THE TECHNOCRACY
STUDENTS' TECHNICAL COMMITTEE, NIT RAIPUR

AAVARTAN'22-23

VIGYAAN
DEPARTMENT OF CHEMICAL ENGINEERING

PROBLEM STATEMENTS

CHEM01. <u>To provide a solution for commercial solar drying of food commodities</u>

Solar trackers are rising in popularity, but everyone understands the complete benefits and potential drawbacks of the system. Solar panel tracking solutions are a more advanced technology for monitoring photovoltaic panels. Stationary mounts hold panels in a fixed position, and can handle their productivity being compromised when the sun passes to a less-than-optimal angle. compensating for this- solar tracker automatically moves to ' 'track" the progress of the sun across the sky thereby maximizing output. The solar energy harvesting using sun trackers for commercial drying solutions needs to be explored.

CHEM02. <u>Catalytic conversion of unconverted cellulose and hemicellulose of 2G ethanol plants</u>

Lignocellulosic biomass is used for production of2G ethanol. However, considering the low yields of final ethanol production to make the 2G production plants more economically viable, ideas are invited for valorizing unconverted C5 and C6 sugars to value added chemicals. Considering various possible chemicals from the left biomass, ideas to include scouting of the chemicals basis their demand and value and ease of their production.

CHEM03. <u>ML based model in predicting NO_x AND SO_x emissions in Air</u>

When it comes to chemical manufacturers, machine learning (ML) and AI solutions help them automate data extraction, supply chain planning, and quality testing. Develop a ML based model in predicting NO_x AND SO_x emissions in the Air.

CHEM04. Increasing efficiency of Balls in Ball Mill.

What are some specific strategies and technologies that can be implemented to increase the efficiency of ball mills in the cement industry, and how effective are these approaches in improving the overall performance of the ball mill? Can the efficiency of the ball mill be improved by optimizing the design and operating parameters of the mill, such as the mill speed, ball charge, and grinding media size and composition?

CHEM05. LIVE AQI path predictor

What are some strategies that individuals and organizations can use to protect their health and the health of their communities from the impacts of poor air quality, and how can the air quality index (AQI) be used to inform these strategies? you have to build a model that's help to sort the live route of vehicle and passenger with minimum AQI

CHEM06. Potential Impact of second generation fuels on economic and environment

Second generation fuels are advanced biofuels, derived from feedstocks such as agricultural waste, wood chips, and algae. On the economic front, the use of second generation biofuels could create new employment opportunities in the biofuels industry and related sectors, such as agriculture and forestry. Additionally, the development and use of these biofuels could reduce the country's reliance on fossil fuels, potentially leading to a decrease in fuel import costs.
Build a model or presentable impactful idea to use it in a better way ?

CHEM07. Battery production and decay optimisations

The electric vehicle (EV) market is expected to continue growing in the future, with increasing demand for EVs driven by concerns about climate change and air pollution, as well as advances in technology , so Battery are essential part of it , for optimisation of battery some key points you have to follow Optimize charging and discharging , proper maintenance,regular storage and should be cost effective.