# Telecoms and Smart Grids

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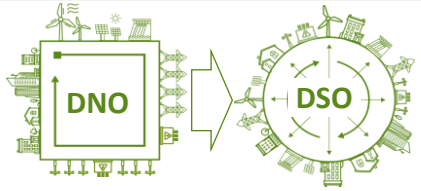
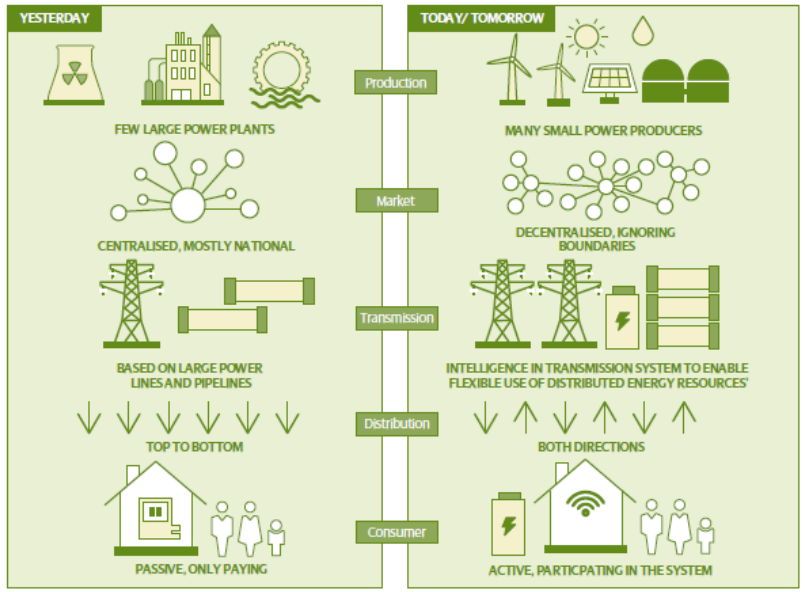
# Smart Grid Deployments

## Utilities Challenges Today




**Evolution** towards **DSO** is happening **today**





| Smart Networks | Flexibility | Neutral Market Facilitator | Value Added Services |
|---|---|---|---|
| Coordinating DSO and network actions to optimise the capacity, security, and reliability of the network. | Working with our customers' ability to operate flexibly. | Enabling our customers to access new markets, and creating a new operating model to improve whole-system co-ordination | Offering additional value to our customers through services, or as provider of last resort where the market fails to deliver. |

**Digitalisation** as an **enabler**

**Electrification of Transport**
**1.0m - 1.5m new EVs** by 2030

**Electrification of Heating**
**0.6m - 0.9m new heat pumps** by 2030.

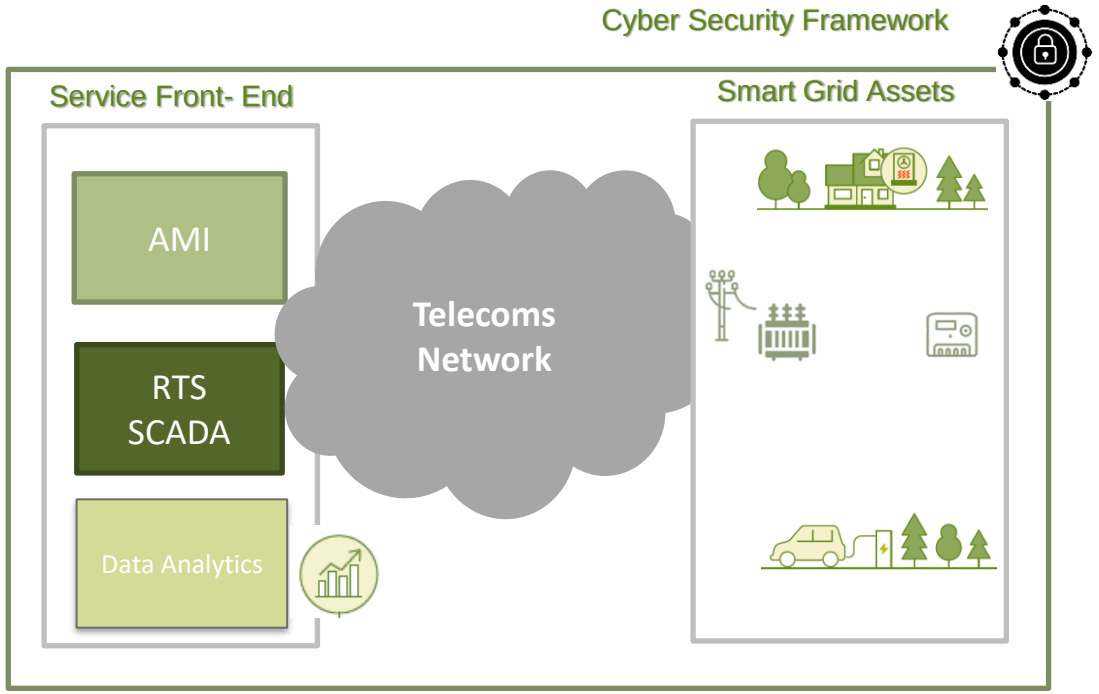
**Distributed Generation**
**+6GW** to **+7GW** of new **generation** by 2030.
*(2.6 x current levels)*

# Smart Grid Deployments Strategy

- ✓ **Digitalisation** of the network business is a challenging reality
- ✓ Deploying **Smart Grids** today:
  - **Enhancing, improving and further monitoring the existing infrastructure**
  - **Deploying New Infrastructure, New Systems and Platforms to allow increased resilience and functionalities of the network**

# Smart Grid Deployments Strategy

- ✓ **RTS** Functionalities improved. Evolution towards ADMS (Advanced Distribution Management System)
- ✓ **Data analytics** will provide the capability to make use of data to optimise the capacity of the network and inform interventions to make them Efficient and Effective.
- ✓ **Increase Digitalisation**: Automation and Control of Secondary and Primary Substations
- ✓ Enhanced **Cyber Security** Framework
- ✓ **Telecoms as a key enabler**



# Telecoms and Smart Grids

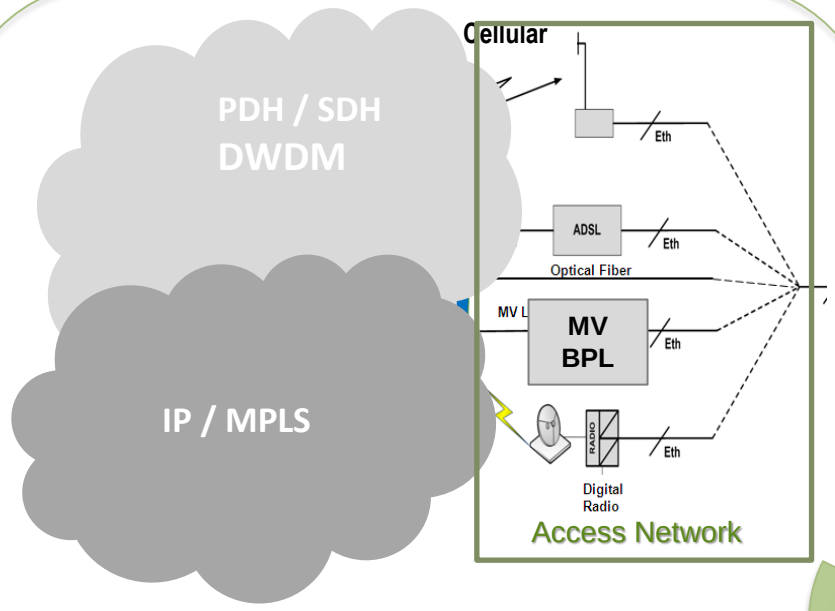
Services Front-End

AMI

SCADA

Security & Videosuirveillance

Telecoms Network

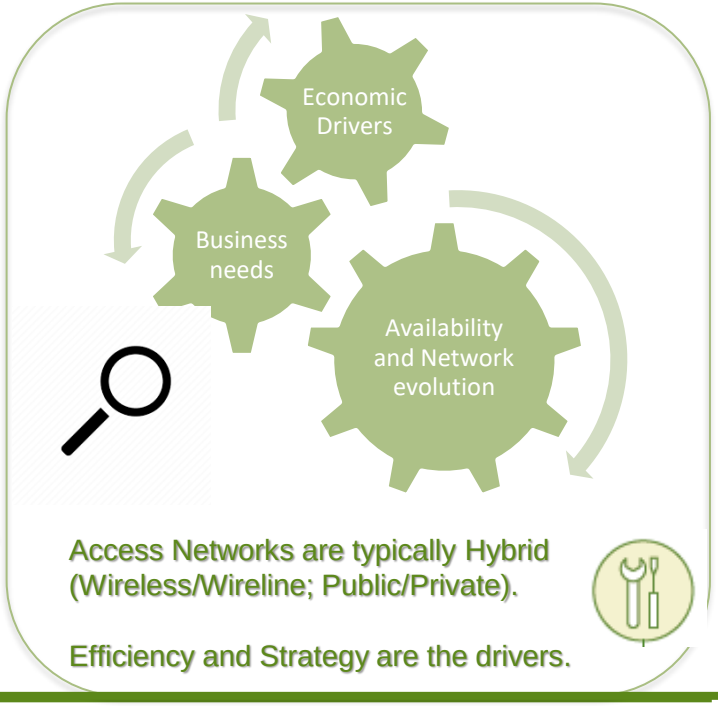



Smart Grid Assets

**Telecoms** are a strong pillar to support Smart Grids

Telecoms infrastructure is to be **resilient, reliable and future proof.**

**Enhanced visibility and control is required**

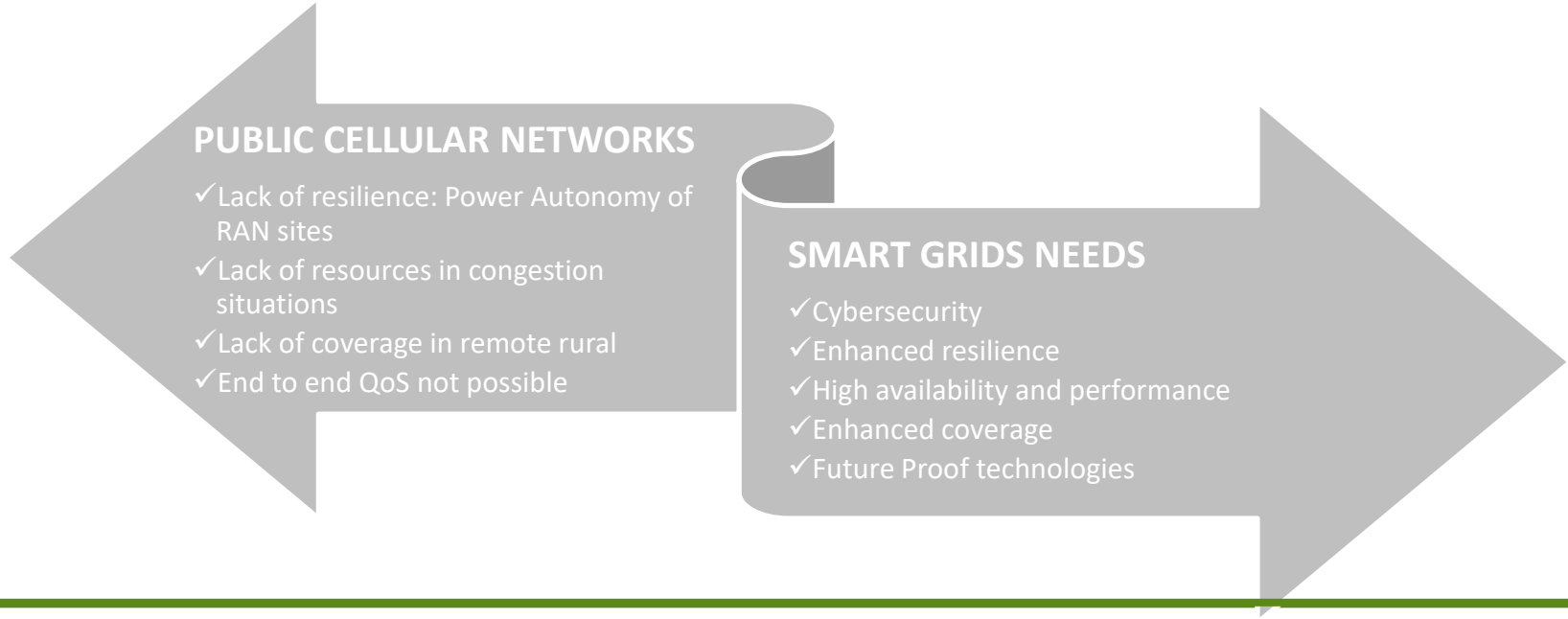



Access Networks are typically Hybrid (Wireless/Wireline; Public/Private).

Efficiency and Strategy are the drivers.

# Wireless Access Technologies

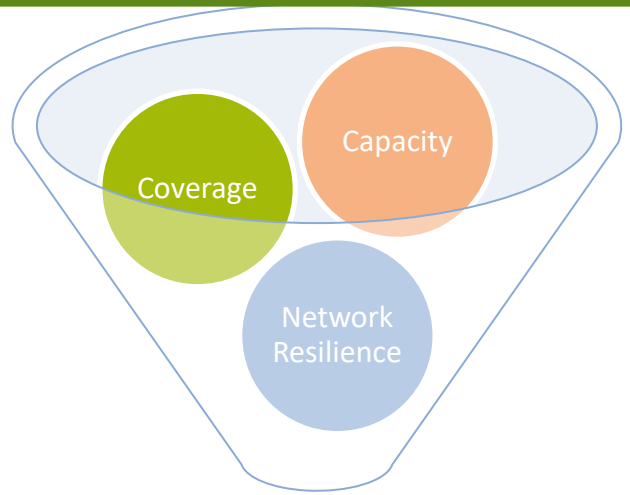
- ✓ Ambitious target dates for the achievement of policies and legal mandates require an increase in communications delivered by **Wireless technologies**.
- ✓ **Public Cellular networks** allow for **quick and cost-effective deployments**; however, **they are not fully adapted to utilities** Smart Grid's needs.
- ✓ **Private LTE** to compensate the weaknesses of Public Cellular



# Public Cellular Networks and Smart Grids. Lessons Learned

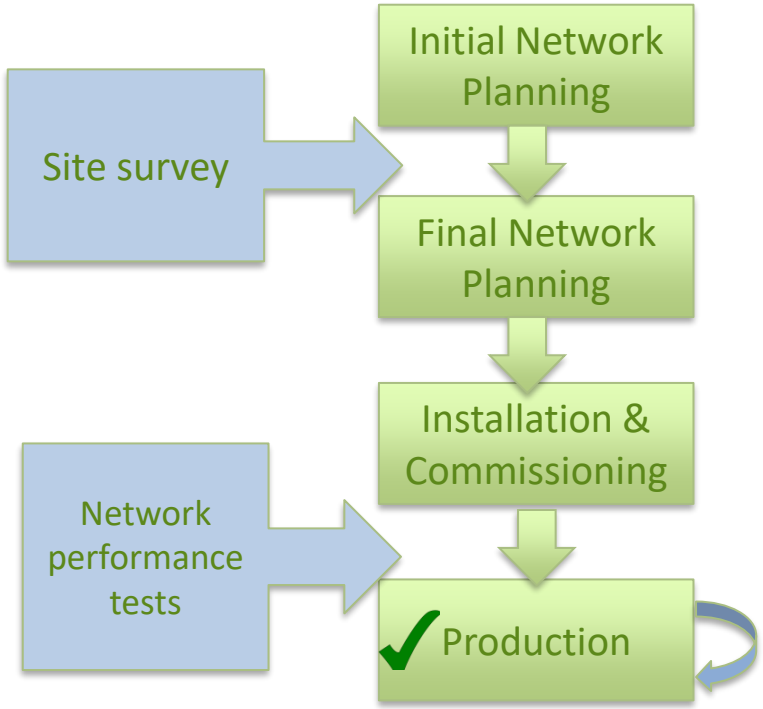
✓ Network performance and availability is strongly dependent on MNO's Network in terms of:

- MNO's network planning: Coverage and Capacity
  - Utilities do not have higher priority to access to resources in congestion situations
  - Coverage
- Network equipment redundancy
- Power autonomy of the RAN sites




# Public Cellular Networks and Smart Grids. Lessons Learned

- ✓ Special considerations need to be taken in all deployment phases when using Cellular as an Access option to Smart Grid assets

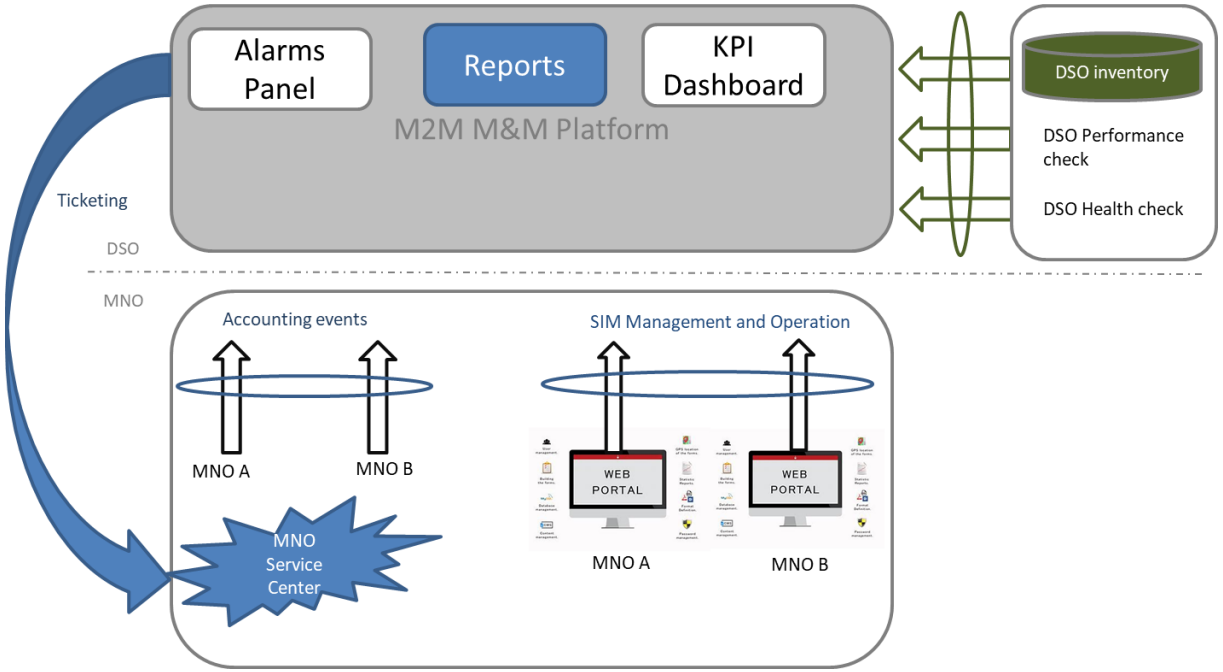



- ✓ MNO's maps of coverage not fully reliable
- ✓ Good Cellular Signal indicators during commissioning are not full guarantee of network performance
- ✓ Pre-production and Production Performance tests needed

- ✓ Proactive/Reactive Monitoring required

# Public Cellular Networks and Smart Grids. Lessons Learned

✓ **Management and Monitoring of Public Cellular Services is necessary** in order to keep up the quality of the service. Specific tailored tools must be developed in order to combine operations with multiple MNOs



# Private LTE strategy in Iberdrola

## Private Radio Technology for Access Network

**LTE is a Radio (Wireless) Technology**

Radio =
Cost -effective &
Faster deployments

**“Private” LTE = Full control of the Network**

Tailored coverage and Resilience

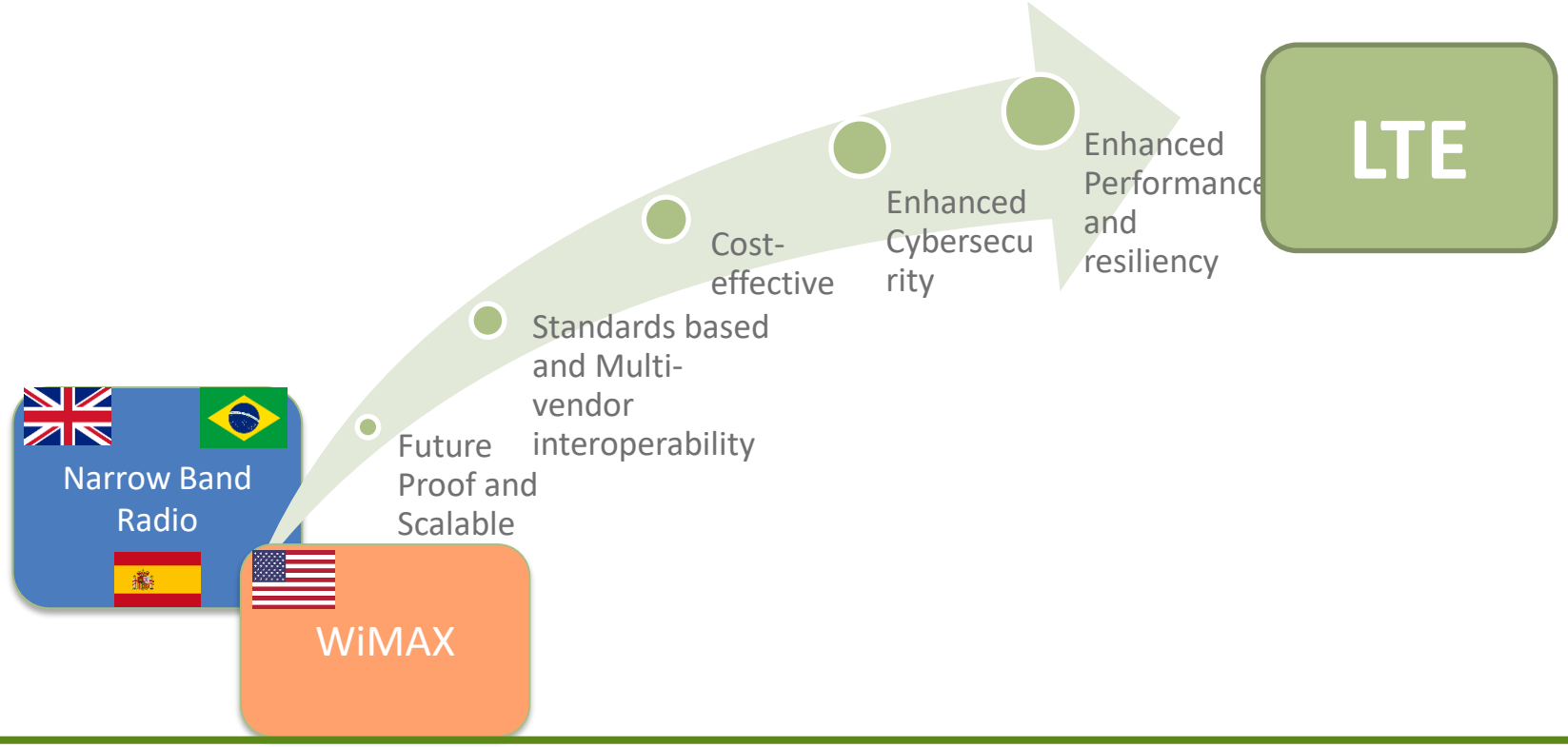
**Public networks → Do NOT meet utilities’ requirements**

Cellular 2G/3G is being obsoleted

# Private LTE strategy in Iberdrola

## Evolution of existing Private Radio technologies

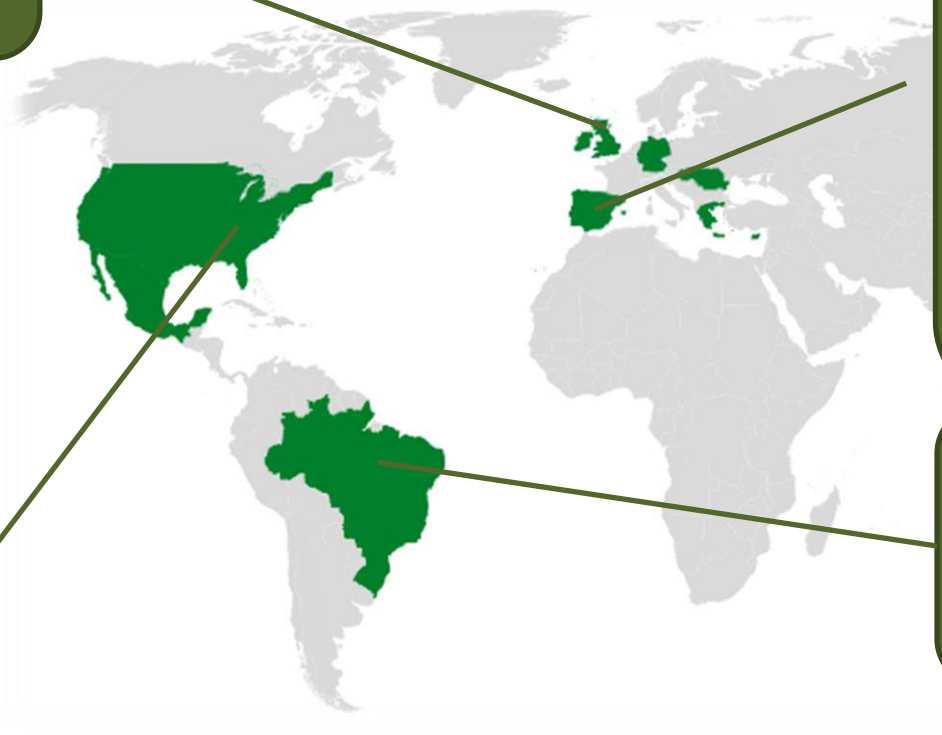
- ✓ **Private Radio technologies (VHF,UHF, WiMAX)** are today serving grid IEDs
- ✓ **Private LTE** is the **evolution: Private, standard and state of the art**



# Private LTE strategy in Iberdrola

UK- Scottish Power: Pilot Project under the framework of Secondary Automation

US-Avangrid: Currently deploying WiMAX for Smart Grid connectivity needs. Looking for spectrum options that allow evolution to Private LTE



SPAIN-Iberdrola: Currently deploying Private LTE as an Evolution of NB UHF/VHF Digital Radio to serve DA, AMI and future Smart Grid use cases

BRAZIL-Neoenergia Private LTE deployment in Atibaia DSO

Spectrum Challenge is Global

# Private LTE strategy in Iberdrola

## Challenges

- **Need to Secure Spectrum**: Broadband Spectrum allocation for utilities is still to be achieved
- **Network Infrastructure & Device ecosystem, across countries**
- **Transition Strategy**:
  - Deployment and network design **leveraging the existing infrastructure** (repeater stations)
  - Building a **strategy for the evolution** of currently deployed access (IEDs)

# Any questions?