

GEOG 3991
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Assignment 4
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International Response, Future Challenges, and Individual Responsibility

Section A: Short Critical Reflections

Topic 1: Beyond the Kyoto Protocol
"Getting serious about the new realities of global climate change."

To date, most of the efforts to reduce fossil fuel emission have focussed on carbon dioxide. But, unfortunately, those efforts have largely failed, creating the difficult global challenge of how to manage consequences of a warming world. Furthermore, the article states that focussing on other emission factors, such as soot, will be easier to regulate, and can help build credibility on the international scale (Burney et al. 2013). Burney is searching for ways countries can strategize for success in slowing global warming. Pollutants like soot are easier to manage than CO₂ emissions. If a plan can be implemented to reduce soot emissions, leaders might apply it to carbon emissions. This is a classic example of smaller, attainable steps contributing to the global goal of slowing global warming. According to Burney, when firms no longer believe that regulation of climate-altering gases is inevitable, they cut back on clean-energy research and development (Burney et al. 2013). I believe that the attainment of smaller goals to control emissions will set a standard for other companies to follow. Societies aren't usually willing to tackle problems with high immediate costs or that require sustained effort. Those who contribute an initial cost for a project usually want to ensure the maximum financial benefit (Burney et al. 2013). We can't just tell the world to stop using fossil fuels without suggesting alternatives. Successfully

controlling soot might encourage people to tackle the challenge of eliminating other emissions, one step at a time.

Reference:

Burney, J. A., Kennel, C. F., & Victor, D. G. (2013). "Getting serious about the new realities of global climate change. Bulletin of the Atomic Scientists, Volume 6, Issue 4., pages 49-57. Retrieved from:
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Topic 2: Mitigation Measures
"The Turning Point: New Hope for the Climate"

It is encouraging to read about the success of solar and wind power. In his report, Al Gore states that enough raw energy reaches the Earth from the sun in one hour to equal all of the energy used by the entire world in a full year (Gore 2014). We are only beginning to harness the sun's energy. According to the article, by 2020 more than 80 percent of the world's people will live in regions where solar energy can be competitive with other energy sources (Gore 2014). Reading about how coal-fired plants in Germany are facing financial losses is a sign that nations are showing a willingness to transition to renewable energy. It is important to know that these energy sources are becoming affordable. The cost of wind energy has dropped 43 percent in the United States since 2009 – making it now cheaper than coal for new generating capacity (Gore 2014). Leaders can no longer blame usage cost as a reason to not convert to greener energy sources. Of course, there is an initial expense, but eventual economic and environmental savings are undeniable. Mr. Gore uses an excellent analogy,

comparing the progression from the first cell phone users to the millions of present-day users. He hopes that green energy users “catch on” and all want to convert to green energy. Referring to the article, "Getting Serious about Global Climate Change," it mentions the hesitation of leaders to convert to sustainable sources. It is rewarding to read Al Gore’s positive outlook on green energy. Many nations such as India and China have braved this financial investment to work toward sustainable global health.

Reference:

Gore, A. (2014, June 18). “The turning point: New hope for the climate.” Rolling Stone, 1212. Retrieved from https://www.harrywalker.com/media/1865/gore_rollingstone_6-18-14.pdf

Topic 3: What Can You Do?

“Dragons, Mules, and Honeybees: Barriers, Carriers, and Unwitting enablers of climate change action.”

It is easy to ask why more people aren’t engaged in actions that would help mitigate climate change. Unfortunately, according to Gifford, the dragons, or barriers, outnumber the mules, or carriers (Gifford 2013). Too many people are still unaware of the seriousness of global warming, and too many people do not care enough to take action: Why should I change if *they* won’t? (Gifford 2013). Everyone is waiting for someone else to solve the climate change issue.

Furthermore, it is often difficult to choose the environment over personal financial realities, especially since life has become expensive. Everyone has multiple life goals, some of which clash with the intention of making smart environmental choices (Gifford 2013). An example of this is knowing that methane emissions from farming

contribute to global warming. We know that a vegan-based diet is a better choice for the environment, yet it is tough to give up that "big juicy steak." I know that driving my car is not the best choice, but I live in an area with no public transit, and there are no power stations for electric alternatives, nor do electric cars cover the distances I require. Walking to work is also not a possibility. Sometimes, the right choice is not always a practical choice. However, we all need to do as much as we can to reduce greenhouse gas emissions, where possible.

Reference:

Gifford, R. (2013, July). "Dragons, mules, and honeybees: Barriers, carriers, and unwitting enablers of climate change action." *Bulletin of the Atomic Scientists*, 69 (4), pages 41-48. Retrieved from: https://moodle.tru.ca/pluginfile.php/900436/mod_bootstrapelements/intro/GO3991_u4_gifford_dragons.pdf

Section B: Essay

Certain Uncertainty: Making the Transition to Green

Creating a global, legally binding, agreement to curb greenhouse gas emissions will hold nations accountable. However, given the varied economic stability between developed and developing countries, an arrangement of such magnitude invites conflict. Should all nations have the same expectations with regards to emission reduction standards? Perhaps they need extra time to convert to green energy, but, the bottom line is, they have an equal responsibility to reduce greenhouse gas emissions. *All* nations are a part of climate change, and that includes Canada. Around the world, businesses, governments, and experts agree that carbon pricing is the cheapest and

most efficient way to cut carbon pollution (Gov't of Canada). Saskatchewan's highest court ruled this month that the federally imposed carbon tax is constitutional, which sets a significant precedent for all provinces. Ultimately, the entire nation needs to transition toward solar and wind power. Time is running out. Canada has the knowledge to reduce emissions, abandon the security of fossil fuel, and convert to renewable, sustainable energy.

The principal reason that a legally binding emissions agreement meets resistance is accountability. It is tough to determine precisely how much each country is responsible for when considering their imports, exports, and overseas factories. Calculating import and export emissions is a fair way to calculate the level of carbon emissions for a country. According to Hausfather, an input-output model is used; one that accounts for the flow of different goods between countries and indicates the carbon intensity produced in different nations (Figure 1). This model has limits, but basically captures energy and emissions embodied in traded goods on a global scale (Hausfather, 2017).

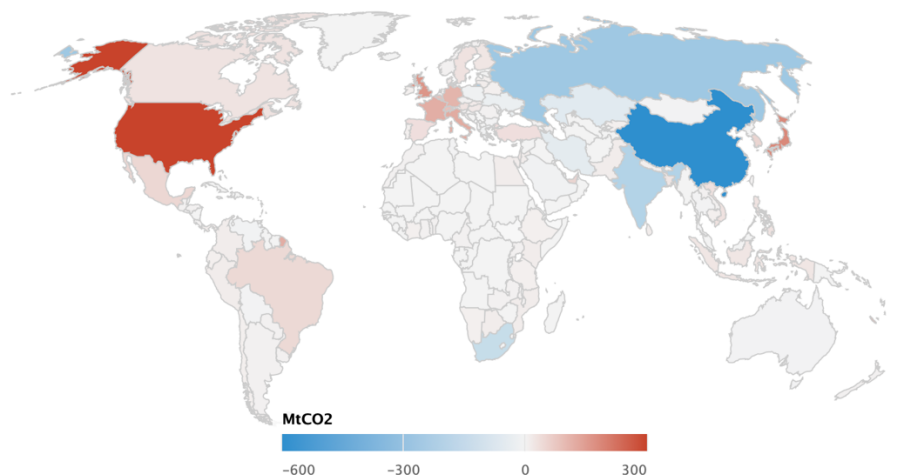


Figure 1 (Hausfather, 2017).

The map shows the 2014 net transfer of CO₂ on a global scale. The red indicates positive values for countries that are net CO₂ importers, while the blue shows net CO₂ exporters. For example, India is blue because more of its emissions go into producing goods that it sends to other countries (Hausfather, 2017). It is interesting to note the extreme “red” value of the United States, as it indicates how outsourcing pollution to overseas factories does not hide the fact a country like the United States is producing extreme amounts of greenhouse gas emissions.

The argument to ease emission restrictions on developing countries is a symbolic gesture, yet it is not sensible or logical considering global levels of warming. We need to decouple economic growth from carbon emissions, and in doing so, nations will avoid the environmental, social and economic costs indicative of dependence on fossil fuels (Argyriou 2017). The fact that a nation is developing does not excuse it from lowering its CO₂ emissions, especially since we are aware of repercussions from the Industrial Revolution. To excuse developing countries from responsibility to a global environment would be giving history permission to repeat itself. Understandably, developing nations face barriers when considering sustainable energy options, which include lack of technical and financial expertise, lack of resources, poor governance, and fragmented decision making (Argyriou 2017). However, their development *must* include sustainable energy. There will be initial costs to implement these mitigation strategies, and this is where developed countries should share their knowledge and provide financial support. It is in the best interest of the global ecosystem to assist

developing countries in navigating clean energy adaptation plans (Argyriou 2017). Climate scientists need to collaborate with social science groups to instill a green conscience in today's world leaders and stake holders. If a moral approach can surpass that of economic greed, the result will be global environmental sustainability.

The Deep Decarbonization Pathways Project was launched to help countries identify a cost-effective transition to a low-carbon future (Mead 2014). This is the type of agreement that needs a global projection. Nations should collaborate to create individualized carbon reduction plans based on the clean resources available in their location. The first action should be to phase out coal and replace it with lower-carbon natural gas, nuclear, hydro, wind, solar energy, and, widespread use of electric and hydrogen fuel cell automobiles (Sachs 2014). Setting an escalating series of goals for phases of energy conversion will make the plan attainable and geared for success. Once in place, this plan must become legally binding, insisting that all nations be held accountable to reduce carbon emissions.

I would like to see Canada develop a transition plan per the DDPP. The oil and gas sector must be phased out. In 2012, this sector replaced transportation as Canada's largest source of emissions, reaching 25 percent of the total national inventory. The sector's growth in annual emissions between 2005 and 2012 was almost entirely due to the oil sands (Dion 2014). Canada needs to regulate this sector if it is going to commit to a sustainable future. Unfortunately, there are barriers. For example, eco-friendly cars are not a realistic option for many remote areas of British Columbia. There are few charging stations, and the vehicles cannot handle the large travel spans. I think that

improving electric and hydrogen fuel cell cars should be a priority because it will diminish the need for the oil and gas sector.

I would also like to see all of the lumber mills in my area convert to clean biomass energy. Currently, the primary operation in the Cariboo region using biomass fuel is in Williams Lake, BC. The Atlantic Power Williams Lake Project (APWL) is a 66 MW biomass-fired generating facility located in Williams Lake. The plant produces energy utilizing wood waste from sawmill operations and roadside logging debris (APC 2019). Not only would the mills be reducing emissions; they would be keeping the forest areas clear of potential fire fuel. Clearing and utilizing wood waste is an efficient, sustainable way to adapt to local climate change in the Interior, since the region has become arid and prone to forest fires.

Increased implementation of solar, wind or geothermal energy would also reduce emissions. The elementary school where I teach, Mile 108 Elementary, currently uses solar panels and a geothermal heating system. I think that all businesses, schools, and residential houses should use some form of green energy. Many homes in Canada are already using the Passive House concept (Figure 2). This type of house relies on very low levels of energy for heating and cooling, using only total primary energy such as solar and geothermal, and has very low air leakage (Hough 2018).

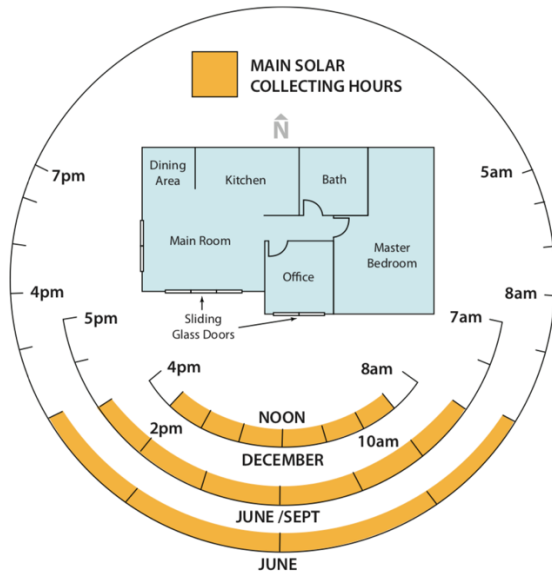


Figure 2 (Wimmers, 2009).

The only path to a global reduction of greenhouse gas emissions, and a transition to clean energy, is to assume responsibility. By collaborating on nation-specific plans that allow for economic development, steps can be taken to create attainable goals for lowering, then eliminating, fossil fuel use. These goals must then become legally binding. If left as optional, governments and corporations will not act to reduce the use of easily accessible fossil fuels. We must abandon security in these current energy sources; we can no longer utilize fossil fuels. Saving the planet is not an option; it is essential.

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