Status Conference

JPP Smart Energy Systems Conference 2019

Welcome to the Status Conference 2019

Smart Energy Systems ERA-Net

Your Moderators: Jatta Jussila and Ludwig Karg

Agenda

Welcome by the Moderators (Jatta Jussila and Ludwig Karg)
Welcome by the host (Gilles Tihon)
Cooperation in exploitation (Jatta Jussila)
Introduction to the Expert Panel and Participants Voting
Pitches and Appraisal of Closing ERA-Net SES Projects
15:35 Wrap-Up

Welcome by the Hosts

Wallonie

Service public
de **Wallonie**

Welcome in Namur !

Joint Programming Platform

Smart Energy Systems Conference 2019

October 7-10, Namur, Belgium

Dr Ir Gilles Tihon

1s : 5 min

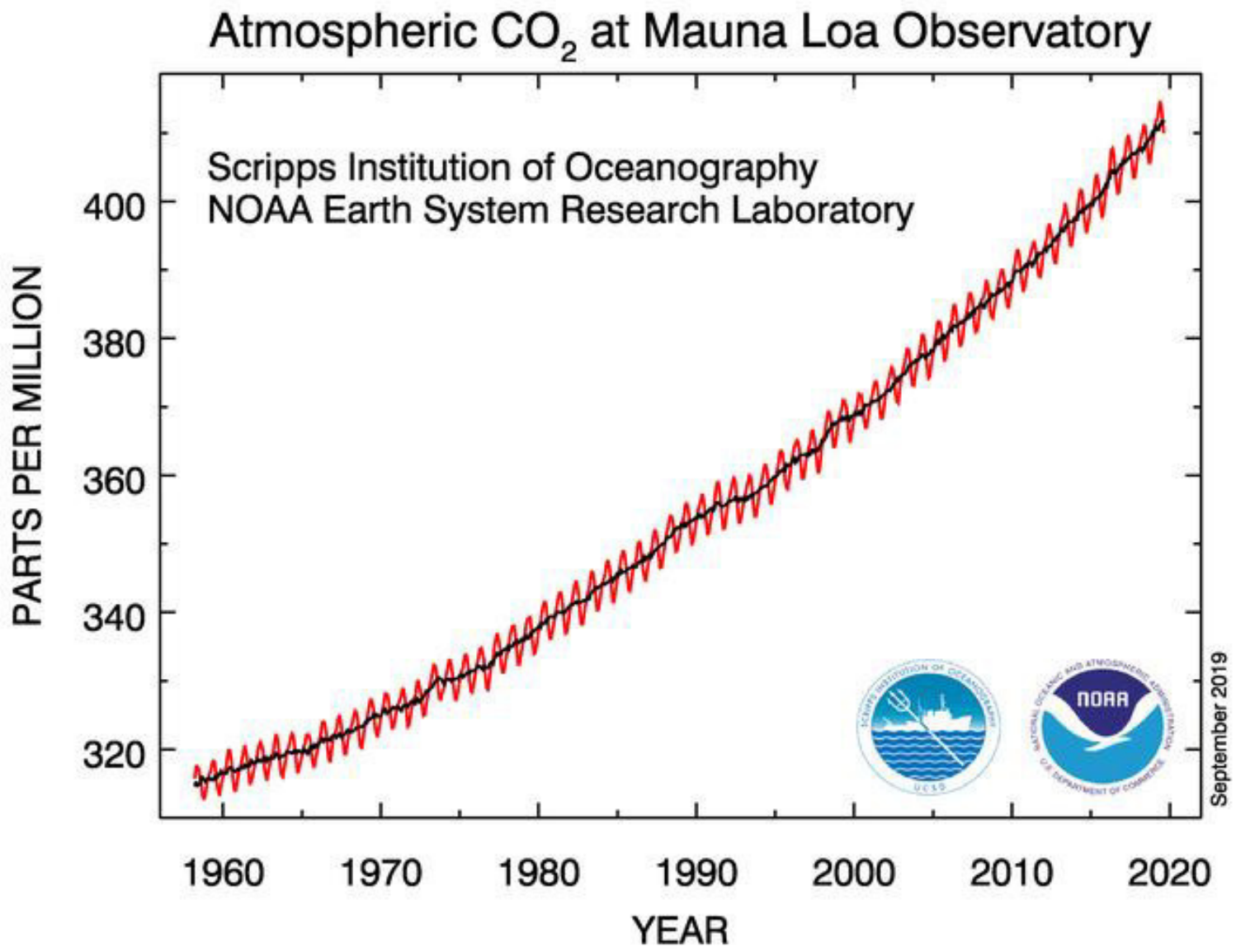
Thursday, June 23, 2016

Blueturn

www.blueturn.earth

Smart Energy Systems Conference

Namur, October 7-10, 2019



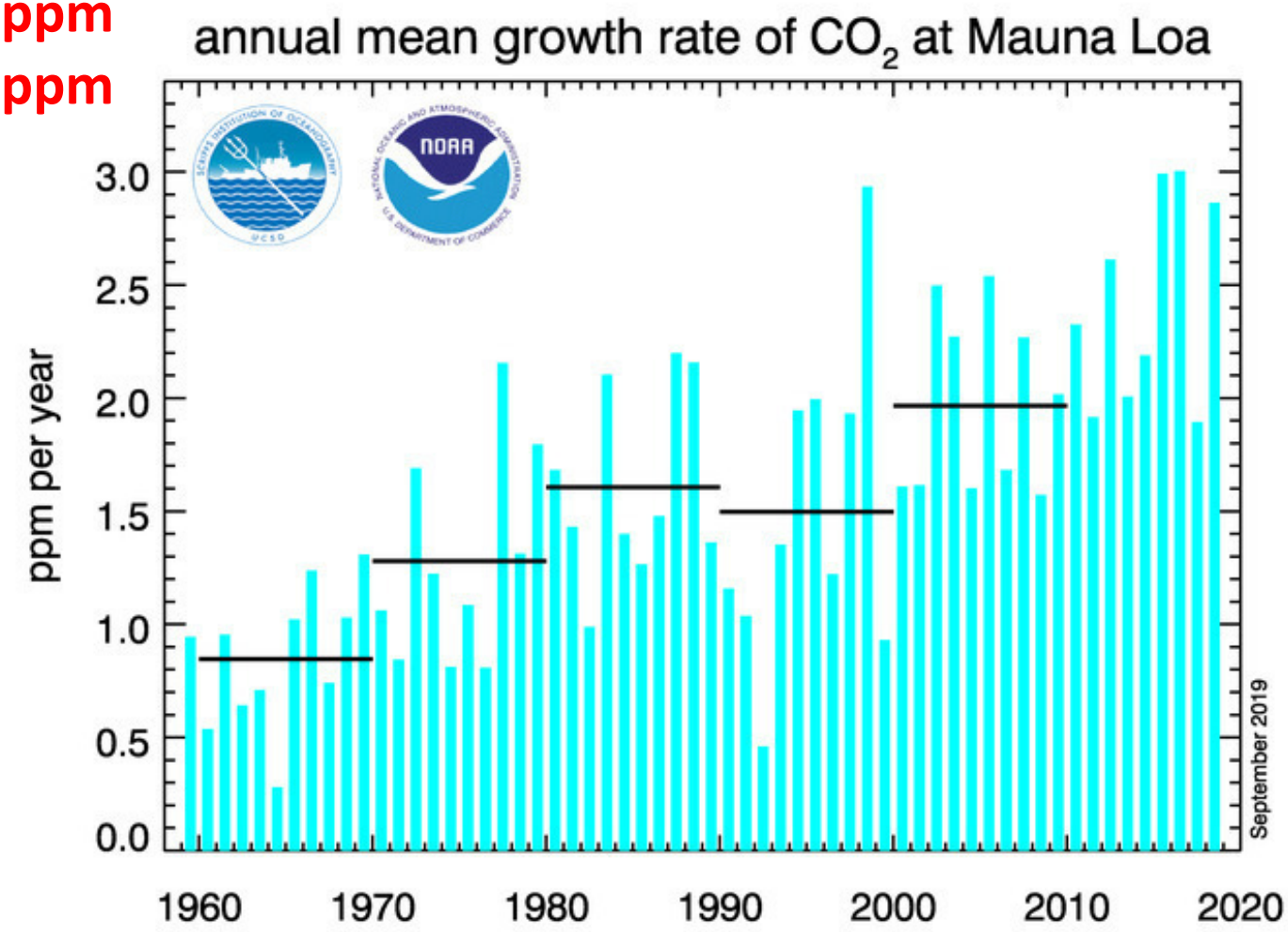
Wallonie énergie SPW

Smart Energy Systems Conference

Namur, October 7-10, 2019

August 2018: 406,99 ppm

August 2019: 409,95 ppm



Wallonie énergie SPW

1s : 5 min

Thursday, June 23, 2016

Blueturn

www.blueturn.earth

Smart Energy Systems Conference

Namur, October 7-10, 2019

Do a good job!

Wallonie énergie SPW

Dr Ir Gilles Tihon

Science | Business 30 Apr 2018 | News:

What will improve in Horizon Europe? 6 main things, EC draft says

The continent generates scientific discoveries "but is lagging behind in turning them into new products, services, processes or business models that impact markets," the paper says.

***Könnölä et al.*, Governance of Energy System Transition, VTT Working Papers 134**

Energy system transition is a complex techno-economic and social long-term change process in which governance efforts can play an important role. On a basis of presented empirical cases the interplay between different governance modes and arenas is crucial. An important aspect of governance for system transition is cooperation and a mutual engagement of public and private actors and stakeholders.

Horizon 2020 interim evaluation
Brussels, 11.1.2018

The Lamy High Level Group recommends supporting innovation (e.g. technological, social, business model) across all EU policy domains. This will notably create a common regulatory framework that fosters entrepreneurship, European industrial competitiveness in the global market and its leadership in the current industrial revolution.

...

The Commission acknowledges the mounting importance of market-creating innovation and will consider ways to further support it in the future building on current actions in the area of the Digital Single Market, Energy Union and Capital Markets Union.

...

The aim should be to put Europe at the forefront of market-creating innovation.

Smart Energy Systems ERA-Net

Closing Project Pitches

Pitching Projects

1	CALLIA
2	DCSMART
3	EPR
4	MATCH
5	Poweralliance
6	RIGRID

The Expert Panel

Richard Vidlička
E.DSO

Zsuzsanna Bodi
ENoLL

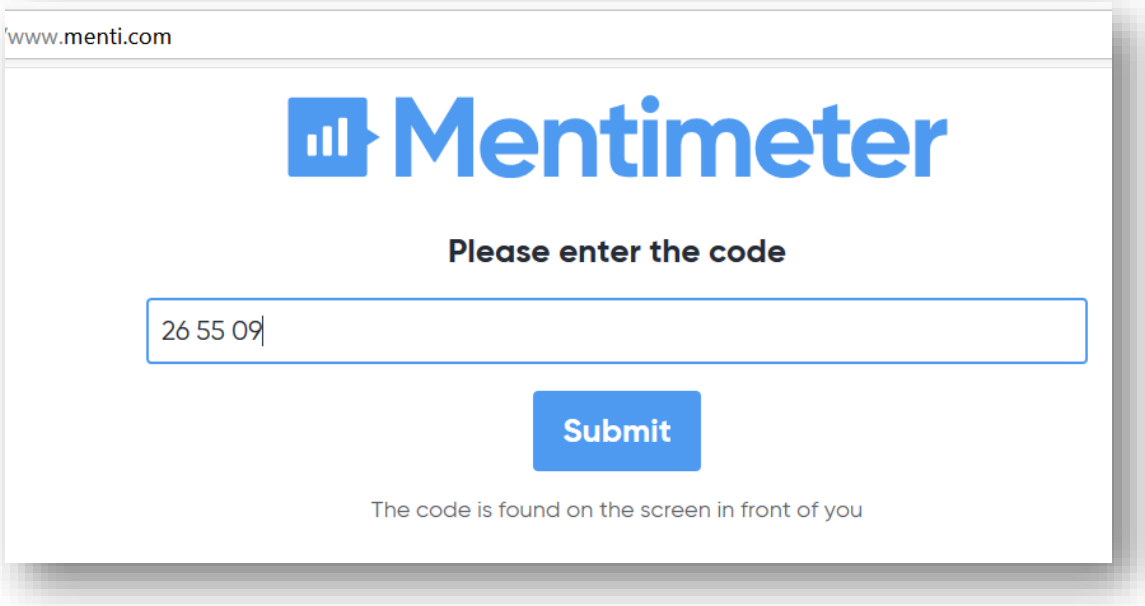
Josh Roberts
REScoop

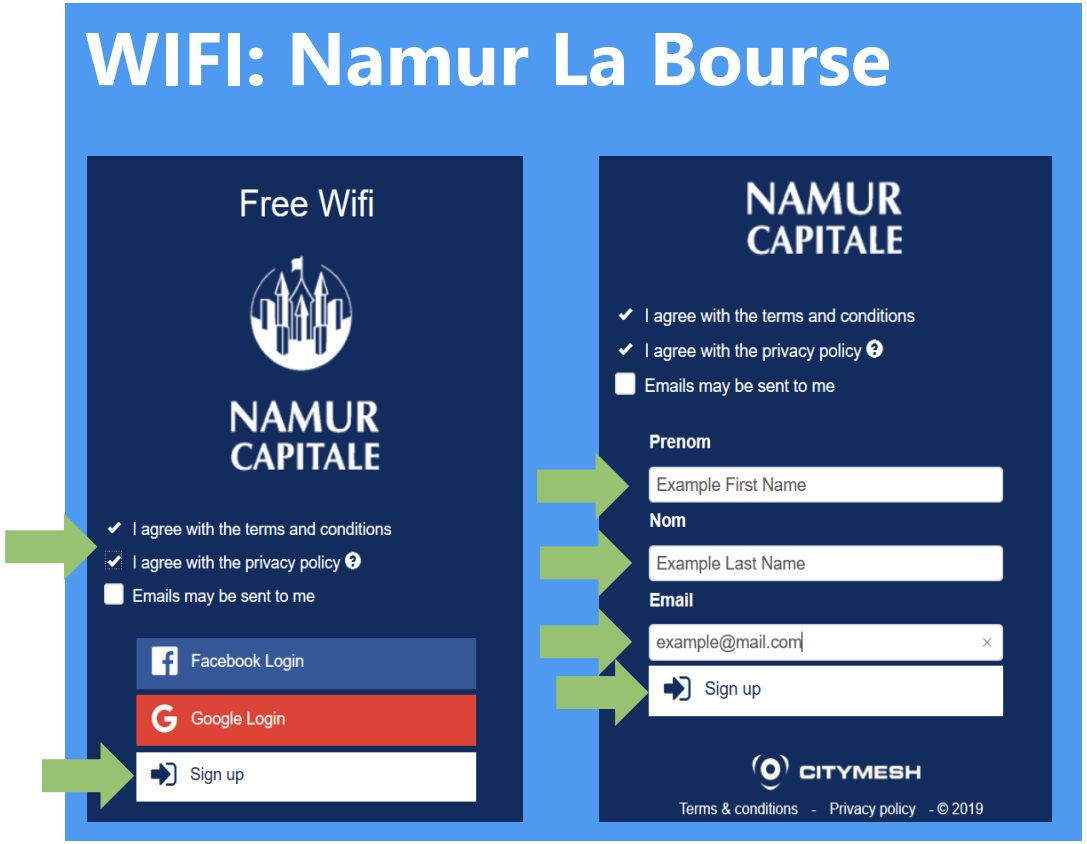
Jan Gilot
Flux50

The Other Experts: You

Which project seems to be best prepared for successful exploitation of its results?

Join us on www.menti.com
and enter the code 26 55 09





Smart Energy Systems ERA-Net

CALLIA

#calliamarket #fieldtestHDIST #interDSO

CALLIA

Learn about the CALLIA communication cascade –

explore how congestions in distribution grids can be prevented within seconds in a fully automated fashion.

1. CALLIA result: the market framework

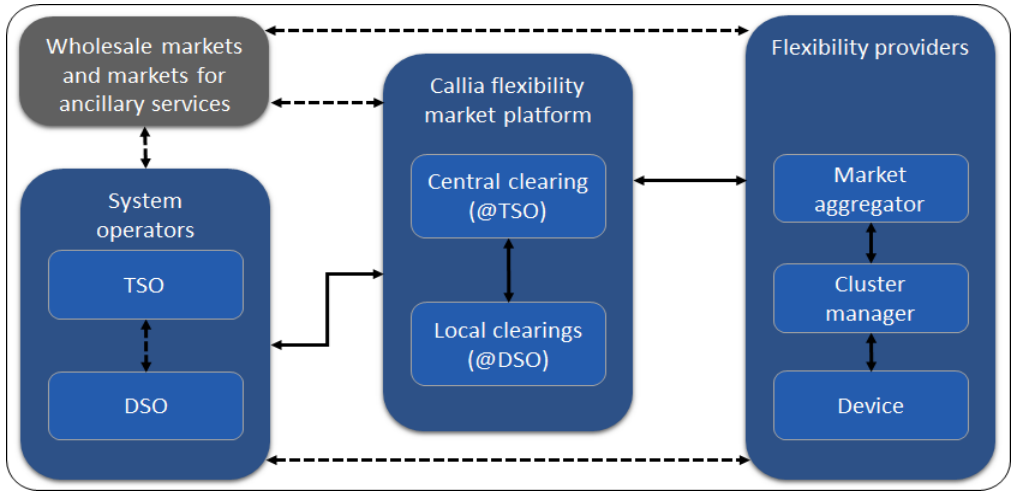
Result

The CALLIA market framework is designed to address congestions at the DSO level in an integrated approach, taking also other DSOs, TSOs and asset operators into consideration. We use a predictive decision making mechanism which optimizes over a receding horizon.

Partners for Further Development and Uptake

- TU Vienna (AT)
- VITO (BE)
- TransnetBW (DE)
- BEDAŞ (TR)

Impression



Mapping

Innovation layer: Market

Level: 6

More Information

https://callia.info/en/results/deliverable-reports/

2. CALLIA result: the communication cascade

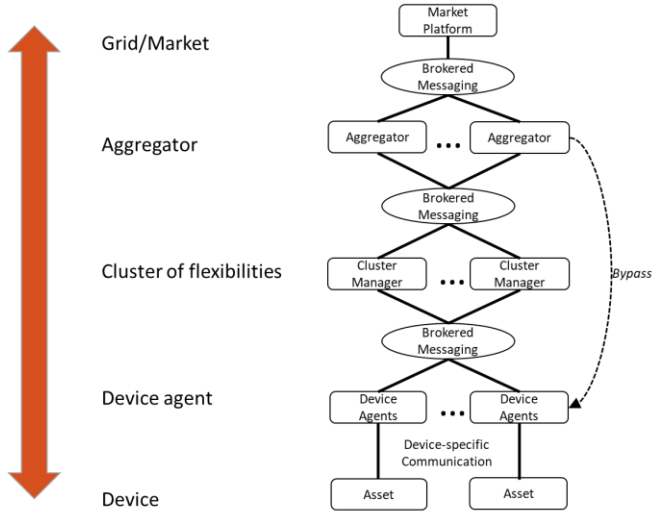
Result

A fully automated and scalable communication cascade from market platform (top) down to the individual device level (bottom) was developed.
Reaction time for the entire cascade is below 100 ms on average and the framework allows integration of a broad range of assets.

Partners for Further Development and Uptake

- VITO (BE)
- REstore (BE)
- Salzburg Research (AT)
- OLI Systems (DE)

Impression



Mapping

Innovation layer:	Technology
Level:	6

More Information

https://callia.info/en/results/deliverable-reports/

3. CALLIA result: the field test

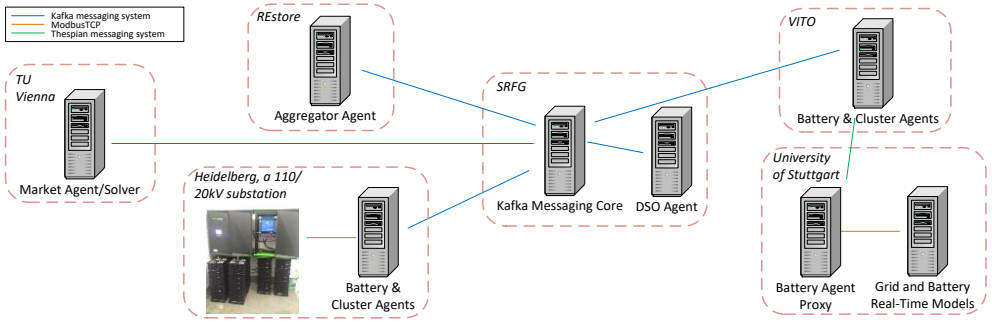
Result

A hybrid approach was pursued for the field test in Heidelberg (DE) and Istanbul (TR). Real assets – P2H and battery storage – were combined with HiL (hardware-in-the-loop) simulations to both test the approach in a full working environment but also to assess the effectiveness on mitigating grid expansion in the future.

Partners for Further Development and Uptake

- BEDAŞ (TR)
- VITO (BE)
- University of Stuttgart (DE)
- OLI Systems (DE)

Impression



Mapping

Innovation layer:	Technology
Level:	7

More Information

https://callia.info/en/results/deliverable-reports/

Appraisal

1	CALLIA
2	DCSMART
3	EPR
4	MATCH
5	Poweralliance
6	RIGRID

Final Seminar - DCSmart - Eranet

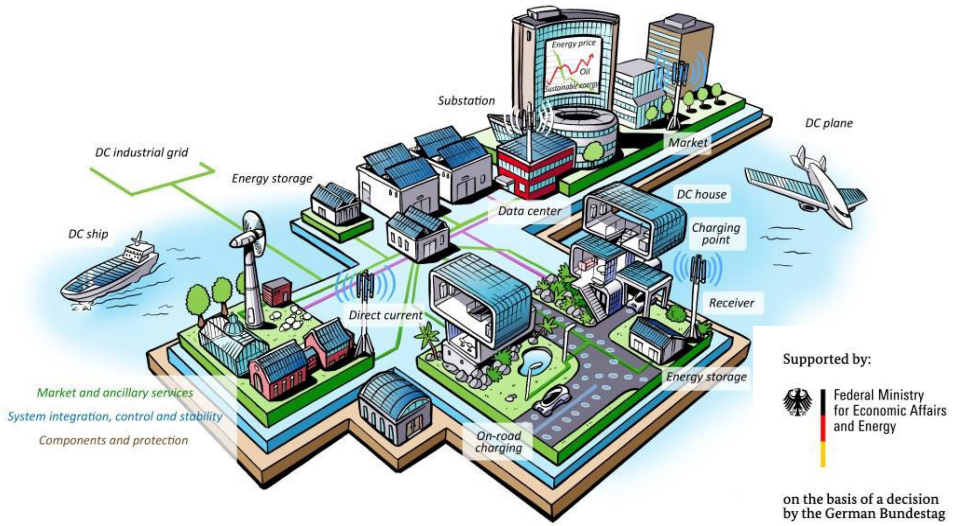
Power Electronics as an key element between future public and local DC grids

Bernd Wunder
Group Leader, DC-Microgrids, bernd.wunder@iisb.fraunhofer.de

Fraunhofer IISB

DC-Smart ■ EC Research Project

- New protection strategies and solutions that couple smart markets with the physical system
- Design modular topologies for meshed dc distribution smart grids (±380V / ±750V)
- Create models and intelligent algorithms for congestion management and autonomous operation



Supported by:
Federal Ministry for Economic Affairs and Energy
on the basis of a decision by the German Bundestag

- Funding volume ≈ 2 Mio. €
- Timeline: 04/16 – 03/19
- Demonstration sites: one in Netherlands and one in Switzerland

Bernd Wunder
Energy Electronics / DC-Microgrids

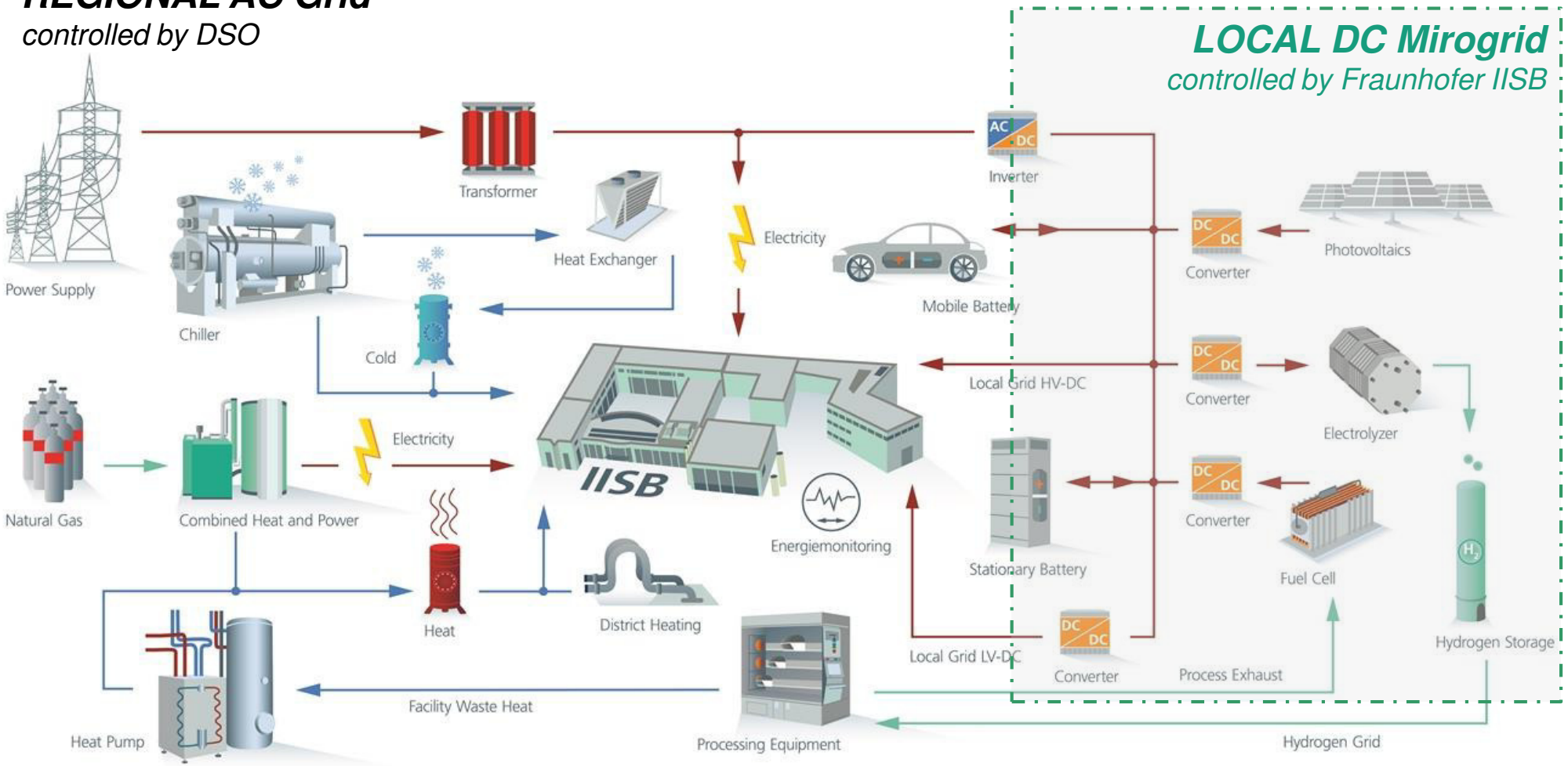
Application Platform for Decentralized Energy Systems

REGIONAL AC Grid

controlled by DSO

LOCAL DC Mirogrid

controlled by Fraunhofer IISB



Bernd Wunder
Energy Electronics / DC-Microgrids

Fraunhofer IISB

Appraisal

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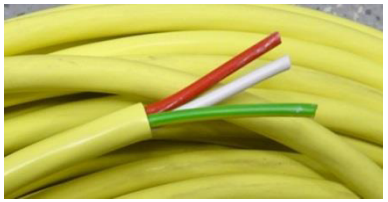
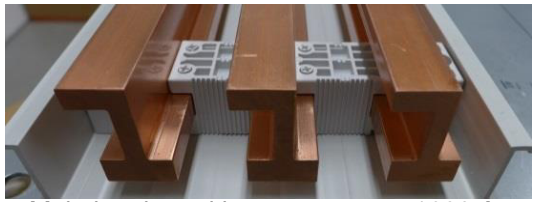
High Power DC - Distribution (HPDC)

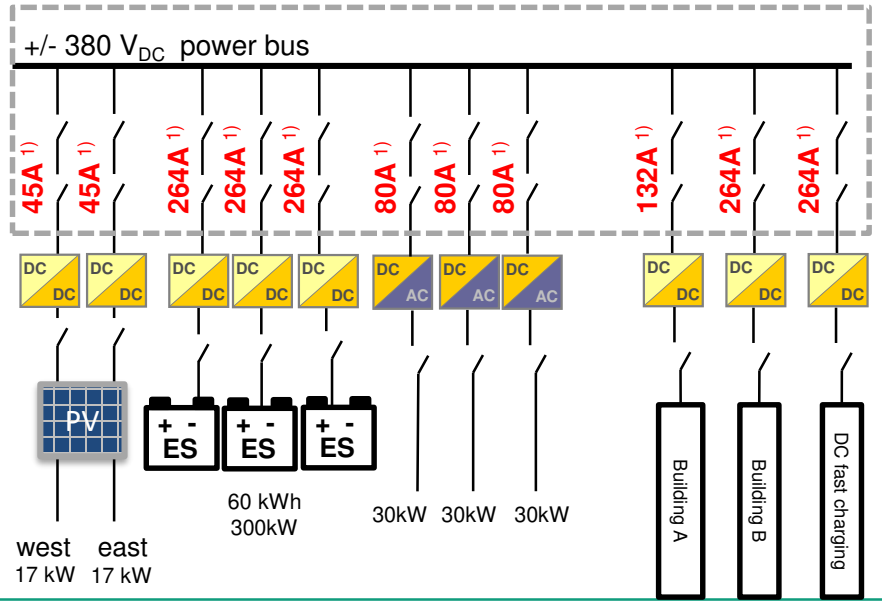
- **Distribution with ±380 V_{DC}, Droop Control and Interface to Energy Management**
- **Integration** of lithium-ion battery systems, solar power, DC-Grid Manager, AC/DC-Bridge DC/DC converters, office and lighting applications and DC charging



DC cables according to new standard IEC 60445 ED 6.0



Main bus bar with currents up to 1600 A and a bipolar 380 V_{DC} voltage



battery capacity: 3 racks with each 20 kWh
AC/DC bridge with up to 100 kW
HPDC-Distribution up to 1600 A / 800 V_{DC} (on main bus bar)

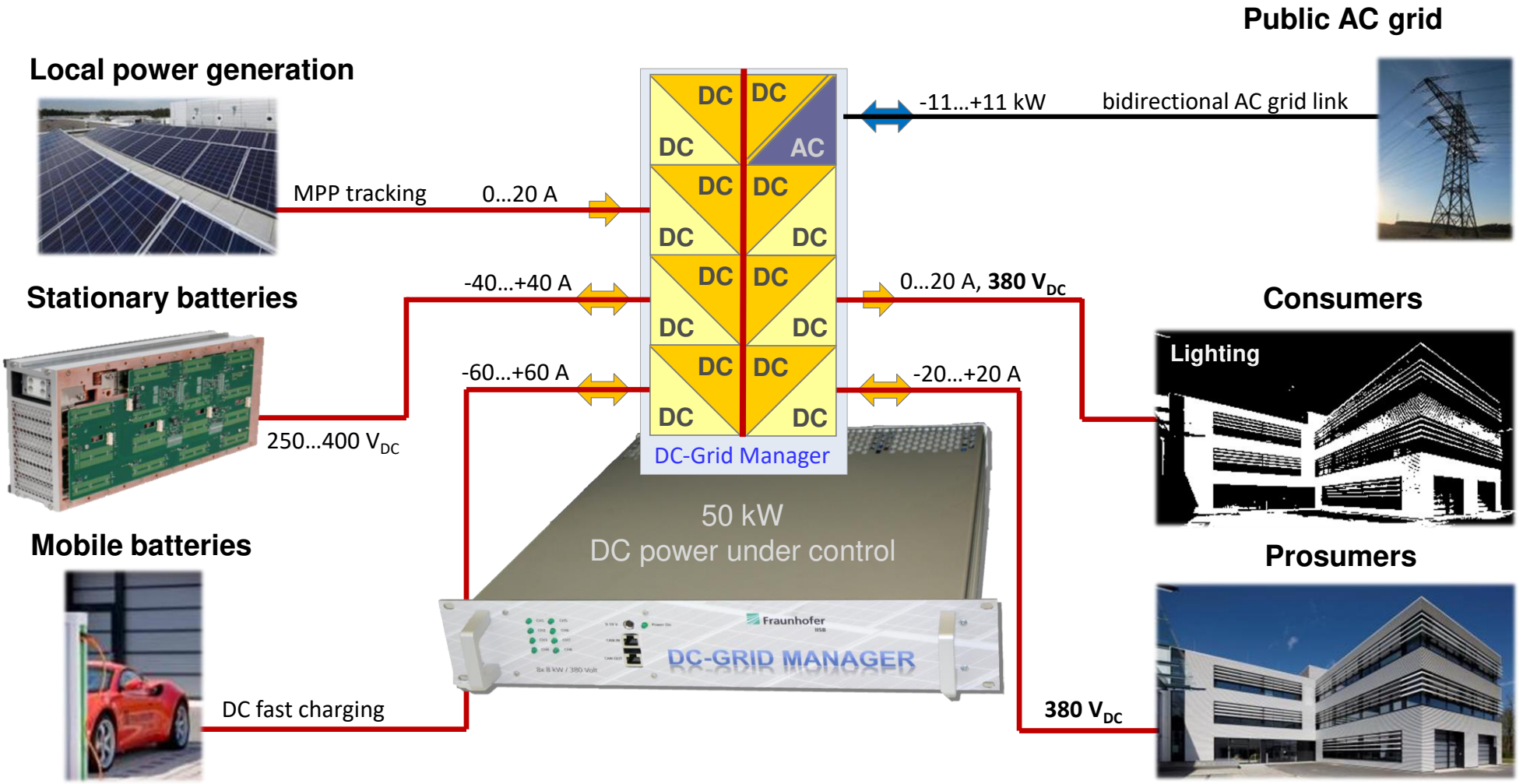
[1)] nominal currents of circuit breaker; not the max currents of the converters as shown on slide 4

Bernd Wunder
Energy Electronics / DC-Microgrids

Fraunhofer IISB

DC-Grid-Manager

Smart, local and central managed LV DC Microgrids



1) DC-Grid Manager: 19“, 2 HU, 8 DC channels à 20 A

Bernd Wunder
Energy Electronics / DC-Microgrids

Fraunhofer IISB

Basic Overview of Fraunhofer Contribution

DC-Smart ■ DC/DC Converter and Safety Element in DC-Smart

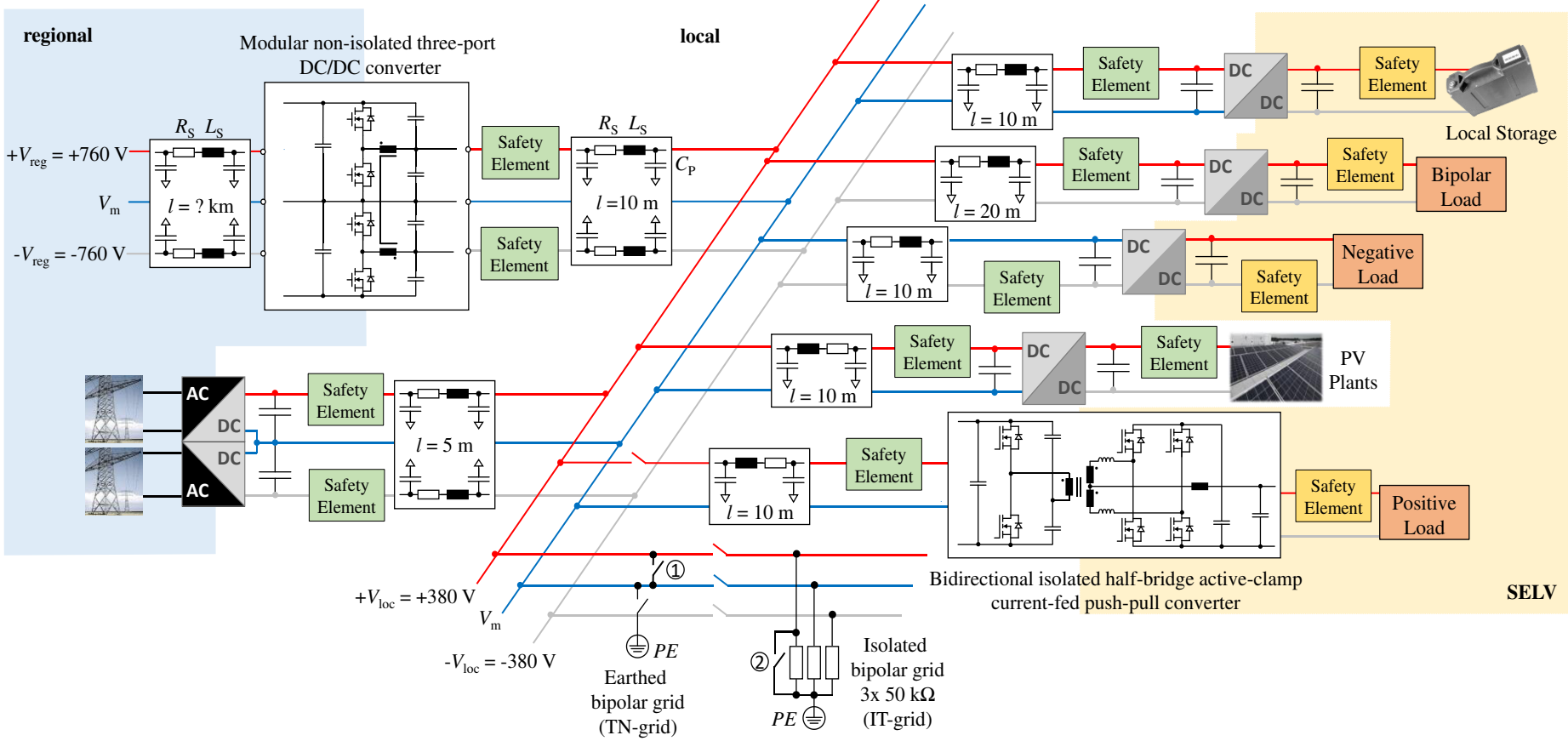


Fig. 1. Schematic of the bipolar DC microgrid with earthed and high-resistance grounding.

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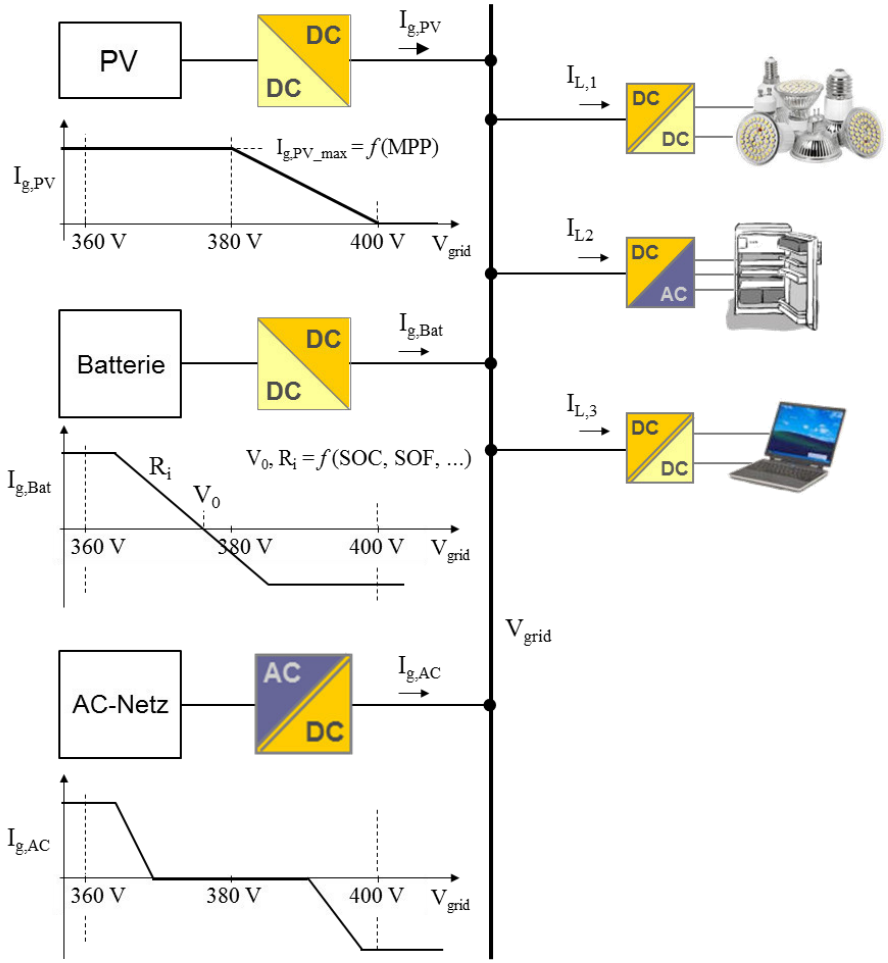
Energy Electronics / DC-Microgrids

Fraunhofer IISB

Droop control

a method to control a grid without a superordinate master



- The grid voltage (V_{grid}) serves as the central control parameter
- All feed-in converters behave like **voltage sources with internal resistance**

Advantages

- No superordinate grid controller necessary
- Maximum in reliability, availability and flexibility
- High level functions can be realized by changing the droop characteristics

Challenges

- Ensuring unconditional dynamic grid stability

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Energy Electronics / DC-Microgrids

Fraunhofer IISB

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European Pattern Recognition project

EPR (European Pattern Recognition)

#Renewable impact #Artificial Intelligence #Data quality

EPR (European Pattern Recognition)

Main findings.

Artificial Intelligence technologies and products have been developed and verified to optimise the electricity system for increased penetration of renewable energy.

EPR demonstrated that AI and PR is usable for analysis of the grid.

1. EPR results

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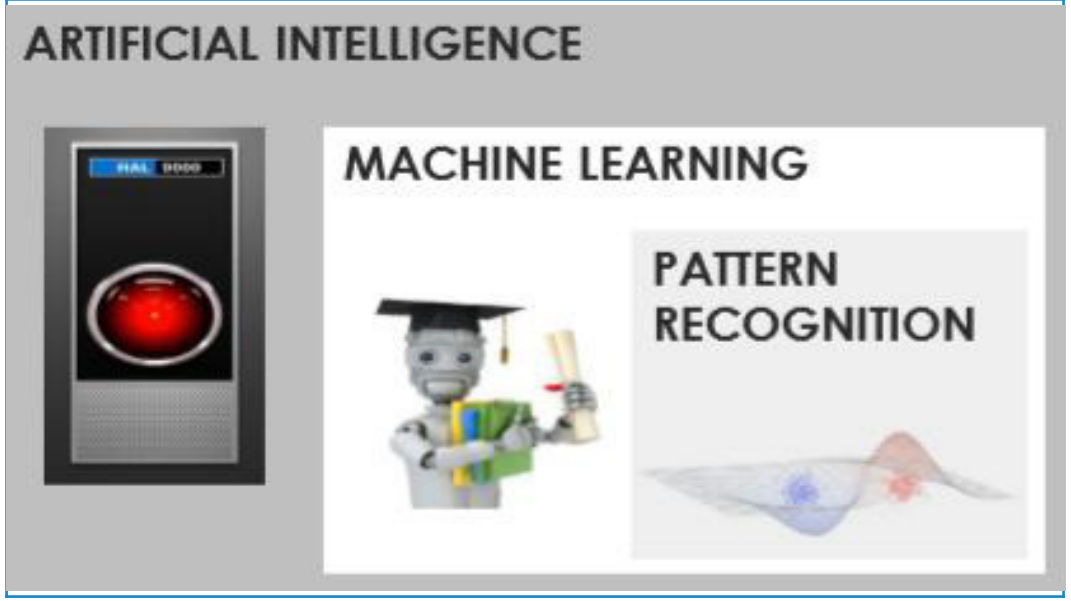
Result

Combining AI with simple calculations is optimal. “Big data” are already available from several sources, e.g. smart meters & PQ metering.

Good data quality and data verification is critical EPR developed visualisation tools, enabling clients to realise the value: savings potential.

Regulators should set incentives towards solutions that avoid future problems, enabling increased share of renewables and set standards for metering based on requirements for analysis, not only billing.

Impression



Mapping

Innovation layer:	Technology
Level:	TRL6-7

More Information http://www.europeanpatternrecognition.eu/

2. EPR results

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Result

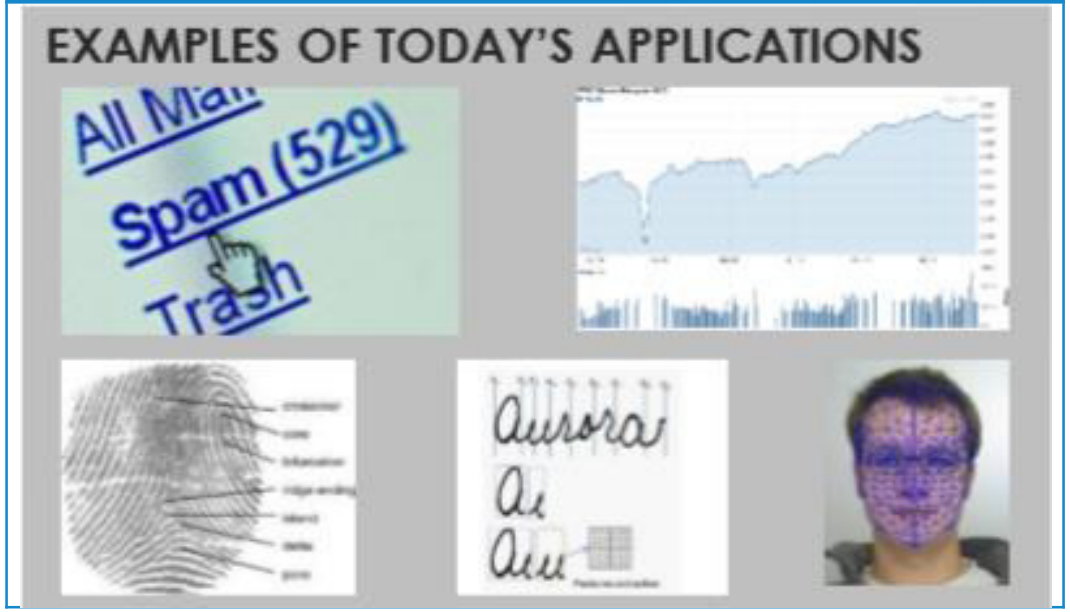
PROACT. A pro-active system solution using PQ data and AI for trend forecasts that can be used to avoid severe disturbances.

Multi-tool. A web-based prototype multi-tool based on PR technology that visualizes and forecasts electrical grid capacities and identifies potential flexibility.

Micro-grid concept. A modular, scalable and flexible micro grid system was developed and demonstrated, where batteries and a smart controller were used to maximise the use of solar energy.

Solar power plant monitoring. EPR compared 2 systems for fault detection and diagnosis of large-scale grid-connected PV systems.

Impression



Mapping

Innovation layer:	Technology
Level:	TRL 6-7

More Information http://www.europeanpatternrecognition.eu/

3. EPR results

Result

Improved Hosting Capacity. Creating higher accuracy than regular theoretical calculations used today, EPR improved the tool for grid operators to assess the capacity for hosting renewable energy.

Conservation Voltage Reduction (CVR). A study on possibilities to curtail the power use in a grid by reducing voltage levels. The need of predictable load patterns and detailed information about load composition is crucial.

Inertia support by wind turbines: ENERJISA's BARES wind farm has been modelled to provide part of its kinetic energy for inertial support.

Impression

Mapping

Innovation layer:	Technology
Level:	TRL6-7

More Information	http://www.europeanpatternrecognition.eu/

4. EPR results

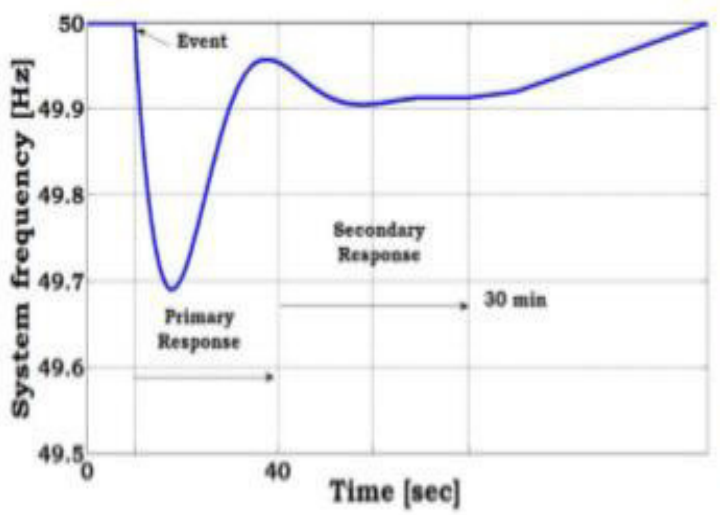
Result

Tools to
Keeping **STABILITY**
Increasing **CAPACITY**
Increasing **FLEXIBILITY**
Decreasing **COSTS FOR INTERRUPTIONS**
Vast exposure in the European knowledge community/ active communication • Seminars, articles • (Social) media

Partners for Further Development and Uptake

Spin-off project on pattern recognition financed by Vinnova - Metrum
LoI with a Swedish utility on further development of the multi-tool - Rejlers Embriq
ACES project

Impression



Mapping

Innovation layer:	Technology
Level:	TRL6-7

More Information http://www.europeanpatternrecognition.eu/

Appraisal

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ÖAW ITA INSTITUTE OF TECHNOLOGY ASSESSMENT

MATCH

Socio-technical configurations, stakeholder requirements, energy system perspective

MATCH

What makes smart grids pilot projects successful? The MATCH project has studied examples from Austria, Denmark and Norway and offers answers to this question.

More information here: https://www.match-project.eu

1. Smart energy solutions are socio-technical MATCH

Result

Smart energy solutions work when they are designed as socio-technical systems from early on.
The successful implementation of new solutions largely depends on a well-designed interplay of social and technical elements.
Smart grid projects must closely involve participants in order to achieve good local integration of the solutions.

Partners for Further Development and Uptake

- ESCOs
- Network operators
- Technology developers
- Technology users

Impression

Mapping

Innovation layer:	Technology and Actors
Level:	TRL 7-8

More Information https://www.match-project.eu/publications/

2. Users matter
MATCH

Smart Energy Systems ERA-Net

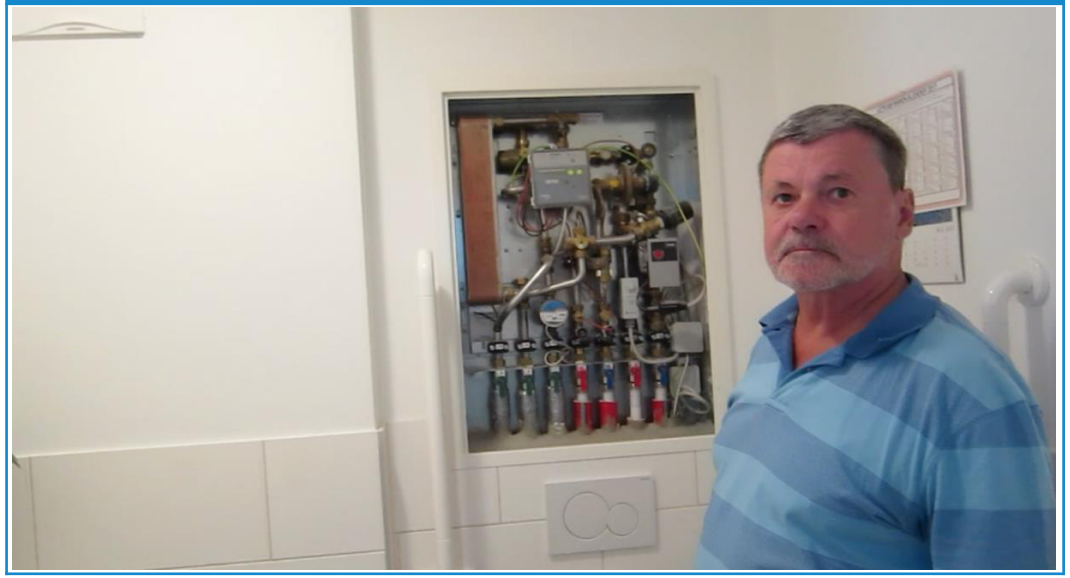
Result

Technology users play a multifaceted and decisive role in R&D projects. It is important to ensure diversity of different roles of utilisation and their associated perspectives, interests and requirements from early on.
We were able to identify six different user roles: Research partners, traditional or ordinary users, prosumers, energy citizens, affiliated users, and user-innovators.

Partners for Further Development and Uptake

- ESCOs
- Network operators
- Technology developers
- Technology users

Impression



Mapping

Innovation layer:	Technology, Market and Actors
Level:	7-8

More Information https://www.match-project.eu/publications/

3. Local solutions need an energy system assessment

Smart Energy Systems ERA-Net

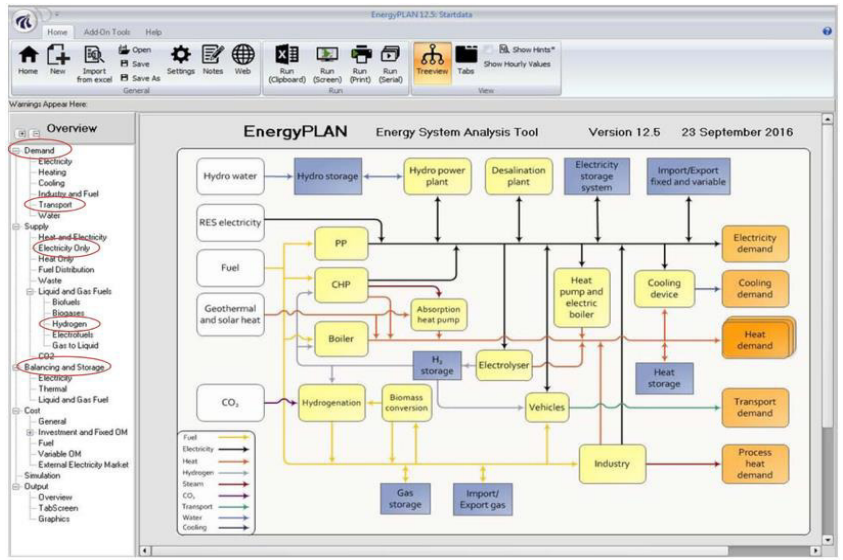
Result

Solutions that work well locally do not necessarily have a significant (positive) impact from the point of view of the entire energy system. Hence, it is important to examine the various systemic effects locally successful solutions have on existing energy systems (regional, national) before replicating or up-scaling them.

Partners for Further Development and Uptake

- Research (Energy system modeling)
- Energy policy-makers
- (Pilot) Project owners

Impression



Mapping

Innovation layer:	Technology and Market
Level:	7-8

More Information https://www.match-project.eu/publications/

Appraisal

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Poweralliance

Poweralliance

Unlock Grid Capacity – Boost Decarbonisation

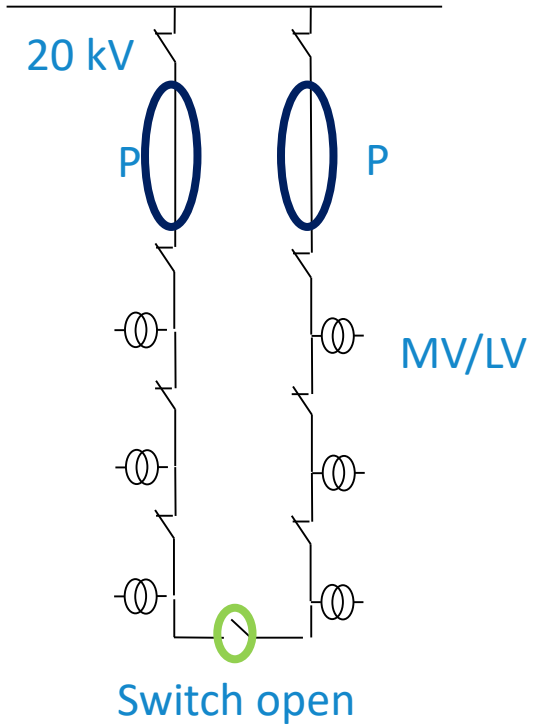
Poweralliance

Double

Capacity on Mid Voltage Grid

Boost

Competitiveness of Decarbonization



1. Forget Security of Supply (for decarbonization only..)

Result

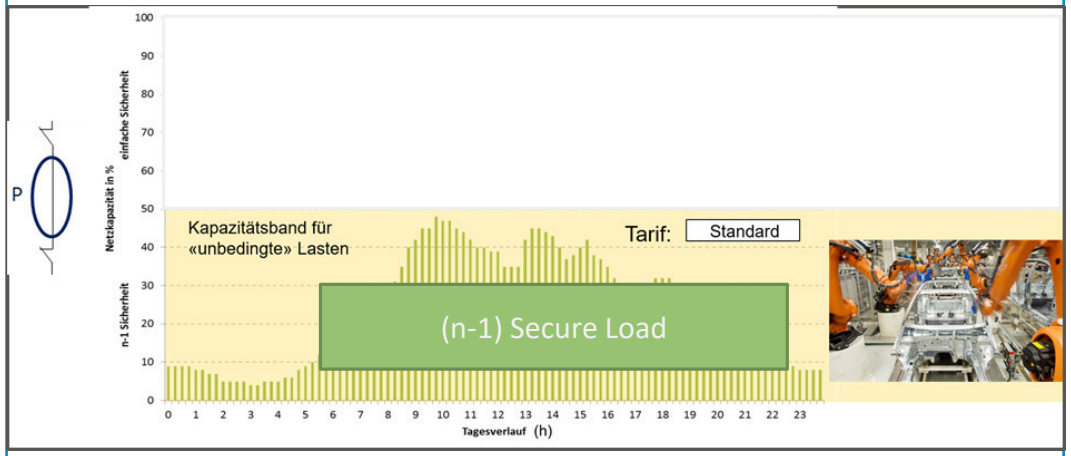
Sector Coupling (Power to X) Is:

- Purely Price driven - N**ot** Demand driven
- Grid Capacity Upgrades Needed
- PTX DOES **NOT** NEED SECURITY OF SUPPLY

Partners for Further Development and Uptake

- P-T-X Technology OEMs
- Energy Service Providers
- Energy Management Systems

Impression



Mapping

Innovation layer: Technology/Policy

Level:

More Information

2. Electricity is NOT Electricity (and Diesel is NOT Heating Oil)

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Result

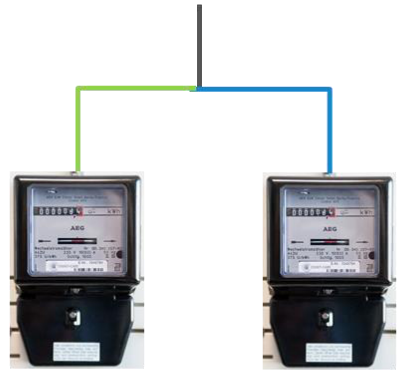
Heat: Electricity Not Competitive against fossil fuels
Transport: PtL Not Competitive against fossil fuels

1. Special purpose Electricity MUST be **cheap** (CO2 expensive)
2. Do **Not** Touch energy only price signal (use grid and levies and taxes instead)

Partners for Further Development and Uptake

- Policy Advisors
- Energy management through Blockchain

Impression



Mapping

Innovation layer: Technology/Policy

Level:

More Information

Appraisal

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Smart Energy Systems ERA-Net

RURAL INTELLIGENT RIgrid

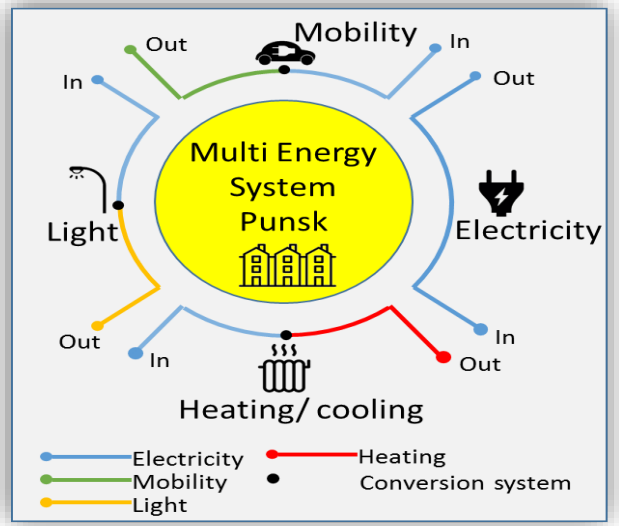
Rural Intelligent GRID

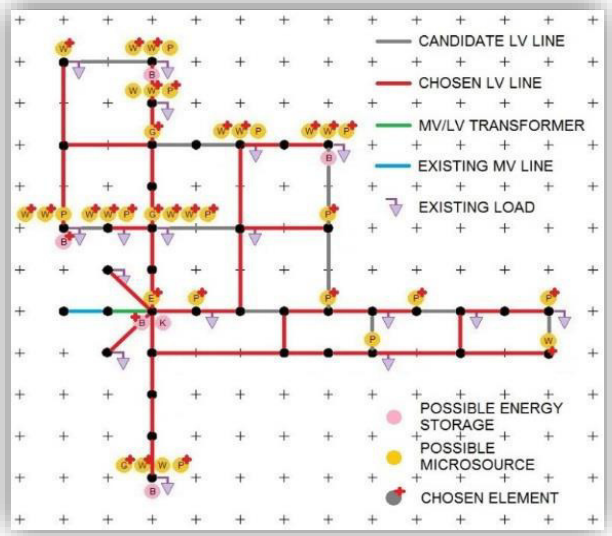
 # RuralRegions # Renewables
 # InteractivePlanning/ SocialAcceptance

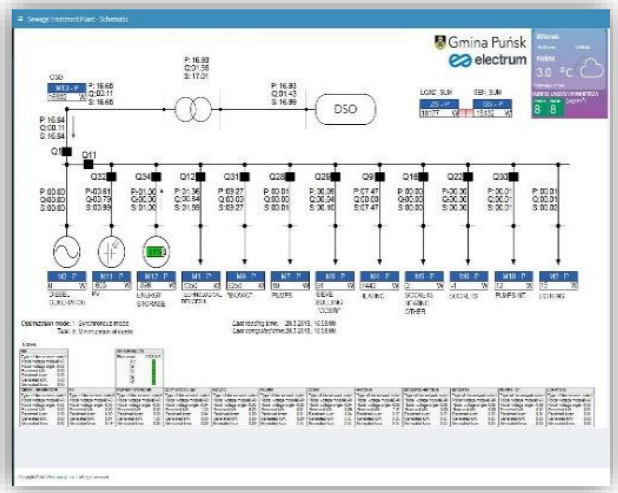
RIGRID – Rural Intelligen GRID

RIGRID offers ready solution for optimal planning and operation of energy infrastructures in rural areas. EMACS remotely monitors and controls the system components such as RES, storage, controllable loads and protection devices to reliably operate the microgrid.

RIGRID from vision:
https://www.youtube.com/watch?v=qdEA6N4yyZc
to realization:
https://www.youtube.com/watch?v=DQKcRqpyKk8



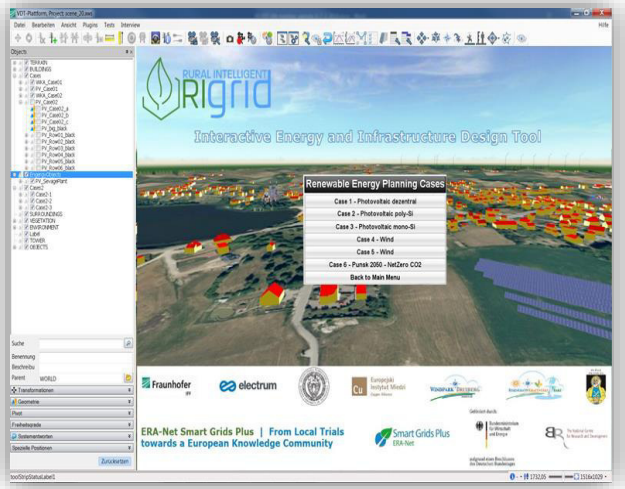


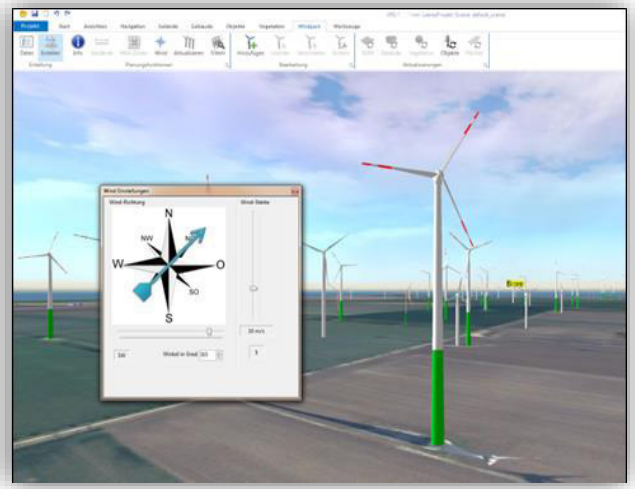


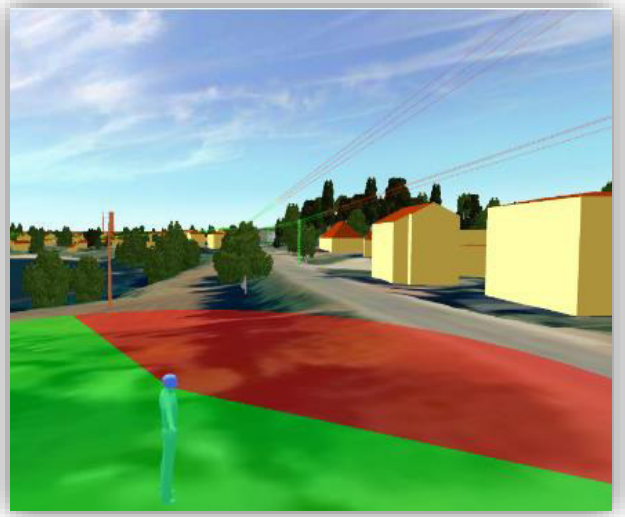
RIGRID – Rural Intelligen GRID

Planning of energetic infrastructures needs active participation of the population in order to increase the transparency and acceptance of the new investments. RIGRID VR-based interactive design tool enables optimal planning of RES, storage and grid structure.

RIGRID from vision:
https://www.youtube.com/watch?v=qdEA6N4yyZc
to realization:
https://www.youtube.com/watch?v=DQKcRqpyKk8







1. Interactive Energy and Infrastructure Design Tool

Smart Energy Systems ERA-Net

RIGRID Result

[RIGRID VR-tool is a modular application for technical and socio-economic planning and operation of new emerging energy infrastructures in rural areas. Technical solutions of microgrid structures can be visualized using Virtual Reality tool. Thus several scenarios can be tested to find optimal placement of PV, wind, storage, lines, cables. Active participation of citizens in the planning process increases the acceptance of new infrastructure and accelerates investment.]

Partners for Further Development and Uptake

- Rural regions/ municipalities
- Energy clusters/ cooperatives
- Engineering/ design offices
- RES investors/ Energy system operators

Impression

[

]

Mapping

Innovation layer:	Technology, Adaptation
Level:	6-7

More Information

https://www.youtube.com/watch?v=DQKcRqpyKk8

https://www.researchgate.net/publication/325988031_Multi-Criteria_Planning_Tool_for_a_Net_Zero_Energy_Village

2. Energy Management and Control System

RIGRID Result

[EMACS remotely monitors and controls system components such us RES, storage, controllable loads and protection devices to reliably operate the microgrid. It exchanges data between PLC controllers and server router via a UMTS cellular network using communication protocols ModBus, IEC61850 GOOSE, OPC, DLMS, IEC60870-5-104, IEC61850 GOOSE and MMS. Visualization of work status, measurements and control information takes place in graphic tool of EMACS web server. Tested and demonstrated in Punsk/ Poland.]

Partners for Further Development and Uptake

- PV parks, wind parks, microgrid owners/ operators
- Energy clusters/ cooperatives
- Components providers, e.g. storage, PV.

Impression

[

]

Mapping

Innovation layer:	Technology, Market
Level:	7-9

More Information

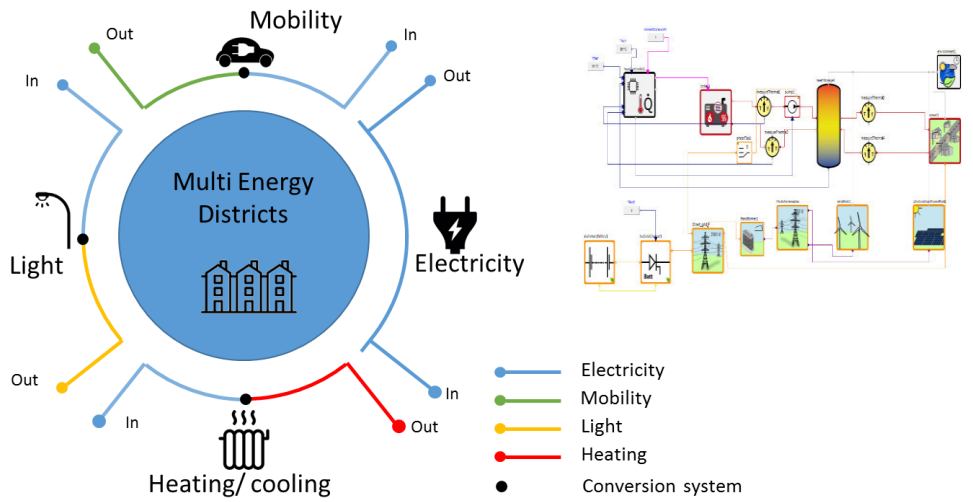
[https://www.youtube.com/watch?v=DQKcRqpyKk8]

3. Multi-criterial planning of Net Zero Energy System

RIGRID Result

Multi-energy systems (MES) can be planned as NZES. The district system (electric, thermal and transportation) is analyzed and modelled considering building's typology, weather conditions, etc. RES based power plants, heat pumps, storage are selected (according technology) and optimally sized to cover all the energy demanded by the system. Economic tool evaluates total investment (TI) required, net present value (NPV), internal rate of return (IRR) and levelized unit energy costs (LUEC) to choose suitable business model.

Impression



Partners for Further Development and Uptake

- Scientist, researchers, technology developers
- Municipalities, Energy clusters/ cooperatives

Mapping

Innovation layer:	Technology
Level:	4

More Information

[https://www.researchgate.net/publication/325988031_Multi-Criteria_Planning_Tool_for_a_Net_Zero_Energy_Village]

Appraisal

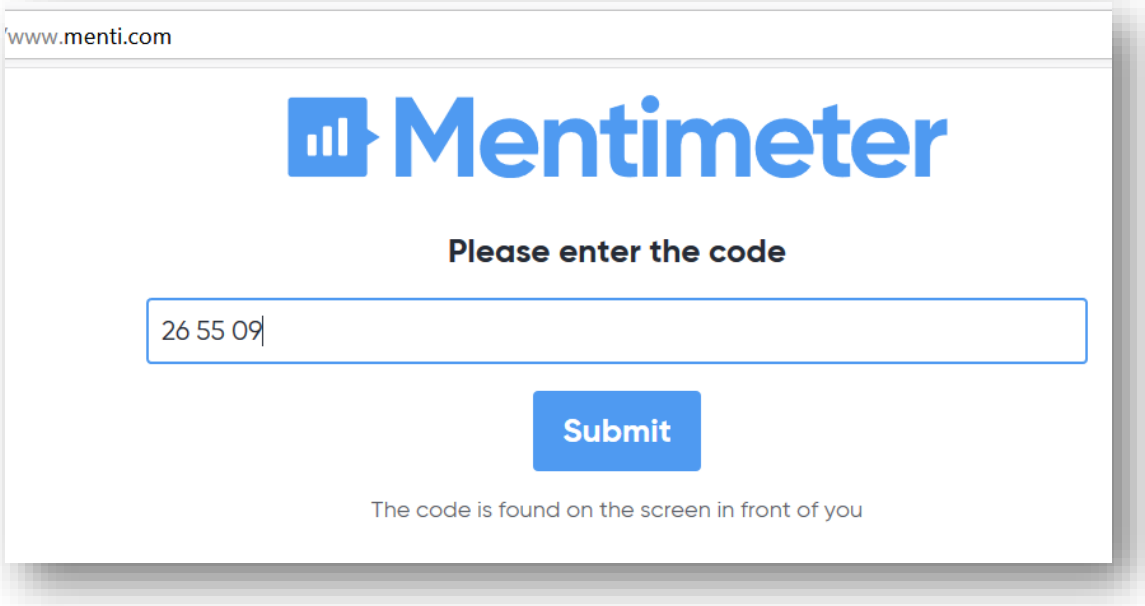
1	CALLIA
2	DCSMART
3	EPR
4	MATCH
5	Poweralliance
6	RIGRID

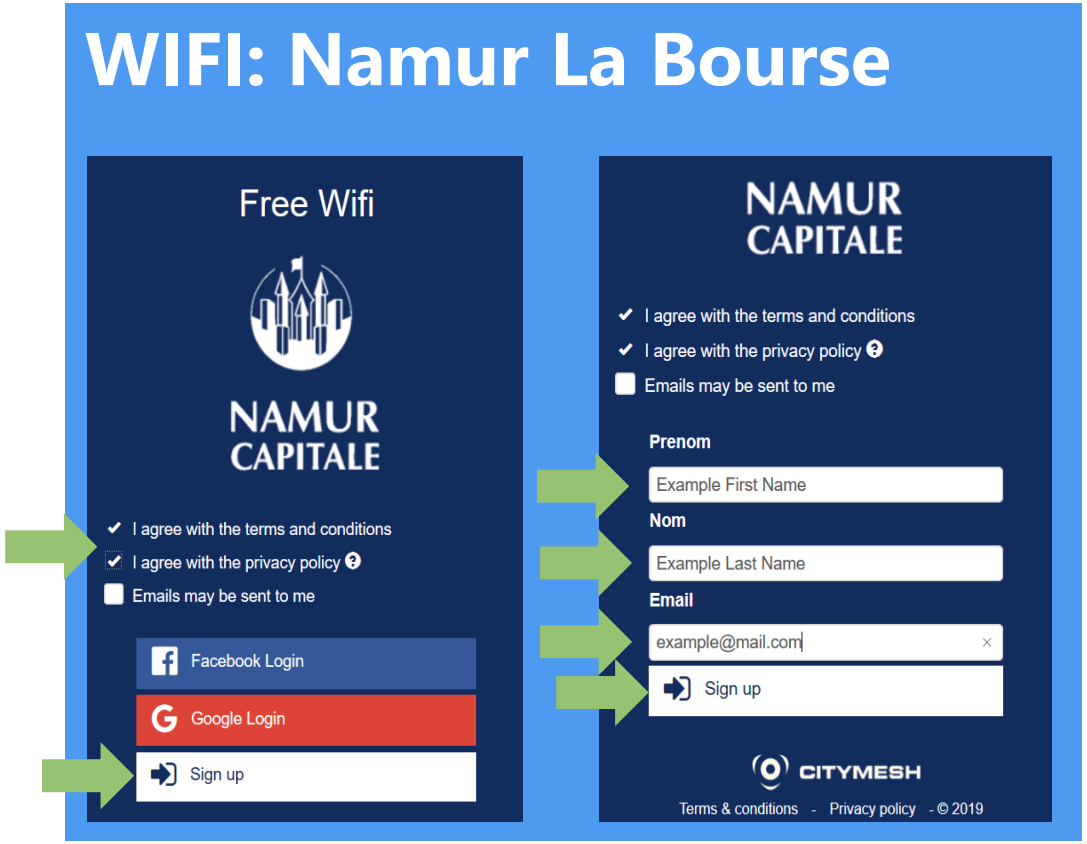
What do You Think?

Which projects seems to be best prepared for successful exploitation of its results?

Join us on www.menti.com

and enter the code 26 55 09





What's next?

Congratulations!

Time for coffee?!

Connect with the pitchers and charge your batteries

then join us back here for the

Launch of the Joint Call 2019 (16:15 pm)

Smart Energy Systems ERA-Net

EASE E.DSO

»MICALL19 Launch of the Joint Call 2019

MISSION INNOVATION
accelerating the clean energy revolution

Smart Energy Systems ERA-Net

JPP Smart Energy Systems Conference 2019

Welcome to the Launch of the Joint Call 2019

Smart Energy Systems ERA-Net

Your Moderators: Jatta Jussila and Ludwig Karg

Agenda

Welcome by the Moderators (Jatta Jussila and Ludwig Karg)
Official Launch of the Joint Call 2019 (Michael Hübner and Fredrik Lundström)
Opening Words by Global Mission Innovation Partners (Dr. Raghunath Reddy, Rachid El Mrabet)
Keynote: The trusted voice of Distribution System Operators in Europe (E.DSO - Richard Vidlička)
Keynote: Energy Storage – a Key Enabler (EASE - Thomas Otuszewski)
Panel with funded projects, funding agencies and associated partners
17:50 Wrap-Up (Michael Hübner and Fredrik Lundström)

MICALL19 Joint Call 2019

on Energy Storage Solutions

MISSION INNOVATION
accelerating the clean energy revolution

Smart Energy Systems ERA-Net

Joint Programming Platform Smart Energy Systems …

30 **funding partners from 23 European countries and regions**

Austria, Croatia, Denmark, Finland, Flanders, France, Germany, Hungary, Ireland, Israel, Italy, Latvia, Lombardy, Norway, Poland, Portugal, Romania, Scotland, Slovenia, Spain, Sweden, Switzerland, the Netherlands, Turkey & Wallonia

ERA-Net Smart Energy Systems has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreements No. 64603 and No. 775970.

Joint Programming for Flourishing Innovation:
From Local and Regional Trials towards a Transnational Knowledge Community

Goal

Organize the learning to enable the right technologies, market designs and customer adoption to achieve the smart energy system vision & goals of Europe

www.eranet-smartenergysystems.eu

Accelerating the clean energy revolution

25 **partners from around the globe**

Goal **Mission Innovation is a global initiative of 24 countries and the European Commission, working to accelerate clean energy innovation.**

- Australia
- Austria
- Brazil
- Canada
- Chile
- China
- Denmark
- European Union
- Finland
- France
- Germany
- India
- Indonesia
- Italy
- Japan
- Mexico
- Morocco
- Netherlands
- Norway
- Republic of Korea
- Saudi Arabia
- Sweden
- United Arab Emirates
- United Kingdom
- United States

Joint Call 2019

on Energy Storage Solutions

21 countries and regions from around the globe

>22 M€ budget

AUSTRIA
DENMARK
ESTONIA
FINLAND
FLANDERS
GERMANY
ICELAND
INDIA
ISRAEL
ITALY
LATIVA
LITHUANIA
MOROCCO
NORWAY
POLAND
ROMANIA
SCOTLAND
SWEDEN
SWITZERLAND
TURKEY
WALLONIA

Joint Call 2019 on Energy Storage Solutions

- **Deadlines**: expression of interest 14:00 CET, November 12, 2019
  proposal submission 14:00 CET, January 22, 2020
- **Compulsory advisory period**: September 18, 2019 – January 22, 2020
- **Call budget:** **>22 MEUR**
- **Funders**: JPP SES and Joint Call 2019 Funding Partners

Projects shall develop **sustainable integrated energy storage systems** for both **short- and long-term** storage including electrical, electrochemical, material, thermal and mechanical storage. The **new solutions for existing energy systems** shall contribute to **solving challenges** defined by Mission Innovation and European roadmaps. Also, solutions shall enable **collaboration between stakeholders** (e.g. SMEs, organisations and communities). Identifying and **involving need-owners** is highly encouraged.

www.eranet-ses.eu/JointCall19

From Smart Grids to Smart Energy Systems

Smart Energy Systems ERA-Net

Focus Initiative Smart Grids Plus
- 3 transnational calls
- > 30 projects
- > 80 mio EUR funds

Focus Initiative Integrated Regional Energy Systems
- Extended scope beyond grids
- Involvement of Associated Partners
- First transnational call May 2018 (> 30 mio EUR funds)

Focus on Integrated Energy Storage
- In collaboration with Mission Innovation Partners
- Extended scope beyond grids
- Involvement of Associated Partners
- First transnational call September 2019 (> 20 mio EUR funds)

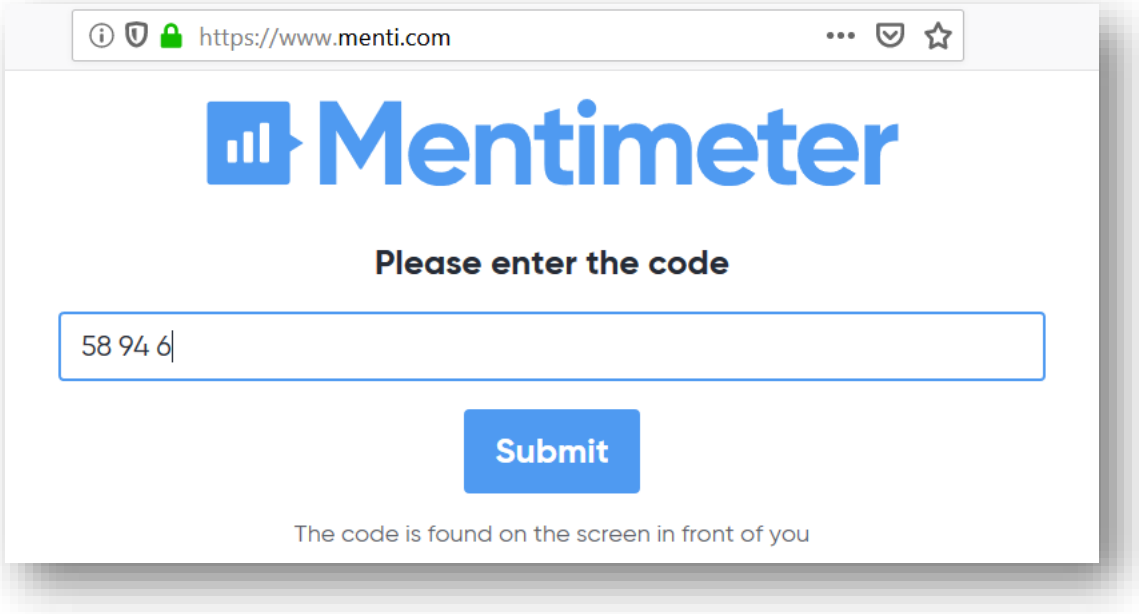
Knowledge Community
- Working Groups
- Knowledge Platform
- Spotlights & Policy Briefs

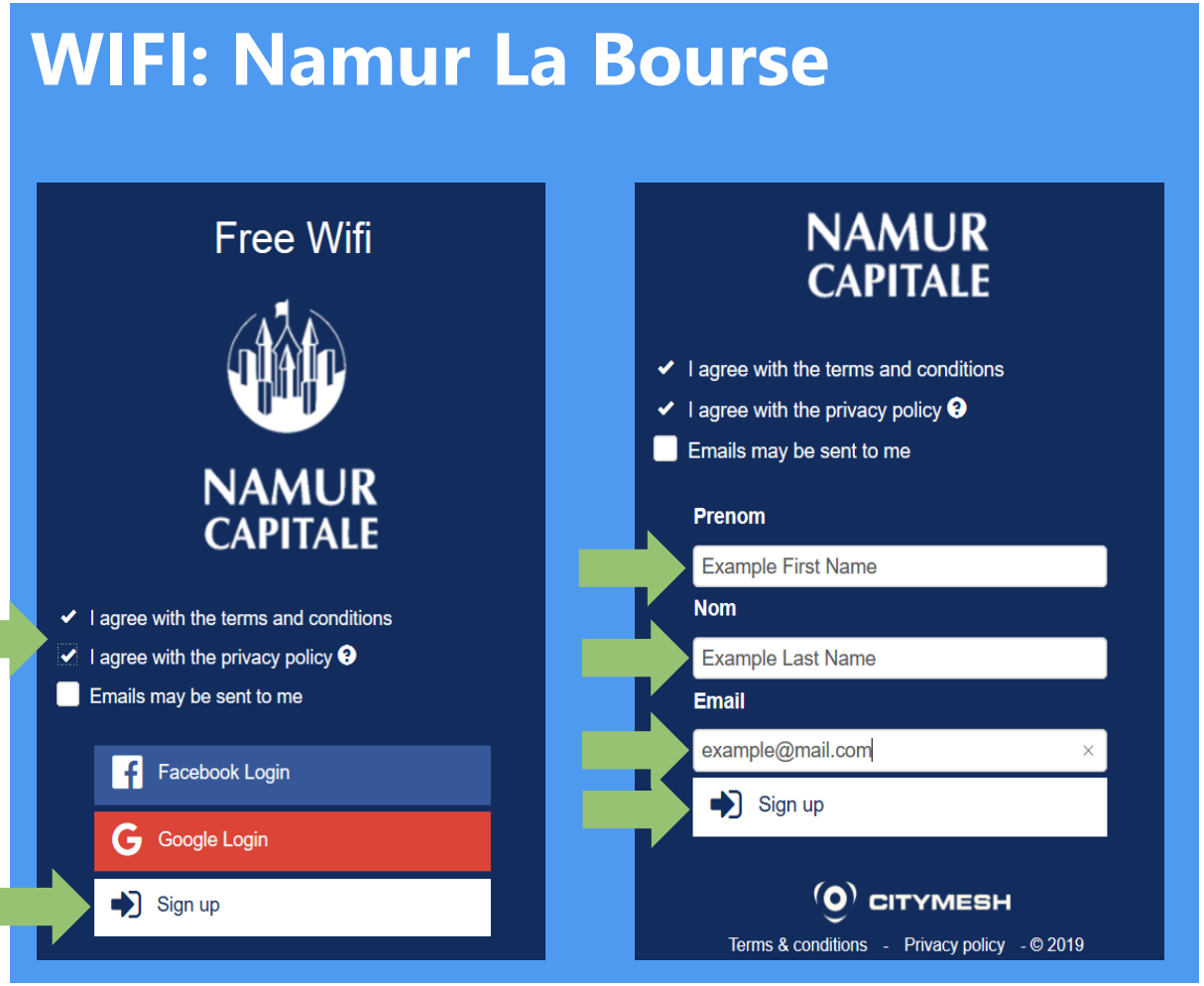
Smart Energy Systems ERA-Net | expera

www.eranet-smartenergysystems.eu

Get Ready on Mentimeter

Join us on www.menti.com
and enter the code 58 94 6





Opening Words by Global Mission Innovation Partners

Rachid El Mrabet

Institut de Recherche en Énergie Solaire et Énergies Nouvelles (IRESEN), Morocco

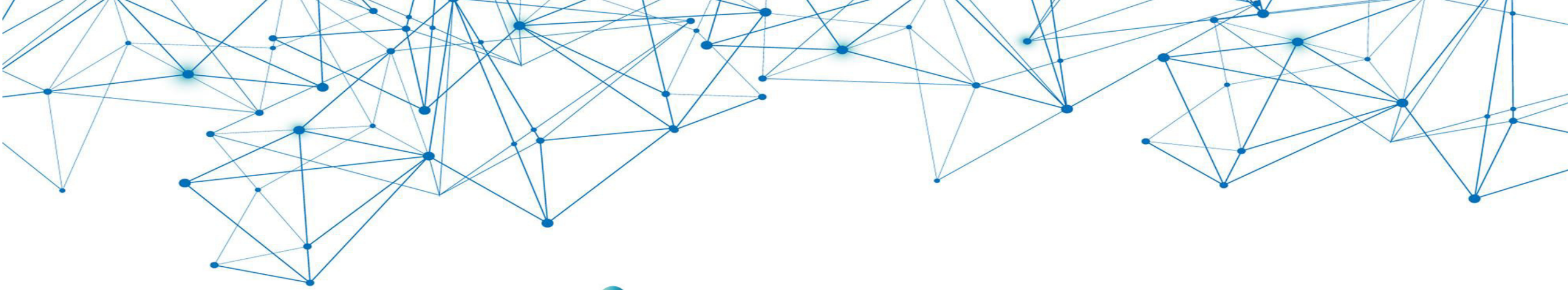
Dr. Raghunath Reddy

Ministry of Science and Technology, India

The trusted voice of Distribution System Operators in Europe

Richard Vidlička

Chairman of the Projects' Committee,
E.DSO



E.DSO

SHAPING SMARTER GRIDS FOR YOUR FUTURE

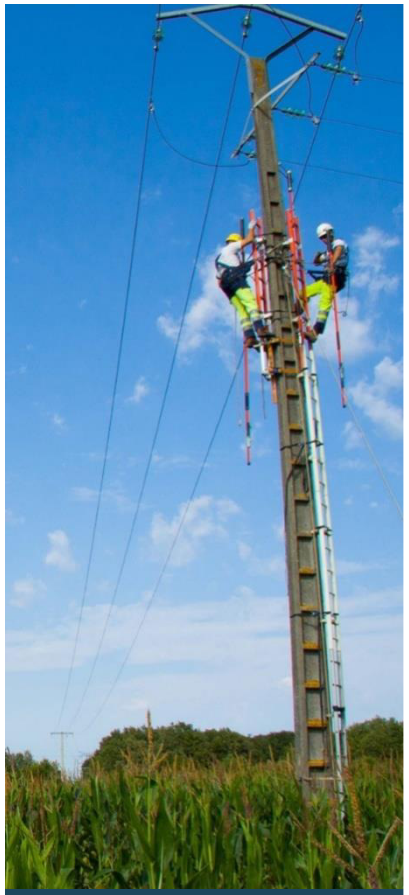
The trusted voice of Distribution System Operators in Europe

E.DSO represents power distribution companies

E.DSO
SHAPING SMARTER GRIDS FOR YOUR FUTURE


Generation


Transmission


Distribution


Supply

E.DSO is the only **100% DSO**, **100% electricity** association at EU level

E.DSO's Members

E.DSO
SHAPING SMARTER GRIDS FOR YOUR FUTURE

44
Distribution System Operators, including 3 associations

>350
million customers

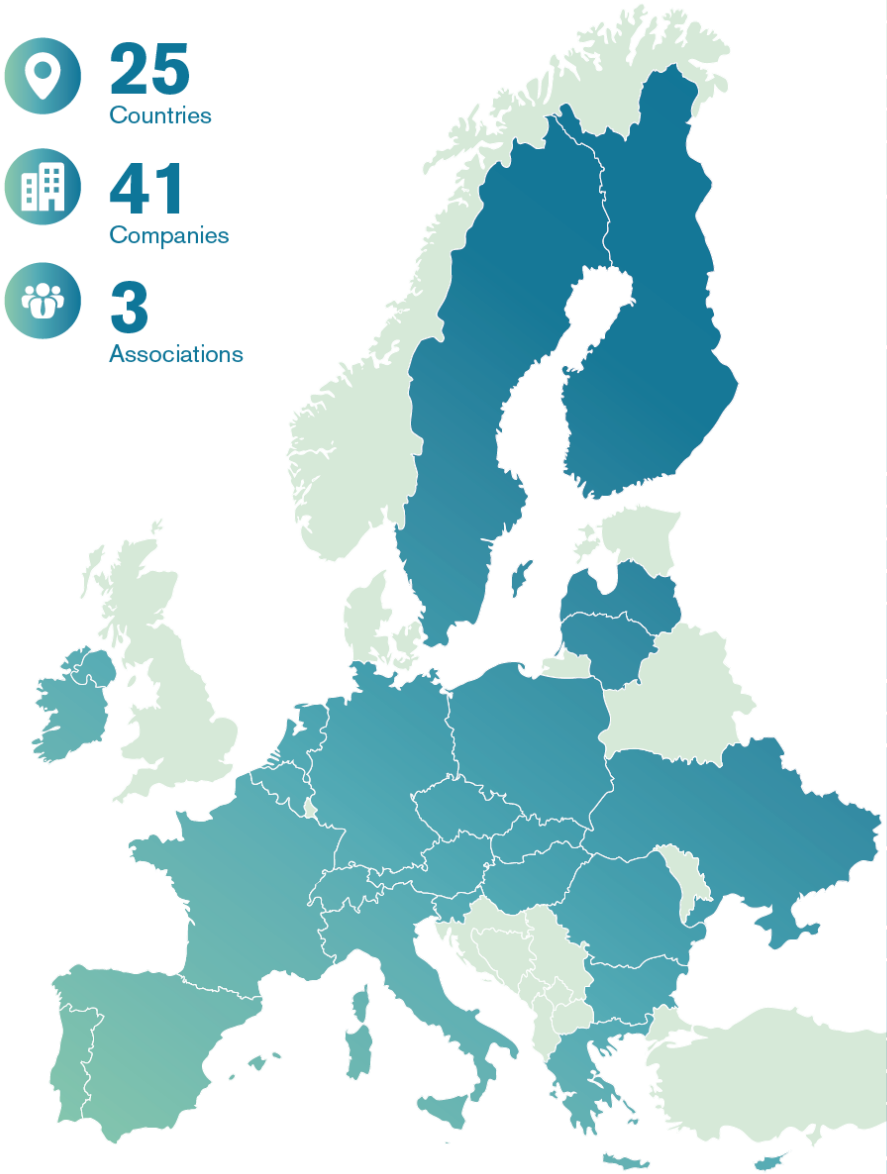
7
million kilometres of distribution lines

E.DSO in figures and map

25 Countries

41 Companies

3 Associations



AT	Energienetze Steiermark Netz Niederösterreich
BE	Fluvius ORES
CH	Services Industriels de Genève
CY	Electricity Authority of Cyprus
CZ	ČEZ Distribuce PREdistribuce
DE	E.ON EWE Netz Netze BW innogy Rheinische NETZ Gesellschaft Stromnetz Hamburg
ES	Hidrocantábrico Distribución Eléctrica Endesa Distribución Electrica i-DE Unión Fenosa Distribución Viesgo Distribución Eléctrica
FI	Caruna
FR	ENEDIS
GR	HEDNO
IE	ESB Networks
IT	areti e-distribuzione Utilitalia
LT	AB "Energijos skirstymo operatorius"
LV	Sadales tikls
NL	Alliander Enexis Netbeheer Nederland STEDIN
PL	Enea Operator Energa Operator PGE Dystrybucja
PT	EDP Distribuição
RO	e-distributie Banat e-distributie Dobrogea e-distributie Muntenia
SI	SODO
SE	Vattenfall
UA	DTEK GRIDS DSO(E)
UK	NIE Networks

E.DSO

SHAPING SMARTER GRIDS FOR YOUR FUTURE

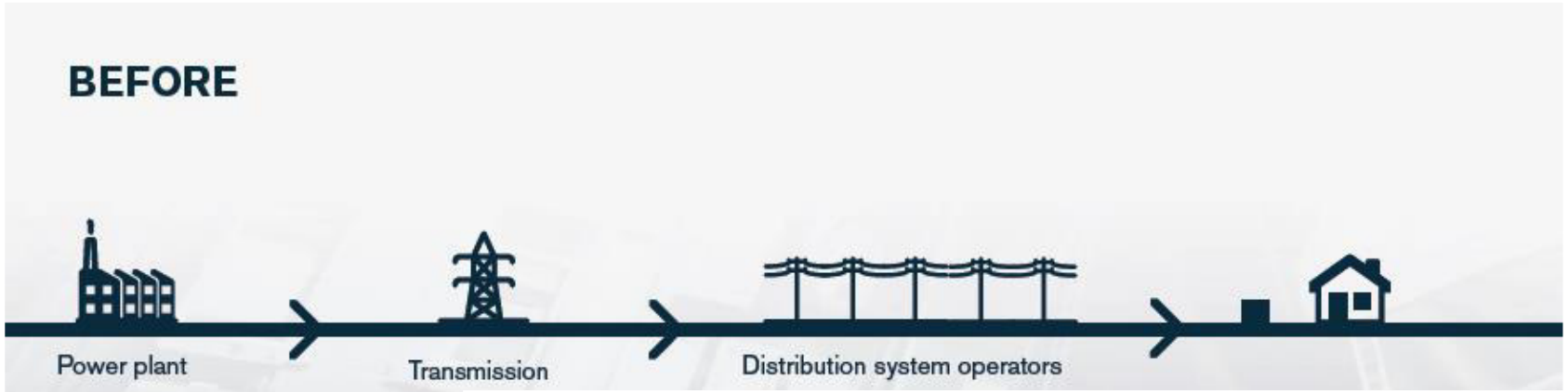
Founded **in 2010**

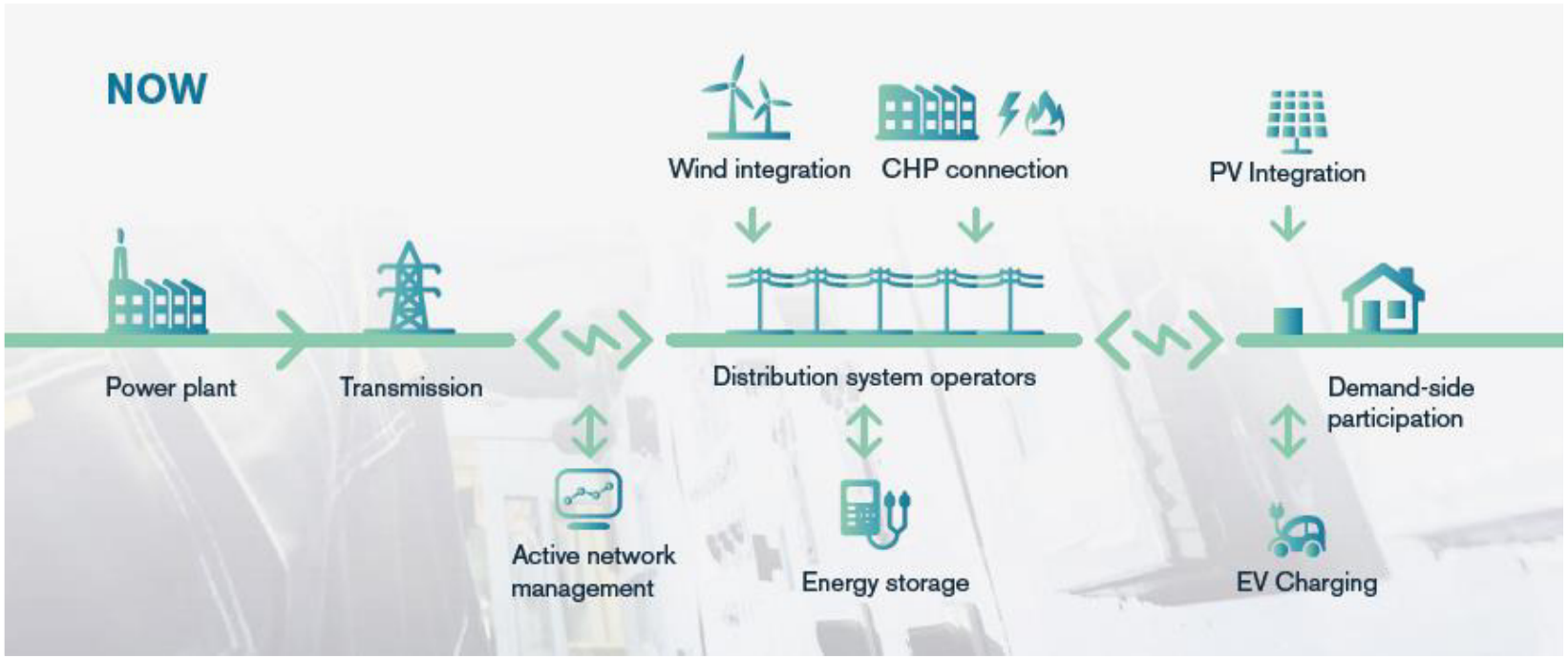
9 full-time staff in E.DSO Secretariat

Participation in **10 EU-funded research projects**

Participation in **all EU expert groups in Smart Grids** (SGTF, ETIP SNET, TSO/DSO Platform)

Energy transition: from a network's perspective





Roles of DSOs in a transitional environment

E.DSO
SHAPING SMARTER GRIDS FOR YOUR FUTURE

Traditional roles

- Network Planning, management, operation
- Customer connection
- Metering
- Quality of supply

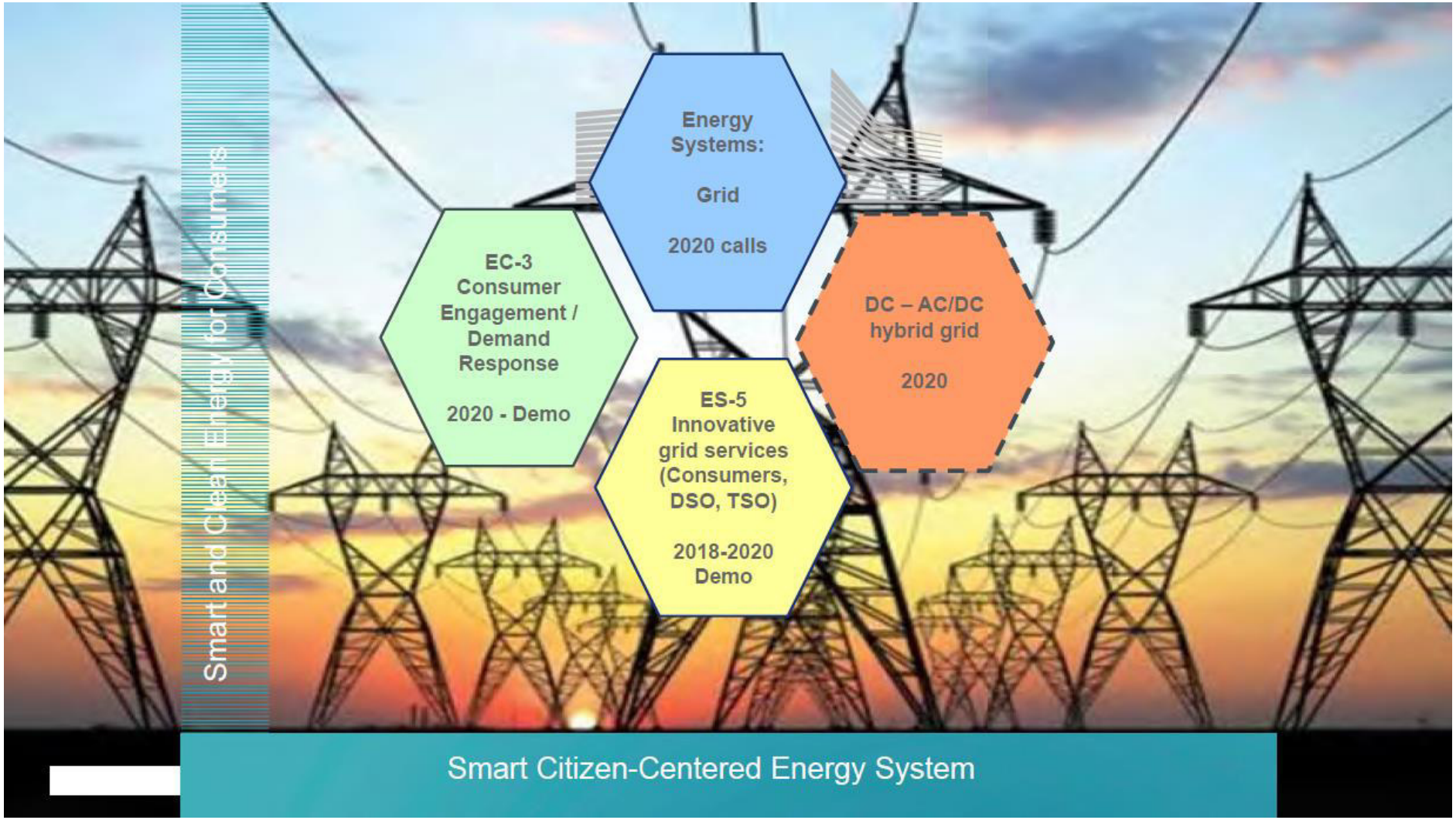
Recent/future roles

- Smart metering
- RES connection
- Neutral market facilitation
- Big data management and third party access
- Smart network planning and active system management

Key Principals of E.DSO Project Committee

- Knowledge sharing
- Neutral market approach
- Customers value added orientation
- Respect to members specific conditions

New Horizon Calls



Storage: a key technology for flexible networks

- Storage is a **multi-use(r) technology**
- Multiple **pilot projects** have already included storage in DSO R,D&I
- Storage is **a flexibility tool** for network operators

➢ Therefore, not only **technical issues** but also **business models** should be researched, in comparison with other flexibility technologies/solutions

DSO Storage: what's in the Clean Energy Package?

- **Flexibility**:

  DSO are allowed and encouraged to procure flexibility services
  Key principles: technology neutral and market-based
  DSOs and TSOs define flexibility market products

- **Ownership and operation of storage by DSOs**:

  O&O is authorised but only in two situations:
  - No market party could be awarded with the right to O&O
  - Storage as a fully integrated network components (FINC)

  In any case, strong oversight by the NRA

Storage for DSOs: next steps in R&D? Examples…

SHAPING SMARTER GRIDS FOR YOUR FUTURE

Technical / Economic

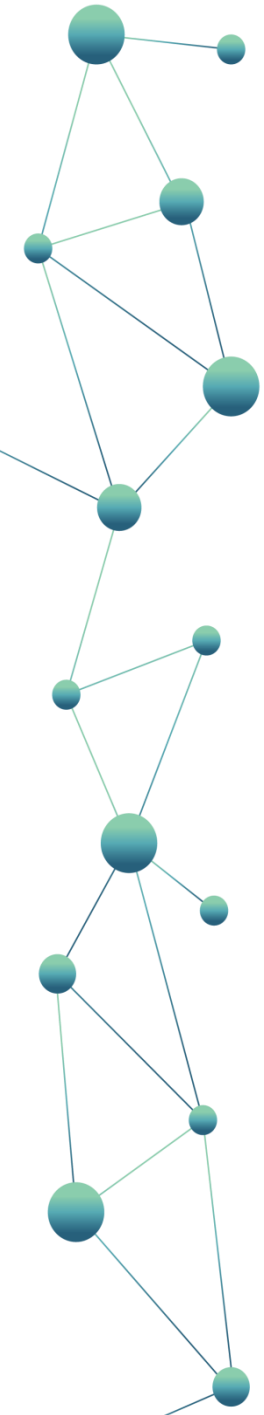
- Ensuring reliability of network storage
- Reduction of cost
- Standardisation of storage solutions

Business

- Definition of flexibility products
- Business models for network storage

Regulatory

- Establishement of stable market models
- Definition of storage
- Definition of roles
- Rules of coordination



E.DSO
SHAPING SMARTER GRIDS FOR YOUR FUTURE

Thank you for attention!

Energy Storage:

A Key Enabler to Achieve EU 2050 Targets

Thomas Otuszewski

Project Officer
EASE

Energy Storage: A Key Enabler to Achieve EU 2050 Targets

02/10/2019

ERA-NET Smart Energy System Conference 2019

Namur - Belgium

Thomas Otuszewski

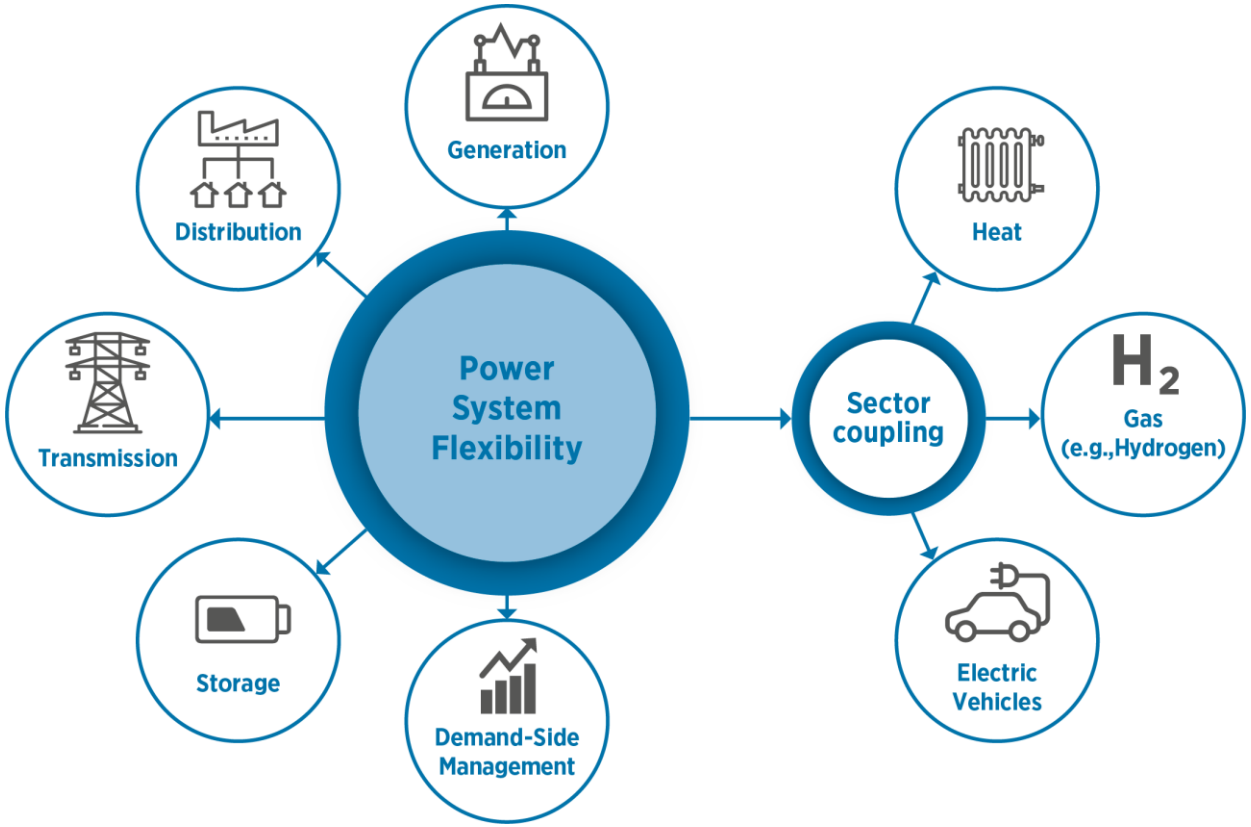
Project Officer

Introduction to EASE

EASE activities & members

The Need for Energy Storage

The Need for Energy Storage



Energy storage provides flexibility to the system at **various time-scales**, from seconds and hours to weeks and months

Energy storage offers highly **reliable, predictable, and accurate flexibility** services totally **independently from external factors** (weather, time or season, consumer behaviour, etc.)

The Need for Energy Storage

The EU has one of the most ambitious energy policies in the world

A renewable energy target
of at least 32% by 2030

A climate neutral Europe by 2050

The Need for Energy Storage

Decarbonisation and the Energy Union

Ursula's European Green Deal

- 2030 emission reduction target: increase to at least 50% by 2030, up from the current 40%
- 2050 climate-neutrality target enshrined into law
- 1 trillion investment over the next decade across the EU – turning EIB into Europe's climate bank

First 100 days will bey key

Research, Innovation, Demonstration

Investment in research and innovation

ETIP SNET
EUROPEAN TECHNOLOGY AND INNOVATION PLATFORM
SMART NETWORKS FOR ENERGY TRANSITION

HYDROPOWER EUROPE

bridge
HORIZON 2020

BATTERIES EUROPE
European Technology and Innovation Platform
Funded by the European Commission

BATTERY 2030+

EASE
EERA
Energy Storage

Energy Storage and Research

Priorities for the Industry from a research point of view

Within the next 2-5 years

- Identify possible market models/use cases able to guarantee the economic feasibility of energy storage devices
- Analyse degradation processes related to diverse duty cycles
- Study system integration
- Conduct research on energy storage in relation to EVs
- Investigate new designs for energy storage and hybrid technologies
- Continue basic materials research

Source: EASE EERA Storage Technology Development Roadmap 2017 HR

Research, Innovation, Demonstration

Bringing innovation on the market

- We need demonstration projects to validate the innovation

- Within the next 5-10 years:
  - ✓ Support new large-scale demonstration
  - ✓ Continue basic materials research
  - ✓ Support communication and interaction of different storage assets

Energy Storage and Research

Priorities for the Industry

Several urgent matters:

- Set up European demonstration and pilot programmes focusing on grid integration of relatively mature energy storage technologies (e.g. large-scale energy storage systems)
- Systematically demonstrate the ways in which energy storage can provide energy services and monetise the added value to the energy system
- Support materials and equipment research
- Develop a strategic energy storage plan for Europe
- Initiate a long-term, coordinated research effort among private companies and research laboratories across Europe

Source: EASE EERA Storage Technology Development Roadmap 2017 HR

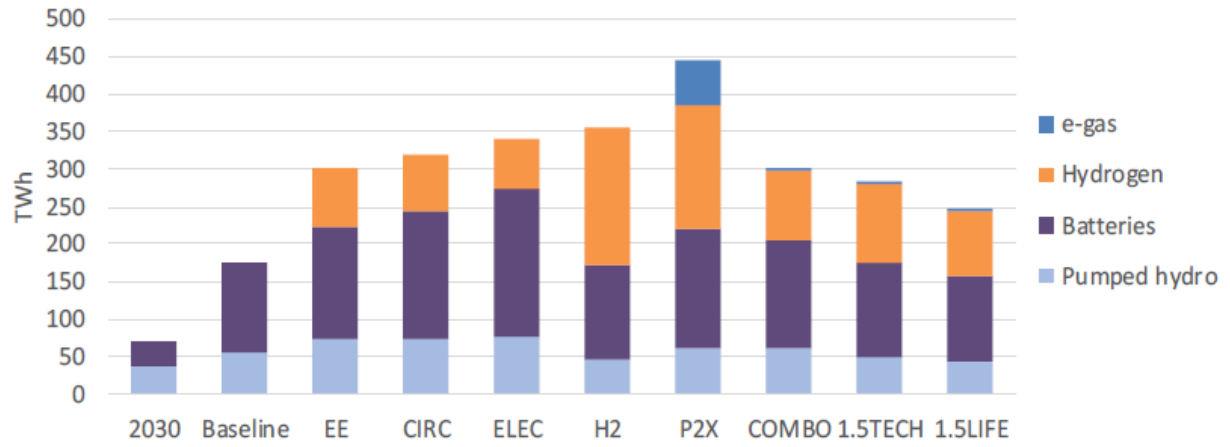
Conclusions

Energy storage is a key enabler of the energy transition

- The EU will pursue a **net-zero power emissions system by 2050**, with a 81-85% share of variable renewables in gross electricity generation
- This requires a significant increase in storage deployment

All the European actors need to support and incentivise energy storage to support RES integration.

Figure 26: Electricity storage in 2050



Source: PRIMES.

Source: European Commission: In-Depth Analysis in Support of the Commission Communication on the 2050 Long-Term Strategy (Nov 2018)

EASE – European Association for Storage of Energy
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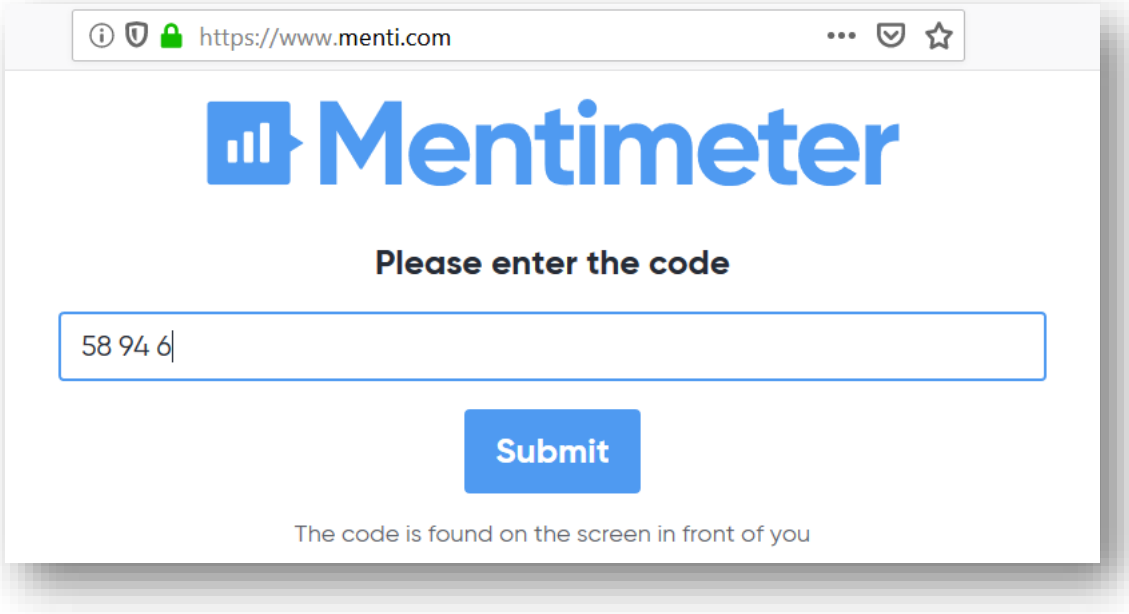
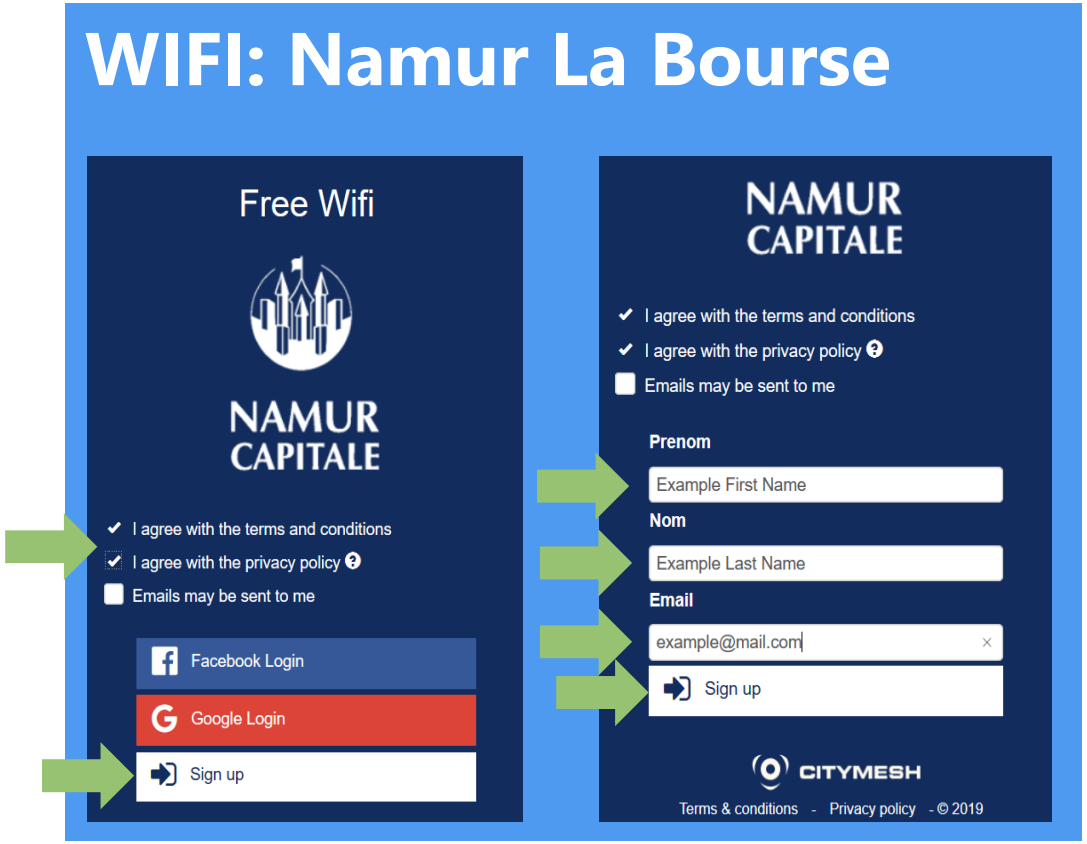
BE – 1030 Brussels
Tel: +32 2 743 29 82 | Fax: +32 2 743 29 90
@EASE_ES
info@ease-storage.eu
www.ease-storage.eu

Share Your Opinion

What do you think is the biggest success factor of JPP ERA-Net SES?

To vote, join us on www.menti.com and enter the code 58 94 6





Your Opinion is …

What do you think is the biggest success factor of JPP ERA-Net SES?

Panel with funded projects, funding organisations and associated partners

Projects	Associated Partners	Funding Organisations
Lars Olsson	**Zsuzsanna Bodi**	**Urban Peyker**
Metrum, EPR	ENoLL	FFG
Ewa Piatkowska	**Josh Roberts**	**Aleksandra Kronberga**
AIT, LarGo!	REScoop	European Commission
Bartlomiej Arendarski	**Gaëtan Masson**	**Jan Gilot**
Fraunhofer IFF, RIGRID	Becquerel Institute	Flux50

Share Your Opinion

What will be drivers for private people to install storage in their homes?

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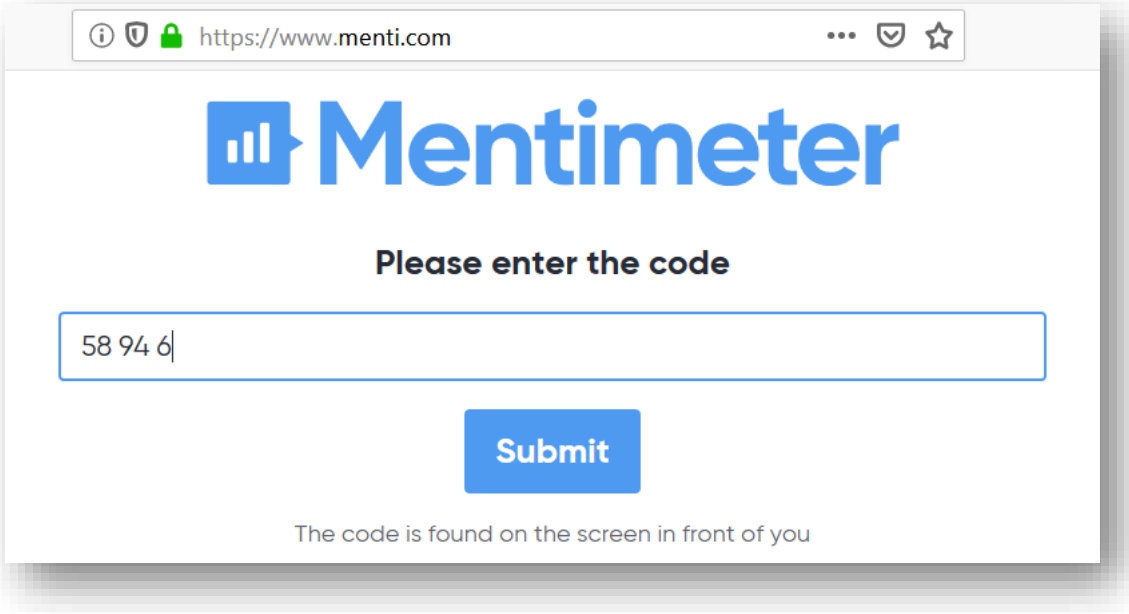

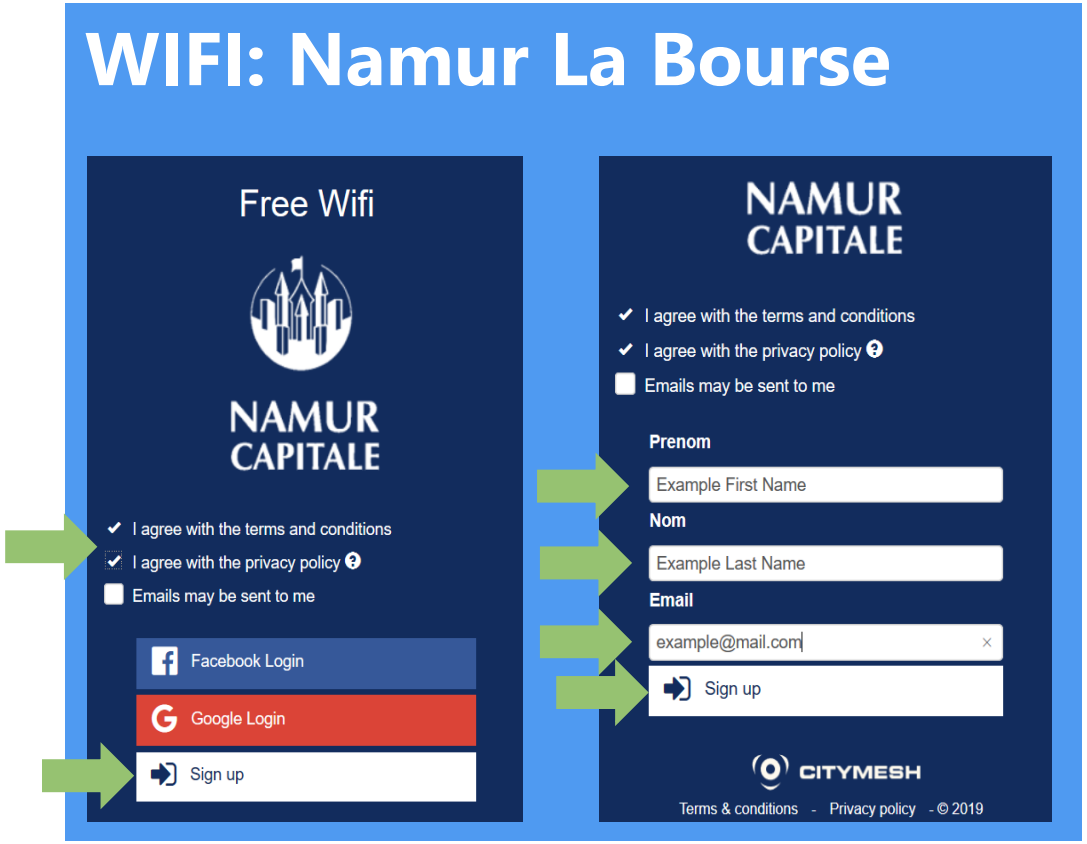

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Panel with funded projects, funding agencies and associated partners
Wrap-Up (Michael Hübner and Fredrik Lundström)

Time to Rest

Charge your batteries and join us back here tomorrow:

08:45-13:00

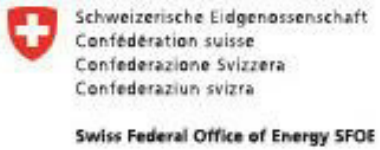
- Matchmaking for the Joint Call 2019

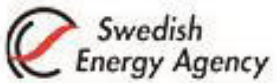
  schedule your meetings:
  https://eranet-smartenergysystems-micall19.b2match.io/
  (go to www.eranet-smartenergysystems.eu)

- NSCG Meeting

From 14:00

Knowledge Community Meeting





Smart Energy Systems ERA-Net

Funding Partners

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