

Case studies

How are PROCHALOR and SEMCRA using Adeunis IoT sensors enhance energy efficiency and thermal comfort in ADOMA housing?

Challenge

[Optimising energy performance in collective housing.]

ADOMA, a subsidiary of Caisse des Dépôts, specialises in the management of social and collective housing, often for people in precarious situations. These buildings, most of which are old, require extensive energy optimisation to guarantee optimal thermal comfort and reduce operating costs. PROCHALOR and SEMCRA were selected to maintain and operate the heating systems following a call for tenders in the Paris region. They used Adeunis solutions to monitor and adjust the buildings' energy consumption in real time.

The main challenges identified in this project :

- **Ensure optimum room temperature (19-20°C)**
Maintaining a stable temperature in homes is essential to ensure the comfort of residents while reducing energy consumption. Too low a temperature can lead to discomfort and complaints, while too high a temperature can lead to unnecessary energy wastage.
- **Optimising district heating control**
District heating networks need to be adjusted according to variations in outside temperature. Precise monitoring enables the boiler room installations to be calibrated to avoid over-consumption while guaranteeing uniform heat.
- **Avoiding thermal disparities between homes**
Temperature differences between floors or between flats with different exposure to the sun are common in apartment blocks. A detailed analysis of the data from the sensors can identify these imbalances and adapt the settings accordingly.
- **Check the temperature of the domestic hot water system**
Maintaining the right temperature in domestic hot water loops is crucial to prevent the proliferation of legionella. Thanks to Adeunis sensors, technicians can quickly detect any anomalies and take corrective actions.
- **Facilitating the work of technicians**
By having precise data on temperatures and any malfunctions, maintenance teams can prioritise their work and avoid unnecessary journeys. This reduces operating costs and improves responsiveness to incidents.

The stakeholders

PROCHALOR / SEMCRA

Operation and maintenance of facilities.

ADEUNIS

Connected sensor designer.

LORAWAN

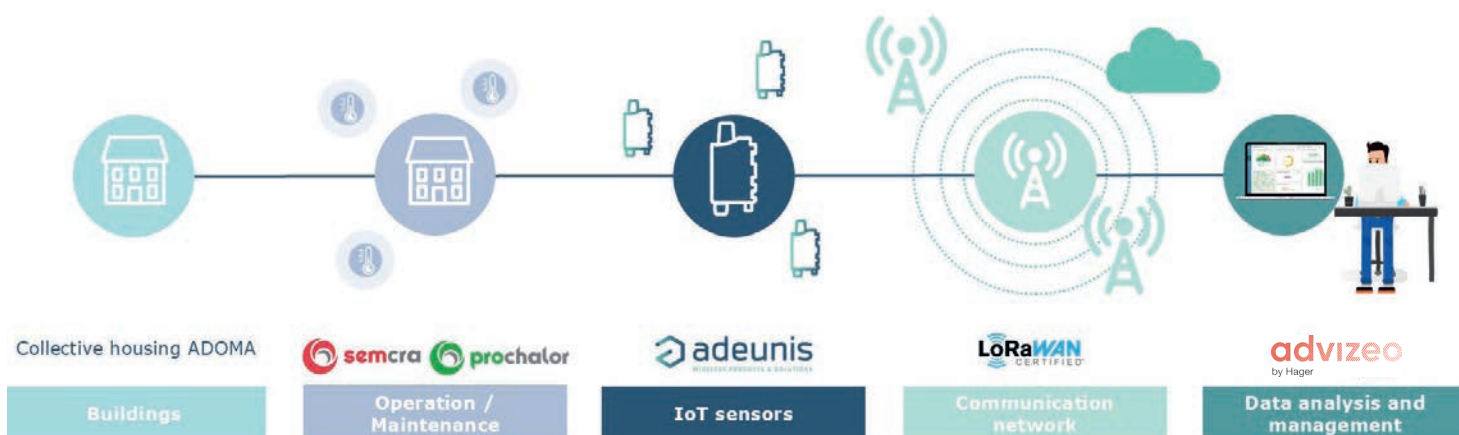
Radio communication protocol designed for the Internet of Things.

ADOMA

End customer, social housing manager.

ADVIZEO

IoT data management platform.





[Optimising energy performance in collective housing.]

The solution deployed

To optimise thermal management of buildings, more than **3,000 Adeunis sensors** have been deployed at 158 sites. These sensors collect and transmit the essential data needed to adjust energy parameters in real time.

Use cases and distribution of sensors

- **2,600 COMFORT sensors**

These sensors measure the ambient temperature in homes in order to guarantee fine regulation and detect thermal discrepancies. Thanks to these sensors, technicians can quickly identify areas where adjustments are needed.

- **160 TEMP sensors**

These temperature sensors detect the outside temperature to enable dynamic adjustment of heating set points according to weather conditions, thus avoiding unnecessary energy consumption.

- **350 TEMP2S sensors**

TEMP2S sensors monitor the flow and return temperatures of domestic hot water loops. They serve two purposes: to ensure a temperature that meets health standards (preventing the proliferation of legionella) and to ensure that heat losses in the network are minimised.

[Optimising energy performance in collective housing.]

Focus on the COMFORT sensor

Objective:

- Monitor changes in ambient temperature and humidity
- Reduce energy consumption
- Guarantee the comfort of building occupants

Highlights:

- 15+ years of autonomy (depending on version and configuration).
- 4-in-1 product: temperature, humidity, alarm button, dry contact input.
- Transmission modes available: periodic, event-based, with history.
- Existing versions: LoRaWAN, Sigfox, NB-IoT / LTE-M.



Focus on TEMP / TEMP2S sensors



Objectifs:

- Periodically monitor temperatures
- Identify temperature losses
- Trigger an alarm if high and/or low temperature thresholds are exceeded

Highlights:

- 10+ years of autonomy (depending on version and configuration).
- TEMP2S: two remote sensors | TEMP: one ambient sensor and one remote sensor
- Transmission modes available: periodic, event-based, with history.
- Existing versions: LoRaWAN, Sigfox, NB-IoT / LTE-M.



[Optimising energy performance in collective housing.]

Implementation

1 - Preparing the roll-out plan

A representative sampling method has been put in place to ensure a strategic distribution of sensors:

- Selection of 10% of homes to ensure representative measurements.
- Distribution according to the orientation of the dwellings (north/south), their position on the floor and their proximity to the heating columns.
- Identification of thermal imbalances and optimisation of heat distribution.

90% of the sensors were installed on the first visit, limiting the need for subsequent work.

2 - Pre-configuration of sensors with KARE+

All Adeunis sensors are pre-configured at the factory with the KARE+ solution, making installation quick and easy:

- No manual configuration required on site, the sensors are ready to install immediately.
- Significant time savings for technical teams.
- Reduced risk of errors during installation.

3 - Training and support for teams

To ensure that field teams get to grips with the solution as quickly as possible, Adeunis has put in place a tailor-made support package:

- One-day technical training course for PROCHALOR and SEMCRA technicians, covering :
 - LoRaWAN technology and the principles of radio-mapping.
 - Sensor installation and configuration.



[Optimising energy performance in collective housing.]

Implementation

4 - Monitoring over time with KARE+

Thanks to the KARE+ platform, operators benefit from real-time monitoring of sensors and their performance:

- Remote updates of sensors, without the need for physical intervention.
- Sensors geolocalisation to make it easier to locate them and optimise interventions.
- Battery status monitoring, so you can anticipate maintenance requirements.
- Alerts in the event of a malfunction, ensuring immediate responsiveness from technical teams.

Focus on KARE+

KARE+ is Adeunis' device management solution for maintaining a fleet of sensors in operational condition. KARE+ simplifies the configuration, monitoring and maintenance of sensors.

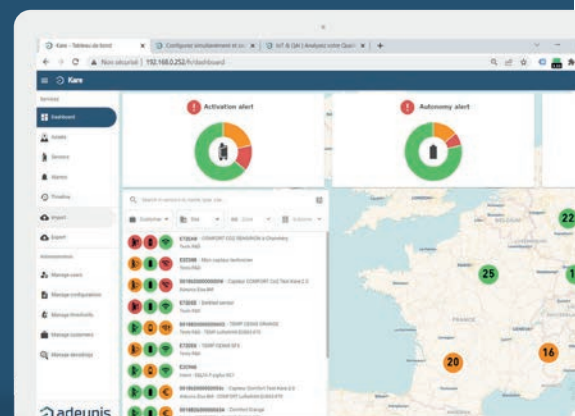
KARE+ is:

KARE

Device
Management
Platform

KARE+

Application for
remote updating of
a fleet of sensors



[Optimising energy performance in collective housing.]

Results with IoT solutions

A successful project that can be replicated

Thanks to this IoT solution, PROCHALOR and SEMCRA now have reliable data that they can use to optimise their work and guarantee the energy performance of ADOMA's homes.

The integration of Adeunis sensors not only enables real-time monitoring of energy performance, but also proactive management of technical installations.

This approach leads to substantial energy savings, improved responsiveness from maintenance teams and an overall improvement in comfort for residents.

This project demonstrates the relevance of IoT technologies in the management of community buildings. By providing precise, actionable indicators, it is possible to quickly identify areas for improvement and take effective corrective action.

« Thanks to Adeunis sensors, we have a real-time view of energy performance and can intervene more effectively. This allows us to act quickly and make substantial savings. »

Guillaume Ferretti, Head of Energy Unit - PROCHALOR / SEMCRA



7 to 10% reduction in energy consumption.



Reduction in unnecessary travel by technicians, lower operating costs.



More even temperature in homes, improved thermal comfort.



Justification of investments in energy renovation, improved management of the property portfolio.



Focus on thermal regulation

Optimising collective heating and controlling boiler rooms: the key role of thermal regulation.

66%

In France, heating accounts for an average of 66% of energy consumption in collective housing.

In multi-family residential buildings, temperature control plays an essential role in maintaining occupant comfort while controlling energy consumption. It involves adjusting the way the heating system operates to suit actual needs, outdoor conditions and the system's ability to distribute heat evenly.

A properly regulated district heating system must meet a number of requirements:

- Guarantee optimal thermal comfort by maintaining a stable temperature in each dwelling, without overheating or cold zones.
- Avoid energy losses caused by inadequate heat distribution.
- Reduce operating costs by limiting over-consumption of energy and avoiding costly maintenance due to malfunctions.
- Reduce environmental impact by limiting CO2 emissions linked to heat production.



The challenges of optimising district heating

Optimising a district heating system is a complex issue, because it involves managing several parameters simultaneously. The major challenges include:

Hydraulic imbalance and heat loss

In a district heating network, the hot water must be distributed evenly to all the homes. However, hydraulic imbalances can occur, leading to:

- significant temperature differences between the first and last dwellings served by the network,
- excess energy consumption, as some dwellings receive too much heat while others lack it,
- thermal discomfort, forcing occupants to open windows to evacuate excess heat, exacerbating energy wastage.

Lack of responsiveness from traditional systems

Traditional heating systems often operate with a significant latency. When a temperature change occurs outside, it can take several hours, or even a whole day, to adjust the heating. This lack of responsiveness leads to:

- overheating at the beginning and end of the heating season (when the outside temperature varies rapidly),
- thermal discomfort, with residents experiencing significant temperature differences before the system adjusts.

Unnecessary energy consumption

In the absence of precise control, collective heating installations can lead to unnecessary expenditure, due to:

- heat production in excess of actual requirements,
- equipment running continuously, even when homes are unoccupied,
- poorly optimised maintenance, leading to a drop in boiler efficiency and premature ageing of installations.



The role of IoT sensors in boiler room management

The Internet of Things (IoT) is making it possible to significantly improve the control of heating systems, thanks to smart sensors capable of:

- measuring the ambient temperature and the temperature of the water in the heating circuit in real time,
- monitoring humidity, pressure and water flow to optimise heat distribution,
- analysing energy consumption to identify anomalies and adjust set points,
- detecting malfunctions and enabling predictive maintenance to avoid breakdowns.

The different types of sensor used

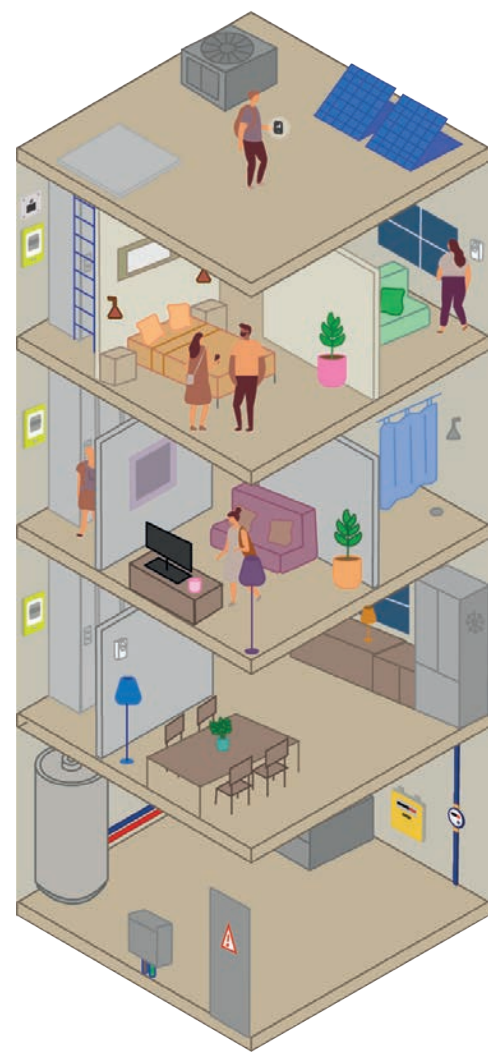
Several types of IoT sensor are currently being deployed in district heating systems:

- temperature and humidity sensors: installed in homes and communal areas, they can be used to assess the efficiency of thermal distribution,
- connected energy meters: they measure energy consumption in the boiler room and homes, enabling precise adjustment of heating,

The impact of sensors on energy optimisation

Thanks to the data collected by these sensors, operators can put in place advanced strategies to improve the efficiency of their boiler rooms:

- automatic adjustment of temperatures according to actual conditions, avoiding wastage,
- detection of hydraulic imbalances, making it possible to correct heat distribution faults,
- anticipation of breakdowns and reduction of corrective work, thus limiting maintenance costs.





Towards more intelligent and efficient temperature control

By integrating IoT sensors and intelligent control solutions in boiler rooms, it is possible to move from conventional regulation to dynamic, optimised management of district heating.

The tangible benefits for building managers and occupants

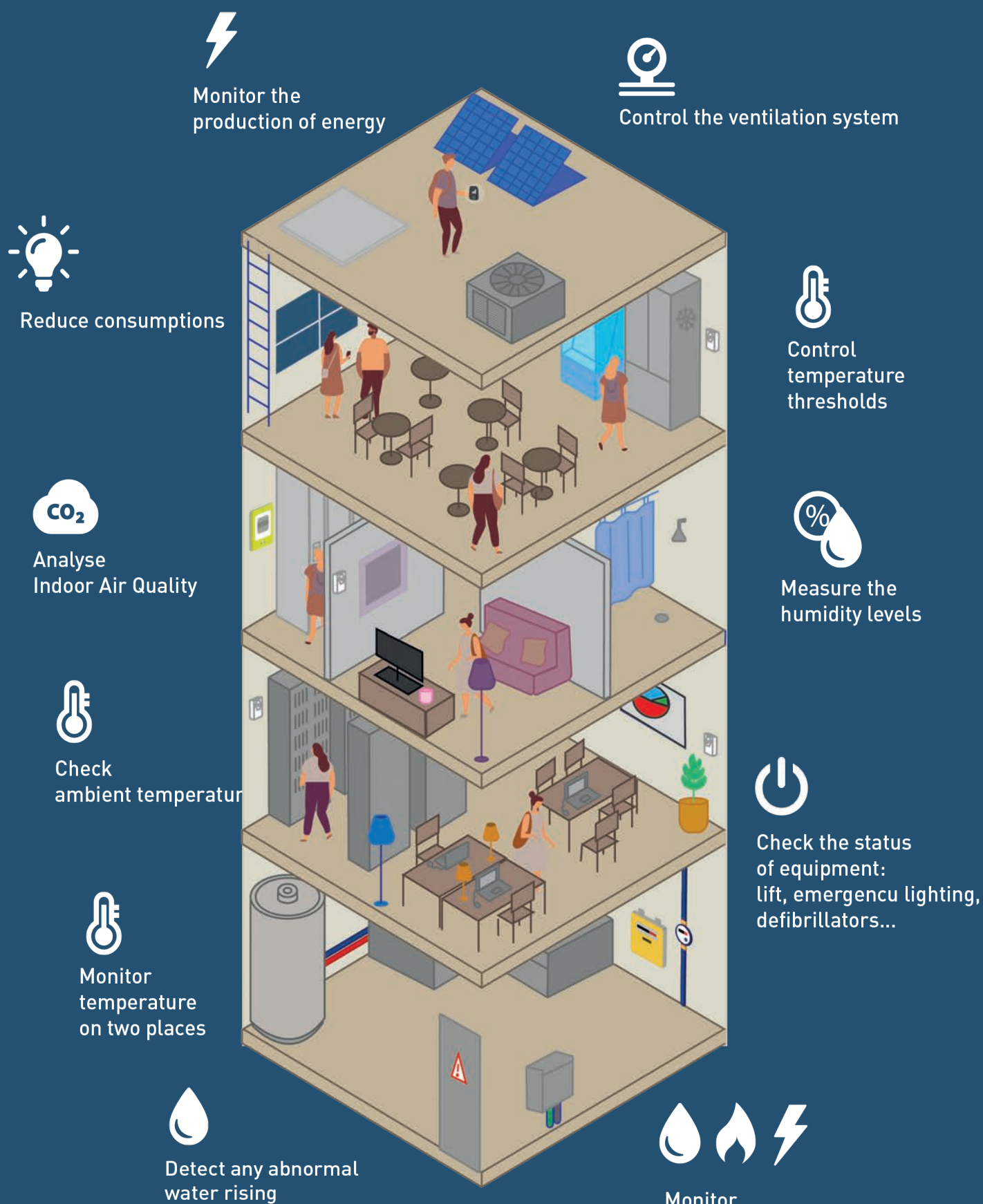
- Lower energy bills thanks to consumption that is adjusted to actual needs.
- Improved thermal comfort thanks to more precise and responsive regulation.
- Reduced CO2 emissions by optimising the use of energy resources.
- Enhanced value of property assets, with well-regulated buildings displaying better energy performance.

A key driver in the energy transition

With increasingly stringent thermal regulations and the need to reduce the carbon footprint of buildings, modernising district heating systems is a key lever for improving the energy efficiency of existing building stock.

The IoT and advanced control solutions offer promising prospects for achieving these objectives, by combining energy performance, user comfort and reduced operating costs.

Even more use cases with our IoT solutions



About Adeunis

In a connected world, Adeunis designs, manufactures and markets wireless sensors and solutions to enhance the operational performance of professionals.

Adeunis is the expert in IoT solutions for Smart Buildings.

Our mission is to help you use IoT to digitise your equipment and services for :

- improved energy performance,
- greater user comfort,
- optimised equipment maintenance.

Adeunis offers a range of connected solutions and services to support you at every stage of your IoT-enabled digitisation project

20 YEARS

expertise to support you, from diagnostics to deployment of your solution.

5 MILLION

objects sold from our full range of multi-network IoT sensors

3 CLICKS

to configure and maintain your fleet of sensors in operational condition



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