

Decoding Carbon

#DECODINGCARBON

Activity: Negative Externality Game – Collective Action and Climate Change



Market Failures and Government Intervention: Need for Climate Policy

Climate change is a **negative externality** as a result of **greenhouse gas (GHG) emissions** released to the atmosphere. As a result, this has led to many negative impacts across the globe, and many more impacts predicted to cause severe negative harm to Earth. In the event that a market activity causes negative externalities, **government intervention** is required to ensure the overall optimal outcome of that market activity. Government intervention for regulating climate change can take many forms, but ultimately it is dictated by the climate policy set by the government. As such, the climate policy will outline the overall goals of the government in regards to tackling climate change. Consequently, this policy drives the creation of various laws and regulations that enforces certain behaviour across various markets.

Examples of government intervention in the context of climate change include various options, such as putting a price on pollution from greenhouse gas emissions through carbon tax or a cap-and-trade system, putting in place performance standards, investing in research and innovation for developing clean technology, supporting energy efficiency standards and so on. These climate policy options are explored in detail under the Climate Policy Options topic below.

Impact Assessments

Considering climate change is a negative externality, should the costs associated with the onset of climate change be taken into consideration when planning a new project? The answer is yes, through a process called impact assessment.

The discipline of **impact assessment** has been around for decades, which includes studying all possible impacts of undertaking a project, including economic, social, human-health and environmental impacts. The answer is yes, they are through a process called impact assessment.

When planning a project, it is important to assess all impacts of implementing that project. This analysis is typically conducted as part of an impact assessment exercise, legally required in most jurisdictions, including Canada. The *Impact Assessment Act* sets the legal requirements for conducting impact assessments of proposed projects, including environmental, social, health and gender impacts. Energy projects are no different and require to go through impact assessments prior to receiving approval for implementation.

The *Impact Assessment Act* created the *Impact Assessment Agency of Canada* which is responsible for leading and managing the impact assessment process for all projects that require it. This is a holistic and thorough process, including an in-depth review of positive and negative environmental, economic,

Social, and health impacts of projects proposed by various proponents. The input received from the agency serves as an important determinant in the eventual decision making of whether the project should proceed, in support of sustainable development (Impact Assessment Agency of Canada, 2020).

Internalizing Externalities

The reason why an impact assessment is legally mandated in most jurisdictions is because of the underlying principle of internalizing externalities. When a voluntary transaction between two parties in a competitive market has a negative impact on an external non-party, then it is called a negative externality.

As such, the price at which the transaction took place does not reflect the true costs of that transaction—in the case of an energy infrastructure project such as a coal-fired power plant, the impact assessment would include economic as well as environmental and social costs such as climate change. If left to the market, there will never be a mechanism to incorporate the negative externalities into the transaction to reflect the true cost or benefit of a transaction. Therefore, in certain markets government intervention through setting policies, laws and regulations is required to ensure overall fairness in the market.

More resources can be found here:

1. Canada's impact assessment process: <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/impact-assessment-process-overview.html>
2. Internalizing externalities: <https://www.coursera.org/lecture/economic-growth-part-1/1-8-internalizing-externalities-BBkxM>

Introduction to Climate Policy – Mitigation vs. Adaptation

Climate policy typically includes focusing on two aspects – mitigation and adaptation. Climate change mitigation is a strategic measure that helps eliminate

the causes of climate change. This is done either by eliminating the factors that add greenhouse gas emissions (such as reduction in the use of fossil fuels) or increase carbon sinks that absorb the emissions (such as adding more forest cover) (NASA, 2020).

Adaptation strategies include actions that help adapt to the expected future changes as a result of climate change. While this contains many aspects, some examples include disaster management to prepare for coping with extreme weather events, dealing with decreased food security, poverty and loss of biodiversity (NASA, 2020). Policies that reinforce adaptation efforts include building more sustainable and resilient communities that enable us to prepare for the predictable and unforeseen impacts of climate change to the best of our abilities.

While there are policies that act towards mitigating the causes of climate change, there are many others that achieve both goals of mitigation and adaptation. This includes spreading awareness and education about climate change to inspire behaviour change towards mitigation and adaptation actions—for additional examples see figure below.

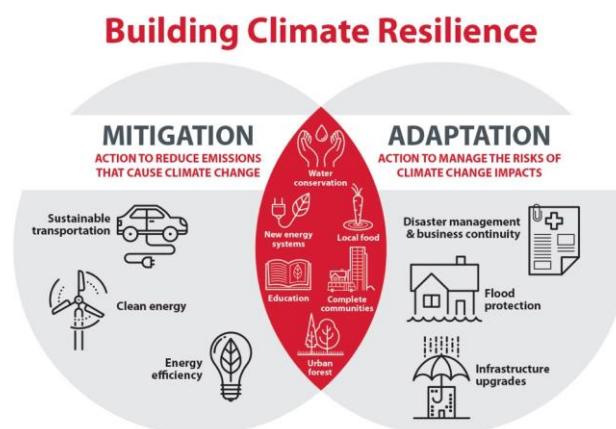


Image Source: (City of Calgary, 2018)

More resources to read:

1. [City of Calgary's climate resilience strategy](#)
2. [NASA – Responding to Climate Change](#)
3. [WWF – What's the difference between climate change mitigation and adaptation?](#)

Tragedy of the Commons

First proposed in 1968 by Garrett Hardin, the term tragedy of the commons refers to the dilemma of the overuse of limited natural resources shared by a group of individuals acting out of their self-interest. Demonstrated through an example of a group of farmers sharing a common land (i.e., 'commons') for their cows, each farmer will act out of his self-interest to add more cows to graze that land. Even though the grass will grow again to support new cows grazing the land, over time the land will not be able to sustain the grazing of too many cows as it will not grow back fast enough to support all the cows. However, the farmer would not necessarily consider whether there is enough grass left behind for other farmers, as all farmers in this scenario will act out of self-interest and only consider the benefit they receive from using the common public resource (i.e., milk from grazing more cows) (National Science Foundation, 2011).

This metaphor demonstrates that the limited natural resources of our planet paired with the overpopulation of humans where individuals always act out of self-interest to sustain themselves on this planet will eventually lead to a tragic outcome. Climate change is a tragedy of the commons—this is because the atmosphere is a shared resource by all individuals inhabiting this planet. All humans inhabiting this planet act out of self-interest when consuming these limited resources, including consumption of resources causing emissions leading to climate change, without necessarily considering its effects on other individuals. Tragedy of the commons poses the question of how to fix it, as the resource at question belongs to the 'commons' and cannot necessarily be privatized—such as the atmosphere. This leads to a need for cooperation between all individuals when consuming a limited resource to ensure the planet sustains all individuals in an equitable manner (National Science Foundation, 2012).

What is Climate Justice?

Climate change impacts different communities around the world in varying degrees, and as such the burdens of dealing with the impacts of climate change are borne unfairly or inequitably between the rich and the poor. This poses the question of **climate**

justice, which links climate change to human rights and development—i.e., ensuring the rights of the people most vulnerable to the effects of climate change are safeguarded by adopting a human-centred approach towards addressing climate change, where the benefits and burdens of its impacts are shared equitably and fairly (Mary Robinson Foundation - Climate Justice, n.d.). An important aspect of climate justice is who pays to fix it—as such industrialized countries have historically contributed more to the global greenhouse gas emissions over time, whereas many less industrialized countries more prone to natural disasters are paying the price of the effects of climate change today.

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