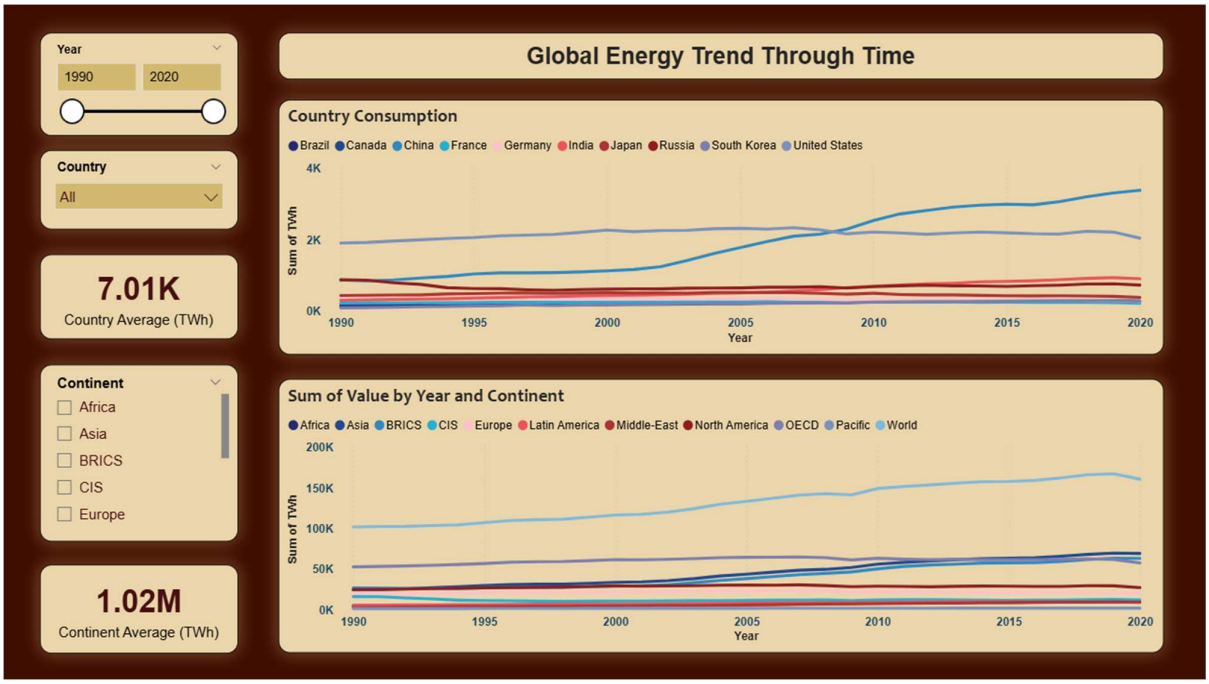
Report

Date	1ST August 2025
Team ID	xxxxxx
Project Name	Global Energy Trends: A Comprehensive Analysis of Key Regions and Generation Modes using Power BI
Maximum Marks	5 Marks

A report is a comprehensive document that provides a detailed and structured account of data analysis, findings, and insights. It is typically used for in-depth analysis, documentation, and communication of results. Reports are suitable for a diverse audience, including decision-makers, analysts, and stakeholders who need a comprehensive understanding of the data.

Designing a report in Power BI involves connecting to data sources, creating visualizations like charts and graphs, customizing their appearance and interactivity, organizing them logically on the canvas, formatting elements for consistency and clarity, and optionally creating dashboards for a summarized view. Throughout the process, it's essential to consider the audience's needs and ensure the report effectively communicates insights from the data. Finally, iterate based on feedback to continually improve the report's design and usefulness.

Dashboard 1: Global Energy Trend Through Time



Valuable Insights:

1. Asia Dominates Global Energy Use

Asia's energy consumption is the highest among all continents, primarily driven by industrialization, rapid urbanization, and population growth in countries like China and India. This highlights the continent's central role in global energy demand.

2. North America Shows High but Stable Usage

North America (especially the United States) maintains consistently high energy consumption levels, though growth is minimal. This may reflect mature economies with optimized usage patterns and better energy efficiency measures.

3. Europe Demonstrates Declining or Flat Consumption

European countries are either stable or slightly declining in energy use, indicating successful implementation of conservation policies, technological efficiency, and transitions toward renewables.

4. Africa's Energy Use is Low but Rising

Africa has the lowest consumption but shows a gradual upward trend. This suggests growing access to electricity and economic development, especially through rural electrification initiatives and microgrids.

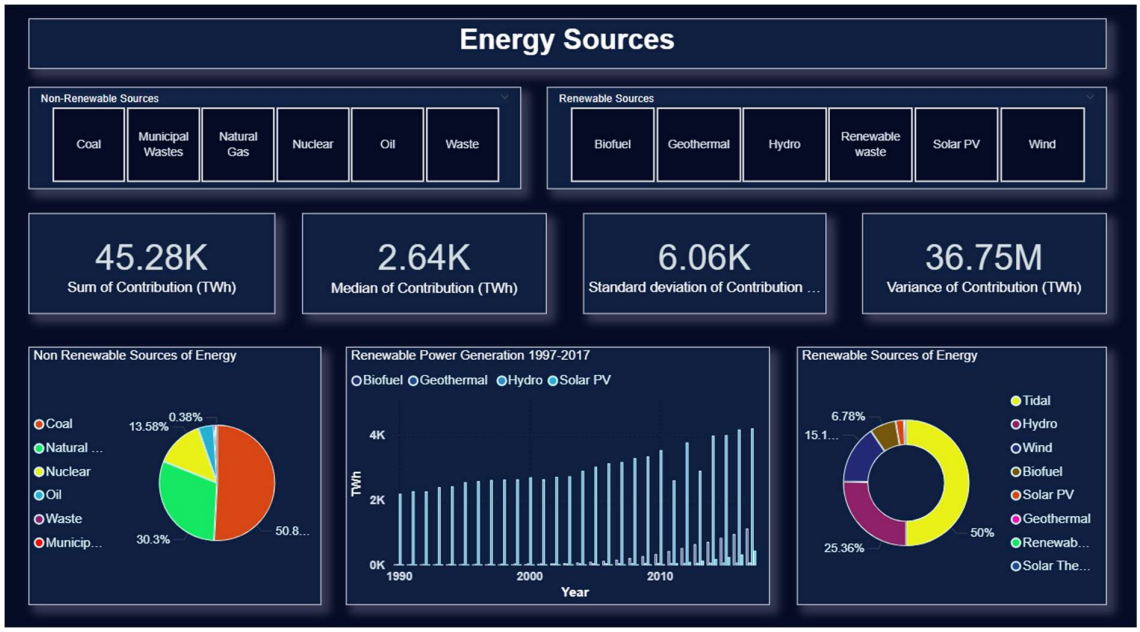
5. Country-Specific Leadership and Trends

The United States is a long-standing top energy consumer. China's energy usage has surged rapidly post-2000, now surpassing the U.S. India is steadily increasing its consumption, pointing to rising industrial output and infrastructure expansion.

6. Global Growth in Energy Demand

All continents, especially in developing regions, show a general increase in energy demand. This signals the need for global energy infrastructure upgrades and sustainable solutions to meet future requirements.

Dashboard 2: Energy Sources



Valuable Insights:

1. Coal is Still the Leading Energy Source

Coal accounts for over 50% of non-renewable energy production, making it the most dominant source globally. This underscores the challenge of transitioning away from fossil fuels in emission reduction efforts.

2. Natural Gas and Oil are Still Crucial

Despite the push for renewables, natural gas and oil remain critical components of the energy mix, often serving as backup or transitional sources due to their flexibility and availability.

3. Hydro Leads Among Renewable Sources

Hydropower is the most widely used renewable energy source, offering consistent and reliable output. Countries with abundant water resources have heavily invested in hydro plants.

4. Solar PV and Biofuel Show Rapid Growth

Solar PV has experienced exponential growth, especially since 2010, owing to decreasing installation costs and government subsidies. Biofuel production is also rising, indicating its role in transportation and rural energy systems.

5. Geothermal and Tidal are Underutilized

Although geothermal and tidal energy have potential, their global production levels are low. This may be due to geographic limitations or lack of investment, representing untapped areas for innovation.

6. Disparity in Source Contributions

The high variance and standard deviation in energy contributions reveal significant imbalance. A few sources dominate while many others lag behind, which poses risks for long-term energy resilience.

Dashboard 3: Power Generation – Top 20 Countries

Valuable Insights:

1. USA and China Lead in Renewable Production

These two nations dominate the production of solar, hydro, and geothermal energy, showing their leadership in energy infrastructure, R&D, and clean energy policies.

2. Brazil is a Hydro Power Giant

Brazil's energy production is largely hydro-based, taking advantage of its vast river systems and topography. It serves as a case study for leveraging natural resources sustainably.

3. Germany and Japan are Solar Leaders

These countries have invested heavily in solar PV technologies, supported by strong government policies, subsidies, and a public push for carbon neutrality.

4. Emerging Countries Are Gaining Ground

India, South Korea, and Canada show moderate but rising renewable generation. Their energy policies reflect increasing emphasis on diversification and self-reliance.

5. Biofuel and Geothermal Adoption is Limited

Production in these sources is much smaller. However, their growth potential is strong, especially in volcanic or agricultural regions.

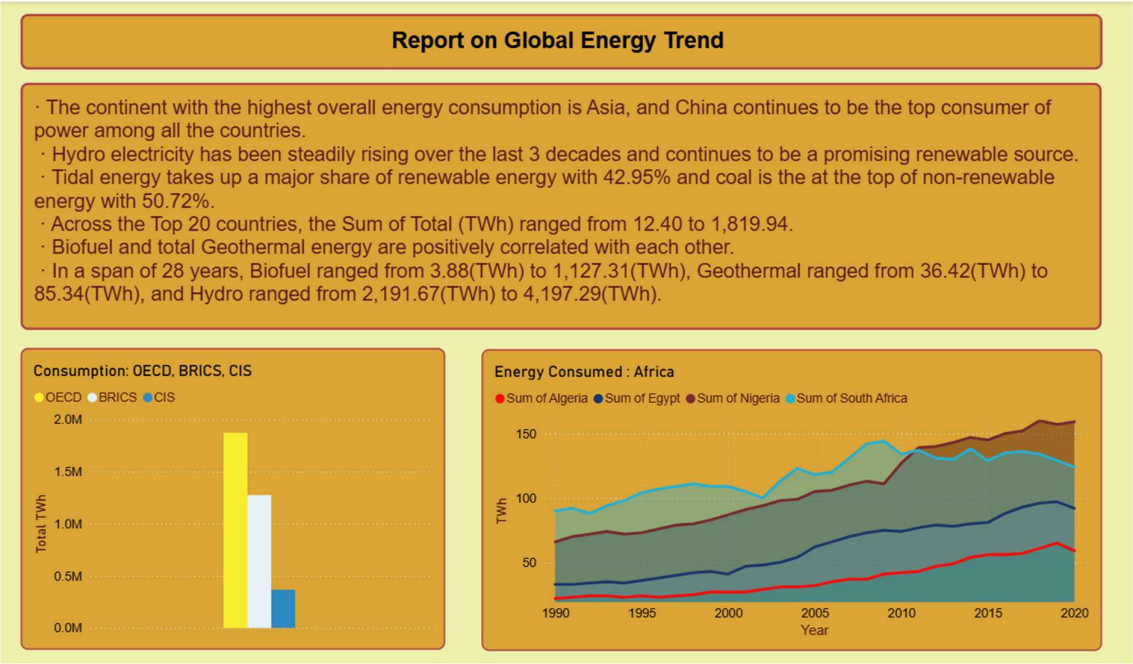
6. Spatial Distribution Shows Energy Gaps

Mapping the data reveals that energy generation is concentrated in developed countries. This underscores the global divide in energy infrastructure and access.

7. Investment Opportunities in Underserved Regions

Countries not in the top 20 have limited generation capacities, highlighting opportunities for foreign direct investment, energy partnerships, and technology transfer.

Dashboard 4: Report on Global Energy Trends



Valuable Insights:

1. Asia is the Most Energy-Intensive Region

Asia has the highest total energy consumption, driven primarily by China and India. It reflects both their economic growth and energy security needs.

2. Tidal Energy Has a Large Share Among Renewables

Tidal energy accounts for 42.95% of the renewable generation share in this dataset, an unexpected insight that reveals its growing (but still localized) role in the energy mix.

3. Coal's Dominance in Non-Renewables

Coal continues to hold the largest share (50.72%) among non-renewables. Its phasedown is crucial for global decarbonization, but it remains entrenched due to low costs and established supply chains.

4. Renewable Sources are Rising But Unevenly

Hydro and solar are the most widely adopted renewables. Others, like geothermal and biofuel, show potential but are limited by infrastructure and geography.

5. Strong Correlation Between Biofuel and Geothermal

There is a notable positive correlation between these two sources, implying they are often implemented together in regional or localized renewable strategies.

6. Production Growth Over 28 Years

Biofuel grew from 3.88 TWh to 1,127.31 TWh, and geothermal from 36.42 TWh to 85.34 TWh. Hydro nearly doubled, indicating stable and increasing reliance.

7. Large Gap in Country Contributions

Top 20 countries show a huge disparity (from 12.40 TWh to 1,819.94 TWh). This reflects inequality in energy production capacity and global access, with room for improvement via international cooperation.

8. Africa's Gradual Energy Rise

Africa's energy consumption remains the lowest but is increasing steadily. Countries like Nigeria and South Africa are leading the region, showing the impact of targeted electrification programs.

9. CIS Consumption is Lower Than OECD and BRICS

Commonwealth of Independent States countries lag behind, suggesting lesser development in energy infrastructure and demand. Targeted investments could improve their global energy standing.