MEASURE ENERGY
CONSUMPTION

TEAM MEMBERS

Phases 2 submission documents

INTRODUCTION:

Measuring energy consumption involves assessing the amount of energy consumed by a device, system, or entity. This process is crucial for efficiency improvements and sustainability. Various tools, such as smart meters or energy monitoring systems, help track and analyze energy usage. Additionally, factors like kilowatt-hours (kWh) are commonly used units for quantifying consumption. Accurate measurement enables individuals and organizations to make informed decisions regarding energy efficiency, cost savings, and environmental impact

DATASET :

To measure energy consumption, you would typically need a dataset that includes relevant information about the energy usage of the devices, systems, or entities you are interested in. Here are some potential features you might find in an energy consumption dataset:

Timestamps: Records of when energy measurements were taken to analyze usage patterns over time.

Energy Consumption Values: The actual energy consumption data, often measured in kilowatt-hours (kWh) or other relevant units.

Device or System Identification: Information identifying the specific devices or systems being monitored, enabling you to associate energy usage with particular entities.

Location Data: If applicable, the physical location where energy is being consumed, which can be important for understanding regional patterns.

Environmental Conditions: Factors such as temperature, humidity, or weather conditions that could impact energy consumption.

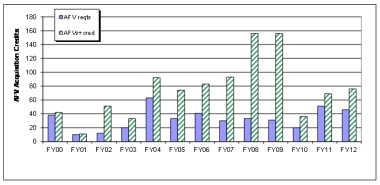
Demographic Information: For residential energy consumption, demographic details about the occupants can be useful, such as the number of people in a household.

Appliance-Specific Data: If you're measuring energy usage at the appliance level, details about individual appliances (e.g., refrigerator, HVAC systems) would be valuable.

Seasonal Information: To account for seasonal variations in energy consumption.

You may find datasets from energy utilities, research institutions, or government agencies. Additionally, some smart home devices and energy monitoring s

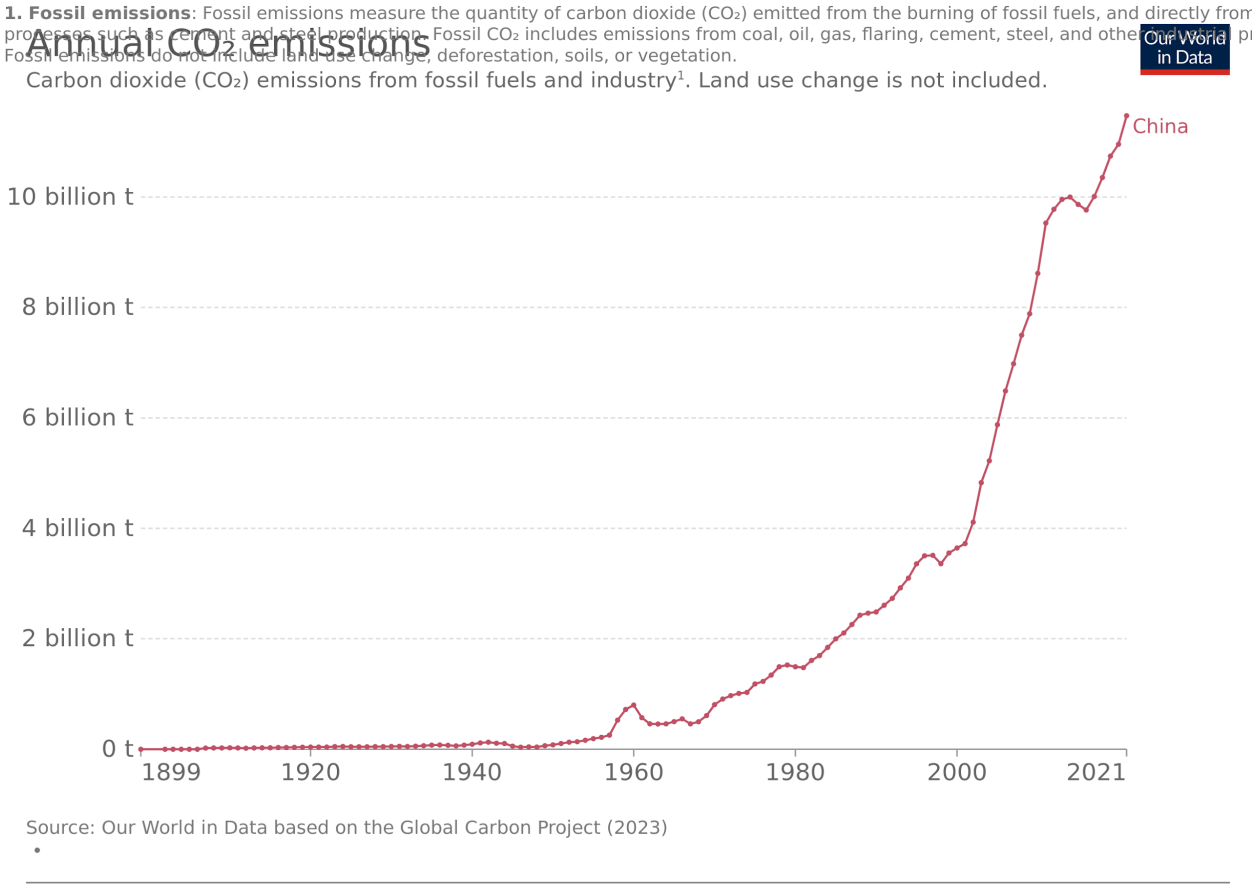
ystems provide users with their own consumption



PROGRAM:

```
      import time

class EnergyMonitor:
    def __init__(self, device_name):
        self.device_name = device_name
        self.energy_consumed = 0  # Initial energy consumption

    def measure_energy(self, power, time_interval):
        # Assuming power is in kilowatts, and time_interval is in hours
        energy_delta = power * time_interval
        self.energy_consumed += energy_delta

    def display_energy_consumption(self):
        print(f"{self.device_name} has consumed {self.energy_consumed:.2f} kWh of energy.")
```

```
# Example of usage
if __name__ == "__main__":
    device1 = EnergyMonitor("Refrigerator")

    # Simulating energy measurements over time
    for hour in range(24):
        # Simulating power usage in kilowatts (replace with actual measurements)
        power_usage = 0.5  # Example: 0.5 kW
        time.sleep(1)  # Simulating a 1-hour interval
        device1.measure_energy(power_usage, 1)

    # Displaying the total energy consumption
    device1.display_energy_consumption()
```



About :

energy sources is harmful to the human body. The air pollution due to fossil fuels can cause various respiratory problems. Energy sources can pollute water which could cause several harmful diseases in humans. Nuclear waste can cause cancer and other deadly problems in the human body.

Measures to Conserve Energy

Energy taxation is a good measure from the government to conserve energy. Furthermore, several countries apply energy or a carbon tax on energy users. This tax would certainly put pressure on energy users to reduce their energy consumption. Moreover, carbon tax forces energy users to shift to other energy sources that are less harmful.

Building design plays a big role in energy conservation. An excellent way to conserve energy is by performing an energy audit in buildings. Energy audit refers to inspection and analysis of energy use in a building. Most noteworthy, the aim of the energy audit is to appropriately reduce energy input.

Another important way of energy conservation is by using energy-efficient products. Energy-efficient products are those that use lesser energy than their normal counterparts. One prominent example can be using an energy-efficient bulb rather than an incandescent light bulb.

In conclusion, energy conservation must be among the utmost priorities of humanity. Mahatma Gandhi was absolutely right when he said, "the earth provides enough to satisfy every man's needs but not every man's greed". This statement pretty much sums up the importance of energy conservation. Immediate implementation of energy conservation measures is certainly of paramount importance.

Conclusion:

The aim of this project was to identify the variables that influence the generation, the consumption and the price of the electricity in United States.

We have seen that the generation of electricity in American states is driven by the number of commercial and industrial customers. Concerning the electricity consumption, it is influenced by the energy production itself and the amount of commercial customers. Our prediction models are quite accurate and confirmed the results of our exploratory data analysis. About our models, we should not forget that lots of variables can explain the electricity consumption and production as we have seen during the eploratory data analysis, but we only used the most significant ones.