

## Project Overview

The objective of this project is to develop a predictive model that utilizes historical electricity prices and relevant factors to forecast future electricity prices. This predictive model aims to provide a valuable tool for both energy providers and consumers, enabling them to make informed decisions regarding consumption and investment by predicting future electricity prices accurately.

## Problem Statement

Electricity prices are subject to various factors, including demand patterns, weather conditions, market dynamics, and regulatory changes. Predicting future electricity prices is crucial for:

- **\*Energy Providers\***: To optimize production, pricing, and resource allocation, leading to efficient energy generation and distribution.
- **\*Consumers\***: To plan their electricity consumption effectively, optimize energy costs, and make informed decisions regarding energy-related investments.

## Scope

- **\*Geographical Region\***: This project will focus on forecasting electricity prices within a specific geographical region (define the region).
- **\*Time Frame\***: The forecasting horizon will cover a specific period (define the time frame), allowing stakeholders to plan their activities accordingly.

## Key Challenges

Predicting electricity prices is a complex task due to the following challenges:

1. **\*Data Quality\***: Ensuring the quality and reliability of historical electricity price data and relevant factors.
2. **\*Data Volume\***: Handling a large volume of data efficiently while ensuring scalability.

3. **\*Feature Engineering\***: Selecting and engineering relevant features that have a significant impact on price forecasting.

4. **\*Model Selection\***: Choosing the most suitable machine learning model or ensemble of models for accurate predictions.

5. **\*Model Interpretability\***: Ensuring that the chosen model(s) can provide interpretable insights for decision-makers.

## **Objectives**

The primary objectives of this project include:

1. Develop a predictive model capable of forecasting electricity prices accurately.
2. Provide stakeholders with a tool to make informed decisions about energy consumption and investment.
3. Improve the efficiency and profitability of energy providers by optimizing resource allocation and pricing strategies.
4. Empower consumers to reduce energy costs and minimize environmental impact through efficient energy consumption.

## **Target Audience**

The target audience for this predictive model includes:

- Energy providers (utilities, power plants, etc.).
- Energy consumers (residential, commercial, industrial).
- Regulatory bodies and policymakers.
- Financial institutions with energy-related investments.

By addressing the challenges and objectives outlined above, this project aims to contribute to the advancement of the energy industry by providing reliable and accurate electricity price forecasts.

Feel free to adapt and expand upon this template to create a comprehensive problem definition section for your project documentation. This section sets the stage for the rest of the document by clearly outlining the project's purpose, scope, challenges, objectives, and target audience.