

Decoding Carbon

#DECODINGCARBON

Activity: Negative Externality Game – Collective Action and Climate Change



A climate policy typically includes various instruments used synonymously, reinforcing each other and achieving the overall target of emissions reduction. Below are some climate policy options that may be part of a climate policy portfolio.

Carbon Pricing

Carbon pricing includes policy tools that impose a cost to emitting **greenhouse gases**. There are three main kinds of Carbon Pricing options - carbon tax, cap-and-trade system and a hybrid of the two options (Canada's Ecofiscal Commission, 2019).

Carbon Tax

A carbon tax puts a direct price on emitting greenhouse gas emissions. Typically set as \$ per tonne of emissions, this policy tool reduces emissions as there is a direct cost associated (Canada's Ecofiscal Commission, 2019). A common myth about carbon tax is that it is a cash grab for governments, which is incorrect as typically the funds generated from carbon pricing are reinvested into the society for clean tech initiatives and building a greener economy. In 2016, the Canadian government introduced carbon pricing under the Pan Canadian Framework for Climate Change which gives provinces and territories a chance to develop their own carbon pricing mechanism. In the absence of that, the federal carbon pricing is imposed; where the direct proceeds from the tax are returned back to the jurisdiction (Environment and Climate Change Canada, 2016).

Cap-and-Trade System

In a cap-and-trade system, the government puts a cap on the amount of emissions released and distributes permits equal to an allowed level of emissions to each party. Parties that emit below the cap can trade their excess permits with parties that emit over the cap. This exchange happens in the trading market, where the price of carbon is set according to the overall demand and supply of permits (Center for Sustainable Systems, University of Michigan, 2019)

Mitigation Regulations

Mitigation regulations aim to eliminate the causes of climate change by introducing measures that will reduce emissions. This may include technology and performance standards, product bans, research and development programs, and government investment into cleaner technology such as energy efficiency programs (Center for Sustainable Systems, University of Michigan, 2019).

R&D and Technology Fund Programs

Programs dedicated to the research and development of innovative technological solutions to a low carbon future. For instance, the government of Canada's Clean Growth Hub Fund supports the transition to a low-carbon and low-pollution economy (Environment and Climate Change Canada, 2020).

Conservation Programs

Programs that aim to protect communities and natural resources vulnerable to the negative effects of climate change. For instance, the government of Canada's Aboriginal Fund for Species at Risk supports the conservation, protection, and recovery of species at risk and their habitats on Indigenous lands or traditionally used territories (Environment and Climate Change Canada, 2020).

Energy Efficiency Programs

Energy saving programs supported by the government, incentivize the adoption of energy efficient consumer products, residential and commercial buildings efficiency retrofits and alternative fuel vehicles. Below are some examples of energy savings measures supported by governments across North America:

- Installation of LED lighting across residential and commercial buildings
- Commercial and residential building upgrades to make them energy efficient by installing energy efficient appliances, weatherproofing to improve the building envelope, and installing high efficiency HVAC systems
- Installation of residential renewable energy systems, such as solar panels by providing incentives
- Utility demand side management programs by incentivizing the use of electricity at non-peak times (e.g., consumers of a participating utility will receive a better electricity rate if they do their laundry at a non-peak hour)
- Adoption of electric and low emissions-vehicles by providing incentives to buy such vehicles and providing free public charging stations, and or providing incentives for installing a residential garage charging unit

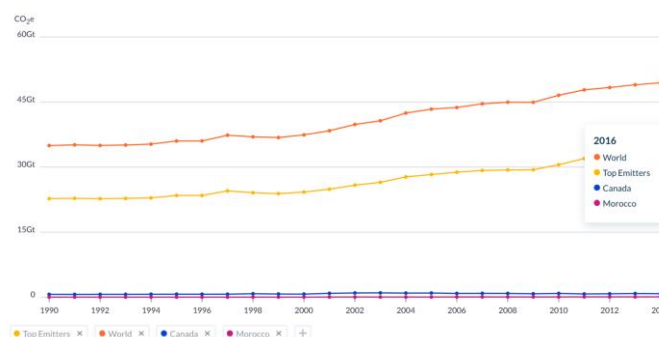
Jurisdictional Scan of Implementation of Climate Policy Options

Country Example—Morocco

Morocco is one of the only two countries, alongside the Gambia, to have CO₂ emissions reduction pledges that will limit temperature increase below

degrees Celsius in line with the Paris Agreement (National Geographic, 2019). Although Morocco does not emit many greenhouse gas emissions compared to the world (see figure below), the pledges take into account its efforts for development in the future, which primarily incorporates a low carbon future development.

Morocco's GHG Emissions



Source: (Climate Watch, n.d.)

In the last decades, Morocco developed several policies that focus on climate change resilience. The country is particularly vulnerable to the effects of droughts, low precipitation and temperature increase, posing a risk to the country's agriculture, fisheries and aquaculture (UNDP, 2017). Therefore, climate change mitigation and adaptation are a top priority for Morocco.

Morocco's National Energy Strategy calls for a drastic transition to renewable energy with a goal of sourcing 42% of its electricity by 2020 and 52% of its electricity by 2030 from renewable energy (National Geographic, 2019). Morocco is a leader in concentrated solar energy, home to the world's largest concentrated solar energy farm – the 580 megawatts Noor-Ouarzazate complex located in the Sahara Desert (image below) – the farm has the potential to offset over 760,000 tonnes of carbon emissions from our planet (CNN, 2019).

While these are mitigation efforts aimed to reducing emissions from electricity generation, Morocco is also taking various adaptation measures to become resilient to the effects of climate change. The country has identified the following strategic sectoral pillars for focusing on its climate adaptation, including: water, agriculture, fishing, forestry and fight against deforestation, biodiversity, health, tourism and housing, town planning and territories (UNDP, 2017).



Source - (ECOZH, n.d)

More information can be found below:

- https://www.adaptation-undp.org/sites/default/files/resources/morocco_nap_country_briefing_final.pdf
- <https://www.adaptation-undp.org/integrating-climate-change-adaptation-development-planning-morocco>
- <https://www.cnn.com/2019/02/06/motorsport/morocco-solar-farm-formula-e-spt-intl/index.html>

Municipality Example—The City of Calgary's Climate Resilience Strategy

The City of Calgary introduced its Climate Resilience Strategy in 2018, which builds on the two main pillars of addressing climate change, climate mitigation and climate adaptation (City of Calgary, 2018).

The City of Calgary's mitigation plan focuses on the following:

- Buildings and energy systems: Reduce GHG emissions from buildings and energy systems by investing in building energy efficiency and clean energy. For instance, improving building codes.
- Transportation and Land Use: Reduce emissions associated with the transportation industry and in how neighbourhoods are designed. For instance, supporting the adoption of electric and

low-emissions vehicles, ride-sharing, car-pooling, and cycling.

- Consumption and Waste: Reduce waste emissions and embodied emissions from the goods and services consumed by people by limiting the amount of total consumption and waste generation. For instance, by improving access to locally sourced food and improving waste management efforts.
- Natural Infrastructure: Reduce emissions by increasing the amount of carbon sinks in the city, such as conserving and managing green spaces and natural areas within the city.

The City of Calgary's adaptation plan focuses on the following:

- People: The City aims to protect its citizens from the impacts of climate change by implementing better air quality management, managing extreme heat scenarios, and conducting citizen outreach to educate Calgarians about climate adaptation.
- Infrastructure: The City aims to strengthen the built infrastructure to become more climate resilient in the face of extreme weather events. This is done by ensuring there is sufficient backup power for critical infrastructure and designing standards and practices for improved infrastructure.
- Natural Infrastructure: Ensuring the natural assets are protected to maximize the services provided by them.
- Water Management: The City aims to build resiliency by preparing for an increased risk of flooding, drought, and poor water quality. This is accomplished by ensuring proper river flow management, stormwater management and ensuring there is a long-term supply of water to all citizens.

The City's Climate Resilience Strategy can be review here in detail:

<https://www.calgary.ca/UEP/ESM/Pages/Climate-change/Climate-Actions.aspx#Eight>

Canada's Climate Policies

Canada has been a part of various global climate agreements to be one of the leading countries in tackling climate change. To ensure compliance with a global agreement, Canada has devised various policies, laws and regulations to meet the goals set out in an agreement. Under the current Paris Climate Agreement, Canada has committed to “limit global average temperature rise to well below 2°C and pursue efforts to limit the increase to 1.5°C” (Environment and Climate Change Canada, 2016). To meet this goal, Canada committed to reducing 30% of greenhouse gas emissions by 2030 compared to 2005 levels and 80% reduction in greenhouse gas emissions by 2050 compared to 2005 levels (Environment and Climate Change Canada, 2016). Below are some of the current federal, provincial and municipal policies that work together to achieve this federal commitment.

Federal Climate Action Policies

Over the years, the Canadian government has implemented various policies to tackle climate change. To meet the targets set out in the Paris Agreement, the current Canadian government under Prime Minister Justin Trudeau implemented the Pan Canadian Framework on Clean Growth and Climate Change in 2016. This federal policy aims to reduce emissions, along with growing the economy and building resilience to tackle climate change—including pricing carbon pollution, addressing market barriers for adoption of energy efficient products, and building resiliency to adapt to a changing climate (Environment and Climate Change Canada, 2016). Under the Pan-Canadian Framework on Clean Growth and Climate Change, all the provinces and territories of Canada are required to have a carbon pricing in place, with the choice of introducing a carbon tax or a cap-and-trade system. The revenue generated from carbon pricing stays within the provinces and territories, and is used to transition to a low carbon and diversified energy future (Miller Thomson, 2016). This is accomplished by pricing carbon pollution and investing the funds generated from the tax towards clean technology and innovation, which in turn will drive an increase in jobs and diversify the economy. Where carbon pricing is

not sufficient to drive change, the government will introduce tighter performance standards such as improved vehicle emissions standards and building codes. Under this framework, the government also intends to make communities and infrastructure adaptive and resilient to the effects of climate change (such as preparing for increased risks of floods, wildfires, and other extreme weather events). The government also identifies the rights of Indigenous Peoples as it implements all the stated measures to combat climate change under this framework (Environment and Climate Change Canada, 2016).

To further investigate the federal climate action plan, visit the link below.

1. [Pan-Canadian Framework on Clean Growth and Climate Change](#)

Provincial Climate Action Policies

Provinces across Canada have different climate action policies to meet the federal climate action requirements under the *Pan-Canadian Framework on Clean Growth and Climate Change*. Through provincial laws and regulations, provinces implement frameworks to address climate change, typically working in conjunction with federal laws and regulations.

Below are some resources that can be used to further understand all the current provincial climate policies in place:

1. [The Carbon Brief Profile: Canada](#)
2. [Climate Planning & Action – British Columbia](#)
3. [Climate Change Legislation – Alberta](#)
4. [Made-in-Manitoba Climate and Green Plan](#)
5. [Made-in-Saskatchewan Climate Change Strategy](#)
6. [Made-in-Ontario Environment Plan](#)
7. [Quebec Climate Change Action Plan](#)
8. [New Brunswick's Climate Change Action Plan](#)
9. [PEI Climate Change Action Plan](#)
10. [Climate Change Nova Scotia](#)
11. [Newfoundland and Labrador Climate Action Plan](#)
12. [North West Territories Climate Change Strategic Framework](#)

13. [Climate Change Action in Yukon](#)
14. [Climate Change Secretariat Nunavut](#)

Municipal Climate Policies

When it comes to acting on climate change mitigation and adaptation, municipalities are on the front lines—from combatting forest fires to ice storms to flooding, Canadian municipalities must implement grassroots actions to combat climate change (Federation of Canadian Municipalities, 2020). In a recent study on the quality of Canadian municipal climate change plans, it was found that most cities in Canada have a climate action plan, with evidence of plans being improved over time. Whereas the major challenges for municipalities in acting on climate change are limited capacity and resources, as well as lack of guided leadership from provinces (University of Waterloo, 2018).

Below are some resources to learn more about municipal climate action policies across Canada.

1. [Evaluating the quality of municipal climate change plans in Canada](#)
2. [Federation of Canadian Municipalities](#)
3. [Cities100: 100 city projects making the case for climate action](#)

Bibliography

- Canada's Ecofiscal Commission. (2019). *Carbon Pricing*. Retrieved from Canada's Ecofiscal Commission: <https://ecofiscal.ca/carbon-pricing/>
- Center for Sustainable Systems, University of Michigan. (2019). *Climate Change: Policy and Mitigation Facsheet*. Retrieved 2 27, 2020, from Center for Sustainable Systems, University of Michigan: http://css.umich.edu/sites/default/files/Climate%20Policy_CSS05-20_e2019.pdf
- City of Calgary. (2018). *Calgary's Climate Program* . Retrieved from City of Calgary: <https://www.calgary.ca/UEP/ESM/Pages/Energy-Savings/Climate-Change.aspx?redirect=/climateprogram>
- Climate Watch. (n.d.). *Historical GHG Emissions* . Retrieved from Climate Watch: <https://www.climatewatchdata.org/ghg-emissions?chartType=percentage>
- CNN. (2019). *Morocco in the fast lane with world's largest concentrated solar farm*. Retrieved from CNN: <https://www.cnn.com/2019/02/06/motorsport/morocco-solar-farm-formula-e-spt-intl/index.html>
- ECOHZ. (n.d). *Noor solar power in Morocco*. Retrieved from <https://www.ecohz.com/renewable-energy-solutions/powerplants/noor-solar-power-in-morocco/>
- Environment and Climate Change Canada. (2016). *Canada's Mid-Century Long-Term Low-Greenhouse Gas Development Strategy*. Retrieved from Environment and Climate Change Canada: https://unfccc.int/files/focus/long-term_strategies/application/pdf/canadas_mid-century_long-term_strategy.pdf
- Environment and Climate Change Canada. (2016). *Pan-Canadian Approach to Pricing Carbon Pollution* . Retrieved from Environment and Climate Change Canada: <https://www.canada.ca/en/environment-climate-change/news/2016/10/canadian-approach-pricing-carbon-pollution.html>
- Environment and Climate Change Canada. (2016). *Pan-Canadian Framework on Clean Growth and Climate Change*. Retrieved from Environment and Climate Change Canada: https://www.canada.ca/en/services/environment/weather/climatechange/pan-canadian-framework/introduction.html#1_1
- Environment and Climate Change Canada. (2016). *The Paris Agreement*. Retrieved from Environment and Climate Change Canada: <https://www.canada.ca/en/environment-climate-change/services/climate-change/paris-agreement.html>
- Environment and Climate Change Canada. (2020). *Aboriginal Fund for Species at Risk* . Retrieved from Environment and Climate Change Canada: <https://www.canada.ca/en/environment-climate-change/services/environmental-funding/programs/aboriginal-fund-species-risk.html#toc1>
- Environment and Climate Change Canada. (2020). *Clean Growth Hub* . Retrieved from Environment and Climate Change Canada: <http://www.ic.gc.ca/eic/site/099.nsf/eng/home>
- Federation of Canadian Municipalities. (2020). *Climate and Sustainability*. Retrieved from Federation of Canadian Municipalities: <https://fcm.ca/en/focus-areas/climate-and-sustainability>
- Miller Thomson. (2016). *Navigating Canada's Federal and Provincial Climate Change Initiatives*. Retrieved from Miller Thomson : <https://www.millertomson.com/en/publications/communiqués-et-mises-à-jour/environotes/novembre-2016-enviro-special-edition/navigating-canadas-federal-and-provincial-climate-change-initiatives/#federal>
- National Geographic. (2019). *Climate change report card: These countries are reaching targets*. Retrieved from National Geographic: <https://www.nationalgeographic.com/environment/2019/09/climate-change-report-card-co2-emissions/>
- UNDP. (2017). *National Adaptation Plans in focus: Lessons from Morocco*. Retrieved from Climate Change Adaptation: https://www.adaptation-undp.org/sites/default/files/resources/morocco_nap_country_briefing_final.pdf
- University of Waterloo. (2018). *New study evaluates the quality of municipal climate change plans in Canada*. Retrieved from University of Waterloo: <https://uwaterloo.ca/canadian-coastal-resilience/news/new-study-evaluates-quality-municipal-climate-change-plans>