nextstation
MOSCOW 2013

HOW ENERGY SMART METERS COULD HELP TO REDUCE ENERGY BILLS OF STATIONS

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Session 4A: Sustainable stations

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- Technology: Nialm
- Toward a station plugged to the district

4A: Context
Buildings at SNCF

➔ French Railways are the first electricity consumer in France.
1.5% of the energy consumption of the country.

➔ 22% of the all energy consumption of SNCF is done by buildings (stations, maintenance centers, offices).
The annual billing of electricity for buildings is about 150M€/an.

➔ Most of buildings were built before 1974. => LOW energy performance.

4A: Context
Management of the energy performance

1) SOBRIETY: Reducing energy wastage

An energy audit and an assessment of the station's energy performance are to advice recommendations.

BUT it's not easy to make an exhaustive audit in an old building like most of stations.

2) EFFICIENCY: Using new technology e.g. Relamping

BUT How to predict the impact of the implementation of this new technology.

3) RENEWABLE ENERGIES: Stations become not only consumers but also producers.

BUT How to manage the balance between consumption and production.

4A: Context

Why using a smart metering system for a station ?

For all reasons presented just before: Smart metering is it the solution ?

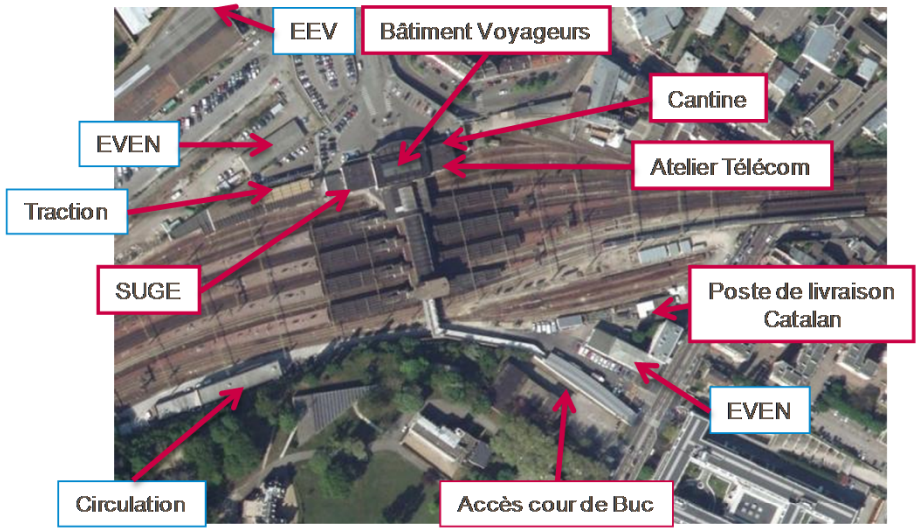
- With smart metering we can go further to increase energy efficiency ?

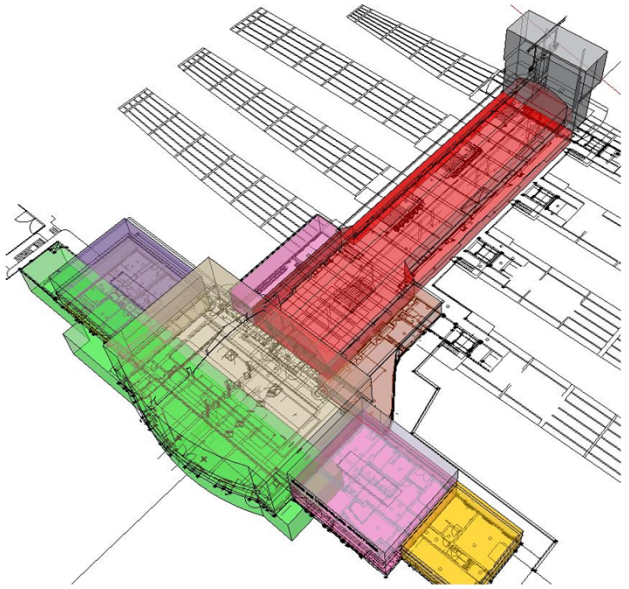
  - **Identify** inefficient or malfunctioning appliances.
  - **Monitoring** in real time energy consumption.
  - **Displaying** energy consumption to make users sensitive.
  - **Identify** appliances which consume the most power.

4A: Context
ID of the STATION

Versailles-Chantier station

55 000 Passengers/day





Energy consumption / year
Gaz 420 MWh
Electricity 1.1 GWh

=100 apartments for electricity

Covered surface = 3200m²

Heated surface = 1500m²

4A: Technology

How to track consumption for each appliance ?

By attaching a sensor or a communication device to each appliance, it is possible to collect and disseminate the power-draw information in near real time.

-Very Expensive more than 200 sensors for this station.
-Very long time to install all sensors more than 2 months.

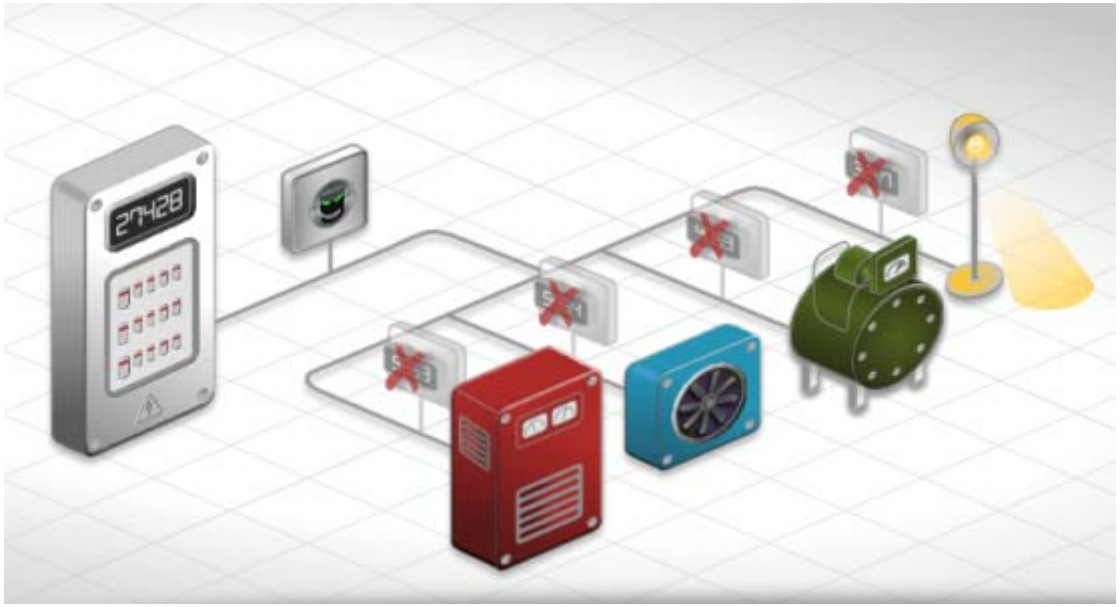
What if you could breakdown electricity consumption with one meter only ?

What if all submetering systems became obsolete because of one signal processing technology?

4A: Technology
NIALM

Today, this comes true thanks to NIALM (Non Intrusive Appliances Load Monitoring) technologies

NIALM technologies are processes for disintegrating power and deducing what appliances are used in a building through a single metering point

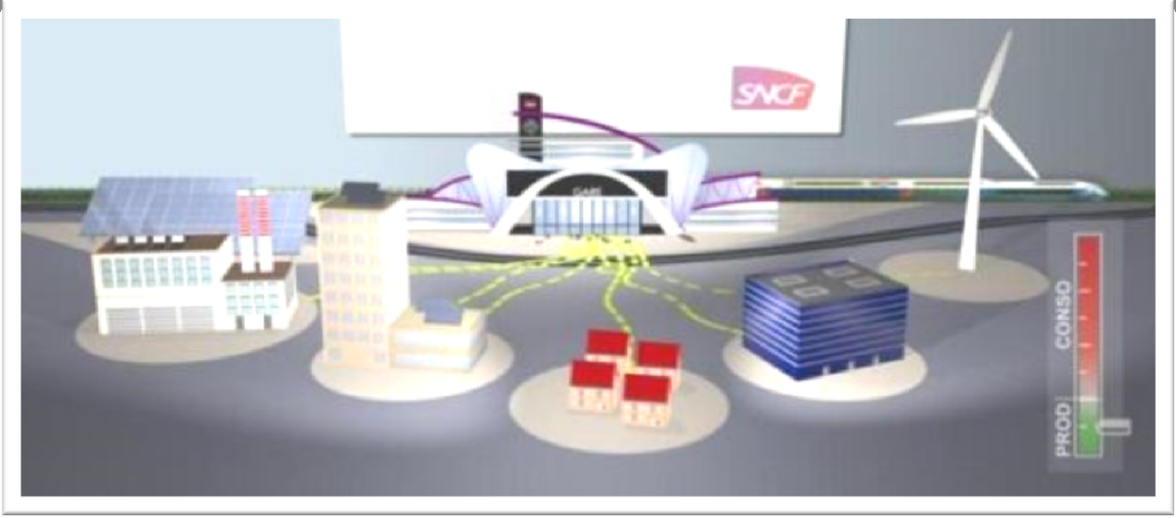


4A: Technology

NIALM

We used 5 boxes (Not only one) to identify more than 80% of electrical consumers of the station.
The implementation of the system has been done in ONE Day.
With the monitoring and few simple actions on the biggest consumers we generated a economy of 15% of the all consumption.

4A:Toward a station plugged to the district



MEASURING all the different types of energy consumption of district offices, housing, shops, public lighting, electric vehicles.

IMPLEMENT the means of production (photovoltaic, cogeneration ...) and means of storage (batteries, flywheel ...).

MONITORING all the means to optimize energy consumption and billing: curtailment of electricity, shifting electricity load to off-peak.

...Thank you

for your kind attention

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