GSPA Open Climate Policy Database

Executive Summary

The latest projections for global greenhouse gas emissions show quickly dimming prospects of staying within the temperature limits designated by the United Nations Intergovernmental Panel on Climate Change (IPCC) and the Paris Agreement obligations for Parties to stay *well-below* 2°C warming, to adequately address anthropogenic climate change. Even with full implementation and enforcement of state Parties' current Nationally Determined Contributions (NDCs), we are unlikely to reduce our greenhouse gas emissions at the necessary rate. International organizations and leaders are generally incentivized to take a cooperative approach when evaluating NDCs; they therefore have had limited capacity to criticise other Parties' unambitious plans. Climate scientists are typically focused on emissions measurement, technical solutions, and article publication, rather than policy evaluation. Some NGOs, including Climate Action Tracker, The Climate Group, and Climate Scorecard, have filled this literature gap in tracking global climate policy. However, these sources do not always sufficiently evaluate all countries, as significant data limitations prevent high granularity in these assessments. We hope this research further elucidates gaps in transparency regarding data on states' climate policy. We also recognize the GSPA is in a unique position, having fewer institutional constraints as a student-led organization, enabling us to connect this project to other ambitious youth-led climate action initiatives. Ultimately, this project underscores the critical role students have in driving material climate action and holding large greenhouse gas emitters accountable through our research.

Project Overview

Through the GSPA, student researchers from Cornell University, the University of Chicago, the University of Edinburgh, and the University of Cambridge worked over the summer and autumn of 2020 to create a database revealing the climate policy commitments of 193 countries.[1]

The teams from each university first conducted initial research on areas of climate policy, proposing 13 possible policy areas. Researchers voted, selecting Energy Production, Agriculture, Environmental Extraction of Fossil Fuels (hereinafter Extraction), Environmental Justice, and Emissions Reporting as the five most important topic areas. The areas were then reduced to four, as it was determined that an environmental justice lens should be incorporated throughout our data collection where quantifiably possible, rather than be siloed separately. The teams wrote summary briefs on each of the four topic areas following in-depth investigations, including background information on extractive practices, definitions and terms, country-level policies, and international agreements, with the goal of turning the deep-dive investigations into multiple research columns to comprise the database.

[1] Countries were defined as entities with Member-State status at the United Nations General Assembly: https://www.un.org/en/member-states/

After writing the deep-dives, each team contributed to the development of the database, with a mixture of columns to be filled out by researchers and columns to be filled using external sources. All researchers filled out the information for 10 countries into a database of 194 different columns, excluding the “Characteristics” section pulled from external sources, encompassing all 4 topic areas. Many columns in the database were kept to simplified, broad metrics to account for measurement and reporting discrepancies between countries. For example, future energy mix is not quantified but instead noted as a simple ‘increase’, ‘decrease’ or ‘maintain’ for ease of data collection. Additionally, in the Extraction section, policies for fracking and gas flaring are noted simply as a policy present or absent dichotomy. Characteristics data for each country adds to our data by providing context for the development status of each country (i.e. annex status in the UNFCCC, urban population, GDP per capita, GINI), and the corruption perception index provides a context for how much government-published data can be taken for face-value.

Each team then assigned weights to each of the policies or indicators measured by the columns and sent the databases to the Index Team, who created an index measuring the overall successes and failures of each country in each target area. The Methodology section of this project thereby outlines how the indexes were created, justifying the key takeaways of this research project.

Key Takeaways

Across our four research target areas, the data presents several key points that must be highlighted when considering the data in the context of next steps for global climate action.

Energy Production

Future commitments for renewable energy, although optimistic in themselves, pale in comparison to concurrent projections in fossil-fuel generated power. Despite developed countries' high-visibility commitments to increase their low carbon energy sources, our data demonstrated that the majority of countries are either concurrently maintaining (100+) or even increasing (60+) their fossil fuel power sourcing. This highlights that the overall energy mix of low-carbon energy sources is changing less than perceived. Less than 25% of states are actively *decreasing* fossil-fuel power reliance, which is a critical and necessary step in decarbonizing the global economy.

Importantly, increasing renewables does not necessarily mean decreasing overall fossil fuel usage. An increase in renewable usage may simply indicate an increase in energy generation or demand. This highlights the need for increased energy efficiency and stronger portfolio strategies to ensure the *percentage* of fossil fuel energy production is decreasing, and that renewables are replacing, not adding to, the overall energy mix. Additionally, it is important to acknowledge that some countries’ energy policies still intend on exporting fossil fuels while decarbonizing their domestic consumption. This may result in national emissions reduction with the nation's energy sector, but not the global reduction needed to comply with Paris Agreement obligations.

Natural Resource Extraction

The majority of countries have accelerated fossil fuel extraction rather than slowing it. According to the IEA, fossil subsidies accounted for approximately $320 USD billion in 2019, which is 3 times the 2020 target for the Green Climate Fund.[2] Of these subsidies. Iran, China, Saudi Arabia, and Russia are the top 4 countries spending the most on subsidizing fossil fuels, with Iran's subsidies totalling over $80 billion USD in 2019.[3] As of 2020, 36 countries still engage in hydraulic fracking—despite bans in most European countries. Finally, our analysis recognises that COVID-19 pandemic has dramatically slowed oil extraction, yielding much lower active rig counts in July 2020 (when our data was primarily collected). For example, Iran had 0 active rigs despite historically being on the largest producers. However, low activity now forebodes even higher activity in the future as oil-dependent states will try to make up losses.

Emissions Reporting

Emissions data is infrequent and suffers from substantial margins of error at a country level. The majority of countries fail to report their emissions frequently enough to accurately track climate progress, with 125 countries reporting only every 5 years or longer. 48 countries have not reported since 2000 or earlier and 2 have not reported since 1994. Notably, India has not reported since 2010 and China has not reported since 2014—despite being two of the highest emitting nations worldwide. Some experts suggest that the uncertainties in state-level emission estimates are so profound that compared to the real number, the margin of error can be up to 100%. Several countries have alleged instances of government or government-enabled cheating in their reporting, including: Bolivia, China, Italy, New Zealand, Russia, Poland, and Ukraine. Yet, this list is limited to documented reports and contingent on a relatively free press for accuracy; therefore, the issue may be much more pervasive.

Agriculture

Agriculture is considered an under-covered sector in climate policy, despite being a concentrated source of gases more powerful than carbon dioxide (e.g. methane and nitrous oxide). Less than half (91) of all countries include agriculture-specific sections in their Nationally Determined Contributions, including the United States. On average, countries have long-term forest management for about only 7% of their forested areas, making these areas vulnerable to deforestation for agricultural purposes.

We found that 4 countries—China, India, Brazil, and the United States—are responsible for almost half of global agricultural emissions. These 4 countries are comparatively carbon-inefficient relative to peer countries, despite their high outputs: China ranks 52nd, India ranks 90th, the U.S. ranks 99th, and Brazil ranks 152nd in carbon efficiency.

[2] IEA, (2020). "Energy subsidies: tracking the impacts of fossil-fuel subsidies" https://www.iea.org/topics/energy-subsidies

[3] *Ibid.*

Methodology

Background to Index Methodology

The index is constructed from raw data by a series of standardisation techniques scaling each score between zero and one. This enables us to compare data from completely different indicators, such as deforestation and community renewables. The scores are weighted and added together to give the final score for each index. Each indicator was weighted on a scale from 1 to 5, 5 representing a highly relevant indicator and 1 representing an indicator that is less relevant or impactful from a climate perspective. The weightings were determined by the five GSPA contributors who had researched the indicator in question. It should be considered that this data was collected in the summer of 2020, amidst the COVID-19 pandemic, and therefore some of the data may not entirely reflect countries' pre-existing business-as-usual consumption trajectories. We intend to update this database annually to smooth such irregularities.

Methodology of Energy Index

The Energy Index favours countries that not only currently have a low-carbon energy mix, but are also committed to reducing the greatest possible share of high-emitting technologies in their national energy mix in the future. Countries are additionally rewarded for improving social consequences of the energy transition through consistent and equitable national policy.

To score countries on their current primary energy supply, we converted raw energy supply data from absolute numbers into percentages, and then multiplied the percentage of each energy source by a given weighting based on the C02-equivalent emissions of the respective source (IPCC AR5 data). To simplify the number of different weightings, we grouped energies into 3 categories (<50g CO2eq, between 50 and 500g, and >500g). The weighting of each category is its mean emission value, and the score of a country is given by the sum of its weighted percentages. Missing values were replaced by zeros.

For the future installed capacity indicator, a score of 1 is given to a country's commitment to reduce the share of a fossil energy, 0 for increasing, and 0.5 for no commitment or staying the same. The values are reversed for low-carbon energies (with solar, wind, and tidal/wave energies grouped as one). The weighting for each energy source is its share in the energy supply mix. Therefore, a currently coal-dependent country that has committed to reduce coal in the future will still receive a high score. The carbon capture capacity scores were simply based on annual captured carbon values in Mtpa.

Finally, with regards to the social impact indicators, having a relevant policy present receives a score of 1, having the intention to create a policy receives 0.5, and the absence of policy receives 0.

Methodology of Agriculture Index

The justification behind the agriculture weightings, giving higher values to the agricultural efficiency and forestry columns, was that these *results* give a better indication of the state of agriculture within a country than simply *commitments*. Moreover, the inclusion of forestry in an agricultural index reflects the importance of both sustainable forestry in preventing climate change and agriculture as a key cause of deforestation. This approach partially accounts for the low coverage of climate policy over agriculture and the pervasive policy exemptions that cover the industry.

Regarding missing data, the predominant approach was that absence of data indicated an absence of effort. For example, if our researchers were unable to find information on green agricultural subsidies in a country, then it was assumed that the country had no green agricultural subsidies.

Methodology of Emissions Reporting Index

The two main criteria for the Emissions Reporting Index are reporting quality and quantity. These characteristics are weighted equally, each accounting for 50% of the total score. Reporting quality is then determined by the frequency of reporting (50%) and the presence/absence of evidence of misreporting (50%). For the frequency categories, of 1-2 years, 3-5 years, >5 years, and never, the assigned scores are 100, 75, 50, and 0, respectively. For the misreporting column, a country receives 100 points if there is no publicly available evidence that a country has misreported their emissions, otherwise they receive no points.

The quantity component of the index is made up of a list of seven gases/ gas types (CO2, CH4, N2O, HFCs, PFCs, SF6, NF3). Carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O) are given slightly lower weightings (⅗) because they are typically reported by all countries, while the other gases are weighted (5/5) each--as these gases serve to differentiate between countries that report all gases and those that report the bare minimum. It is important to note that only a small number of countries produce products using fluorinated gases (HFCs, PFCs, SF6, NF3), though most still import the same products. 100 points are assigned to any gas that has been reported, is reported to not occur in the country, or is reported in aggregate with other gases. Zero points are given to countries that do not provide data.

The tables below illustrate the methodology in numerical terms:

New weighting system:	
Quality	½
Quantity	½
Quality of Reporting	
Frequency	0.5
Evidence of Misreporting	0.5

Quantity of Reporting (Weighting/5)	
CO2 (3)	0.1034482759
CH4 (3)	0.1034482759
N2O (3)	0.1034482759
HFCs (5)	0.1724137931
PFC (5)	0.1724137931
SF6 (5)	0.1724137931
NF3 (5)	0.1724137931

Quality of Reporting	
Frequency	**Index Score**
1-2	100
3-5	75
>5	50
never	0
Gases	**Index Score**
1	100
0	0
NO	100

Methodology of Extraction Index

The total number of active onshore and offshore drilling sites is pulled from the International Rig Count, 2020 using the most recent data from July 2020, found in row 471. For countries not explicitly listed in the count, data was found through country level documents and alternative searches. A future improvement on this database would be to calculate change over time; for example, having 2010 total number of active drilling sites subtracted from the 2019 total number of active drilling sites, divided by the 2010 total number of active drilling sites. For countries where researchers could not locate the necessary data, the input was set to 0. On the back end of data manipulation, NA's were changed to 0's.