# Project Initialization and Planning Phase

| Date | 11July 2024 |
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| Team ID | SWTID1720359900 |
| Project Title | Natural Gas Price Prediction |
| Maximum Marks | 3 Marks |

### Project Proposal (Proposed Solution) report

Accurate natural gas price prediction is vital due to market volatility, influenced by factors such as supply, demand, and geopolitical events. This proposal aims to transform price prediction using machine learning, enhancing both efficiency and accuracy. By utilizing advanced ML algorithms(Decision Tree) and incorporating historical data alongside external factors, the predictive model will streamline forecasting processes. This will mitigate financial risks associated with price fluctuations, enable real-time, data-driven decisions, and provide reliable insights for producers, consumers, and investors. Implementing this solution promises better operations, reduced risks, and increased stakeholder satisfaction.

| **Project Overview** | |
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| Objective | The primary objective is to revolutionize natural gas price prediction by implementing advanced machine learning technique(Decision Tree), ensuring more precise and efficient forecasting |
| Scope | The project comprehensively evaluates and improves natural gas price prediction, incorporating machine learning for a more accurate and efficient forecasting system.. |
| **Problem Statement** | |
| Description | The current natural gas price prediction model is unreliable, causing unexpected price changes and customer distrust. This project aims to develop an accurate machine learning model using historical data and contextual information, addressing factors like supply and demand, geopolitical events, weather, and economic indicators. |
| Impact | Addressing these challenges will lead to improved forecasting accuracy, reduced market risks, and an overall enhancement in decision-making processes, contributing to stakeholder satisfaction and organizational success. |
| **Proposed Solution** | |
| Approach | Utilizing machine learning to analyze historical data and predict natural gas prices, creating a dynamic and reliable forecasting system. |

| Key Features | - Implementation of a machine learning-based Decision Tree Model. |
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| | - Real-time decision-making for improving accuracy .<br>- Continuous learning to adapt to evolving price changes. |
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**Resource Requirements**

| Resource Type | Description | Specification/Allocation |
|---|---|---|
| **Hardware** | | |
| Computing Resources | CPU/GPU specifications, number of cores | T4 GPU |
| Memory | RAM specifications | 8 GB |
| Storage | Disk space for data, models, and logs | 1 TB SSD |
| **Software** | | |
| Frameworks | Python frameworks | Flask |
| Libraries | Additional libraries | scikit-learn, pandas, numpy, matplotlib, seaborn |
| Development Environment | IDE | Jupyter Notebook, VS Code |
| **Data** | | |
| Data | Source, size, format | Kaggle dataset, 614, csv<br>UCI dataset, 690, csv |