Group of Twenty

Research Report

The Question of:

Decreasing worldwide carbon dioxide emissions by means of financial stimuli

Introduction

The rise in global temperatures, the increase in mean sea level, the melting of the ice caps and glaciers, and extreme weather phenomena, collectively known as climate change, is a great threat to modern society. The emissions of carbon dioxide and other greenhouse gases by humans and human activities are accepted by most as the cause of climate change. Countless initiatives have been set up in hopes of mitigating these effects before they spiral out of our control. World leaders have recognized the direness of this issue and have produced many agreements such as the Copenhagen Accord, Montreal Agreement, Kyoto Protocol, and most recently, the historical Paris Agreement in hope of bringing about international action against climate change.

The problem, however, does not lie in the intent of combatting climate change as all UN member states have signed to the most recent Paris Agreement (with the exception of the USA which has made clear that it wishes to withdraw from the agreement) but it lies in the reality of the implementation of these international agreements. Though many countries are content with setting ambitious goals, the reality is that without concrete and binding enforcement mechanisms in place, these ambitious goals remain infeasible. Many of the UN's usual enforcement mechanisms are ineffective but also impractical in the case of fighting climate change. For example, in the case that a developing country cannot hold themselves to a UN standard and economic or political sanctions are put in place, the developing country's ability to meet this standard is only further implicated. Thus, an alternative and substantially more effective means of ensuring that countries keep to international climate agreements is creating an incentive for them to do so. To put in place financial stimuli that would encourage countries to decrease their carbon dioxide such as carbon pricing is a goal the G20 must consider.

The Committee

The Group of Twenty is an international forum consisting of the world-leading industrialised nations. In total, the Group accounts for 85% of the world GDP and two-thirds of its population. Much of the important discussions are held on the sidelines and in informal meetings.

The Group of Twenty was established in December 1999 in Berlin, Germany as a meeting between finance ministers and central bank governors hosted by the German and Canadian ministers. Originally the G20 meetings were solely for finance ministers, however, after an inaugural meeting between G20 leaders in Washington DC as a reaction to the collapse of the Lehman Brothers in 2008, leader's summits became an annual event.

The chairmanship rotates annually between the party states; the country that holds the presidency gets to invite additional nations who are not a party state. Throughout LEMUN, the guest delegations in the G20 will have the same rights as a normal delegation, except for their vote which is only advisory.

Key Terms

Emission Trading System (ETS)

An Emission Trading System (ETS) is a scheme or cap-and-trade system whereby emitters are required to hold a permit for each tonne of carbon dioxide they emit. The number of permits available determines the level of the cap. When emitters don't already have a permit, they must either decrease their emissions or buy a permit from another emitter, who must subsequently decrease their emissions. Essentially, this trades the burden of carbon dioxide emission reduction. Other types of emission like methane or air pollutants could also be subjected to ETS permits.

Carbon Tax

A carbon tax is a "form of explicit carbon pricing directly linked to the level of carbon dioxide emission" according to the World Bank Group. Essentially, emitters have to pay the government on basis of how much carbon dioxide they are emitting, which is usually calculated through the carbon content being burned. A maximum level of emissions is by no means guaranteed when using a carbon tax, however, it is a cost-effective economic instrument. Other greenhouse gases, like methane, could be subjected to similar measures.

Greenhouse Gases (GHG)

GHG is an acronym for greenhouse gases, which are gases which are responsible for the "greenhouse effect". The greenhouse effect traps the sun's warmth in the planet's lower atmosphere. Due to increased levels of greenhouse gases in the atmosphere, the greenhouse effect is amplified which results in the climate changing, subsequently causing other environmental phenomena such as the increase in extreme weather conditions including droughts, hurricanes and tornados, a rise in mean sea levels, the melting of the ice caps, and an increase in global temperatures. Carbon dioxide is the best-known greenhouse gas but certainly not the only nor the most potent greenhouse gas.

Nationally Determined Contributions (NDC)

According to the United Nations Framework Convention on Climate Change, "NDCs embody efforts by each country to reduce national emissions and adapt to the impacts of climate change". The Paris Accord requires each Party to hold to these NDCS though the agreement is non-binding. This generally includes the mitigation of domestic carbon dioxide emission levels. In Article 6 (3) of the Paris Agreement it describes these NDCs and authorizes the use of "internationally transferred mitigation outcomes to achieve nationally determined contributions [of other nations]".

General Overview

Carbon pricing as a financial stimulant

The massive burning of coal in the 19th century in Europe and later the rest of the world fuelled the industrial revolution. The rapid industrialization, urbanization, and the exponential growth of population during this time created our dependency on fossil fuels. The world as we know it today is entirely dependent on the energy we create through the burning of coal, natural gas, and oil.

Burning fossil fuels for energy was seemingly quintessential: abundant, cheap, and fast. However, the burning of fossil fuels has one critical flaw, it releases carbon dioxide. A property of this gas is that it absorbs infrared radiation, and thus acts as a "greenhouse gas". Greenhouse gases are naturally present in our atmosphere, they trap the infrared radiation (which carries heat) from the sun into the atmosphere, keeping the earth warm and creating something akin to an "insulating blanket". Without it, the sun's infrared radiation would simply reflect off our desolate planet of ice and rock. With the excess of greenhouse gases being produced by human activity, however, the insulating blanket traps *too much* heat, changing the climate. In the IPCC's reports, the effects of this climate change through the enhanced greenhouse effect is thoroughly documented. The following quote by Carlo Rovelli from his book *Seven Brief Lessons on Physics* sums up the nature of the consequences:

> "*The brutal climate and environment changes are unlikely to spare us. For the Earth they may turn out to be a small irrelevant blip, but I do not think that we will outlast them unscathed – especially since public and political opinion prefers to ignore the dangers we are running, hiding our heads in the sand."*

Currently, the importance of climate change and thus carbon dioxide emissions has finally been recognized in most parts of the world and is eliciting an international response. Not only have there been numerous international agreements signed by world leaders, but the media and education have played a great roll in getting the general masses to understand the problem at hand.

In 2015, a monumental step was taken towards decreasing carbon dioxide emissions through the creation of the Paris Agreement. This document (which I suggest you study thoroughly) sets concrete goals and establishes means to achieve them. All 197 UNFCCC (United Nations Framework Convention on Climate Change) member states has either signed or ratified this agreement, truly demonstrating the unified global initiative to tackle global warming. Unfortunately, this utopian vision of a world united against global warming was quickly dissolved after U.S. President Donald Trump announced that the United States of America would be withdrawing from the agreement as soon as legally possible. Donald Trump cited that the "draconian" financial and economic burdens the *non-binding* Paris Accord including nationally determined contributions (NDCs) would impose on the US as a reason for the withdraw from the accord.

Nationally determined contributions are the heart of the Paris accord; nations set their own GHG mitigation targets considering its domestic circumstances and capabilities. This is important as in the

context of sustainable development and efforts to eradicate poverty, one must consider the heavy economic burden of reducing domestic GHG emissions; the Paris Agreement gave us a solution. NDCs are also known as "internationally transferrable mitigation outcomes", which means that countries can work together to meet their pledges. It provides developing countries with financial support but also lowers the cost of meeting the NDCs of developed countries as emission reductions in Less Economically Developed Countries (LEDCs) are less costly.

Though not technically a financial stimulus, the NDCs have dramatically changed our approach to combatting GHG emissions and have pathed the way for the implementation of other financial stimuli.

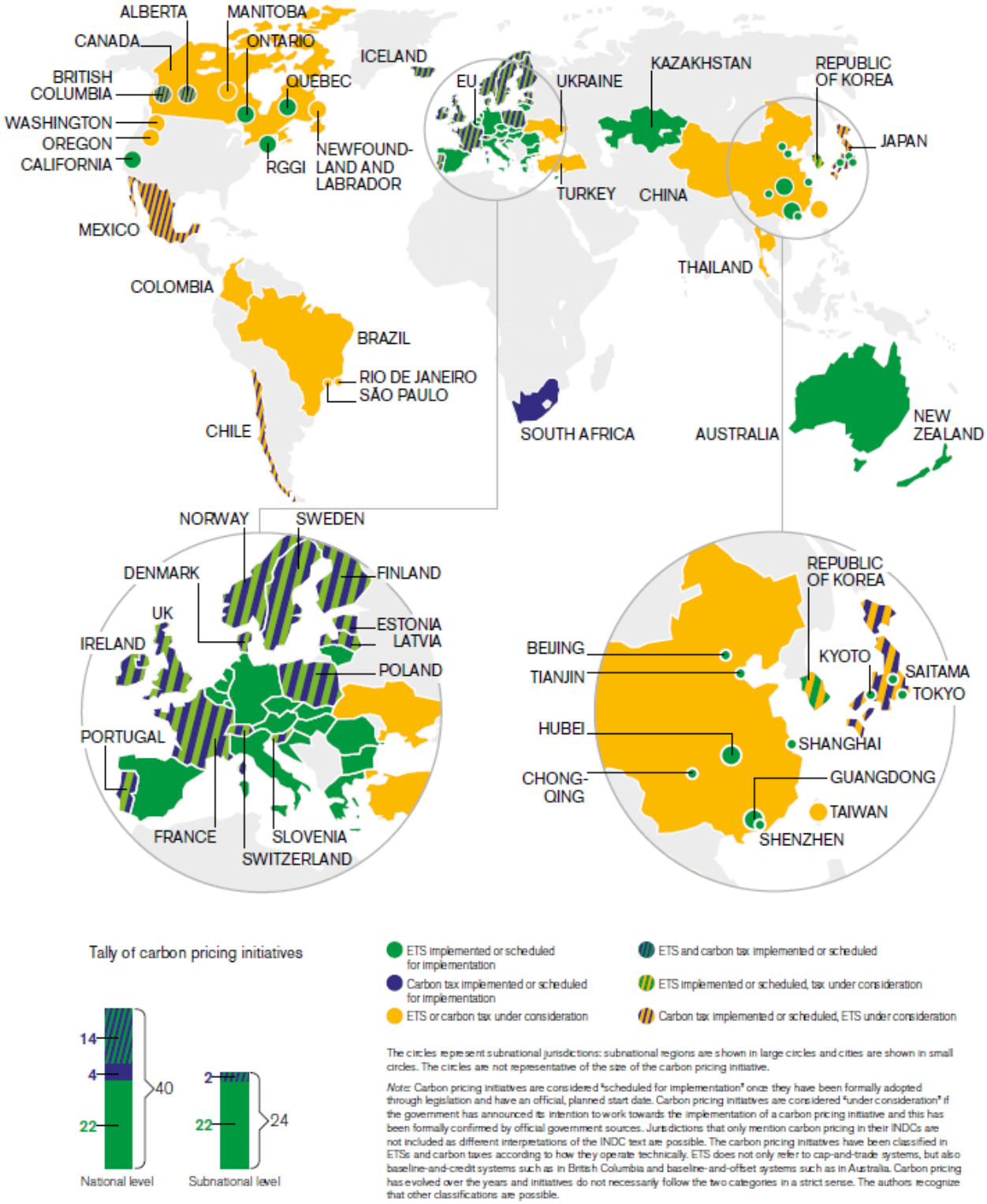
Carbon pricing as a financial stimulant

Pricing carbon dioxide is a viable conventional method of creating an incentive for countries to commit to decreasing carbon dioxide emissions. There are many types of carbon pricing which are appropriate for different domestic circumstances and yield different results. These factors must be thoroughly assessed before committing to a particular carbon pricing initiative as it will undoubtedly have great repercussions for the economy. Currently, we are seeing a trend of national and subnational jurisdictions but also private sector entities choosing to adopt carbon pricing systems.

Usually the first stage in carbon pricing is when they begin to capture what is known as "external costs of carbon emission". These are costs that the public pays for regardless in different forms, such as healthcare costs from heatwaves, damage to crops, property damage from flooding and sea level rise. Through capturing the external costs of carbon emissions in a carbon price, it ties these costs to their source. It shifts the burden of the cost back to those who are responsible for it in the first place and have the power to reduce it. It gives an economic signal to polluters to discontinue their actions or pay for the consequences. Additionally, a carbon price stimulates the innovation of clean technology and market, fuelling new low-carbon drivers of economic growth.

A regional system of carbon pricing has also been implemented in the EU. Analysing its model can give us a clearer understanding of its effectiveness and benefits, but also how similar systems could be implemented worldwide. To date, 11 gigatons of carbon dioxide equivalent (or about 20% of GHG emissions) are covered by 51 carbon pricing initiatives. Over the last year, the total value of ETSs and carbon taxes increased by 56%, which currently is US $82 billion. Figure 1 is a detailed overview of the current worldwide status of carbon pricing initiatives.

Figure 1



Ramstein, Céline, et al. "State and Trends of Carbon Pricing 2018." World Bank Group, May 2018.

ETS

An emission trading scheme (ETS) puts a cap on the total level of GHG emissions and allows industries with low GHG emissions to sell their extra allowances to large emitters. This creates supply and demand for emission allowances, establishing a market price for GHG emissions. The cap ensures that the target emission reductions will take place and keep the emitters within the pre-allocated carbon budget. Though there are larger models of emission trading schemes such as that of the EU, ETSs are mostly applied to subnational jurisdictions.

An ETS ensures that the emission outcomes of a country are reliably aligned with the national target, which links well with the current emphasis on NDCs of the Paris Agreement. An ETS is far more flexible than a carbon tax and can be adjusted to changing market conditions. It can operate with price management mechanisms which will further improve price predictability and protect the economy from unacceptable price extremes which diminishes the risks carbon pricing. The trading of units in an ETS further adds on to this flexibility which improves economic efficiency.

A key disadvantage of ETSs is that emitters who claim to be exposed to trade from countries without a price on carbon are freely allocated permits. This means that many large emitters are not covered by the ETS which means that emissions are not curbed by those who have the most impact. Often ETS does not include biological emission, usually from agriculture, which is responsible for more than half the emissions in New Zeeland for example.

Carbon Tax

In contrast to an ETS, a carbon tax will directly set a price on carbon by defining a tax rate on GHG – or more practically – on the carbon content of various fossil fuels. Unlike an ETS, a carbon tax is not pre-defined, but the carbon price is. In some countries where an ETS is already in place, a carbon tax will be applied on sectors outside of this ETS.

Carbon taxes are a way to internalize the negative externality of carbon emissions. Essentially, consumers and producers must pay the full social cost of consumption. For example, a private cost of an aeroplane trip may be $400, however, the external cost of pollution from that flight might be an estimated $120. If one synthesizes the private and external carbon costs, the final price is $520. This might discourage some from flying, consequently leading to a decrease in air-traffic and thus a decrease in pollution. A carbon tax is transparent and certain, provided that [it is firmly founded in the law and rises by a pre-determined amount regularly. This allows businesses to plan with certainty and further stimulates the investment in renewable technology.

What makes the carbon tax unattractive in the eye of the general public is that often the costs emitters face are passed on to the consumer, making things like electricity more expensive. A way to compensate for this is if the revenue of the carbon tax to be returned to citizens equally. A carbon tax is quite static and though it may be raised to align with the national emission targets, there are fiscal implications of a carbon tax's inability to adjust to changing market conditions.

Major Parties Involved

United States of America (USA)

The withdrawal of the USA from the Paris Agreement is highly controversial; however, it can only be officially announced on November 4th, 2019, following the Paris Agreements timetable. There is subsequently a one year waiting period before the withdrawal takes effect meaning that the earliest the United States can officially escape the agreement is November 4th, 2020. Furthermore, with subnational jurisdictions and businesses stepping up it is likely that the US will meet its 2025 emission reduction target regardless. For example, the Governors of California and Washington have signed to the Paris Declaration on Carbon Pricing in the Americas. California has also agreed to hold regular political and technical dialogues on the implementation of carbon markets with the EU.

Currently there are no national carbon pricing initiatives in place. Since the previous attempt to pass a bill to implement a national trading system in the US in 2009, a period of relative quiescence passed. In the last few months multiple legislators have introduced bills pushing for carbon pricing at national or state level. Both ETS (Healthy Climate and Family Security Act) and carbon tax (American Opportunity Carbon Fee Act) initiatives have been introduced to the U.S. Senate.

European Union (EU)

The European Union is the third largest emitter of greenhouse gases globally and is a key player in the issue, especially in the context of using financial stimuli to achieve mitigation outcomes. It aims to decrease its domestic production of greenhouse gases by 40% by 2030. The EU is a leading player being the first international ETS, operating in 31 countries (EU + Iceland, Lichtenstein and Norway). It is also the largest ETS, accounting for over three-quarters of international trading. The EU has also stated that it aims to link the EU ETS with other compatible systems.

This year the fourth phase of the EU ETS was formally approved. Some key reforms including the annual cap reduction to 2.2% from 1.74% and the reduction of free allocation of permits across all sectors. The EU has received criticism as all carbon pricing systems have, and being a cornerstone of green policy financial stimuli, it could potentially be used as a model for other regions.

China

China has one of the highest levels of carbon dioxide levels globally, contributing to about 23.75% of the emissions. Currently, China is the largest emitter of GHG in the world as seen in Figure 2. China's NDC stated that they aimed to have carbon dioxide emissions peak and to cut emissions per unit of GDP by 60-65% of 2005 levels by 2030.

In 2017, it launched its national ETS with an initial focus on the completion of the necessary infrastructure and legal foundation. Once the ETS is operational, it will be the largest carbon market in the world. Low carbon emission innovation stimulated by carbon pricing was also cited to be a complementary objective of China. China's coverage of GHG emissions through their new ETS was largely responsible for the great increase in coverage of GHG emissions from 2017 to 2018, bringing us closer to the Carbon Pricing Leadership Coalition's (CPLC's) target.

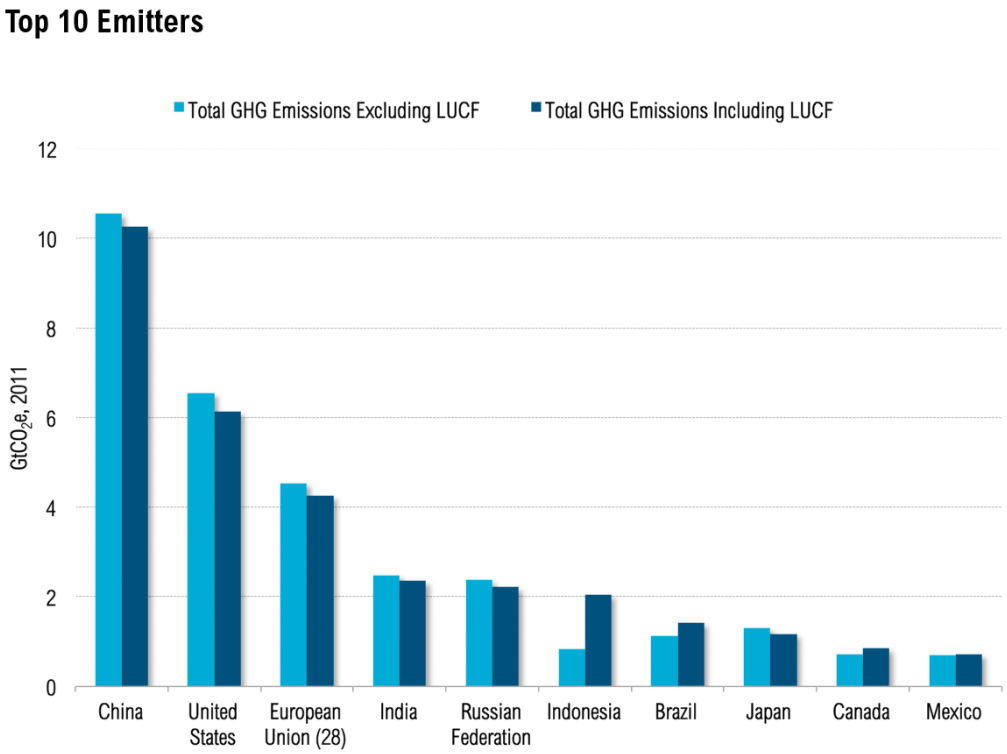


Figure 2

United Kingdom (UK)

Since 2013, the UK has maintained a carbon tax and has signed and ratified the Paris Agreement of 2016, making their incentive to combat carbon dioxide emissions clear. Fossil fuel producers are obliged to pay to emit CO2, the minimum price of said payment is the "carbon price floor". The UK's Energy and Climate Change Minister has confirmed that the UK, albeit having voted to pull out of the EU, will retain its membership of the EU Emission Trading Scheme (ETS) until its third trading phase expires in 2020.

France

In March 2018, the UK unilaterally raised its carbon floor price to £18 per tonne. As a response to this, France pushed for an increase of the carbon floor price at an EU level, hoping to increase the price across the trading bloc. France subsequently promised that its own national floor price would be set to €44 a tonne from 2022. The French Ecology minister Brune Poirson stated that: "The prices are often too weak to push real changes in behaviour and yet this is what we need if we are going to accelerate the fight against climate change,". France along with Germany, Britain, Finland, the Netherlands, and Sweden committed to sending a strong market signal towards as which would help to attain the bloc's goals of greenhouse gas reduction of at least 40% by 2030.

Canada

Although Canada has implemented a range of policies to decrease carbon dioxide emissions, it remains the largest emitter per capita as seen in Figure 3. Canada is part of the Paris Declaration on Carbon Pricing in the Americas.

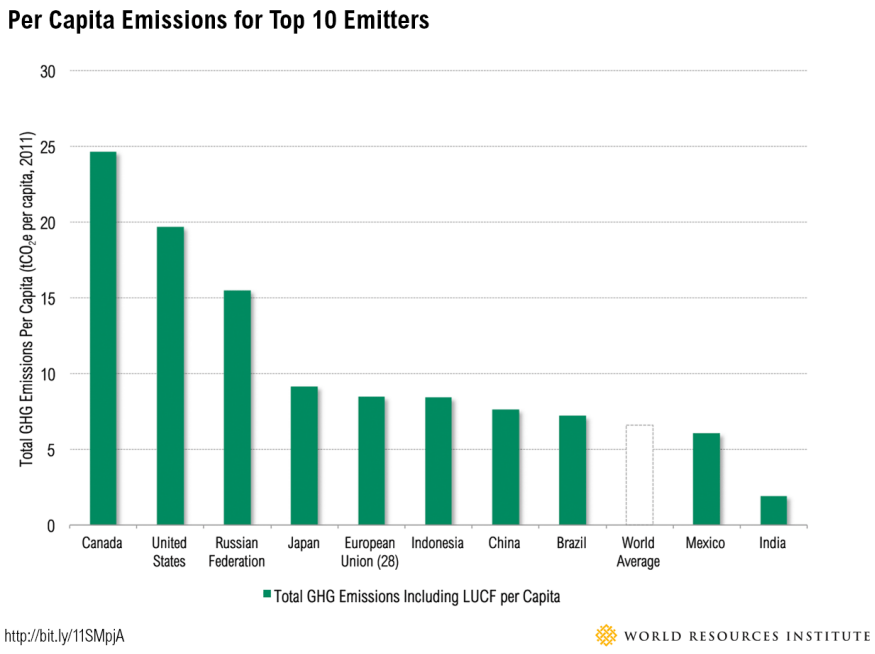


Figure 3

India

India's Paris Agreement NDC is to reduce emission intensity by 33-355 by 2030 compared to 2005 levels. They also pledged to achieve 40% of cumulative electricity installed capacity from renewable energy-based sources by 2030. India also aims to increase tree cover, additionally creating a carbon sink of 2.5 – 3 billion tonnes of CO_2 equivalent. This ambitious goal of $2.5 trillion will be financed with both domestic and international funds.

Australia

Australia was the first country to implement an explicit national carbon tax in 2012 which was repealed two years later in 2014. The tax level equated to $23 per tonne of CO_2. The tax which had been brokered by the Greens during a period of government stalemate between 2011-2012 was repealed by Australia's Senate in 2014 as it was strongly opposed by the country's two major political parties, the left-leaning Labour party, and the centre-right Liberal party. When under pressure to form a minority government, Julia Gillard the labour prime-minister who had promised "there would be no carbon tax under the government I lead", made a deal with the Green party to legislate a carbon price; a carbon tax by another team. She received a lot of heat and anger and was branded "Ju-Liar" by a right-wing shock jock. Not only did the political cynicism inhibit the political capabilities of the first female prime minister of Australia, but her perceived lack of a conviction in the carbon price policy also damaged its credibility.

In 2015, Australia implemented a cap-and-trade carbon price scheme that was linked to the EU ETS. The effect and success of the carbon pricing system were reported in one of Australia's major papers, partially regaining its credibility. The distribution of the carbon tax revenues was complex. A large portion went to the Australian Renewable Energy Agency for project funding including focuses on "biodiversity, low carbon agriculture, small business grants and support for indigenous communities". More than half of the revenue was reported to be support for low- and middle-income households to cover the increase in prices that business passed on to the consumers. However, in the end more than 3 million households lost more to carbon tax then they received; according to the Associated Press "voters have never stopped hating the tax and its effect on their electric bills".

Timeline of Events

Date	Description of Event
1700s	Start of the industrial revolution.
1938	Guy Callendar shows that both temperature and carbon dioxide concentration has risen over the last century. The "Callendar effect" is dismissed almost entirely.
1972	**The United Nations Environment Programme** (UNEP) is formed where climate change is hardly recognized on the agenda.
1986	Meltdown of Chernobyl reactor cripples possible plan to use nuclear power as a replacement for fossil fuels.
1987	As a result of the **Montreal Protocol**, chemicals that damage the ozone layer are restricted.
1988	To assess evidence for climate change, the Intergovernmental Panel on Climate Change (IPCC) is formed
1989	The UK Prime Minister Margaret Thatcher is the first to call for a global treaty on climate change
1989	Carbon emissions reach six billion tonnes per year
1992	**UNFCCC** is established, and countries agree to return emissions to 1990 levels
1997	**Kyoto Protocol** agreed. Developing nations agree to reduce emissions by an average of 5% by 2008 – 12. The USA does not ratify the protocol.
2005	Kyoto Protocol becomes international law for those who have ratified it
2012	Arctic sea ice is at the lowest summer cover since the measurements began in 1979.
2014	A form of carbon pricing exists in some form in most G20 member states
2015	Fossil fuels find a competitor in solar electricity and wind power in some regions.
2015	All UN member states adopt **Paris Agreement**
2016	US President Donald Trump delivers official notice that the US intends to withdraw from the Paris Agreement.

Previous attempts to solve the issue

Since the first IPCC report in the 1980s there has been a great array of initiatives to curb the effects of global warming. The most recent of these is the monumental Paris Agreement, which united all UNFCCC members into an accord which will shape the future of the fight against global warming.

In 2005, the EU ETS was first implemented paving the way for other potential international emission trading schemes. As of now, 51 carbon pricing initiatives have been implemented (or are scheduled for implementation) worldwide. This includes 25 ETSs, and 26 carbon taxes. Furthermore, a number of other green fiscal politics have been effective and have improved environmental performance in a range of countries. This incentive, however, is at a developing stage in most countries, even at a sub-national level. These initiatives play a role in helping countries domestically reduce their GHG emissions and work towards a cleaner, carbon-free world.

The Future

The foundation of the future of carbon pricing and other financial stimuli to decrease carbon dioxide emissions is in the increased cooperation between governments, businesses, non-state actors, non-governmental organizations (NGOs) and other stakeholders. The G20 has a great role in this when acting as a platform for economic discussions.

Every year, new carbon pricing schemes are implemented, and new ones are brought into consideration. What also deserves the focus of the G20 is the improvement of existing models. No carbon pricing model is perfect and with changing international markets, it is imperative carbon pricing initiatives adapt as well.

In 2030, the NDCs of the parties of the Paris Agreement are reviewed and between now and then, many things must change to achieve many of the ambitious goals nations have set. With the US most likely leaving the Paris Agreement in 2020 some aspects of the Paris Accord may have to be revaluated. Another controversial element of the future of carbon pricing is the UK's vote to leave the EU and therefore, potentially the EU's ETS. This is due to happen when the third ETS trading phase expires in 2020.

Important Decisions a Resolution Must Take

The first question that one must ask themselves before they even try to begin to tackle this topic is "what level of priority does my delegation designate to mitigating their carbon dioxide emissions?" Once this is established one can further begin to understand the policies of their delegation on carbon pricing.

Secondly, the benefits and concerns of different types of financial stimuli must be assessed on basis of your delegation's economy, infrastructure, and interests. Once you have established what you want to gain from using financial stimuli as a means of decreasing carbon dioxide emissions and by what means specifically you want to achieve this you can start to bring this issue into a G20 context.

The G20 has a lot of power in forming global economic policy, collectively controlling 85% of the global gross domestic product, but the question is how this power should be used. Seeing as most G20 members have committed to some form of carbon pricing, what is the best strategy to ensure other countries follow their example? Furthermore, should other regional ETS models such as that of the EU be adopted? Is it possible to link the Nationally Determined Contributions of the Paris Agreement to existing ETSs?

Another imperative question when considering financial stimuli as a means of combatting carbon dioxide emissions is whether this should be regulated by the UN or any other body at all. However, do not limit yourself to these questions, but rather consider what your delegation's vision of combating the emissions of GHGs is and what would be economically viable for them to achieve.

Further Reading

I) An extensive report on the state and trends of carbon pricing as published by the World Bank Group in May 2018. It is very recent and provides a detailed overview of the status of carbon pricing but also information specific to your delegation (use ctrl + f to find your delegation). https://openknowledge.worldbank.org/bitstream/handle/10986/29687/9781464812927.pdf

II) The Paris Agreement of 2016 is one of the most important documents on climate change. Understanding this agreement will give you a better understanding of what action has already been taken and contextualizes any further action on climate change. (The document is quite long and complicated, so you may choose to find a summarizing document or video) https://unfccc.int/sites/default/files/english_paris_agreement.pdf

III) This website contains information about the fiscal policies of every country regarding the environment, thus also concerning climate change http://www.greenfiscalpolicy.org/

IV) For further information on the effects of global warming, I would recommend reading the IPCC's reports on the topic https://www.ipcc.ch/report/ar5/syr/.

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