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Meinhard Doelle

Dalhousie University Schulich School of Law, meinhard.doelle@dal.ca

Roman Dremliuga

Far Eastern Federal University - Faculty of Law

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Comparing Russian and Canadian Climate Policy: Protecting Arctic Interests?

Meinhard Doelle*

Marine & Environmental Law Institute, Schulich School of Law, Dalhousie University, Canada

Roman Dremluga

Department of International Public and Private Law, Far Eastern Federal University, Russian Federation

Abstract

The global human influence on the climate is growing at an alarming pace. This trend appears doomed to continue. Polar regions are feeling the effects first. This means that if the impacts of climate change serve to motivate effective policies, polar regions could be a good place to look for climate policy innovation. It is within this context that this article considers Arctic climate policy in Russia and Canada. The basic question posed is whether the unique and immediate threat climate change presents in the Arctic is reflected in progressive laws and policies with respect to four key areas: mitigation, adaptation, impacts and vulnerability, and development.

Keywords: *climate change, mitigation, adaptation, development path, Arctic, Canada, Russia*

Responsible Editor: David L. VanderZwaag, Marine & Environmental Law Institute, Schulich School of Law, Dalhousie University, Canada

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1 Introduction

With each passing year, the global human influence on the climate is increasing. This trend appears doomed to continue, as global efforts to curb emissions show few signs of coming into line with the science, which in turn appears to become

*Correspondence to: Meinhard Doelle, e-mail: mdoelle@dal.ca

more alarming with the passage of time. As global greenhouse gas (GHG) emissions and resulting concentrations in the atmosphere continue to increase, polar regions are feeling the effects first. This means that if the impacts of climate change can be expected to be a motivator for effective policies, polar regions could be a good place to look for climate policy innovation.¹

A Government of Canada report entitled *From Impacts to Adaptation: Canada in a Changing Climate 2007* concludes that climate changes in Canada's Arctic over the past 50 years have been unprecedented.² The report, in line with the more recent *Canada's Changing Climate Report* from 2019, notes that "there is increasing evidence that changes in climate are already having impacts on ecologic, economic and human systems" in the Arctic.³ Among the key findings of the report with respect to the Arctic are the following:

- Changes to permafrost, sea ice, lake ice and snow have important implications for human infrastructure design and maintenance.
- Climate change will have serious consequences for biodiversity shifts and the distribution of many species in the North, and for human populations that rely on them to meet their basic needs.
- Climate change will both threaten existing transportation infrastructure and offer new options, most notably marine transportation, as a result of the reduction in summer sea ice. These changes will bring new opportunities and new threats to the Arctic.
- Climate change will create additional challenges for Indigenous communities interested in retaining aspects of their traditional subsistence-based way of life, but may also provide new opportunities in this regard.⁴

The National Round Table on the Environment and the Economy (NRTEE) in its *True North* report on adaptation offered a list of impacts of climate change in the Canadian Arctic that it concluded would require the attention of policy-makers from an adaptation perspective. The following are some of the key impacts identified:

- changes to the culture of Indigenous communities
- decline in iconic species, such as polar bear and caribou
- changes to diet and food security
- threats to health, including mental health
- decreased availability of water supplies
- problems as a result of the spruce bark beetle
- melting permafrost damaging infrastructure and winter roads
- damage to municipal infrastructure
- coastal erosion and storm surges
- increase in local shipping and transit shipping in the Northwest Passage
- threats linked to increased mineral and oil and gas development.⁵

In short, the particular vulnerability of the Canadian Arctic to climate change has been known for some time. Of the two polar regions, it is the Arctic that has an established constituency, both in the form of its Indigenous population and more recent migrants from the south, often drawn to the North by opportunities related to resource extraction. Arctic Indigenous peoples' culture and way of life has historically been closely tied to a predictable and stable climate. Many of the Arctic Indigenous peoples live under developing country conditions. At the same time, much of the economic development of the Arctic that has attracted migration from the south has been based on the extraction of resources, much of it GHG intensive.⁶

The main manifestation of changes in climatic conditions in the Russian Arctic is the decrease in the area of ice in the Arctic Ocean. We can observe a decrease in ice thickness, and almost complete disappearance of perennial ice in the Russian Arctic seas. In winter, the entire water area of the Northern Sea Route continues to be covered by thick annual ice. Some studies cited in this article show that the Russian Arctic is experiencing more severe climate change impacts than the rest of the world and other parts of the Arctic.⁷ Thus, Russia's problems are similar to Canada's, but more severe.

It is within this context that this contribution to the special issue considers Arctic climate policy in Canada and Russia. The basic question posed is whether the unique and more immediate threat climate change presents in the Arctic is reflected in more progressive laws and policies with respect to four key areas: mitigation, adaptation, impacts and vulnerability, and development. A secondary question posed is whether there is any detectable relationship in the jurisdictions studied among these four areas of climate policy. Are there signs that heightened awareness of impacts and vulnerability in the Arctic is translating into more progressive policies on adaptation, mitigation, and development?

The remainder of this contribution proceeds as follows. Section 2 offers a brief overview of the UN Climate Regime as context. It then proceeds to consider climate policy in Russia in section 3, followed by Canada in section 4. Each of these two sections considers the elements of climate policy outlined above. The contribution concludes in section 5 with some reflections on lessons that can be drawn from the experience with climate policy in these two Arctic states.

2 The UN climate regime

The origins of the international climate change regime can be traced back to a series of United Nations General Assembly resolutions adopted in the late 1980s. These resolutions resulted in the negotiation of the United Nations Framework Convention on Climate Change (UNFCCC), which was adopted at Rio de Janeiro in 1992, entered into force in 1994 and established the architecture for subsequent climate change agreements. The first substantive agreement following the UNFCCC was the Kyoto Protocol, negotiated in 1997.⁸ The General Assembly

resolutions also resulted in the establishment of the Intergovernmental Panel on Climate Change (IPCC) to give scientific and technical advice to negotiators and policy-makers.

2.1 The Paris Agreement

The key elements of the approach to climate mitigation in the Paris Agreement⁹ consist of a collective long-term goal with a number of elements, nationally determined mitigation efforts, five-year review cycles of progress in implementing individual efforts toward the collective goals, and a commitment to increase ambition as part of the five-year review cycles to ensure the collective long-term goals are met. This section offers a brief overview of these elements.

The first of the key elements of the Paris Agreement is its set of long-term goals. Article 2.1 sets out the objective of keeping the global average temperature increase to “well below” 2°C and the aspiration to limit this increase to 1.5°C; these targets are at the heart of the Paris Agreement. The temperature goal is supplemented with a commitment to ensure emissions peak as soon as possible, and to reach a balance of emissions removals in the second half of the century. Arguably, 1.5°C has now become the ultimate standard against which the success of collective mitigation efforts under the UNFCCC will be measured, and it seems likely that 1.5 scenarios being explored by the IPCC will conclude that GHG emission neutrality will have to be reached before 2050.¹⁰ This ambitious set of long-term goals provides an important foundation for each state’s future nationally determined contributions (NDCs), their justification on the grounds of equity, and the five-year cycles of NDC communication and the Global Stocktake. Over time, as the IPCC completes its scenario work, the well below 2°C and 1.5°C goals can be expected to shape further discussions on elements of the long-term ambition, such as specific time frames for the expressed need for global emissions to peak as soon as possible and for reaching a balance of emissions and removals.¹¹

The long-term temperature goal also provides important context for other key elements of the Paris Agreement, particularly adaptation and finance.¹² Meeting the long-term goal is an essential pre-condition for successful adaptation efforts, and finance in turn is critical for meeting both the mitigation and adaptation goals of the Paris Agreement. Important connections are made to poverty eradication and sustainable development. Through the process to be designed for the Global Stocktake under Article 14, the long-term goal articulated in Article 2 is expected to become the ultimate guide for implementation of the Paris Agreement.¹³

In short, at the heart of the Paris Agreement, along with adaptation, finance, transparency and review, is the mitigation effort, largely represented by the individual NDCs measured against the long-term temperature goal, but supplemented by efforts outside the UN climate regime, such as efforts of the International Maritime Organization, International Civil Aviation Organization, and initiatives under the

ozone regime to eliminate the use of hydrofluorocarbons (HFCs).¹⁴ Parties recognized in Paris that the initial NDCs would not add up to an adequate collective effort in light of the long-term goal. NDCs are to be strengthened every five years starting in 2020, informed by the 2018 Talanoa Dialogue (the facilitative dialogue under the UNFCCC), and then every five years starting in 2025, following a Global Stocktaking exercise carried out two years before each updated NDC is due.¹⁵ The Paris Agreement offers important guidance on how parties are to determine the adequacy of their NDCs with respect to mitigation.¹⁶

3 Russia's climate policy

Russia is one of the top world emitters of GHGs and has begun to recognize its responsibility with regard to mitigating its impact on climate. As mentioned by the President of the Russian Federation at the East Economic Forum, Russia plans to reduce emissions to 75% of 1990 levels,¹⁷ considering the absorptive capacity of forests.¹⁸ Russia has begun to recognize that it has become a significant victim of climate change. Global warming in Russia is happening 2.5 times faster than the average global warming.¹⁹ According to official reports of the Russian authorities, particularly dramatic consequences of climate change will affect permafrost zones and the Arctic.²⁰ Russia acknowledges its responsibility and has become a party to the Paris Agreement.²¹

The real development of modern climate policy in Russia began after it ratified the Kyoto Protocol in 2005. Since then, it has more consistently developed its climate change policy. The decision of the Russian Federation to ratify was essential to the international regime of climate protection. Due to Russia's accession to the Kyoto Protocol, the necessary conditions were satisfied for this international agreement to enter into force.²² The Protocol had to be ratified by Annex B countries representing 55% of total Annex B carbon dioxide emissions in 1990.

The first few years after ratification were unnoteworthy, since Russia had to coordinate and balance other vital interests with climate policy. However, in 2008, the Government of the Russian Federation enacted the Concept for Long-Term Social and Economic Development of the Russian Federation up to 2020.²³ One year later the Russian President enacted the Climate Doctrine of the Russian Federation.²⁴ Officially, Russia now supports global efforts to develop and implement climate change policy, despite the fact that there are significant political players within Russia who do not share global concerns on the climate issue. Of note, Russia met its first commitment period targets under the Kyoto Protocol due to the dramatic economic crisis of the 1990s. In effect, a decrease in GDP led to a reduction of carbon dioxide emissions. Russia did not have to take measures to reduce emissions since emissions during this period were naturally much lower than they had been in 1990. Moreover, Russia even gained an advantage in the form of an emission allowance that it could sell because of its surplus.

In accordance with Article 7 of the Climate Doctrine, the basic principles of the climate policy are:

- the global character of the interests of the Russia in relation to climate change
- the priority of national interests in development and implementation
- transparency and informational openness
- recognition of the need for action both within the country and within the framework of a full-fledged international partnership in international research programs and projects related to climate change
- comprehensive consideration of potential losses and benefits associated with climate change
- adoption of the precautionary principle to ensure the security of human beings, the economy and the state from the adverse effects of climate change.

In order to implement the Climate Doctrine and define the road map for its realization, in 2011, the Russian government enacted the Comprehensive Implementation Plan of the Climate Doctrine of the Russian Federation for the Period up to 2020.²⁵ In 2020–2021, Russia’s national climate policy was updated. It became more sophisticated and comprehensive. For instance, federal mitigation policy was legislated in the form of a federal law “On limiting greenhouse gas emissions.”²⁶ For adaptation measures, a new separate plan was enacted.²⁷ Such detailed implementation measures imply that Russia may be moving from declarations to active actions. The Russian Federation has signed and accepted the Paris Climate Agreement, though it did not apply the standard procedure of ratification. Most international treaties are ratified by an enactment of Federal Law, but the Paris Agreement was accepted by an Order of the Government.²⁸

At the end of 2021, it became known that the Russian authorities expect to achieve a carbon-neutral economy by 2060. Russian President Vladimir Putin announced these plans during a plenary session of Russian Energy Week in October 2021.²⁹ Also, under the target scenario “Strategy for socio-economic development of Russia with low greenhouse gas emissions up to 2050” by 2050, emissions will be 60% lower than in 2019 and 80% lower than in 1990. Further implementation of this scenario will allow Russia to achieve carbon neutrality by 2060.³⁰

Three dimensions of Russian climate policy will be further elaborated below: (1) mitigation, (2) impacts, vulnerability and adaptation, and (3) development. However, it is difficult to clearly identify Russian climate policy in relation to the Arctic region. There is no special Russian Arctic policy in terms of mitigation, but there are some Arctic specific measures with respect to impacts, vulnerability, adaptation and development.

3.1 Federal mitigation policy

Federal mitigation policy has evolved over time and through the changing attitude of the Russian Government toward climate change. There is no doubt that changing politicians' minds is more difficult than revising legislative acts, and evolution in this regard has been modest. For instance, there were numerous official Russian statements regarding doubts over the anthropogenic nature of current climate change during the period of enacting the Climate Doctrine and planning for ratification of the Kyoto Protocol. International efforts to address climate change were often viewed with suspicion and scepticism by Russian politicians.³¹

The Climate Doctrine was a shifting point in Russian mitigation policy. In accordance with Article 23 of the Doctrine, “[t]he Russian Federation shall concentrate its efforts to the maximum extent possible on reducing anthropogenic emissions of greenhouse gases and increasing their absorption by sinks and accumulators.” In order to achieve this goal, the Doctrine proposes several directions:

- improve energy efficiency
- increase the use of renewable and alternative energy sources
- implement financial and tax measures to stimulate reduction of anthropogenic greenhouse gas emissions
- protect and improve the quality of greenhouse gas sinks and accumulators.

The first comprehensive plan for implementation of the Climate Doctrine of the Russian Federation for the period up to 2020 was adopted in 2011.³² The plan provides for a wide range of measures, from the education of specialists and raising of public awareness to the development of a long-term GHG emission forecast model for the Russian Federation. The plan also recommends developing and implementing operational measures to mitigate anthropogenic impacts on climate.

In 2021 the Federal Law “On limiting greenhouse gas emissions” was adopted, coming into force 180 days after its adoption. It defines the following principles for mitigating greenhouse gas emissions:³³

- ensuring sustainable and balanced development of the economy of Russia while reducing greenhouse gas emissions
- obligating regulated organizations to submit regular reports on greenhouse gas emissions
- making the fulfilment of targets for reducing greenhouse gas emissions mandatory
- implementing climate projects on a voluntary basis
- promoting scientific validity, a systematic and comprehensive approach to limiting greenhouse gas emissions.

Of note, federal mitigation policy is not homogeneous. As the energy sector was the main source of GHG emissions in Russia, comprising more than 80% of the country's total emissions in 2008, an extensive part of the Doctrine and the plan was devoted to the energy sector and energy efficiency.³⁴ The key operational measures that directly concern the generation of energy are implementation of a set of measures to limit greenhouse gas emissions during energy generation from fossil fuels, implementation of measures to increase the use of renewable energy sources for heat and electricity generation, and introduction of innovative technologies based on the use of atomic energy.

Thus, reducing GHG emissions in the energy sector is the main priority of Russia's federal mitigation policy. The text of the new Energy Strategy of Russia explicitly states that one of the main indicators of successful realization of the energy strategy is reducing the negative impact of the activities of fuel and energy complex organizations on the climate and their adaptation to climate change.³⁵

In terms of numbers, the Russian mitigation policy, in line with the "action plan to ensure the reduction of greenhouse gas emissions to the level of no more than 75 percent of the volume of these emissions in 1990," is to take such necessary measures to reduce emissions by 2020.³⁶ In accordance with this policy, Russia's Energy Strategy states that greenhouse gas emissions will remain at 70–75% of the 1990 levels in 2035.³⁷ The intended nationally determined contribution (INDC) of Russia, submitted in advance of the COP 21 negotiations, included a commitment to reduce anthropogenic greenhouse gases by 30% below 1990 levels by 2030.³⁸

In response to signing the Paris Climate Agreement, in 2016 Russia enacted a new plan for implementing measures to improve state regulation of greenhouse gas emissions and to prepare for ratification of the Paris Agreement.³⁹ The presidential decree on the approval of the goal of greenhouse gas emission limitation by 2030 was issued in November 2020.⁴⁰

Despite the favourable perception of emission reduction measures by the Russian government and society, there have been difficulties implementing such measures. First, political confrontations with the countries of Western Europe and North America have hindered implementation efforts. Sanctions imposed on Russia have limited Russia's access to necessary technologies and investments. Sanctions are aimed at influencing Russia in its foreign policy, but as a side effect, they have had a significant effect on domestic policies to reduce greenhouse gas emissions. The Russian energy sector is the main actor in such reduction policies and it is also the main target of sanctions by the European Union and United States.⁴¹ Due to these sanctions, oil, gas and coal companies have put more investment into the development of extraction technologies to substitute for banned foreign technologies.⁴² This in turn has diverted resources from other areas (including environmental modernization).⁴³ Some authors have concluded that the lack of technologies for the efficient use of natural resources and other ecology technologies poses a significant challenge for Russia.⁴⁴

The sanctions have particularly affected the energy sector, which has been entrusted with most of the responsibility for reducing GHG emissions. In order to comply with the emission reduction plan, the energy infrastructure needs to be modernized, which will require substantial investment. However, in the current international environment, neither the European Union nor North American countries will invest in Russian industry.⁴⁵ A further significant factor that may affect Russia's plans to reduce GHG emissions is the drop in oil prices. Due to the oil price collapse, Russian energy companies have been forced to revise their investment policy and reduce investment in environmental protection measures.⁴⁶

It is clear from official statements and enacted documents that the Russian strategy of mitigation mostly concerns the energy sector and the development of forest sinks. Moreover, as the Russian economy is heavily dependent on resource extraction, a rapid transition to renewable energy would threaten short-term economic and social stability. The Russian Federation supports international efforts aimed at combating climate change, but the issues of climate change and environmental protection have to be considered without prejudice to the interests of energy-producing states.⁴⁷ Aspects of sustainable development such as ensuring universal access to energy and developing clean hydrocarbon energy technologies have to be taken into consideration.⁴⁸

Despite the economic and political difficulties in meeting its commitments to reduce greenhouse gas emissions, Russia is consistently implementing plans in this area. Strategic documents have been adopted, and legislation and methods for calculating greenhouse gas emissions have been revised. Nevertheless, internal and external problems may become a significant factor working against implementation of Russia's emission reduction plans. Further, Russia, as the fourth largest emitter in the world, is obliged to undertake more efforts to follow the Paris Agreement, because most of its achievements to date are due to the economic crisis and depopulation after the disintegration of the USSR.⁴⁹ Russia has made a significant step toward implementation of global climate policy by ratifying the Paris Agreement.

3.2 Impacts, vulnerability and adaptation

Impacts, vulnerability and adaptation are important elements of Russian Arctic policy. Fundamentals of State Policy of the Russian Federation in the Arctic until 2035 states that one of the main goals of the policy is the "protection of the Arctic environment."⁵⁰ Among others, the policy includes the following measures concerning climate change: expansion of research on natural and natural-technogenic hazards in the Arctic, development and implementation of modern methods and technologies for forecasting such phenomena in a changing climate, as well as methods and technologies to reduce threats to human life; development and application of effective engineering solutions to prevent damage to infrastructure elements due to global climate change; and development on a scientific basis of a network of

specially protected natural areas and water areas in order to preserve ecological systems and their adaptation to climate change.

In contrast to the 2000s, and even more so the 1990s, more recent Russian studies have concluded that climate change is having a negative impact, especially in the Arctic and polar regions. Spatial development strategies of the Russian Federation for the period up to 2025 state that the consequences of climate change, especially the melting of permafrost regions, poses a serious threat to the socio-economic development of the Russian Federation.⁵¹ Climate change is also mentioned as a factor affecting state security.⁵²

In addition, almost every strategic document enacted in the last decade contains a list of such challenges in its sphere. Among such documents are the National Security Strategy,⁵³ Environmental Safety Strategy,⁵⁴ Forestry Development Strategy,⁵⁵ the Concept of Sustainable Development of Small Indigenous Minorities of the North, Siberia and the Far East,⁵⁶ Basics of State Policy in the Field of Environmental Development,⁵⁷ Foundations of the State Policy in the Arctic,⁵⁸ the Strategy of Spatial Development,⁵⁹ and the Strategy for Activities in the Field of Hydrometeorology and Related Areas.⁶⁰ The abundance of documents indicates that the federal government is aware of the impacts and vulnerability of Russia to climate change, but demonstrates that there are competing views on policy in this area. These strategies differ in terms of language, timing, challenges and measures. Of note, there is no single governmental body in charge of Russian climate policy and coordinating climate policies across different ministries. Theoretically, the Russian Federal Service for Hydrometeorology and Environmental Monitoring (Roshydromet) could function in this manner, but it has no significant role in terms of authority and resources.

Studies of the consequences of climate change conducted by Roshydromet show that the Russian Arctic is more vulnerable to the negative impacts of global climate change processes than previously thought. The average rate of warming (the linear trend for 1976–2018) for the Earth's land surface is 0.29°C per decade. The average for the territory of Russia is 0.47°C per decade, which is 68% higher than for the Earth's land surface. In the Russian Arctic, the average is 0.69°C per decade.⁶¹

Russia actively studies the influence of climate change on the Arctic Ocean. For instance, the Arctic and Antarctic Research Institute carried out an Arctic 2018 expedition in August–September in the Laptev Sea, East Siberian Sea and adjacent deep-water parts of the Arctic basin to study the transformation of Atlantic waters in the Arctic basin and their impact on the hydrological regime of the marginal seas.⁶² In July 2019, the Research Institute launched an expedition to assess the state of the waters, marine and coastal ecosystems of the Arctic seas in relation to global climate change.⁶³

Russia's adaptation efforts are reflected in comprehensive plans for implementation of the Climate Doctrine.⁶⁴ The most recent plan was adopted in 2019, namely, the National Action Plan of the First Phase of Adaptation to Climate Change for the Period till 2022.⁶⁵ The plan does not define specific measures for the Arctic

but implies that measures are to be implemented by specific ministries. The plan supposes some climate change adaptation measures in the Arctic. For example, in accordance with the plan, several ministries have been tasked with developing industry adaptation plans for climate change in the Russian Arctic Zone. Among the ministries that have to develop such plans are the Ministry for the Development, Roshydromet, Rospotrebnadzor, the Ministry of Economic Development, the Ministry of Finance, the Ministry of Construction, and the Ministry of Natural Resources and Environment.

Some of these plans or their drafts have already been developed and published but include no specific measures regarding the Arctic. For instance, the Ministry of Natural Resources and Environment and the Ministry of Construction climate change adaptation plans for natural resource management do not specify adaptation measures for the Arctic.⁶⁶ Only the Ministry for the Development of the Russian Far East has prepared a plan for adaptation to climate change in the Arctic.⁶⁷

3.3 Russia's development path

As discussed above, prior to Russia's accession to the Kyoto Protocol, climate change was generally perceived in the political sphere as a positive factor. Thus, many policy and practical documents have development measures related to climate change. Until the last decade, all adaptation measures could be referred to as development measures.

An obvious development measure is the establishment of a sea highway within the framework of the Northern Sea Route.⁶⁸ The development of the Northern Sea Route and the provision of shipping services in the Arctic is one of the sub-programs of the state program "Social and Economic Development of the Arctic Zone of the Russian Federation"⁶⁹ and the objective of various transportation strategies and road maps.⁷⁰ The Fundamentals of State Policy of the Russian Federation in the Arctic for the period up to 2035 defines the development of the Northern Sea Route as a main priority of the Russian Arctic policy.⁷¹

Basically, the position of Russia is that regardless of melting sea ice, environmental standards applied to ships that go through Northern Sea Route should not become less strict. In 2013, Russia adopted the Strategy for the Development of the Arctic Zone of the Russian Federation and Ensuring National Security for the Period up to 2020 (Arctic Development Strategy).⁷² The Strategy defines the goals, principles, key areas, and objectives of the government in the sphere of Arctic development and enumerates the basic risks and challenges for security and future development, but excludes any reference to a possible change in the legal status of the Arctic due to the decrease in ice cover. Moreover, Russia does not recognize any concerns or needs regarding the legal status of the Russian Arctic region.

The second economic driver for the Arctic region from the Russian government's point of view is resource extraction. As mentioned in the Maritime Doctrine of the Russian Federation, "[t]he national maritime policy in the Arctic regional direction is

determined by the special importance of ensuring the free access of the Russian fleet to the Atlantic and the Pacific Ocean, the richness of the exclusive economic zone and the continental shelf of the Russian Federation, and the increasing importance of the Northern Sea Route.” This is also reflected in the 2013 Arctic Development Strategy.

As the majority of the development measures were enacted before official recognition by the Russian authorities of the anthropogenic character of climate change, they are not positioned as climate change adaptation or mitigation measures. Despite the difficulties with investments and technology imports due to sanctions, Russia has successfully implemented projects in several areas, mainly due to the consolidation of domestic resources. It is fair to say that there is no coherent policy in Russia to develop the Arctic in the context of climate change, however, separate strategic initiatives have been adopted to deal with the consequences of climate change.

4 Canada’s climate policy

In Canada, there are a number of jurisdictions who share control over Canada’s Arctic territory, namely, the federal government, three territorial governments, and Indigenous government structures, including those established pursuant to modern land claims agreements.⁷³ The political landscape in the North has shifted significantly over the past few decades, and is likely to continue to evolve. Historically, the North was largely under the control of the federal government, both directly and through its influence over the two traditional territorial governments, one in the Yukon, the other in the Northwest Territories. A third territory was created in the form of Nunavut in 1999.⁷⁴

Over time, territorial governments have become somewhat more independent of the federal government, gradually becoming more like provinces. The level of control at the territorial level over human activities within each jurisdiction varies based on the unique history and circumstances of each territory. The Yukon government, for example, has exercised administrative control over resource development on public lands since 2003. Ownership, however, remains with the federal government.

Comprehensive land claims and self-government agreements with Indigenous peoples who occupy the Arctic have resulted in yet another layer of government in parts of Canada’s North. In the Yukon, 11 out of 14 First Nations have entered into comprehensive land claims agreements with the federal government. In Nunavut, the comprehensive land claims and self-government agreement between the Inuit and the federal government itself resulted in the creation of the territory of Nunavut. In the Northwest Territories, only some of the various Indigenous claims have been settled through comprehensive land claims agreements to date, with many others in various stages of the negotiation process. The majority of the territory is covered by often overlapping comprehensive land claim agreements. Each agreement has its unique features, and allocates different rights and obligations to Indigenous

communities with respect to a range of issues, including environmental protection, resources and control over development.⁷⁵ The result is a complex and ever-changing jurisdictional picture throughout the North. Ownership of resources, regulatory control over their development, and the right to share in the revenues generated from their development vary from territory to territory, and within each territory depending on the existence and nature of comprehensive land claim agreements.

In the following sections, the federal climate policy efforts in Canada are considered in three broad areas: (1) mitigation, (2) impacts, vulnerability and adaptation, and (3) Canada's development path. This is followed with an assessment of climate policy at the territorial level of government in Canada in the same three areas. Given that the differences among the territories are modest, the three territories are considered together.

4.1 Federal climate policy

Federal climate policy has evolved over time since Canada's early leadership on this issue in the late 1980s in the form of a global conference on climate change in 1988 in Toronto,⁷⁶ and Canada's support for and ratification of the UNFCCC (signed on 12 June 1992; ratified 14 December 1992). Mitigation has received the most attention to date, and is therefore considered first. As there is no separate mitigation policy for Canada's Arctic region, Canada's general approach to climate mitigation is considered here. Efforts to anticipate impacts and vulnerabilities and to adapt to them are then considered, with an emphasis on the Arctic region. This is followed by an assessment of whether there are any signs that the issue of climate change is affecting the development path pursued by the federal government.

4.1.1 Federal mitigation policy

The evolution of federal mitigation policy on climate change is perhaps best viewed as developing in four stages represented by four very different governments during the period from 1988 to 2022. The first period from 1988 until 1993 represents the Conservative government of Brian Mulroney. The second stage from 1993 until 2005 represents the Liberal governments of Jean Chretien and Paul Martin. The third phase from 2006 to 2015 represents the Conservative government of Stephen Harper.⁷⁷ The final phase under current Liberal Prime Minister Trudeau is ongoing. The focus in this section will be on the last two stages, as they have the most relevance to the current situation.

When the Harper Conservative government took office in 2006 as a minority government, it refused to implement the climate action plan developed by the previous Liberal government. It took over two years for the Harper government to begin to release details of its own climate policy.⁷⁸ The essential elements of this policy emerged over the course of the following four years, increasingly so after the Harper government won a majority in 2011. The primary objective of the Harper

government's climate policy appears to have been to shield Canada's resource extraction and energy industries, particularly oil sands developments, from the impacts of climate policy. To this end, the government withdrew from the Kyoto Protocol, and it shifted from a position of international leadership to a reluctant participant in the UNFCCC process.⁷⁹ Domestically, the Harper government spent its time in office refusing to implement the climate policies of the previous government, and replacing existing climate mitigation measures with its own, often less effective ones.⁸⁰

The Harper government reduced Canada's mitigation pledge from around 555 MT CO₂ eq by 2012 in the form of the Kyoto Protocol to 575 MT CO₂ eq by 2020 in the form of Canada's Copenhagen pledge.⁸¹ It did so, even though its mitigation commitment was clearly inadequate in light of the current science and any reasonable principle of equity. Emissions, in the meantime, continued to rise in Canada.⁸²

The Liberal Party under Justin Trudeau showed signs of leadership on climate change during the 2015 federal election. It beat out the NDP in part by appealing to traditional NDP and Green Party voters on issues such as climate change. Once elected, it continued to show leadership during the UN climate negotiations, by playing an important, constructive role in the final days of the Paris climate negotiations in December 2015. It was part of an "ambition coalition" of over 100 countries that secured the inclusion of the global goals of keeping temperature increases to well below 2°C while striving for 1.5°C, and aiming to reach global carbon neutrality by the second half of the century. Canada continued to show leadership by ratifying the Paris Agreement quickly to help bring it into force in record time by November 2016.

As the Trudeau government turned its attention to domestic implementation, the failure to turn international leadership into domestic action soon began to show. The first step was not encouraging. In spite of its criticism of the Harper government on its inadequate efforts on climate change, and in spite of its commitment to the Paris Climate Agreement, the Trudeau government did not increase the ambition of Canada's NDC from the inadequate NDC the previous government had filed before the Paris Agreement was finalized. In spite of agreeing to provisions in the Paris Agreement that recognize the gap between individual commitments and the collective goals and calls for an increase of effort over time to meet the collective goals, Canada continues to show no willingness to increase its commitment by revising its NDC.

The second step of the Trudeau government was more encouraging. It was able to negotiate a Pan Canadian Framework on Climate Change with most of the provinces and all territories.⁸³ The agreement was disappointing to some in that it did not bring all provinces on board, and its commitment would not get Canada all the way to its 2020 or 2030 emission reduction targets under the inadequate NDC filed by the Harper government. Nevertheless, it had the potential to be an important

breakthrough in overcoming the past divisions over effective climate mitigation in Canada and to put Canada on the path to decarbonization.

Perhaps the biggest flaw of this effort was the federal government's failure to clearly position the Pan Canadian Framework, from the start, as an initial step that needed to be strengthened over time in line with Canada's commitments under the Paris Agreement. Instead, it became an inadequate high-water mark to be attacked and whittled down by interests that oppose the decarbonization of Canadian society out of near-sighted self-interest and political opportunism. It is clear that the opposition to the transition comes from those who benefit from the status quo. There is no credible evidence that Canada, as a whole, will benefit from resisting this transition. There are strong indications to the contrary even in the short to medium term, and the combination of the cost of inaction and the economic opportunities associated with action leaves little doubt about the net economic benefits of decarbonization in the long term.⁸⁴

Since it negotiated the Pan Canadian Framework, rather than fully implement it and prepare for the next level of effort, the Trudeau government took a number of steps backward in response to relentless pressure from some provinces and industry sectors. Such steps include the following:

- Developing backstop legislation for a key element of the Pan Canadian Framework, the carbon pricing element, that abandons the spirit of the Framework by exempting 70% of emissions for some industry sectors from the carbon price. This essentially means that most emissions from these sectors are actually not subject to a carbon price at all.⁸⁵
- Announcing that exemption to some industries will be increased to 80 and 90%, further eroding the carbon pricing element of the Framework, meaning that even more emissions from these sectors are not subject to a carbon price. Assuming modest efforts to reduce emissions, these sectors may now be exempt from the carbon price all together, without a clear signal that the remainder will be priced in the future.⁸⁶
- Negotiating agreements with some provinces that will delay the 2030 coal phase out under the Pan Canadian Framework well past 2030.⁸⁷
- Significantly weakening its methane emission reduction initiative under the Framework, even though it is clear that reducing methane emissions in the short term is critical for meeting the collective goals in the Paris Agreement, given that methane is a much more potent GHG than carbon dioxide, with a shorter lifespan in the atmosphere.⁸⁸
- Indicating that it intends to exclude certain new fossil fuel projects (such as in situ oil sands projects) from the scrutiny of its reformed assessment process under the new Impact Assessment Act.⁸⁹
- Approving new fossil fuel infrastructure without imposing conditions on the approvals to ensure consistency with Canada's climate commitments (such as

carbon offsetting or restricting project lifespans in line with a clear decarbonization time frame consistent with Canada's climate commitments), and without demonstrating the economic viability of this infrastructure if it is to operate within the constraints of Canada's climate commitments.⁹⁰

- Releasing a discussion paper on a planned strategic assessment that signals a reluctance to carefully consider the climate implications of new projects, particularly infrastructure and industrial projects likely to lock in future GHG emissions and undermine Canada's ability to meet its current weak NDC, let alone meet Canada's commitment to increase the ambition of its NDC to make a fair contribution to the global effort to keep temperatures well below 2°C and to decarbonize the global economy in time to achieve this temperature goal.⁹¹

In spite of these setbacks, the government has continued its effort to implement the Pan Canadian Framework over growing opposition from provinces and some industry sectors, particularly with respect to the implementation of a national carbon price. Canada has recently indicated an intention to move beyond the ambition of the Pan Canadian Framework, and has announced more ambitious targets and additional measures intended to ramp up its mitigation effort.⁹² Overall, in spite of a clear desire by some past and the current government to show leadership with respect to climate change mitigation in Canada, efforts to date have had limited results so far, and are still not in line with what is needed for Canada to make a fair contribution to the global effort.

4.1.2 Impacts, vulnerability and adaptation

The federal government, through its own documents, has demonstrated a good and long-standing understanding of the impacts of and vulnerability to climate change, including in Canada's Arctic region. While there are still challenges with the regional and local resolution of future predictions and the pace of change we can expect, the basic threats posed to natural systems and human populations by sea level rise, permafrost melting and the reduction of snow and ice cover are well understood and documented. The profound changes to the Arctic Ocean, in particular, are expected to result in transformational changes to biophysical and human systems in Canada's Arctic region, and this awareness is reflected in government documents.⁹³

A useful framework for considering federal action on adaptation is offered by the NRTEE in its 2012 adaptation report.⁹⁴ The report considers four categories of possible government action on adaptation:

- Generation and dissemination of information, including general awareness raising, weather forecasting, and information on climate scenarios, sectoral and regional vulnerabilities, and on infrastructure resilience.
- Regulation, such as the regulation of land use, biodiversity protection, resource conservation, and the construction and maintenance of transportation and building infrastructure to ensure it is climate resilient.

- Financial measures, such as user fees to encourage resource conservation, tax credits for climate-proofing buildings, capital cost allowances on technologies for adaptation, payment for ecosystem goods and services, research and development (R&D) subsidies, and technology deployment subsidies.
- Direct government action on climate science, impacts and adaption R&D, monitoring and early warning systems, coordination and partnerships with other key actors in the region.⁹⁵

The federal government continues to operate under the 2011 Adaptation Policy Framework.⁹⁶ There have been a variety of programs and other initiatives to deal with climate adaptation in the Arctic region. Most of the efforts to date fall into the category of information generation and dissemination. Some direct government action has also been taken, primarily with respect to coordination and scientific research. Since 2000, responsible federal departments have been involved in awareness raising and education. There have been efforts to coordinate adaptation efforts in the North among relevant federal departments, territorial governments, Indigenous communities and other key stakeholders in the North. Some federal adaptation programs have never been fully implemented, while others have been short lived.⁹⁷

Clearly, Canada has made some effort on adaptation in the Arctic, most recently under the umbrella of the Pan Canadian Framework and through its Adaptation Platform. While there is no particular focus on the Arctic, or on ocean-related adaptation needs arising from sea level rise, coastal erosion, and the social and cultural impacts of changes in snow and ice cover, these issues do appear to be included in Canada's overall effort on adaptation. Relative to Canada's inaction on mitigation, the overall effort on adaptation is considerable. Regulation and financial measures, particularly with respect to resource conservation and infrastructure resilience, are thus far absent from federal adaptation initiatives. In short, while there has been some effort at the federal level, there are critical gaps in all four areas identified for government action on adaptation: information, regulation, financial measures, and direct government action.

4.1.3 Canada's development path

There are many ways that climate change can influence the development path of a particular region. Most obviously, perhaps, a country may choose to support development that is seen as contributing to climate change mitigation in some way, that is, development that supports decarbonization and thrives in a decarbonized world. A jurisdiction could furthermore decide to transition away from existing industries or industry sectors that are contributing to the problem. Both approaches can serve both as a mitigation strategy and as a development strategy, on the basis that there will be less demand for products and services that contribute to climate change in the future, and more demand for those that assist in mitigating climate change.

Similarly, there are possible connections between adaptation and development. Encouraging development in areas less likely to be affected by climate change can serve as both a sound development path and an adaptation strategy, as would the avoidance of new development in areas particularly vulnerable to climate change, such as certain coastal areas. Generally, investment in a range of technologies, goods and services needed for effective climate mitigation and adaptation can serve as a focus for economic development.⁹⁸

There is only limited concrete evidence that climate change is influencing the federal government's approach to development. Until recently, Canada as a whole in fact experienced a shift in emphasis away from value-added manufacturing and service industries in eastern and central Canada, toward energy and GHG intensive resource extraction industries in western and northern Canada.⁹⁹ The current government takes the view that it can continue to support the fossil fuel sector, while at the same time making efforts to strengthen sectors that are expected to thrive in a decarbonized world. The government has submitted a low carbon development plan for Canada in line with a commitment under the Paris Climate Agreement.¹⁰⁰

Canada's 2009 Northern Strategy considers climate change mainly as an opportunity for development in the North, in terms of marine transportation, oil and gas development, and mineral extraction. Climate change is recognized in the Strategy. If it is shaping the development path for the Arctic region, it is in the sense that reduced sea ice and warming temperatures are facilitating resource extraction and marine transportation in the Arctic. It is notable that changes to the Arctic Ocean, in particular, are seen in the Strategy as economic opportunities rather than as reasons to take climate mitigation and international leadership more seriously. There is a general recognition that existing transportation and building infrastructure are vulnerable to climate change, but no concrete steps are proposed in the Strategy. There are no other specific initiatives in the Northern Strategy that recognize the various interactions between climate change and development.

In April 2017, the federal government announced an initiative to develop a New Arctic Policy Framework to replace the 2009 Northern Strategy. This policy framework was released in September 2019. It is based on eight overarching goals, including strong economies, healthy communities, security, strong infrastructure, support for rules-based international order, knowledge-based decision-making, ecosystem health, and reconciliation. The framework is to be implemented in partnership with territorial and Indigenous governments. In its current form, it lacks the detail necessary to assess its potential as a driver for improved federal climate policy or an improved climate lens for Canada's Arctic development path.¹⁰¹

In short, there is limited concrete evidence that the many links between climate change and development are recognized at the federal level in Canada. In particular, there is no indication that industries that are not part of the solution are being discouraged or less encouraged. Offshore oil and gas exploration, for example, still seems a primary focus for economic development in spite of the challenge it

represents for climate mitigation. There is also no indication that industries that are part of the solution are being adequately encouraged and supported as part of an overall climate informed development path.

4.2 Territorial climate policy

The Arctic region of Canada is governed differently than the rest of the country. Most notably, it is made up of three territories, Yukon, the Northwest Territories (NWT), and Nunavut, rather than provinces. The significance of this distinction is primarily constitutional. Provinces are granted powers and responsibilities in Canada's constitution, territories are not. This means that in the Arctic region, the federal government has full constitutional jurisdiction, subject to Indigenous rights and title. Any powers granted to territorial governments are granted through legislation, regulation, or policy, and can be withdrawn or expanded unilaterally by the federal government.

4.2.1 Territorial mitigation policy

GHG emissions in the three territories are small in relation to Canada's overall emissions, representing less than 2 MT per year out of national emissions of over 700 Mt. Per capita emissions are comparable to other regions of Canada. Given the cold climate, and the transportation challenges, opportunities for emission reductions are more limited in the North than in the rest of the country. For example, more than half of GHG emissions relate to transportation, with off-road vehicles representing the most significant source. Short of lifestyle changes, the solutions to reducing such emissions are largely outside the control of territorial governments.¹⁰²

Clearly, climate mitigation is in its early stages in the three territories. What is most encouraging is that climate mitigation policy is being integrated with the priority issue of meeting the future energy needs of the population. Lack of capacity, resources and control appear to be the major impediments to more significant mitigation efforts at the territorial government level.

4.2.2 Vulnerability, impacts and adaptation

Adaptation priorities clearly vary. The NWT lists coastal erosion and the shortened winter road season as its top adaptation challenges.¹⁰³ Given its heavy reliance on winter roads, the NWT faces unique transportation challenges.¹⁰⁴ Yukon lists increased maintenance cost of its all-season road infrastructure, invasive species and the impact of the spruce bark beetle infestation as its top adaptation challenges.¹⁰⁵ Nunavut considers various impacts related to changes in sea ice as its top adaptation challenge.¹⁰⁶ Maintenance of its airport infrastructure is likely its most critical transportation issue. Nunavut has also developed its own adaptation strategy, which is focused on partnerships, research and monitoring, education and outreach and government policy.¹⁰⁷

All three territories are home to significant Indigenous populations, whose traditional sources of food and culture are threatened by climate change. However, the social adaptation challenge is perhaps most significant in Nunavut, where 85% of the population is Inuit, access to the wage economy is limited, and adherence to traditional lifestyles and dependence on country food, their traditional source of food, is still the strongest.

There are also many common issues. All three jurisdictions are affected by changes in permafrost, snow cover, ice cover and sea level rise, though to varying degrees. All face the challenge of improving their building infrastructure to become climate resilient. All lack the funding and control over their own destiny to address the climate adaptation challenge on their own. The production of a joint adaptation strategy is an encouraging sign of territorial cooperation.

Based on stakeholder interviews, the NRTEE identified a number of actions required at the territorial level to move forward effectively on adaptation issues in the North. Among the actions identified were the following:

- Develop internal capacity, and educate the public
- Commit to action, including through the allocation of funding and human resources and by keeping the climate strategies current
- Facilitate community action
- Develop partnerships with other governments.¹⁰⁸

A 2017 Yukon report documents CDN\$13 million spent on 80 adaptation projects between 2008 and 2017, with most of the funding coming from the federal government. Among the challenges identified in the report are the complexity of the issue of climate adaptation, funding, inadequate mitigation efforts, and competing priorities.¹⁰⁹

Overall, the adaptation challenge appears well understood at the territorial level of government. However, inadequate resources, other priorities, and insufficient public awareness and education have limited action to date. Given the increasing demand for building and road infrastructure in the near future, it will be critical for the future of northern communities that climate adaptation is fully integrated into planning and implementation as soon as possible.¹¹⁰

4.2.3 Territorial development paths

In spite of some devolution of powers over time, the territories are still highly dependent on the federal government, both financially and because the federal government still has ultimate control over resource development. Even Yukon, which was granted some control over the administration of resource development, does not own its resources. It seems clear that the federal government still sees resource extraction as the main economic driver for the Arctic region. Importantly, the 2020 climate strategy released by the Yukon government does not focus on reducing GHG emissions

from the mining sector, suggesting that there is not yet a focus on an economic development path that is consistent with decarbonization.¹¹¹

Given the financial dependence of the territorial governments on annual federal budget decisions in particular, it is unlikely that a territorial government would, on its own, give priority to a zero-emissions development path. It is not surprising, therefore, that no alternative development path has been put forward in any detail by any of the three territorial governments. What is surprising, perhaps, is that the Northwest Territory has set as its first goal in its 2030 Strategy and its 2019–2023 Action Plan the pursuit of a lower emissions development path. There is little detail offered other than some mitigation efforts such as the implementation of a carbon price and efforts to reduce the GHG emissions intensity of its energy sources.¹¹² Similar GHG emission reduction efforts are under way in the other two territories, but not in the context of the explicit goal to pursue a lower emissions development path.

5 Conclusion

As global mitigation actions continue to fail to fall in line with what the scientific community has indicated is needed to avoid the worst impacts of anthropogenic climate change, Arctic regions in Canada and Russia are facing the growing likelihood of severe changes to their climate system, changes that are much more dramatic than in other parts of the world, and changes that will threaten natural and human systems alike. In this article, we have sought to assess to what extent these facts have translated into effective climate policy in Russia and Canada. In particular, we have looked at efforts to reduce GHG emissions and to adapt to the changes, and we have considered whether Russia or Canada have changed their Arctic development path in light of climate change.

Our conclusion is that in spite of growing awareness of the scale of the impacts from climate change in the Arctic, there is limited evidence that either Canada or Russia is taking more serious action on climate change. There is every indication that both Canada and Russia understand the changes that climate change will bring to the Arctic region. There is a growing recognition, perhaps more so in Canada than in Russia, that these changes require adaptation, and that climate change poses a significant threat to ecosystems and the Arctic communities that depend on them. There is less indication in either country that the threat and reality of climate change in the Arctic has led them to choose a different development path, one that is in line with global efforts to fully decarbonize by or before 2050.

Clearly, there is heightened awareness of the impacts of climate change in both countries as a result of their Arctic territory. Much more difficult to determine is whether this awareness is translating into action. Compared to other countries with similar profiles, it is hard to conclude that Canada and Russia are global leaders on climate mitigation, or on efforts to decarbonize their economies. Having said this,

there are some signs in both countries that climate mitigation is starting to be taken more seriously, and it is certainly conceivable that concern over Arctic impacts is contributing to this shift. What is more clear is that this awareness is translating into adaptation efforts.

The main difference in climate policy between Russia and Canada lies in the nature of each country's economic structure. As a more significant part of Russia's GDP is based on extracting, processing and transporting oil and gas, this is reflected in the strategy chosen by Russia. State policy is mostly focused on replacing dirtier sources of energy production with natural gas, hydro energy and nuclear energy. Russia has put in place some initiatives in the sphere of transitioning to a green economy, however, due to immediate economic considerations, this transformation will likely take more time than in Canada.

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69. Resolution of the Government of the Russian Federation of 21 April 2014 No. 366 (edited on 5 June 2019), "On approval of the state program of the Russian Federation 'Social and economic development of the Arctic zone of the Russian Federation'."
70. Order of the Government of the Russian Federation of 30 September 2018 No. 2101-r, "Approval of the comprehensive plan of modernization and expansion of the main infrastructure for the period up to 2024"; Decree of the President of the Russian Federation of 13 May 2017 No. 208, "On the economic security strategy of the Russian Federation for the period up to 2030"; Maritime Doctrine of the Russian Federation (approved by the President of the Russian Federation on 26 July 2015).
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73. Of course, Indigenous governments established under self-government agreements are exerting growing influence over the Arctic region. In light of the diversity of these self-government arrangements, and the complexity this would add to the analysis, the inclusion of the Indigenous level of government in this study was therefore not possible.
74. *Yukon Act*, SC 2002, c 7; *Northwest Territories Act*, RSC 1985, c N-27; *Nunavut Act*, SC 1993, c. 28.
75. NRTEE, *True North*, 36; Aboriginal Affairs and Northern Development Canada, *General Briefing Note on Canada's Self-Government and Land Claims Policies and the Status of Negotiations* (Ottawa: Government of Canada, 2012); Government of Canada, *Canada's Northern Strategy: Our North, Our Heritage, Our Future* (Ottawa: Minister of Indian Affairs and Northern Development and Federal Interlocutor for Métis and Non-Status Indians, 2009), 30.
76. World Meteorological Organization (WMO) and United Nations Environment Programme (UNEP), *Proceedings of the Conference on the Changing Atmosphere: Implications for Global Security* (Toronto: WMO and UNEP, 1989).

77. See NRTEE, *Canada's Opportunity: Adopting Life Cycle Approaches for Sustainable Development* (Ottawa: NRTEE, 2012), 28; D. Mahony (ed.), *The Law of Climate Change in Canada* (Aurora: Canada Law Group, 2019).
78. Government of Canada, *Turning the Corner: Taking Action to Fight Climate Change* (Ottawa: Government of Canada, 2008).
79. O. Jull, "Canada Withdraws from Kyoto Protocol to Avoid Non-compliance Penalties," *Bulletin – Canadian Bar Association National International Law Section Newsletter* 2012.
80. One area of significant investment has been in research and development of carbon capture and storage technologies, though meaningful emission reductions from this technology are not expected in the foreseeable future.
81. The 555 MTs represents the target under the Kyoto Protocol. The 575 MTs represents the most recent pledge made by Canada within the UNFCCC. Canada's pledge is out of step with that of other developed countries, most of which had made commitments to deep cuts by 2020 compared to their Kyoto targets. Canada and the United States stood alone in pledging a 2020 target that was in fact higher than their respective 2012 Kyoto targets.
82. NRTEE, *True North*, 29. The Commissioner of the Environment and Sustainable Development (CESD) concludes that Canada's current target represented in relation to the 1990 base year is 3% above 1990 levels by 2020 compared to the Kyoto target of 6% below 1990 by 2012. CESD, "Chapter 2: Meeting Canada's 2020 Climate Change Commitments," *2012 Spring Report of the Commissioner of the Environment and Sustainable Development to the House of Commons* (Ottawa: Office of the Auditor General of Canada, 2012), 31–57, 51. See also M. Jaccard, "Canada's Kyoto Delusion: The Evidence is Finally Forcing Us to Admit We Have Done Nothing," *Literary Review of Canada* 15(1) (2007).
83. Environment and Climate Change Canada (ECCC), *Pan-Canadian Framework on Clean Growth and Climate Change* (Gatineau: ECCC, 2016).
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