PREDICTING ELECTRICITY CONSUMPTION WITH MACHINE LEARNING

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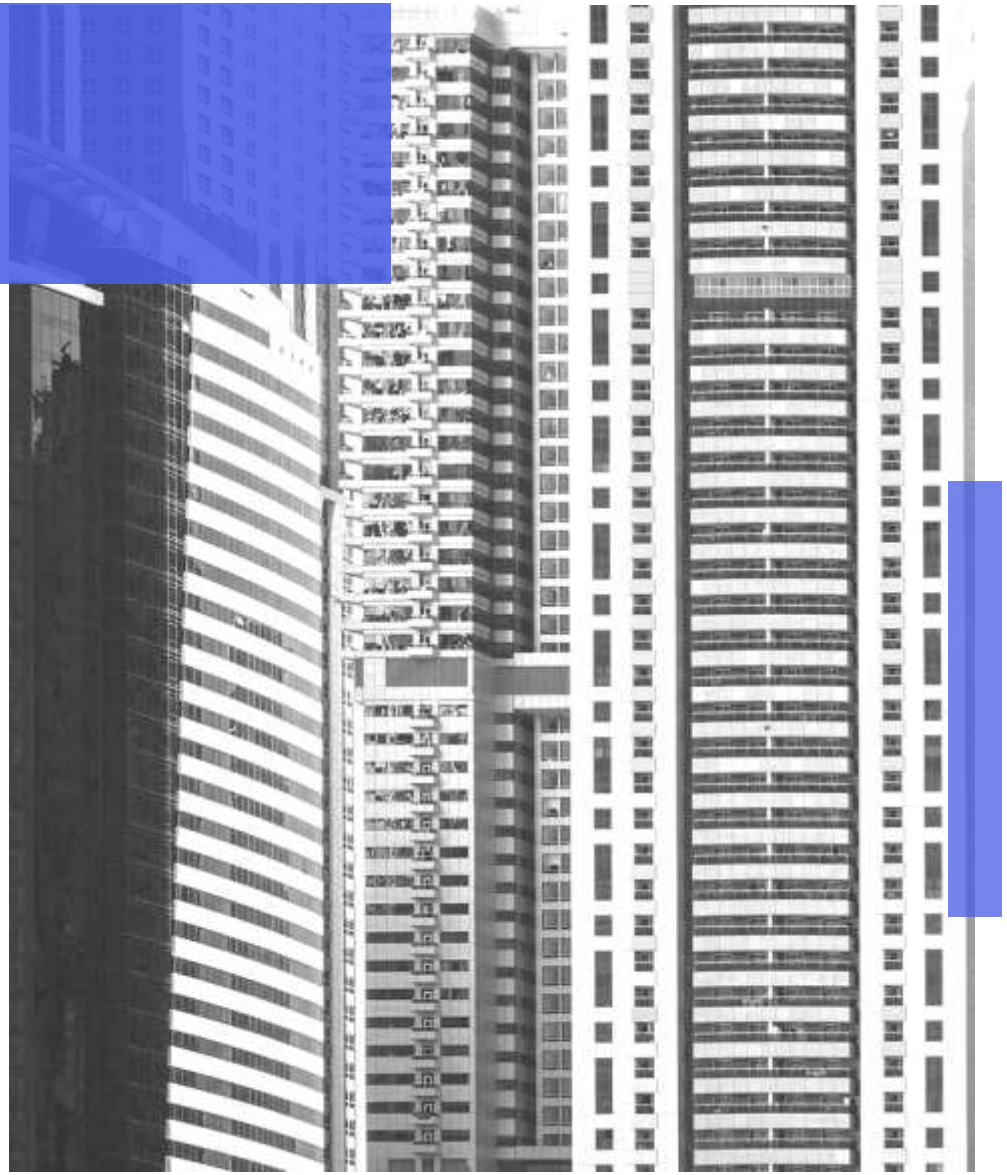


AGENDA

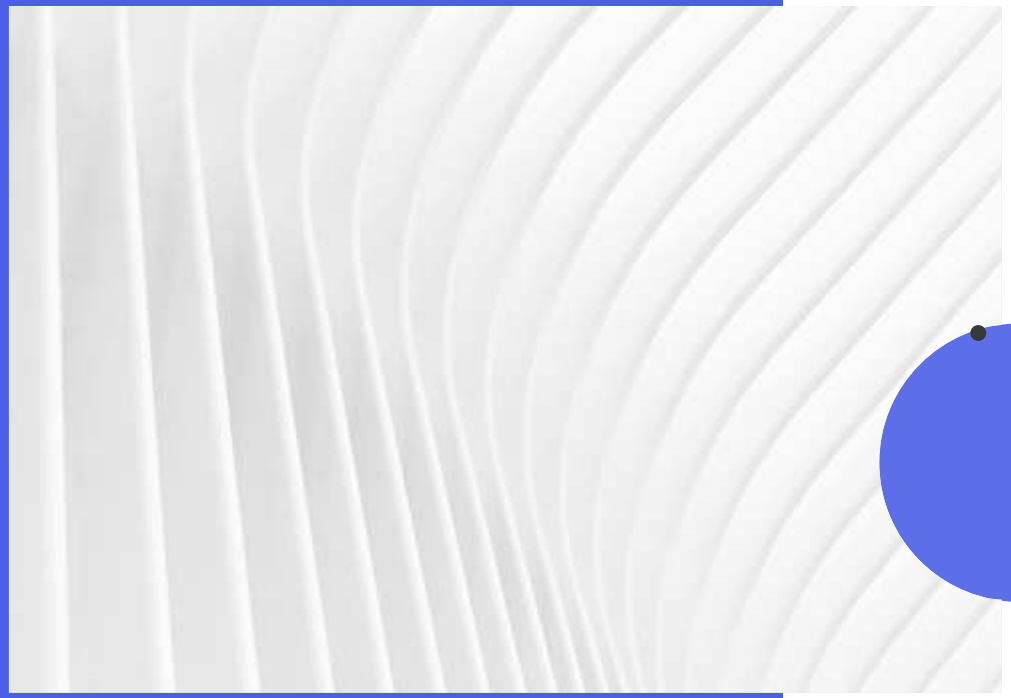
PROBLEM STATEMENT

OBJECTIVE

DATASET

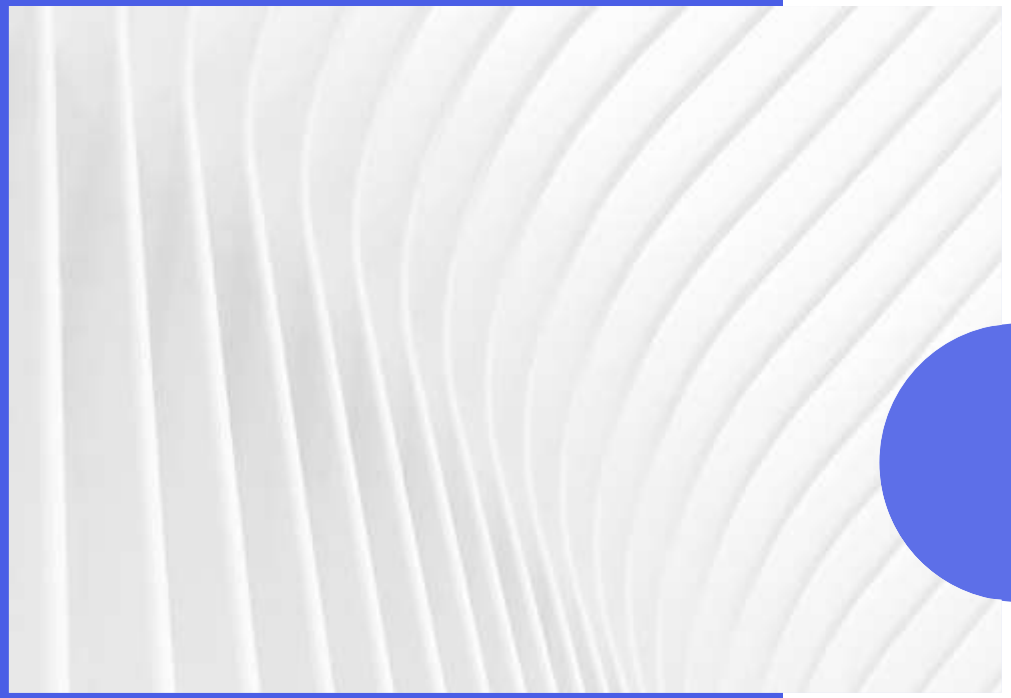
APPROACH

PROBLEM STATEMENT



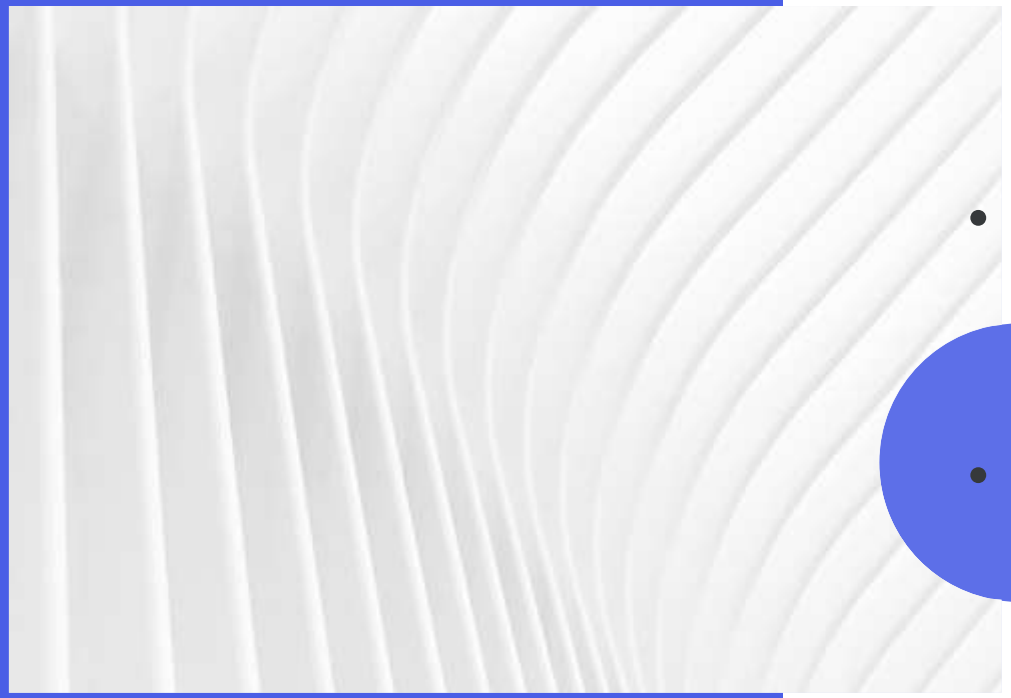
- Inconsistent electricity supply and demand leading to blackouts and power shortages.
- Difficulty in managing power generation and distribution due to unpredictable consumption patterns.
- Need for efficient energy management and resource allocation.

OBJECTIVE



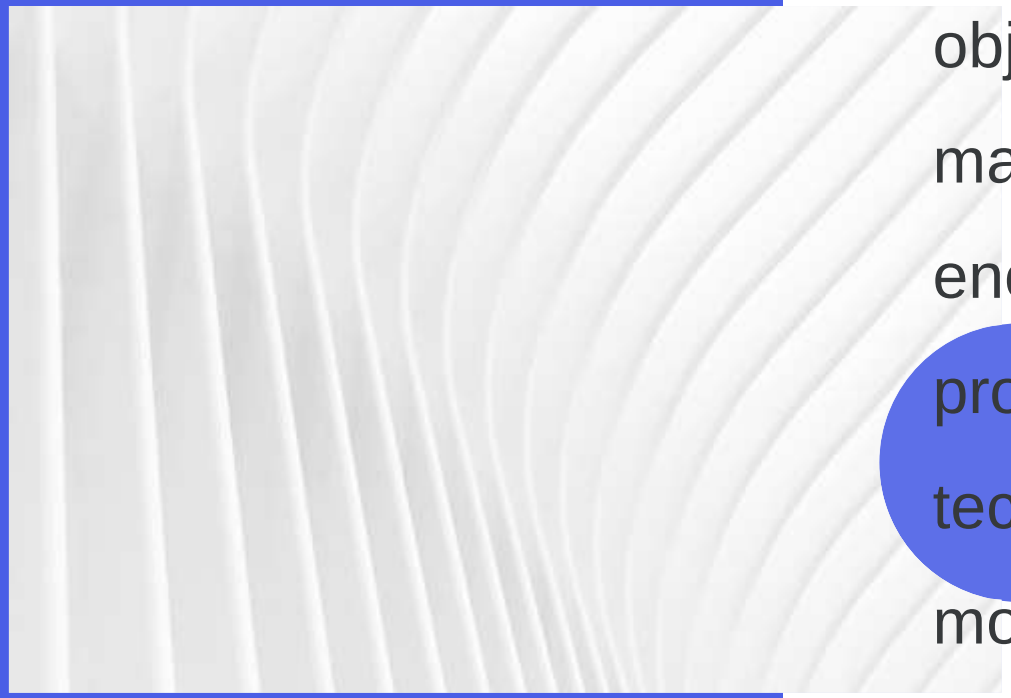
- Develop a machine learning model to accurately forecast electricity consumption.
- Enable better grid management, demand response, and renewable energy integration.

DATASET

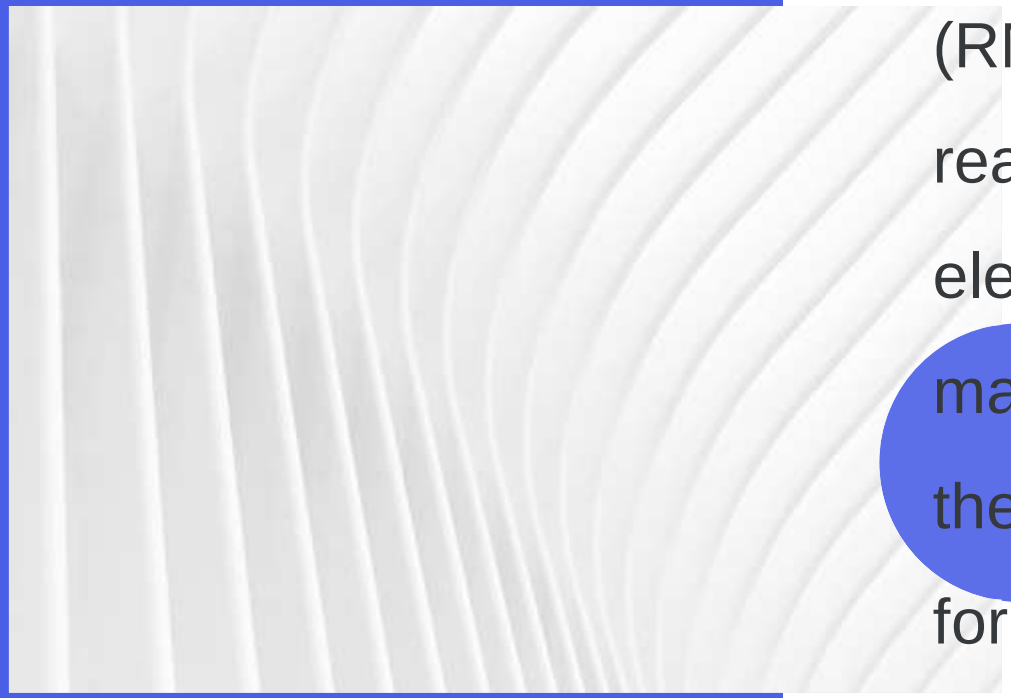


- Historical electricity consumption data (hourly, daily, weekly).
- Meteorological data (temperature, humidity, wind speed).
- Calendar data (holidays, weekdays, weekends).
- Economic indicators (GDP, unemployment rate).

APPROACH



The purpose of this research was to predict energy consumption using the data of Finland's transmission system operator. The objective of this project was to test if a machine learning model can yield good enough results in a complex forecasting problem, exploring machine learning techniques and developing a data-driven model for forecasting energy. The data contained 6-year hourly electrical consumption in Finland, and it is a univariate time series, as it is seasonal.



We used a long-short term memory (LSTM) model to train the data. The model was evaluated using root mean squared error (RMSE) to be directly comparable to energy readings in the data. The result shows that electricity consumption can be predicted using machine learning algorithms so we can use the results to deploy renewable energy, plan for high/low load days, and reduce wastage from polluting on reserve standby generation.


THANK YOU