IElectrix Project – Installation and commissioning of the Indian demonstration in Delhi

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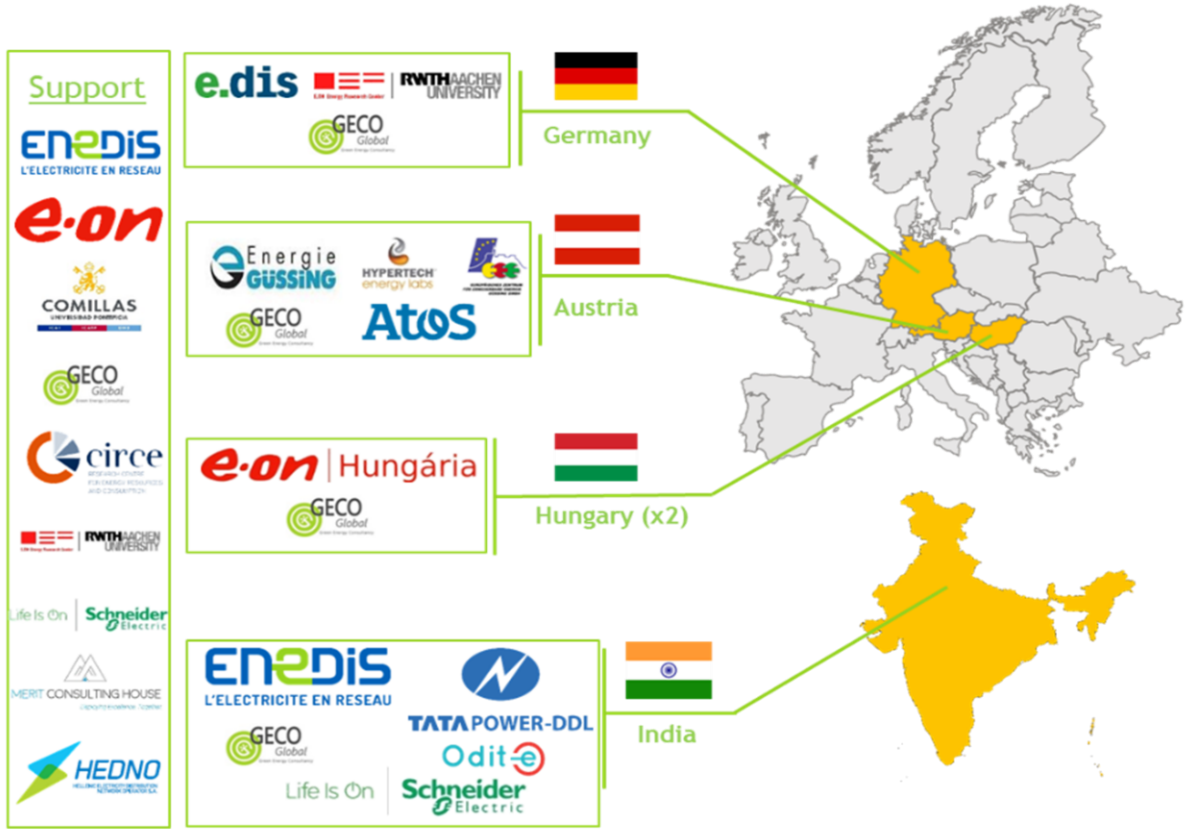
H2020 European program

Type: Energy Community microgrid

Customer pain points

- Minimizing energy bill by maximizing self-consumption of the renewable energy
- Maximizing ROI by minimizing network reinforcement
- Continuity of power supply
- Grid congestion: voltage & power
- Prosumers engagement: energy awareness



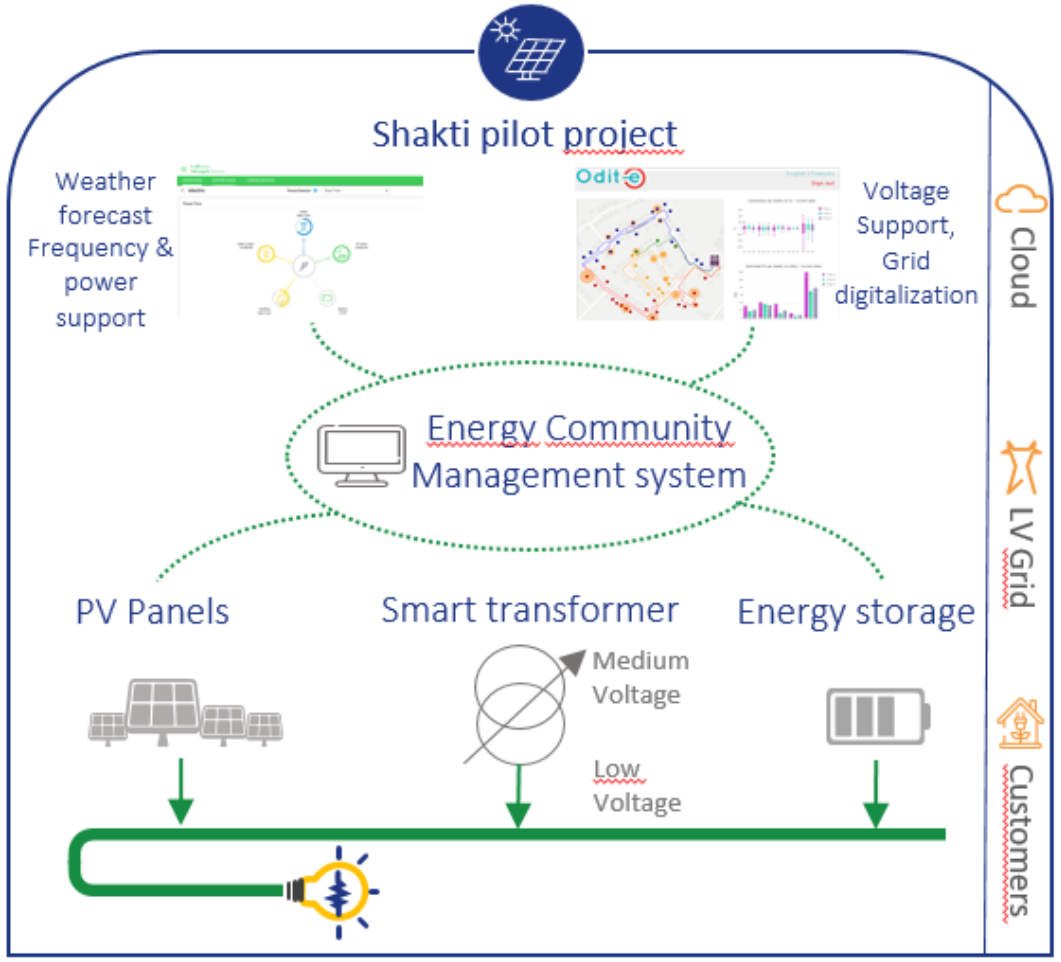
The Indian Demonstration

Shakti demo: Smart Grid serving customers through 3 LV public feeders

Location: St Xavier School, north of Delhi

Energy Community: School of 4,000 students + 34 prosumers & customers (smart meters)

Transformer: 630 kVA
PV Panels: 200 kWc
Battery Energy Storage System: 200 kVA/270 kWh



Objectives

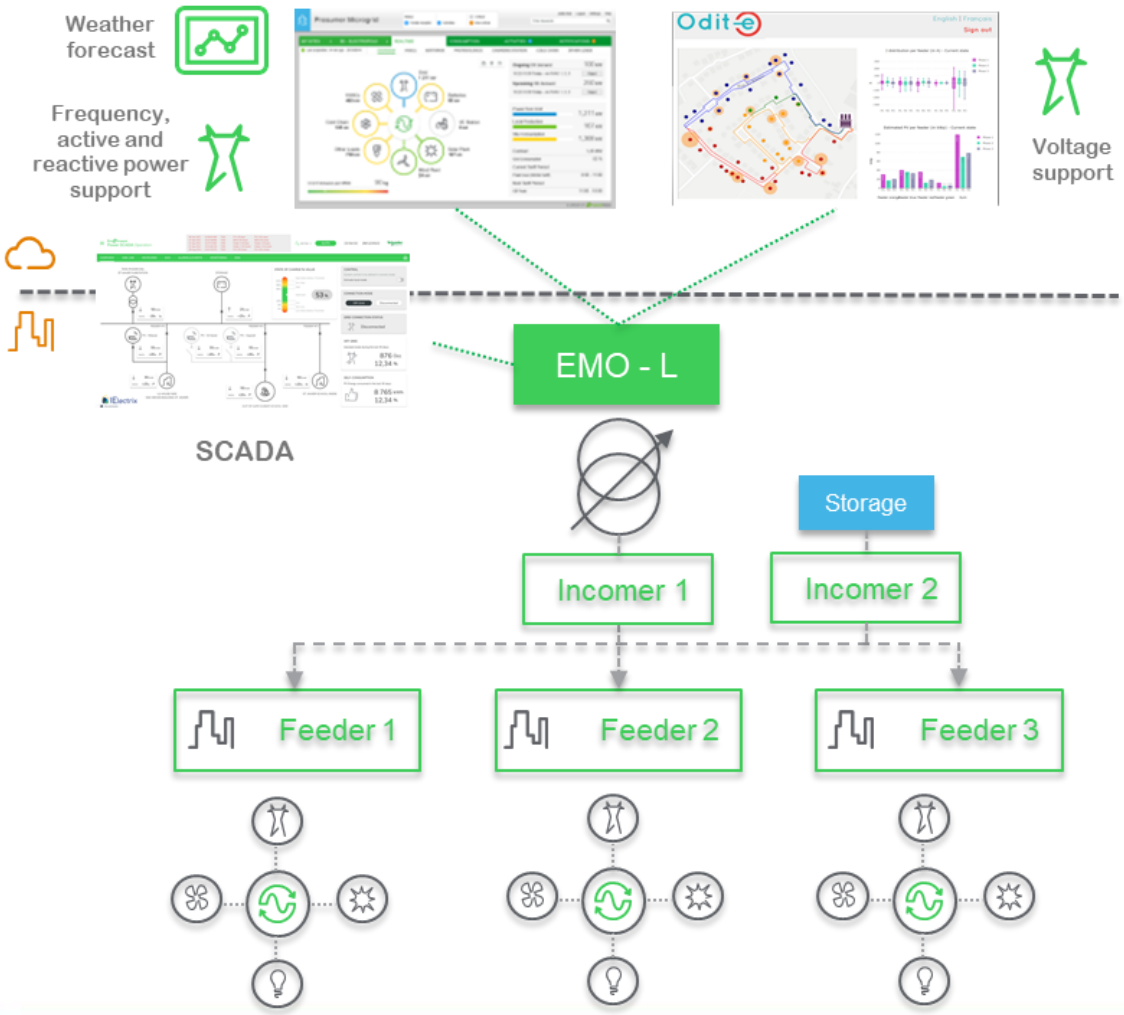
Energy Storage
To increase renewable energy sources integration without additional network investments and enhance local use of **local renewable energy**

Power quality improvement
To make power supply more efficient and reliable by digitizing the network and introducing automation

Community prosumer involvement
To enable flexibility of the customer's demand and enhance **customers' involvement**

Resilience
To increase the **reliability and resilience** of the electricity supply

The Substation architecture



EMS : EMA

Forecast and manage self consumption + frequency support

PMS : EMO

Manage connection mode, SoO & PMS, Volt control

Power SCADA Operation

Online monitoring & remote control

Minera Transformer

Eliminates the impact of voltage fluctuation

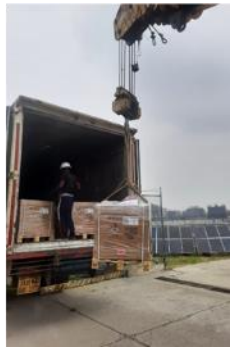
ECC

Ensures sources and loads switching

Tranport & site installation

Transport

- Shipment from France to India
- Container shortage crisis
- Refrigerated maritime container and truck for battery cells



Site installation

Preparation of the site: Civil and engineering works

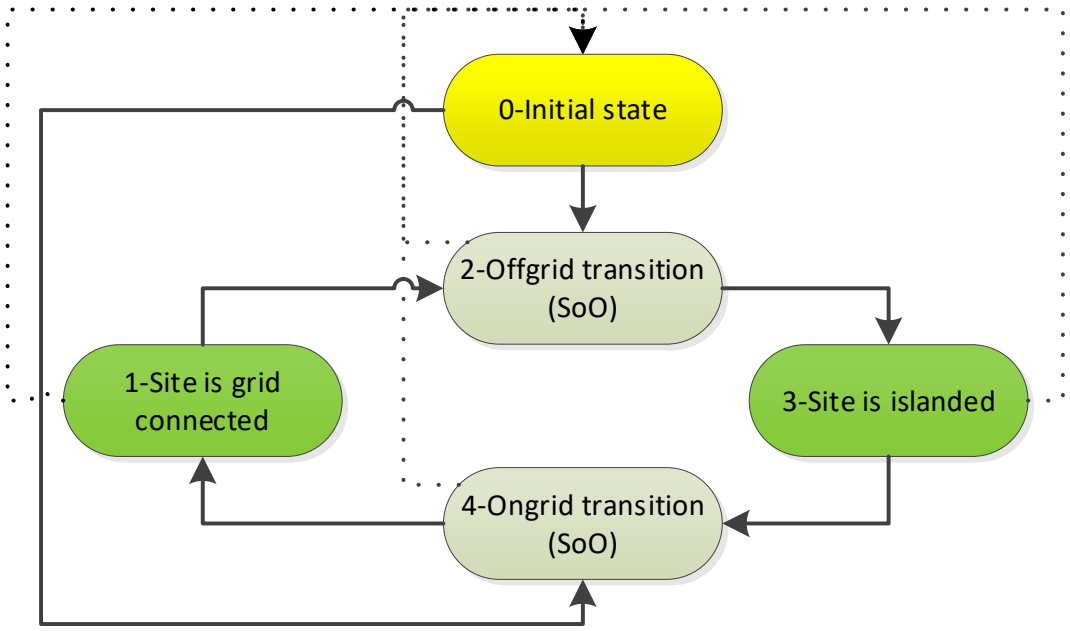
Shelter for the Battery Energy Storage System

Renovated substation housing the demonstration equipment

Electrical installation

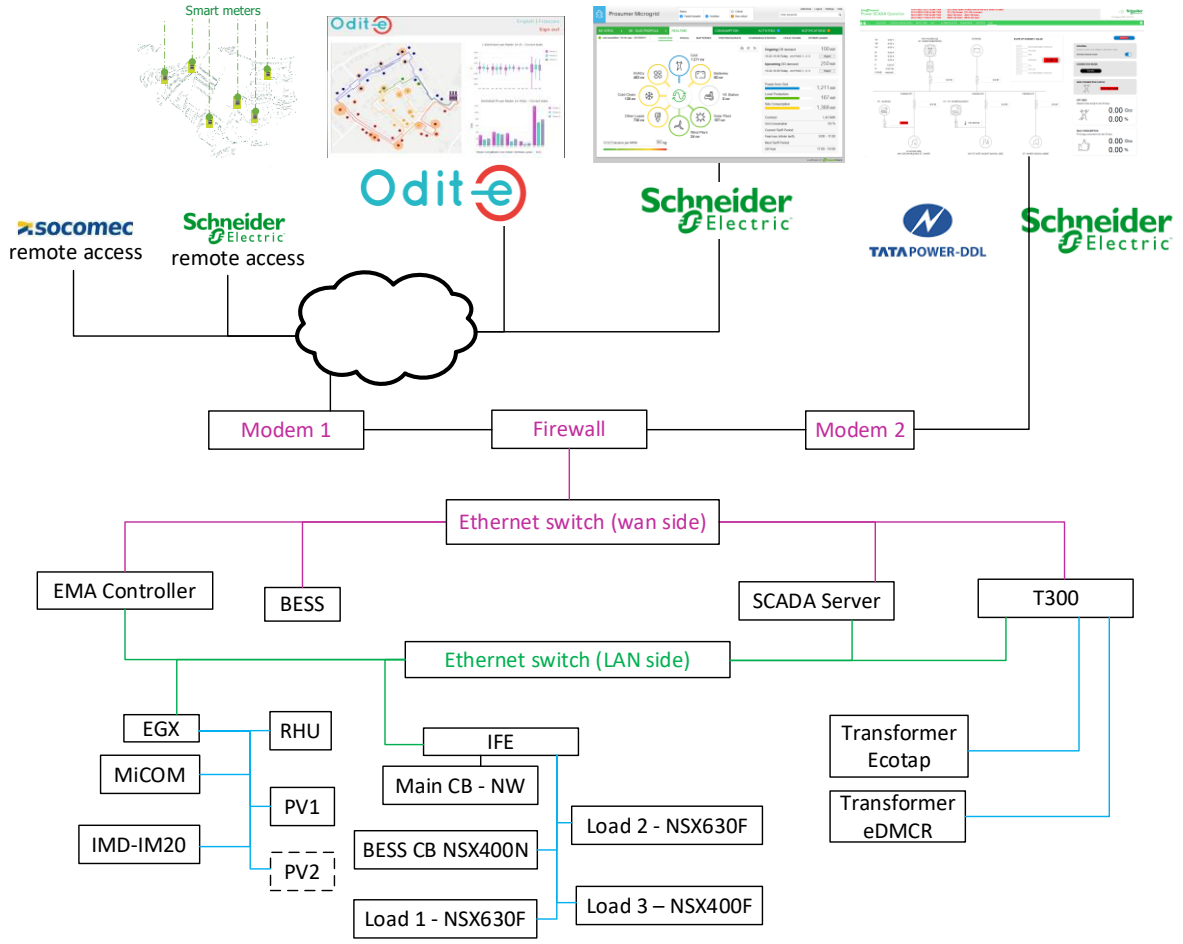
- Power cables
- Control wiring – Interoperability
  - Ring Main Unit (RMU) / Transformer
    - DMCR (monitoring working conditions)
    - PVR (Pressure Valve Relief)
  - RMU / LV Energy Control Center (ECC)
    - Intertrip
  - LV ECC / Battery Energy Storage System
    - Main breaker status
    - Main voltages

- Auxiliary power supply: UPS
- Algorithm: Sequence of Operation



IT Commissioning

- Physical layers: ethernet, RS485 & optical
- Protocols: Modbus SL – TCP/IP, IEC 104, https
- Cybersecurity



Key Takeaways/ Recommendations

- Public prosumer MV/LV installation for Energy Transition
  - Electricity 4.0: Electricity & Automation
- International & cross cultural collaboration
- Team synchronisation: weekly meetings
- Local expertise support

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Any question?

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