



ENERGY MANAGEMENT BY THE SMART GRIDS

MANDJET PLATFORM

› Energy › Smartgrid › Nanogrid › Production › Storage › Consumption › Internet of Things



IMT Atlantique
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The structure of electricity networks is set to change in the coming years. Indeed, the growing amount of energy-consuming equipment and the arrival of new equipment (such as electric vehicles) in the system will considerably change the way energy has to be managed. On the other hand, mainly for environmental reasons, production techniques are changing and becoming highly decentralized. To compensate for these observations and encourage local production, the power grid will rely on a communication network and on-board intelligence to carry out tasks autonomously. This type of smart electricity network is known as a smartgrid or nanogrid depending on the size and grouping considered.

> Equipment

As part of the ongoing change in the field of electricity, the **MANDJET** platform includes a set of equipment, tools and know-how about electricity production and consumption. Via a communication system, it is possible to manage the energy of a given site, allowing :

- 1/ Electricity generation (using solar panels, wind turbine),
- 2/ Energy storage
- 3/ Energy consumption at the right time.

The whole platform is controlled in real time by communicating objects that implement the latest standards, such as IPv6.

> Electric vehicle component

The **MANDJET** platform is also oriented towards electric mobility. The platform integrates a set of light vehicles (e.g. electric scooters) and heavy vehicles (e.g. OSV - Open Source Vehicle) which allow the integration of common uses of the energy generated. Specific work is being carried out on the vehicle's recharging station, as well as on battery management within the vehicle (BMS for Battery Management System).

> Service

Through the tools and algorithms we develop, we are able to monitor the different equipment (production and consumption), and to regulate consumption in relation to production as effectively as possible. This information is crucial for an electrical distributor who would like to optimize consumption on a larger scale. This platform can also be integrated with other electricity production / consumption sites in order to operate at neighborhood / city level.

At the heart of the
Rennes campus



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A multidisciplinary team
of experts in



Information system,
digital manufacturing



Standard IP battery for
the Internet of Things



Smart meter



Load balancing algorithm



Dissemination of data
and privacy



What we offer

Depending on the equipment
powered by our own production,
we will particularly focus on :

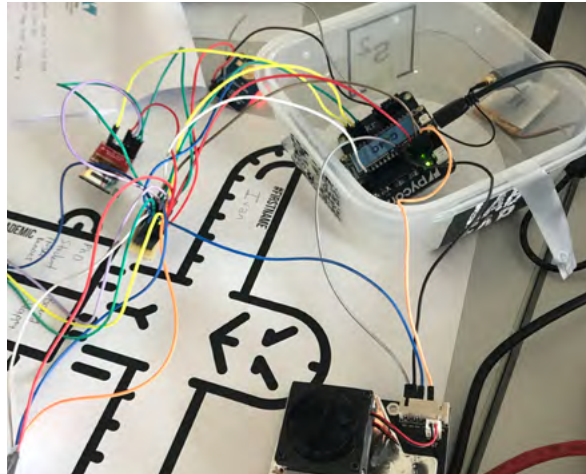
- > Forecasting production
- > Smoothing consumption
- > Algorithms so equipment consumes when power is generated
- > Panel rotation control
- > Direct current networks
- > The development of prototypes and communication protocols standards for the Internet of Things.
- > The instrumentalization of buildings
- > Access to a LoRa network

This project brings together the
work undertaken in a number of
research projects, both local
and European.



Around the platform

- Experimental and open LoRA network for testing and management of heterogeneous networks (IEEE 802.15.4, PLC, etc.)
- Smart Grid competence centre in industrial partnership
- Joint laboratory with Artefacto on building management and real-time data visualization
- MOOC Digital Manufacturing path to get started in digital manufacturing, with a MOOC dedicated to nanogrid



[Discover the platforms](#)



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