

GETTING READY FOR PV

Using smart meters and AI to optimise low-voltage grid operations and be ready for PV introduction

- The Objective
- Getting the information, Smart Meters
- Generating Actionable Insight, Analytics
- The Outcome for Gazelec

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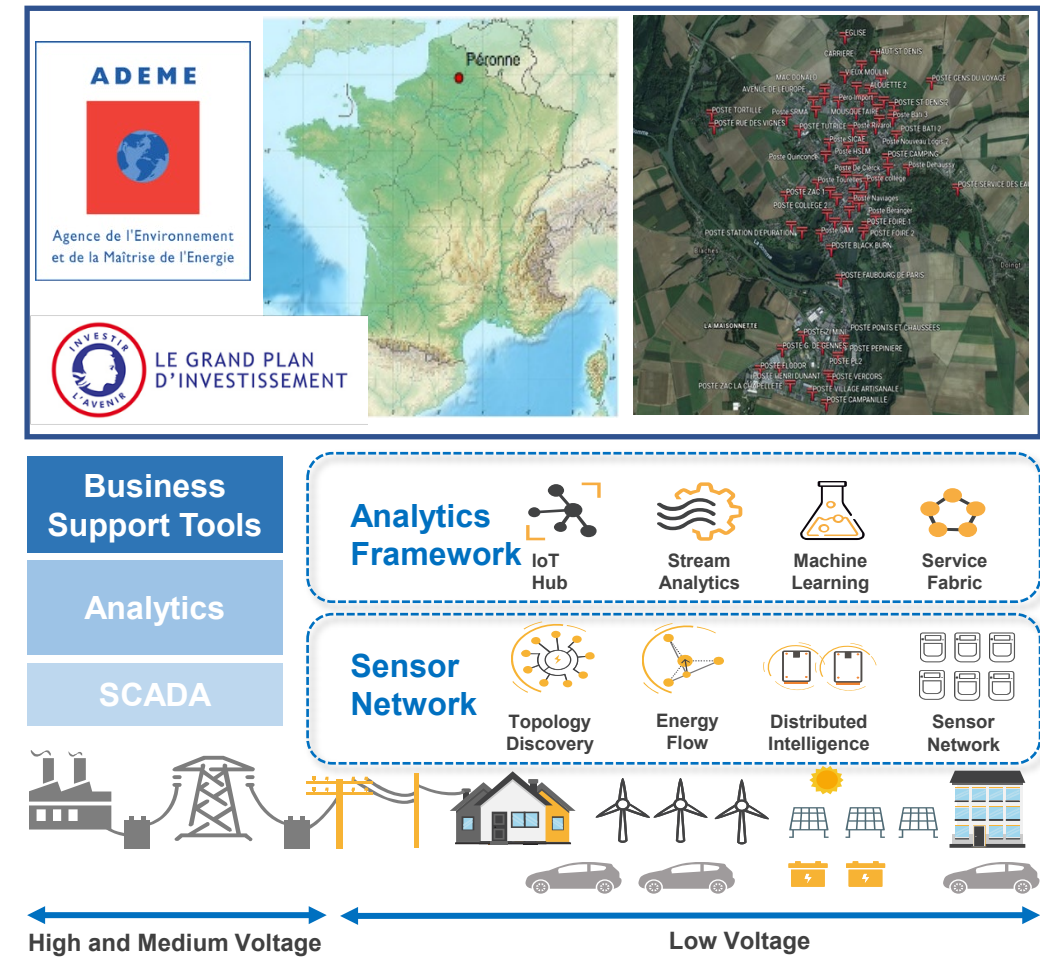
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THE OBJECTIVE

Using smart meters and AI to optimise low-voltage grid operations and be ready for PV introduction

- Gazelec, Péronne, France
 - 7600 inhabitants
 - Electricity meters + Water meters + Gas meters
- Project
 - Large-scale experimentation: 3500+ meters (79 subs)
 - Funded by the French Agency for Ecological Transition
- The Business Challenge:
 - Increase efficiency of distribution
 - Optimise the grid PV capacity & Connection request
 - Demonstrate green credentials
 - Optimise CAPEX investment in grid



GETTING THE INFORMATION

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- NES OSGP smart meters
- Provide visibility within the black box
- Remote sensors, deep in the grid
- Information from every residence and sub-station
- 25+ power quality and characteristic measurements
- Reliable and frequent access to the information
- Flexibility and adaptability
- Management software to keep it all working

DISTRIBUTED INTELLIGENCE IN THE LOW-VOLTAGE GRID



Smart Meters



Data Concentrator

A Micro-computer in the Home

- 32-bit Micro Processor, Dual-Core Cortex-M4, hardware
- AES-128/256-bit encryption support
- High density memory (32Mb) with head-room for future data use growth and application expansion
- 2 MEP expansion ports, H1, Wireless and Wired M-Bus, Zigbee, 2G/3G/4G
- 2 S0 outputs, Control relay, Plug-on IO

Leading edge grid sensing capabilities

- 18-bit resolution measurement with better analog front end engine

A Computer in the Field

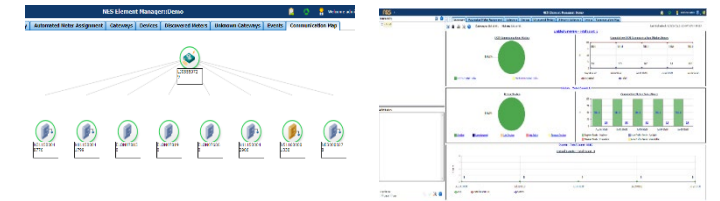
- Full Linux Kernel 3.2 OS
- 600MHz processor, 512MB DRAM, 1.8GB MMC
- Pluggable ethernet, serial, external USB, last gasp, external backup power
- Third-party modules for additional grid monitoring and control

The Platform for Grid Applications

- Energy Application Platform™ framework
- Common smart grid analytics and value-based operational apps
- Utility-specific custom functionality downloadable over the life of the DCN
- Remotely and securely adding distributed applications and device/ sensor support drivers in the field
- Platform for your own monitoring, analytics and automation tools

Operational Tooling

- Grid topology mapping
- Communications SLAs
- Event and configuration management
- Security management
- Release management



GENERATING THE ACTIONABLE INSIGHT

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○ Odit-e technology & project method

- Using only smart meters data
- Creation of a digital twin
- Identification of the grid's topology
- Network analysis (network constraints)
- Estimate the impact of adding PV generation
- Optimization of the PV hosting capacity



THE OUTCOME FOR GAZELEC

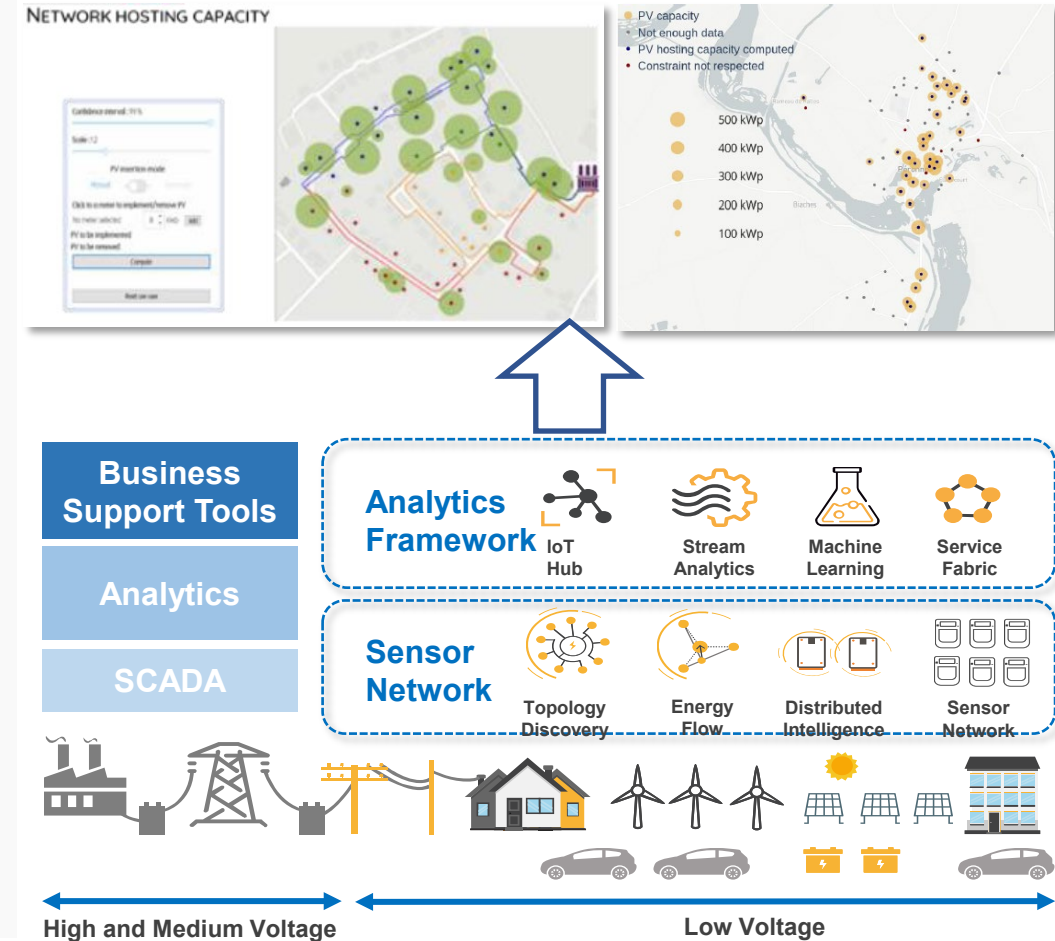
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Outcomes

- Network analysis & proposition of an adapted rebalancing plan
- Hosting capacity map
 - Total PV capacity for the whole city : 9000 kW peak

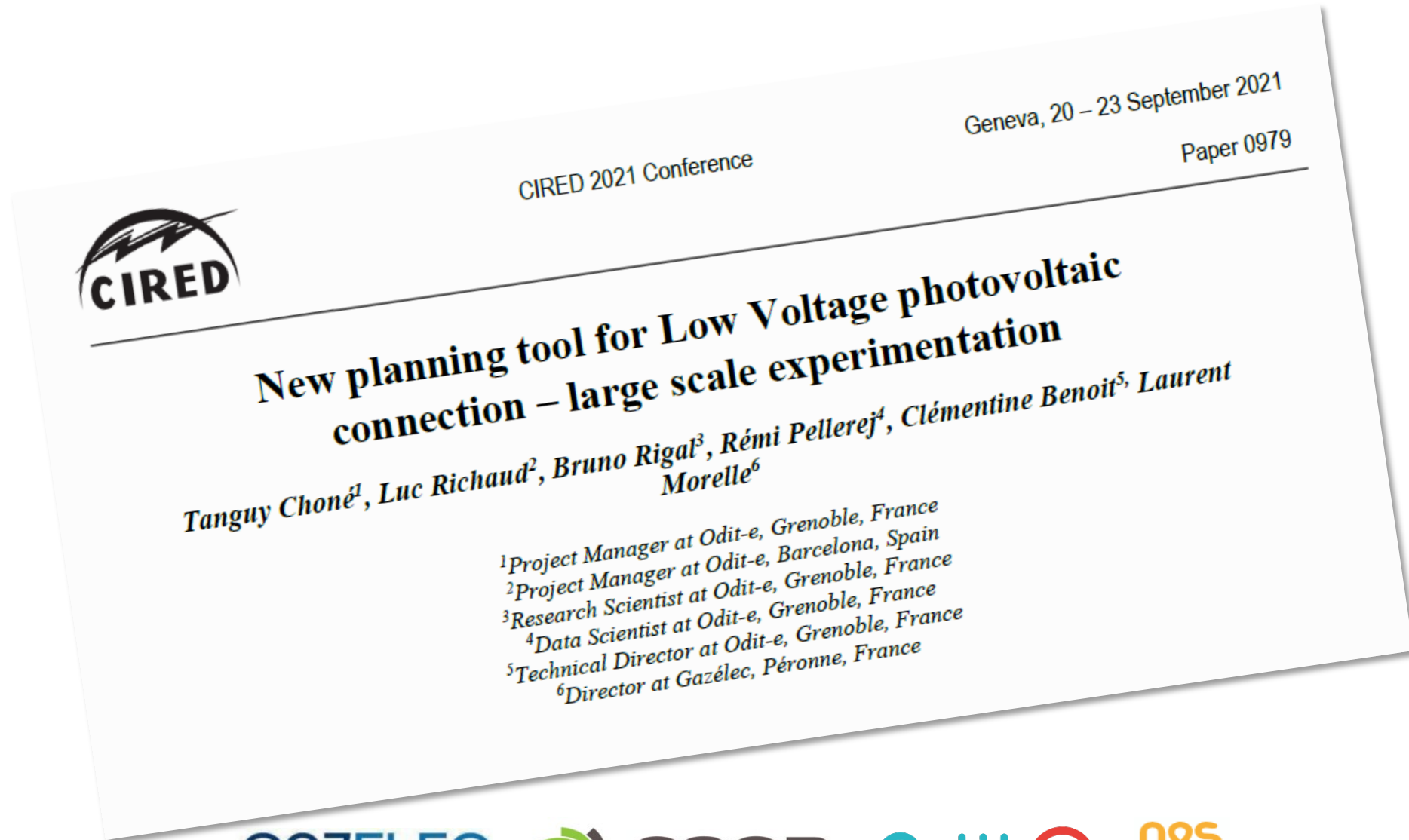
Next Steps

- Implement rebalancing plan
- Validate the results & improvement proposal



LEARN MORE

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Thank you

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