US Carbon Emissions

In Relation to Climate Change

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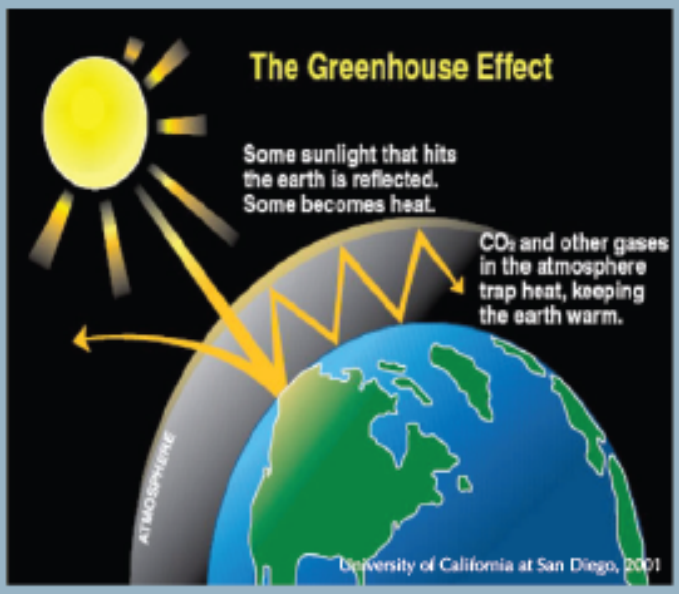
Causes of climate change

Following the industrial revolution, the advent and rapid diffusion of new mechanized technology lead society to base nearly all processes and systems on fossil fuel consumption, from indoor heating to food production. However, **burning fossil fuels releases greenhouse gases (GHGs) into the atmosphere**, of which carbon is by far the most commonly emitted. GHGs become problematic after sunlight is absorbed by the Earth, when heat is radiated from the surface of the planet towards outer space. **GHGs trap this heat near Earth's surface, raising the temperature of the atmosphere as a whole in a process known as the greenhouse effect** (EPA, 2017).



Consequences of Climate Change

- Elevated frequency of hot extremes in most inhabited regions
- Heavy precipitation in several regions
- Higher probability of drought in some regions
- High economic losses due to extreme weather and agricultural losses
- Loss of arable land
- Widespread extinction and habitat loss
- Rising sea levels
- Large scale melting of polar ice caps

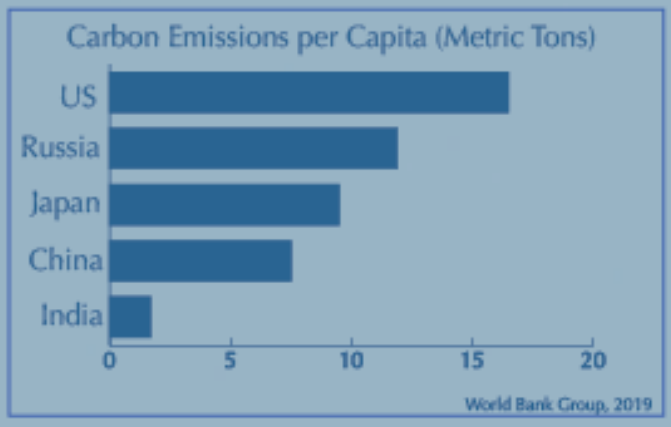
(IPCC, 2018)

Risks

When compared to pre-industrial averages, global temperatures have increased by roughly 1.0°C due to increases in atmospheric carbon concentrations stemming from human activities. While this may seem insignificant, **warming of 1.5°C represents a threshold of risk beyond which natural and human systems face severe risks, with effects strengthening between 1.5°C and 2°C.** Additional increases in temperature above pre-industrial levels will yield increasingly **devasting economic, ecological, and social consequences** (IPCC, 2018).

US emissions

The United States is the second largest emitter of carbon in the world behind China. However, due to China's enormous population, the **US is by far the largest emitter per capita among the top five carbon emitters in the world**, demonstrating the responsibility that the US has to cut emissions (Union of Concerned Scientists, 2018).



The case for market based solutions

Many efforts and policies aimed at curbing emissions, such as mandates and command and control regulations, carry inherent risks to economic performance and threaten the livelihoods of ordinary people. Market based solutions, however, differ in that they work to integrate the hidden cost of burning fossil fuels, known as negative externalities, into the initial cost of products and services requiring the consumption of fossil fuels. **Currently, activities and products that result in carbon emissions do not take into account the cost that such emissions impose on society as a whole, and are therefore relatively too cheap and economically inefficient.** Market based policies put a price on carbon in order to internalize negative externalities associated with emissions, namely climate change and its ensuing risks (Metcalf & Weisbach, 2009). This encourages the private sector to shift way from practices that require high levels of emissions. **Market based solutions are widely supported by economists as being both cost effective and efficient,** and are viewed by many in both corporate and environmental groups as being the preferred climate change mitigation technique. Of all market based strategies, carbon taxes and carbon cap and trade systems are generally thought to be the most feasible and effective policies (Barron et al., 2018).

Carbon Taxes

- Firms are taxed a set dollar amount per metric ton of carbon they emit
- Drives up prices of carbon intesive goods and services
- Prices properly reflect the burden of carbon emissions
- Incentivizes energy efficient production, decreased carbon emissions
- High prices force individuals to consider the consequences of emissions in their buying habits

(Metcalf & Weisbach, 2009)

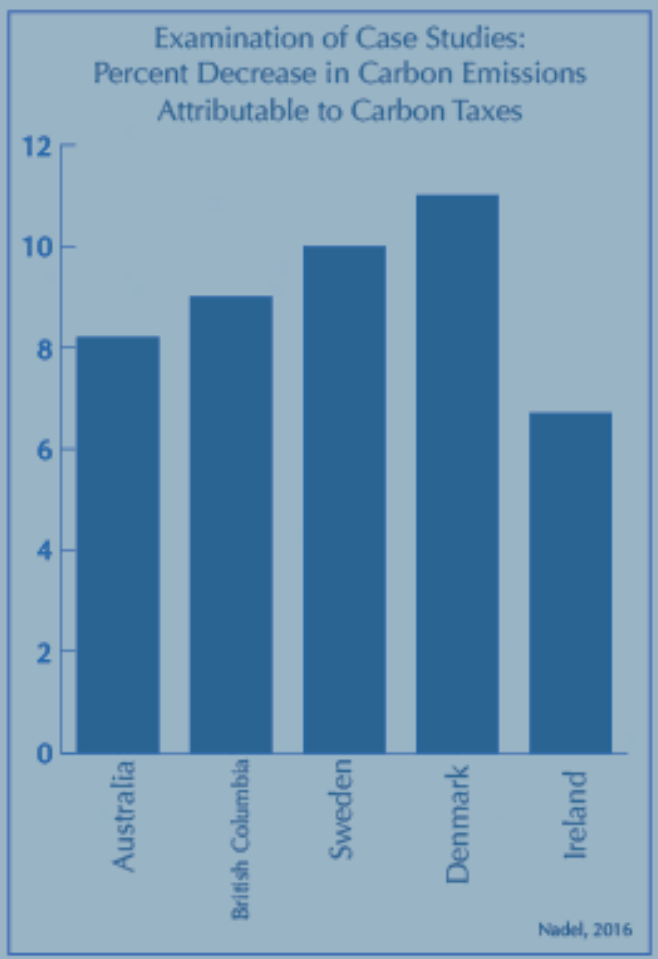
Carbon Cap and Trade

- Limits the amount of carbon that companies can emit
- Allocates the rights to emit through a system of permits distributed to companies
- Permits can be bought and sold on the open market ("trade")
- Places strict limits on emissions ("cap")
- Commoditizes carbon emissions
- Incentivizes companies to decrease emissions in order to profit from selling unused permits

(Avi-Yonah & Uhlmann, 2009)

Proposed solution: Carbon tax

A well designed carbon tax is the best policy option to decrease US emissions and mitigate climate change. Using 2005 emission levels as a base, **taxing carbon at $15 per metric ton would reduce GHG emissions by 14%**, making carbon taxes an extremely effectively tool to cut US emissions (Metcalf & Weisbach, 2009). Furthermore, early experiementation with carbon taxes has yielded positive results. After enacting a carbon tax, **British Columbia reduced carbon emissions by 9%** while ensuring the tax had a negligable economic impact. Due to its proximity and cultural simliarity to the US, British Columbia's success bodes well for the implementation of a similar tax in the US (Murray & Rivers, 2015). The timeframe in which a cap and trade system could be established is far too long due to the period of time necessary to create a self-sustainable tradeable permits market (Avi-Yonah & Uhlmann, 2009). Conversely, **a tax could be implemented immediately, and revenues could be used to benefit society or offset any regressive effects of the tax** (Williams et al., 2014).



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