index⁺

meterbuy

AN INNOVATIVE SOLUTION FOR THE
ENERGY MANAGEMENT
OF YOUR BUILDINGS

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INDEX+ solutions

Meters & AMR

SMART METERING OCCUPANT
Consumptions control

WEB INTERFACE
Index, consumptions...

INTEGRATION
Interface
with other softwares

BOILER MONITORING
Efficiency improvement,
failure detection...

DASHBOARD
Essential figures of the building

ALERTS
Leaks, manipulation,...

COST ALLOCATION
Also during the year

index+
SERVICES
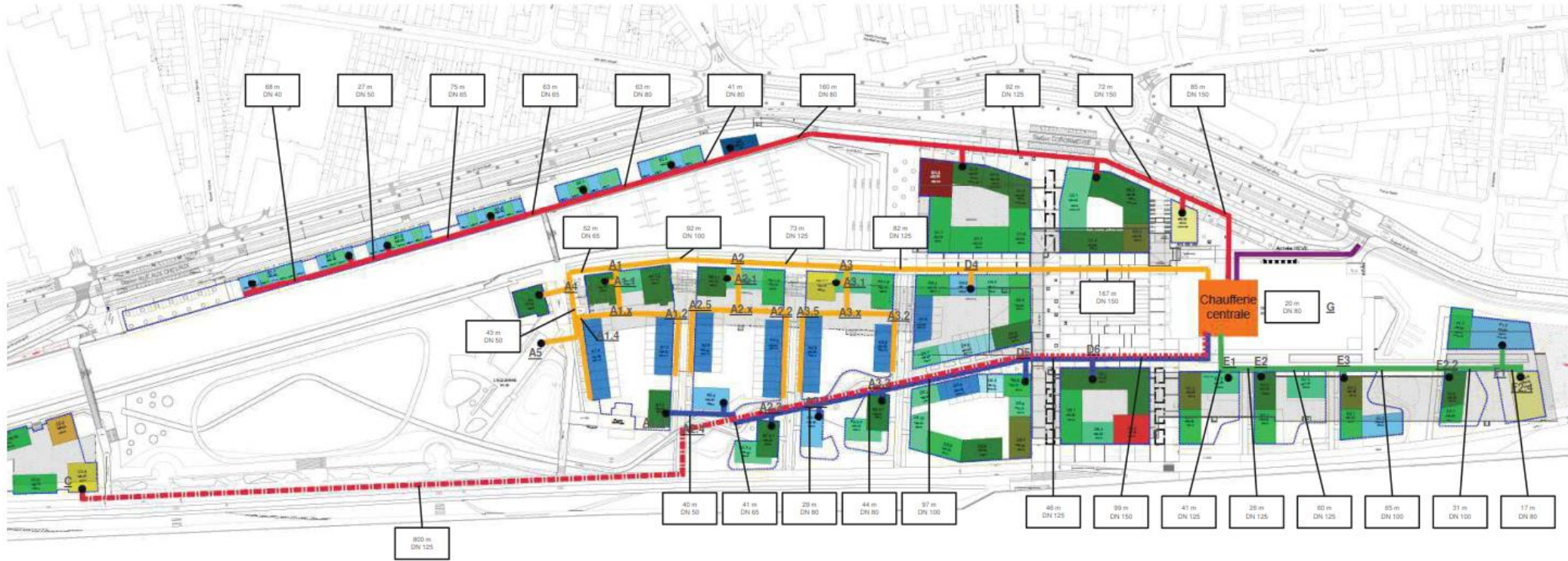
index+

Rives-Ardentes project - Liège

- # buildings = 37
- # housings = 1.325

- Largest ecodistrict planned in Belgium
- District heating

District heating network

Project aspects

- AMR network on a district area

- Multi-energies

- Different monitoring purposes
  - ✓ Managing of the district heat network
  - ✓ Managing the local renewable energy community
  - ✓ Managing electric charging station
  - ✓ Cost allocation within each building (flats / offices / shops…)

- Versatility for future IoT applications
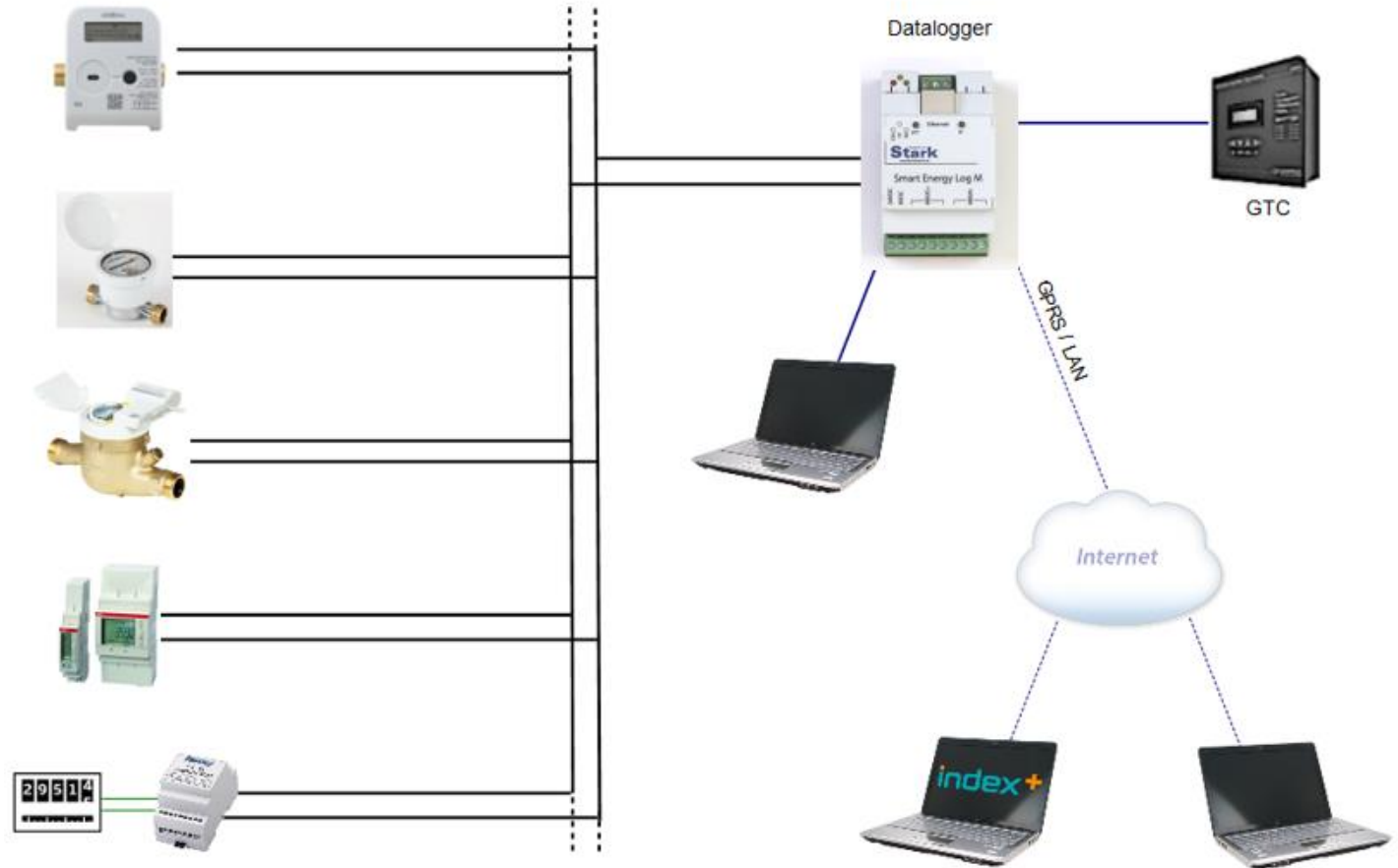 - ✓ Car park management
  - ✓ Follow up of air quality…

Eau
Chauffage
Electricité
Gaz
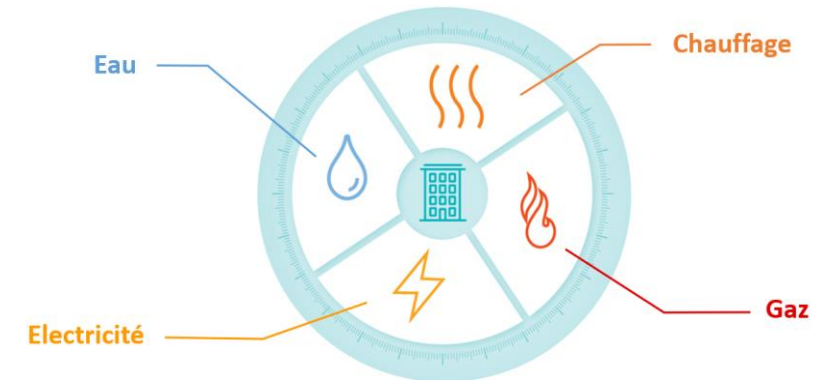
Wired networks (M-Bus / ModBus)

Advantages :
- ✓ Reliability

Disadvantages :
- No versatility
- Installation cost
- Limited range
- Limited sensor availability

OMS Radio

Advantages :
- ✓ Easy to install
- ✓ Cost effective

Disadvantages :
- Limited radio range
- Limited sensor availability
- Battery life time (10+ years)
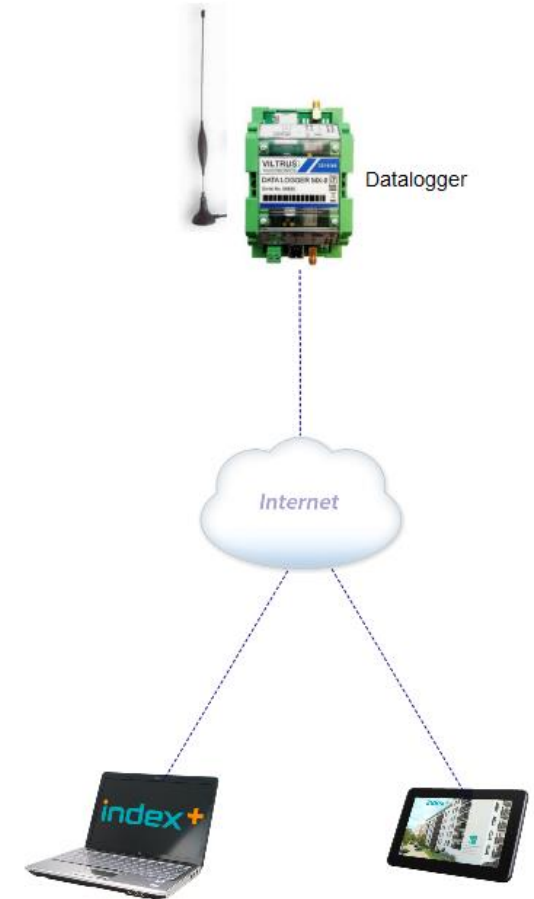

Energie thermique

Eau chaude

Eau froide

Electricité
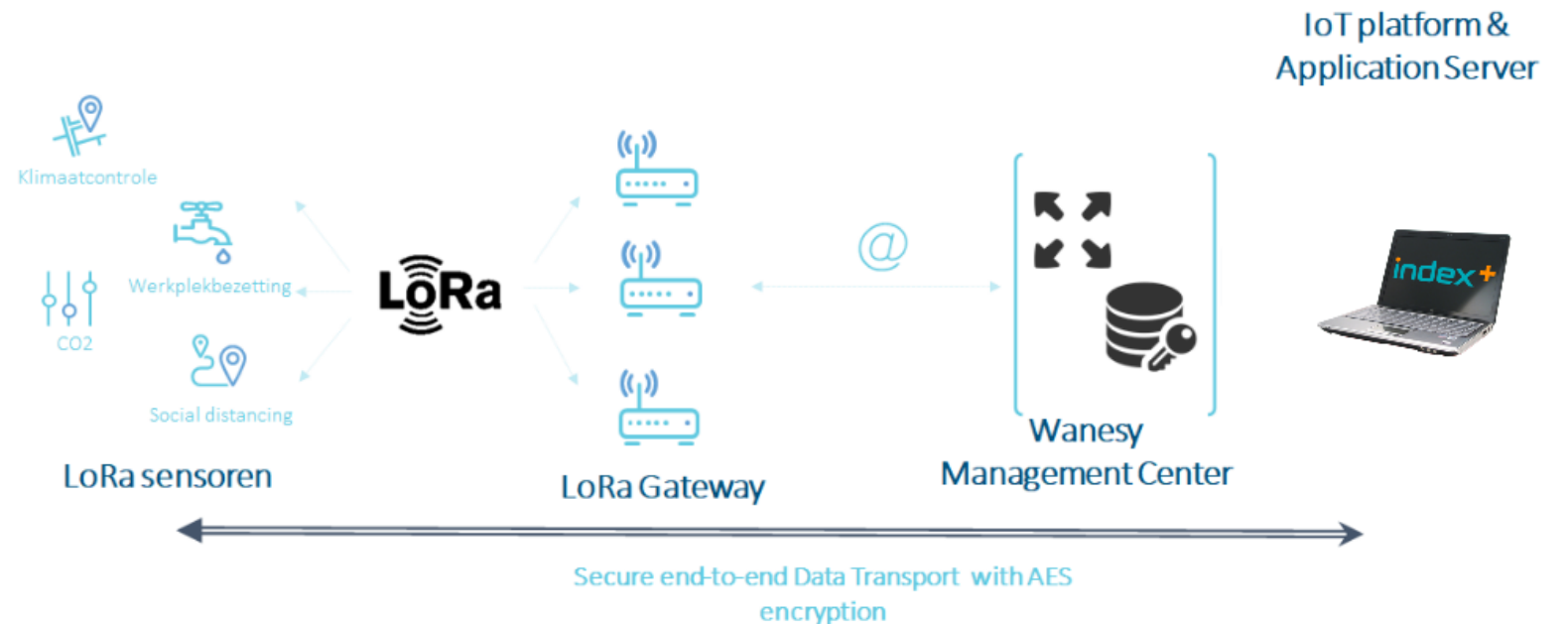
Compteurs GRD
ou existants

Répéteur radio

Datalogger

Internet

LoRa network

Advantages :
- ✓ Easy to install
- ✓ Cost effective
- ✓ Extensive sensor choice
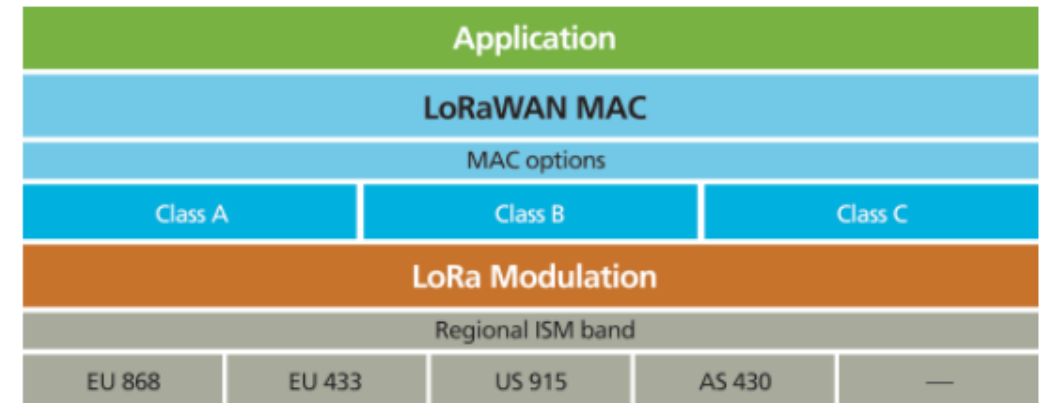- ✓ Radio range
- ✓ Versatility

Disadvantages :
- Battery life time (10+ years)
- Limited data quantity / day

IoT platform & Application Server

Klimaatcontrole

Werkplekbezetting

CO2

Social distancing

LoRa sensoren

LoRa Gateway

Wanesy Management Center

Secure end-to-end Data Transport with AES encryption

LoRa network ?

- **Purpose :** IoT technology for communication between sensors and a data base (≡ WiFi or BlueTooth but with better properties)

- **Main Advantages** :

  - **Communication** : Up to 5km (urban area) or 15 km (open site)

  - **Low consumption**: Battery life time > 10 years

- **LoRa** : Name given to the radio wave modulation technology on which LoRaWAN networks are based

- **LoRaWAN** : Long range radio wide area network radio protocol based on LoRa technology

Application				
LoRaWAN MAC				
MAC options				
Class A		Class B		Class C
LoRa Modulation				
Regional ISM band				
EU 868	EU 433	US 915	AS 430	—

LoRa networks - Gateways

LoRa sensors

Smart Building

Smart Metering

Smart Parking

Smart Lighting

Smart Waste

Smart Alarming

Track & Trace

Heat / cold meter

Hot water

Cold water

Electricity

Existing or supplier meters
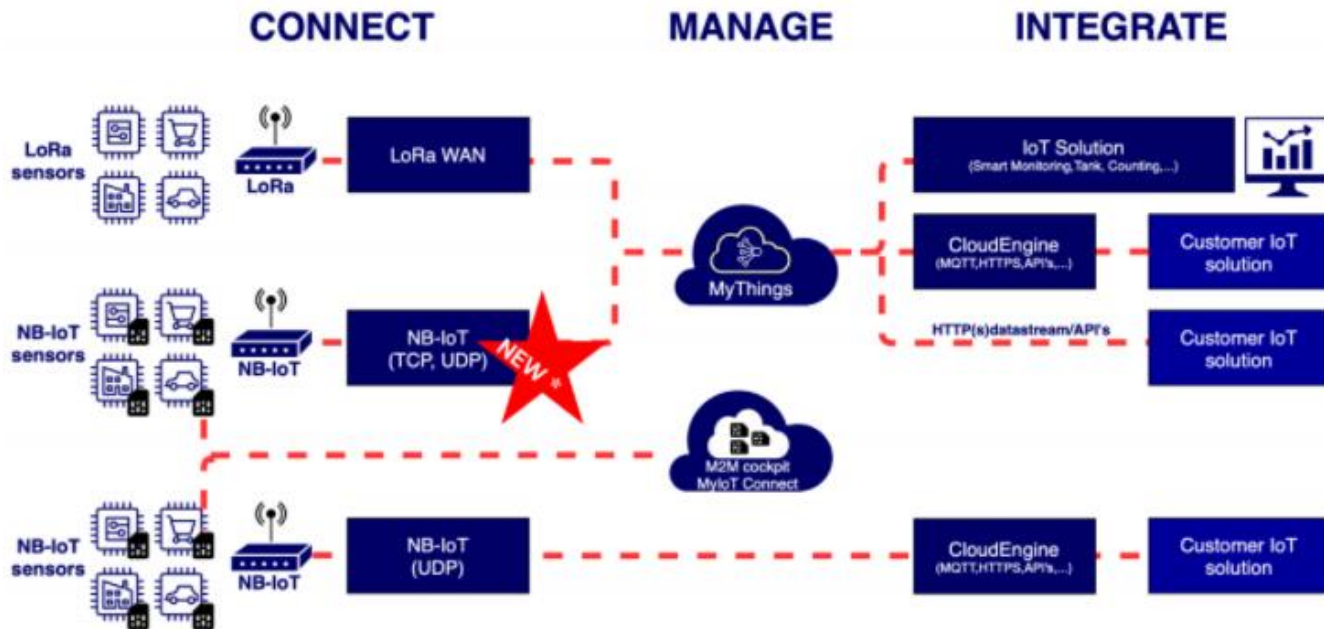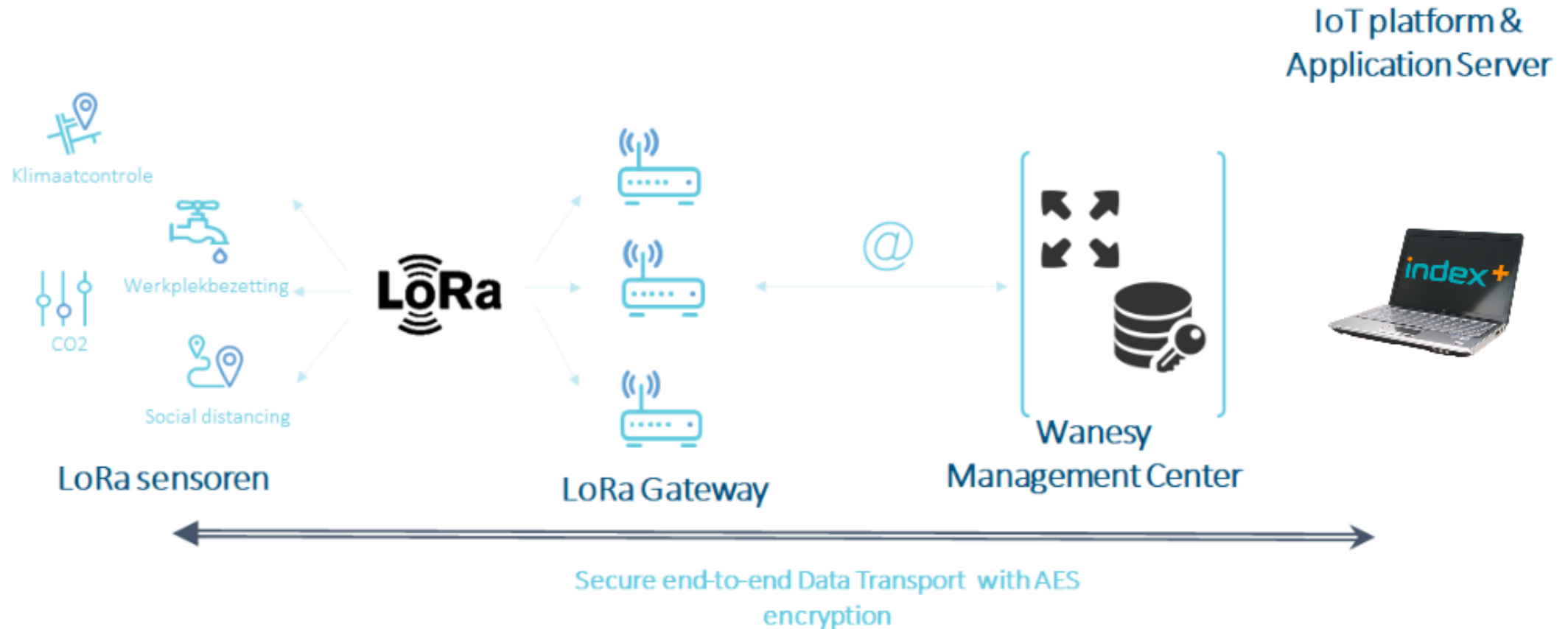
Analogic converter

Smart plug

Car park sensor

T + H_2O + CO_2 sensor

Public LoRa network

Private LoRa network

IoT platform &
Application Server

Klimaatcontrole

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LoRa sensoren

LoRa Gateway

@

Wanesy
Management Center

Secure end-to-end Data Transport with AES
encryption

Advantages of private LoRa network

- **Radio coverage :** Better indoor radio reception (dedicated installed gateways)

- **Cost :** Simulation with district equipped with 700 sensors

Public network	
Aspect	**Cost**
Service	1€/sensor x month
Cost after 5 Years : +/- 42.000€	

INDEX+ Private Network	
Aspect	**Cost**
Gateway	700€ (1x)
Installation	1000€ (1x)
Service (200.000 msg)	100€/month
Cost after 5 Years : +/- 8.000€	

Example : District of Dison city equipped with LoRa Network
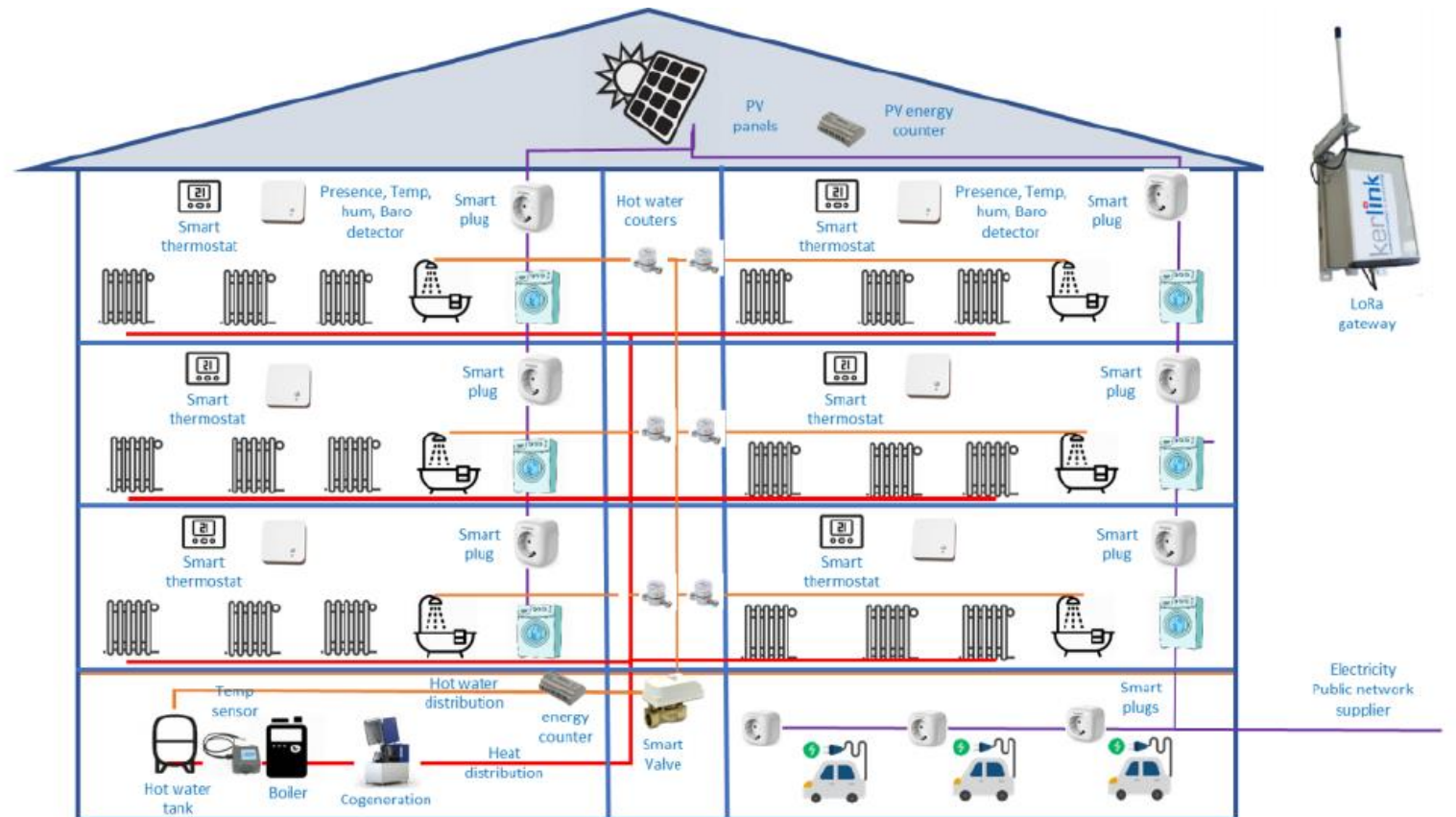
Radio coverage

Gateway
**(installed on a school roof)**

Example of smart building management

- ✓ Optimizing local renewable energy production & use
- ✓ Monitoring of energy uses
- ✓ Owner education
- ✓ Abnormal energy use detection and subsequent alerting
- ✓ Automatic energy control with district needs
- ✓ Open for future needs…

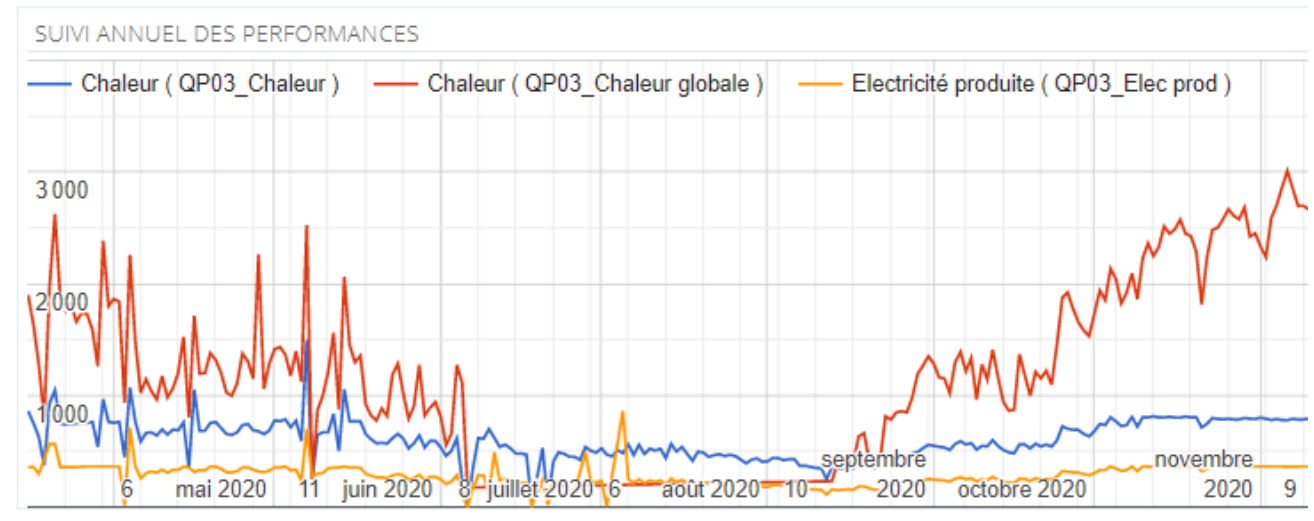# Data Management of the Distric Monitoring System (1)

Network Monitoring

➢ Substation status
➢ Optimization of renewable energy use
➢ Billing of energy use
➢ …
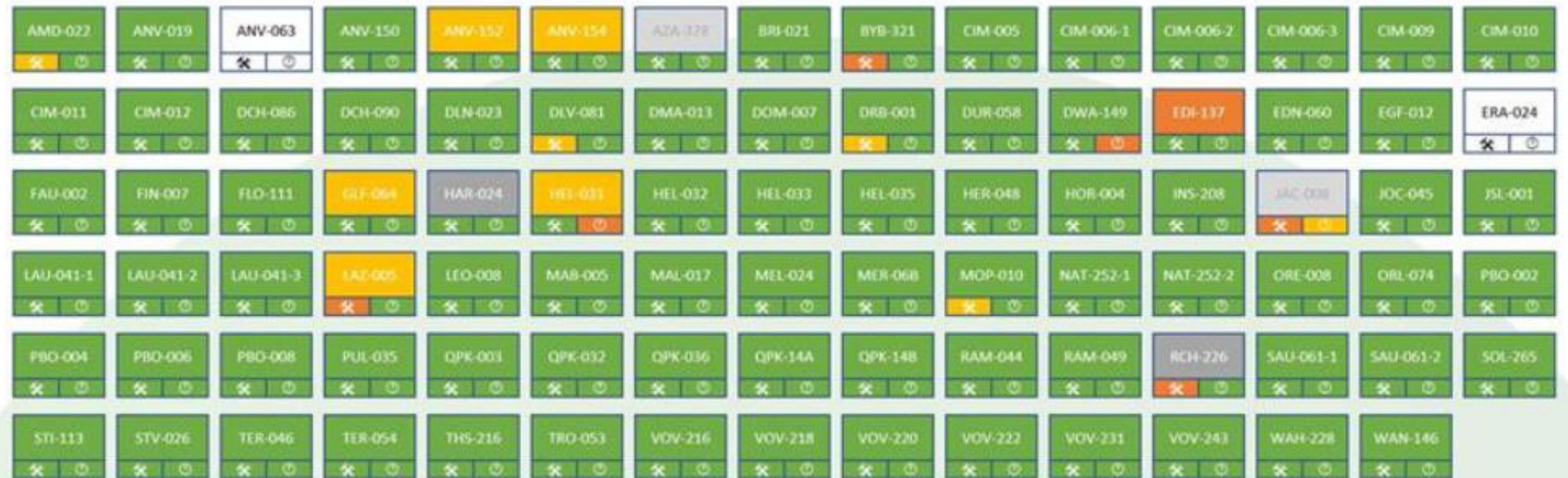
Data Management of the Distric Monitoring System (2)

Monitoring of individual substation
- ➢ Energy efficiency optimization
- ➢ Cost allocation

Interface with third-party applications
- ➢ Car electrical charging station
- ➢ Car park management
- ➢ Energy billing

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