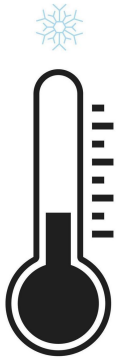
ThermaSense

ThermaSense: Heating Oil Problem Statement



Problem Statement

Heating oil is used to keep homes warm in winter. Due to rising costs, they have disproportionately affected low-income families.

Climate change & supply chain issues increase cost, causing preventable deaths in extreme cold.

Impact on Households

Low-income families are forced to ration energy and heat.

Rationing gas heating leads to health risks, frozen pipes, and unsafe alternative heating methods.

ThermaSense: Problem Statistics

- Heating oil prices have increased over **60% in the past decade**.
- Over **10 million Americans** struggle to afford heating oil in the winter.
- Cold-related deaths are a major concern for **low-income families** without proper heating.

ThermaSense: Our solution

Data-Driven Prediction

Utilizing **historical heating oil** consumption and **climate data** to forecast demand spikes

AI-Powered Forecasting

Implement **machine learning models** to analyze distribution patterns and predict future needs

Cost & Supply Optimization

Reduce **oversupply** and **prevent shortages** by optimizing resource allocation

Impact & Benefits

Ensures **reliable supply** and **efficient resource allocation**.
Lower heating costs for low-income families.

ThermaSense: Business Model

Consumer	Utility Companies	Government
Free access to real-time oil-gas demand insights, empowering informed energy use. Widespread adoption enhances data quality and company visibility.	**Primary revenue source** as Utilities pay for AI-driven demand forecasting, reducing costs, optimizing grid efficiency, and improving infrastructure planning.	Supports **energy programs & sustainability policies.** Governments can fund insights for policy development and enhance grid resilience.

ThermaSense: Technology

ML Model Architecture

- Built using Keras: a simply 3-layer MLP
- Designed for flexibility and scalability with expanding data sources

Data Integration & Potential Enhancements

- Input includes historical data, location, temperature, and weather
- Utilizes Boston-specific data for initial testing and validation

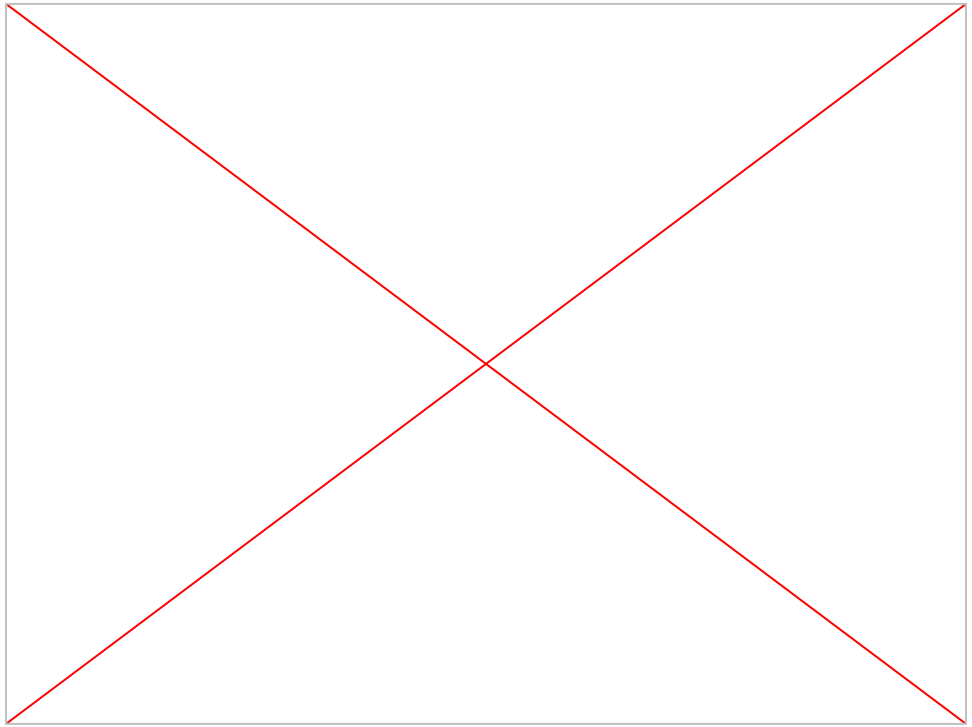
Current Data & Future Plans

- Future upgrades to advanced architectures for improved performance
- Plans to incorporate diverse datasets as the business scales

ThermaSense: Input Zip-code

Clients input their zip code, where we collect weather forecast and give that to our model

ThermaSense: Demo



Citations

- Massachusetts Department of Energy Resources. *Massachusetts Home Heating Fuels Prices*. Massachusetts Government, 2025, https://www.mass.gov/info-details/massachusetts-home-heating-fuels-prices. Accessed 16 Feb. 2025.
- Abrams, Abigail. “Why Home Heating Costs Are Rising—And What to Do.” *TIME Magazine*, 14 Sept. 2022, https://time.com/6218281/heating-costs-rising-2022/. Accessed 16 Feb. 2025.
- Ivanova, Irina. “More Americans Are Having to Choose Between Food and Energy Bills.” *CBS News*, 3 Feb. 2023, https://www.cbsnews.com/news/energy-prices-electricity-heat-costs/. Accessed 16 Feb. 2025.