IMPROVING ENERGY EFFICIENCY

Via Indoor Temperature Prediction Software

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Purpose

Our company guarantees 15% annual savings compared to its competitors and our machine learning software provides an additional 5% reduction in heating costs.

We are looking for new ways to improve these numbers and create a more environment friendly system.

Smart Boiler Software

Mechanics:

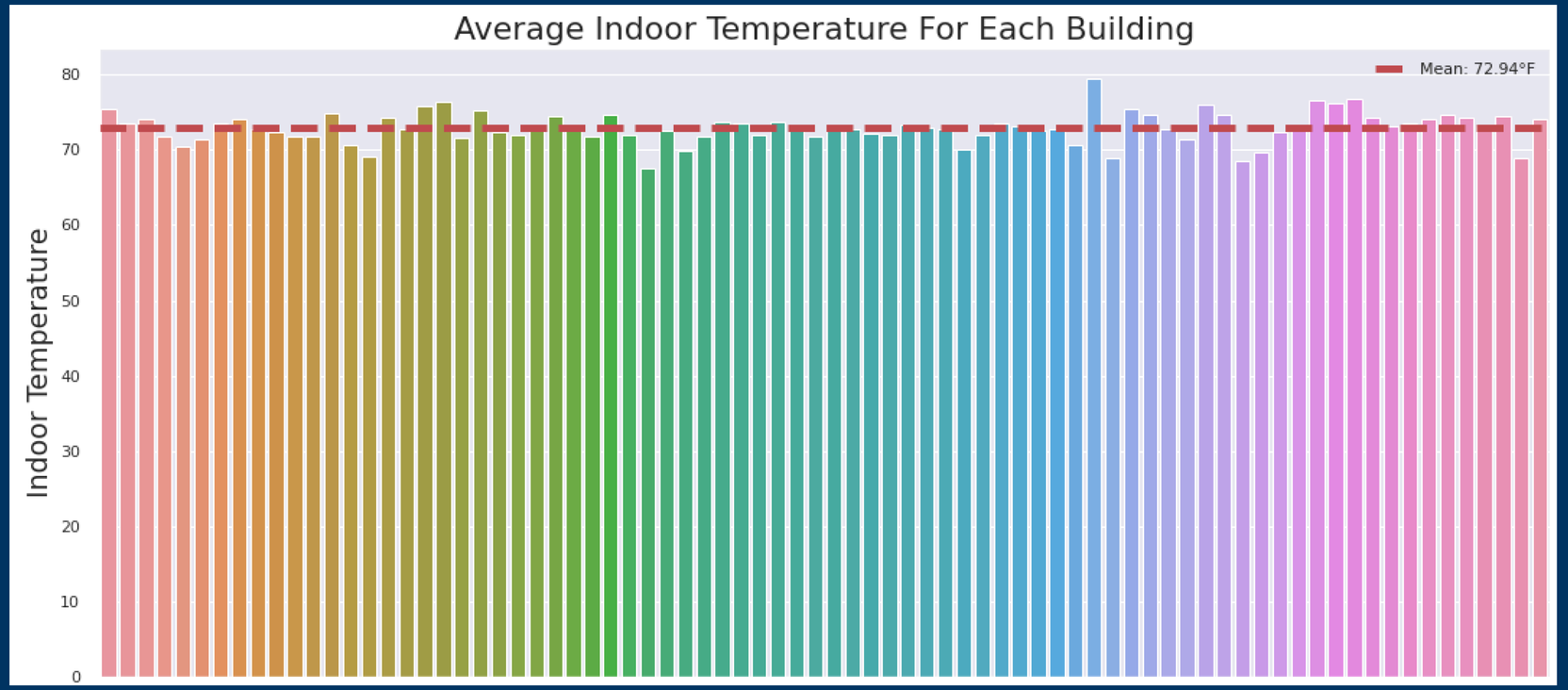
- Boiler setting is different for each building.
- After certain indoor temperature, boiler turns off automatically.
- The boiler generally turns off automatically after outdoor temperature exceeds 55 °F.
- The boiler runs 30 to 90 minutes regardless indoor temperature.

What Is The Problem?

- The boiler turns on automatically when the indoor temperature hits the low setting.
- Once it is turned on, it runs 30 to 90 minutes regardless of indoor temperature.
- This causes fluctuations in indoor temperature which means less efficient climate control.
- This causes more fuel consumption and therefore more cost.

Insights

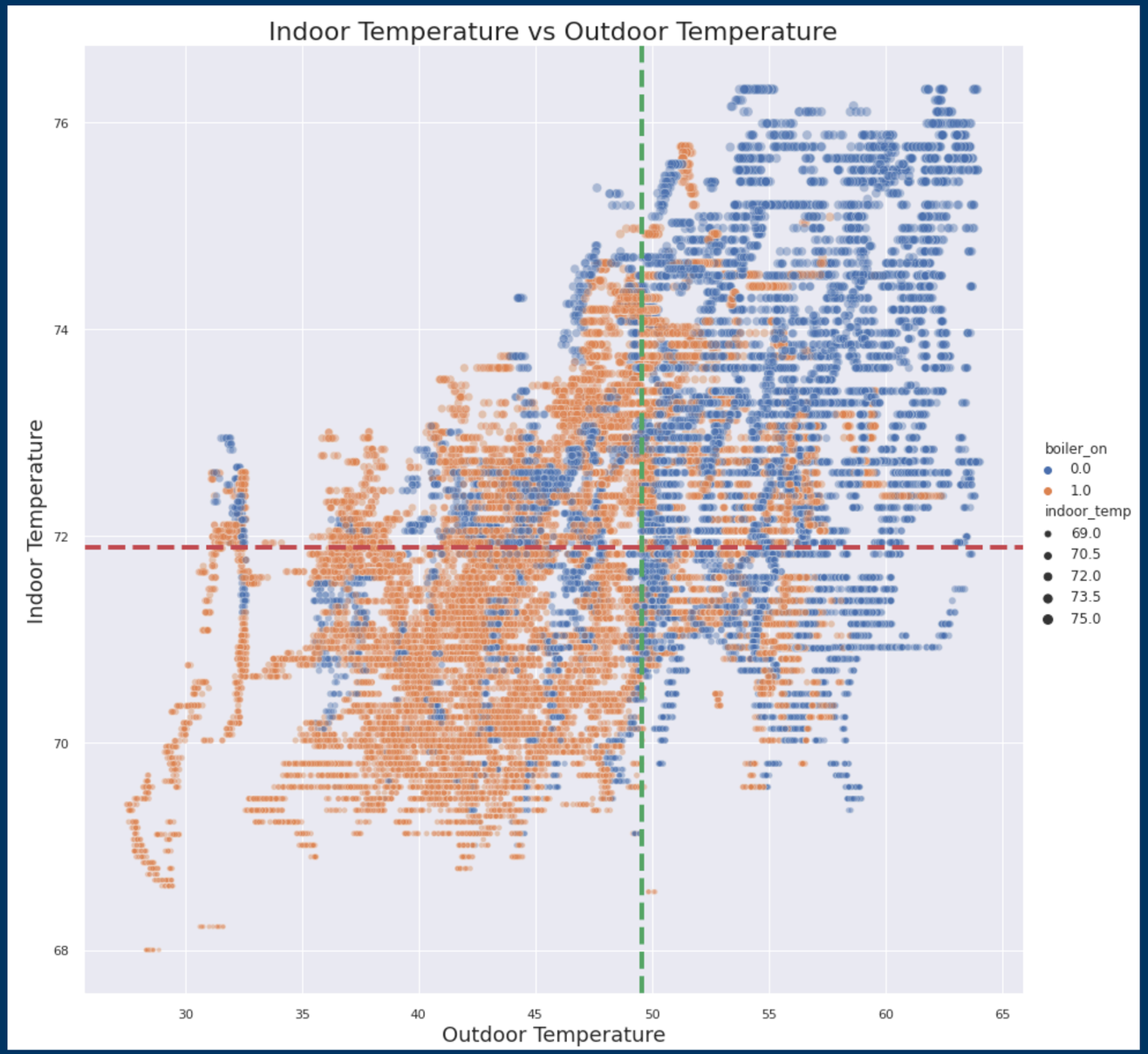
We observed 78 non-commercial buildings in our network in New York State from November 17, 2020 to December 17, 2020 and captured indoor and outdoor temperature values and boiler on/off setting information minute by minute.



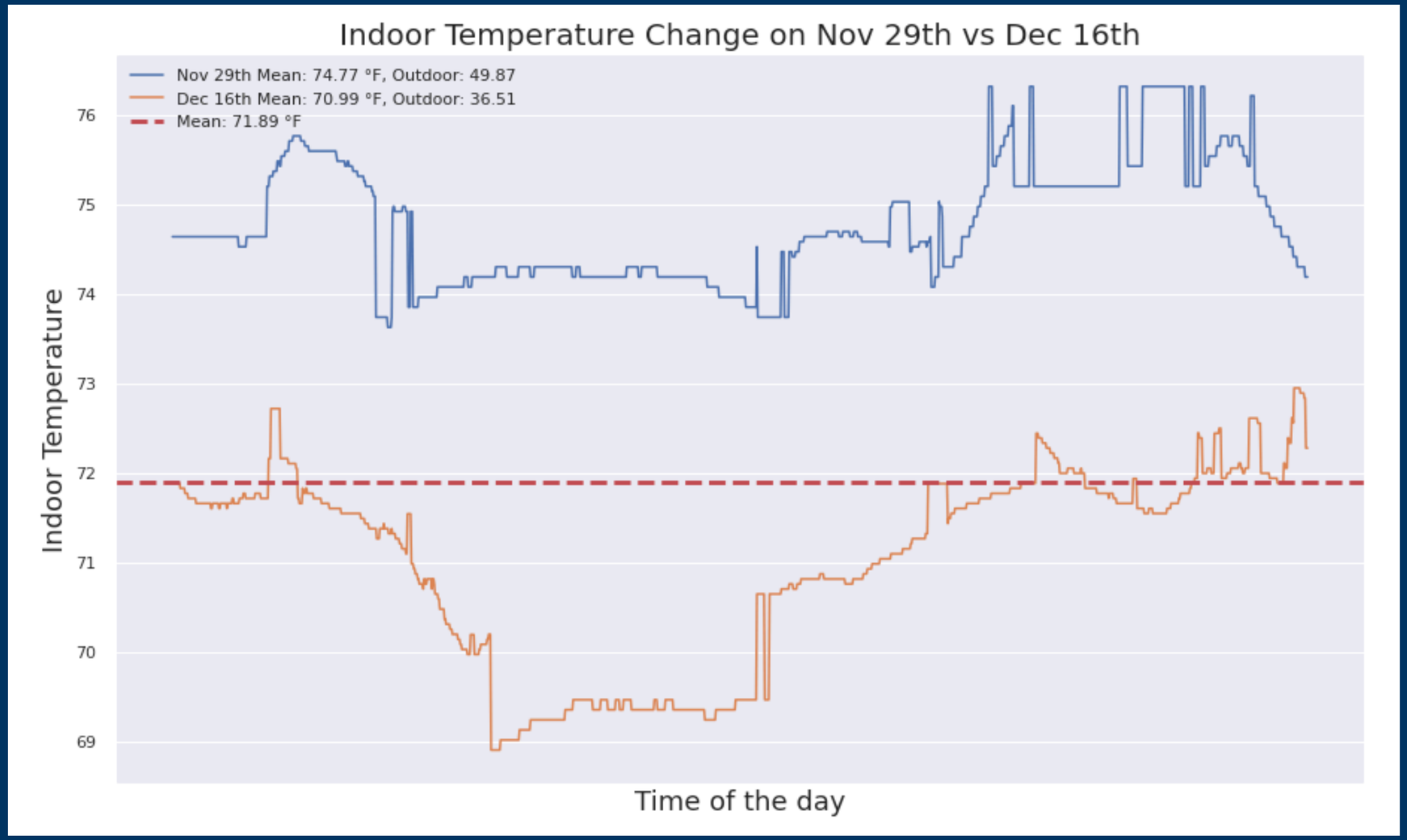
PILOT MODEL

Indoor Temperature vs Outdoor Temperature

- The average indoor temperature is 71.89 °F.
- The boiler mostly turns off when the indoor temperature is above the average.
- The mode of outdoor temperature is 49.58 °F.
- The boiler mostly turns on when the outdoor temperature is below the mode.
- When the difference between the indoor and outdoor temperatures is high, boiler most likely to turn on.



Comparing Indoor Temperature Change on Nov 29th and Dec 16th



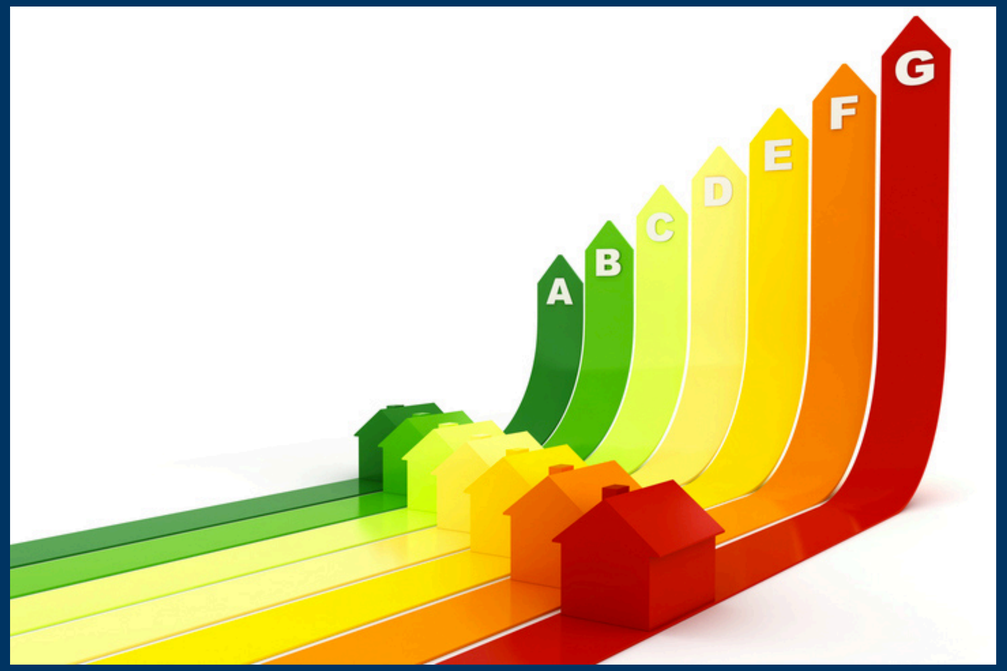
November 29th, 2020

- Indoor Temp: 74.77°F
- Outdoor Temp: 49.87 °F
- Boiler on: 12 hours

December 16th, 2020

- Indoor Temp: 70.99 °F
- Outdoor Temp: 36.51 °F
- Boiler on: 21 hours

Energy Efficiency Software



Our company provides 15% annual savings for customers. Our machine learning software provides an extra 5% reduction in heating costs.

We developed a machine learning model that uses boiler's previous 5 minute snapshots of indoor temperature, outdoor temperature, and boiler on/off information.

It predicts the indoor temperature in the next 10 minute with 93% accuracy.

What Does This Mean?

- Implementing this model will help our automated system to make better decisions when turning on and off the boilers.
- Our current model runs for 30 to 90 minutes each time when it is turned on. With our new model, we can reduce the time the boiler stays on.
- Our new software adjustment is widely applicable which will not significantly increase our costs to run our software.
- This update will not require any physical installation.

Other Benefits

- It will lower the heating and fuel costs of the building.
- Better indoor climate control.
- Improved energy efficiency underscores our commitment to fighting climate change.
- Increased savings can be passed on to the customer, improving customer satisfaction.
- Greater customer satisfaction simplifies lead generation for new customers.

Questions?

Thank you.