**Ministry/Organization Name/Student Innovation: Gas Authority of India Ltd (GAIL).**

**PS Code: SK793**

**Problem Statement Title: Forecasting Natural Gas International Prices using advanced Time-Series Techniques**

**Team Name: Coding\_Nahi\_Aati**

**Team Leader Name: Shivam Tyagi**

**Institute Code (AISHE): U - 1056**

**Institute Name: Netaji Subhas University of Technology**

**Theme Name: Heritage & Culture**

**Please provide as much information as possible as it would help us evaluate the submission better.**

**Product/Idea**

* What is the problem you are trying to solve?

(Do you have any supporting statistics from reliable sources, if so please do share.)

1.Using past trend analysis for long term forecasting of natural gas prices.

2.Leveling down the market uncertainty.

3. Unforeseen events detection.

* How does your idea address the problem?

Problems & solution->

1.Lack of features of factors affecting the natural gas prices

sol->feature extraction using cnn

2. Uncertainty in the market

sol->rare event detection using GMM, autoencoder, etc

3. Varying trend

sol->Sequential Deep learning models

* Who are the target customers?

1.Hedge funds

2.Investors

3.Economists

3.National strategists

4 fuel hedging

* What makes your idea unique?

1.We’re using regular models and then shifting to novel models

Using

cnn as feature extraction

2. Using GMM, Autoencoders for rare event analysis

3.Sequential feature capturing

4.Interactive plots

5.Model comparisons

* Do you have a revenue generation model? If so please do share.

The software can be sold on a subscription model to various interested players.

This will give an edge to corporations and companies to predict prices and make less risky decisions. 300$ per year with support and updates..

* What are the geographies, do you think the idea would be suitable for?

Everywhere

* What are the risks associated with your idea and how can you mitigate it?

Problem and Solution

1. Unforeseen events

sol->Added Unforeseen events detection

2.Long term forecasting is difficult and varying trend

sol->Use of multiple models and custom built deep learning models for better performance.

* Who are the stakeholders involved in bringing this idea/product/service to the market?

(Ex: State govt, Department of trade and taxes, pollution control board, Manufacturers, Ministry of Power)

1.Government

2. Finance Ministry

3. Refineries

4.Ministry of road transport and highways

5. PSU

6.Hedge funds

7.Power Sector Companies

**Intellectual Property Assessment**

* Is your idea patentable or patented? (If so please provide details)

No

* Is your idea built on existing work? If so, how is it different?

The backbone of our idea is based on existing research paper

but we are using novel ideas and added multiple components that make it unique

like DNN, RNN, CNN etc.

**Prototype/ Proof of Concept**

* What is the nature of the prototype/ proof of concept you would be able to submit?

(Ex: Github repository, Hardware prototype)

Presentation, draft of webpage

* Have you completed pilot tests for your prototype/POC? If so please share.

ans) No

* What is the approximate cost of developing the prototype?
* Please share the relevant elements while submitting the POC/ Prototype
* Block diagram
* Software Architecture- Control/Data flow
* Block Diagram of Data Flow
* Hardware architecture
* Components/ Connectors
* CAD models
* Visual/Touch Interface
* (Mechanical actuators/switches, touch sensitivity, haptics)

**Supporting details**

* What regulatory requirements have to be met to bring the idea to life?

Better analysis of data from the past years to make a model which gives a more accurate forecast.

* Do you have a business plan/ commercialization strategy? If so please share.

Yes, the software can be sold on a subscription model to various interested players.

This will give an edge to corporations and companies to predict prices and make less risky decisions. 300$ per year with support and updates.

* What is a rough estimate of manufacturing/operational costs?

2200$ per Year

* What is the volume of products/ amount of revenue you expect to make in the first year?

The introductory prices will be low till market volume increases then we'll increase our prices to normal values and have regular updates, to help capture the larger targeted market. Volume of 10-15 products.