Project title

Measure Energy Consumption

Problem statement:

The measurement of energy consumption is critical in understanding and optimizing energy usage in various sectors, including manufacturing sites, homes, commercial buildings, and transportation. However, the manual collection and analysis of energy consumption data can be time-consuming and error-prone. Therefore, there is a need for an automated approach to collect, analyze and visualize energy consumption data for better decision-making.

Problem Definition and Design Thinking:

In the project we can see about how to measure energy consumption by python.

World energy supply and consumption is global production and preparation of fuel, generation of electricity, energy transport, and energy consumption. It is a basic part of economic activity. It includes heat,[2] but not energy from food.

This article provides a brief description of energy supply and consumption, using statistics summarized in tables, of the countries and regions that produce and consume most.

Energy production is 80% fossil,[3] half of which is produced by China, the United States and the Arab states

of the Persian Gulf. The Gulf States and Russia export most of their production, largely to the European Union and China, where not enough energy is produced to satisfy demand. Energy production is increasing 1 to 2% per year,[4] except for solar and wind energy which averaged 20% per year in the 2010s.[5][6]

World Wind and Solar power (GW) [7]

Year	Wind	Solar
2012	267	104
2015	416	228
2018	563	489
2021	825	849

Produced energy, for instance crude oil, is processed to make it suitable for consumption by end users. The supply chain between production and final consumption involves many conversion activities and much trade and transport among countries, causing a loss of one quarter of energy before it is consumed.

Energy consumption per person in North America is very high while in most of Africa it is low and more renewable.[8][9] There was a significant decline in energy

usage worldwide caused by the COVID-19 pandemic, especially in the iron and steel industry as demand for new construction shrank. An increase in the global demand for manufactured goods by the iron and steel industry, could increase consumption to levels similar to that in 2019.[10]

Of about 50 billion tonnes worldwide annual total greenhouse gas emissions,[11] 36 billion tonnes of carbon dioxide was emitted due to energy (almost all from fossil fuels) in 2021.[12] The goal, set in the Paris Agreement to limit climate change, will not nearly be reached.[13] Several scenarios to achieve the goal are developed.

Problems in Measure Energy Consumption:

- Limited: Most using energy sources, petroleum and coal are limited sources. According to the current demand, they will be finished in next few decades and people will start to fight for those sources.
- Environment pollution: So many types of environmental pollution are occurred due to use of petroleum energy sources. ...
- Price increment: Prices of energy sources can be increases suddenly.

Problem Domain of Measure Energy Consumption:

The measure energy consumption is used to analyze the amount of energy that can be used in both public and private sector.

Problem Expectation in Measure Energy Consumption:

To analyze amount of energy consumed during day and night time in public and private sector.

Dataset Source:

The dataset of the project can be downloaded in the below website.

https://www.kaggle.com/datasets/robikscube/hourly-energy-consumption.

Requirements used for making a project:

In these part we can see about what are requirements used for project. the requirements are mentioned in below

- Programming language: python
- Version: python 3.11

- Library used: pandas,numpy,matplotlib,seaborn,sci-kit learn,datetime,logger,json.
- System Requirements: windows 10.

Steps taken for the project:

1. Read the file of the dataset are download from the Kaggle website.
2. Import either libraires or csv files.