

Possibilities of Submetering Analysis

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IOT Analytics

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Agenda

Background

- What is Submetering

- What are the Possibilities of Submetering for IOT?

Analysis

- The Data

- Basic Stats

- Missing Data and Other Problems

Possible Applications

- Predictive Analytics

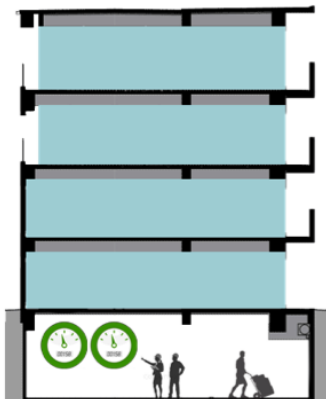
- Dashboards

Recommendations

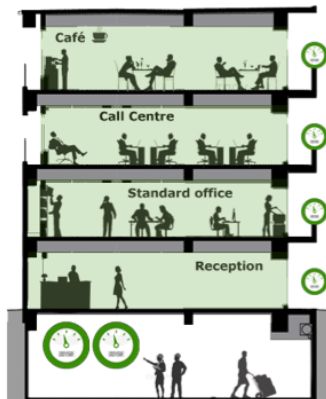


What is Submetering?

Building-level metering



Submetering by floor



What are the Possibilities of Submetering for IOT?

Connected Submeters give a real time reading of the energy use in different parts of buildings or even different device groups

This mean we can...

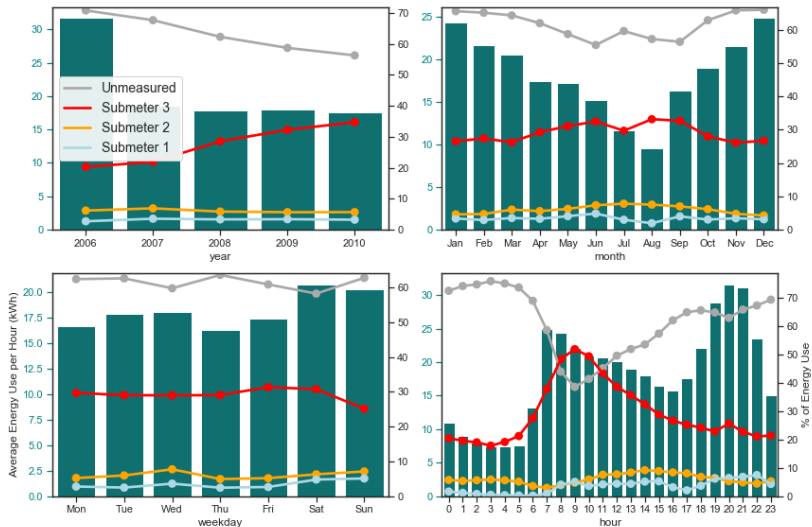
1. See what is actually spending that electricity
2. Pinpoint possible failure points fast and precisely
3. Gather time series data about the electricity use with a chosen granularity for further analysis

The Data

- ▶ Minute level readings from 3 submeters and overall energy usage between December 2006 and November 2010 in House in Sceaux
- ▶ The three submeters cover the kitchen, the laundry room and the combination of the water-heater and air-conditioning
- ▶ Electricity use not covered by submeters can be calculated by deducting the submeter readings from overall electricity use

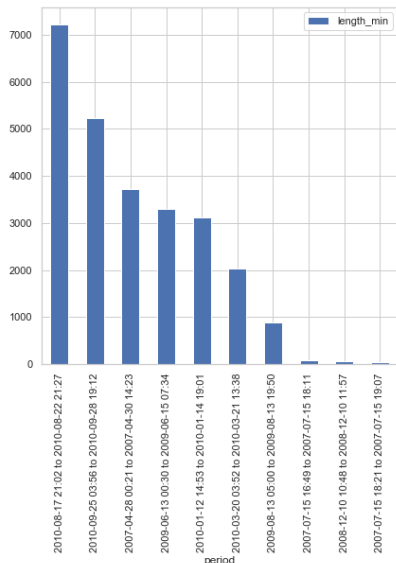


Basic Stats



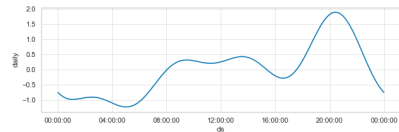
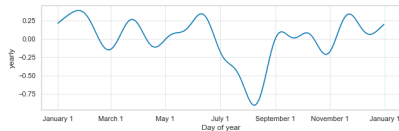
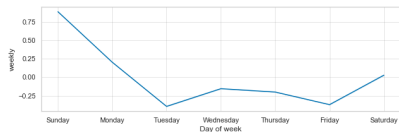
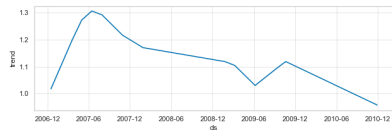
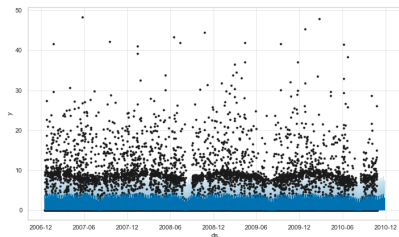
Missing Data and Other Problems

- ▶ Grouping of submeters is based on room and not function
 - ▶ Refrigerator is in the laundry room
 - ▶ Water heater and air-conditioner not separated
- ▶ 1.25 % of values missing. Sometimes in stretches over a day
 - ▶ Fixed with a predictive model
- ▶ Electricity use not covered by submeters makes up over half of the energy consumption

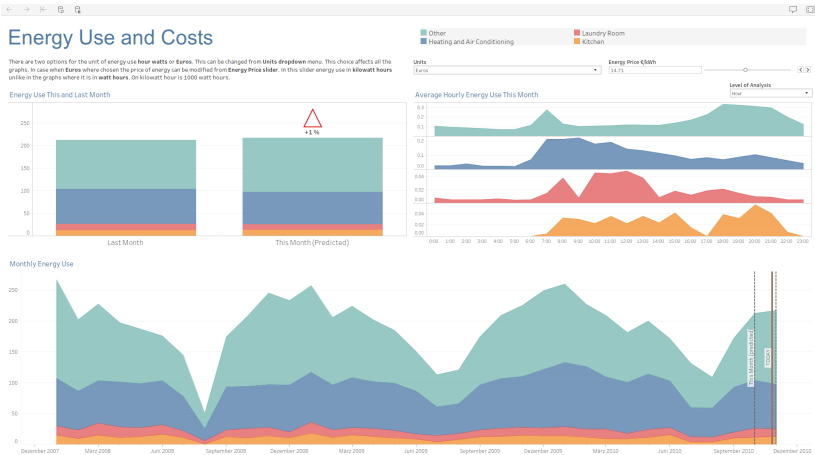


Predictive Analytics

- ▶ Multiple seasonal patterns easily modeled
- ▶ Minute level data impossible to model \Rightarrow have to aggregate
- ▶ Hourly level realistic in overall use and daily level in submeters



► Dashboard for the breakdown of electricity use by period combined with predictions



Recommendations

1. Make sure that the submeter groupings make sense to the customer
2. Build customer facing dashboard with some predictive analytics features

The End

Questions?