PROJECT REPORT ON

“ NATURAL GAS PRICE PREDICTION”

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INTRODUCTION

**OVERVIEW**

**Prediction**of natural gas price has become increasingly important because the association with crude oil. The energy commodity which includes natural gas price, is dramatically volatile with high risk and uncertain situations. Here, we will investigate natural gas spot price with additional variables such as meteorological data, economic data etc. related to climate data including production related data, consumption related data and temperature related data.

**PURPOSE**

* Most U.S. natural gas use is for heating and generating electricity, but some consuming sectors have other uses for natural gas.
* With the help of this project we can predict the price of natural gas.
* It can be useful for the government to formulate energy planning.

**LITERATURE SURVEY**

EXISITING PROBLEM

Though we all are aware of the fact that, gas consumption is traditionally high during winter session which leads to rising market prices. However, market do not behave the way we expect; the problem is that, in contrast to popular belief, there is remarkable deviation in price almost throughout the year.

PROPOSED SOLUTION

In order to target the said problem, we will use machine learning algorithm to examine if we can predict the future price by adding different parameters which may have external direct or indirect effect on natural gas price. We will try to develop a forecasting model to predict the spot price of natural gas based on historical prices.

**THEORITICAL ANALYSIS**

BLOCK DIAGRAM

Diagram, schematic

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HARDWARE/SOFTWARE DESIGNING

* Install Anaconda.
* Install Required Libraries.
* Data Collection.
  + Collect the dataset or Create the dataset
* Data Preprocessing.
  + Import the Libraries.
  + Importing the dataset.
  + Checking for Null Values.
  + Data Visualization.
  + Taking care of Missing Data.
  + Label encoding.
  + One Hot Encoding.
  + Feature Scaling.
  + Splitting Data into Train and Test.
* Model Building
  + Training and testing the model
  + Evaluation of Model
* Application Building
  + Create an HTML file
  + Build a Python Code

**EXPERIMENTAL INVESTIGATIONS**

* Load the dataset
* Handling the missing values
* Sometimes you may find some data are missing in the dataset.Then we use isnull().any() method to see which column has missing values.
* To visualize the dataset we need libraries called Matplotlib and Seaborn. The Matplotlib library is a Python 2D plotting library that allows you to generate plots, scatter plots, histograms, bar charts, etc.

Chart, line chart

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* Split The Dataset Into Train Set And Test Set
* Train Dataset: Used to fit the machine learning model.
* Test Dataset: Used to evaluate the fit machine learning model.
* we applied the decision tree regression algorithm on our dataset to predict the price.
* Once the model is trained, it’s ready to make predictions.

**FLOW CHART**

**Chart, bar chart

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**RESULT**

**OUTPUT WEBPAGE**

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**ADVANTAGES**

* We can predict the future prices of natural gas by our model.
* And we can find the accuracy with the help of our model.
* With the help of Decision tree algorithm we can easily predict the price

**DISADVANTAGES**

* We cannot predict the price with 100% accuracy .

**APPLICATIONS**

* Electrical power Sector
* Industrial Sector
* Residential Sector
* Commercial Sector

**CONCLUSION**

* Here we understood the problem is a regression kind of problem.
* We understood how to pre-process/clean the data using different data preprocessing techniques.
* We analyze or get insights into data through visualization.
* Applying Decision tree algorithm according to the dataset and based on visualization.
* We found the accuracy of the model.
* We understood how to build a web application using the Flask framework.

**FUTURE SCOPE**

Gas price prediction can be rather difficult, but in the long run, the factors that push its price are quite clear and obvious .It is a sustainable fuel and thus has an important role to play in the long term , and thus its demand will only get bigger.However ,it is also a resource that is becoming easier to acquire thanks to new technologies and mining methods-so supply is also on the rise.It becomes about balancing the supply and the demand, but the good thing is demand is rapidly rising.

**BIBILOGRAPHY**

Reference: Moting Su & Zongyi Zhang & Ye Zhu & Donglan Zha, 2019. "[**Data-Driven Natural Gas Spot Price Forecasting with Decision Tree Regression Algorithm**](https://ideas.repec.org/a/gam/jeners/v12y2019i6p1094-d215937.html)," [Energies](https://ideas.repec.org/s/gam/jeners.html), MDPI, Open Access Journal, vol. 12(6), pages 1-13, March.

**APPENDIX**

**SOURCE CODE**

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