Assessing the Impact of Electrification in Spanish Distribution Networks

The lights will stay on with 50 million heat pumps

5th July 2021
Utility of the Future vs Energy Company of the Future

The lights will stay on with 50 million heat pumps

2030 Vision: Renewable Generation technologies that are **cost competitive** for a decarbonized electric industry

**Toward a decarbonized Energy demand: technologies for the electrification of the economy**
The lights will stay on with 50 million heat pumps.

Heat Pump and EV Impact assessment

Inputs

- Clustering of EV and Heat Pumps at individual supply points
- Demand Patterns
  - EV
  - HP
- Network Connectivity
- Smart Meters

Simulation Model

- LV Network Power Flow Simulation Model
  - 110,000 MV-LV Transformers
  - 150,000 km LV network

Outputs

- Network constraint identification
  - Overloaded Transformers
  - Network overloads and voltage excursions

Strategic Investment Planning
The lights will stay on with 50 million heat pumps.

**4M** Heat Pumps &

**5M** Electric Vehicles in Spain

**Localised network** reinforcements ahead of need

~2% secondary transformers

~1% LV Networks

Short and medium terms: **Not problematic**
Long term: **Enhanced digitisation**
The lights will stay on with 50 million heat pumps.

Take Aways

Leveraging the previous digitalization of the system

Estimating the future demand framed by Spanish NECP

Localised “weaker” points in the network

The network is continuously updated to meet new demand requirements and the reinforcements needed will be within the network investment plans.

On the long term, enhanced digitalization, smart charging and smart heat pumps will be key enablers.

“Fit for 55” Package offers a unique opportunity to boost momentum on electrification of the building and industry sector