to the drone flight regulations, operational experiences)
- Terminology;

DEFENDER - Areas for Standardization efforts

- Standards connected with information security (family of ISO 27000) improvements informational security methods with physical and human aspect (Human in the loop) of providing comprehensive approach for protection of CEI;
  - **ISO 27001:2017 Information technology – Security techniques – Information security management systems – Requirements**
  - **ISO 27002:2017** Information technology – Security techniques – Code of participate for information Security Controls
  - **ISO 27003: 2018** Information technology – Security techniques – Infomation securty management systems – Guidance;
  - **ISO 27004:2018** Information technology – Security techniques – Information Security Management – Monitoring, measurment, analysis and evaluation;
  - **ISO 27005:2019** Information technology – Security techniques Information risk management;
  - **ISO 27019:2019 Information technology – Security techniques - Information Security controls for the Energy Utility Industry;**
  - **ISO 27032:2012** Information technology – Security techniques – Guidelines for cybersecurity;
  - **ISO 22301:2014 Business continuity management systems – Requirements**;
- Standards for technical security systems (cameras, sensors, security centres) improvements in cyber security considerations IOT, OT and other inputs;

DEFENDER – Challenges and findings

- Standardization is a lengthy process that goes beyond a single project period;
- Threats becomes really complex and dynamic – standardization has problem to follow this speed of changes;
- Energy and other CI sectors/domains are still too much silos driven which have strong reflection in standardization area;
- Almost all important deliverables in DEFENDER were classified as „EU Restricted“

Defending the European Critical Energy Infrastructure

Thank you!

- For further information do not hesitate to contact us at :
- **denis.caleta@ics-institut.si**

PANEL DISCUSSION

THE ROLE OF REGULATION AND STANDARDIZATION AND THE POTENTIAL IMPACT IN THE POWER SECTOR

30th of April 2020

ONLINE
VIDEOCONFERENCE

Moderator:

Cristian COLTEANU
Director Strategy & International Affairs
Romanian Energy Center

Panelists:

Claudia BRANDUS
President
Romanian Wind Energy Association

Zoltan NAGY-BEGE
Vice-president of Romanian Energy Regulatory Authority

Massimo BERTONCINI
Senior Innovation Manager
Engineering Ingegneria Informatica SPA

Mate CSORBA
Global Service Line Leader for Cyber Security
DNV GL Digital Solutions

Dan PREOŢESCU
Project Manager
Romanian Energy Center

Mihaela ALBU
Professor
University POLITEHNICA of Bucharest

Iuliana CHILEA
General Director
ASRO

The role of Regulation and Standardization and the Potential Impact in the Power Sector

Discussion Topics:

- ✓ **Software Products and Implementation at National and Regional level**
- ✓ **Regulatory implications**
- ✓ **Impact of Digitalization on Standardization**
- ✓ **Standardizing Cyber Security Products and Services**

QUESTION 1:

Is standardization a key for interoperability?

QUESTION 2:

EU funded projects that tackles problems of the power system delivers, develop, implement their own tools, products for the energy sector (both hardware and software products).

Question:
How should a standardization system begin so that the products become more scalable (to extend their functionalities and ease replicability)?

QUESTION 3:

Do all the existing ICT standards cover all the requirements for power systems (with an emphasis on IT - OT interface)?

QUESTION 4:

How should the regulatory bodies collaborate with standardization bodies? How the panellists see this complementary relationship between the two organizations at both national level and EU level ?

QUESTION 5:

Could cyber threats influence the redefinition of critical energy infrastructure? … not only transmission but distribution as well

QUESTIONS AND DEBATE

15’

30th of April 2020

ONLINE
VIDEOCONFERENCE

FINAL REMARKS

Mihai PĂUN

Vice-President

Romanian Energy Center

CONFERENCE SOUVENIR

GROUP PHOTO

PLEASE TURN ON YOUR VIDEOS

THANK YOU!

ROMANIAN ENERGY CENTER ASSOCIATION

Romanian Energy Center – CRE • Rue Pere de Deken, 14 • B-1040 Brussels •www.crenerg.org
Centrul Român al Energiei – CRE • Str. Sofia Nr. 6, Etaj 1 • Sector 1 • Bucuresti • România • Tel +4 021 795 3020 • Fax +4 021 3035 630• office@crenerg.org