

Problem Statement Worksheet (Hypothesis Formation)

How do the 4 largest developing and 4 largest developed countries, in terms of overall GDP, compare against each other in their reliance on and overall consumption of the different forms of energy from 1965 up to 2019?

1 Context

Energy consumption generally increases over time and with population increase while the different fuel sources a country relies on for their energy shift and change over time. Some countries have abundant supplies of natural resources such as oil or natural gas, while others do not, which affects which energy sources they use the most. Further, developed countries have more capital to put towards expensive investments such as oil rigs or nuclear power plants.

2 Criteria for success

The comparison of reliance on and total energy consumption between the 4 Developed and the 4 Developing countries is fully explored with respect to each energy source: Coal, Oil, Natural Gas, Renewables, and Nuclear. Trends over time are examined and emphasis is placed on how relationships stand currently (in 2019).

3 Scope of solution space

Understanding the reliance on (percent of total consumption) each energy source and the actual consumption in TWh of each energy source by each of the 8 countries.

4 Constraints within solution space

- Energy data only goes up until 2019, while GDP data goes only until 2016
- Data on electricity and carbon emissions is inconsistent within data set
- Russian data does not start until the 1960's and has unexplained and dramatic kinks
- Countries are unlikely to shift away from energy sources which are naturally abundant within their geography

5 Stakeholders to provide key insight

Chris Hui
Companies hiring energy analysts
IMF / UN

6 Key data sources

<https://www.kaggle.com/datasets/pralabhpoudel/world-energy-consumption>