

Modelling Energy use for Council Properties

Civic Hall

Why?

- Estimation of usage for planning energy purchasing.
- Alerts to building managers of deviations from the expected behaviour e.g. “you are using more power than expected, do you have a leak in your pool?”
- Feedback to users “well done for turning lights out at night!”

Modelling – kNN model

Model trained on 3 years data (50k samples)

~10s to train model and predict usage.

Using data:

date, time, public holidays

30min interval temperature readings from Garforth

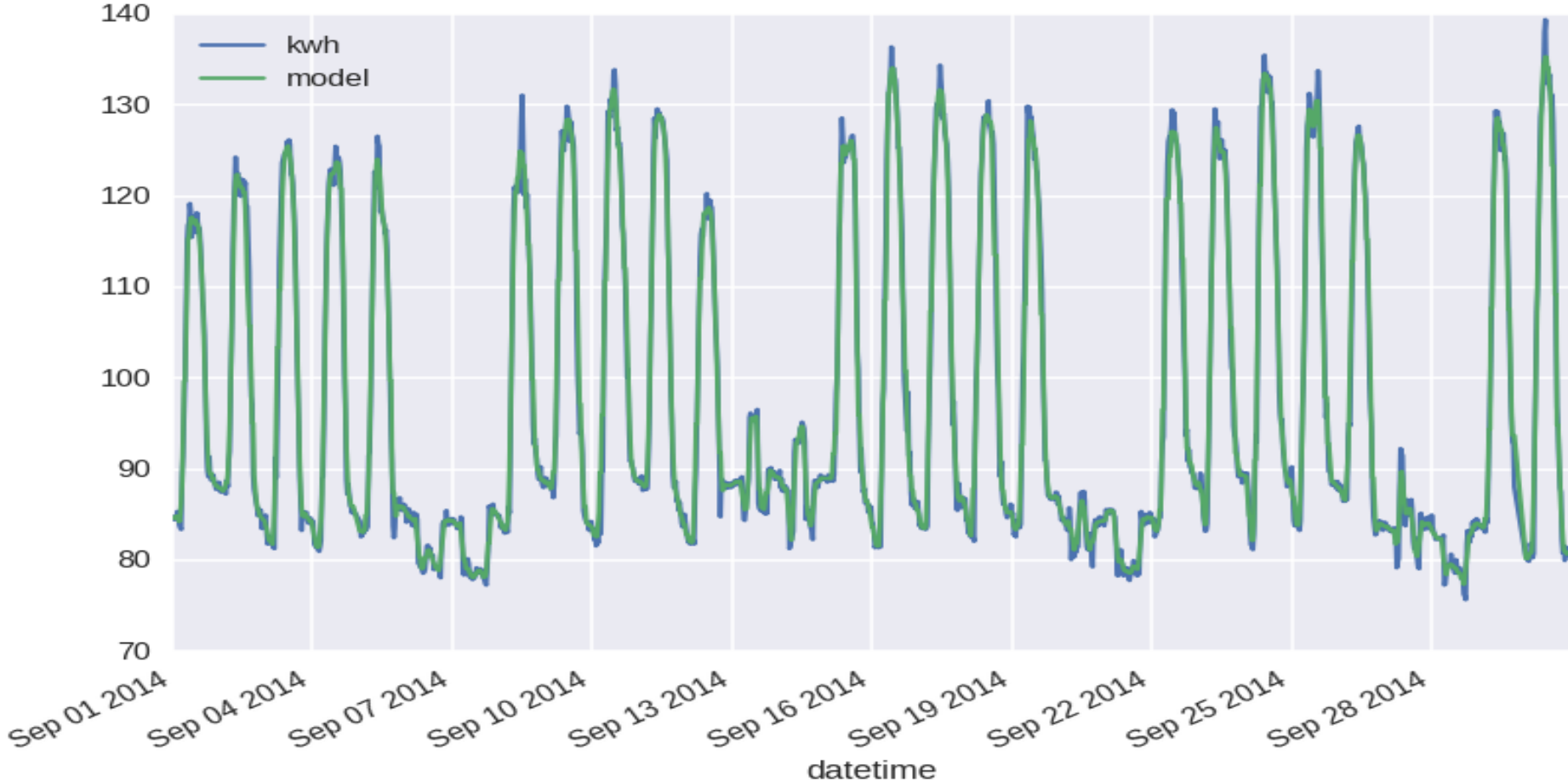
Estimated Energy for 09/2014



Measured: 138392, Predicted: 136504 KWh

Difference: -1887 KWh

Model with continuous training



Difference: 37 KWh

Proposal

- Expand model to encompass more buildings,
- Provide front end for user feedback in the form of alerts for managers and “building efficiency” traffic lights for users.
- Add occupancy data, (network users/ turnstyle counts) for better understanding of features in data.
- add gas and water readings
- Do it realtime for live updates

Notes Whilst Exploring

- Building starts up at 5 am, use proportional to occupancy?
- Power usage mostly between 8:30 and 14:30 in the summer and 17:00 when colder



Notes Whilst Exploring

- Some Data missing from 2014 dataset
- 80KWh baseline from server room
- 4/4/2014 saw 40KWh drop in baseline power
- Building degree day base = 11.5?

