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Group of Twenty

Enhancing Renewable energy incentives

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Introduction

The issue of climate change has become a prevalent and, for the vast majority, undisputed topic in recent years, especially due to the countless scientific reports published about the issue which cite human activity as the primary offender and cause of climate change. The Intergovernmental Panel on Climate Change (IPCC) has published a report stating that if global temperatures were to surpass a threshold of 1.5 ºC above pre-industrial levels, there would be severely negative impacts on the environment. More than a 2 ºC increase and we would reach a so-called 'point of no return' due to rising sea levels and extreme climates. Currently, we are on track to reach the 2.0 ºC limit by 2050.

It is clear change must happen, but rising scepticism and the negative impacts on the economy have made governments reluctant to implement change. Most states are still reliant on fossil fuels. Conventions such as the Paris Agreement and the Kyoko Protocol are in place, but they are often non-binding and allow states to determine themselves which goals to set and when to reach them, with no consequences if they fail. More needs to happen if we are to have any impact on the current issue.

Definition of Key Terms

Climate Change

Climate change, colloquially known as global warming is defined as a change in climate patterns (both global and regional) due in part to increased levels of greenhouse gases in the atmosphere, particularly Carbon Dioxide produced by the use of fossil fuels. Specifically, this change was observed during the mid to late 20th century and onwards.

Greenhouse Gases

Greenhouse Gases are gases that have the ability to absorb infrared (IR) radiation and reradiate it back to Earth, rather than back into space, thereby contributing to the greenhouse effect and climate change. Some common greenhouse gases include Carbon Dioxide, methane, and water vapour.

Carbon Tax

A Carbon Tax is a tax that is imposed on the burning of fossil fuels such as oil, gas and coal. It is placed by the government usually on companies and brands. In most cases, the government sets a cap on the amount of carbon that is allowed to be burned or released into the atmosphere and offenders must pay a capital that is proportionate to the amount of carbon they burn.

General Overview

The IPCC has made it clear that change must occur in the use of fossil fuels, as well as the lack of use of renewable energy if climate change is going to be halted. However, change is slow due to several factors, including but not limited to the efficiency of renewable energy, the economics of energy, and the politics surrounding the issue.

Efficiency of renewable energy

Part of why states are so hesitant to implement measures that incentivise renewable energy is due to how inefficient renewable energy is relative to fossil fuels. In hard numbers, there is not much difference between the energy forms, which solar having an efficiency rate of 20%, wind 58%, coal 33-40% and gas 54%, but these are efficiency rates once the energy has already been collected. The issue is that over time, renewable energy sources are more difficult to maintain and run. Solar for example, only works when there is sun and while the energy collected can be stored, it is in contrast to fossil fuels, which do not depend on weather conditions. The unpredictable nature of renewable energy makes it difficult for nations to become reliant on them.

Economics of fossil fuels versus renewable energy

A large part of the issue is that renewable forms of energy are economically inferior to fossil fuels. The costs of building renewable energy plants are much higher than that of fossil fuels, and they also produce less energy in the long term.

Furthermore, the current global infrastructure is highly supportive of fossil fuels. Renewable energy plants are dependent on being close to the source, such as water, wind, or sun and fossil fuel plants are not limited by that. In order for renewable energy to be transmitted to the areas that require it, new technology and infrastructure must be developed. The demand for fossil fuels needs to decrease before any change can be made.

Politics surrounding the issue

The political standings of climate change also makes it incredibly difficult for change to be made. Regardless of the numerous scientific studies published, the legitimacy of the issue has been called into question by major players, including the president of the USA. These statements do not hold much weight when compared to the reports published by the IPCC, but governments are still slow to make concrete and specific changes to the way they are run.

Many economies are nearly entirely dependent on fossil fuels, such as Saudi Arabia, where 90% of their economy can be accounted for by the oil industry. It is very difficult for such nations to discard or limit their use of fossil fuels or even to say they will as the impact it has on their economies is significant. It has been shown, however, that the renewable energy industry has large promise and might even be able to provide more jobs than the current nonrenewable energy industry. Ultimately, the economies will be better off but the period of change will be incredibly difficult and it plays a large part in reluctance to switch to renewable sources.

Finally, fossil fuels company have a large influence on their respective governments due to their large part in the economy. They hold power over their governments in the form of lobbyists, and states are, therefore, reluctant to place regulations on the use of fossil fuels. There is a constant threat that these companies could choose to relocate to a nation with

more favourable laws and regulations, which is a large part of why so many nations have chosen to stay in the background and impose minimal restrictions.

Major Parties Involved

Intergovernmental Panel on Climate Change (IPCC)

The Intergovernmental Panel on Climate Change (IPCC), formed in 1988, is a UN body that evaluates climate science by providing objective information about climate change, causes, and potential consequences of it. Every few years, the publish several major reports written by hundreds of individually selected scientists, the most notable report being the Special Report on Global Warming of 1.5 ºC (SR15) which details the aim of limiting climate change levels to 1.5 ºC above pre-industrial levels. It also lays out concrete steps to achieve that goal, such as reaching a net-zero on carbon emissions by 2050.

European Union (EU)

The European Union, or EU for short, is a coalition of 27 European countries which is the 3rd largest contributor to greenhouse gas emissions. They have very strong policies to combat their emission in place, however, in stark contrast to some of the other major polluters. The EU has ratified the Paris Agreement has defined targets for key sectors of the EU economy, the first of which was agreed on in 2008 and set goals for 2020. They have also set goals for 2030, such as “cutting its greenhouse gas emissions by at least 40% by 2030, compared to 1990.”

At the core of their efforts lies the emission trading system (ETS), a carbon market with a ‘cap and trade’ system. A limit is placed on the total carbon emissions that organisations are allowed to produce. This limit is slowly reduced. With the ‘cap and trade’, however, organisations can buy and trade allowances for their emissions, which creates more cooperation and flexibility but still limits carbon emissions.

United States of America (USA)

The United States of America is a global power with enormous influence and is also the second-largest polluter of greenhouse gases in the world, topped only by China. The USA has pulled out of the Paris Agreement, due to the current government, specifically the president, calling into question the legitimacy of the issue. Pulling out of the Paris Agreement has gone back on promises made by the Obama administration, and was done in part due to the nations wish to revive the coal industry in order to provide more jobs and boost the economy.

China

China is the world's largest contributor to greenhouse gas emissions, producing 27% of all global emissions. However, it is also the second largest economy, and has shown significant efforts to reduce their emissions, which experts say they are on track to meet. China has pledged to have their emissions either plateau or decline by "around 2030" and 20% of energy would come from fuel sources that are nonfossil. In 2017, China also began to implement a 'cap and trade' system similar to the one in use in the EU.

Timeline of Key Events

Date	Event
1700s	Start of the Industrial Revolution
1985	First major international conference about the green house effect takes place in Villach, Austria. The conference warned that greenhouse gases would ""in the first half of the next century, cause a rise of global mean temperature which is greater than any in man's history." Gases such as methane, ozone, nitrous oxide, and CFCs are also reported to contribute to climate change.
1988	Intergovernmental Panel on Climate Change (IPCC) is formed

4 June 1992	United Nation Framework Convention on Climate Change (UNFCCC) is started
11 December 1997	As a result of the UNFCCC the Kyoto Protocol is signed, although the USA does not ratify, stating they will not until they see evidence of “meaningful participation” from developing countries.
16 February 2005	The Kyoto Protocol goes into effect and, in states that ratified it, becomes law.
12 December 2015	Paris Agreement is signed by all member states.

UN involvement, Relevant Resolutions, Treaties and Events

- Kyoto Protocol, 11 December 1997 (1243)
- Paris Agreement, 12 December 2015 (2210)

Previous Attempts to solve the Issue

The two previous attempts, the Kyoto Protocol and the Paris Agreement, both set their sights on reducing carbon and other greenhouse gas emissions. Both have been effective in their own right, although the Paris Agreement is non-binding and flexible. Due to this, member states have set their own goals and there are no repercussions should they fail to meet them. The nature of the Paris Agreement allowed for widespread approval of it but states are not held accountable and many goals will not be enough to prevent global temperatures from rising to 1.5 ºC above the pre-industrial levels. The attempts made have been fair and are good foundations, but more action must be taken in order to slow down and eventually halt climate change.

Possible Solutions

Possible solutions for the issue can be very simply broken down into two categories: those that incentivise the use of renewable energy and those that disincentivise the use of nonrenewable energy sources such as fossil fuels.

Most solutions to disincentivise fossil fuels are already in place in individual member states or organisations but can be expanded on and suggested to states that have not yet adopted them. For example, suggesting the implementation of a carbon tax would make fossil fuels less cost-effective to companies. A carbon tax, as defined earlier, is a tax imposed upon companies as a result of the burning of carbon. The offending company pays a capital proportionate to the amount of carbon they burned. Part of why fossil fuels are so common is that they are very cheap and release a lot of energy for very little mass. Companies will always choose the most cost efficient option they have, and making it expensive to burn carbon will increase the probability that they choose renewable energy such as solar over fossil fuels. Carbon taxes do have downsides, such as increasing prices of products. It is expensive to choose alternative sources of energy, and that increase in production cost will be apparent in the resultant price of products. It must be noted that carbon taxes have already been implemented in major economies such as France and the UK, indicating that it does work.

Similarly, the suggestion that member states might implement emission trading schemes would disincentivise and limit fossil fuel consumption. As explained earlier, and ETS is a system in which companies can buy and trade allowances on their emission caps, encouraging and fostering cooperation between the companies. ETS inherently includes a cap on carbon emissions that companies must hold to, and this disincentivises the use of fossil fuels by imposing heavy repercussions should they go over their threshold. The ETS in the EU has proven effective and could be implemented in other member states, possibly even on an interstate scale in which member states have a cap on their carbon emissions.

It must be brought up that fossil fuels are so popular in part due to their efficiency. They produce a lot of energy, are easy to move and it is easy to extract the energy from them. While the inherent efficiency of fossil fuels cannot be changed, more funding could be directed towards research into the development of renewable energy. This could be done by increasing funding to universities that offer renewable energy courses, encouraging a larger

percentage of GDP to go towards companies which work on the development of renewable technology, etcetera.

The move to renewable energy has the potential to leave millions of people without a job, which is a large concern in many member states and the threat of job insecurity has already lead to some states, such as the USA, to pull out of agreements. Furthermore, the dismantling of the nonrenewable energy market would have large impacts on the economy of many countries. If nations are to implement measures which work in favour of renewable energy sources, there must be measures in place to ensure that jobs will be secured and the economy will take only minimal damage. A suggestion to provide job security would be to transfer those who are currently working in the nonrenewable energy industry into the renewable energy industry. This would require extensive training courses, which is not always cost-effective, and so, additionally, trade unions could be set up and implemented. Furthermore, many of the skills those workers have may be transferable, in which case there may be opportunities in other sectors which could be explored.

All states must also play an equal role in the incentivisation of renewable energy. The problem may arise that some member states which may be more affected by the change to renewable energy implement weak measures and do not contribute noticeably to the common goal. These issues must be handled with tact as it is understandable that nations choose to protect themselves from economic harm, and some measures taken to combat that may unintentionally harm LEDCs by enforcing implementations that are too harsh on fragile states and their economies.

Companies are not the only ones emitting carbon, and some steps could also be taken to minimise the use of fossil fuels by the general public. Companies by far produce the most emissions, but measures could be implemented that improve public transport and thereby incentivise people to turn to public transport rather than private transport, especially if the public transportation vehicles run on renewable energy sources such as hydrogen. Residents in areas that see a lot of sun could be encouraged to use solar panels on their houses and those in areas with a lot of wind could be asked to turn to wind energy. This could be achieved by offering tax cuts for the use of renewable energy, paying off small debts, and other financial incentives.

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Appendix or Appendices

Appendix I

http://documents1.worldbank.org/curated/en/590951468333307760/pdf/The-design-and-sustainability-of-renewable-energy-incentives-an-economic-analysis.pdf