

UTILITIES PANEL DISCUSSION

Moderator: Rémi Demerlé, Semtech

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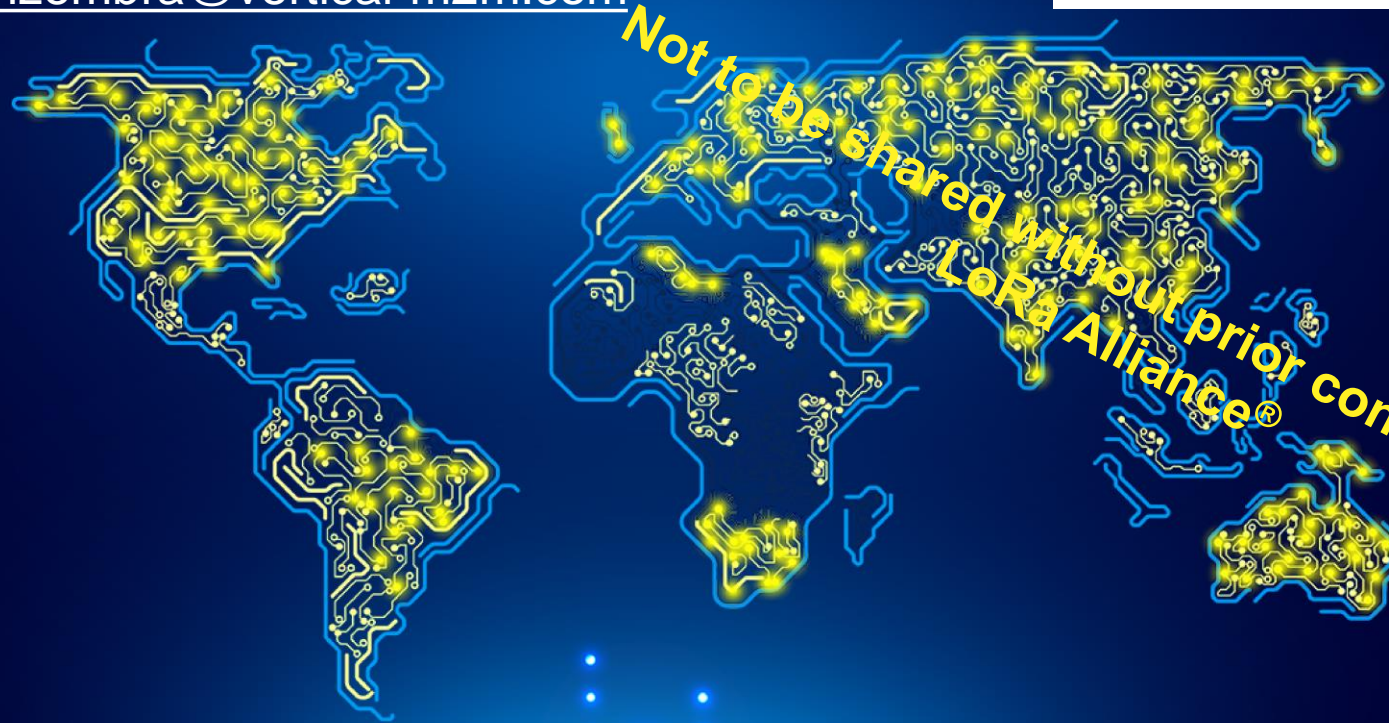
1. Building more efficient smartwater solutions with LoRaWAN®

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150 LoRaWAN® devices available with “CommonSense” platform



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CommonSense (CLOUD or ON-PREMISE)
IoT Platform

150+ LoRaWAN®



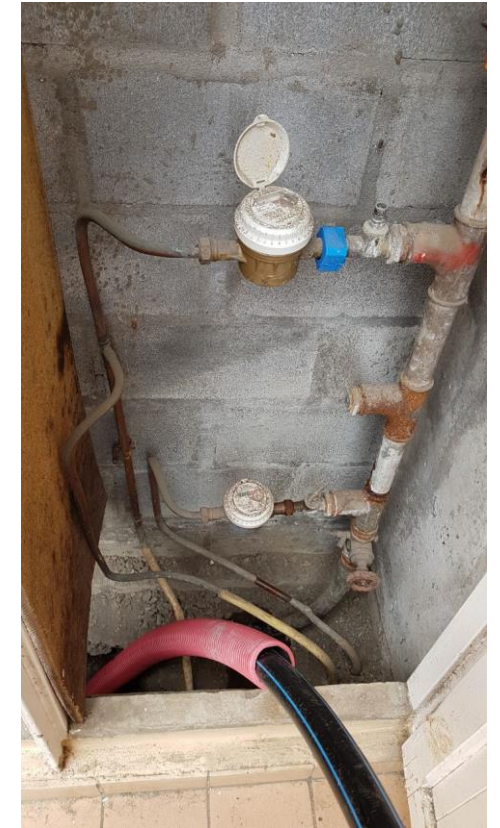
Managing water life cycle, a truly challenging but promising market

- Water is a worldwide critical resource as well as a sustainable development challenge :
 - Utilities are losing **up to 30%** of their water supply through leakages
 - The revenue of global NRW (Non-Revenue Water) management solutions market mostly due to water leaks will grow from \$850.5 million in 2018 to \$1,594.3 million by 2025 according to a Research & Markets study dated Oct. 2018
- Water treatment plant management efficiency is key for quality cost-effective production of drinking water
- Water metering services allow to avoid over-consumption



LoRaWAN® solves several key issues for Smart water applications

- Why LoRaWAN® is relevant for smartwater applications?
 - A complete **ecosystem** with a wide range of smartwater IoT devices:
 - Meters
 - Valves
 - Sensors (flowmeters, dry contacts, ...)...
 - **True deep indoor** capabilities
 - Low consumption devices complying with long-lasting requirements of water industry
 - Ability to combine **private and public deployments**, depending on business models, constraints and markets



Smart water applications for REUNION telereleve



REUNION Telereleve is both an engineering company specialized in water infrastructures and a LoRaWAN® service provider

Challenge: Need to aggregate different sensors, actuators and meters

Target markets: property managers with hundreds of buildings to manage and cities

Solution:

- Private network and device management => full infrastructure managed by VERTICAL M2M
- Maddalena smart water metering
- Strega electrovalve
- Adeunis MODBUS
- Adeunis Dry contact

LoRaWAN Benefits:

- Advanced value added services (water leak detection in buildings)
- Front-end / web application for customers
- LoRaWAN benefits : deep indoor, private network

Next steps : aggregate more devices, grow predictive services in water management

- **Potential market : > 15 000 meters and sensors within 3 years**



Unlocking smart water usages for BRL

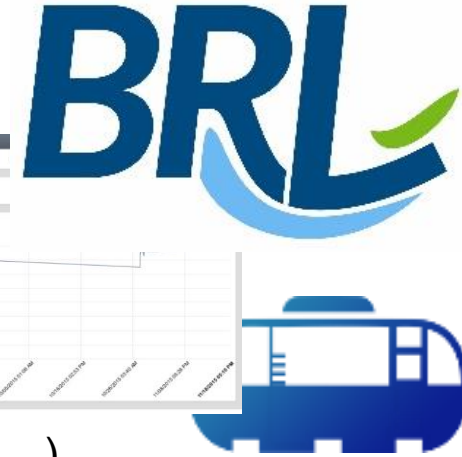
BRL exploitation (France): Engineering company specialized in water infrastructures

Challenge: Aggregate different sensors and meters

Target markets: agriculture, industrial customers and residential customers

Solution:

- Device management through various public networks
- Advanced value added services (KPIs for water management, full remote configuration of devices...)
 - Water meters
 - Adeunis analog
 - Adeunis Pulse
 - Adeunis dry contact



Location	Type	Value	Status	Alert
St. Emilion	Water Meter	4000	OK	OK
St. Emilion	Water Meter	3000.00	OK	OK
St. Emilion	Water Meter	470.19	OK	OK
St. Emilion	Water Meter	2000	OK	OK
St. Emilion	Water Meter	1000	OK	OK
St. Emilion	Water Meter	20000	OK	OK
St. Emilion	Water Meter	200.00	OK	OK
St. Emilion	Water Meter	1170	OK	OK
St. Emilion	Water Meter	400.01	OK	OK
St. Emilion	Water Meter	100.01	OK	OK
St. Emilion	Water Meter	100.01	OK	OK

LoRaWAN[®] benefits: deep indoor, use of public operator networks in France

- Next steps: implement more remote IoT services to improve operations and lower costs
- Potential market: > 5,000 sensors and meters within 3 years



SAINT - EMILION

2. Monitoring and analyzing solutions with LoRaWAN® for power utilities

Olcay Taysi from NetOP Technology

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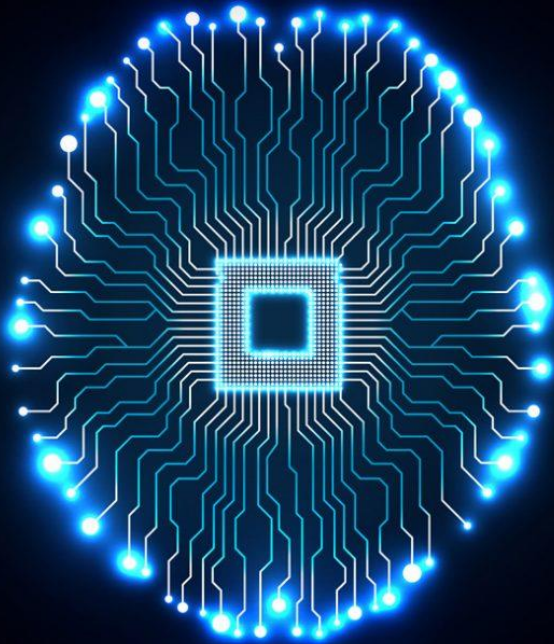
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Low Voltage Electricity Distribution Networks Monitoring & Analyzing System



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*AI & ML
INSIDE*

CHALLENGE

Most of the electricity distribution companies know nothing after the substation.

All of them monitoring the electricity distribution grid with SCADA systems until the substation but nobody knows that valuable data that will contribute to the decision-making mechanism is hidden in substations.

NetOP brings this hidden treasure to light and blend it with AI.

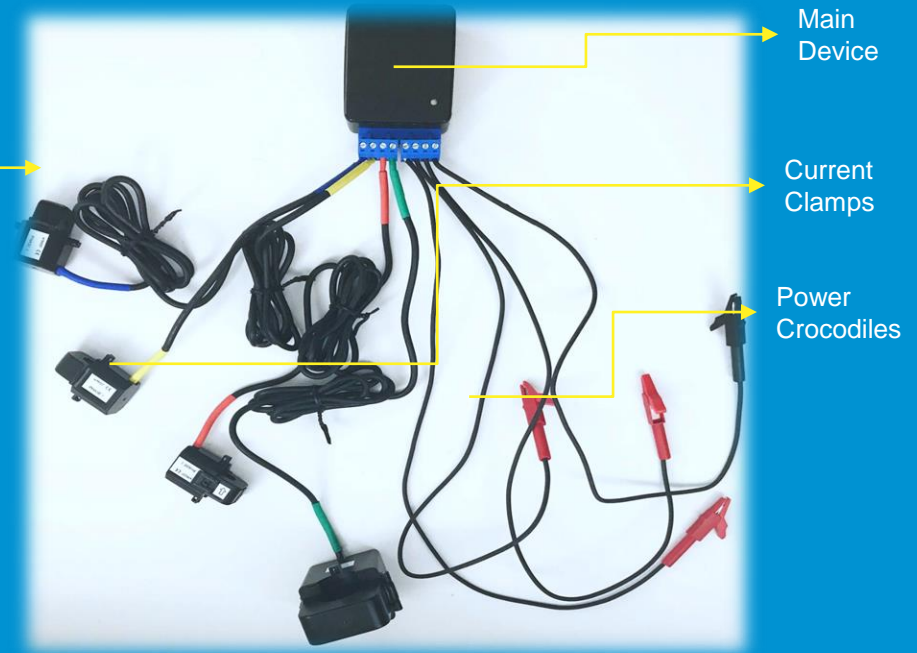
Power Distribution Substation

One of the arteries feeding the city
If really monitored and analyzed
it's easy to reach tons of results

Electricity Distribution Company
Municipality
City Council
Police Department
Fire Department
Government
need BIG DATA to make decisions



- Values Monitoring**
- Zero I Current
 - Voltage (PH1 PH2 PH3)
 - Current (PH1 PH2 PH3)
 - Frequency (PH1 PH2 PH3)
 - Power Factor (PH1 PH2 PH3)
 - Power (PH1 PH2 PH3)
 - Voltampere (PH1 PH2 PH3)
 - Total Harmonic Distortion I
 - Total Harmonic Distortion U
 - Harmonic 3 (PH1 PH2 PH3)
 - Harmonic 5 (PH1 PH2 PH3)
 - Harmonic 7 (PH1 PH2 PH3)
 - Harmonic 9 (PH1 PH2 PH3)
 - Harmonic 11 (PH1 PH2 PH3)
 - and 40 different more...



NetOP Octopus V1
Substation Electricity Monitoring Analyzer

- 3 phase electricity monitoring sensor for low voltage substation feeders
- NetOP Octopus can monitor substations feeder by feeder / phase by phase and collect data in real time
- Generated big data analyzed by AI algorithms
- Alerts & Reports generated instantaneously and forwarded to relevant units
- Embedded LoRaWAN® connectivity inside



Easy to deploy
Easy to use
Easy to install
Affordable cost
Independent
Network
Secure
Scalable
Sustainable

USE CASE: Detection of Abnormal Power Usage



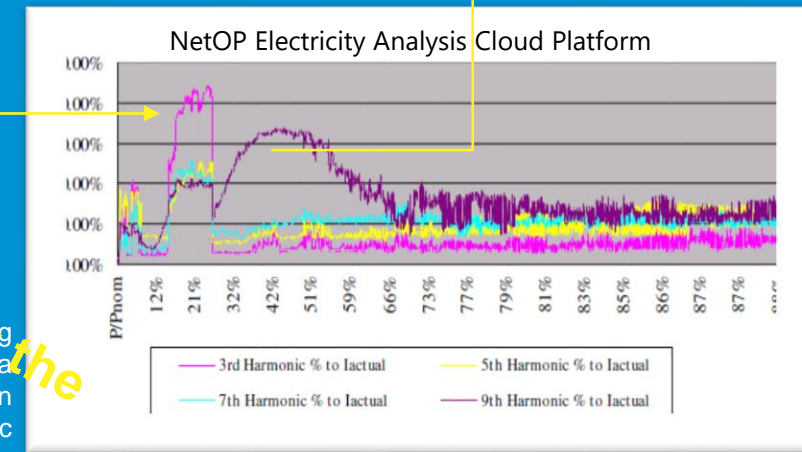
With the help of smart sensors developed by NetOP, the city's electricity consumption is monitored from substations and recording "electricity consumers" that signed the electricity grid with a unique signature. The big data generated is analyzed by AI-powered algorithms and it gives a possibility to reach back-to-date, real-time and predictive decisions.

All units that work for a better city can benefit dozens by using this data. It can prevent frauds, leakages, manipulations, accidents, breakdowns, even crime.

Indoor Cannabis Farming



This kind of bulbs effects Power Harmonics and signs the power grid with the unique signature (Harmonic 3 effected)



AI powered algorithms analyzing harmonics data and detect an abnormal situation on 3rd Harmonic

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With NetOp, Incredible digital transformation from “knows nothing to predictive”

3. Critical Monitoring of energy transport infrastructure

Massimo Marini, CTO from PROESYS
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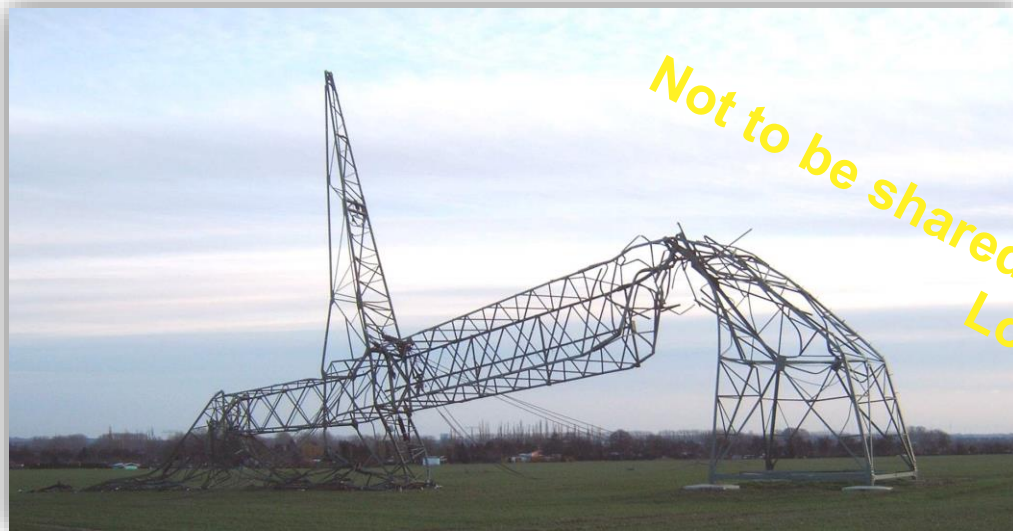


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ENERGY TRANSPORT USE CASE: Structural integrity of HV Pylons



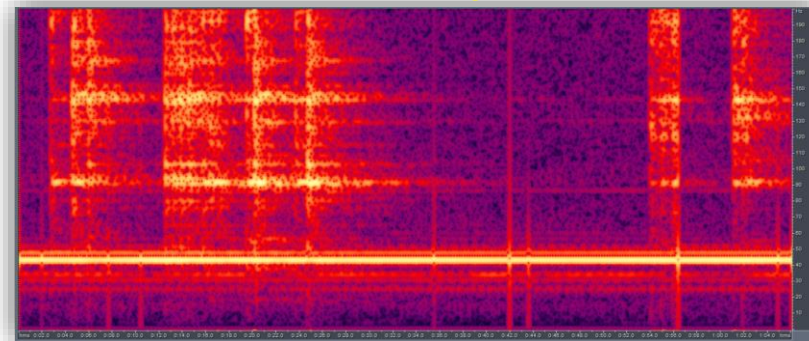
Customer requirements:

- diagnostics of excessive stress on the structure
- Structure collapse due to fatigue or landslide or severe weather
- physical attack / sabotage detection / copper theft

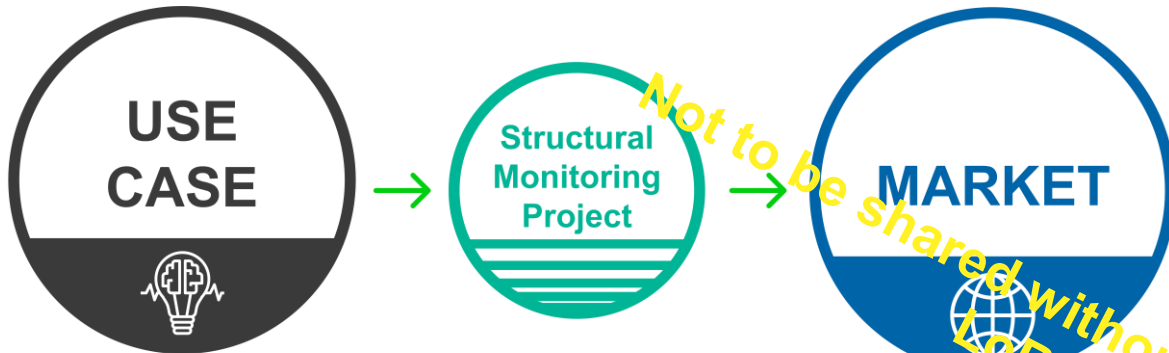
LoRa technology and the use of a private LoRaWAN® network are ideal solutions to monitor the **health of critical infrastructure and HV pylons** installed in remote areas with no public network coverage

ProEsys developed a custom sensor performing real-time **Inclination, Vibration and Spectral analysis** :

discriminating the periodic oscillations of the tower from intentional tampering with mechanic tools.



ENERGY TRANSPORT USE CASE: Structural integrity of HV Pylons



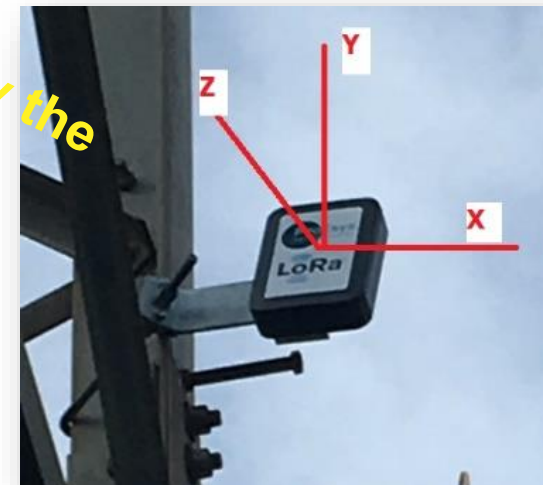
- Custom sensors
- Rugged gateways for hostile environments
- Network server infrastructure

Any **anomaly triggers an alarm sent in real-time** over the LoRaWAN® network together with the exact position of the HV pylon.



What we wanted to monitor:

- Integrity and verticality of HV pylons
- Protection against attacks and sabotage
- Prevention against copper theft
- Temperature of pylon
- Other specific applications



Advantages of LoRaWAN® Technology for Customers



Long Range: suitable for nationwide coverage of rural and mountain areas not covered by GSM, LTE and NB-IoT.



Low Power: sensors live up to 10 years on battery → reduced maintenance for hard-to-reach sites.



Ideal for **private and closed network** solutions with no internet access → required by critical infrastructure owners.



All network elements under **full control of network owner**: sensors, gateways, network server, application server → a must for critical infrastructure owners, some require source code of all equipment.



High level of cyber security in the entire signal chain.



Remote parameter changes on sensors, up to entire firmware upgrade.



Standard protocol ensuring compatibility with different vendors of sensors and gateways.



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@LoRaAlliance



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**WELCOME TO LoRaWAN® LIVE
BUSINESS TRACK 2.00PM – 6.00PM**

BERLIN, JUNE 13, 2019



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