

SOGNO

Service Oriented Grid for the Network of the Future

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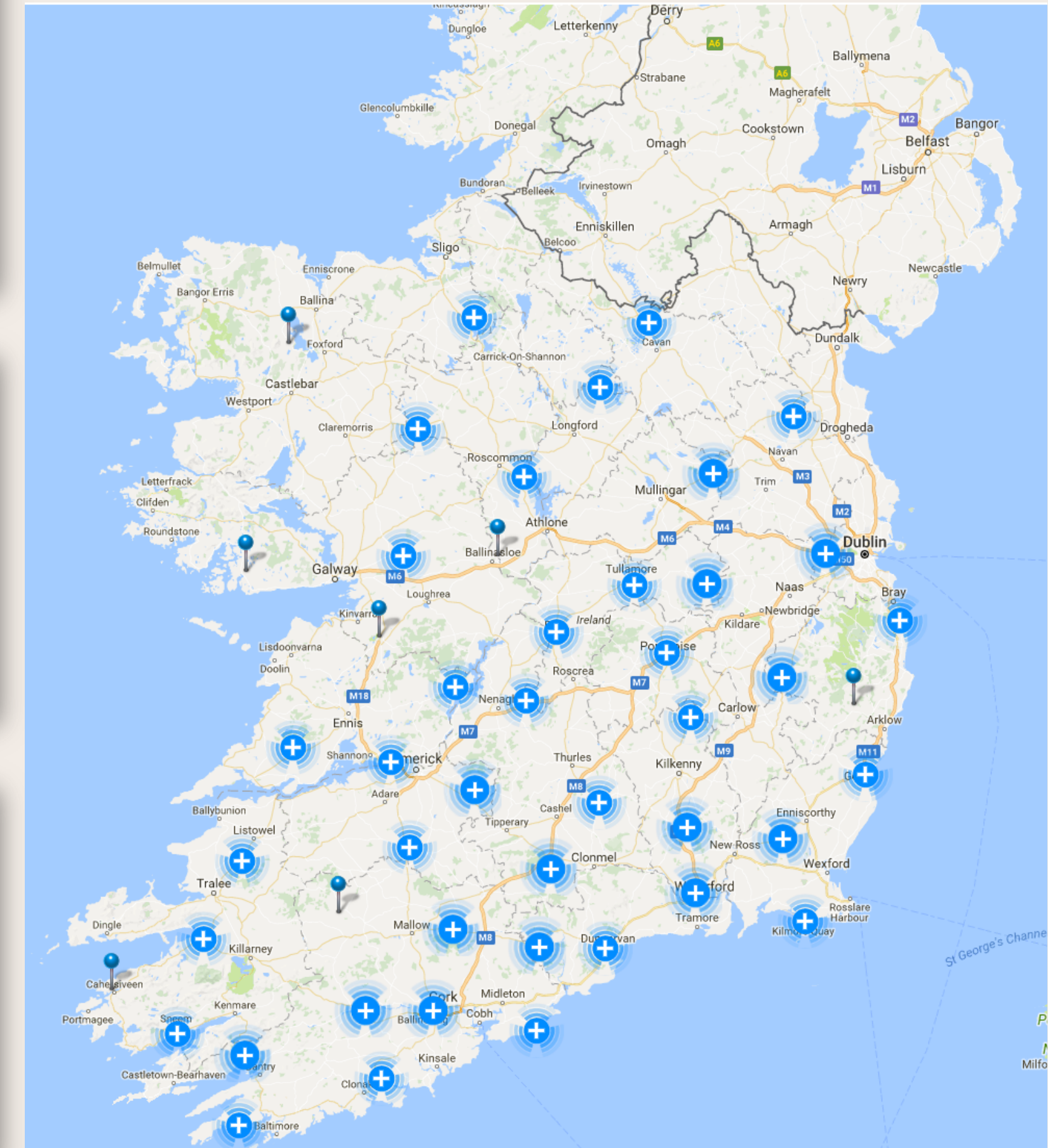
Problem Scenario: Storm Ophelia in Ireland (2017)



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



The Guardian International edition



Transport and power disruption continues as
Storm Ophelia moves on

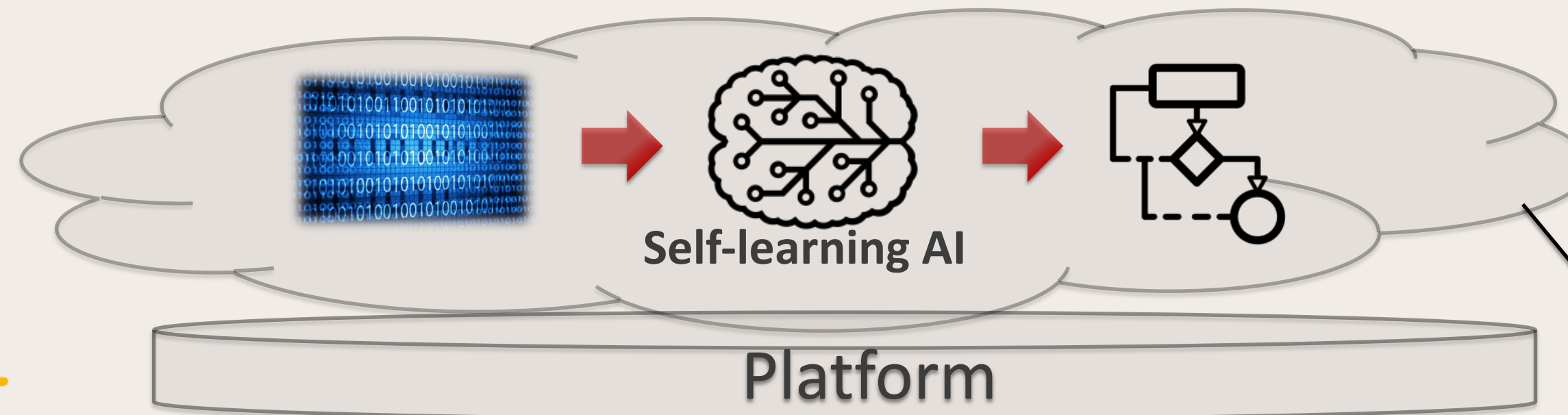
- **5.500 damaged overhead lines!**
- **385.000 homes and businesses with no electricity!**
- **665.6m customer minutes of service were lost!**



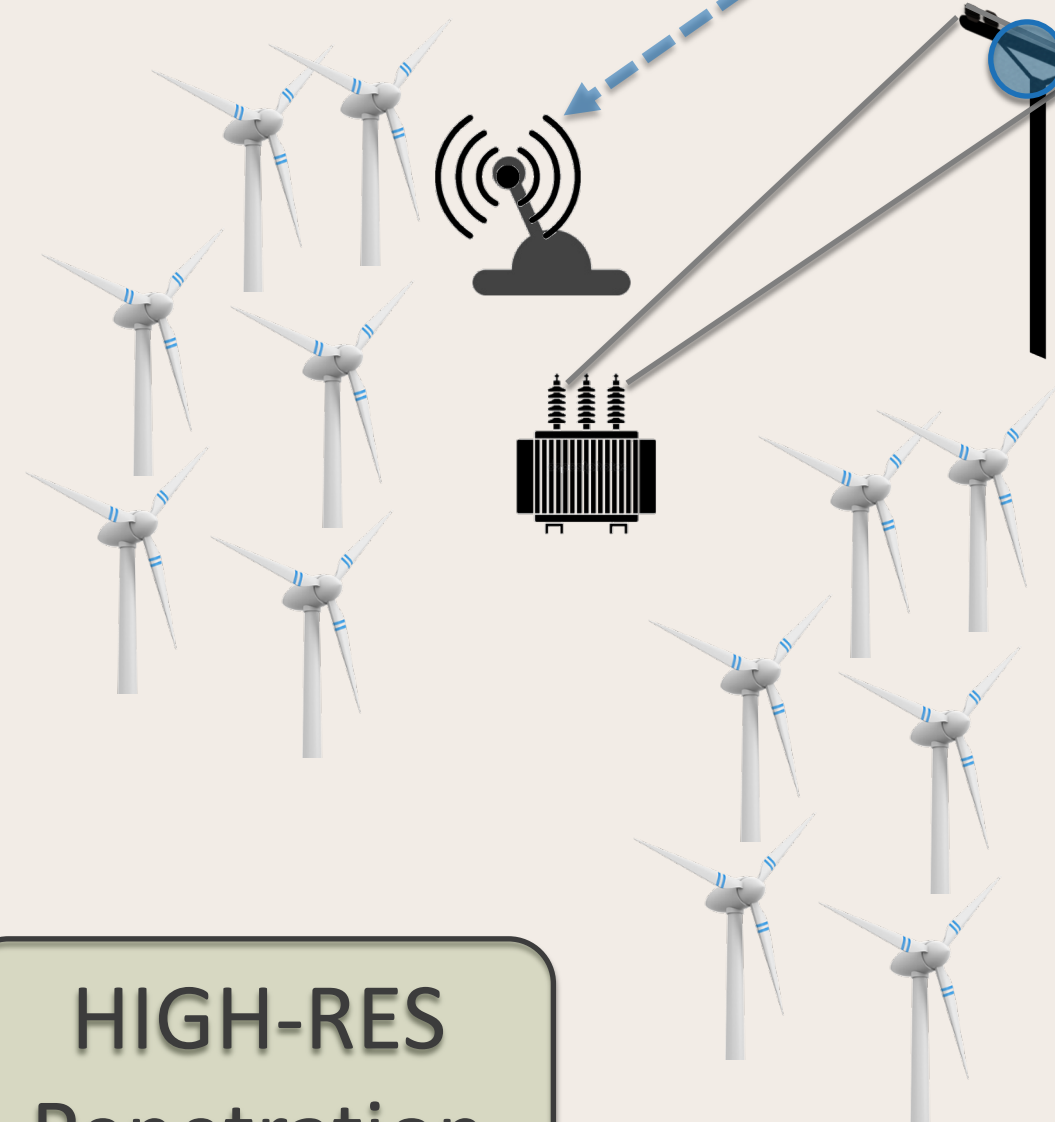
SOGNO Vision



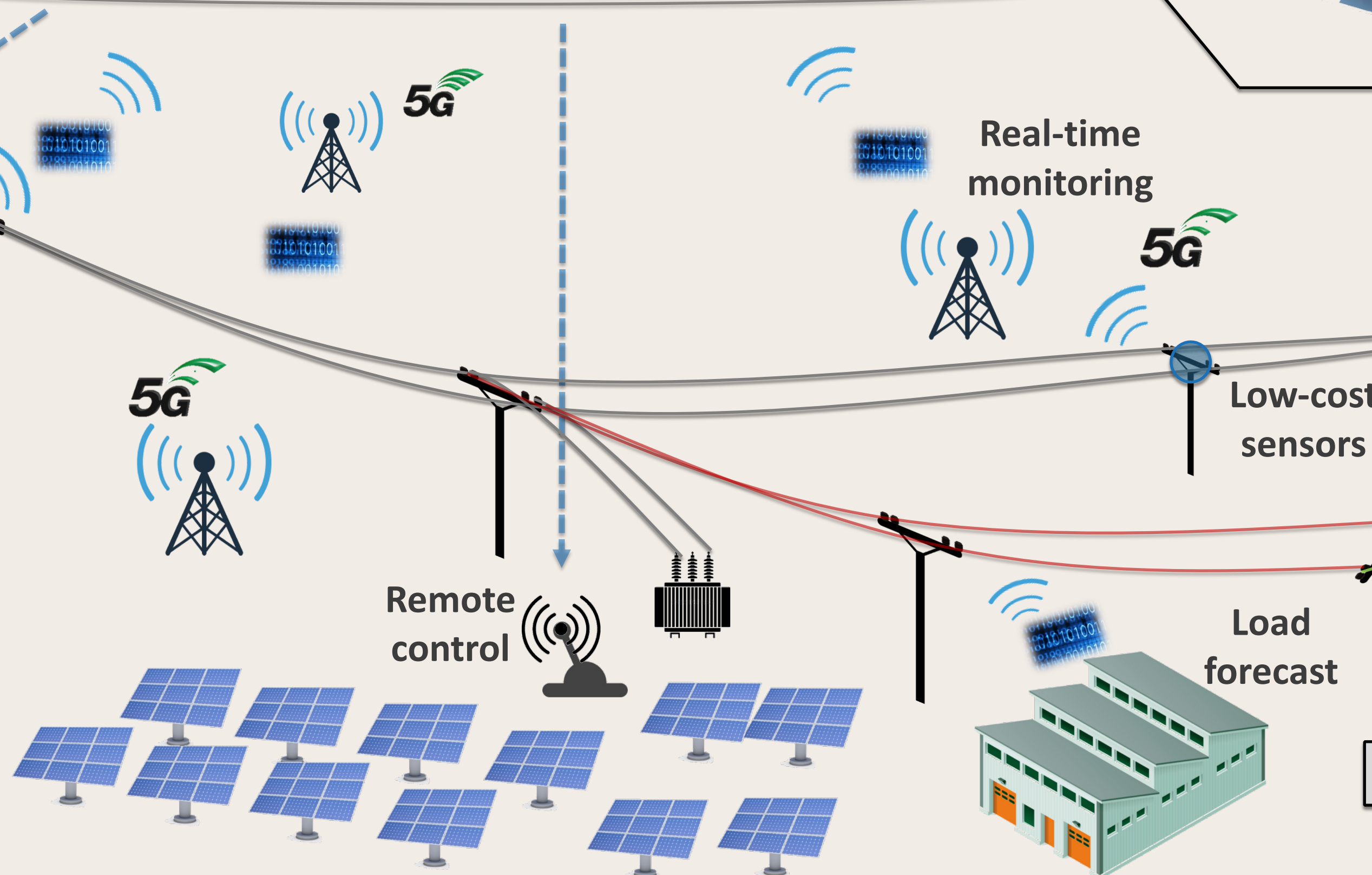
Cloud based services



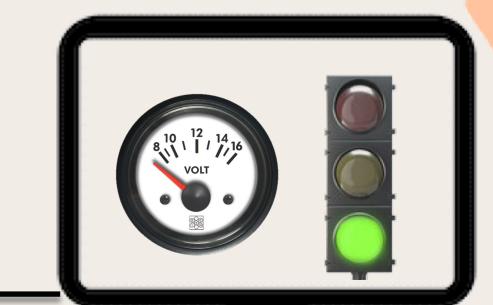
Generation forecast



HIGH-RES Penetration



Service provider



Power quality evaluation



Self-healing



Out of order!





- **Operations optimisation** for DSOs by e.g. day-ahead and generation forecast, congestion prediction, power curtailment reduction
- Condition based **preventive maintenance** e.g. detection of voltage violations, overloading conditions
- Automated **predictive maintenance**
- **Safety and security** from a restoration perspective and grid resilience perspective e.g. by self-automated healing algorithms

→ **Enabling higher penetration of Renewable Energy Sources**

→ **5G connecting devices e.g. sensors and actuators**

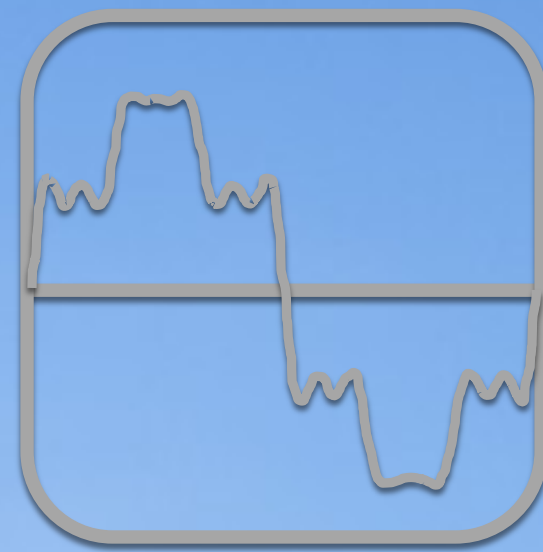


Installing new devices at one of the ESB trial sites in Ireland

SOGNO power network management software services:



State Estimation



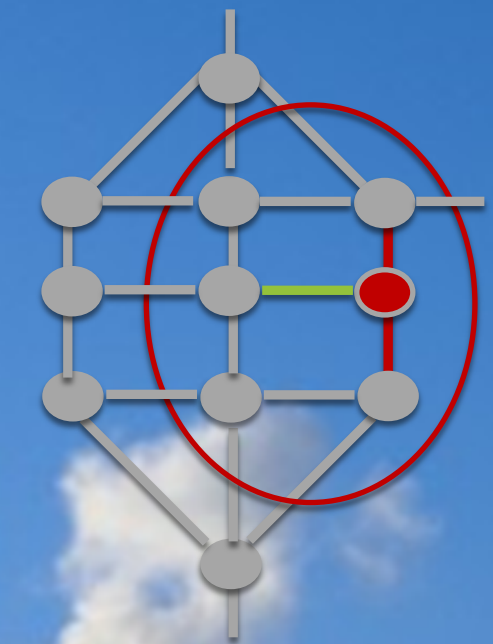
Power Quality
Evaluation



Load &
Generation
Forecast



Power Control

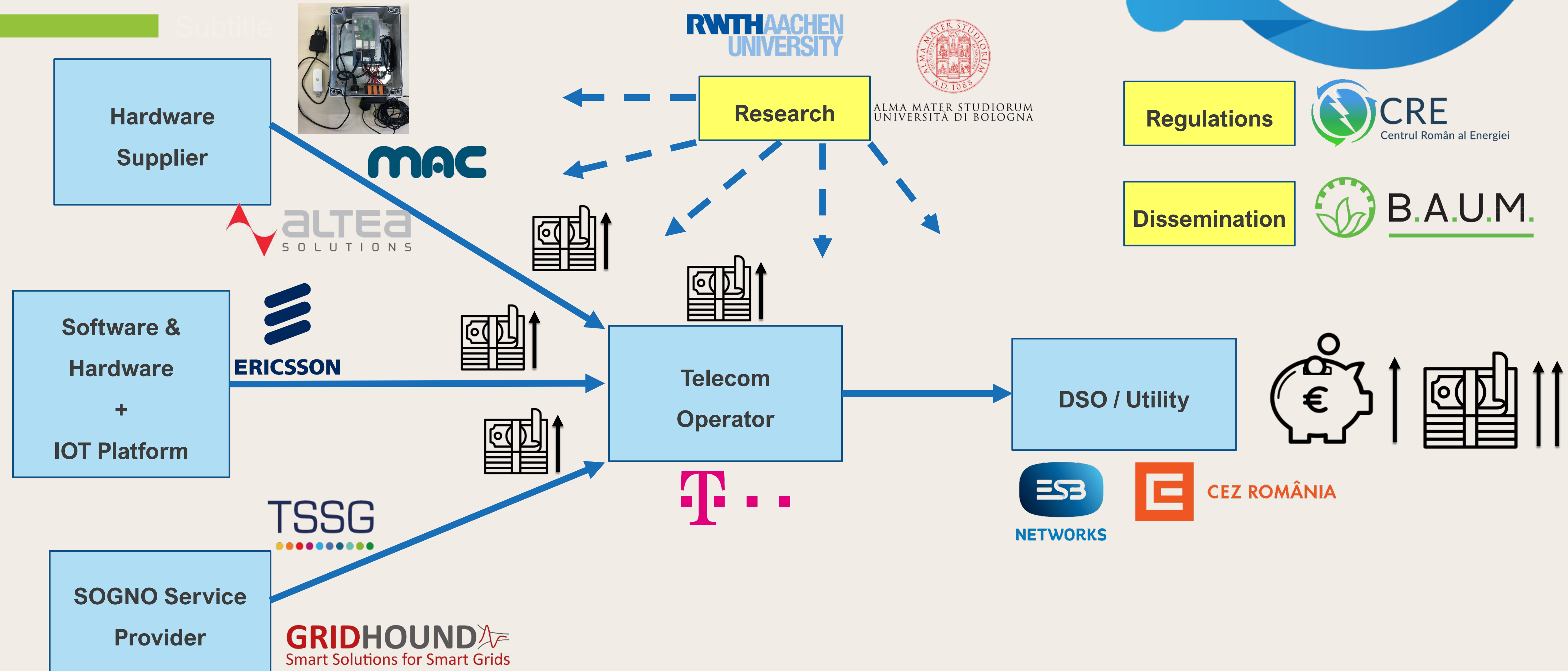


Fault Location,
Identification &
Service
Restoration

→ supported by **Deep Learning data-driven** control algorithms and a low cost PMU

Value Chain as a Business Model

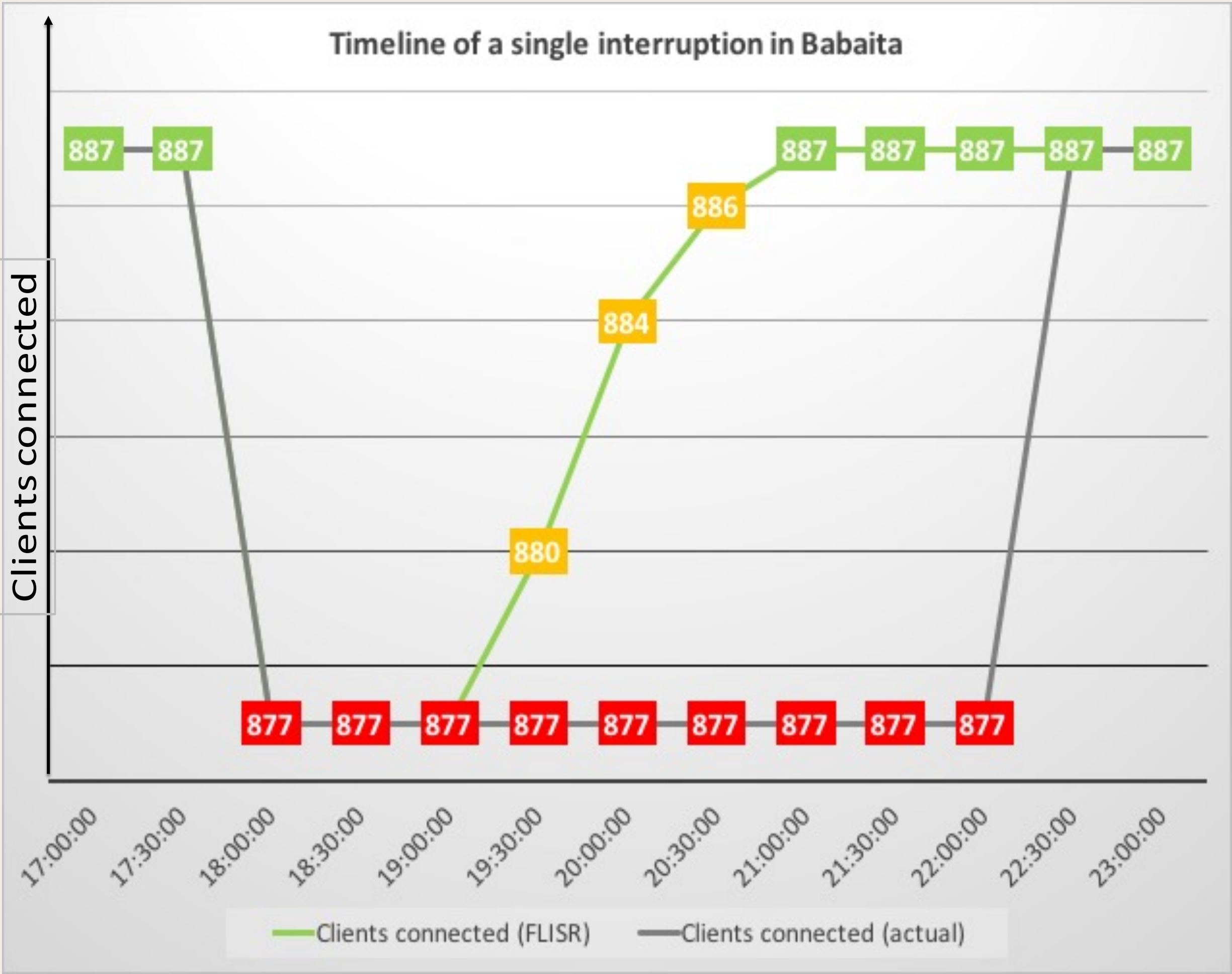
Subtitle



Business Value Assessment



Fault Location Isolation and Service Restoration (FLISR)



Direct (positive) impact:

Reduction of CML
Reduction of EENS

Indirect (positive) impact:

Customer satisfaction

	BABAITA AREA (LV)	OLTENIA AREA (LV)
Reduction of reconnection time by 10 %		
No. of Clients	887	993
Penalty cost reduction	-23,08%	-34,29%
Impact on SAIDI	-10,00%	-10,00%



Field Trials in 4 Countries



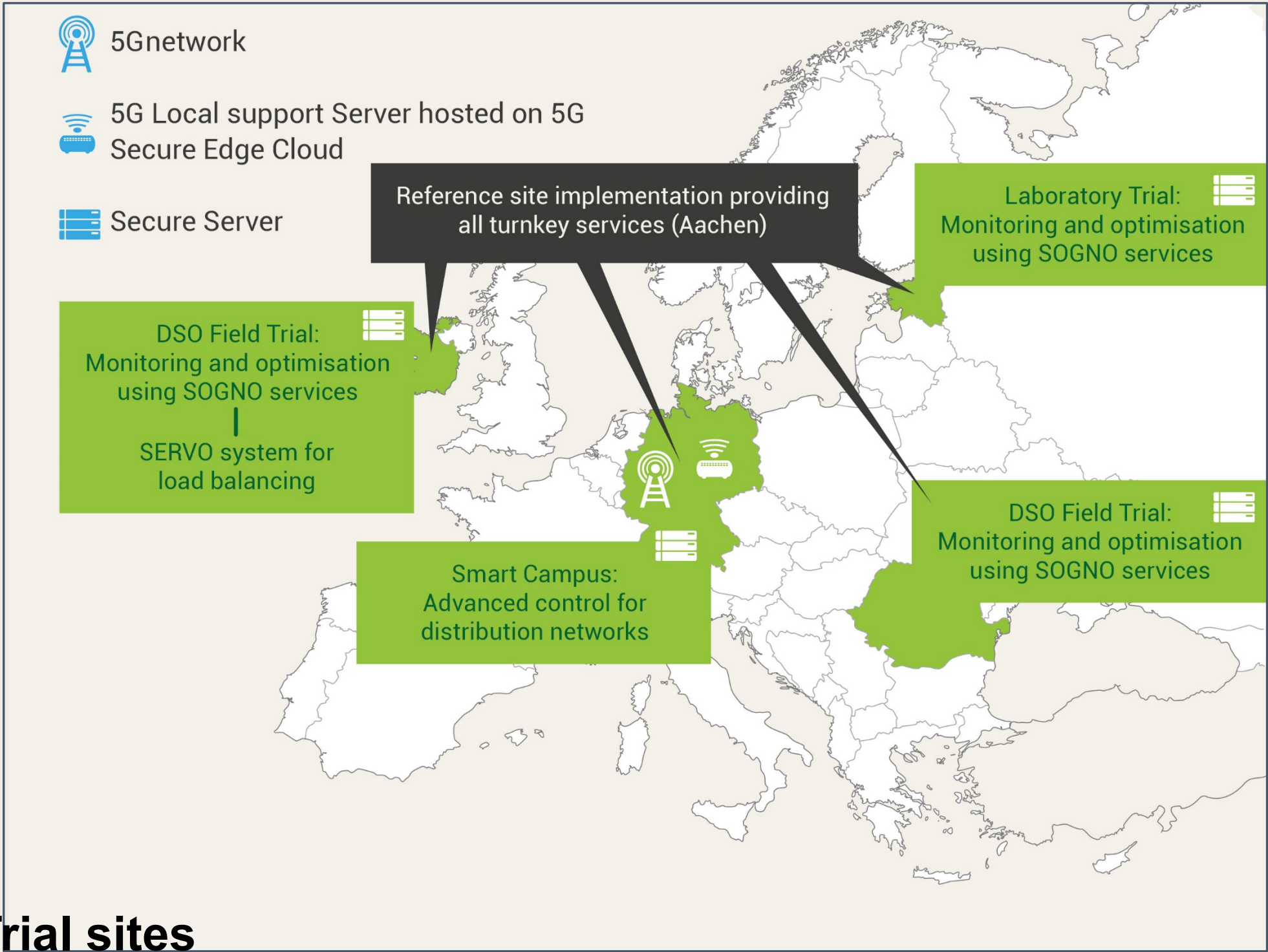
One of the ESB Field trial locations in SW Ireland



One of the CEZ Romania Field Trial sites



CEZ Romania, Oltenia Trial Site Craiova County Hall



Aachen, Germany
RWTH Melaten Campus
Field Trial Site



Mektory – TTU
Campus
Electricity GRID
Test Site,
Tallionn, Estonia



Regulatory changes could generate business value

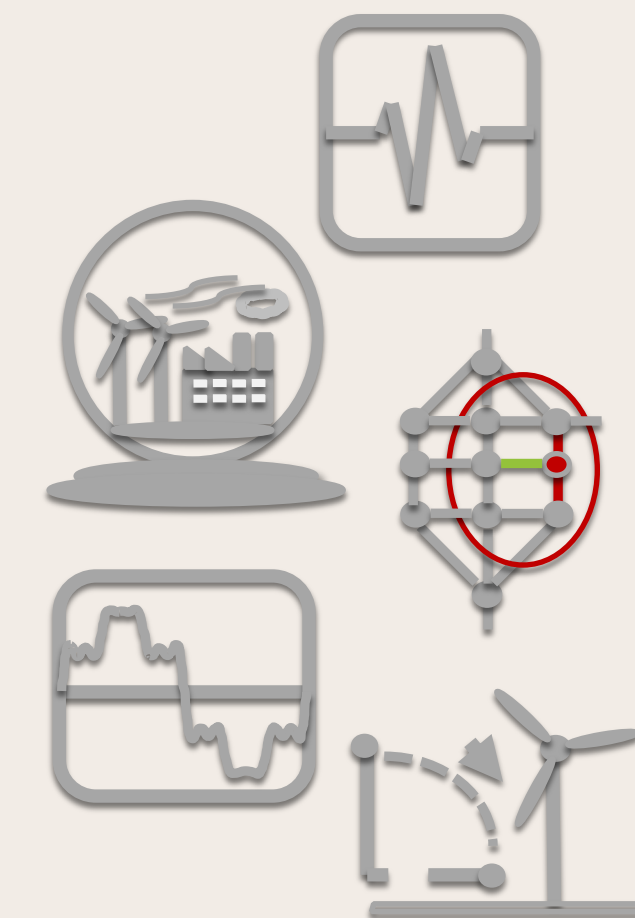
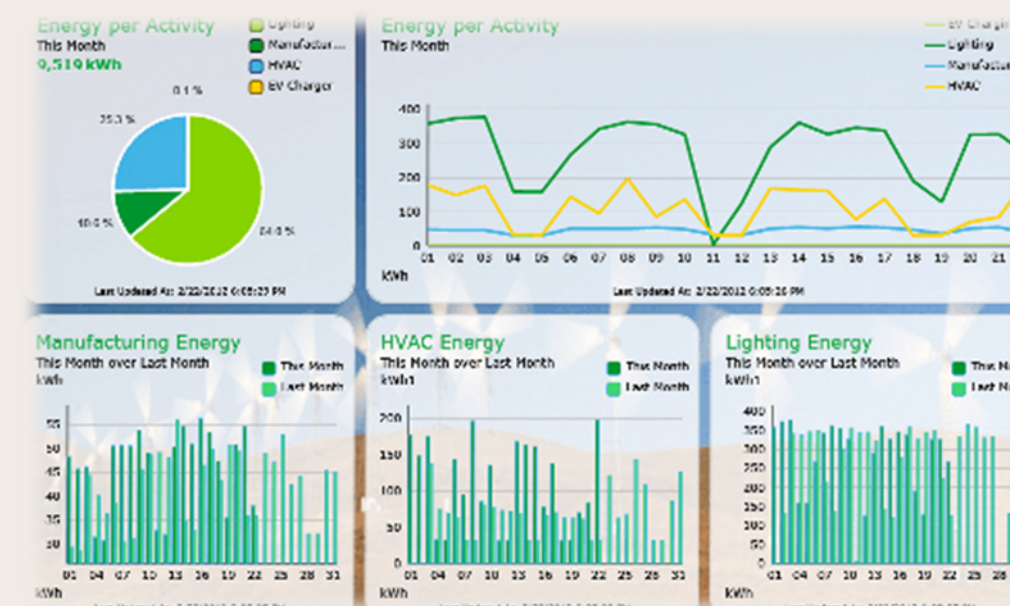
Subtitle

1. Recognition of the “cost of service” – TOTEX approach

Legal framework in which investment in software or in software-based services is encouraged (= current purchase of physical components)



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2. Legal Incentives

Legal framework which encourages software-based services



Thank you!



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