# Infosys Springboard Internship Programme - 2024

# Electricity Demand and Price Forecasting

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This document provides a summary of the process, findings, and conclusions for the project 'Electricity Demand and Price Forecasting' undertaken as part of the Infosys Springboard Internship Programme.

# Abstract

This project focuses on forecasting energy demand and pricing using a combination of machine learning and deep learning models. The datasets used include weather data and energy-related metrics from various sources. The project explores multiple methodologies, including hybrid models, to achieve accurate predictions.

# Methodology

The methods employed in this project can be broadly categorized into:

1. Machine Learning: XGBoost Regressor
2. Deep Learning: GRU, LSTM, CNN, CNN-LSTM, LSTM-Attention
3. Hybrid Models: GRU-XGBoost, LSTM-Attention-XGBoost

**Results**

The Mean Absolute Error (MAE) is used to report the results for the normalized test set:

* TSO prediction: 0.070
* XGBoost: 0.016
* GRU: 0.015
* LSTM: 0.018
* CNN: 0.025
* CNN-LSTM: 0.019
* LSTM-Attention: 0.015
* Hybrid GRU-XGBoost: 0.014
* Hybrid LSTM-Attention-XGBoost: 0.015

The findings indicate that the **hybrid methods** demonstrated better performance in terms of MAE compared to other methods. Additionally, all machine learning and deep learning methods outperformed the TSO prediction.

# References

1. OpenWeatherMap API: https://openweathermap.org/api

2. ENTSOE Transparency Platform: https://transparency.entsoe.eu/dashboard/show

3. Spanish TSO: [https://www.esios.ree.es/en/market-and-prices?date=27-03-2023#](https://www.esios.ree.es/en/market-and-prices?date=27-03-2023)

4. GitHub Repo : https://github.com/KeerthiVasan-ai/Electricity\_Demand\_and\_Price\_Forecasting