

International Perspectives to Climate Change

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Background

Different countries have different perspectives on energy. The US lets the market regulate fuels and uses a mixture of fuel sources including petroleum, natural gas, coal, nuclear, and some renewables. China, a developing country, has an abundance of coal, very cheap (old) technologies, and economies of scale. France, for energy security purposes, pursued nuclear immediately after the 70s oil shock. Neighboring Germany, also for policy reasons, has installed a large amount of renewables in the form of solar. Other countries try to make use of surrounding resources; for instance, Brazil's top-down approach exploits water (hydroelectricity), and Iceland's democratic approach exploits their geothermal and hydro resources.

The stock of anthropogenic greenhouse gases can be attributed to each country and reflects both fuel choices as well as the length of time they spent as an industrialized country. Historically, the top five emitters have been the US (~33%), China (~10%), Russia (9%), Germany (8%), and the United Kingdom (7%). Recently, many developing countries are beginning to contribute much more than the developed countries. In 2012, of the roughly 8Gt emitted globally, the top emitters were China (23.5%), US (18.27%), India (5.83%), Russia (5.72%), and Japan (4.04%).

Country	Population (millions)	Land Area (million sq km)	GDP (2010, trillion USD)	2012 annual emissions (billion tonnes)
China	1,338	9.3	10.2	8.2
US	309	9.1	14.6	5.3
Brazil	195	8.5	2.2	0.42
Iceland	65	0.10	0.011	0.36
France	0.31	0.54	2.2	0.005

(The Carbon Map)

Objectives

Students will be able to:

- Identify the sources of global carbon emissions and the countries responsible for them – past, present, and near future.
- Describe which countries are taking action to mitigate carbon emissions, and the various ways in which this is being done.

- Discuss what exists at the confluence of climate change and human activity, and how particularly vulnerable countries go about acknowledging this new reality and adapting to it.
- Debate international policy frameworks to adapt to climate change and mitigate its worst effects.

Materials Needed

- Large map of world
- Small tokens (beans, rice, etc).

Safety Concerns

None.

Vocabulary

- Energy intensity: Energy intensity is a measure of the energy efficiency of a nation's economy. It is calculated as units of energy per unit of GDP.
- Gross domestic product (GDP): Gross domestic product (GDP) is the market value of all officially recognized final goods and services produced within a country in a given period of time. GDP per capita is often considered an indicator of a country's standard of living.

Procedure

Time	Activity	Description	Supplies
30 minutes	Lecture	<ol style="list-style-type: none"> 1. Describe theory of anthropogenic contribution to climate change, namely the first industrial revolution. Use a couple of anecdotes or a thirty-second spiel to highlight the extent of the growth in carbon emissions as a result of this period and the rise of the developed world. 2. Describe the assumption that greater energy consumption corresponds to greater development. Note the weaknesses inherent in this argument without delving into the philosophical discussion. 3. The extent of carbon emissions today (i.e. 8 Gt) will be noted, and predictions for the growth of these emissions outlined. 4. Strengths and weaknesses of policy frameworks that govern research and mitigation efforts 	None
30 minutes	Group discussion	<p>Without naming countries, discuss:</p> <ol style="list-style-type: none"> 1. There are many ways to contribute to efforts to mitigate climate change – reducing energy use is just one. What are they? 2. Where the impacts of climate change will be felt most severely, according to various indicators 	None.

		(most notably increase in drought)? 3. Why are many vulnerable countries are apprehensive of the changes being wrought by climate change? What they are doing to adapt, both within their borders and on the international stage?	
30 minutes	Interactive	<ol style="list-style-type: none"> Split students into four groups, each with a large map of the world and a bunch of small tokens. The group will use the tokens to symbolize the relative contributions of each group. Questions include: <ol style="list-style-type: none"> Which 5 countries have historically been responsible for most carbon emissions Which 5 countries are responsible for them now? Which will be responsible for them in twenty-years' time? Once the groups are finished, show the actual answers. You may want to use The Carbon Map: http://www.carbonmap.org/ <ol style="list-style-type: none"> US (~33%), China (~10%), Russia (9%), Germany (8%), United Kingdom (7%) China (23.5%), US (18.27%), India (5.83%), Russia (5.72%), Japan (4.04%) Who knows? Group discussion of the answers and their implications. 	Large map of world, tokens.

Additional Resources**Opinion / Newspaper**

List of Climate Change Initiatives | Wikipedia

http://en.wikipedia.org/wiki/List_of_climate_change_initiatives

The Carbon Map <http://www.carbonmap.org/>

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