St. Clair College

Worldwide Energy Consumption: A Global Comparison

Group No: *06*

Course: *Data Visual and Reporting (DAB - 2016)*
Professor: *Muhammad Shahid*
Due date: *July 3rd, 2023*

1. Introduction

Global energy consumption has emerged as a critical issue in the modern world due to its profound impact on various aspects of society. Throughout history, the demand for energy has risen dramatically alongside population growth, urbanization, and industrialization. The burning of fossil fuels, such as coal, oil, and natural gas, has been the primary source of energy for several decades, contributing to significant environmental concerns, including climate change, air pollution, and resource depletion. Understanding the historical trends and patterns of global energy consumption is crucial for devising sustainable strategies to meet future energy demands, reduce greenhouse gas emissions, and transition to cleaner and renewable energy sources.

In today's scenario, global energy consumption continues to increase steadily, driven by factors such as population growth, economic development, and technological advancements. Developing countries, particularly in Asia and Africa, are experiencing rapid industrialization and urbanization, leading to a surge in energy requirements. On the other hand, developed nations face the challenge of balancing energy consumption with sustainability goals. Governments, international organizations, and energy companies are actively exploring alternative energy sources, including solar, wind, hydropower, and nuclear, to diversify the energy mix and reduce reliance on fossil fuels. Additionally, energy efficiency measures, such as improved building insulation, smart grids, and energy-saving technologies, are being implemented to optimize energy use and mitigate the environmental impacts of energy consumption. By analyzing and understanding the current landscape of global energy consumption, policymakers and stakeholders can make informed decisions to promote a sustainable and resilient energy future.

1.1. Background

Early humans harnessed fire for warmth and cooking. Over time, advancements in technology led to the discovery and utilization of various energy sources, such as coal, oil, natural gas, and renewable energy. The energy consumption patterns of different countries vary significantly due to factors like population size, economic development, industrialization, and energy policies(BBC bitesize). Understanding global energy consumption provides valuable information for policymakers, researchers, and individuals seeking sustainable solutions to address energy demands and mitigate environmental impacts.

As the world continues to experience rapid population growth and industrialization, the demand for energy has soared to unprecedented levels.(Ritchie and Roser, n.d) This surge in energy consumption has raised concerns about its sustainability and environmental consequences. Global comparisons of energy consumption enable us to assess the disparities among countries and identify opportunities for improvement.

Developed countries typically exhibit higher energy consumption per capita, primarily due to their advanced industrial sectors and higher standards of living. On the other hand, developing nations face the challenge of balancing energy demands with limited resources and the need for economic growth. Furthermore, the shift towards renewable energy sources and the adoption of energy-efficient technologies have become key strategies for reducing energy consumption and mitigating climate change. Through an in-depth analysis of global energy consumption, we can gain valuable insights into the current state of energy utilization worldwide and foster discussions on sustainable practices and policies for a more energy-efficient future.

2. Objectives and goals

By studying historical patterns of global energy consumption, we can identify the factors and drivers that have shaped energy usage over time. This knowledge helps us understand how energy consumption has evolved and provides a baseline for assessing future trends. Additionally, Global energy consumption analysis enables us to compare and contrast the energy consumption patterns among countries and regions. This comparison highlights disparities in energy access, per capita consumption, and energy efficiency. Identifying these disparities helps in targeting interventions and identifying opportunities for improving energy access, promoting sustainable practices, and reducing energy-related inequalities.

Our target audience is Policy Decisions Maker with Accurate and up-to-date information on global energy consumption informs the development of energy policies at the national and international levels. Policymakers can use this data to set targets, establish regulations, and allocate resources effectively. By aligning policies with the realities of global energy consumption, governments can create a conducive environment for sustainable energy transitions and foster collaboration among nations.

3. Dataset

The excel provides information from the World Energy. It covers various aspects of global energy consumption and production, including primary energy consumption, carbon dioxide emissions, oil and gas reserves, production and consumption, coal reserves and trade, nuclear energy, hydroelectricity, renewables, electricity generation, key materials production and reserves, and renewable energy capacity.

The workbook is organized into different sections or tabs, allowing easy navigation between the tables. Some of the specific topics covered include:

- Primary energy consumption, categorized by fuel type and per capita, from 1965 to the present.

- Carbon dioxide emissions from energy sources, natural gas flaring, and flaring emissions.
- Carbon dioxide equivalent emissions from methane and process emissions.
- Oil-related data such as proved reserves, production, consumption, prices, refining capacity, trade movements, and regional consumption.
- Gas-related data including proved reserves, production, consumption, prices, and trade movements.
- Coal reserves, production, consumption, prices, and trade movements.
- Nuclear energy generation and consumption.
- Hydroelectricity generation and consumption.
- Renewables consumption, renewable power generation, and generation by source (including solar, wind, geothermal, biomass, and biofuels).
- Electricity generation from various sources, such as oil, gas, coal, and other renewables.
- Information on key materials like cobalt, lithium, graphite, and rare earths, including production, reserves, and prices.
- Renewable energy capacity for wind and solar.
- Approximate conversion factors, definitions, and methodology used in the statistical review.

4. Visualization Plan

Using the map chart we will Comparative Analysis of Energy Consumption by Country and Year. We are using year,country and Primary energy consumption per capita (kWh/person) variable from per-capital-energy use sheet.

The stacked bar graph visually represents the growing proportion of renewable energy sources in the global power generation sector. The graph compares the utilization of coal, gas, and renewables.

Will also use different charts such as text, line to show the trend among the different energy, table to represent certain record of the solar energy data.

Then at the end will use the story/ dashboard to show the visualization.

5. References:

1 . International - U.S. Energy Information Administration (EIA) (Data Source)

2. Overview of global energy. (n.d.). Our World in Data. https://ourworldindata.org/energy-overview

3. Global patterns of energy supply and consumption - Energy supply and consumption - AQA - GCSE geography revision - AQA - BBC bitesize. (n.d.). BBC Bitesize. https://www.bbc.co.uk/bitesize/guides/zxc2sg8/revision/1

4. International Energy Agency. (2009). *World energy outlook* (p. 17). Paris: OECD/IEA.

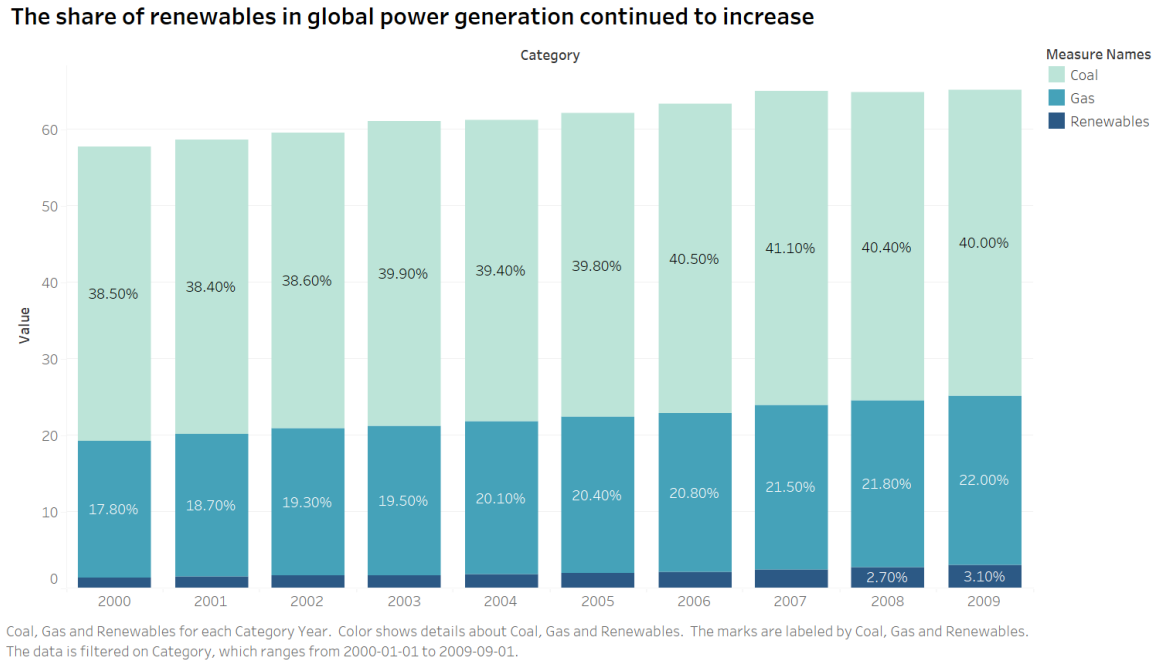
5. Allouhi, Amine, et al. "Energy consumption and efficiency in buildings: current status and future trends." Journal of Cleaner production 109 (2015): 118-130.

6. Cao, Xiaodong, Xilei Dai, and Junjie Liu. "Building energy-consumption status worldwide and the state-of-the-art technologies for zero-energy buildings during the past decade." *Energy and buildings* 128

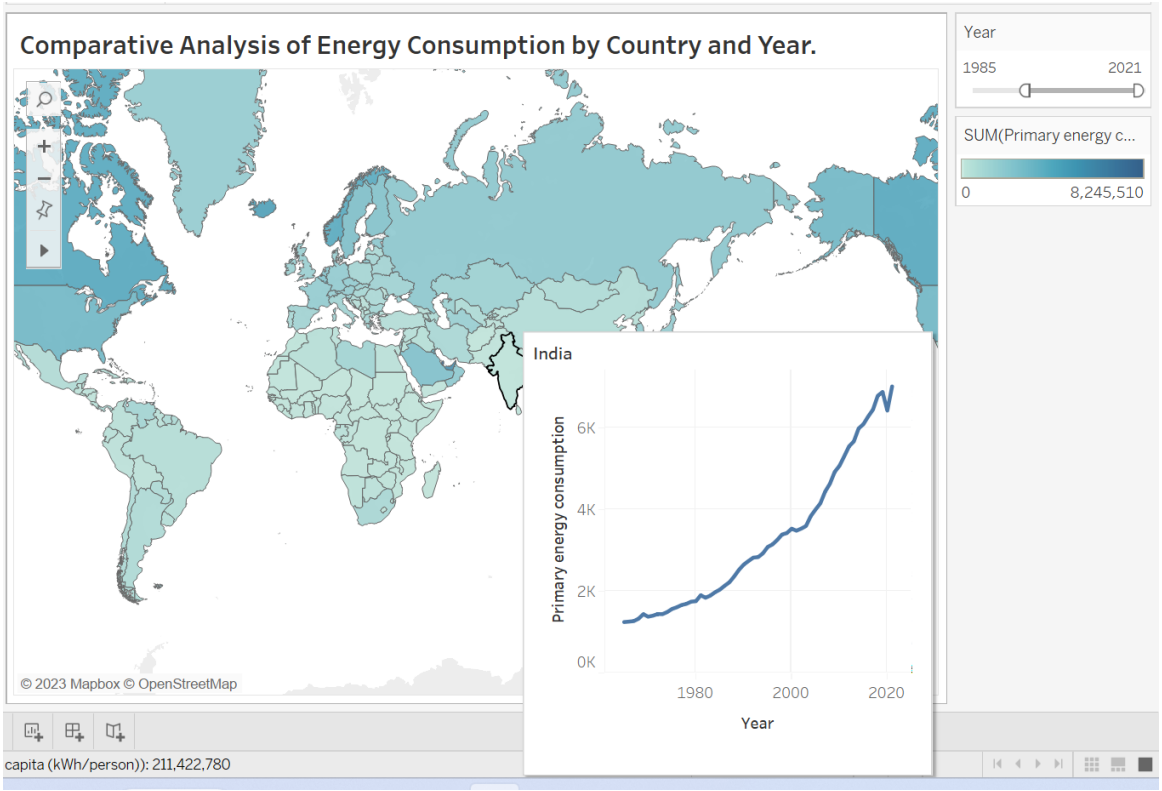
(2016): 198-213.

6. Sample Visual

6.1 The share of renewables in global power generation has demonstrated a consistent upward trend, reflecting the ongoing growth and adoption of sustainable energy sources.



6.2 A comparative analysis of energy consumption by country and year provides valuable insights into the patterns and trends of energy usage across different nations.



7. Contributions :

Aarti Anil Zikre (0825897) – Plot the charts in table and make the data which can we can use in the tableau.
Andrews Truman (0824852) – Find the dataset and information regarding it.
Melvin Kozhikkadan Jolly (0801117) – Read the references, new technique which we can use to build the visualization better.
Pearlin Ronald Pereira (815060) – Maintain the documentation and the details and look for the update and betterment of project.