Electricity Load Forecasting for Office Buildings -
Evaluation of Alternatives

- Project Group
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Background and Motivation

- Electricity load forecasts for office buildings

- Necessary for

  - Generator scheduling

  - Energy purchase

  - Energy conservation

Problem Statement

- Evaluating alternative approaches for **short term load forecasting** for office buildings (KreSIT)

- Electricity Usage data for KreSIT

- Predict electricity usage for 15-30 min. time slots

Previous Approach Used

- Support Vector Regression

- Features:
  - Weather
  - Occupancy
  - ToD, DoW

Proposed Alternative

- Time series based models

- ARIMA models

- Input characteristics

    - Seasonality

    - Calendar effects

- Output characteristics

    - High Volatility

    - Non constant mean and variance

Hourly Electricity Usage

September
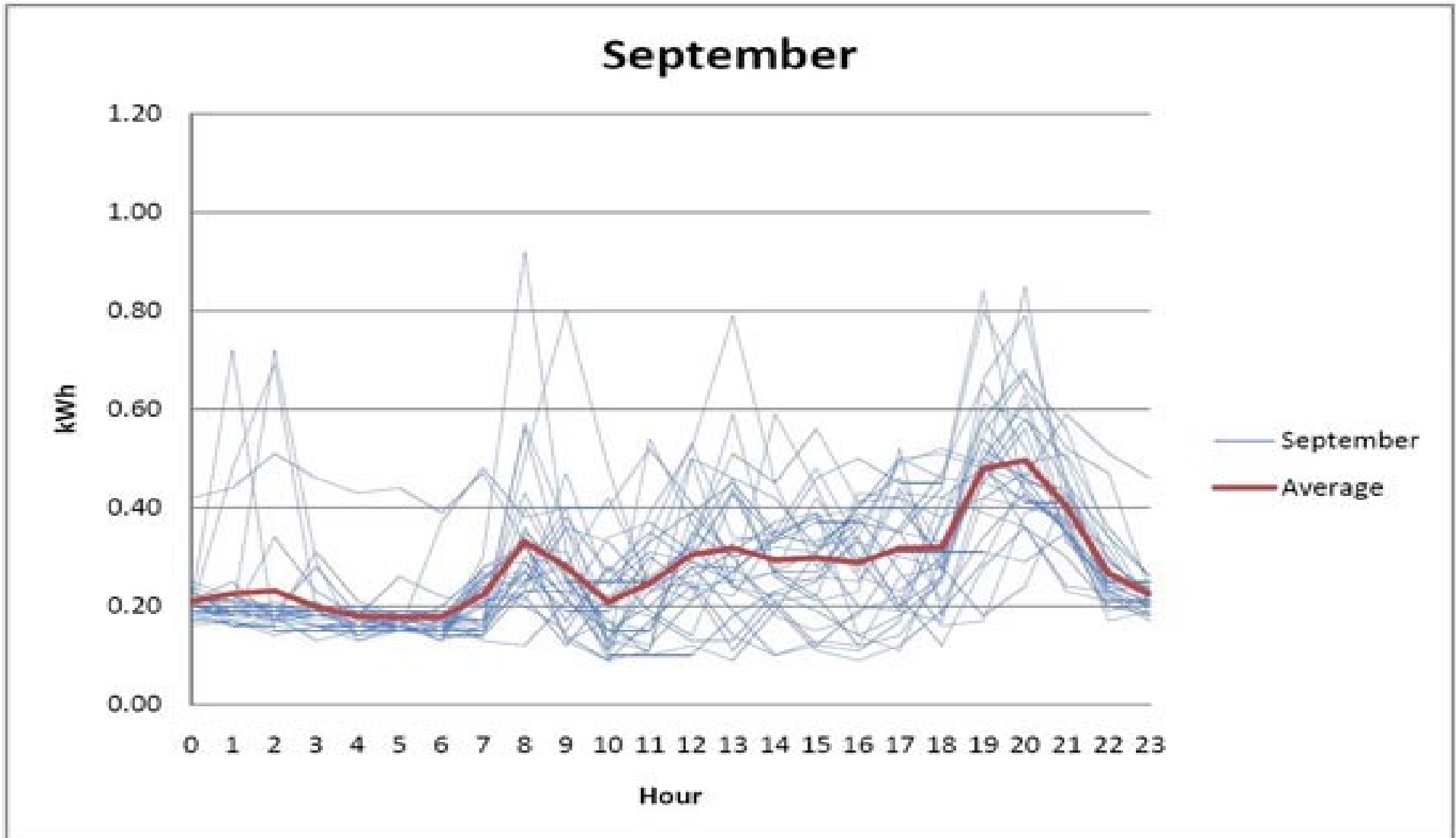
Time line

End Date	Milestone
8 March 2013	Literature Survey
26 March 2013	Model and Tool selection
5 April 2013	Data Acquisition
12 April 2013	Implementation
16 April 2013	Analysis and performance comparison
30 April 2013	Refinements and conclusions

Challenges

- Understand Time series models
- Apply time series models for forecasting
- Tooling support

Progress

- Literature survey nearing completion
- Tool evaluation in Progress
    - R tool/language for time series forecasting
- Model selection
    - ARIMA models

References

- Shu Fan and R.J. Hyndman. Short-term load forecasting based on a semi-parametric additive model. Power Systems, IEEE Transactions on, 27(1):134 –141, feb. 2012.

- F.J. Nogales, J. Contreras, A.J. Conejo, and R. Espinola. Forecasting next-day electricity prices by time series models. Power Systems, IEEE Transactions on, 17(2):342–348, 2002.

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