Script

* Intro 15s - Dheeraj

Good afternoon everyone, my name is Adam Dunn… I’m Nathen Gay and my name is Dheeraj Ghangas and we are SMART Power.

* + Relatable scenario
* Need for AI in energy industry 30s - Dheeraj
  + Problem statement

5 W’s. Who, What, Where, When, Why. Exports of clean energy cost Ontario 1.25 billion dollars in a 21 month span from 2016 to 2017. That is enough energy to power 2 million homes across the nation for an entire year. Why did this occur? Due to the result of poor load forecasting across various regions. It is evident that system operators need a more efficient way to forecast, and this is where SMART Power comes in. ~population increase

* What SMART Power does 1 min - Dheeraj

SMART power seeks to provide accurate short term electrical load forecasting to save money for customers as well as Canadians across the nation. We leverage a Machine Learning time series model using Microsoft Azure to improve the prediction accuracy and reliability of short-term forecasting. We gather data from the Government of Canada as well as systems operators, we can train a model using different datasets in various regions using time, regional load or weather data. Now I will hand it off to \_\_\_\_\_ to you show a live demo. ~mention how we forecast it regionally rather than provincially. Thus increasing the accuracy.

* Demo/Prototype – explain its implementation 3 mins /180s
  + Login – Nathen 10s
  + Dashboard – outline UI – Nathen 35s
  + Model – Toggle model settings and submit (1 iterations) - Adam 30

Our approach to the model interface is that we wanted to extend customization to the customer so we have implemented four layers of settings. A forecast will be for a single region that the customer has purchased a subscription for previously. For the purpose of this demo we have integrated Toronto, Ottawa and Bruce Penninsula.

In terms of statistical analysis, we have reviewed some of the classical metrics used to measure forecasting accuracy and allowed the customer to optimize the model based on their selection.

Forecast horizon is how far into the future the user wishes to predict. This being a short term forecast, we offer increments of 6 hours, 12 hours and 24 hours. The cost of using a larger forecast horizon is that there is added inaccuracy that increases the wider the range becomes, forcing the user to always keep that in mind as a cost-benefit.

The last setting is the start time, where the user would input the current and end timestamps to outline the range they wished to predict.

* + Forecast – graphs demand forecasts and overlays real data - Adam 80s

After submitting your model request, JSON requests access our running webservice to obtain data and pass it to the webapp. The main chart shows SMART power’s generated forecast, including max, min and average to allow the customer to know all the uncertainty before any kind of decision making on their end. If they are only interested a single dataset, the user can toggle any of them off at their leisure.

Now, a forecast is only as good as the model itself, so we’ve incorporated common metrics to provide insight on the model. They’re strength can be identified through a colour combination of green representing ideal, yellow being average, and red poor to make it easy for the user to know the validity of their model. We believe in passing on as much information to the customer as possible so that they can make the most informed decision.

If the model strength is not to the user’s liking, they can submit a re-run request. This is not an implemented feature in the prototype yet, but we believe it would be essential in any kind of final product.

Lastly, all the forecasting data can be exported to common file formats such as CSV, DAT and RDATA for analysis outside of the webapp.

* + Show Samples for Toronto, Ottawa and Bruce over 1 week – Adam

Now, you might be thinking, that’s great that you can provide all this but how accurate are the models that SMART power makes? We tested forecasts over 7 days from April 4th -10th on a regional basis to demonstrate its robustness despite predicting during the high-point of the COVID lockdown. Shown is our test for Toronto, achieving a 2.3% error from the actual electrical demand which would’ve been classified as a strong performance on our webapp.

* Flow chart for architecture 30s - Nathen
* Business Model 2 mins
  + Value proposition 20 s - Nathen
  + Customers, Relationships, Partners 20s - Nathen
  + Revenue Streams 30s - Nathen
  + Cost Model 10s - Nathen
  + Financial Statements & Assumptions 40s - Dheeraj
* Next Steps 30s - Adam
  + Timeline

Moving forward, we believe a feasible amount of time needed to launch Smart power is 10-12 months

and in that time we would address company incorporation, acquiring our primary customer; the IESO, launching our official webapp on our domain, and automated model training.