***Project Name - Global Power Plant Database***

India has targeted significant reduction of particulate matter (PM), sulfur oxide (SOx) and nitrogen oxides (NOx) emissions from coal fired power plants by 2022.  The most challenging piece of the government’s plan is retrofitting 440 power units of 166.5 Gigawatts (GW) capacity with flue gas desulphurization systems.  About 54% of India’s installed power generation capacity is fueled by coal and coal fired thermal power, which ranks among the highest polluting industries in India.  In 2015, the Government of India introduced new power plant standards and pollution control equipment needed to achieve targeted emission reduction by December 2022.  Power producers will make significant investments in installing pollution control technologies and India’s Federation of Indian Chambers of Commerce and Industry (FICCI) estimates the cumulative investment required is about $35 billion.   
   
India’s Ministry of Environment, Forest and Climate Change (MoEFCC) targeted significant reduction of particulate matter (PM), sulfur oxide (SOx) and nitrogen oxides (NOx) emissions from coal fired power plants.  Other key stakeholders in this air pollution mitigation project are: the Ministry of Power (MoP), Central Electricity Authority (CEA), Government owned and India’s largest power producer NTPC Limited and the Central Pollution Control Board (CPCB).  The most challenging piece of the government’s plan is retrofitting 440 power units of 166.5 Gigawatts (GW) capacity with flue gas desulphurization (FGD) systems by December 2022.  It is likely that the time frame for installation will be extended and these emission norms present numerous export opportunities for American air pollution control technology firms over the next five years.

After processing the data we can see that:- *estimated\_generation\_gwh, other\_fuel3, wepp\_id, generation\_gwh\_2013, generation\_gwh\_2019, other\_fuel2, other\_fuel1 columns have almost 100% data is missing and (owner) missing 62% of Data. So we need to drop it.*

***The Global Power Plant Database*** is a comprehensive, open source database of power plants around the world. It centralizes power plant data to make it easier to navigate, compare and draw insights for one’s own analysis. The database covers approximately 30,000 power plants from 164 countries and includes thermal plants (e.g. coal, gas, oil, nuclear, biomass, waste, geothermal) and renewables (e.g. hydro, wind, solar). Each power plant is geolocated and entries contain information on plant capacity, generation, ownership, and fuel type. It will be continuously updated as data becomes available.

* In fuel type we get to know that High MegaWatt Energy generation By Nuclear fuel and it is very efficient.
* And 2nd highest MegaWatt Energy generation by Coal fuel.

Multivariate Analysis gives us :-

* primary\_fuel: Mostly Coal is used as primary fuel.
* commissioning\_year: we can see capacity incerases after 2000.
* generation\_gwh\_2013 to eneration\_gwh\_2017: we can see generation growth is almost same for every year.

# Exploratory Data Analysis (EDA):-

* Coal and Hydro Fuel are primary used in power plant.
* Solar & Wind averagly used in power plant.
* Nuclear fuel is very less used in power plant

Building Machine Learning Models:-

* The methodology for the dataset creation is given in the World Resources Institute publication "A Global Database of Power Plants"
* The database can be visualized on Resource Watch together with hundreds of other datasets.
* The database is available for immediate download and use through the WRI Open Data Portal.
* Associated code for the creation of the dataset can be found on GitHub. The bleeding-edge version of the database (which may contain substantial differences from the release you are viewing) is available on GitHub as well.

***Hyperparameter tuning*** allows data scientists to tweak model performance for optimal results. This process is an essential part of machine learning, and choosing appropriate hyperparameter values is crucial for success. For example, assume We’re using the learning rate of the model as a hyperparameter.

**Concluding Remarks:-**

*The Committee was requested to analyze the technological and institutional alternatives to retain an option for future U.S. nuclear power deployment.*

*A premise of the Senate report directing this study is “that nuclear fission remains an important option for meeting our electric energy requirements and maintaining a balanced national energy policy.” The Committee was not asked to examine this premise, and it did not do so. The Committee consisted of members with widely ranging views on the desirability of nuclear power. Nevertheless, all members approached the Committee's charge from the perspective of what would be necessary if we are to retain nuclear power as an option for meeting U.S. electric energy requirements, without attempting to achieve consensus on whether or not it should be retained. The Committee's conclusions and recommendations should be read in this context.*

*The Committee's review and analyses have been presented in previous chapters. Here the Committee consolidates the conclusions and recommendations found in the previous chapters and adds some additional conclusions and recommendations based upon some of the previous statements. The Committee also includes some conclusions and recommendations that are not explicitly based upon the earlier chapters but stem from the considerable experience of the Committee members.*

*National Academies of Sciences, Engineering, and Medicine. 1992. Nuclear Power: Technical and Institutional Options for the Future. Washington, DC: The National Academies Press. https://doi.org/10.17226/1601.*