



INTERNATIONAL DATATHON

CASE BRIEF

PRESENTED BY UNSW
DATASOC AND
SUDATA



PROBLEM STATEMENT

How has the implementation of sustainable energy been impacted, assisted or handicapped by countries' governance culture?

AUDIENCE

You will be given 7 minutes to present followed by a 3 minute Q&A. You may choose the stakeholders you cater your response to. Examples of audiences may include but are not limited to governments, environmental groups or academics.

CONTEXT AND GUIDANCE

As early as the 1800s, windmills and dams began replacing conventional energy sources due to depleting resources and rising demand. This was an attempt to switch to **sustainable energy**: energy that meets the needs of the present without compromising the needs of future generations. Technologies that facilitate this aim to be unhindered by scarcity ("renewable"), or non-damaging to the environment, most commonly seen as hydropower, wind/solar, and nuclear power.

Since then, multitudes of acts and reforms have sought to fully achieve this transition: Australia's Renewable Energy Target, the UN's Sustainable Development Goals, the Paris Treaty, and the upcoming climate change conference COP26 are salient examples. Yet every single reform listed above has failed to complete their targets, with countries missing deadlines and even fully abandoning their pledges. So what difficulties prevent even world powers from reaching such vital and inevitable goals?

One factor that could influence this is a country's **governance**. Governance encompasses all the forms of interaction that define a society. Either declared outright as law or inherently as traditions, cultural norms, and ethos, governance is defined by what decisions are made, and how they are made. As such, a country's governance falls into two categories: its system of governance (the nature of its governing body), and its governing characteristics (the rules, reforms, and decisions of its governing body). It should be clear how much both categories can potentially impact a country's adoption of sustainable energy practices. For this datathon, we have provided for you the **Worldwide Governance Indicators (WGI)** as a measure of this concept.

You can also limit the scope of the question to *some specific variables or categories* of your interest. Below are some potential areas you could explore:

- A **geographical area**: For example, Australia and its small island nation neighbours in the Indo-Pacific or Oceania.
- Countries whose **main energy sources** are in a particular category: renewables, fossil fuels or nuclear.
- Countries starting with **zero values** in specific variables but progressing to non-zero values throughout the years.
- Countries which have **regressed** in their adoption of sustainable energy.
- The failure of **past** global sustainable energy initiatives, and their consequences.
- How a country's **global role** as a producer/manufacturer/consumer affects their ease of adoption.

Please note that your analysis is not limited to the potential areas discussed above, and can include other findings that you may find interesting and worthwhile to explore.

SUBMISSION

By **10:00AM on Sunday** you will be required to submit a presentation (.pptx, .pdf or Google Slides) and your code (all in one script) into a Google Drive folder that will be unique to your team. Any external datasets used should also be uploaded or linked within this folder. This will be sent out to all teams by email on the day.

Recommended items to include in your presentation are:

- Your general methodology
- Your discussion of chosen variables and interpretations of trends and analysis
- Your conclusions, inferences and understandings drawn from the dataset
- Issues faced and flaws of your analysis
- Visualisations to concisely convey your messages, especially to a broader audience

DATASET DESCRIPTIONS

INTRODUCTION

To save you some time, we have pulled and cleaned the main datasets for easy download from:

<https://drive.google.com/drive/folders/1Y9ixxdi6Z1bZiSSiXIrcSAucniA8iMlj?usp=sharing>

There are two datasets provided to you: *energy.csv* and *WGI.csv*. Both datasets have been substantially cleaned to aid you in your analyses but you will still be able to access the original datasets if you prefer. You are also welcome to reference your own data sources as long as they are relevant to the problem statement and are properly cited.

DOCUMENTATION

Below is extensive documentation on the datasets which we recommend using. They are extremely useful for finding out which files would be useful to your team, without downloading them.

For each dataset, we have included:

- Description
- Source
- Variable/column descriptions

OWID ENERGY DATA

A collection of key metrics maintained by Our World in Data. It is updated regularly and includes data on energy consumption (primary energy, per capita, and growth rates), energy mix, electricity mix and other relevant metrics.

Source: <https://github.com/owid/energy-data>

Column name	Description
country	Country
iso_code	International recognised code that designates a country
year	Year from 2000-2016 for each country
gdp	Total real gross domestic product, inflation-adjusted
population	Total population
electricity_generation	Electricity generation measured in terawatt-hours
X_electricity	Electricity generated by X resource measured in terawatt-hours
X_production	Production of X resource measured in terawatt-hours
X_consumption	Primary energy consumption of X resource measured in terawatt-hours
X_share_elec	Share of electricity consumption that comes from X resource
energy_cons_change_pct	Annual percentage change in primary energy consumption
energy_cons_change_twh	Annual change in primary energy consumption measured in terawatt-hours
energy_per_gdp	Energy consumption per unit of GDP. This is measured in kilowatt-hours per 2011 international-\$
energy_per_capita	Primary energy consumption per capita, measured in kilowatt-hours per year

You may also choose to aggregate variables in the following way:

- fossil fuels = coal + oil + gas
- renewables = solar + wind + hydro + biofuel + other_renewables
- low_carbon = renewables + nuclear

WORLDWIDE GOVERNANCE INDICATORS

The **Worldwide Governance Indicators (WGI)** is a research dataset summarising the views on the quality of governance provided by a large number of enterprise, citizen and expert survey respondents in industrial and developing countries.

The WGI report on six broad dimensions of governance for over 200 countries and territories over the period 1996-2020: Voice and Accountability, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law and Control of Corruption. Estimates of governance range from approximately -2.5 (weak) to 2.5 (strong).

Source: <https://info.worldbank.org/governance/wgi/>

Column name	Description
country	Country
iso_code	International recognised code that designates a country
year	Year from 2000-2016 for each country
VoiceandAccountability	Captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.
Political StabilityNoViolence	Captures perceptions of the likelihood that the government will be destabilised or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism.
GovernmentEffectiveness	Captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.
RegulatoryQuality	Captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.
RuleofLaw	Captures perceptions of the likelihood of crime and violence and the extent to which members of the public have confidence in and abide by the rules of society, respect contract enforcement, property rights, the police, and the courts.
ControlofCorruption	Captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.

CRITERIA

Criteria	Considerations	Marks
Solution Quality	1. <i>Hypothesis</i> <ul style="list-style-type: none"> Defined a clear problem statement and hypothesis that is used to frame the analysis 	5
	2. <i>Research - translating the question into a data problem</i> <ul style="list-style-type: none"> Demonstrated an understanding of the qualification process and accounted for this in their presentation Clear referencing to data sources 	5
	3. <i>Analysis</i> <ul style="list-style-type: none"> Usage of clear quantitative analysis as evidence to support theories Efficient and hypothesis-driven usage of datasets (provided and/or external) to support answer Uses compelling visualisations to support thesis/hypotheses 	15
	4. <i>Insights</i> <ul style="list-style-type: none"> Conclusions are clearly communicated and interpreted. The conclusions and insights address the problem statement and answer the problem/question effectively. 	15
Presentation Quality	<ul style="list-style-type: none"> Effectively conveys the answer through appropriate visualisations Demonstrates an understanding of the context and impact of the analysis Concise visual presentation 	10
	<ul style="list-style-type: none"> Clear delivery and message throughout the presentation Engaging and easy to follow 	10
Total		60