

Analysis of Submetered Household Energy Consumption

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Agenda

- ▶ Background
- ▶ Challenges
- ▶ Deliverables
- ▶ Approach
- ▶ Preliminary results
- ▶ Recommendations

Smart Home

- ▶ Can be determined as usage of technical systems, automated processes and connected, remote-controlled devices in flats and houses.
- ▶ The essential aim of the functions is to improve the quality of life and convenience in home.
- ▶ Last but not least is greater security and more efficient use of energy

Challenges

Will smart home owner benefit from submeterings based on:

- ▶ payoff despite installation and maintenance expenses
- ▶ more rational (controlled) energy usage and go-green reputation

Can smart home buyer take advantage of anonymous selling own data records?

Suggestions

- ▶ Electric power consumption reports in kWatt/hour and € terms
- ▶ Detailed energy records based on appliance nature and house location
- ▶ Prediction of future electric power usage trends

Approach

- ▶ Missing values treatment
- ▶ Adjustment of proper granularity level
- ▶ Predictive modelling
- ▶ Intercative dashboards

Deliverables

Commercially viable product

- ▶ I Deep data analysis (January 2011)
- ▶ II Predictive analytics (February 2011)
- ▶ III Dashboard software development (April 2011)

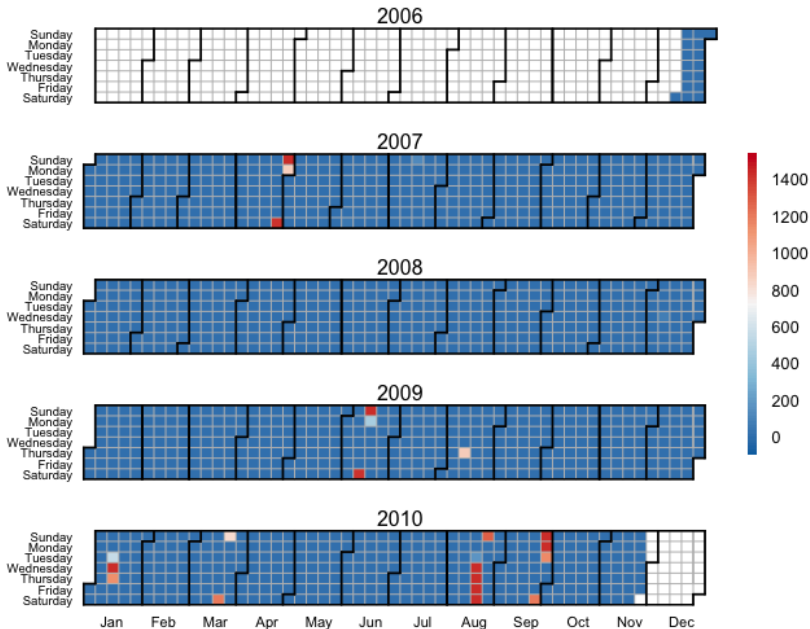
Elaboration

- ▶ Development of savings strategies
- ▶ Correction of negative household behaviour patterns

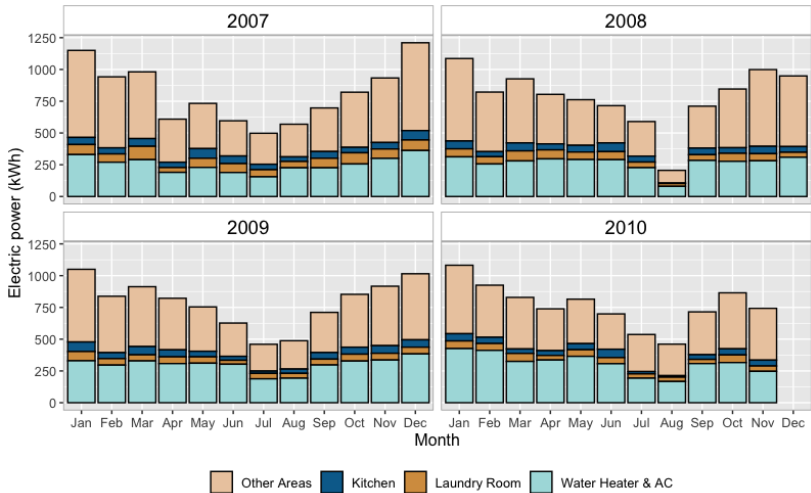
Total Energy Consumption

	GAP	Submeter_1	Submeter_2	Submeter_3
	Min. : 1.267	Min. : 0.000	Min. : 0.000	Min. : 0.000
	1st Qu.: 5.133	1st Qu.: 0.000	1st Qu.: 0.000	1st Qu.: 0.000
	Median : 10.033	Median : 0.000	Median : 0.000	Median : 1.000
	Mean : 18.194	Mean : 1.122	Mean : 1.299	Mean : 6.458
	3rd Qu.: 25.467	3rd Qu.: 0.000	3rd Qu.: 1.000	3rd Qu.:17.000
	Max. :185.367	Max. :88.000	Max. :80.000	Max. :31.000
	NA's :25979	NA's :25979	NA's :25979	NA's :25979

Missing Values



Energy Usage (by month)



Energy Usage (by day of week)



Recommendations

- ▶ Gas submeter can be advised for consideration as overall gas consumption can compromise kitchen performance. Depending on cooking preferences (mainly using gas powered hot plates) kitchen data would be biased.
- ▶ Eating outside may reduce energy consumption in the kitchen area. Collection of catering bills on monthly basis could facilitate kitchen associated data quality.

Thank you!