# CLIMATE CHANGE IN CANADIAN ENVIRONMENTAL ASSESSMENT LEGISLATION: REVIEW AND RECOMMENDATIONS FOR FURTHER CONSIDERATION OF GREENHOUSE GAS EMISSIONS

by

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**DEDICATION PAGE**

To my family.

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**ABSTRACT**

Climate change is the most urgent crisis of our time, as reflected in international agreements like the recent Paris Agreement. State members must now integrate climate change considerations into domestic legislation to honour their commitments. Environmental assessment (EA) is considered a strong tool to address climate change, but Canadian federal and provincial legislation remain unclear on how climate change and greenhouse gas (GHG) considerations must be integrated into the EA process. The Energy East pipeline project case study illustrates the need for a better integration of these considerations for more consistent assessments. European Union and American EA legislation, as well as recognized best practices, provide inspiration for recommendations on how to incorporate climate change and GHG considerations in the Canadian EA process. Recommendations include the integration of specific GHG considerations in all Canadian EA legislation, as well as a federally established threshold approach that would trigger a climate EA process.

Keywords: Canada, climate change, environmental assessment, greenhouse gas, international law, law, legislation, Paris Agreement, regulation, threshold.

**LIST OF ABBREVIATIONS USED**

CBD – Convention on Biological Diversity

*CEAA – Canadian Environmental Assessment Act*

*CEAA 2012 – Canadian Environmental Assessment Act, 2012*

CEQ – Council on Environmental Quality

$CO_2$ – Carbon dioxide

$CO_2e$ – Carbon dioxide equivalent

COP – Conference of the Parties

CWF – Contaminant Weighting Factor

EA – Environmental assessment

EA MB – *The Environment Act* (Manitoba)

ECCC - Environment and Climate Change Canada

EU – European Union

GHG – Greenhouse gas

IPCC – Intergovernmental Panel on Climate Change

Kt – Kilotonne

Mt – Megatonne

MOU – Memorandum of Understanding

NDC – Nationally Determined Contributions

NEB – National Energy Board

*NEPA – National Environmental Policy Act* (United States)

PPM – Parts per Million

*RREIAR QC – Regulation respecting environmental impact assessment and review* (Quebec)

UNFCCC – United Nations Framework Convention on Climate Change

US – United States of America

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# CHAPTER 1: INTRODUCTION

## 1.1 INTRODUCTION: CLIMATE CHANGE AND ENVIRONMENTAL ASSESSMENT

Climate change has been at the forefront of environmental issues over the past few years. Never have climate change science and research been more categorical: climate change is happening and it is intrinsically linked to human activities and greenhouse gas (GHG) emissions.[1] International treaties and agreements have also evolved over the years to reflect this phenomenon and they now recognize the urgency to address climate change. The adoption of the Paris Agreement[2] in 2015 and its entry into force in 2016 seemed to give a second wind to this sense of urgency to act on climate change. Canada, along with many other state members, ratified the Paris Agreement in October 2016. As of April 2018, 175 parties had ratified the convention, which entered into force in October 2016.[3] The commitments made under the Paris agreement now need to be integrated into the relevant domestic legislation of each ratifying country. Ultimately, this should lead to greater domestic action towards better tackling climate change, including the adoption of new legislation or amendments thereto.

The impact of climate change has already taken its toll in Canada and throughout the world.[4] Climate change is a multisectoral and complex issue that requires the adoption of global measures and actions to be thoroughly addressed. One need not endeavour to reinvent the wheel in attempting to include in their domestic legislation some of the climate

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[1] IPCC, *Climate change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, Rajendra K. Pachauri & Leo Meyer, eds. (Geneva, Switzerland: IPCC, 2014) at 2 [IPCC 2014].
[2] *Paris Agreement*, 4 November 2016, UN Doc 2015/10/Add.1 [*Paris Agreement*].
[3] United Nations Framework Convention on Climate Change, *Paris Agreement – Status of Ratification*, accessed on 18 April 2018, online: <https://unfccc.int/process/the-paris-agreement/status-of-ratification>.
[4] IPCC 2014, *supra* note 1 at 6.

change considerations agreed upon in Paris, but strong legislative actions are still required. Some new legislation needs to be drafted, and other pre-existing legislation simply needs to be reviewed and amended to allow for the integration of these considerations. Included in the latter category are laws and regulations related to environmental assessment (EA). EA is a world recognized tool used to minimize or avoid environmental effects by considering environmental factors as part of the decision-making process.[5] Generally, EA can be described as a political process that uses science and tries to balance public, political, and private interests.[6] EA seeks to evaluate the risk of environmental impacts of a proposed project. Essentially, EA identifies potential adverse environmental effects; develops alternative mitigation measures to alleviate these adverse environmental effects; predicts if any significant adverse environmental effects will persist after the implementation of the proposed mitigation measures; and includes a monitoring program to ensure the proper application of the EA and the effectiveness of the proposed mitigation measures.[7]

The EA process generally follows a three-step approach. The first step is the scoping stage (following the indispensable preliminary screening stage that decides whether an EA is required for the proposed project). It is during the scoping stage that environmental impacts are identified. The second step involves an assessment stage, where the pre-identified impacts are evaluated and where alternatives and potential mitigation measures are proposed. Ordinarily, only significant environmental impacts are assessed and mitigated.

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[5] Canadian Environmental Assessment Agency, "Basics of Environmental Assessment" (25 March 2015), online: <http://www.ceaa.gc.ca/default.asp?lang=en&n=B053F859-1> [CEAA *Basics*].
[6] Conservation Council of New Brunswick, "Environmental Impact Assessment in New Brunswick – The Need for Reform", Position paper (2004) at 2 [Conservation Council of NB].
[7] CEAA *Basics*, *supra* note 5.

An important amount of discretion and subjectivity can be used to decide whether an environmental impact is deemed to be 'significant'.[8] The results are then usually compiled in a report for public consultation that is used to decide whether the proposed project can be approved, with or without conditions.[9] The final step of the EA process, the implementation stage, takes place once the proposed project is approved and includes monitoring activities. The implementation stage is particularly important to the EA process when it includes monitoring activities that assess the actual impacts of the project and, if needed, allows for the adjustment and mitigation of these impacts.[10] As currently shaped, climate change can be considered in all these phases of the EA process, especially through the calculation and mitigation of GHG emissions.[11]

In Canada, specific laws and regulations such as the *Canadian Environmental Assessment Act* (*CEAA 2012*) and its provincial equivalents cover the application of the EA process. Recently, the federal government has taken steps to review and reform the current EA legislation. The goal of this review process is "to protect the environment and introduce modern safeguards, support reconciliation with Indigenous peoples and ensure that good projects go ahead and resources get to market sustainably"[12]. An expert panel on the federal EA processes and on the modernization of the National Energy Board (NEB) was recently

[8] Jacqueline Peel, "Environmental impact assessments and climate change", in Daniel A Farber & Marjan Peeters, eds, *Elgar Encyclopedia of Environmental Law: Volume 1 – Climate Change Law* (Edward Elgar Publishing: Massachusetts, 2016) 348 at 350 [Peel].
[9] *Ibid*.
[10] *Ibid*.
[11] *Ibid*.
[12] Government of Canada, "Environmental and Regulatory Reviews: Proposed Approach" (29 August 2017), online: <https://www.canada.ca/en/services/environment/conservation/assessments/environmental-reviews/share-your-views/proposed-approach.html>.

put in place, with public consultations held across the country.[13] Four grand themes emerged from these consultations: inclusiveness (ensuring public participation at the earliest planning stages through the end of proposed projects), transparency (decisions made during the EA process should be based on the best available expertise, science, and evidence), keeping project reviews focused (EA should not be used for addressing policy issues), and recognizing Indigenous rights (including Indigenous peoples as partners in the development of their territories).[14] Based on the result of this review process, the federal government is presently considering changes to the EA process and legislation.[15] There seems to be a desire for a shift in the Canadian EA process and legislation; it is time for greater climate change integration.

### 1.2 Integration of GHG Considerations in the EA Legislation: the Context

EAs have been in place for decades and have since been increasingly used for the consideration of climate change.[16] The United States (US) was the first country to adopt legislation on EA, in 1970, requiring environmental impact statements for federal agencies under the *National Environmental Policy Act* (*NEPA*).[17] It was only in 1997 that the Council on Environmental Quality (CEQ) first mentioned climate change in its draft

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[13] *Ibid.*
[14] *Ibid.*
[15] Government of Canada, "Better rules to protect Canada's environment and grow the economy" (18 April 2018), online: <https://www.canada.ca/en/services/environment/conservation/assessments/environmental-reviews.html> [Canada, "Better rules"] and Bill C-69, *An Act to enact the Impact Assessment Act and the Canadian Energy Regulator Act, to amend the Navigation Protection Act and to make consequential amendments to other Acts*, 1st Sess, 42th Parl, 2018 (first reading 8 February 2018) .
[16] Jacqueline Peel, Hari Osofsky & Anita Foerster. "Shaping the 'Next Generation' of Climate Change Litigation in Australia" (2017) 41:2 *Melbourne University L Rev* 793 at 796.
[17] Michael B Gerrard, "Climate Change and the Environmental Impact Review Process" (2008) 22:3 Natural Resources & Environment 20 at 20 [Gerrard].

guidance document for *NEPA*.[18] Not only did it mention climate change, but it also deemed the phenomenon to be reasonably foreseeable and therefore advised that it should be assessed in *NEPA* documents (such as environmental impact statements).[19] The integration of climate change in the EA process is not a novelty and many other guidance documents and policies have been created since the draft guidance published by the CEQ to better integrate climate change in the EA process.[20] However, these types of documents have very limited legal weight which, in addition to sparse legislative integration, has led to limited and variable results.[21]

The importance of EA in addressing climate change has often been recognized, including in recent international agreements.[22] EA was commonly used as an expression of the international environmental commitments of a country. EA has been identified as an important tool for governments to meet their international commitments, while helping

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[18] *Ibid.*
[19] *Ibid.*
[20] For example, see the Canada, Federal-Provincial-Territorial Committee on Climate Change and Environmental Assessment, *Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners*, November 2003, online: <https://www.canada.ca/en/environmental-assessment-agency/services/policy-guidance/incorporating-climate-change-considerations-environmental-assessment-general-guidance-practitioners.html> [*General Guidance*]; and, Nova Scotia, Environment, "Guide to Considering Climate Change in Environmental Assessments in Nova Scotia", February 2011 online: <https://novascotia.ca/nse/ea/pubs.asp> [*Guide - CC in EA in NS*].
[21] Shardul Agrawala, *et al* "Incorporating climate change impacts and adaptation in environmental impact assessments: Opportunities and challenges" (2012) 4:1 Climate & Development 26 at 8 [Agrawala *et al*, 2012].
[22] For example, see the UNFCCC (*United Nations Framework Convention on Climate Change*, 9 May 1992, 1771 UNTS 107 (entered into force 21 March 1994) [UNFCCC]) and the Kyoto Protocol (*Kyoto Protocol to the United Nations Framework Convention on Climate Change*, 11 December 1997, 2303 UNTS 162, 37 I.L.M. 22 (1998) (entered into force 16 February 2005)). Vonk Sok, Bryan J Boruff & Angus Morrison-Saunders. "Addressing climate change through environmental impact assessment: international perspectives from a survey of IAIA members" (2011) 29:4 Impact Assessment and Project Appraisal 317 at 317 [Sok, Boruff & Morrison-Saunders].

understand the uncertainties associated with climate change impacts.[23] The recent entry into force of the Paris Agreement can and should serve as a trigger to enact domestic legislative changes like the integration of GHG considerations in the Canadian EA process. Such actions are essential, especially since the general common law assumption prescribes that all laws must be interpreted in a way that respects the international commitments of the country.[24]

Generally, EAs provide "decision makers with information about the environmental consequences of proposed activities"[25]. Since EAs are intended to assess the possible environmental effects of a proposed project and to identify ways to avoid or minimize these effects, using the pre-existing EA process has been deemed an efficient and effective method for the integration of climate change considerations in proposed projects.[26] EA is a well-known and established process, used by industries and governments around the world, and it provides a readily available means to ensure the inclusion of climate change considerations at the early planning stage.[27] The consideration of climate change through this process has even been said as being essential, especially at the project level, in order

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[23] Philip Byer *et al*, *Climate Change in Impact Assessment: International Best Practice Principles. Special Publication Series No 8*. (Fargo, USA: 2012, International Association for Impact Assessment) at 1 [Byer *et al*. 2012].

[24] Neil Craik, "Transboundary Environmental Assessment in Canada: International and Constitutional Dimensions" (2010) 21 J Env L & Prac 107 at 14.

[25] Peel, *supra* note 8 at 348.

[26] OECD, Environment Directorate, *Incorporating climate change impacts and adaptation in Environmental Impact Assessments: Opportunities and Challenges* Environmental Working Paper No 24, ENV/WKP (2010) 10 (2010) at 8-9 [OECD].

[27] Caroline Rodgers (Ontario Centre for Climate Impacts and Adaptation Resources), "Incorporating Climate Change into Decision-Making Processes" (Presentation delivered at the Ontario Association for Impact Assessment, Toronto, 24 October 2013) [unpublished] (online: <http://www.oaia.on.ca/2013conf/presentations/06a-RODGERS.pdf>) at 8 [Rodgers 2013].

to incorporate better-adapted measures.[28] Integrating climate change considerations in EA legislation has been recognized as a way to ensure a better environmental decision-making process.[29] Yet, no real consensus exists on the integration of climate change considerations into EAs[30] and its application is still limited.[31] Even if EAs are mainly a result of legislation, the process can still be influenced by a number of political frameworks (each with their own national and local policy contexts).[32] This also implies that a one-time solution, applicable to all jurisdictions throughout the world, would be very difficult, if not tantamount to impossible, to develop.

In Canada, jurisdiction over the environment is a shared responsibility, meaning that both the federal and the provincial governments have a role to play in the matter.[33] As such, each of these levels of government has adopted and enacted laws and regulations related to the environment and to the EA process.[34] The exact boundaries and parameters of federal and provincial jurisdiction over climate change and GHG emissions still remain unclear and uncertain.[35] Uncertainty in the legislation is a concern for many, including industries.[36] Without cooperation from all levels of government, this jurisdictional uncertainty might result in a rise of constitutional litigation on climate change.[37] To clarify the integration of

[28] OECD, *supra* note 26 at 8.
[29] Kalina Arabadjieva, "'Better Regulation' in Environmental Impact Assessment: The Amended EIA Directive" (2016) 28 J Envtl Law 159 at 160 [Arabjieva].
[30] Sok, Boruff & Morrison-Saunders, *supra* at note 22 at 317.
[31] Agrawala *et al*, 2012, *supra* note 21 at 29.
[32] Sok, Boruff & Morrison-Saunders, *supra* note 22 at 318.
[33] Jaime Benidickson, *Environmental Law*, 4th ed (Toronto: Irwin Law, 2013) at 31 [Benidickson].
[34] *Ibid* at 265.
[35] John B Laskin, "Climate Change and the Canadian Constitution" in Dennis Mahony, ed, *The Law of Climate Change in Canada, 2015 Student Edition* (Toronto, Canada: Canada Law Book, 2014) 3-1 at 3-4, 3-16, 3-17 [Laskin].
[36] *Ibid* at 3-17.
[37] *Ibid*.

climate change considerations into existing EA legislation guidelines and policies were developed, but these only offer very limited legal weight.[38] Therefore, in case of ambiguity, courts will solely rely on their interpretation of the law in their decision-making process; guidelines and policies will not be considered.[39] In other words, guidelines and policies are generally not enforceable, nor can they add requirements that are not already stated in the legislation. Only statutes and regulations can prescribe requirements and define ways to enforce them. As this research will demonstrate, climate change and GHG considerations are not clearly included in the current Canadian EA legislation.

Up to now, case law on climate change has been limited[40] and "[c]ourts have so far been 'extremely reluctant to engage in substantive review of EA decisions'"[41]. Courts have also been very careful in their interpretation of EA legislation to determine if it does include climate change considerations.[42] It is manifest that climate change and GHG considerations are still not explicit and distinctive legally binding requirements under current EA legislation.

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[38] For example, see *General Guidance*, *supra* note 20; and, *Guide - CC in EA in NS*, *supra* note 20.
[39] Lorne Sossin & Charles W Smith. "Hard Choices and Soft Law: Ethical Codes, Policy Guidelines and the Role of the Courts in Regulating Government" (2002-2003) 40 Alta L Rev 867 at 887 [Sossin & Smith].
[40] Laskin, *supra* note 35 at 3-23.
[41] Dennis Mahony, "Federal Climate Change Law and Policy" in Dennis Mahony, ed, *The Law of Climate Change in Canada, 2015 Student Edition* (Toronto, Canada: Canada Law Book, 2014) 4-1 at 4-15 [Mahony, "Federal Climate Change"].
[42] Sossin & Smith, *supra* note 39 at 887; Mahony, "Federal Climate Change*", supra* note 41 at 4-15, see *Hollinger Farms No. 1 Inc. v. Ontario (Minister of Environment)* (2007), 29 OAC 303 (Div Ct).

### 1.3 SYNOPSIS

The release of excessive GHG emissions linked to human activities is extremely likely the cause of climate change[43] and will result in serious environmental impacts.[44] Based on this and on the Canadian federal and provincial commitments to act on climate change, it is imperative that GHG emissions be considered in all projects subject to the EA process. Such considerations come with some challenges (as it will be discussed), but using this readily available and widely utilized tool is an effective way to ensure that GHG reduction commitments will be met. Bearing in mind this current context, this thesis will examine how GHG considerations can and should be integrated into Canadian EA legislation. This research assesses both federal and provincial EA statutes and regulations, evaluates how the existing legislative regime can allow for the integration of GHG considerations, and identifies limits to that integration.

Next, this paper will use the Energy East project as a case study and analyze how the project proponent considered climate change and GHG emissions in its application documents. Even though TransCanada, the Energy East project proponent, abandoned its project in October 2017, the analysis nonetheless remains applicable to this research given its importance.

Thereafter, EA legislation from the European Union (EU) and the US is examined, assessing how the proposed climate change and GHG considerations in these jurisdictions can be compared to the situation in Canada. The legislation from both jurisdictions

[43] IPCC 2014, *supra* note 1, at 48.
[44] *Ibid*, at 56.

provides some potential solutions to the challenge of integrating GHG considerations into the EA process, but they also raise certain criticisms regarding their integration.

Finally, recommendations are proposed based on the results of the research and analyses. These recommendations provide ways to further the consideration of GHG emissions in the EA legislation and process in Canada. These will lead to a clearer integration of GHG emissions in EA legislation, thus leading to a more consistent and thorough consideration in the Canadian EA process.

# CHAPTER 2: METHODOLOGY, RESEARCH STRUCTURE AND LIMITATIONS

## 2.1 LEGAL RESEARCH METHODOLOGIES

This thesis is mainly based on four legal research methodologies: comparative research, quantitative research, policy scholarship, and doctrinal research. All these methodologies have their own strengths and weaknesses and, therefore, were used at various points throughout the research so as to better address specific issues.

An important part of this thesis relies on comparative research, which compares different specific legislation (this study compares EA legislation).[45] First, EA legislation from both provincial and federal jurisdictions is analyzed and put in comparison to determine if and how climate change is considered under the current EA processes used throughout the country. This comparison also allows to identify the highlights and shortcomings of the EA legislation in various jurisdictions and how that legislation ensures the integration of GHG considerations into EAs. To further the analysis, other EA legislation is also used for comparison in this paper. The EU and the US have already begun to integrate climate change and GHG emissions into their EA legislation and processes, and they offer another interesting ground for comparison. The experience of these jurisdictions offers a different perspective on how climate change and GHG emissions could be integrated into Canadian EA legislation, and also allows for the identification of certain legislative limitations. Nevertheless, they offer an interesting source of comparison to assess the Canadian integration of climate change and GHG considerations into its EA legislation. Here,

[45] Robert Cryer *et al*., *Research Methodologies in EU and International Law* (Portland, OR: Hart Publishing, 2011) at 28 [Cryer].

comparative research provides the means to identify differences and to make recommendations on the current legislative state of the EA sector.

Quantitative research is another legal methodology used in this thesis, mainly to assess the case study of the Energy East project. Quantitative research is useful in the examination of whether laws are producing the results that were expected.[46] Here, the research includes an analysis of all the application documents submitted by the project proponent of the Energy East project in support of its EA process (under the federal *CEAA 2012* legislation). This exercise involved reviewing and analyzing hundreds of documents and thousands of pages to determine the frequency of reference to climate change and GHG emissions in each of them. For the purposes of this research, selected climate change keywords are identified to make this analysis more effective. These keywords are: "climate change", "climate", "greenhouse gas", "greenhouse", "GHG", "emission", and "weather event"[47]. Using these keywords, the documents were further analyzed, in context, to determine how climate change and GHG emissions were considered and integrated into the EA process. A table compiling all the keywords identified in the EA documents can be found in Annex 1. Quantitative research allows one to add another dimension to this legal research, offering a concrete example of the application of Canadian EA legislation to a large-scale project. Quantitative research serves as a valuable complement to other types of legal research methodologies.[48] Here, the results from this quantitative research are used in conjunction

[46] Michael McConville & Wing Hong Chui. *Research Methods for Law* (Edinburgh: Edinburgh University Press, 2007) at 47 [McConville & Chui].
[47] The author uses the keywords in their singular version in order to maximize the results of the research (for example, including both "emission" and "emissions" as part of the research).
[48] Matthew Herder, "Demythologizing PHOSITA: Applying the Non-Obviousness Requirement Under Canadian Patent Law to Keep Knowledge in the Public Domain and Foster Innovation" (2009) 47 Osgood Hall LJ 695 at 712.

with the aforementioned legal research methodologies to demonstrate and reinforce the need for legislative changes in the EA process in Canada.

The previously mentioned methodologies are used to review the current state of Canadian EA legislation and demonstrate the need for amendments to its statutes. Since the main objective of this research is to advocate for changes to the current Canadian EA legislation by the further consideration of GHG emissions, policy scholarship also plays an important part in this thesis.[49] Ultimately, this research seeks to influence law- and policy-makers behind EA legislation and it offers substantive solutions to foster better and consistent integration of GHG considerations throughout the country. With the current federal review on the EA process, this research hopes to provide guidance thereto and to demonstrate the need for GHG considerations in EA legislation.

Finally, doctrinal research (the analysis of primary and secondary legal sources to clarify the law on a particular topic[50]) provides the foundation for this thesis. It provides insights into the past and current challenges faced in the integration of climate change and GHG considerations in the EA process. Doctrinal research also allows me to confirm the important place of such considerations in the EA process. Various doctrinal documents were consulted and used for this section of the thesis, mainly peer-reviewed articles, journals, books, reports, and conference materials. These various sources offered the

[49] Robert Birnbaum, "Policy Scholars are from Venus ; Policy Makers are from Mars" (2000) 23.2 *The Review of Higher Education* 119 at 127.
[50] McConville & Chui, *supra* note 46 at 4.

background needed to set the context for this thesis, while providing hints of solutions and the limits to this research. From that point on, a more detailed analysis was possible.

It is important to remember that not all methodologies and legislation are directly transferable from one jurisdiction to another. Therefore, the final recommendations flowing from this research take into account the differences that might arise from the various legal systems, cultures, and the many other factors that could significantly influence the legislation and processes found in each jurisdiction. Such an approach favours the formulation of recommendations tailored specifically to Canada, its provinces, and the EA sector. In addition, the use of these diverse legal research methodologies helps to facilitate the entire process by providing a more complete picture.

### 2.2 RESEARCH STRUCTURE

This thesis begins with an overview of the current state of doctrinal research, reviewing books and articles published on the integration of climate change and GHG considerations in the EA process and the role of legislation through it all. This approach establishes the foundation for the research in this paper and is divided into four subsections: “challenges to the integration of GHG considerations in the EA legislation”; “the role of legislation”; “the role of international law”; and, “guiding principle for GHG considerations in EA legislation”. These subsections present the current state of climate change and GHG considerations in the EA process and provide motivation for the thesis and for changes to EA legislation.

The legal analysis follows with the comparison of current provincial and federal EA legislation. The EA legislation and process from the three territories in Canada were excluded from this research because of their unique co-management approach which involves the federal government, the government of each territory and the Indigenous communities.[51] The EA process in each territory is regulated by either federal statute, territorial legislation, or Land Claims Agreement.[52] Because of the significant differences in the territorial EA legislation and approaches, these were excluded from this research for ease of comparability and analysis.

The legal analysis involves the evaluation of EA laws and regulations, and an examination of how GHG considerations are integrated into legislation. Table 1 lists all the EA legislation that was analyzed and compared in this research.

[51] Indigenous and Northern Affairs Canada, "Environmental assessments in Canada's North" (2016), online at: <http://www.aadnc-aandc.gc.ca/eng/1466431262580/1466431344459>.
[52] Deborah Carver, *et al*. "Inter- jurisdictional coordination of EA: Challenges and opportunities arising from differences among provincial and territorial assessment requirements and processes", A commissioned report prepared for the Canadian Environmental Assessment Agency through the Environmental Planning and Assessment Caucus (20 November 2010), available online at: <http://rcen.ca/caucus/environmental-planning-and-assessment/resources>, at 4, 11 [Carver].

Table 1: Federal and Provincial EA legislation in Canada

| Jurisdiction | Legislation |
|---|---|
| Federal | *Canadian Environmental Assessment Act, 2012* (2012)<br>*Regulations Designating Physical Activities* (2012)<br>*Prescribed Information for the Description of a Designated Project Regulations* (2012) |
| Alberta | *Environmental Protection and Enhancement Act* (2000)<br>*Environmental Assessment Regulation* (1993)<br>*Environmental Assessment (Mandatory and Exempted Activities) Regulation* (1993) |
| British Columbia | *Environmental Assessment Act* (2002)<br>*Exemption Regulation* (2016)<br>*Reviewable Projects Regulation* (2002) |
| Manitoba | *The Environment Act* (1987)<br>*Classes of Development Regulation* (1988) |
| New Brunswick | *Clean Environment Act* (1973)<br>*Environmental Impact Assessment Regulation* (1987) |
| Newfoundland and Labrador | *Environmental Protection Act* (2002)<br>*Environmental Assessment Regulations, 2003* (2003) |
| Nova Scotia | *Environment Act* (1994)<br>*Activities Designation Regulations* (1995)<br>*Environmental Assessment Regulations* (1995)<br>*Environmental Assessment Review Panel Regulations* (2013) |
| Ontario | *Environmental Assessment Act* (1990)<br>*General* (1990)<br>*Green Energy Act, 2009* (2009) |
| Prince Edward Island | *Environmental Protection Act* (1988) |
| Quebec | *Environmental Quality Act* (1972)<br>*Regulation respecting environmental impact assessment and review* (1981)<br>*Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere* (2007)<br>*Regulation respecting the application of the Environmental Quality Act* (1993) |
| Saskatchewan | *The Environmental Assessment Act* (1979) |

Here, the research includes current requirements to be considered and other possible inclusions that may be currently considered, but that are not explicitly required. The goal is to offer an overview of how GHG emissions can be integrated under the current EA legislation. An examination of the terminology and wording used in the legislation, as well as a look at the content and context of the legislation, ensures the completion of that goal.

This process is based on an inductive reasoning process to interpret and structure the information gathered.[53] The results are presented using six subsections: purpose clause, definitions, classification, inside the EA, discretionary power, and regulatory power.

First, the federal legislation is reviewed, presenting the highlights of, limits to, and possibilities for the consideration of GHG emissions in the current EA process. Then, provincial EA legislation is reviewed, with noteworthy provisions or legislation for the GHG considerations in the EA process. Only the provisions or legislation that offered an approach different from the one presented in the federal review are explored here. This comparison already leads to some interesting conclusions, with certain jurisdictions offering different approaches to the EA process that, in some cases, might hinder or promote the consideration of GHG emissions. The review of the EA legislation of each province and federal jurisdictions allowed for the provision of a complete and broad portrait of the current situation. It allowed for the identification of some subtle and not-so-subtle differences in the EA process across the country, and presented the various specific contexts of each jurisdiction.

Afterwards, this thesis presents the analysis of the case study on the Energy East pipeline project. This chapter examines the submitted application documents that were presented to the NEB. This case study was chosen because it was a project under federal legislation (*CEAA 2012*), and also because it took into account the interim approach proposed by the federal government in 2016. Another important reason motivating the choice of this case

[53] Gordon M. Hickey, Nicolas Brunet & Nadège Allan, "A Constant Comparison of the Environmental Assessment Legislation in Canada" (2010) 12:3 J Environmental Policy & Planning 315 at 317.

study is because of its possible link to climate change and GHG considerations, thereby providing an opportunity to assess the possible integration of GHG considerations during the federal EA process. This particular project has been at the forefront of public interest, especially in regard to climate change and the international commitments of Canada.[54] The methodology behind the case study is detailed afterwards and the proposed project is described explaining the setting of the project. Then, the application documents are reviewed and analyzed. The application documents are all accessible on the public registry of the NEB.[55] From there, climate-change-related keywords were identified and analyzed to present the current integration of GHG emissions in the EA process for this case study. The results are presented in four general subsections: general findings; volume 20: conversion design and GHG emissions; volume 21: environmental protection plan and mitigation measures; and, volume 22: technical data reports and GHG technical data report. These subsections identify areas *where* climate change and GHG emissions are integrated in this case study and *how* they are integrated. Using a case study helps to validate the results from the legislative analysis and doctrinal research. It provides a deeper understanding of the issues and gives additional strength to the results of this research.

[54] Jillian Bell, "Energy East pipeline: What you need to know – Here's why emotions are running so high on both sides of the debate", *CBC News* (26 January 2016) online: <http://www.cbc.ca/news/canada/energy-east-pipeline-explained-1.3420595>; Jeff Lewis & Shawn McCarthy, "TransCanada asks NEB to halt federal review of Energy East pipeline", *The Globe and Mail* (7 September 2017) online: <https://beta.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/transcanada-seeks-halt-to-federal-review-of-energy-east-pipeline/article36204721/?ref=http://www.theglobeandmail.com&>.

[55] Canada, National Energy Board, "2014-10-30 – Application for Energy East, Asset Transfer and Eastern Mainline (OH-002-2016)", Regulatory Documents, online: <https://apps.neb-one.gc.ca/REGDOCS/Item/View/2540913>.

Next, EU and US EA legislation are analyzed to examine climate change and GHG emissions integration.[56] These jurisdictions were chosen partly on the basis of the literature review because they offered some specific mention of climate change and GHGs in their EA legislation, and also partly because their contexts can be fairly comparable to those that exist in Canada. The chapter presents and analyzes the EA legislation of both the EU and US, focusing on the consideration of GHG emissions. This comparative analysis allows me to pinpoint the legislative differences between these jurisdictions and Canada on how all parties integrate GHG considerations, thus allowing the identification of the strengths and weaknesses of them all. Critiques relating to the EU and US integration of climate change in the EA legislation of their respective jurisdictions are also presented. This helps complete the analysis, offering a more thorough perspective of the situation.

Finally, recommendations are made to further the integration of GHG considerations in Canadian EA legislation. These recommendations are based on the previous four chapters and are presented in the same six subsections used in the Canadian EA legislation review: purpose clause, definitions, classifications, inside the EA, discretionary power, and regulatory power. The recommendations are meant to provide the basis for what changes are needed under the current Canadian EA legislation in order to ensure a consistent and clear integration of GHG considerations in the EA process.

[56] Even if the EU is a supranational state, its EA legislation can still be a useful comparison tool in the context of this research as Canada is a federation with a federal government along with provincial and territorial governments, all with the power to act on global issues (such as the environment and climate change).

## 2.3 RESEARCH LIMITATIONS

My research is not exempt from certain limits and assumptions. Legislation and case studies can always evolve and thus the interpretation of their provisions and relevance can also undergo a certain degree of evolution. This is especially true in EA, given the broad discretionary power often awarded to the responsible authority. Consequently, a certain level of subjectivity can be encountered in the application of the discretionary power of that authority. In an attempt to mitigate this limitation, this research is focused on explicit requirements in the EA legislation, and it seeks to limit nuances that might arise from legislative interpretation. Furthermore, precise references to provisions in the legislation are included to ensure consistency and reliability.

The research also focuses on the mitigation aspect of climate change considerations, which includes the calculation and mitigation of GHG emissions in projects subject to the EA process. This decision was made to limit the considerable scope of this research and to offer a more thorough assessment of that aspect. Adaptation remains a fundamental aspect of addressing climate change and, going forward, it will be imperative that both mitigation and adaptation are borne in mind when considering climate change.

Another limit can be found in the broad range of legal requirements that might be mandatory under a particular EA process. Since the responsible authority often has the regulatory power to add or remove particular requirements for certain projects subject to an EA, this can lead to a significantly broad range of legally binding requirements in

various EA processes. However, since these additional legally binding requirements are not mandatory for all EAs, they are not included here.

This research aims to examine the current requirements for GHG considerations and to ensure their inclusion in all EA legislation. Working on a multi-jurisdictional research can also involve certain challenges where overlaps are possible and where results cannot always be directly compared (according to the particular context of each jurisdiction). This is true with Canadian EA legislation, and also with the inclusion of EA legislation from the EU and US. The selection of the jurisdictions for this research was made based on their integration of climate change and GHG considerations, as well as on their comparability with the Canadian EA legislation and context. While preparing the final recommendations, the Canadian context was considered in order to propose changes that are better adapted to its context, an essential and delicate part of comparative law research.[57]

Further, the case study chosen was still in progress, was only a reflection of part of the EA process, and cannot represent all EA processes in place across Canada. A more thorough analysis of all past completed EAs would offer a more comprehensive picture of past integration of climate change and GHG considerations in the EA process. However, given the nature of this thesis, the case study chosen still offers a realistic overview of the EA process currently in place and provides additional depth to this research.

[57] Cryer, *supra* note 45, at 28-29.

## CHAPTER 3: SETTING THE TONE

EA can be a way "to address climate change issues and could provide a suitable entry point to incorporate considerations of climate change impacts and associated adaptation within existing modalities of project design, approval and implementation"[58]. Fundamentally, all GHG emissions should be considered in the EA process; this is the guiding principle behind my research. This principle guides the analysis of all EA legislation reviewed here. The objective of this research is to provide general recommendations to guide and clarify the legislative integration of GHG considerations in the EA process.

This chapter provides a brief literature review on the integration of GHG considerations in the EA process and legislation. First, it examines and addresses some of the main challenges that have been identified with respect to this integration. The following subsection explains how legislation plays a pivotal role in this integration. The role of international law is examined afterwards and, finally, the guiding principle of this research will be further detailed in the last subsection of this chapter.

### 3.1 CHALLENGES TO THE INTEGRATION OF GHG CONSIDERATIONS IN EA LEGISLATION

In Canada, the environment is a shared responsibility between the federal and provincial governments and each of them has put in place its own EA requirements, which can pose some challenges.[59] Several challenges for GHG emissions in the EA process have been

[58] Alexandra Jiricka *et al*. "Consideration of climate change impacts and adaptation in EIA practice – Perspectives of actors in Austria and Germany" (2016) 57 Envtl Impact Assessment Rev 78 at 79 [Jiricka].
[59] Laskin, *supra* note 35 at 3-1.

identified in the past and might help explain the delay in ensuring clear legislative integration. What follows are the main challenges identified for this integration.

The most often cited challenges to the integration of GHG emissions in the EA process are: the indirect and cumulative nature of GHG emissions[60] and the climate change impacts resulting from these emissions. Indeed, it is so far impossible to directly link specific climate change impacts to specific GHG emissions resulting from an individual project or activity. Therefore, establishing the significance of the GHG emissions of an individual project or activity can prove to be difficult.[61]

Even if the direct link between specific GHG emissions and a certain climate change impact is not yet possible to establish, the link between global GHG emissions and general climate change impacts is clear. Canadian review panels have already considered indirect emissions of projects in past EAs, where low levels of emissions were said to be possibly significant.[62] The link between global GHG emissions and general climate change impacts is well established and therefore this type of challenge should not prevent further consideration of GHG emissions in the EA process, especially given the commitments of Canada to reduce its GHG emissions. Individual projects should need to consider both their direct and indirect GHG emissions as a recognized significant environmental effect.

[60] Mahony, "Federal Climate Change", *supra* note 41 at 4-14.
[61] *Ibid.*
[62] *Ibid.*

Another identified challenge to the integration of GHG emissions in the EA process lies in the important discretionary power found in the majority of Canadian legislation. In fact, EA is "predominantly based upon discretion"[63]. In *CEAA 2012*, the relevant federal authority can always use its discretionary power for a variety of reasons, even being able to completely exempt a project from the application of the Act. This exemption can even apply to projects that are likely to cause significant environmental effects, provided that the significant environmental effects can be justified in the circumstances.[64] This implies that "any particular decision can be justified by social, economic, political, cultural, or aesthetic concerns of the moment, even if they have deleterious long-term effects on ecosystem function. Environmental decisions thus become political decisions"[65]. Such a power could hence be used to entirely exclude proposed projects with possible significant environmental effects (including climate-change-related matters) from the EA process, even without having to mitigate these projected effects. Such a discretionary power can also be found in the EA legislation of many provinces and could therefore result in serious environmental damage.[66]

However, this same discretionary power can also be very helpful in preventing environmental damage, including climate-change-related matters, by being used to attach additional conditions to the proposed project. It would be possible to include GHG

[63] Bruce Pardy, *Environmental Assessment and Three Ways Not to Do Environmental Law*, (2010) 21 JELP 139, at 146 [Pardy].
[64] *Canadian Environmental Assessment Act, 2012*, SC 2012, c 19, ss 37, 52 [*CEAA 2012*].
[65] Pardy, *supra* note 63 at 149.
[66] Martin ZP Olszynski, "Environmental Assessment as Planning and Disclosure Tool: *Greenpeace Canada v. Canada (A.G.)*" (2015) Dal LJ 207 at 227.

considerations in such conditions (for example: mitigation measures to reduce GHG emissions).[67] Consequently, discretionary power can act as a double-edged sword where it can both hinder or facilitate the integration of climate change considerations. Because the direction chosen for enacting those discretionary decisions by the relevant authority can never be completely consistent and predictable, this can result in an inconsistent integration of GHG considerations in the EA process.

Given that the responsible authority is always bound to respect the objects and global goals of the legislation from which its power ensues when exercising its discretionary power,[68] the protection of the environment should still prevail.[69] To help lessen this challenge, it would be beneficial to have more structured legislation with clear boundaries limiting and guiding the application of this discretionary power and of its subjectivity (for example, by setting certain standards for annual GHG emissions).

Since climate change is depicted as a long-term issue, it is often downgraded to a lower level of importance relative to other short-term societal and political issues that are perceived as needing more attention.[70] This tendency to award minimal interest to climate change is amplified by the absence of clear legal obligations on the matter.[71] Consequently, GHG considerations still have not been considered adequately in EA practice.[72] These elements give further importance and urgency to the need to better integrate GHG

[67] *CEAA 2012*, *supra* note 64, s 37(1)(*c*).
[68] Ruth Sullivan, "Statutory Interpretation in a New Nutshell" (2003) 82 Can B Rev 51 at 54.
[69] Federally, the responsible authorities are also bound to "exercise their powers in a manner that protects the environment and human health and applies the precautionary principle". *CEAA 2012*, *supra* note 64, s 4(2).
[70] *Ibid* at 83.
[71] *Ibid*.
[72] *Ibid*.

considerations into EA legislation. Having a legal obligation to consider and integrate GHG emissions in the EA process will give more weight and relevance to the phenomenon of climate change, thus ensuring a more consistent integration and even furthering actions on the issue. This obligation would help define GHG emissions as a rightful consideration in the EA process.

All these factors, and more, help in the understanding of why, to date, there has been a limited consideration of GHG emissions in the practical application of EA.[73] However, all these challenges can be addressed. Better-structured EA legislation with clear consideration of GHG emissions can help overcome these challenges. New legislation on the matter, such as the European *Directive 2014/52/EU*, gives hope to see an increase in climate change and GHG considerations in the EA practice.[74] Additionally, the federal government has clearly expressed its commitment to reduce its GHG emissions and to act on climate change (with the adoption and ratification of the Paris Agreement, respectively in December 2015 and April 2016).[75] This should all help promote further GHG considerations in domestic EA legislation in Canada.

[73] *Ibid* at 85.
[74] *Ibid*.
[75] Environment and Climate Change Canada, Statement, "Minister of Environment and Climate Change marks Canada's Ratification of the Paris Agreement" (5 October 2016), online: <https://www.canada.ca/en/environment-climate-change/news/2016/10/minister-environment-climate-change-marks-canada-ratification-paris-agreement.html>.

### 3.2 THE ROLE OF LEGISLATION

The notion of integrating climate change and GHG considerations into the EA process is not a new concept and has been explored by various groups, including governmental bodies in Canada.[76] In fact, Canada has even proposed a general guideline on the matter, "Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners" (General Guidance), which was jointly released in 2003 by both the federal and provincial governments (under the previous federal Act on EA, *Canadian Environmental Assessment Act*, *CEAA*).[77] However, even with this General Guidance, GHG emissions have not been adequately considered in most EA documents in Canada and inconsistencies became apparent in many of those projects, even between projects of similar nature.[78] The General Guidance has been said to be ambiguous in its application, especially regarding its methodology for classifying GHG emissions. Neither is it a legally binding document (unless precisely referred to in conditions to an EA set by the responsible authority). However, as is the case with many other guidance documents, this results in considerable inconsistencies in its implementation across Canada.[79]

Few countries in the world have actually integrated GHG considerations in their EA legislation. Instead, many have opted for non-binding guidance documents and other similar types of documents.[80] Consequently, only a limited number of EA documents have

[76] OECD, *supra* note 26 at 13.
[77] *Ibid* at 14,16.
[78] *Ibid*.
[79] *Ibid* at 13.
[80] *Ibid* at 22.

so far really implemented GHG considerations in their processes.[81] Climate change and GHG emissions have been considered in previous EAs. For example, past Canadian review panels have recognized that a significant burden to society is added by even low levels of emissions and have also considered indirect GHG emissions of a project.[82] However, research demonstrates that when climate change was indeed considered in various EA documents, inconsistencies in their considerations were found in many of them.[83] All these factors result in inadequate projections for the future.[84] In fact, research has shown that:

- climate change has not been adequately acknowledged or addressed in most EAs;
- uncertainties about climate change have been addressed even less well;
- climate change is addressed inconsistently between similar types of project; and
- more recent EAs are not necessarily better with respect to these concerns[85].

Even if high-level policy documents reflect the need to integrate climate change and GHG considerations in the EA process, their actual integration into the EA process is not always consistent nor adequate, and that is if they are even considered at all.[86] The decision-making process leading to concrete environmental protection should be achieved through legislation.[87] It has been shown that legal requirements, in regard to climate change, "lead to increased attention for a given subject area".[88] Using legislation to ensure the integration of GHG considerations would lead to a more consistent and thorough integration in the decision-making process, the very process where concrete actions take place.[89]

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[81] *Ibid.*
[82] Mahony, "Federal Climate Change*", supra* note 41 at 4-14.
[83] For example, some EA documents used historical climate data as their references, while other projects misused observational records.
[84] OECD, *supra* note 26 at 22.
[85] Philip H Byer & Julian Scott Yeomans. "Methods for addressing climate change uncertainties in project environmental impact assessments" (2007) 25:2 Impact Assessment & Project Appraisal 85 at 85.
[86] OECD, *supra* note 26 at 13.
[87] Pardy, *supra* note 63 at 141.
[88] Jiricka, *supra* note 58 at 82
[89] *Ibid.*

Generally, there is a recognized and urgent need for more formalized regulations and guidelines related to the integration of GHG considerations into the EA process.[90] This might be accentuated by the fact that there are currently only a limited number of legal frameworks and guidelines addressing climate change issues in the EA process. There seem to be shortcomings between the aspirational view of this integration and its application.[91] Given the urgency to act, the use of regulations would be one of the most rapid and effective ways to integrate GHG considerations in the EA process.[92] In much of EA legislation in Canada, the legislator has an important power to regulate and could therefore fairly easily add GHG considerations to existing regulations on EA or adopt new regulations on the matter. This would allow for a strong legal integration of climate change in the EA process, without the need for parliamentary debates or other lengthy legislative processes that might further delay their integration.

Regulations have been identified as a key element in order to legislate and manage the integration of GHG considerations at every phase of the EA process.[93] Indeed, as demonstrated in an international survey conducted by the International Association for Impact Assessment in 2010 to assess how the current EA process could best address climate change issues, over 93% of respondents agreed or strongly agreed that EA regulations and guidelines were needed in order to effectively address climate change.[94] Most respondents indicated that regulations or guidelines or both were needed to address

[90] Sok, Boruff & Morrison-Saunders, *supra* note 22 at 323.
[91] *Ibid*.
[92] *Ibid*.
[93] *Ibid*.
[94] *Ibid* at 319-20.

climate change during the screening phase of EA.[95] The survey also revealed a need for improved methodological development in EA in order to integrate climate change considerations from the very beginning until the very end of the EA process.[96] Regulations and guidelines were further mentioned as being the best way for EA to address climate change during the evaluation and approval phase of the process.[97] Most importantly, the survey respondents stated that this implied the importance of having formal legal instruments to bind regulators and decision-makers in the EA process.[98] These points further reinforce the need for strong, legally binding integration of climate change and GHG considerations as part of the EA process, such as in laws and regulations.

Another benefit of acting through legislation to integrate GHG considerations into the EA process is the possibility of adding consistency to the whole process across the country. Legislation can help ensure certainty, predictability[99] and conformity[100] in environmental policy, which are particularly important in environmental law.[101] Legislation to address climate change in Canada needs to be furthered.[102] To do so, a concerted approach should be privileged by policymakers.[103] EA is part of the responsibilities of provincial governments and it offers a significant way for them to act on climate change in their own

[95] *Ibid* at 321.
[96] *Ibid* at 322.
[97] *Ibid*.
[98] *Ibid*.
[99] Pardy, *supra* note 63 at 145.
[100] Benidickson, *supra* note 33 at 5.
[101] Pardy, *supra* note 63 at 153.
[102] Dennis Mahony, "Overview" in Dennis Mahony, ed, *The Law of Climate Change in Canada, 2015 Student Edition* (Toronto, Canada: Canada Law Book, 2014) 1-1 at 1-5.
[103] *Ibid*.

jurisdiction.[104] However, it is necessary that both the federal and provincial governments harmonize their EA legislation. A harmonized process would ensure a more consistent EA process throughout Canada, while reducing certain overlaps.[105] Additionally, this would not only help to meet the global GHG emissions reduction objectives set out in the climate change action plans of each jurisdiction, but also those agreed upon in international agreements (such as the Paris Agreement).[106]

Finally, additional help is needed for project proponents to define how GHG emissions and other climate-change-related considerations can be classified as a significant environmental effect to further their integration in the EA process. The current legislation is broad and contains certain uncertainties, especially regarding climate change and GHG emissions. Uncertainty in the legislation is a concern that can lead to constitutional litigation.[107] Clear and precise legislation on the matter could provide that much needed help.[108] More precise definitions of what constitutes a significant environmental effect, that specifically includes GHG emissions are needed as part of the EA process. The language used in the legislation needs to be precise by clearly mentioning and integrating GHG considerations as part of the EA legislation. This would help reduce uncertainties and result in a more consistent application and consideration of GHGs in all EA processes across the country.

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[104] Dennis Mahony, "Ontario Climate Change Law and Policy" in Dennis Mahony, ed, *The Law of Climate Change in Canada, 2015 Student Edition* (Toronto, Canada: Canada Law Book, 2014) 9-1 at 9-62 [Mahony, "Ontario"].
[105] Carver, *supra* note 52 at 6-7.
[106] Gerrard, *supra* note 17 at 24.
[107] Laskin, *supra* note 35 at 3-17.
[108] Sok, Boruff & Morrison-Saunders, *supra* at note 22 at 317;

### 3.3 THE ROLE OF INTERNATIONAL LAW

International law encompasses the legal principles and rules governing activities of States. It also establishes binding norms for States in their dealings with one another.[109] One of the primary sources of international law is through the use of treaties (or conventions).[110] A treaty creates law for its consenting parties and is binding once it is signed and ratified by the consenting parties.[111]

#### 3.3.1 International Law and Domestic Legislation

Treaties, as defined by international law, "[signal] the highest expression of political will"[112] and such legally binding instruments result in credible commitments.[113]

> They have the potential to crystallize international commitments into domestic legislative action, thereby co-opting domestic enforcement mechanisms and generating predictability and certainty in implementation as well as accountability at the domestic and international level.[114]

International commitments have implications at the domestic level. In fact, international law is known to have an influence on state behaviour[115] and is often intended to influence domestic law.[116] In order to be effective, treaties need to be implemented at the domestic level.[117]

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[109] John P Grant, *International Law*, (Dundee: Edinburg University Press, 2010), at 1-2 [Grant].
[110] *Ibid*, at 2 & 12.
[111] *Ibid*, at 13-14.
[112] Lavanya Rajamani, *The 2015 Paris Agreement: Interplay Between Hard, Soft and Non-Obligations* (2016) 28 J Envtl L 337, at 340 [Rajamani].
[113] *Ibid*.
[114] *Ibid*.
[115] Daniel Bodansky, "The Legal Character of the Paris Agreement" (2016) 25:2 RECIEL 142 at 142 [Bodansky].
[116] Anthony Aust, *Handbook of International Law* (New York: Cambridge University Press, 2005), at 13 [Aust].
[117] *Ibid*.

The act of ratification of a treaty generally signifies greater domestic implications and commitments for state members.[118] Once ratified, "a signatory State must do nothing to defeat the object and purpose of the treaty"[119].

> [E]very treaty in force is binding upon the parties to it and must be performed in good faith. …. [I]f a new legislation or modifications to existing law are necessary in order to comply with a new treaty, the state must ensure this has been done by the time the treaty enters into force for it. Otherwise the state risks being in breach of its treaty obligations and will be liable in international law if, as a result of that omission, another party, or one of its nationals, is harmed[120].

Treaties usually also survive domestic political changes, often signalling serious long-term commitments and consistency from state members.[121] Parties to treaties therefore have binding obligations that can have long-term impacts on their domestic legislation.

### 3.3.2 International Conventions and Treaties on Climate Change and EA

One important source of international law is found in international conventions and treaties. Since climate change is a global issue, it is not surprising that some treaties and framework treaties related to the environment include provisions on climate change, but also on EA.[122] The United Nations Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity (CBD), and some of their related agreement and guidelines will be briefly examined here. This will help demonstrate the importance of international law in support of a greater integration of GHG considerations in the EA process in Canada.

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[118] Bodansky, *supra* note 115 at 149.
[119] Grant, *supra* note 109 at 13; *Vienna Convention on the Law of Treaties*, 23 May 1969, 1155 UNTS 18232 (entered into force 27 January 1980), art 18 [*Vienna Convention*].
[120] Aust, *supra* note 116 at 79-80; *Vienna Convention*, *supra* note 119, art 26.
[121] Rajamani, *supra* note 112 at 340.
[122] Aust, *supra* note 116 at 328-29.

The UNFCCC, established in 1992, is a key international framework convention centred specifically on climate change.[123] It now counts 197 parties, including Canada.[124] The main goal of the UNFCCC is to stabilize "greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system"[125]. For more than 20 years, EA has been recognized as an important tool to address climate change, as it was mentioned in the 1992 Framework Convention on Climate Change.[126] This recognition further demonstrates the need to ensure the integration of GHG considerations in the EA process domestically in Canada.

Two noteworthy subsequent treaties were adopted as legal instruments under the UNFCCC: the Kyoto Protocol and the Paris Agreement.[127] Both of these can be defined as "treaties" as per the Vienna Convention on the Law of Treaties.[128] The Paris Agreement is specifically relevant to this research, so it is important to define that its status is also recognized as a legally binding treaty for all its parties.[129] Hence, when it entered into force in November 2016, it created obligations for all state members of the agreement.[130] Specifically, the fact that the Paris Agreement is recognized as a treaty denotes a "high degree of political commitment by governments at the international level vis-à-vis other

[123] *Ibid* at 339.
[124] UNFCCC, "Status of Ratification of the Convention", online at: <http://unfccc.int/essential_background/convention/status_of_ratification/items/2631.php>.
[125] UNFCCC, *supra* note 22, art 2.
[126] Sok, Boruff & Morrison-Saunders, *supra* at note 22 at 317.
[127] Rajamani, *supra* note 112 at 342.
[128] Bodansky, *supra* note 115 at 150; *Vienna Convention*, *supra* note 119, art 2.
[129] Ralph Bodle, Lena Donat & Matthias Duwe, "The Paris Agreement: Analysis, Assessment and Outlook" (2016) 10:1 Carbon & Climate L Rev 5 at 13 [Bodle, Donat & Duwe].
[130] *Ibid*; Bodansky, *supra* note 115 at 142.

parties, and at the domestic level through the ratification process"[131]. However, even if the Paris Agreement is a legally binding treaty, not all provisions of the agreement are necessarily considered as legally binding for all individual parties.[132] Some provisions create obligations that are defined through the wording, while other provisions are regarded as not binding and thus allow flexibility for parties.[133]

Generally, the obligations of the Paris Agreement are mainly procedural obligations.[134] These obligations include the need for individual parties to "prepare, communicate and maintain successive Nationally Determined Contributions [NDCs] that it intends to achieve"[135]. As part of that obligation, the NDCs will need to be communicated every five years and will need to be progressive.[136] However, the Paris Agreement does not create an individual obligation for parties to achieve their NDCs. Instead, parties are only required to "pursue domestic mitigation measures, with the aim of achieving the objectives of such NDCs". [137] Even if all provisions of the Paris Agreement are not directly creating obligations, the good faith principle of international law still applies and the expectations are that Parties intend and will aim to achieve their NDCs.[138]

[131] Bodle, Donat & Duwe, *supra* note 129 at 19.
[132] Bodansky, *supra* note 115 at 145.
[133] *Ibid* at 145-46.
[134] Bodle, Donat & Duwe, *supra* note 129 at 13, 2.
[135] Bodansky, *supra* note 115 at 146; *Paris Agreement*, *supra* note 2, art 4.2.
[136] Bodansky, *supra* note 115 at 146; *Paris Agreement*, *supra* note 2, art 4.3, 4.9.
[137] Bodansky, *supra* note 115 at 146; *Paris Agreement*, *supra* note 2, art 4.2.
[138] Rajamani, *supra* note 112 at 354; *Vienna Convention*, *supra* note 119, art 26.

While provinces might be limited in their legislative actions on the international front, the Paris Agreement can still act as a force to drive stronger GHG considerations in their respective jurisdictions. Many provinces were present for the negotiations leading to the Paris Agreement, thus demonstrating their interest on the agreed-upon commitments. Furthermore, when international obligations fall in a matter of provincial competence, the implementation also falls within their jurisdiction.[139]

A further international environmental convention worth mentioning for this research is the CBD. As the UNFCCC, the CBD is another important legally binding treaty that was signed in 1992 at Rio Earth Summit.[140] The CBD entered into force in 1993[141] and now includes 196 parties (including Canada).[142] The CBD relies on principles related to sustainable development[143] and to the precautionary principle[144]. Specifically, the goals of the CBD are to encourage actions that will lead to a sustainable future,[145] through: "[the]

[139] Laskin, *supra* note 35 at 3-19, 3-20.
[140] UN Environment – Convention on Biological Diversity, "The Convention", online at: <https://www.cbd.int/convention/>.
[141] UN Environment – Convention on Biological Diversity, "Introduction", online at: <https://www.cbd.int/intro/default.shtml>.
[142] UN Environment – Convention on Biological Diversity, "List of Parties", online at: <https://www.cbd.int/information/parties.shtml>.
[143] For example: "“[s]ustainable” use means the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations”, *Convention on Biological Diversity*, 5 June 1992, 1760 UNTS 79 (entered into force 29 December 1993), art 2 [*CBD*], and " [e]cosystems, species and genetic resources should be used for the benefit of humans, but in a way that does not lead to the decline of biodiversity". United Nations, "Convention on Biodiversity", online at: <http://www.un.org/en/events/biodiversityday/convention.shtml> [UN, “Convention”].
[144] For example: "where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat". UN, “Convention”, *supra* note 143.
[145] *Ibid.*

conservation of biodiversity; [the] sustainable use of biodiversity; [and, the] fair and equitable sharing of the benefits arising from the use of genetic resources"[146].

The CBD is of particular interest to this research not only because of its relevance to the environment, but also because of its recognition of impact assessment as a fundamental instrument to achieve the objectives of the Convention.[147] Impact assessment is a formal part of the Convention. In fact, article 14, "Impact Assessment and Minimizing Adverse Impacts", is entirely devoted to it.[148]

Specifically regarding EA, the CBD developed two guidelines in relation to EA and SEA: the "voluntary guidelines on biodiversity-inclusive impact assessment" ("*Guidelines on IA*"), [149] and the "draft guidance on biodiversity-inclusive strategic environmental assessment" ("*Draft guidance on SEA*"). [150] Both these international guidelines add supplementary commitments regarding the EA process of each state member of the CBD, including the Canadian government. Although these guidelines are not all related to climate change, some of the provisions do provide guidance for the further integration of climate change and GHG considerations in the Canadian EA legislation.

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[146] *Ibid*.
[147] UN Secretariat of the Convention on Biological Diversity & Netherlands Commission for Environmental Assessment, *Biodiversity in Impact Assessment, Background Document to CBD Decision VIII/28: Voluntary Guidelines on Biodiversity-Inclusive Impact Assessment* (Montreal, Canada: 2006) at 8.
[148] See "Impact Assessment and Minimizing Adverse Impacts" in CBD, *supra* note 143, art 14.
[149] UNEP CBD 2006, 8th Mtg, UN Dec VIII/28 [CBD, "*Guidelines on IA*"].
[150] UNEP CBD 2006, 8th Mtg, UN Mtg Doc VIII/27/ADD.2, Annex II [CBD, "*Draft guidance on SEA*"].

The first document, the *Guidelines on IA*, was formally adopted by the Conference of the Parties (COP) in 2006.[151] The adoption of these guidelines signals additional domestic commitment by state members, which should see to their implementation.[152] The guidelines reinforce the importance of EA, but also highlight in various sections the need for state members to consider international conventions in their own EA processes.[153]

It was also in 2006 that the COP endorsed the second document, the *Draft guidance on SEA*.[154] With this endorsement, the COP wants state members to take into account and implement the guidance in the context of their commitment to the CBD.[155] The *Draft guidance on SEA* recognizes that certain legal requirements trigger the need for an EA or a SEA, but it further mentions that international treaties can also trigger that requirement.[156] This reinforces the importance of international law on domestic legislation. In regard to sustainability, the guidance specifically mentions climate change as one of the elements to consider when conducting a sustainability assessment, but also explains that the consideration of climate change often requires a longer time frame for proper assessment.[157] These provisions further demonstrate the need for further climate change and GHG considerations in the EA process.

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[151] CBD, "*Guidelines on IA*", *supra* note 149.
[152] UN Environment – Convention on Biological Diversity, "Impact Assessment - Background", online at: <https://www.cbd.int/impact/background.shtml>.
[153] CBD, "*Guidelines on IA*", *supra* note 149, ss 1-2, 11.
[154] CBD, "*Draft guidance on SEA*", *supra* note 150.
[155] *Ibid*, s 14.1(b).
[156] *Ibid*, s 5(f)
[157] *Ibid*, ss 16(f), 22.

The principles of international law, along with the various conventions, treaties, and guidelines, clearly demonstrate the importance of international obligations in domestic legislation, specifically regarding EA and climate change. International law and treaties can influence domestic legislation and must be taken into account by state members.

### 3.3.3 International Law and the Integration of Climate Change in the EA process

International climate change agreements do not always specifically require state members to adopt particular domestic legislation. They do, however, require that participating nations implement efforts to minimize their environmental impacts.[158] As such, the integration of commitments made on the international front (such as those related to the Canadian NDCs and the other commitments included in the Paris Agreement) does not need to be explicitly mentioned in the domestic legislation in Canada. Nevertheless, as international law dictates, efforts should be made to ensure that the Canadian legislation does not hinder these commitments. Therefore, the Canadian government needs to ensure that climate change and GHG emissions are properly integrated in its EA process.

EA has been recognized as a great tool to achieve GHG reductions targets set out in provincial, national, and international policies and agreements, such as the ones set out in the Paris Agreement.[159] Authors and researchers agree that EAs can and should play an important role in addressing climate change and can help reach the targets set out in

[158] Benidickson, *supra* note 33 at 87.
[159] Dean Stinson O'Gorman (Canadian Environmental Assessment Agency), "Integrating Climate Change and Environmental Assessment: Canadian Experiences" (Presentation delivered at the IAIA Special Symposium on Climate Change and Impact Assessment, at the World Bank, Washington, DC, 15 November 2010), online: <http://conferences.iaia.org/washingtonDC2010/proceedings.html> at 19, 21 [O'Gorman].

international agreements.[160] Such recognition does not only exist in the doctrinal world, as it has also been recognized in international treaties (for example, as mentioned previously, in the UNFCCC and CBD). EA has also been mentioned and recognized as an important tool to address climate change in the 1997 CEQ Draft Guidance document[161] on the integration of climate change in the US *NEPA*.[162] This recognition on the international front warrants domestic recognition in Canada in order to respect the good faith principle of international law.

International law can greatly influence the development of legislation domestically and the commitments made under international agreements need to be respected by each member state. As such, that international law clearly provides an additional important motive for furthering the integration of GHG considerations in Canadian EA legislation, at both at the federal and provincial levels.

### 3.4 Guiding Principle for GHG Considerations in EA Legislation

From my literature review, it is clear that the consideration of GHG emissions belongs in the EA process. The degree to which GHG considerations are considered and the way they are considered will vary, but all projects will need to assess their impact on climate change, through their GHG emissions.

[160] Jiricka, *supra* note 58 at 78-9, 85-6; Sok, Boruff & Morrison-Saunders, *supra* at note 22 at 317, 321-23.
[161] In the US, the CEQ is in charge of the implementation of *National Environmental Protection Act* (*NEPA*).
[162] Gerrard, *supra* note 17 at 20.

On the basis of the foregoing, it is possible to see that clear climate change and GHGs mention and consideration are needed in EA legislation to ensure consistent and meaningful integration.[163] This is the guiding principle behind this research. The legislative review that follows (in Canada, its provinces, the EU, and the US) uses the following guiding principle as the measuring factor: are GHG considerations clearly mentioned and integrated in the legislation and if so, how are they integrated? From there, it is possible to assess the current integration of GHG considerations in the EA legislation and process in Canada. This approach is also applicable in the legislative analysis of climate change and GHG considerations in other jurisdictions (the EU and the US), and it demonstrates how integration is ensured elsewhere. Finally, based on these reviews and analyses, it will then be possible to make recommendations for a further integration of GHG considerations in Canadian EA legislation.

[163] Jiricka, *supra* note 58 at 78-9; Sok, Boruff & Morrison-Saunders, *supra* at note 22 at 317.

## CHAPTER 4: OVERVIEW OF THE CURRENT EA LEGISLATION IN CANADA

After the first legislation on EA was adopted in the United States in 1969,[164] Canada released its own non-legislative (and thus, non-binding) process, the "Environmental Assessment and Review Process" in 1973.[165] The Federal Environmental Assessment Review Office was established thereafter in 1992, EA was finally enacted in legislation with *CEAA*.[166] *CEAA* entered into force in 1995 and with this, the Canadian Environmental Assessment Agency (the Agency) was created for its administration.[167] *CEAA* was amended a few times[168] before being replaced by the most recent version of the Act in 2012: *CEAA 2012*.[169]

Concurrently, Canadian provinces also adopted their own EA statutes and regulations, each with its individual particularities. Provincial EAs have their own set of procedures, per their specific legislation. However, they tend to have the same general goal as their federal counterpart, namely seeking to identify if a project will have significant adverse environmental effects and if these effects are justified. Both at the federal and provincial levels, project proponents are required to submit certain documents to the responsible authorities for the completion of their EA and responsible authorities can issue enforceable conditions in their final decisions.

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[164] Meinhard Doelle, *The Federal Environmental Assessment Process: A Guide and Critique* (Canada: LexisNexis Canada Inc., 2008) at 2 [Doelle].
[165] Takafumi Ohsawa & Peter Duinker, "Climate-change mitigation in Canadian environmental impact assessments" (2014) 32:3 Impact Assessment & Project Appraisal 222, at 223 [Ohsawa & Duinker]; Doelle, *supra* note 164 at 6.
[166] Doelle, *supra* note 164 at 10.
[167] Ohsawa & Duinker, *supra* note 165 at 223.
[168] *Ibid.*
[169] *Ibid.*

This chapter will examine the integration of GHG considerations in the EA legislation currently in place in Canada, both at the federal and provincial levels. This analysis will determine what is currently required under these laws and regulations in regard to integrating GHG considerations in the EA process. It will also identify the means by which it would be possible to include GHG considerations in the current EA process, even without explicit legislative requirements. This chapter aims to provide a portrait of the current situation in Canada and establish the foundation needed to further the analysis of this research. Solutions and recommendations for further integration of GHG considerations in the EA process are presented in Chapter 7, so the present chapter will focus on the current possible integration without providing in-depth solutions to possible shortcomings in the legislation.

For the purpose of this analysis, the best possibilities for the integration of GHG considerations into the current Canadian EA legislation have been grouped in six subsections. These subsections are: purpose clause, definitions, classification, inside an EA, regulatory power, and discretionary power. At the federal level, a final subsection was added to examine the current EA legislation review process and interim approach. All of these subsections present different ways in which GHG considerations are either required or ways in which the integration of GHG considerations is possible under the current legislation. This review will help understand the changes needed for legislative reform in order to better integrate GHG considerations.

## 4.1 CURRENT GHG INTEGRATION IN EA LEGISLATION AT THE FEDERAL LEVEL

*CEAA 2012* is the main legislation requiring federal EAs.[170] Under this legislation, projects identified in the *Regulations Designating Physical Activities* and by the Minister of the Environment and of Climate Change are to be subject to *CEAA 2012* and the federal EA process.[171] The federal EAs are conducted by a designated responsible authority (the Agency, the NEB or the Canadian Nuclear Safety Commission) or by a review panel.[172]

### 4.1.1 Purpose Clause of *CEAA 2012*

Purpose clauses are often used to set the tone for the interpretation and the application of an act. Should a provision of an act be ambiguous, the purpose clause of that act guides the interpretation of that provision. However, on the legal side, a purpose clause is used exceptionally, but can legitimately still be used to guide the interpretation of legislation by courts in Canada.[173] The purpose clause of *CEAA 2012* contains some valuable information to assist in its interpretation.

> The purposes of this Act are
>
> > (a) to protect the components of the environment that are within the legislative authority of Parliament from significant adverse environmental effects caused by a designated project;
> >
> > (b) to ensure that designated projects that require the exercise of a power or performance of a duty or function by a federal authority under any Act of Parliament other than this Act to be carried out, are considered in a careful and *precautionary* manner to avoid significant adverse environmental effects;
> >
> > (c) to promote cooperation and coordinated action between federal and provincial governments with respect to environmental assessments;
> >
> > (g) to ensure that projects, as defined in section 66, that are to be carried out on federal lands, or those that are outside Canada and that are to be carried out or

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[170] *CEAA, 2012*, *supra* note 64, s 4.
[171] *Ibid*, s 2(1).
[172] The Minister of the Environment is in charge of appointing the group of independent experts who will make up the review panel, when such a process is followed. *Ibid*, ss 38(1), 42(1).
[173] Donald Poirier & Anne-Françoise Debruch, *Introduction générale à la common law*, 3rd ed (Cowansville, Que: Yvon Blais, 2005) at 198-99, 414-15.

financially supported by a federal authority, are considered in a careful and *precautionary* manner to avoid significant adverse environmental effects;
(h) to encourage federal authorities to take actions that promote *sustainable development* in order to achieve or maintain a healthy environment and a healthy economy;
and
(i) to encourage the study of the cumulative effects of physical activities in a region and the consideration of those study results in environmental assessments.

(2) The Government of Canada, the Minister, the Agency, federal authorities and responsible authorities, in the administration of this Act, must exercise their powers in a manner that protects the environment and human health and applies the *precautionary principle*[174].

A few key elements in the federal purpose clause could be particularly relevant for GHG emissions integration. Paragraph 4(1)(c) mentions that *CEAA 2012* aims to promote cooperation and coordination between the federal and provincial governments in regard to EAs. Climate change is a complex and cumulative issue that knows no boundaries. Cooperation and coordination with the provinces, when conducting EAs, are needed to better address climate change (for example, this would ensure that the proper GHG calculating and mitigation measures are implemented). Ensuring that all jurisdictions have a coordinated approach for the integration of GHG considerations would provide a better chance of success when trying to address the global issue of climate change. It would also help to achieve the international climate change commitments of Canada and enhance consistency in EA processes across the country.

The purpose clause of *CEAA 2012* also incorporates the consideration of cumulative effects in the EA process. The possibility of including cumulative effects in an EA can add weight in favour of the argument for the integration of GHG considerations because it is the

[174] *CEAA, 2012*, *supra* note 64, s 4 [emphasis added].

cumulation of GHG emissions that is regarded as the main cause of climate change and its environmental impacts. Cumulative environmental effects are further mentioned in the Act when describing the factors that must be taken into account in the EA of a designated project. *CEAA 2012* prescribes that environmental effects include changes caused by "any cumulative environmental effects that are likely to result from the designated project"[175]. This reinforces the importance of considering cumulative effects as part of the EA process, as mentioned in the purpose clause. The consideration of these emissions as cumulative environmental effects would provide another possible way to include climate change and GHG considerations in the EA process.[176]

Other essential elements mentioned in this purpose clause are the notions of sustainable development and the precautionary principle. To fully appreciate the importance of these two well-respected environmental principles relative to climate change integration, additional fundamental definitions are needed.

The definition of sustainable development refers to "development that meets the needs of the present, without compromising the ability of future generations to meet their own needs"[177]. GHG emissions can lead to serious environmental impacts, such as an increase in the intensity and frequency of droughts and floods, which could very well compromise the ability of future generations to meet their own needs. Therefore, the mention of

[175] *Ibid*, s 19(1)(*a*).
[176] IPCC 2014, *supra* note 1 at 4.
[177] *CEAA, 2012*, *supra* note 64, s 2(1).

sustainable development here allows for climate change to be considered in the EA process as serious environmental effects that could arise for future generations.

The second notion is the precautionary principle, another well-known and internationally recognized environmental principle.[178] The Supreme Court of Canada defined the precautionary principle in 2001.

> In order to achieve sustainable development, policies must be based on the precautionary principle. Environmental measures must anticipate, prevent and attack the causes of environmental degradation. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.[179]

Therefore, in order to avoid serious or irreversible damage to the environment, preventive environmental measures should be implemented even without definitive and unanimous scientific certainty. Serious and irreversible adverse environmental effects could arise from climate change. As such, even if some scientific uncertainty surrounding climate change remains, the precautionary principle in the purpose clause dictates that preventive measures to protect the environment should still be implemented, such as reducing GHG emissions.

As such, some elements of the purpose clause in *CEAA 2012* do encourage possible integration of GHG considerations. However, these elements remain generally worded and none leads to explicit and legally binding mandatory considerations.

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[178] UNFCCC, *supra* note 22, art 3.3

[179] *114958 Canada Ltée (Spraytech, Société d'arrosage) v Hudson (Town)* 2001 SCC 40, [2001] 2 SCR 241 at 31.

### 4.1.2 Definitions

The definitions section is a particularly important section where essential terms and notions are defined, further guiding the interpretation and application of the EA process. *CEAA 2012* begins with some essential definitions that help guide the application of the Act. Some of these definitions offer additional possibilities for the inclusion of GHG considerations in the current EA process.

One of the most important definitions of that Act is the definition of an "environmental effect".[180] Section 5 provides a very broad definition of an environmental effect, where climate change could be included, under paragraphs 5(1)(*a*) or 5(1)(*b*). The definition states that an environmental effect can consist of a change that might be caused to certain components of the environment (which could include GHG considerations as the cumulation of GHG emissions leads to climate change impacts, some of which could have

[180] "5. (1) For the purposes of this Act, the environmental effects that are to be taken into account in relation to an act of thing, a physical activity, a designated project or a project are

(*a*) a change that may be caused to the following components of the environment that are within the legislative authority of Parliament:

(i) fish and fish habitat as defined in subsection 2(1) of the *Fisheries Act*,

(ii) aquatic species as defined in subsection 2(1) of the *Species at Risk Act*,

(iii) migratory birds as defined in subsection 2(1) f the *Migratory Birds Convention Act, 1994*, and

(iv) any other component of the environment that is set out in schedule 2;

(*b*) a change that may be caused to the environment that would occur

(i) on federal lands,

(ii) in a province other that the one in which the act of thing is done or where the physical activity, the designated project or the project is being carried out, or

(iii) outside Canada; and

(*c*) with respect to aboriginal peoples, an effect occurring in Canada of any change that may be caused to the environment on

(i) health and socio-economic conditions,

(ii) physical and cultural heritage,

(iii) the current use of lands and resources for traditional purposes, or

(iv) any structure, site or thing that is of historical, archaeological, paleontological, or architectural significance."

*CEAA, 2012*, *supra* note 64, s 5(1).

an impact on the fish and fish habitat, aquatic species and migratory birds) or changes to the environment (which could also include GHG emissions, as the projected impacts of climate change resulting from GHG emissions are expected to cause changes to the environment, such as coastal erosion or droughts) that could occur in or outside Canada where the project is planned. This is a very broad definition that could include many changes in the ecosystems, species present in a watercourse, type of soil in a certain area, or emissions of pollutants and GHGs. As it is currently phrased, this definition does offer the possibility of including GHG considerations in the EA process.

Additionally, *CEAA 2012* refers to the "environment" as:

> "environment" means the components of the Earth, and includes
> (*a*) land, water and air, including all layers of the atmosphere;
> (*b*) all organic and inorganic matter and living organisms; and
> (*c*) the interacting natural systems that included components referred to in paragraphs (a) and (b)[181].

This definition is useful for determining what can be considered as an environmental effect.[182] Again, this is a broad definition and technically, with this definition, GHG emissions could still be included in what constitutes an environmental effect for the federal EA process. Since GHG emissions and climate change are associated with the air (a component of the environment) and since climate change impacts are projected to affect the land, water, air, organic and inorganic matter, living organisms, and the interactions between natural systems, GHG emissions could be considered as an "environmental effect".

[181] *Ibid*, s 2(1).
[182] *Ibid*, s 5(b).

The federal legislation also includes a definition of sustainable development[183], providing further insight into the interpretation of the Act itself. The notion of sustainable development is referenced both in the purpose clause[184] and in the definition section of the Act. Furthermore, by not only including the definition of sustainable development in the purpose clause, including it in this part of the Act as well, reinforces its legal role in the application of the Act. This emphasizes its relevance and importance in the EA process. Since the projected impacts of climate change threatens future generations, this definition can also be a gateway for further inclusion of GHG considerations in the Canadian EA process.

These definitions all offer possible ways to force integration of GHG emissions in the EA process, but none specifically mentions GHG considerations. This lack of specificity could lead to shortcomings and inconsistencies in the integration of GHG emissions in all federal EAs.

### 4.1.3 Classification

The *Regulations Designating Physical Activities* prescribe the activities that are to be subject to the EA process under *CEAA 2012*. The regulation allocates each listed activity to one of the responsible authorities, as described in the Act, and defines who has the responsibility of overseeing the EA process of that specific activity. Generally, activities

[183] "[S]ustainable development: means development that meets the needs of the present, without compromising the ability of future generations to meet their own needs". *Ibid*, s 2(1).
[184] *Ibid*, s 4.

listed in items 1 to 30 of the schedule are under the authority of the Agency[185], activities found in items 31 to 38 of the schedule are under the authority of the Canadian Nuclear Safety Commission[186], and activities detailed in items 39 to 48 of the schedule are under the authority of the NEB[187]. Depending on the responsible authority, the EA for an activity can require slightly different processes. Currently, there is no mention of climate change or GHG emissions related matters in the classification system used at the federal level.

A distinctive feature of this classification method is that only the activities listed in the schedule of the *Regulations Designating Physical Activities* are to be subject to the federal EA process (unless otherwise designated by the Minister).[188] This indirect classification method leaves activities that are not mentioned in the legislation entirely out of the EA process, resulting, ultimately in fewer projects needing to undergo the EA process, compared to the previous version of the Act.[189] This could potentially exclude harmful activities from undergoing an EA and, therefore, lead to significant adverse environmental effects. Such a classification system, combined with the lack of explicit GHG considerations in this legislation, could indeed result in leaving projects with significant potential effect on climate change entirely out of the EA process.

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[185] *Regulations Designating Physical Activities*, SOR/2012-147, s 4(1) [*Regulations Designating Physical Activities*].
[186] *Ibid*, s 4(2).
[187] *Ibid*, s 4(3).
[188] *Ibid*, s 2; *CEAA, 2012*, *supra* note 64, s 14(2).
[189] Brenda Heelan Powell, "The Difference a Year Makes: Changes to Canadian Federal Environmental Assessment Law in 2012" (2012-2013) 37 LawNow 24 at 27.

### 4.1.4 Inside an EA

At the federal level, the *Prescribed Information for the Description of a Designated Project Regulations* (SOR/2012-148) dictates the information required in an EA. Presently, there is no specific mention of climate change or GHG emissions in these requirements, but as is the case with many other provisions of the federal EA legislation, the current wording provides the means for the inclusion of such considerations.

Section 17 of the regulation requires a project subject to an EA to include:

> [a] description of any changes that may be caused, as a result of carrying out the project, to
>
> (a) fish and fish habitat as defined in subsection 2(1) of the *Fisheries Act*;
> (b) aquatic species, as defined in subsection 2(1) of the *Species at Risk Act*; and
> (c) migratory birds, as defined in subsection 2(1) of the *Migratory Birds Convention Act, 1994*[190].

Although these information requirements are limited to certain species and habitats, GHG considerations could still be included in the current wording of this provision. Climate change impacts could have an effect on the species and the habitat mentioned in the regulation, therefore falling under the scope of this provision. For example, if a proposed project released GHG emissions, the increase in GHG emissions could potentially have an impact on increasing water temperature, which could result in changes in the fish and fish habitat mentioned in the regulation.[191] This regulation thus provides an additional possibility for the inclusion of GHG considerations in the current EA process.

[190] *Prescribed Information for the Description of a Designated Project Regulations*, SOR/2012-148, s 17.
[191] As mentioned previously, specific GHG emissions cannot be linked to specific climate change impacts, but such impacts are still projected and should still be considered.

### 4.1.5 Regulatory Power

Even if climate change or GHG emissions are not expressly mentioned in the current Act, they could be integrated in its affiliated regulations. *CEAA 2012* gives the Minister the important power to make regulations deciding which projects would be qualified as a "designated project" under the Act.[192] By adopting a regulation, the Minister can essentially decide which activities will be subject to the EA process, under which responsible authority, and what needs to be included in their EA processes.[193]

Other regulatory powers are also awarded to the responsible authorities in different sections of the Act.[194] Section 83 refers to the power of the Governor in Council to make general regulations that can amend requirements or exclude requirements under *CEAA 2012*. Paragraphs 83 (*e*) and (*g*) are of particular interest for this research, where the Governor in Council can prescribe anything stipulated under *CEAA 2012* and can also specify the

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[192] *CEAA, 2012*, *supra* note 64, s 84 and as demonstrated with the *Regulations Designating Physical Activities*, *supra* note 185.

[193] *CEAA, 2012*, *supra* note 64, s 84; *Regulations Designating Physical Activities*, *supra* note 185, s 2.

[194] "83. The Governor in Council may make regulations

(*a*) amending Schedule 1 or 3 by adding or deleting a body or a class of bodies;

(*b*) prescribing, for the purposes or paragraph 15(*c*), the federal authority that performs regulatory functions and that may hold public hearings;

(*c*) exempting any class of proponents or class of designated projects from the application of section 59;

(*d*) varying or excluding any requirement set out in this Act or the regulations as it applies to physical activities to be carried out

…

(*e*) prescribing anything that, by this Act, is to be prescribed;

(*f*) prescribing the way in which anything that is required or authorized by this Act to be prescribed is to be determined; and

(*g*) generally, for carrying out the purposes and provisions of this Act.

84. The Minister may make regulations

…

(*b*) prescribing the information that must be contained in a description of a designated project;

(*c*) respecting the procedures, requirements and time periods relating to environmental assessments, including the manner of designing a follow-up program.

*CEAA, 2012*, *supra* note 64, ss 83-84.

process to be followed for the carrying out of the different provisions of the Act. This means that the Governor in Council has the power to modify or add a new regulation that could explicitly require the integration of GHG emissions into all EAs at the federal level. This power could also be used to prescribe the process required for such integration. These regulatory powers are significant for this research because of their ability to facilitate the specific integration of GHG considerations into the federal legislation. Integrating GHG considerations into federal EAs through these regulatory powers would spare the fastidious task of amending the current Act or even adopting a new Act.[195] The modification or adoption of a new Act can be an extensive and lengthy process at the Legislative and Senate levels. Changing an existing regulation or adopting a new regulation explicitly on the integration of GHG emissions in the EA process allows GHG considerations to still be legally required in the process, without having the long process of amending the Act itself.[196] Enacting new legislation or amending the existing Act would be the preferred legislative change needed (as it would provide strength and stability to the process). Using regulations would be an effective way to add legal weight to GHG considerations under the EA process. With the ongoing review process at the federal level, regulations could help bridge the gap between *CEAA 2012* and the possible new EA, allowing the integration of GHG considerations in the EA process to begin sooner.

[195] It must be noted that the Act is currently under review (since 2016). Regulations could still be added meanwhile to ensure the integration of climate change considerations in the EA process while the review is taking place. Canada, "Better rules", *supra* note 15.
[196] Privy Council Office – Government of Canada, "Guide to Making Federal Acts and Regulations: Part 3 – Making Regulations" (2 December 2009), online: <http://www.pco-bcp.gc.ca/index.asp?lang=eng&page=information&sub=publications&doc=legislation/part3-eng.htm>.

Section 84 describes another regulatory power that could be important to include GHG considerations in the EA process. Here, the Minister has the power to prescribe what needs to be included in the description of a designated project. The Minister can use this regulatory power to require GHG considerations in the description of a proposed project. With this, the project proponents would have to address GHG considerations from the very beginning of the EA process. Requiring GHG considerations to be integrated at such an early stage of the EA process has already been recognized as the best stage for achieving better results.[197] Therefore, this early requirement would be ideal to ensure the consideration of GHG emissions in a maximum number of projects at the federal level.

Currently, *CEAA 2012* and its related regulations do not explicitly mention GHG considerations, thus leading to inconsistent integration in EAs. With the extensive regulatory power awarded to the responsible authorities, the integration of GHG considerations would be fairly simple to include in an EA regulation. More details on what such legislation should include will be discussed in Chapter 7.

### 4.1.6 Discretionary Power

*CEAA 2012* grants an important discretionary and regulatory power to the Minister in regard to designating projects for an EA. The Minister has a very crucial regulatory power that gives her or him an important discretionary power over a very fundamental part of the EA process: deciding which project will be subject, or not, to an EA.[198] The making of the

[197] Jiricka, *supra* note 58 at 86.
[198] *CEAA, 2012*, *supra* note 64, s 84 and as demonstrated with the *Regulations Designating Physical Activities*, *supra* note 185.

*Regulations Designating Physical Activities* is the result of this discretionary and regulatory power where the activities identified in the schedule of the regulation are to be considered as "designated project" under *CEAA 2012*.[199] In addition to this fundamental discretionary power, the Minister can also use her or his discretion to designate a particular activity as a designated project, even if it is not prescribed in the regulations.[200] These two very important discretionary powers could be used to further include GHG considerations in the EA process, as projects more susceptible to have an effect on climate change could be required to be subject to the EA process, simply based on the decision of the Minister. However, because this is a discretionary power, it would not provide the consistency needed for the integration of GHG considerations in the EA process. Since climate change is considered to be cumulative and a global issue, consistency is essential. The very important discretionary power awarded here, could prove to be too flexible to ensure the consistency needed to better address climate change.

Another discretionary power found in *CEAA 2012* gives the responsible authority the power to decide if a project will be likely to cause significant adverse environmental effects (as defined by the Act).[201] Following this decision, the Governor in Council has an additional discretionary power: deciding whether the identified significant adverse environmental effects are justified in the circumstances.[202] The Governor in Council or the responsible authority (respectively) can add conditions to the decision regarding the

[199] *Regulations Designating Physical Activities*, *supra* note 185, s 2.
[200] *CEAA, 2012*, *supra* note 64, s 14(2).
[201] *Ibid*, s 52(1).
[202] *Ibid*, s 52(4).

environmental effect of the proposed project.[203] The above discretionary powers could be another way for GHG considerations to be included in the current federal EA process. Therefore, the responsible authority or the Governor in Council could decide that GHG considerations be indeed considered as significant adverse environmental effects and that mitigation measures should be implemented for the proposed activity. As this is still a discretionary power and since GHG considerations are not explicitly mentioned in these sections, these considerations remain mere possibilities and not explicit requirements.

### 4.1.7 The Federal EA Legislation Review Process and Interim Approach

The federal government has recently undertaken the review of its EA legislation and process. This includes the review of the EA process at the federal level and the modernization of the NEB.[204] The review process was launched in early 2016, the Canadian government received the recommendations in the fall 2017, and proposed changes were announced in 2018.[205] Ultimately, these could lead to legislative, regulatory or policy changes at the EA level.[206] With this review, the federal government seeks "to develop new, fair processes that are robust, incorporate scientific evidence, protect our environment, respect the rights of Indigenous people, and support economic growth"[207].

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[203] *Ibid*, s 53.
[204] Canada, "Better rules", *supra* note 15.
[205] Government of Canada, "Review of Environmental and Regulatory Processes: What We've Done and Where We're Going", (29 September 2017), online: <https://www.canada.ca/en/services/environment/conservation/assessments/environmental-reviews/environmental-assessment-processes/whatwehavedone-wherewearegoing.html> [Canada, "Review Process"]; Canada, "Review", *supra* note 195.
[206] *Ibid.*
[207] Canada, "Review Process", *supra* note 205.

An Expert Panel was established and mandated to review the EA process under *CEAA 2012*, while engaging with Canadians, Indigenous groups, and key stakeholders. The panel was mandated to develop recommendations based on the consultations conducted by the Minister of Environment and Climate Change Canada (ECCC). Various stakeholders in this review process brought forth many interesting propositions. "Building Common Ground: A New Vision for Impact Assessment in Canada – The Final Report of the Expert Panel for the Review of Environmental Assessment Processes" ("Final Report") gathered the recommendations from the Panel and was submitted to the federal government in April 2017. In June 2017, the follow-up document from the federal government was released: "Environmental and Regulatory Reviews – Discussion Paper" ("Discussion Paper"). The inclusion of climate change and GHG considerations in EAs is one of the issues brought forward in both of these documents and this subsection highlights the findings of this review process.

In its Final Report, the Panel recognizes that EAs "should play a critical role in supporting Canada's efforts to address climate change"[208]. The Panel acknowledged the need for climate change to appropriately and meaningfully be considered in EAs.[209] Challenges were identified for this integration, including the lack of clarity for this integration that, in turn, leads to increased uncertainty. The Panel recognized that there is "an urgent national need for clarity and consistency on how to consider climate change in project and regional

[208] Canada, Expert Panel – Review of Environmental Assessment Processes, *Building Common Ground: A New Vision for Impact Assessment in Canada – The Final Report of the Expert Panel for the Review of Environmental Assessment Processes* (Ottawa: Canadian Environmental Assessment Agency, 2017) at 84 [Expert Panel – *Final Report*].
[209] *Ibid.*

IA"[210], while also recognizing the need for cooperation between federal and provincial government to better address this issue.[211] A threshold approach was also suggested for sectors, industries, or regions in order to respect commitments made by Canada on the international front.[212] Participants in the consultation phase of the review proposed a climate test or climate change trigger, especially since GHG emissions are known to have cumulative impacts.[213] It was proposed that all GHG emissions should be evaluated in the scope of an EA: upstream, direct, and downstream.[214] The Panel acknowledged the need for increased consistency in the consideration of climate change in EAs and for establishing models and methodology for this consideration.[215] However, the Panel believes that strategic EA is better suited for this consideration of climate change.[216] Even with this proposition to shift climate change consideration to strategic EA, there is still a place for increased clarity and consideration for climate change and GHG emissions in project EAs. Ultimately, the Panel recognized that there is an "urgent national need for clarity and consistency on how to consider climate change in project and regional [EA] to support Canada's policy and sustainability goals"[217].

Climate change and GHG emissions seem to have a less important place in the response from the federal government in its Discussion Paper. First, the Discussion Paper reiterates the importance of the review process for: increasing transparency surrounding the science,

[210] *Ibid.*
[211] *Ibid.*
[212] *Ibid* at 85.
[213] *Ibid* at 104.
[214] *Ibid* at 105.
[215] *Ibid* at 84.
[216] *Ibid.*
[217] *Ibid* at 85.

improving data and evidence behind the decision-making process, regaining public trust, and protecting the environment.[218] It mentions the interim approach (which is detailed below) that was proposed in January 2016 and that includes the assessment of direct and upstream GHG emissions for projects under review.[219] One of the guiding principles for the proposed changes in this review process includes the need for "evidence-based decisions reflecting the best available science"[220]. This is particularly important in regard to climate change, especially when dealing with climate models and projections that can be ever-evolving and scientifically complex. One of the propositions considered by the federal government is to use an "open science and data platform to assess and integrate the available science, evidence and Indigenous knowledge that supports [EA] and regulatory processes"[221]. This is an important proposition, especially for climate change, where information evolves rapidly and can sometimes be difficult to access.[222] The Discussion Paper also mentions the importance of recognizing and managing climate change as part of cumulative effects and that strategic EAs are better suited to assess cumulative effects than project EAs (as proposed by the Final Report of the Panel).[223] The Discussion Paper explains that life cycle GHG emissions associated with individual projects should be assessed and that the methodology for this assessment should be provided in a guidance document.[224] This proposition does not address the issue for project-based EAs, nor does

[218] Government of Canada, *Environmental and Regulatory Reviews – Discussion Paper*, June 2017, online: <https://www.canada.ca/en/services/environment/conservation/assessments/environmental-reviews/share-your-views/proposed-approach/discussion-paper.html> at 3.
[219] *Ibid* at 4.
[220] *Ibid* at 7.
[221] *Ibid* at 12.
[222] OECD, *supra* note 26 at 25.
[223] *Ibid* at 9.
[224] *Ibid*.

it address the lack of clear legal requirements in EA legislation in Canada. Cooperation and collaboration are also discussed in support of a more efficient EA process.[225] Further cooperation with provinces is proposed in order to better plan and manage cumulative effects.[226] Propositions for changes to the federal EA legislation and process were announced in 2018 and reviews are still ongoing.[227]

When the federal government announced this review, it also launched the interim approach intended for major projects subject to *CEAA 2012* during the review process. The interim approach specifies that

> [a]ddressing climate change in Canada will require collaboration with Canada's provinces and territories to incorporate greenhouse gas emissions in environmental assessment processes and as part of a national climate change framework. To inform these processes, upstream greenhouse gas emissions associated with projects under review will be assessed[228].

The explicit mention of climate change and of GHG emissions in this interim approach clearly demonstrates the importance of including such considerations in the EA process. Furthermore, the interim approach includes five principles to help guide the responsible authority in its decision-making process. One of these principles directly refers to GHG and states that "[d]irect and upstream greenhouse gas emissions linked to the projects under review will be assessed"[229]. This specific mention of GHG and of methodology demonstrates the need for further clarification in the EA legislation to guide the integration

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[225] *Ibid* at 17.
[226] *Ibid*.
[227] Canada, "Better rules", *supra* note 15.
[228] Government of Canada, Statement, "Government of Canada Moves to Restore Trust in Environmental Assessment" (27 January 2016), online: <https://www.canada.ca/en/natural-resources-canada/news/2016/01/government-of-canada-moves-to-restore-trust-in-environmental-assessment.html?=undefined&wbdisable=true>.
[229] *Ibid*.

of GHG considerations in the EA process. Adopting this interim approach reinforces the notion that there is a need to include climate change in the EA process. Major projects submitted after January 27, 2016 that are subject to *CEAA 2012,* will also be subject to this interim approach guiding the application of the federal legislation. This offers another possible way to integrate GHG considerations in the EA process using the existing legislation. The responsible authority can use the principles in the interim approach to guide its decision-making process and can now specifically include direct and upstream GHG linked to the projects for their assessment.[230] This type of clarification expressly includes GHG emissions and states that their direct and upstream emissions can be analyzed as part of the current EA process. Of course, this interim approach is not part of any legislation and, therefore, has limited legal weight. Additionally, the interim approach is not applicable to all types of projects subject to the federal EA process, but is only limited to major projects. What constitutes a major project is not defined and remains at the discretion of the responsible authority. Therefore, the interim approach could potentially have a limited or broad application.

While launching this interim approach for all new major projects, the government also explicitly stated that

> "[t]he Government of Canada has introduced five principles that will guide its decision-making on major natural resource projects while the Government undertakes a review of environmental assessment processes. For two significant projects currently under review by the National Energy Board (NEB), the Trans

[230] Upstream GHG emissions "relate to the emissions located upstream of the supply chain in the proposed project. Michael Burger & Jessica Wentz, "Downstream and Upstream Greenhouse Gas Emissions: The Proper Scope of NEPA Review" (2017) 41 Harvard Envtal LR 109 at 113 [Burger & Wentz (2017)].

> Mountain Expansion project and Energy East Pipeline project, the Government of Canada will immediately take steps to ensure consistency with these principles."[231]

For these particular projects, the federal government has issued specific principles guiding the decision-making process and ensuring the application of the principles from the interim approach.[232] In regard to the Energy East pipeline project, the federal government has said that it will "[a]ssess the upstream greenhouse gas emissions associated with this project and make this information public"[233]. By explicitly mentioning GHG emissions in this pipeline-specific approach, the interim approach reinforces the importance of such considerations to be assessed in the general EA process. It provides an additional avenue for GHG considerations to be included in the EA process. However, the only GHG emissions that need to be considered under this principle are limited to the upstream emissions. This limitation leaves out all other GHG emissions that might be involved in the project and dismisses their consideration as part of the EA process. This limitation can result in the formulation of an incomplete portrait of the GHG emissions associated with the proposed project. Using this approach should be considered as a floor and not a ceiling approach, where these principles only suggest the minimal requirements that need to be considered, but are not limited to only providing the information mentioned in the interim approach. This would allow all GHG emissions associated with a proposed project to be considered.

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[231] Government of Canada, Backgrounder, "Interim Measures for Pipeline Reviews" (27 January 2017), online: <https://www.canada.ca/en/natural-resources-canada/news/2016/01/interim-measures-for-pipeline-reviews.html>.
[232] *Ibid.*
[233] *Ibid.*

In March 2016, ECCC announced its methodology to estimate the upstream GHG emissions of major projects as part of its interim approach under the federal EA process. The definition of "upstream" was further defined in this methodology, where it is said to include "all industrial activities from the point of resource extraction to the project under review. The specific processes included as upstream activities will vary by resource and project type, but in general they include extraction, processing, handling and transportation"[234].

The methodology also describes the two-part process for assessing the upstream GHG emissions of a project. First, a quantitative estimate of the GHG emissions from the upstream production associated with the project will be required[235] and then, a discussion on the "project's potential impact on Canadian and global GHG emissions"[236] is expected. This two-part approach offers an opportunity to provide the much-needed quantitative analysis of GHG emissions related to a project and gives an opportunity to include considerations of the implications of the GHG emissions of the project on a greater scale.

The first part of the methodology is limited to upstream and direct GHG emissions.[237] It is expected that comparable data will be used in this part.[238] The methodology includes a formula for the upstream emissions calculations, and acceptable sources of data are also

[234] Department of Environment and Climate Change, *Canada Gazette*, "Estimating upstream GHG emissions" (19 March 2016) 150:12, online: <http://www.gazette.gc.ca/rp-pr/p1/2016/2016-03-19/html/notice-avis-eng.php#nl4>.
[235] *Ibid.*
[236] *Ibid.*
[237] *Ibid.*
[238] *Ibid.*

included. The methodology mentions that variability is to be expected and that several scenarios will need to be developed to provide a range estimating the upstream GHG emissions.[239] This helps answer some of the critics of integrating GHG considerations in the EA process with respect to the variability and uncertainty surrounding climate change. Including a variety of scenarios allows for this uncertainty to be taken into account, while still providing a quantitative estimate for upstream GHG emissions.

The second part of the methodology allows global considerations to be included in the decision-making process. The application of this second part takes into account the implications of the recent ratification by Canada of the Paris Agreement and the cumulative nature of climate change. The discussion part of the proposed methodology is expected to include an assessment of

> the conditions under which the Canadian upstream emissions estimated in Part A could be expected to occur even if the project were not built. … The discussion will also explore the potential impact of GHG emissions associated with the project on overall Canadian GHG emissions, and where possible, on global GHG emissions[240].

This discussion could also include different scenarios, based on the various technical and economic data used.[241] The methodology does not state that this discussion could include a scenario where the project does not take place (for example, where the oil is not extracted for a pipeline project), although it would be an option worth considering, given the changing markets in regards of renewable energy and fossil fuels.[242] This second part

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[239] *Ibid.*
[240] *Ibid.*
[241] *Ibid.*
[242] Tom Randall, "Wind and Solar Are Crushing Fossil Fuels – Record clean energy investment outpaces gas and coal 2 to 1" *Bloomberg* (6 April 2016), online: <https://www.bloomberg.com/news/articles/2016-04-06/wind-and-solar-are-crushing-fossil-fuels>.

allows for an analysis of the implications of the upstream emissions of a project on the Canadian and global GHG emissions scale. This is an important discussion to be included in the EA process, helping project proponents understand how GHG emissions and climate change can have global implications.

The second part of the methodology helps address an important challenge in the integration of GHG considerations in the EA process, the face that GHG emissions cannot be directly linked to a specific climate change impact. By integrating global considerations in the process, this results in a more comprehensive portrait for the responsible authority in its decision-making process. Global considerations need to be generally included in all EA processes.

While it does offer another opportunity for climate change and GHG emissions to be included in the current EA process, the methodology of the interim approach has some significant drawbacks. The methodology is not part of any legislation and, hence, lacks significant legal weight. This could limit its application and enforcement across the country. The methodology is also limited to only major projects and the calculations are limited to upstream GHG emissions, excluding downstream and indirect emissions.[243] This

[243] "Upstream" emissions relate to the emissions located upstream of the supply chain in the proposed project. Direct emissions often refer to the "emissions associated with the production of fossil fuels in fossil fuels production projects". When climate change is discussed in EA documents, direct emissions are generally the type of emissions mentioned. In the fossil fuels industry, direct emissions represent only a small proportion of the life cycle emissions produced. Burger & Wentz (2017), *supra* note 230 at 113, 122.
Indirect emissions are described as "a consequence of the activities within well-defined boundaries of, for instance, a region, an economic sector, a company or process, but which occur outside the specified boundaries." IPCC 2014, *supra* note 1 at 124. For example, in fossil fuels production projects "indirect or 'downstream' emissions usually 'occur as a result of the transportation, processing and end use of […] fuels'". Burger & Wentz (2017), *supra* note 230 at 122.

offers a seriously limited representation of the GHG considerations needed for a project and thus limits the information available to the responsible authority in its decision-making process.

### 4.2 PROVINCIAL EA LEGISLATION

All Canadian provinces have adopted their specific legislation on the EA process, each with its own particularities. Still, most provinces follow a similar process where a responsible authority decides whether a proposed project will be subject to an EA and if a submitted EA can be granted approval (with or without conditions).

This section provides an overview of what is currently required for the inclusion of GHG considerations into the EA legislation of various provincial jurisdictions. The EA legislation in all Canadian provinces was considered for this research. This overview will highlight provisions in some of the EA legislation where the integration of climate change and GHG emissions might not be required, but where it might nonetheless still be possible. These provisions could be used to further integrate GHG considerations in the EA process. Specifically, this section will present provincial EA legislation that offers a notably different approach than that of the previously examined federal EA legislation, in regard to GHG emissions integration.

This section is divided in the same six subsections as the federal section, each of them describing some of the current ways to include GHG considerations in the EA process. These subsections are: purpose clause, definitions, classification, inside an EA, regulatory power, and discretionary power.

### 4.2.1 Purpose Clause

Not all provincial EA legislation includes a purpose clause or a purpose section. In EA legislation, even if purpose clauses are not legally considered as part of the legislation, they aid in the interpretation of the object of an EA and can also provide the legislator the means to include certain notions important in the interpretation of that EA legislation.[244]

As in federal EA legislation, some purpose clauses refer to key environmental notions for GHG considerations such as the notions of sustainable development [245] and the precautionary principle[246]. None of the provincial purpose clauses specifically mentions or refers to GHG considerations. General purpose clauses such as those found in the EA legislation in Prince Edward Island ("to manage, protect and enhance the environment"[247]) and in Ontario ("for the betterment of the people of the whole or any part of Ontario by providing for the protection, conservation and wise management in Ontario of the environment"[248]) can still provide a possible means of integrating GHG considerations in the current EA process. Climate change could lead to significant damaging impacts for the environment (for example with increasing coastal erosion). With purpose clauses expressing their goal to protect the environment, they allow climate change and GHG considerations to be included in the EA process. These purpose clauses help in the interpretation of the legislation allowing another possible means for GHG emissions to be

[244] Mark Haddock "Current Issues in Environmental Assessment in British Columbia" (2010) 21 J Env L & Prac 221 at 223.
[245] See: Alberta (*Environmental Protection and Enhancement Act*, RSA 2000, c E-12 s 2 [*EPEA AB*]); Manitoba (*The Environment Act*, CCSM c E125 s 1(1) [*EA MB*]); and, Nova Scotia (*Environment Act*, SNS 1994-95, c 1, s 2 [*EA NS*]).
[246] *EA NS*, *supra* note 245, s 2.
[247] *Environmental Protection Act*, RSPEI 1988, c E-9, s 2 [*EPA PEI*].
[248] *Environmental Assessment Act*, RSO 1990, c E.18, s 2 [*EAA ON*].

considered under the current EA legislation. However, without specific mention, these considerations are limited.

### 4.2.2 Definitions

Most provincial EA legislation begins with the definition of terms and terminologies deemed important for their legislation. These definitions are often fundamental to the EA process and can be especially helpful when trying to find possible ways for integrating GHG considerations under current EA legislation. Many of the core definitions generally found in provincial EA legislation would allow such integration. Some of these include the definitions of "environment"; "environmental effect"; "adverse effect"; "contaminant"; and, "significant". A notable definition is found in *The Environment Act* of Manitoba (*EA MB*), which includes a definition of "greenhouse gas". These definitions are examined here, focusing on the possible ways they offer further integration of GHG considerations in the EA process.

Perhaps the most important definition for this research is the one on "greenhouse gas", as expressed in the *EA MB*. This definition is especially important since it is the only definition in all Canadian EA legislation that specifically addresses any climate-change-related matter. In the *EA MB*, GHG is defined as:

> any of the following gases:
> (a) carbon dioxide,
> (b) methane,
> (c) nitrous oxide,
> (d) hydrofluorocarbons,
> (e) perfluorocarbons,
> (f) sulphur hexafluoride,

(g) any other gas prescribed by regulation[249].

This definition includes all major known GHGs and leaves room to include other GHGs that could be added by future regulations. The legislators deemed it important to include such a detailed definition, especially since there is mention of GHGs in a further provision of the Act. However, even with this definition and the further provision on GHG in the Act, it is still unclear how GHG emissions should be integrated in the EA process. Also, the Act does not mention if all GHGs are to be treated equally or if certain GHGs can have a greater environmental effect than others.[250] However, this definition still sets the tone for what could be an important requirement in the Canadian EA process for GHG considerations, where GHG emissions would be clearly included as a required consideration in the EA process. The definition itself does not hold any legal requirements for the EA process, but combined with further provisions in the Act and with its purpose clause, it could lead to additional requirements for GHG considerations in the EA process.

Other important definitions in provincial EA legislation can be found in the *Environment Act* of Nova Scotia and in the *Environmental Assessment Regulations* of Nova Scotia. The *Environment Act* of Nova Scotia contains a noteworthy definition for GHG integration in the EA process. Indeed, the provincial legislation is the only Canadian EA legislation that defines the term "significant". Here, "significant"

> means, with respect to an environmental effect, an adverse effect that occurs or could occur as a result of any of the following:
> (i) the magnitude of the effect,
> (ii) the geographic extent of the effect,

[249] *EA MB*, *supra* note 245, s 1(2).
[250] Although, scientifically, it is clear that some GHG do have proportionally more important environmental effects than others, especially in regard to climate change. See IPCC 2014, *supra* note 1 at 87.

(iii) the duration of the effect,
(iv) the frequency of the effect,
(v) the degree of reversibility of the effect,
(vi) the possibility of occurrence of the effect[251].

Once more, this definition does not specifically include climate change or GHG emissions, but based on the projected importance of climate change impacts, climate change and GHG emissions could still be considered as "significant environmental effects".[252] According to the definitions found in Nova Scotia, climate change and GHG emissions could be considered as "significant" and as "environmental effects"[253], therefore increasing the likelihood for them to be considered in the EA process. Even if the definition is quite general, it still provides a good reference to determine what a "significant environmental effect" is. If an environmental effect is deemed to be significant, it could result in the rejection of a proposed project.[254] The concept of "significance" is central to EA processes in Canada.[255] Its definition in the EA legislation is therefore essential and could provide another possible way for climate change and GHG emissions to be integrated in the EA process.

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[251] *Environmental Assessment Regulations*, NS Reg 26/95, s 2(1)(l) [*EAR NS*].
[252] The definition for "significant environmental effects" as mentioned here, could included climate change since the projected impacts of climate change will be extensive, irreversible, and are considered as a certainty. IPCC 2014, *supra* note 1 at 2-31.
[253] The definition of "environmental effect in Nova Scotia

> means, in respect of an undertaking,
>
> > (i) any change, whether negative or positive, that the undertaking may cause in the environment, including any effect on socio-economic conditions, on environmental health, physical and cultural heritage or on any structure, site or thing including those of historical, archaeological, paleontological or architectural significance, and
> > (ii) any change to the undertaking that may be caused by the environment,
>
> whether the change occurs inside or outside the Province;

*EA NS supra* note 245, s 3(v).
[254] *EAR NS*, *supra* note 251, s 34(1)(f).
[255] Ohsawa & Duinker, *supra* note 165 at 223; Toby Kruger, "The *Canadian Environmental Assessment Act* and Global Climate Change: Rethinking Significance" (2009) 47 Alta L R 161 at 162-3 [Kruger].

Another noteworthy definition is the one on "environmental effect" found in the EA legislation of Newfoundland and Labrador. This definition includes changes "to the present or future environment that would result from an undertaking"[256]. It provides the opportunity to include effects on the environment that are not necessarily immediate. This definition perfectly exemplifies the types of changes that are expected from climate change, as their effects will not always be immediate, but will tend to arise as time passes.[257] Therefore, an undertaking emitting a significant amount of GHG would be contributing to the aggravation of climate change impacts; of the future environment, and could be considered as causing an "environmental effect", as per the definitions provided in the *Environmental Protection Act* of Newfoundland and Labrador. This reasoning reveals another possible way for GHG emissions and climate change considerations to be included in the current EA process.

"Contaminant" is also a noteworthy definition found in most provincial EA legislation.[258] Its definition can vary by province, but can be generally summarized as a substance that is foreign or present in excess that can have an effect on the environment. Some provinces even specify that contaminants can be found in different physical states (solid, liquid or gaseous) and in different forms (microorganism, sound, vibration, rays, heat, odour, radiation or any of these combinations).[259] GHG emissions are gaseous substances that, when found in excess in the environment, can have adverse effects on the environment

[256] *Environmental Protection Act*, SNL 2002, C E-14.2, s 2 (o) [*EPA NL*].
[257] IPCC 2014, *supra* note 1 at 8.
[258] See: Quebec – *Environmental Quality Act*, C Q-2, s 1(5) [*EQA QC*]; Saskatchewan – *The Environmental Assessment Act*, SS 1979-80, c E-10.1, s 2(b) [*EAA SK*]; New Brunswick – *Clean Environment Act*, RSNB 1973, c C-6, s 1 [*CEA NB*]; Nova Scotia – *EA NS supra* note 245, s 3(k); Prince Edward Island – *EPA PEI*, *supra* note 247, s 1(b); Newfoundland and Labrador – *EPA NL*, *supra* note 256, s 2(h).
[259] See: Quebec – *EQA QC*, *supra* note 258, s 1(5); Prince Edward Island – *EPA PEI*, *supra* note 247, s 1(b).

(with various climate change impacts, such as erosions, floods and droughts) and can cause damage to the health of humans, plant or animal life. According to these definitions, GHGs could, even if they are not explicitly mentioned, be considered as contaminants. In fact, many jurisdictions have already classified some GHG or all GHGs as contaminants in their legislation and mandatory reporting is now required for facilities emitting GHGs over a certain legally set standard.[260] However, even if GHGs are identified as contaminants in some legislation, they are not necessarily included as contaminants under the current EA legislation and processes, but they are not explicitly excluded either. Without specific legislative requirements on GHG considerations, the definitions of contaminant, pollutant and pollution do allow climate change and GHG emissions to be integrated in the EA process, as per the legislation currently in place.

### 4.2.3 Classification

The EA legislation in many Canadian provinces provides some type of classification for the EA process in those provinces. Classification can be used to determine if an EA is required altogether and which EA process will be followed by a proposed project. Provincial EA legislation includes different classification systems. They can be classified by the private or public sector; type of activities; location of the proposed project; regulation standards; and, type of environmental effect. Sometimes, a threshold approach is used, but more frequently EA legislation categorizes activities on lists that prescribe if an EA process is required and then dictate the applicable EA process to be followed. Some of these lists simply outline whether a specific project is exempted from the EA process or

[260] For example, see *Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere*, CQLR c Q-2, r 15 [*Regulation emissions of contaminants QC*].

whether an EA is mandatory. Others prescribe a more streamlined EA process depending on the type of project. While these classification systems do not explicitly mention GHG considerations, some do offer possible ways to integrate climate change and GHG emissions in the EA process. This section presents some of the most noteworthy classification systems utilized in current provincial EA legislation and it also describes how some of these different classification systems can be used in order to include GHG considerations.

Many provinces have adopted EA legislation that lists activities that are exempted from an EA or activities for which an EA is mandatory.[261] Some provinces have an approach similar to that in federal EA legislation, where activities that are listed as exempted from the EA process can still be required to be subject to an EA, depending on the use of the discretionary power given to the responsible authority.[262] Most provinces using these types of classification have not specifically included GHG considerations in their lists, but an indirect link to climate change and GHG emissions can often still be found. Some of these classification lists are based on anticipated environmental effects and the process to be followed varies according to this classification.[263] For example, in Alberta, certain types of projects that are known to typically release relatively large emissions of GHGs have

[261] See: Alberta – *Environmental Assessment (Mandatory and Exempted Activities) Regulation*, Alta Reg 111/1993, Manitoba – *EA MB*, *supra* note 245 and the *Classes of Development Regulation*, Man Reg 164/88; Quebec – *Regulation respecting environmental impact assessment and review*, CQLR c Q-2, r 23, s 2 [*RREIAR QC*]; New Brunswick – *Environmental Impact Assessment Regulation*, NB Reg 87-83, s 3(1) [*EIAR NB*]; Nova Scotia – *EAR NS*, *supra* note 251 Schedule A; Newfoundland and Labrador – *EPA NL*, *supra* note 256, s 45(b).

[262] See: Alberta – *EPEA AB*, *supra* note 245, s 43; New Brunswick – *EIAR NB*, *supra* note 261, s 6.

[263] John D. Stefaniuk, "Manitoba Climate Change Law and Policy" in Dennis Mahony, ed, *The Law of Climate Change in Canada, 2015 Student Edition* (Toronto, Canada: Canada Law Book, 2014) 8-1 at 8-12 [Stefaniuk]; *EPA NL*, *supra* note 256, s 45(b).

already been identified as mandatory and are therefore subject to the EA process.[264] On the other hand, in Ontario, the *General* regulation exempts certain types of undertakings from certain provisions of their *Environmental Assessment Act*. This is meant to simplify the EA process for projects whose completion is deemed to be possible without significant negative environmental effects.[265] Listed activities with generally positive environmental effects (such as low-emission and energy efficient projects) follow a less stringent process[266] and activities that would generally result in more significant environmental effects (such as private sector coal-fired generation projects) have to be subject to the individual EA (the most stringent process under the *Environmental Assessment Act* of Ontario).[267] Such legislation allows for low emissions and projects with generally positive environmental effects to go through a less rigorous and more rapid EA process, thus encouraging the implementation of these types of projects.[268] In New Brunswick,[269] Nova

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[264] Such projects include oil sands and coal-fired power plants. Teresa Meadow, "Alberta Climate Change Law and Policy" in Dennis Mahony, ed, *The Law of Climate Change in Canada, 2015 Student Edition* (Toronto, Canada: Canada Law Book, 2014) 6-1 at 6-13.

[265] The list includes:

> "(a) reforestation and woodlot management;
> (b) restocking of indigenous wildlife;
> (c) provision of conservation area workshops, administration buildings, outdoor education and interpretive centres;
> (d) conservation services;
> (e) municipal tree replacement;
> (f) agricultural land management of authority-owned lands;
> (g) flood-proofing;
> (h) fish and wildlife habitat management;
> (i) development of conservation areas and campgrounds".

*General*, RRO 1990, Reg 334, s 8 [*General ON*].

[266] Mahony, "Ontario", *supra* note 104 at 9-13.

[267] *Ibid*.

[268] For example, encouraging public transit projects. *Ibid*.

[269] For example, the list includes: offshore drillings for the extraction of oil, pipelines over five kilometres in lengths (with certain exceptions), projects that would affect a special feature of the environment, and projects that would affect two acres or more of wetlands. *EIAR NB*, *supra* note 261 Schedule A.

Scotia[270] and Newfoundland and Labrador,[271] undertakings requiring an EA (listed in the legislation) include projects that generally are known to have an impact on climate. These classification systems do not specifically mention climate change or GHG emissions, but by grouping together activities that are expected to have greater GHG emissions on a list of mandatory EAs allow for the indirect integration of GHG considerations.[272] While not explicitly targeting all projects that *could* have a significant impact on climate change and GHG emissions, the current EA legislation allows for the possibility of GHG considerations to be included into the EA process.

An interesting distinction found in the *General* regulation in Ontario targets climate change and GHG emissions related considerations. The *General* regulation includes its own definitions for projects specific to the renewable energy sector: renewable energy generation facilities, renewable energy projects, renewable energy testing facilities, and renewable energy testing projects.[273] Since energy efficiency and renewable energy have been important factors to consider when addressing climate change, the regulation indirectly reinforces the importance of GHG considerations with these definitions. Ontario even goes a step further by exempting certain renewable energy projects from the EA

[270] In Nova Scotia, projects in the Class I and Class II list of undertakings have to be subject to an EA and many of the listed activities could include climate change considerations. (*EA NS*, *supra* note 245) They include a broad range of activities that might have an effect on climate change, such as extraction of petroleum-based products and their related GHG emissions, the development of a waste facility and the associated generation of methane, including the building of new roads which could further promote the emission of GHGs and might also destroy carbon sinks such as forests and wetlands. (*EAR NS*, *supra* note 251 Schedule A.)

[271] The classification is similar in Newfoundland and Labrador (*Environmental Assessment Regulations, 2003*, NLR 54/03, ss 29, 30, 32-36, 37(1), 38, 39(1)-(2), 40(1), 41, 42(1), 43-46, 47(1), 48(1), 49(1), 50, 51(1)(a)-(c).)

[272] Mahony, "Ontario", *supra* note 104 at 9-12.

[273] All of these definitions refer back to the *Electricity Act, 1998* or the *Green Energy Act, 2009* of Ontario. *General ON*, *supra* note 265, s 1.

process altogether.[274] Proceeding with this exemption accelerates their approval, thus facilitating their general implementation.[275] These exemptions encourage the development of such climate-friendly activities and indirectly include GHG considerations in the current EA process in Ontario.

Another noteworthy approach used in Quebec is the threshold approach used for certain projects. In using this approach, only projects that meet or exceed standards set in the regulation must go through the EA process.[276] By referring to other regulation standards, this type of approach would allow for the inclusion of GHG considerations in the EA process. Currently, there are regulations in place requiring certain facilities to report on their GHG emissions, but none specifically relates to the EA process. This could provide another possibility for the inclusion of further GHG considerations in the EA process.

These subtle variations in the classification systems as found in current provincial EA legislation offer different opportunities for GHG integration in the EA process. Some distinctions offer possibilities to further include climate change and GHG emissions in the EA process, while others might limit the opportunity to do so.

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[274] *Ibid*, ss 15, 15.0.1, 15.0.2.
[275] Richard D. Lindgren & Burgandy Dunn, "Environmental Assessment in Ontario: Rhetoric vs. Reality" (2010) 21 JELP 279 at 300 [Lindgren & Dunn].
[276] Specifically, the *EQA QC* refers to contaminant or contaminants that would be "present in the environment in a concentration or quantity greater than the permissible level determined by regulation of the Government, or whose presence in the environment is prohibited by regulation of the Government". *EQA QC*, *supra* note 258, s 1(6).

### 4.2.4 Inside an EA

Canadian provincial EA legislation includes various requirements on what information is needed in their EAs. Some provinces make detailed requirements, others make recommendations as to what should be included, and some simply allow the responsible authorities to set these requirements through the use of their discretionary powers. These various approaches affect how GHG considerations can potentially be included in the final EAs (either by limiting or fostering their integration). The following section will feature additional possibilities for including climate change and GHG emissions in the EA process under the current legislation.

As mentioned previously, by defining GHGs, Manitoba is the first and only province in Canada to include a definition related to climate change in its EA legislation. This definition is particularly valuable when coupled with section 12.0.2 of the *EA MB* on "climate change considerations". The section reads as follows:

> When considering a proposal, the director or minister must take into account — in addition to other potential environmental impacts of the proposed development — the amount of greenhouse gases to be generated by the proposed development and the energy efficiency of the proposed development.[277]

This very important provision was added in 2009 and is aimed at promoting the integration of climate change and GHG considerations in the EA process, as it explicitly mentions GHGs and energy efficiency. This provision makes it clear that GHGs and energy efficiency should be considered under the current EA process, a very crucial step to ensure the integration of GHG considerations in the EA process. Although this is an important

[277] *EA MB supra* note 245, s 12.0.2.

step, the implication of this section for actual EAs remains unclear, as its consideration remains at the discretion of the director or the Minister.[278]

Most EA legislation contains few of the mandatory elements required for each EA. Instead, most legislation set broad provisions, with a number of factors to consider, leading to various results and inconsistency.[279] Some of these provisions and other conditions can be made mandatory by the responsible authorities, based on their discretionary powers.[280] Such potential mandatory requirements could then provide additional ways to ensure further integration of GHG considerations in the EA process with the current EA legislation.

Some EA legislation also mentions specific methodologies that could provide an interesting avenue for the integration of GHG considerations in the current EA process. The *Reviewable Projects Regulation* in British Columbia gives a weighting factor for specifically identified contaminants. This contaminant weighting factor (CWF) is used to calculate the total waste discharge permitted for each facility proposed under the EA review process.[281] To calculate this total weight discharge, the proponent must respect the quantity

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[278] Stefaniuk, *supra* note 263 at 8-12.
[279] Pardy, *supra* note 63 at 147.
[280] These can include: terms of reference, direct expected environmental impact, indirect environmental effects, type of impacts, mitigation measures, and qualitative and quantitative analysis. (See: British Columbia – *Environmental Assessment Act*, SBC 2002, c 43, ss 5(2)(a), 11(2)(b), 31 [*EAA BC*]; Alberta – *EPEA AB*, *supra* note 245, s 49; Ontario – *EAA ON*, *supra* note 248, ss 16(1)-(3); Québec – *RREIAR QC*, *supra* note 261, ss 3*(b)-(c)*; New Brunswick – *CEA NB*, *supra* note 258, s 31.1(2); *EA NS*, *supra* note 245, s 36(a), *EAR NS*, *supra* note 251, ss 19(1)(f), 19(1)(h)-(j).)
[281] CWF: means the contaminant weighting factor set out in Appendix 1 for a permitted contaminant" and where "[t]he total waste discharge for a facility is the quantity of waste that is permitted under the *Environmental Management Act* to be discharged from the facility". *Reviewable Projects Regulation* (BC Reg 370/2002), ss 1-2.

of waste prescribed under the *Environmental Management Act* of British Columbia and must calculate it by "adding the products obtained by multiplying the CWF for each permitted contaminant by the permitted discharge rate, in tonnes or other unit of measurement specified in Appendix 1, for that contaminant"[282]. Certain air contaminants are listed under Appendix 1 of the *Reviewable Projects Regulation*, including some of the most abundant and well-known GHGs: carbon dioxide ($CO_2$), methane, and nitrogen oxides. However, their weighting factors do not reflect the consideration of their impact on climate change. Here are the values cited in the regulation:

Table 2: CWF for GHGs in the *Reviewable Projects Regulation* of British Columbia

| **Air Contaminant** | **Weighting Factor** |
|---|---|
| Carbon Dioxide | 0.00 |
| Methane | 0.00 |
| Nitrogen Oxides | 0.67 |

Source: *Reviewable Projects Regulation* (BC Reg 370/2002), Appendix 1, Table A

Considering that the value given for the CWF generally varies between 0.00 and 40.14 for all air contaminants listed, higher CWF should be given to all GHGs to allow for a further integration of GHG considerations. This would help to consistently integrate GHG emissions for climate change mitigation purposes in future EAs. A quick adjustment to these numbers would allow a clear and comprehensive integration of climate change and GHG considerations, where GHGs would then be a greater factor to consider in the EA process in British Columbia. This would lend further importance to the consideration of GHG emissions by all reviewable projects identified by the *Reviewable Projects Regulation*. This interesting methodology ensures that contaminants, such as GHGs, are

[282] *Ibid*, s 2(2).

more thoughtfully considered in EAs. However, the CWF awarded to each GHG listed does not reflect the need to consider and include GHG emissions in the current EA process. If the values behind the CWF were to be reviewed to reflect the need for a stronger consideration of GHGs, it would open the door to even further integration of climate change and GHG emissions in the EA process.

### 4.2.5 Regulatory Power

All provincial EA legislation in Canada provides responsible authorities with some form of regulatory power. This power to regulate can vary between provinces, but generally it allows the responsible authority to further define the application of an EA and to add specific requirements to the EA process.

For provinces using a classification system, such as in British Columbia, the responsible authority can specify methods of grouping projects by categories or other factors relevant to this classification (for example: depending on the type of projects and their potential for adverse environmental effect).[283] By using this important power, the responsible authority could group projects that have a general tendency to release great amounts of GHGs, such as fossil fueled energy production plants. The regulatory power can even be used to identify projects for which an EA will be required or for which they will be partly or completely exempted of the EA process.[284] This important power to regulate gives the responsible

[283] See: *EAA BC*, *supra* note 280, s 5(2)(a); Manitoba – *EA MB*, *supra* note 245 s 41(1); Ontario – *EAA ON*, *supra* note 248, s 14(4); Quebec – *EQA QC*, *supra* note 258, s 31.9; New Brunswick – *CEA NB*, *supra* note 258, s 31.1(2); Newfoundland and Labrador – *EPA NL*, *supra* note 256, s 111(1).
[284] See: Alberta – *EPEA AB*, *supra* note 245, s 59; Manitoba – *EA MN*, *supra* note 245, s 41(1); Ontario – *EAA ON*, *supra* note 248, s 14(4); New Brunswick – *CEA NB*, *supra* note 258, s 31.1(2); *EPA NL*, *supra* note 256, s 111(1).

authority the flexibility to include requirements on GHG considerations through the current EA process by regulation.

Often, the responsible authority also has the power to regulate the structure of the EA. For instance, in Alberta, the Minister can make regulations on EAs and particularly on: "(b) establishing procedures governing the environmental assessment process; … [and] (f) respecting the form and content of environmental impact assessment reports"[285]. Such is also the case in many other provinces, where the responsible authority can adopt a regulation describing the mandatory information needed in an EA and defining further standards required for an EA.[286] Additionally, some provinces can use their regulatory power to include pre-existing guidelines or policies as part of the EA process.[287] This approach could be particularly helpful in regard to GHG considerations, especially since a joint guidance document already exists (the General Guidance)[288] and since some provinces also have their own documents on the matter.[289] GHG considerations could easily be integrated in the current EA legislation through such regulatory power.

Some EA legislation gives significant regulatory power to their responsible authorities. Such is the case in Saskatchewan, where *The Environmental Assessment Act* gives a broad power to regulate to the Lieutenant Governor in Council.[290] The Lieutenant Governor in

[285] *EPEA AB*, *supra* note 245, s 58.
[286] For example: *CEA NB*, *supra* note 258 s 31.1(2); *EA NS supra* note 245, s 3A(1).
[287] For example: *EA NS supra* note 245, ss 8A(1)-(2).
[288] *General Guidance*, *supra* note 20.
[289] For example, the province of Nova Scotia published in February 2011 a "Guide to Considering Climate Change in Environmental Assessments in Nova Scotia". *Guide - CC in EA in NS*, *supra* note 20.
[290] "The Lieutenant Governor in council may make regulations:

Council can use that regulatory power to define the entire EA process with the ability to determine the scope, the process and other areas of EA in Saskatchewan. In Manitoba, the EA legislation gives the Lieutenant Governor in Council the power to prescribe which gases are to be included in the definition of GHGs through this regulatory power.[291] From the power of defining words or expressions, to the power of establishing classes of developments and methods for conducting assessments, these are all areas where GHG considerations could be integrated. Such integration through regulation adds consistency and clarifies their considerations for all future EAs. This is an important power that could provide the clarification and consistency needed in the integration of GHG considerations in all provincial EAs.

In the context of this research, all these provisions are important to consider as they can collectively yield significant power to effectively further integrate GHG considerations into the provincial EA legislation.[292] By regulation, the responsible authority can clarify

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> (a) defining, enlarging or restricting the meaning of any word or expression used in this Act but not defined in this Act;
> (b) establishing classes of developments;
> (c) respecting:
>  (i) the scope of assessments and content of statements for developments and for classes of developments; and
>  (ii) the procedures and methods for conducting assessments and preparing statements for developments and for classes of developments;
> …
> (l) prescribing any other matter or thing that is required or authorized by this Act to be prescribed in the regulations;
> (m) respecting any other matter or thing that the Lieutenant Governor in Council considers necessary to carry out the intent of this Act."

*EAA SK*, *supra* note 258, s 27.

[291] *EA MB*, *supra* note 245, s 41(1)(a.1).

[292] Using the pre-existing provisions and regulations would allow the integration of GHG considerations in a more effective way as it would prove to be a less extensive and lengthy process then going through with the adoption or amending of a new Act on the matter.

which types of projects can result in significant environmental impact (including through GHG emissions) and establish the documentation required for an EA.[293] Clarifying this integration through this regulatory power would add legal weight to the consideration of climate change and GHG emissions in the EA process. The regulatory power could even make these considerations mandatory. In doing so, it would help clarify the wording of the current EA legislation and ensure consistency throughout all EAs. Consistency is essential when addressing climate change because it is the cumulation of GHG emissions that leads to the impacts of climate change. This becomes especially important when assessing whether the GHG emissions of a project can be considered as significant in the scope of an EA.[294] Of course, these regulatory powers do not apply expressly to climate change and could also be used to undermine the consideration of climate change components in the EA process. For example, theoretically, the power to exempt certain undertakings from an EA could exempt all undertakings linked to the development of the oil industry, which could be quite significant for climate change. As such, certain boundaries should be set in order to ensure a proper consideration of climate change and GHG emissions in all EAs.

### 4.2.6 Discretionary Power

EA legislation in all Canadian provinces allows for some degree of discretion by the responsible authority, though the scope of that discretion varies province by province. Under most legislation, the responsible authority can decide: what information will be mandatory in an EA; what is considered as an environmental effect; and, what conditions are required for the development of certain proposed projects. However, some provinces

[293] Kruger, *supra* note 255 at 183.
[294] *Ibid* at 177.

give greater discretionary power to their responsible authority by allowing it to decide which projects will be subject to an EA. This section will explore how these discretionary powers are different from the federal discretionary powers and how they can help include GHG considerations in the current provincial EA processes.

Generally, provincial EA legislation gives the responsible authority the power to decide what information is required in each EA. The responsible authority is often mandated to dictate the terms of reference or the guidelines upon which the EA will be developed.[295] This offers up another possibility for including GHG considerations in the EA process. In recent years, some terms of reference did include climate change and GHG considerations.[296] Similarly, the legislation in many provincial jurisdictions gives the responsible authority the power to add conditions to the approval of a project.[297] These additional conditions then become mandatory for the development of the proposed project.[298] Through the use of these conditions, the responsible authority could then require the integration of climate change and GHG considerations into the EA process.[299] This vast

[295] In Quebec, the EA legislation has the Minister mandated to indicate "the nature, the scope and the extent of the environmental impact assessment statement" that the proponent must prepare (*EQA QC*, *supra* note 258, s 31.2). In New Brunswick, the Minister, along with the review committee, is also responsible to decide if the submitted environmental impact assessment report is satisfactory (*EIAR NB*, *supra* note 261, s 11). In Nova Scotia, the Minister has the mandate to prepare the terms of reference that will be used when an EA report is required (*EA NS supra* note 245, s 36(a)). In regards of the EA process itself, the *EPA PEI* states that the EA and the environmental impact statement content are to be decided by the Minister (*EPA PEI*, *supra* note 247, s 9(3)).

[296] Tony Crossman, "British Columbia Climate Change Law and Policy" in Dennis Mahony, ed, *The Law of Climate Change in Canada, 2015 Student Edition* (Toronto, Canada: Canada Law Book, 2014) 5-1 at 5-63.

[297] *EAA BC*, *supra* note 280, s 31; *EPEA AB*, *supra* note 245, s 49; *EAA ON*, *supra* note 248, ss 3(2), 9(1)(b), 16(3); *EAA SK*, *supra* note 258, s 7.3(3), *EAMB*, *supra* note 245, s 41(1), *EIAR NB*, *supra* note 261, s 6(6); *EA NS supra* note 245, ss 32, 40(1)(b); *EPA PEI*, *supra* note 247, s 28; *EPA NL*, *supra* note 256, ss 67(3), 69.

[298] *EA NS supra* note 245, ss 32, 40(1)(b).

[299] For example, the responsible authority could decide that all proposed projects are to be subject to a certain standard of GHG emissions.

discretionary power might be useful for the integration of GHG considerations, but as is the case with all discretionary powers, where legislation has no clear mention or integration of climate change or GHG components, project proponents have no real obligations to consider climate change in their EAs, unless decided by the discretionary power of the responsible authority.[300]

Discretionary power is taken to another level in Saskatchewan where there is no set list of activities triggering an EA process in the legislation. Instead, the Minister is in charge of identifying projects as a development[301] and, as such, deciding whether these projects will go through the EA process.[302] According to the current legislation, the decision of the Minister can be solely based on the information submitted by the project proponent.[303] This

[300] "At this time, however, there also are no references to 'climate change' or related themes within the language of the *Environmental Protection Act* or regulations and no requirement at law or in policy to include analysis of climate change impacts in any registration documentation." Sean Foreman *et al*, "Atlantic Provinces Climate Change Law and Policy" in Dennis Mahony, ed, *The Law of Climate Change in Canada, 2015 Student Edition* (Toronto, Canada: Canada Law Book, 2014) 11-1 at 11-17.

[301] Under the *EAA SK*,

> "development" means any project, operation or activity or any alteration or expansion of any project, operation or activity which is likely to:
>
> (i) have an effect on any unique, rare or endangered feature of the environment;
>
> (ii) substantially utilize any provincial resource and in so doing preempt the use, or potential use, of that resource for any other purpose;
>
> (iii) cause the emission of any pollutants or create by-products, residual or waste products which require handling and disposal in a manner that is not regulated by any other Act or regulation;
>
> (iv) cause widespread public concern because of potential environmental changes;
>
> (v) involve a new technology that is concerned with resource utilization and that may induce significant environmental change; or
>
> (vi) have a significant impact on the environment or necessitate a further development which is likely to have a significant impact on the environment.

*EAA SK*, *supra* note 258, s 2(d).

[302] *EAA SK*, *supra* note 258, s 7.3(1).

[303] *Ibid*.

discretionary power is much more important than the other discretionary powers already set out in other typical Canadian EA legislation.[304]

The definition of what constitutes an environmental effect is not always clearly detailed in the EA legislation of each provincial jurisdiction. However, the responsible authority often has an important discretionary power in that regard, which could allow for further integration of GHG considerations in the current EA process. For example, the executive director in British Columbia can specify the potential effects that would need to be considered in the EA, "including potential cumulative environmental effects"[305]. Since an "environmental effect" is not expressly defined in the Act, it would be possible for GHG considerations to find their way into EAs, depending on the specifications set by the executive director. In Nova Scotia, the Minister has a discretionary power to accept the reports submitted under the legislation and to decide if the environmental effects caused by the proposed undertaking are absent, minimal or unacceptable.[306] As such, the responsible authorities in these provinces can use their discretionary powers to include GHG considerations in what would be considered as an "environmental effect" and, therefore, include them in the EA process.

The integration of GHG considerations in provincial EAs mainly relies on the use of discretionary powers by the pre-identified responsible authority. As currently written, provincial EA legislation allows for the potential inclusion of GHG considerations in the

[304] *Ibid*, s 7.3(3).
[305] *EAA BC*, *supra* note 280, s 11(2)(b).
[306] *EAR NS*, *supra* note 251, s 18.

EA process. However, no current provincial EA legislation guarantees a thorough and consistent consideration of climate change and GHG components throughout their EA process.

### 4.3 SYNTHESIS

Under the current federal and provincial EA legislation, there are many ways to include GHG considerations in the EA process. However, inconsistency and lack of clear requirements remain an obstacle on how GHG emissions can be considered in the EA process. Furthermore, no provision or section specifically requires the project proponent to thoroughly integrate GHG considerations in their respective EAs. Finally, the discretionary power can be used to support this integration, but can also be used to set the same considerations aside.

The current situation reinforces the need for the adoption of clear regulations on the integration of GHG considerations, thus allowing for a more structured and consistent integration. This matter can be addressed through the important regulatory powers that legislation provides to responsible authorities.

## CHAPTER 5: CASE STUDY – THE ENERGY EAST PROJECT

The review of Canadian laws and regulations on EA shows that no EA legislation provides the legislative framework required to create a substantial legal obligation to include GHG considerations in the EA process. To better demonstrate the application and integration of GHG considerations in the EA process in Canada, a case study of a recent EA project was chosen for analysis. This case study offers a tangible example to illustrate how the current general provisions used in Canadian EA legislation can be interpreted and applied to integrate GHG considerations in the EA process. The selected case study is the Energy East pipeline project, a project that was reviewed and overseen by the NEB under the federal *CEAA 2012*.[307] It was a major undertaking for which the first project description was submitted in October 2014,[308] with amendments filed in December 2015.[309] Since then, the official consolidated application and relevant documents were filed in May 2016.[310] After a tumultuous start, the Energy East hearing panel under the EA process was suspended in the fall of 2016.[311] A new hearing panel was put in place, ready to restart the process from

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[307] *Regulations Designating Physical Activities*, *supra* note 185 ss 2, 4(3); Government of Canada, "Energy East and Eastern Mainline – Have your Say!" (5 April 2017), online: <https://www.nebenergyeast.ca> [Canada Energy East].

[308] Canadian Environmental Assessment Agency, "Energy East Project" (10 October 2017), online: <http://www.ceaa.gc.ca/050/details-eng.cfm?evaluation=80073>.

[309] Energy East Pipeline Ltd., "Supplemental Application to Participate Process: Notification of Application to Participate in National Energy Board Hearing – Energy East Pipeline" (31 March 2016), online: <http://www.ceaa.gc.ca/050/documents-eng.cfm?evaluation=80073>; *Regulations Designating Physical Activities*, *supra* note 185, ss 2, 4(3); Canada Energy East, *supra* note 307.

[310] Government of Canada – National Energy Board, "Application for the energy East Project and Asset Transfer" (17 May 2016), online: <https://apps.neb-one.gc.ca/REGDOCS/Item/View/2995824> [NEB, "Application"].

[311] After motions alleging a reasonable apprehension of bias, the previous three panel members of the Energy East Hearing recused themselves in September 2016. A new panel was appointed in January 2017 and the recommencement of the hearing process was announced on 27 January 2017. Government of Canada – National Energy Board, "Ruling No. 1 – Consequences of the Energy East Hearing panel's recusal and how to recommence the Energy East Hearing" (27 January 2017), online: <https://apps.neb-one.gc.ca/REGDOCS/Item/View/3179115> at 2-3 [NEB "How to recommence"]; Government of Canada – National Defense, "Energy East Hearing to restart from the beginning" News Release (27 January 2017),

the beginning.[312] The announcement regarding the recommencement, made in January 2017, voided all the decisions made by the previous hearing panel[313] and also voided "the Lists of Issues and the EA Factors Documents"[314] for the Energy East project. The new hearing panel was supposed to issue new EA Factors Documents at a later date.[315] However, all the documents submitted as part of the Energy East application on 17 May 2016 remained valid for this EA process.[316] As such, the information submitted by the project proponent could still be used for the EA process. It is that information that is analyzed in this case study. As previously noted, even if the Energy East project was very recently abandoned by TransCanada, the case study remains relevant to this research in demonstrating how climate change was considered in a large-scale project under *CEAA 2012* and under the interim approach.

The Energy East pipeline project was chosen for this case study to demonstrate a recent example of conducting an EA in Canada. It also allowed a glimpse of the possible influence of international climate negotiations (such as the Paris Agreement) on Canadian domestic affairs, as the Energy East project application was submitted in May 2016, a month after Canada signed the agreement. Additionally, this submission also follows the announcement of the interim approach by the federal government.[317] Major projects under review will be assessed following this interim approach by the federal government and one

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online: <https://www.canada.ca/en/national-energy-board/news/2017/01/energy-east-hearing-restart-beginning.html> [National Defense].

[312] NEB "How to recommence", *supra* note 311 at 2-3; National Defense, *supra* note 311.

[313] *Ibid.*

[314] NEB "How to recommence", *supra* note 311 at 3.

[315] *Ibid.*

[316] *Ibid.*

[317] As previously discussed in section 3.1.5.

of the principles in the interim approach requires the assessment of the direct and upstream GHG emissions linked to the project.[318] The Energy East project also announced that it would assess its upstream GHG emissions, as per the interim federal approach.[319] On that matter, a Memorandum of Understanding (MOU) was entered into between the NEB and ECCC, which helped guide this GHG assessment. The MOU states that ECCC was going to be in charge of assessing the upstream GHG emissions associated with the project. ECCC was set to produce a report with this assessment.[320] Release of the final upstream GHG report was set for March 2018 (after the review of public comments on the matter).[321] However, it must be noted that the MOU is "not legally binding and does not impose, nor is it intended to impose, any legal commitments on, or give rise to any legal rights not otherwise held by the Participants"[322]. This situation gives limited legal weight to this MOU and its commitments regarding the upstream GHG emissions report. However, it does provide an additional way for climate change to be integrated in the EA process for this particular project. This case study evaluates how the assessment of climate change and GHG emissions are integrated and interpreted under the current EA process.

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[318] National Energy Board – Government of Canada, "Memorandum of Understanding between Environment and Climate Change Canada and the National Energy Board for the Establishment of a Public Engagement Process for the Assessment of Upstream Greenhouse Gas Emissions related to the Energy East Project (MOU)" (1 December 2016), online: <https://www.neb-one.gc.ca/bts/ctrg/mmrndm/2016nvrnmntclmtchngcnd-eng.html> [NEB "MOU"].
[319] Government of Canada – National Energy Board, "National Energy Board starts the clock on Energy East Pipeline Project" News Release (16 June 2016), online: <https://www.canada.ca/en/national-energy-board/news/2016/06/national-energy-board-starts-the-clock-on-energy-east-pipeline-project.html>.
[320] NEB "MOU", *supra* note 318.
[321] *Ibid.*
[322] *Ibid.*

## 5.1 CASE STUDY METHODOLOGY

This case study seeks to demonstrate how EA legislation is applied and how GHG considerations are currently integrated into the federal EA process. To assess how this case study does in fact integrate climate change and GHG considerations, a keyword search was used to cover all the application documents submitted for the Energy East project. As previously mentioned in the general methodology section for this research, the keywords are all related to climate change and are as follows: "climate"; "climate change"; "greenhouse gas"; "greenhouse"; "GHG"; "emission; and, "weather event". The context of each identified keyword was then further analyzed to ensure that the keyword was indeed related to GHG considerations. Only the keywords associated with GHG considerations were tallied in this research.[323]

Following this first scan of the application documents, the methodologies and the application documents were further examined, using a set of predetermined questions. Inspiration for the use of these questions was drawn from two past reviews on the integration of climate change and GHG emissions in prior EAs conducted in the US: one was completed by the Defenders of Wildlife in 2013, and the other by the Sabin Centre for Climate Change Law (Columbia University) in 2015. The Defenders of Wildlife established a list of ten questions for their analysis of 154 final Environmental Impact Statements that were completed between July 2011 and April 2012 in the US.[324] After this

[323] It is possible that some of these words can be used in a non-climate-change-related context in the different documents reviewed. For example, "emission" might include emissions that are not related to climate change or GHG emissions, such as light or noise emissions. A careful evaluation of the context of each keyword is therefore important here. A table with all the keywords identified can be found in Annex 1.
[324] These ten questions were:

evaluation, the Sabin Centre for Climate Change Law completed a follow-up study on the integration of climate change and GHG considerations in the EA process in the US. It reviewed over 300 federal Environmental Impact Statements prepared between July 2012 and December 2014.[325] That study used a series of five questions for the evaluation, which targeted public infrastructure and construction projects.[326]

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> (1) [d]oes the EIS [Environmental Impact Statement] include relevant and recent information?
> (2) Does the EIS include downscaled modeling?
> (3) Are projections made using appropriate timescales?
> (4) Does the EIS discuss the impact of climate change on the reasonably foreseeable future condition of affected resources under No Action?
> (5) Does the EIS discuss the impact of climate change on the reasonably foreseeable future condition of affected resources under the various alternatives?
> (6) Does the EIS discuss the impact of climate change on the success or outcome of the proposed action?
> (7) Does the EIS identify and work through climate related uncertainties?
> (8) Does the project include a monitoring program adequate to detect effects of climate change?
> (9) Does the agency discuss the impact of climate change on vulnerable human communities?
> (10) Does the mitigation section of the EIS discuss ways to mitigate the project's impacts to reduce climate change effects?

Aimee Delach *et al*, *Reasonably Foreseeable Futures: Climate Change, Adaptation and the National Environmental Policy Act*, Defenders of Wildlife (Washington, DC: Defenders of Wildlife, 2013) online: <http://www.defenders.org/publication/reasonably-foreseeable-futures-climate-change-adaptation-and-national-environmental> at 8-9.

[325] Jessica Wentz, *Assessing the Impacts of Climate Change on the Built Environment under NEPA and State EIA Laws: A Survey of Current Practices and Recommendations for Model Protocols*, Sabin Center for Climate Change Law (New York: Columbia Law School, 2015), online: <http://columbiaclimatelaw.com/program-areas/environmental-assessment/eia-protocols/> at 30 [Wentz, "Survey"].

[326] These questions were:

> (1) [d]oes the EIS [Environmental Impact Statement] contain any discussion of how climate change will impact the project or its surrounding environment?
> (2) Does the EIS discuss how climate change will impact the quantity or quality of water resources to be used or affected by the project?
> (3) Does the EIS examine how climate change will impact the affected environment of the project, taking into account the various environmental and human resources in the area?
> (4) Does the EIS examine the impacts of climate change on the project itself and any implications that this may have for the resilience of the project or the environmental consequences of the project?
> (5) Did the analysis of climate change impacts influence the agency's final decision in any way, e.g., by causing the agency to: (i) conclude that an otherwise insignificant impact was significant, (ii) modify design features, or (iii) implement additional mitigation measures?

*Ibid*.

Drawing inspiration from these two recent studies, a list of five questions was developed for this research:

(1) How is climate change and GHG emissions discussed in the EA application documents?

(2) How are mitigation actions to minimize the impact on climate change discussed in the EA application documents?

(3) In what manner do the EA application documents discuss how projected climate change impacts will affect the project itself and the affected environment of the project?

(4) What recommendations are made in the EA application documents to mitigate the climate change and GHG contributions of the project?

(5) To what extent, and how, did the analysis of climate change and GHG emissions influence the final decision by the responsible authority in any way (e.g. by concluding that an otherwise insignificant impact was indeed significant, by modifying the final project or by implementing additional measures related to climate change and GHG emissions)?

All the information collected from this analysis was gathered in a table for each application document, which is presented in Annex 2. These questions were analyzed as a whole and are globally presented and assessed here.[327] An in-depth assessment of these results follows with a particular focus on linking the legislation to its application through the Energy East project.

[327] As such, not each question is explicitly addressed in the analysis part of this case study and only the most relevant factors are presented for each volume and for the analysis as a whole.

## 5.2 ENERGY EAST PROJECT: OVERVIEW

The proposed project consists of a 4,500 kilometre-long pipeline meant to carry 1.1 million barrels of crude oil per day from Alberta and Saskatchewan to refineries, storage tanks and a marine terminal facility located in New Brunswick (as shown on the map in Annex 2).[328] This project involved the conversion of existing gas pipelines to oil transportation pipelines, the construction of new pipelines to connect to the existing pipelines, and the construction of associated facilities, pump stations and tank terminals (including marine facilities to facilitate access to other markets by ship).

This project fell under the authority of the NEB. EAs completed under the NEB have different mandatory requirements than EAs completed under the responsibility of the Agency. The project proponents first need to submit an environmental and socio-economic assessment in their application.[329] This information was submitted by the proponent of the Energy East project to the NEB and was still under review before the proponent abandoned the project.[330] At the time of this research, the following were the first steps completed in finalizing the EA of the Energy East Project: the project description was filed, the engagement and participant funding were issued, the application was filed, and the interested parties had applied to participate in the process.

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[328] Energy East Pipeline Ltd., "Volume 1: Consolidated Project and Asset Transfer Applications" in *Energy East Project Consolidated Application* (Calgary, Alberta: TransCanada, May 2016) i at iii.
[329] Government of Canada – National Energy Board, "The NEB'S Lifecycle Approach to Protecting the Environment", (21 June 2017) online: <http://www.neb-one.gc.ca/sftnvrnmnt/nvrnmnt/lfcclpprch/index-eng.html#s2>.
[330] Government of Canada – National Energy Board, "Energy East Project", (22 November 2017) online: <http://www.neb-one.gc.ca/pplctnflng/mjrpp/nrgyst/index-eng.html>.

The consolidated application submitted in May 2016 was filed in 25 volumes, accounting for a total of 38,885 pages.[331] This research focuses on the environmental aspects of these application documents, assessing whether and how GHG considerations were integrated into the application stage of the EA process under the NEB.

## 5.3 ENERGY EAST APPLICATION: ANALYSIS

The consolidated application consists of 25 volumes, each exploring various matters relevant to the EA process as conducted under the authority of the NEB. A review of these 25 volumes revealed that the pre-identified climate-change-related keywords were mentioned in nine of those 25 volumes. These volumes included: "Volume 1: Application and Project Overview"; "Volume 5: Conversion Design"; "Volume 11: Environmental and Socio-Economic Assessment"; "Volume 12: Risk Assessment"; "Volume 14: Project and Assessment Overview"; "Volume 18: Effects of the Environment on the Project"; "Volume 20: Assessment Summary and Conclusions"; "Volume 21: Environmental Protection Plan for the Energy East Pipeline Ltd. Energy East Pipeline Project – New Pipeline"; and, "Volume 22: Technical Data Reports Greenhouse Gas Technical Data Report". Each of these volumes was analyzed, and the results are presented here.

### 5.3.1 General Findings

Some identified keywords could include GHG considerations, but they do not explicitly demonstrate the relationship they have with climate change and GHG emissions. For example, in volume 11, the terms "worst case weather" and "heavy weather" conditions

[331] NEB, "Application", *supra* note 310.

are mentioned. These terms are not defined and, although they could include extreme weather events resulting from climate change, there is no mention of such considerations. It is possible to assume that they are included, but since the project proponent does not directly allude to climate change or GHG emissions, it is therefore impossible to determine if climate change or GHG emissions were considered in these parts of the EA process. Climate change and GHG emissions should have been mentioned in these considerations. Even if they had been considered and subsequently discarded, it would have at least been beneficial to understand how and why they were considered.

Some volumes mention that the GHG emissions associated with the project activities could have an impact on the atmospheric environment.[332] Volume 11 specifically states that the Energy East project will contribute to the "pre-existing adverse effect of GHG emissions on climate change"[333], where both the construction and operation phases could contribute to an increase in GHG emissions.[334] However, the project proponent also states that the contribution of the project to global GHG emissions and to climate change will remain small, without further explaining how this conclusion was reached.[335] To ensure consistency and accountability throughout all EAs, specific references should be made to calculations and to sound scientific research in order to support conclusions drawn from an EA, especially regarding a complex matter such as climate change. The general conclusion

[332] Energy East Pipeline Ltd., "Volume 14: Project and Assessment Overview" in *Energy East Project Consolidated Application Environmental and Socio-Economic Assessment,* (Calgary, Alberta: TransCanada, May 2016) at A-12, A-13, B-5 [Energy East, "Vol 14"]; Energy East Pipeline Ltd., "Volume 11: Environmental and Socio-Economic Overview" in *Energy East Project Consolidated Application* (Calgary, Alberta: TransCanada, May 2016) at 3-18 [Energy East, "Vol 11"].
[333] Energy East, "Vol 11", *supra* note 332 at 3-18.
[334] *Ibid* at 3-11.
[335] *Ibid* at 3-18.

aforementioned reappears throughout the assessment of the GHG emissions associated with many of the phases of the project. For example, the project proponent explains that as part of the decommissioning and abandonment phase of the project, this phase could have a potential effect on the atmospheric environment because of the potential GHG emissions released by the equipment used.[336] The project proponent goes on to explain that the "[e]ffects of decommissioning and abandonment on the atmospheric environment are considered negative, short term, moderate magnitude, localized and reversible once work is complete. Residual effects on the atmospheric environment are predicted to be not significant"[337]. Specifically, in regards of GHG emissions, the project proponent states that

> [t]he amount of GHG emissions will be small compared with GHG emissions generated during construction and operation of the Project, as well as compared with provincial, national and global totals. GHG emissions during decommissioning and abandonment would not substantively influence provincial, national or global totals or cause a detectable change in atmospheric carbon dioxide concentrations at the provincial, national or global levels. Consequently, effects of GHG emissions from decommissioning and abandonment activities related to the Project will be negative, short term (i.e., only occurring during decommissioning activity), regional and of low magnitude. However, as for all GHG emissions (regardless of the amount), the effects are considered irreversible because breakdown in the atmosphere occurs over a long period (>100 years). GHG emissions from decommissioning and abandonment are predicted to be not significant[338].

Here again, there is no further explanation as to why GHG emissions are deemed not to be significant, nor does the proponent cite the sources for this affirmation, even though some GHG emissions are known to have a long lifetime span and of an irreversible nature. The same conclusions are reached for the deactivation phase of the project. It is said that deactivation activities will result in GHG emissions, but that those emissions (combined

[336] Energy East, "Vol 14", *supra* note 332 at 8-5.
[337] *Ibid* at 8-9.
[338] *Ibid*.

with the use of mitigation measures) will be small and that once the deactivation activities are completed, the emissions will be non-existent. The GHG emissions are said to "not measurably contribute to provincial or national GHG emissions"[339] and that "[r]esidual effects are predicted to be not significant"[340]. The same observations as those made for the previous phases of the project apply here: there is no detailed explanation as to why GHG emissions are deemed not to be significant. Even if GHG emissions from a specific project cannot be directly linked to a specific climate change impact, their cumulative effects can still create major environmental effects.[341] Based on the cumulative nature of GHG emissions, even a small contribution to GHG emissions will have an effect on climate change.[342] Which means that although the GHG emissions from the project is portrayed as being "small" in a global context, their cumulative effects could be quite significant.

### 5.3.2 Volume 20: Conversion Design and GHG Emissions

Section 6 of Volume 20 specifically addresses climate change and GHG emissions. In this section, the project proponent explains the importance of considering GHG emissions in relation to climate change, the various regulatory requirements regarding GHGs in Canada, the calculations made for estimating the GHG emissions associated with the proposed project, and the GHG management plan proposed by the project proponent.

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[339] Energy East, "Vol 14", *supra* note 332 at 8-22.
[340] *Ibid*.
[341] Kruger, *supra* note 255 at 173-74.
[342] Anna Johnston, "Executive Summary" (Summary of the *Federal Environmental Assessment Reform Summit* prepared by West Coast Environmental Law, August 2016) at 5-6; Kruger, *supra* note 255 at 173-74.

This section starts by explaining that GHG emissions contribute to the warming of the climate and to climate change.[343] The project proponent explains that the effects of GHGs are cumulative and that GHGs can stay in the atmosphere for tens to hundreds of years after their release.[344] The project is expected to release $CO_2$, methane, and nitrous oxide.[345]

The project proponent then briefly explains the regulatory requirements for GHG emissions in each of the jurisdictions crossed in the proposed sites for the project (these include: the federal government and the following provinces: Alberta, Saskatchewan, Manitoba, Ontario, Quebec, and New Brunswick). Here, the project proponent recognizes the international commitments made by Canada with the Copenhagen Accord in 2010 and then cites the most recent emissions reduction target from the federal government made in 2015.[346] Even though this consolidated application was submitted in May 2016, months after the 2015 Paris Agreement text was adopted, and a month following its signature by the Canadian government, the document does not mention the Agreement. Given the fact that the recent 2015 federal climate change targets are mentioned and that international agreements are mentioned in this very same section, how can the project proponent not even mention the most recent one?[347] This seems inconsistent with the rest of the documentation provided by the project proponent for this consolidated application. An important international agreement such as the Paris Agreement should have been

[343] Energy East Pipeline Ltd., "Volume 20: Assessment Summary and Conclusions" in *Energy East Project Consolidated Application Environmental and Socio-Economic Assessment* (Calgary, Alberta: TransCanada, May 2016) at 6-1 [Energy East, "Vol 20"].
[344] *Ibid.*
[345] Each of these GHGs are then expressed in tonnes of carbon dioxide (t $CO_2e$), indicating their respective greenhouse effect. *Ibid.*
[346] The federal government wants to reduce its GHG emissions by 30% below the 2005 levels by 2030. These are the same targets used by Canada for the Paris Agreement. *Ibid* at 6-2.
[347] *Ibid.*

mentioned, especially since the submitted documents referred to the Copenhagen Accord. The mere mention of international commitments demonstrates the importance of such considerations for project proponents in their EA, and the need to further include such considerations in future EA legislation. Because the federal government is bound by these international agreements, the activities proposed within federal jurisdiction also fall under these commitments.

This section is also where the project proponent cites the different targets for GHG emissions reduction and the mandatory GHG emissions reporting required for each jurisdiction of the project (when applicable). The most aggressive GHG emission reduction targets are in Quebec, with a reduction goal of 20% below 1990 levels by 2020.[348] It is also there that mandatory GHG emissions are more stringent, with a requirement that facilities emitting over 10 kilotonnes (Kt) $CO_2e$ per year file in an annual report.[349]

The Energy East consolidated application focuses mainly on mitigation for their climate change and GHG considerations where the project proponent assesses the direct GHG emissions of the project during its construction and operation phases.[350] As per the definition of the project, the consolidated application does not consider the effects related to its GHG emissions outside of these phases, nor does the assessment mention the cumulative nature of these emissions or evaluate the GHG emissions associated with the

[348] *Ibid* at 6-5.
[349] These facilities will also be subject to their cap and trade system, unlike any other provinces mentioned thus far. Ontario also uses the same reporting threshold for GHG emitting facilities (25 Kt $CO_2e$ per year). *Ibid* at 6-5, 6-6.
[350] *Ibid* at 6-6.

extraction and transport of the fossil fuel by the pipeline. The project proponent then describes where and how the GHG emissions associated with the project are released.[351] However, before detailing its emissions, the project proponent expressly states that "Energy East will not have ownership or be directly responsible for emissions that will be generated and released from third-party power generation, therefore these are not included in the scope of the [environmental and socio-economic assessment]"[352]. More and more studies agree that fossil fuels not yet extracted should remain in their reserve in order to limit the temperature increase associated with climate change under 2°C.[353] Furthermore, the recent Paris Agreement specifically states that the average global temperature increase should be limited to "well below 2°C", even stating that efforts should be made to further limit the increase to 1.5°C.[354] The project proponent does state that "[t]he assessment of GHGs includes *substantial* GHG emissions associated with the Project scope"[355], but does not define what "substantial" means in that context. By definition, substantial refer to considerable quantities.[356] In the context of an EA, project proponents need to identify environmental effects that are deemed "significant", which is defined as "of a noticeably or measurably large amount"[357]. It could then be assumed to be that the project proponent estimates that the Energy East project GHG emissions are indeed considered as significant environmental effects.

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[351] *Ibid* at 6-11, 6-12.
[352] *Ibid* at 6-12.
[353] Christopher McGlade & Paul Ekins, "The geographical distribution of fossil fuels unused when limiting global warming to 2°C" (2015) 517 Nature 187 at 190.
[354] *Paris Agreement*, *supra* note 2, at Annex, art 2.1(a).
[355] Energy East, "Vol 20", *supra* note 343 at 6-11 [emphasis added].
[356] *Merriam-Webster*, 2017, online at: <http://www.merriam-webster.com/dictionary/>, *sub verbo* "substantial" at 3b.
[357] *Ibid*, *sub verbo* "significant" at 2a.

Before detailing estimated GHG emissions, volume 20 also lists all mitigation measures that are recommended to reduce the potential GHG emissions of the project.[358] The project proponent then ranks its GHG emissions according to the standards it created (since none were provided by the guidelines or legislation used to complete this EA application). According to this system, a "low" emitting project would release fewer than 50 Kt $CO_2e$ per year, a "moderate" emitting project would release between 50 Kt $CO_2e$ and 1 000 Kt $CO_2e$ per year and a "high" emitting project would release over 1 000 Kt $CO_2e$ per year.[359] Under the General Guidance, these limits help to determine if a project will need to develop and implement a GHG Management Plan. Although these limits are based on federal reporting thresholds, there is no legislative provision to ensure clear and consistent calculation and the means to enforce them in all EAs. These categories are therefore purely subjective and so is the methodology employed here. Why not use the most stringent legislation in the jurisdiction that the project will cross to set the "low" limit (in this case, using the Quebec requirements of a GHG emissions reporting threshold set at 10 Kt $CO_2e$ per year[360])? Why even use reporting thresholds and not use other thresholds or standards? These questions, and more, arise from a lack of more stringent and demanding legislation on EA. Nonetheless, the project proponent goes on to estimate and qualify its GHG emissions using these standards. According to these categories, the project proponent

[358] Such mitigation measures include: regular equipment maintenance, reducing equipment idling, using the best available technology economically achievable to reduce GHG emissions in the design of the project, using natural gas or electricity to fuel power pump stations, and the implementation of a routine equipment maintenance and inspection.
[359] These limits are based on the federal reporting thresholds for GHG emitting facilities, with the "low" emitting project limit set at the federal reporting threshold of 50 Kt $CO_2e$ per year and the "high" emitting project limit set on the 90th percentile of facility emissions reported in Canada. Energy East, "Vol 20", *supra* note 343 at 6-15.
[360] *Regulation emissions of contaminants QC*, *supra* note 260, s 6.1.

estimates that its average annual construction GHG emissions would be 386 Kt $CO_2e$ per year (0.05% of the 2013 annual GHG emissions of Canada and 0.001% of the 2012 global emissions).[361] This means that the construction phase of the Energy East project would be considered as a "moderate" emitting project.[362] On the operational side, the project is expected to release an estimated 440 Kt $CO_2e$ of GHG emissions per year (representing 0.06% of the 2013 GHG emissions from Canada and 0.001% of the 2012 global GHG emissions).[363] This would also result in the project being a "moderate" emitter during that specific phase of the project.[364] Based on these results, the project proponent determines that a GHG Management Plan would have been prepared upon approval of the Energy East project.[365] Even with these results, the project proponent states that

> [a]s the effect on climate change from the contribution of a single project cannot be accurately measured or attributed, it is not reasonable to conclude a significant adverse residual effect on atmospheric GHG concentrations or climate change from a single project's GHG emission[366].

Thus, the project proponent explains that the Energy East project would not have a significant environmental effect, based on its GHG emissions, even though the analysis concluded that the project was a moderate emitter during two phases of its project and that the GHG emissions were deemed to be "substantive". This provides another reason why standards and a more detailed legislation on the EA process should be implemented, and where the degree of significance should be prescribed by legislation for consistency and accountability in all EAs. Imposing GHG emissions standards in EA legislation would help

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[361] Resulting in an estimated 996 Kt $CO_2e$ total GHG emissions from construction activities during the projected lifespan of the project (approximated at 2.58 years). Energy East, "Vol 20", *supra* note 343 at 6-18.
[362] *Ibid.*
[363] *Ibid* at 6-22.
[364] *Ibid* at 6-23.
[365] *Ibid* at 6-24.
[366] *Ibid.*

limit the potential climate change impacts, while also ensuring that Canada respects the international commitments to which it adhered.

The following section of volume 20 contradicts the previously made statement of the project proponent, which concluded that the GHG emissions associated with the project were not significant. Here, the project proponent explains that GHG emissions cumulative effects are very likely to contribute to climate change according to the IPCC 2013 report.[367] Additionally, this section again reinforces the importance of the cumulative effects of GHG emissions, where it states that the global atmospheric concentration of $CO_2$ was estimated at 405 parts per million (ppm) in March 2016 and that the scientific community agreed that concentrations above 450 ppm of $CO_2$ in the atmosphere would result in a substantial effect on the climate.[368] Having said that, the project proponent reiterates that, "[t]he contribution of the Project on its own would be small in a global context (0.001%) and would not contribute measurably to climate change"[369]. However, if GHG emissions are cumulative and are linked to climate change, and if the actual $CO_2$ concentration levels keep rising and approaching the aforementioned 450 ppm level (that would result in substantial climatic effects), any contributions, small or large, are in fact significant and could indeed result in significant effect on the environment and climate change. The subjectivity of Canadian EA legislation and the flexibility it allows regarding the integration of GHG considerations demonstrates the need for it to be better structured to ensure proper action on climate change. Because GHG considerations are not clearly mentioned in the EA legislation,

[367] *Ibid.*
[368] *Ibid.*
[369] *Ibid.*

project proponents have no explicit legal obligations to even consider them in their EAs. Even if they do consider them, they have no legal guidelines or standards to follow. This case study of the Energy East pipeline EA application amply demonstrates that shortfall.

Finally, the project proponent states that even if the previously made calculations resulted in qualifying GHG emissions as not significant, a GHG Management Plan would still have to be prepared once the Energy East project was approved. The project proponent explains that because of the projected "moderate" level of GHG emissions resulting from its activities, Energy East would develop a GHG Management Plan.[370] This exercise is purely voluntary and there are no legal obligations under the current EA legislation specifying what needs to be included in this plan. Furthermore, the project proponent would only have to develop such a plan after the Energy East project was accepted. If climate change and GHG emissions are indeed considered as significant environmental effects, how can one approve a project without first having completed the GHG Management Plan? Since there are no explicit legal obligations in the current EA legislation for GHG considerations, limited actions are possible and the current integration could be considered sufficient in order to satisfy the present EA requirements. Needless to say, current legislation offers limited help in addressing the climate change issue and in acting in observance of international commitments on the matter.

[370] *Ibid* at 6-25.

### 5.3.3 Volume 21: Environmental Protection Plan and Mitigation Measures

Volume 21 proposes the environmental protection plan for the Energy East pipeline project. This volume gives an overview of the environmental protection measures that would be implemented by the project proponent to avoid or reduce the potential adverse environmental effects identified during the construction phase of the new pipelines.[371] These mitigation measures are said to be "based on past project experience, current industry best management practices, and input from stakeholders and regulators during public consultation where they are applicable"[372]. This volume does contain some climate-related environmental protection measures that are mainly found in the pipeline construction and post-construction monitoring sections.

Specifically regarding GHG emissions, the mitigation measures proposed by the project proponent are simple standard mitigation measures that mainly target the use of the equipment that would be responsible for releasing GHG emissions during the construction phase of the project.[373] Some mitigation measures are proposed regarding adverse weather,

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[371] Energy East Pipeline Ltd., "Volume 21: Environmental Protection Plan – New Pipeline" in *Energy East Project Consolidated Application Environmental and Socio-Economic Assessment* (Calgary, Alberta: TransCanada, May 2016) at 1 [Energy East, "Vol 21"].

[372] *Ibid* at 3.

[373] The GHG mitigation measures include:

> 23. Vehicles and equipment will be turned off when not in use, unless weather and/ or safety conditions dictate the need for vehicles and equipment to remain turned on and in a safe operating condition.
> 24. Vehicle and equipment idling times shall not exceed one hour when temperature is between 25˚ C and 5˚ C, which will allow workers to have a comfortable rest location and address safety issues with working under more extreme conditions.
> 25. Vehicle and equipment engines will be properly maintained according to the manufacturer's specifications.
> 26. Burning of construction debris or refuse will not be permitted unless permits or approvals are granted. Where timber or brush is going to be burned the appropriate permits and approvals will be obtained.

mainly for protecting the soil resources, including topsoil.[374] Again, these are standard measures, not offering measures tailored to address the particular climate change impacts that are anticipated in the area of the project. The project proponent also has specific measures planned for watercourse crossings and adverse weather events. Volume 21 explains that there will be monitoring of weather reports and watercourses flow before the construction phase in order to schedule the construction accordingly.[375]

Although these measures are all considered as good practice, none of them specifically mentions adverse weather conditions related to climate change (such as an increase in severity or frequency of such events).[376] Since these measures do not mention adverse

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> 27. The Company and its Contractor's commitment to minimizing un-wanted emissions and specific mitigative requirements will be communicated to Project personnel in the Project kick-off meeting, site orientations, daily meetings as required, Project environmental handbook and Environmental Protection Plan.
> 28. Where practical, use multi-passenger vehicles for the transport of crews to and from job sites.

*Ibid* at 22.

[374] Adverse weather mitigation measures include the following:

> 26. In the event of adverse weather that could result in rutting and/or compaction, the Environmental Inspector(s), in consultation with the Construction Manager, may implement contingency measures as outlined in the Adverse Weather Contingency Plan (Appendix F). A soils specialist and/or regulatory personnel may be consulted.
> 27. Following an adverse weather event, the Contractor will confirm the efficacy of sediment and erosion control measures and whether corrective action is required. The Environmental Inspector(s), in consultation with the Construction Manager will implement contingency measures as outlined in the Adverse Weather Contingency Plan (Appendix F).
> 28. Where poor weather conditions and Project activities have the potential to cause increased sedimentation, modify or suspend the construction stage until weather conditions abate or effective mitigation procedures have been implemented and follow the Adverse Weather Contingency Plan (Appendix F).

*Ibid* at 27.

[375] Volume 21 explains that there will be monitoring of weather reports and watercourses flow before the construction phase in order to schedule the construction accordingly. For the clean-up and reclamation part of the construction phase, the project proponent states that the replacement of topsoil and stripping will be postponed if there would be any wet weather or high winds in order to "prevent erosion and/or damage to the soil structure" and that seeding will be planned according to the weather conditions. *Ibid* at 29, 42-43.

[376] Although the type, scale and intensity of adverse weather events cannot still be predicted with confidence, the IPCC still denotes that extreme weather events will increase with further warming. IPCC 2014, *supra* note 1, at 72.

weather conditions, it is difficult to say if climate change was even considered in the proposed environmental protection plan for the Energy East project. Further, because of the decreasing scientific uncertainty surrounding climate change, it should have specifically been mentioned and considered in the project documents to ensure the completion of a thorough EA. EA documents are meant to expose potential environmental effects resulting from the project and if all appropriate factors are not taken into account, then these documents could result in the presentation of incomplete information, thus leading the responsible authority to make a misguided decision.

The measures proposed for consideration in the post-construction monitoring part of the volume include additional adverse weather mitigation measures, described by categories, such as: wind erosion, water erosion, floods and excessive flow, and erosion and sediment control.[377] The proposed mitigation measures could all be interpreted as being related to adverse weather resulting from climate change impacts, but, again, these mitigation measures do not specifically mention climate change or GHG emissions. The project proponent does not even mention if these mitigation measures were prepared using historical weather conditions information or if they included consideration of projected climate conditions (that would include climate change and GHG considerations). If the information used is simply derived from historical data and past project experience, this

[377] The mitigation measures include: mulch application to topsoil and stripping piles, reducing activity during adverse weather conditions, removal of all equipment at the crossing site to an area above the anticipated high water level, covering of the excavated soil with an impervious membrane from weather events, and ensuring the implementation of preventive measures where weather events would threaten erosion and sediment control measures used for the Energy East project. *Ibid* at Appendix F, F-8-F-10, F-17, F-34.

would result in the consideration of inadequate information, especially regarding weather and climatic data.[378]

Although these mitigation measures are a good start, the environmental protection plan does not mention how these measures will be implemented and monitored to ensure appropriate and effective application. Furthermore, most of these measures are written in a way that would allow the project proponent to use a very limited version thereof. These limitations would not, therefore, allow for a proper mitigation of predicted environmental effects. For example,

> 23. Vehicles and equipment will be turned off when not in use, unless weather and/ or safety conditions dictate the need for vehicles and equipment to remain turned on and in a safe operating condition.
> …
> 28. Where practical, use multi-passenger vehicles for the transport of crews to and from job sites[379].

These mitigation measures would allow the project proponent to reduce GHG emissions when applied thoroughly during all of the construction phase, but because of the current wording (i.e. by using "unless weather and/or safety conditions" and "where practical"), they do not force a reduction of GHG emissions to their absolute lowest. As such, these measures might only offer very limited actual mitigation of GHG emissions in their real life application, thus limiting the reduction of the predicted environmental effects.

[378] *Ibid.*
[379] *Ibid* at 22.

### 5.3.4 Volume 22: Technical Data Reports GHG Technical Data Report

Finally, volume 22 presents the GHG technical data report for the Energy East project. This report describes the current GHG emissions in all the jurisdictions involved in this project and details the estimated GHG emissions that the project is expected to produce.[380] This report explains in greater detail the methodology used to collect and calculate the GHG emissions-related information presented in the previous volumes of the consolidated application.[381]

The project proponent recognizes that GHG emissions are not limited to the immediate atmosphere above where the project would take place; that impacts from GHG emissions are cumulative; and, that GHG emissions contribute to the global phenomenon that is climate change.[382] The project proponent explains that the information used to describe the current GHG emissions in the territories affected by the Energy East project were obtained from the Environment Canada National Inventory Report (2015), the federal GHG Reporting Program (2015), and the World Climate Institute Climate Analysis Indicator Tool (2015). The calculations were made with the most recent available data as of December 2015. While using the most recent data on GHG emissions is a good practice, it again raises the question of why the project proponent did not mention anywhere the most recent climate change international agreement, the Paris Agreement.

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[380] Energy East Pipeline Ltd., "Volume 22: Greenhouse Gas Technical Data Report" in *Energy East Project Consolidated Application Environmental and Socio-Economic Assessment* (Calgary, Alberta: TransCanada, May 2016) at 1-1 [Energy East, "Vol 22"].
[381] *Ibid.*
[382] *Ibid.*

This report does offer the background information required to assess how the estimated GHG emissions were calculated. Once again, however, it focuses solely on the construction and operational phase, without mentioning the general impact of GHG emissions that will be associated with the pipeline transportation of crude oil.

While this technical data report provides the valuable background information required for understanding the methodology behind the calculations and the GHG-related information provided in the previous volumes of the consolidated application, the focus of the report remains limited. It addresses only the construction and operational phases of the project, without mentioning the general impact of GHG emissions that will be associated with the crude oil transported by the pipelines. Consequently, it ignores the important issue of how the transport of crude oil contributes to global GHG emissions and the overall global climate change issue. Therefore, this omission could potentially result in the exclusion of significant information from the EA documents presented to the NEB.

### 5.4 ENERGY EAST: SYNTHESIS

The consolidated application provided by the Energy East project proponent does address some climate-change-related matters, such as mitigation measures required to reduce the GHG emissions associated with some of the phases of the project. Although the project proponent recognizes that the project would be considered as a moderate emitter (emitting over 826 Kt $CO_2e$ per year), it nonetheless concludes that these GHG emissions would not be a significant environmental effect for the purpose of the EA application. This seems like

a counter-intuitive conclusion, especially since the project proponent clearly recognizes the importance of GHG emissions that cumulatively contribute to global climate change.[383]

Furthermore, despite the plan proposed by the project proponent to develop and implement a GHG Management Plan, it would only have been available after the project was accepted. As well, the plan would not have been part of the EA documents considered by the NEB to make its decision on the project. This GHG Management Plan is an important document that should have been made available for consideration by the board prior to its decision, even more so if climate change and GHG emissions are considered as important environmental effects (as they should be, bearing in mind the recent commitments made under the Paris Agreement).

Because Canada has signed and ratified the Paris Agreement, it is becoming increasingly important for the Government to respect its commitments in addressing climate change and to reduce its global GHG emissions. Projects such as the Energy East pipeline should be reviewed carefully because of their expected contributions to global GHG emissions. Again, the project proponent mentioned the federal and provincial commitments to GHG emissions reduction, without mentioning the most recent Paris Agreement (even though the consolidated application was submitted months after the adoption of the Paris Agreement). Given the importance of this international agreement and the recent data used in the Energy East project submission, it is surprising that the proponent did not mention it and instead chose to mention an older international climate change agreement. However,

[383] *Ibid.*

since the EA legislation does not explicitly integrate GHG considerations, the submitted application can still be considered as appropriate, despite these shortcomings.

## CHAPTER 6: THE EU AND THE US

Since climate change is recognized as an important global challenge, discussions and integration of climate change and GHG considerations in the general EA process have been increasing worldwide.[384] The integration of climate change and GHG emissions in EA legislation still needs improvement in Canada. Meanwhile, other jurisdictions are already amending their EA legislation to improve the integration of climate change and GHG considerations in their EA process. These amendments can offer guidance for furthering the integration of climate change and GHG considerations in the Canadian EA legislation. The amendments and the consideration of previous chapters of this research will allow for the formulation of recommendations in the final chapter of this thesis.

The EU adopted its *Directive 2014/52/EU* in April 2014, reviewing and amending the previous European EA directive. The amendments include many procedural changes, but also include specific mention of climate change and GHG considerations. The US proposed its "Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews" ("Final Guidance") in August 2016, where it offered some insights on how climate change and GHG emissions should be further integrated into the EA legislation. Although the US Final Guidance was recently revoked,[385] it can still offer insights to further the integration of climate change and GHG emissions in the EA process. Both

[384] Jiricka, *supra* note 58 at 78.
[385] US, Office of the Federal Register, *Withdrawal of Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews* Notice by the Council on Environmental Quality (5 April 2017) online at: <https://www.federalregister.gov/documents/2017/04/05/2017-06770/withdrawal-of-final-guidance-for-federal-departments-and-agencies-on-consideration-of-greenhouse-gas> [US, "Withdrawal"].

*Directive 2014/52/EU* and the Final Guidance will provide the foundation for a comparative analysis for furthering the integration of climate change and GHG emissions in Canadian EA legislation.

### 6.1 THE EU

*Directive 2014/52/EU* was adopted because general changes to the EA process by all EU member states were needed.[386] EA is recognized as an effective tool in addressing climate change[387] and this was recognized with specific integration of climate change and GHG emissions in the directive.

#### 6.1.1 The EU – *Directive 2014/52/EU*

*Directive 2014/52/EU* was adopted to amend the pre-existing Environmental Impact Assessment Directive.[388] This new directive required implementation from each of the member states by 16 May 2017.[389] The changes to the legislation are extensive and give a more important role to legislation in the EA process, which can result in better decision-making for the environment, a very crucial element in EAs.[390] The amendments to the EA directive take many shapes, from mainly procedural aspects to new requirements in different stages of the EA process.[391] More importantly here, *Directive 2014/52/EU*

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[386] Jiricka, *supra* note 58 at 78.
[387] *Ibid* at 79.
[388] Arabadjieva, *supra* note 29 at 159.
[389] *Ibid*; Directives EC, *Commission Directive 2014/52/EU of 16 April 2014 amending Directive 20011/92/EU on the assessment of the effects of certain public and private projects on the environment*, [2014] OJ, L 124/1, art 2(1) [*Directive 2014/52/EU*].
[390] Arabadjieva, *supra* note 29 at 160.
[391] *Ibid*.

explicitly mentions climate change and GHG considerations.[392] The direct mention of climate change and GHG considerations is a distinctive trait that is rarely seen in EA legislation.[393] These enhanced legal obligations and specifications can be very helpful for project proponents in their integration of climate change and GHG emissions in the EA process.[394]

Specifically, the new Annex III to *Directive 2014/52/EU* identifies criteria to be used to determine whether a project should be subject to the EA process. Listed among these

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[392] Specifically, the directive states that:

> (7) Over the last decade, environmental issues, such as resource efficiency and sustainability, biodiversity protection, *climate change*, and risks of accidents and disasters, have become more important in policy making. They should therefore also constitute important elements in assessment and decision-making processes.
>
> …
>
> (13) *Climate change* will continue to cause damage to the environment and compromise economic development. In this regard, it is appropriate to assess the impact of projects on *climate* (for example *greenhouse gas emissions*) and their vulnerability to *climate change*.
>
> …
>
> (15) In order to ensure a high level of protection of the environment, precautionary actions need to be taken for certain projects which, because of their vulnerability to major accidents, and/or natural disasters (such as flooding, sea level rise, or earthquakes) are likely to have significant adverse effects on the environment.
>
> …
>
> Article 3
>
> 1. The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:
>
> (a) population and human health;
>
> (b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;
>
> (c) land, soil, water, air and *climate*;
>
> (d) material assets, cultural heritage and the landscape;
>
> (e) the interaction between the factors referred to in points (a) to (d).
>
> 2. The effects referred to in paragraph 1 on the factors set out therein shall include the expected effects deriving from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned.

*Directive 2014/52/EU*, *supra* note 389 at I(7), I(13), I(15); art 3(1)-3(2) [emphasis added].

[393] Wentz, "Survey", *supra* note 325 at 10.

[394] Jiricka, *supra* note 58 at 86.

criteria are cumulative effects[395] and climate change.[396] As currently worded, these criteria are not mandatory requirements, but their specific mention as a means of deciding which project should be subject to the EA process clarifies the importance of their integration in this process. It also reinforces the importance of climate change and GHG considerations in the early phases of the EA process (for example, at the screening stage). The screening stage "determines the scope of the legislation – which projects are caught and which are not – and triggers consequent legal obligations on the parties" [397]. This is one of the most important steps of the EA process where certain projects will be triggered into following an EA process and where others will not. The criteria listed should be the "main reasons for requiring or not an [EA]"[398]. Furthermore, the inclusion of climate change and GHG considerations in the earliest phase of the EA process is essential to ensure a greater potential of actions on climate change. This approach ultimately results in reducing costs and in preventing maladaptation.[399] However, by making these criteria non-mandatory, *Directive 2014/52/EU* provides the decision-maker with significant flexibility in this critical phase of the EA process. As such, climate change, GHG emissions and cumulative effects might not, ultimately, be considered for every project, even though scientific evidence demonstrates that they should be considered and addressed.[400]

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[395] "The characteristics of projects must be considered, with particular regard to: … (b) cumulation with other existing and/or approved projects". *Directive 2014/52/EU*, *supra* note 389 at *Annex*, *Annex III*, art 1(b).
[396] "The characteristics of projects must be considered, with particular regard to: … (f) the risk of major accidents and/or disasters which are relevant to the project concerned, *including those caused by climate change*, in accordance with scientific knowledge". *Ibid* at *Annex*, *Annex III*, art 1(f) [emphasis added].
[397] Arabadjieva, *supra* note 29 at 163.
[398] Christoph Mayer, "Directive 2014/52/EU: Big Step Forward or Merely Minimum Consensus? – An Attempt to Evaluate the New EU-Regulations in the Assessment of the Effects of Certain Public and Private Projects on the Environment" (2016) I:1 Law Rev 97 at 103.
[399] Jiricka, *supra* note 58 at 86.
[400] Manitoba, Manitoba Law Reform Commission, *Discussion Paper: Manitoba's Environmental Assessment and Licensing Regime* (Winnipeg, Manitoba: The Manitoba Law Reform Commission, January 2014) at 15 [Manitoba Law Reform].

Once a project has triggered the EA process, the project proponent must present an EA report. This report needs to include certain information specific to each project.[401] In the new *Directive 2014/52/EU*, such information includes climate change elements, namely a description of the GHG emissions associated with the proposed project and a description of the climate change impacts that might affect the project.[402] Thus, proposed projects are now legally required to include climate change and GHG considerations in their EA reports. EA legislation that includes direct and specific mention of climate change and GHG emissions is rarely seen, especially legislation making these considerations mandatory.[403] However, this mandatory description of climate-change-related elements is only required when these elements are likely to be significantly affected by the project. Thus, there is still room for interpretation and subjectivity in the application of these provisions, especially since the Directive does not clearly define the expression "significantly affected".[404]

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[401] *Directive 2014/52/EU*, *supra* note 389, art 1(5)'1(f).

[402] Annex IV specifically mentions:

> 4. [a] description of the factors specified in Article 3(1) likely to be significantly affected by the project: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, *climate (*for example *greenhouse gas emissions*, *impacts relevant to adaptation*), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.
>
> 5. A description of the likely significant effects of the project on the environment resulting from, inter alia:
>
> …
>
> (f) the impact of the project on *climate* (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to *climate change*.

*Directive 2014/52/EU*, *supra* note 389 at *Annex*, *Annex IV*, art 4-5(f) [emphasis added].

[403] Wentz, "Survey", *supra* note 325 at 10.

[404] Arabadjieva, *supra* note 29 at 163.

When the EU adopted its directive on environmental assessment in 2011, it was said that it had "harmonised the principles for the environmental impact assessment of projects"[405]. Given that climate change is a global issue that needs a global response, a comprehensive and harmonized EA process that includes climate change and GHG considerations is needed. This would help reduce the inconsistencies and overlaps often found in the EA processes used within each jurisdiction.[406] With this recognition of the need for a harmonious EA process,[407] the EU understands that minimal requirements need to be set

[405] *Directive 2014/52/EU*, *supra* note 389, art (1).

[406] Arabadjieva, *supra* note 29 at 161.

[407] (37) In order to improve the effectiveness of the assessments, reduce administrative complexity and increase economic efficiency, where the obligation to carry out assessments related to environmental issues arises simultaneously from this Directive and Directive 92/43/EEC and/or Directive 2009/147/EC, Member states should ensure that coordinated and/or joint procedures are used to fulfill the requirements of the Directive are provided, where appropriate and taking into account their specific organisational characteristics. Where the obligation to carry out assessments related to environmental issues arises simultaneously from this Directive and from other Union legislation, such as Directive 2000/60/EC of the European Parliament and of the Council (1), Directive 2001/42/EC, Directive 2008/98/EC of the European Parliament and of the Council (2), Directive 2010/75/EU of the European Parliament and of the Council (3) and Directive 2012/18/EU, Member States should be able to provide for coordinated and/or joint procedures fulfilling the requirements of the relevant Union legislation. Where coordinated or joint procedures are set up, Member States should designate an authority responsible for performing the corresponding duties. Taking into account institutional structures, Member States should be able to, where they deem it necessary, designate more than one authority.

(38) Member states should lay down rules on penalties applicable to infringements of the national provisions adopted pursuant to this Directive. Member states should be free to decide the kind or form of those penalties. The penalties thus provided for should be effective, proportionate and dissuasive.

(39) In accordance with the principles of legal certainty and proportionality and in order to ensure that the transition from the existing regime, laid down in Directive 2011/92/EU, to the new regime that will result from the amendments contained in this Directive is as smooth as possible, it is appropriate to lay down transitional measures. Those measures should ensure that the regulatory environment in relation to an environmental impact assessment is not altered, with regard to a particular developer, where any procedural steps have already been initiated under the existing regime and a development consent or another binding decision required in order to comply with the aims of this Directive has not yet been granted to the project. Accordingly, the related provisions of Directive 2011/92/EU prior to its amendment by this Directive should apply to projects for which the screening procedure has been initiated, the scoping procedure has been initiated, (where scoping was requested by the developer or required by the competent authority) or the environmental impact assessment report is submitted before the time-limit for transposition.

…

(41) Since the objective of this Directive, namely to ensure a high level of protection of the environment and of human health, through the establishment of minimum requirements for the environmental impact assessment of projects, cannot be sufficiently achieved by the Member States but can rather, by reason of the scope, seriousness and transboundary nature of the environmental

for projects subject to an EA in order to ensure a higher level of environmental protection. Furthermore, because of the global nature of certain environmental issues (such as climate change), these requirements are best set at a higher level (national or subnational level), while still respecting the principles laid out in the "Treaty on European Union".

The modifications to the EU directive "provide a structured basis for the exercise of discretion without constraining the flexibility of the decision-maker"[408]. A certain degree of flexibility is often needed because of the wide variety of projects covered under EA legislation. The allotted flexibility allows the decision-maker to adapt to the ever-changing environmental, cultural, political and scientific context.[409] Evidently, such flexibility can result in a significant downside in that there is no guarantee in how this flexibility will be applied. Providing the EA legislation with a general objective or with certain boundaries can provide ways to minimize the shortcomings of such flexibility.[410]

*Directive 2014/52/EU* does not set precise environmental standards related to climate change in order to enhance environmental protection. Instead, the directive attempts to increase the information that needs to be provided by the project proponent and modifies the way that the responsible authority uses this information in the decision-making

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> issues to be addressed, be better achieved at Union level, the Union may adopt measures, in accordance with the principle of subsidiarity as set out in Article 5 of the Treaty on European Union. In accordance with the principle of proportionality, as set out in that Article, this Directive does not go beyond what is necessary in order to achieve that objective.

*Directive 2014/52/EU*, *supra* note 389, art (37)-(39), (41).

[408] Arabadjieva, *supra* note 29 at 163.

[409] *Ibid.*

[410] For example, with the old BC legislation or the criteria set in Annex IV of the EU Directive.

process.[411] The amendments to Annex IV provide clear integration of climate change and GHG emissions[412] with enhanced guidance and examples on the information to be included in the EA documents.[413] Generally, the requirements found in Annex IV are broader in scope and more precise regarding the level of detail that the project proponent needs to include.[414] With a tighter legislative structure and control, the review and level of compliance of the project proponent are less complicated for the responsible authority.[415] This results in a more consistent EA review process and integration of GHG considerations into that process. Generally, the amendments of the European EA directive result in an increase in consistency, efficiency and transparency in the EA process, thus resulting in improving the general quality of the EA process.[416] Increasing the consistency and efficiency, especially in regard to GHG considerations, are key elements that can both be improved in Canada. The real test remains in seeing how each member state will apply this directive.

### 6.2 THE US

The first substantial environmental statute in the US came into force in 1970: *NEPA*. *NEPA* required the government to take the environment into account in its decisions. The Act also

[411] Arabadjieva, *supra* note 29 at 164.
[412] Such as: "A description of the factors specified in Article 3(1) likely to be significantly affected by the project: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape", *Directive 2014/52/EU*, *supra* note 389 at *Annex*, *Annex IV*, art 4.
[413] Arabadjieva, *supra* note 29 at 165.
[414] *Ibid.*
[415] *Ibid.*
[416] *Ibid* at 168.

implemented the environmental impact statements for federal agencies.[417] The process under *NEPA* is required for "major Federal actions significantly affecting the quality of the human environment"[418]. This includes the consideration of direct and indirect effects that are deemed reasonably foreseeable.[419]

The question of including climate change and GHG emissions in these requirements remains, as in Canada, vague and unclear. As currently worded, climate change and GHG considerations could be included even if they are not expressly stated. Consequently, a number of legal actions involving the extent of climate change integration under *NEPA* were brought to US courts for over 20 years.[420] With some success, litigants have used *NEPA* to force federal agencies to further include considerations of climate change and GHG emissions in their proposed projects.[421] American courts did recognize that even a small contribution to a widespread environmental problem is significant.[422] Federal courts also did state on many occasions that climate change and GHG considerations could not be ignored by federal agencies in their *NEPA* documents.[423] Indeed, in 2007, the court specifically stated that, "[t]he impact of greenhouse gas emissions on climate change is precisely the kind of cumulative impacts analysis that NEPA requires agencies to

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[417] Gerrard, *supra* note 17 at 20.
[418] *National Environmental Policy Act of 1969, 42 USC § 4321 (1969)* §§ 102(C) [*NEPA*].
[419] Gerrard, *supra* note 17 at 20.
[420] Paul Weiland, Robert Horton & Erik Beck. "Environmental Impact Review" in Michael B. Gerrard & Jody Freemen, eds, *Global Climate Change and U.S. Law*, 2nd ed (USA: American Bar Association, 2014) 153, at 153 [Weiland, Horton & Beck].
[421] *Ibid.*
[422] Mahony, "Federal Climate Change*", supra* note 41 at 4-14.
[423] "[F]ederal agencies cannot turn a blind eye to climate change in the process of preparing NEPA documents". Weiland, Horton & Beck, *supra* note 420, at 153.

conduct"[424]. The fact that courts recognized GHG emissions and climate change as requirements under NEPA confirms that they should be included in the EA process and that they should be recognized as "significant" environmental effects in the scope of an EA. However, environmental actions have not always been successful, especially given the discretionary nature of certain powers awarded by the legislation to the responsible authority.[425] This therefore results in a substantial level of discretion given to agencies in their consideration of climate change and GHG emissions in the EA process in the US, and reinforces the need for an increased structure regarding discretionary power in EA legislation. The mere fact that numerous actions have been brought forward in various courts across the US demonstrates the need for clarification on the integration of climate change and GHG emissions in the current EA legislation.

Many Canadian provinces have signed agreements and MOUs with American states. Consultation and cooperation between the bordering nations is a common practice in many different fields (such as using the same low-carbon fuel standard in American states and Canadian provinces).[426] This review of the American EA legislation will focus on the federal legislation, providing insights on how GHG considerations are integrated in the EA process in the US.

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[424] *Center for Biological Diversity v National Highway Traffic Safety Administration, 538 F (3d) 1172 (9th Cir 2008)*, cited in Gerrard, *supra* note 17 at 21.

[425] The courts only have a limited power to compel agencies in their consideration of climate change in the EA process. Therefore, significant deference is awarded by courts to agencies on their discretionary powers, such as the choice of method of calculations or models and the selection of a threshold of significance for GHG emissions. Since *NEPA* is mainly a procedural legislation, the courts can only ensure that the agency has considered the environmental effects and cannot impose an action within the discretion of the responsible authority in regards of the actions to be taken in the scope of a project. Weiland, Horton & Beck, *supra* note 420 at 153, 156, 168-69.

[426] Mahony, "Ontario", *supra* note 104 at 9-63.

### 6.2.1 The US – Legislation

To further help the integration of climate change and GHG emissions in the American EA process, the CEQ, the governmental body in charge of the implementation of *NEPA*, first issued a draft guidance document on the integration of climate change in *NEPA* documents in 1997. Based on scientific evidence available at the time, climate change was deemed to be reasonably foreseeable. Therefore, that first document published 20 years ago advocated that climate change should be assessed in *NEPA* documents, such as in environmental impact statements. [427]

The Draft Guidance was amended in 2014 and again, recently, in August 2016. Although, the recent Final Guidance was withdrawn in March 2017,[428] important concepts that could help further the integration of climate change and GHG emissions in the EA process can still be retrieved from the document. The Final Guidance instructed federal agencies, under the scope of *NEPA*, to integrate climate change and GHG considerations. For this, CEQ wanted federal agencies to include GHG emissions and the impacts of climate change on the proposed project in their EA documents.[429] The Final Guidance informed federal agencies to quantify the GHG emissions of projects, whenever the tools and data were

[427] Gerrard, *supra* note 17 at 20.
[428] The Final Guidance was withdrawn by an executive order from the then newly sworn-in US President, Donald Trump. US, Council on Environmental Quality, *Final Guidance on Greenhouse Gases and Climate Change*, (Washington, DC: Executive Office of the President, 2016) [CEQ, "Final Guidance"]; US, "Withdrawal", *supra* note 385.
[429] CEQ, "Final Guidance", *supra* note 428; Michael Burger & Jessica Wentz, "CEQ Issues Finale Guidance on Climate Change and NEPA with Two Key Changes from 2014 Draft" (3 August 2016), *Sabin Center for Climate Change Law – Climate Law Blog* (blog), online: <http://blogs.law.columbia.edu/climatechange/2016/08/03/ceq-issues-final-guidance-on-climate-change-and-nepa-with-two-key-changes-from-2014-draft/> [Burger & Wentz (2016)].

available to do so[430] (if the tools and data were not available, an explanation of why that quantification was not possible was recommended[431]). Specifically, it recommended that agencies quantify all the direct and indirect GHG emissions of a project.[432] However, this new recommendation still did not impose any requirements to take further measures following the quantification of GHG emissions. Consequently, projects could still be approved without further mitigation measures having to be considered or even implemented. The Final Guidance did recommend that agencies should include alternative and mitigation measures in their evaluation. It recommended careful evaluation of these measures, but without making their adoption mandatory.[433] The Final Guidance included examples of measures designed specifically to reduce or mitigate GHG emissions, which could prove useful for federal agencies.[434] By providing such examples, the Final Guidance helped clarify the methodologies that should be followed for completing an EA.

Important information brought forward in the Final Guidance related to the calculations of the GHG emissions of a project, where agencies are advised that their quantification should include both direct and indirect emissions.[435] The Final Guidance even provided an example for projects involving fossil fuel extraction. In that case, direct GHG emissions

[430] Burger & Wentz (2016), *supra* note 429.
[431] CEQ, "Final Guidance", *supra* note 428 at 4.
[432] Burger & Wentz (2016), *supra* note 429.
[433] Jessica Wentz, "Draft NEPA Guidance Requires Agencies to Consider Both GHG Emissions and the Impacts of Climate Change on Proposed Actions" (2015) 26:4 Environmental L in New York 57 at 58 [Wentz, "Draft NEPA"].
[434] "Such mitigation measures could include enhanced energy efficiency, lower GHG-emitting technology, carbon capture, carbon sequestration (e.g., forest, agricultural soils, and coastal habitat restoration), sustainable land management practices, and capturing or beneficially using GHG emissions such as methane." CEQ, "Final Guidance", *supra* note 428 at 19.
[435] *Ibid* at 16.

would include all the emissions from the actual process of exploration and extraction of the resource and indirect emissions would include the end use of that extracted fossil fuel, such as coal combustion.[436] Including both direct and indirect emissions provides the decision-maker with a more complete portrait of the proposed project, thus allowing a more informed decision-making process.

An important notion recognized by the CEQ in its Final Guidance is the one related to cumulative GHG emissions. It expressly explains that

> a statement that emissions from a proposed Federal action represent only a small fraction of global emissions is essentially a statement about the nature of the climate change challenge, *and is not an appropriate basis for deciding whether or to what extent to consider climate change impacts under NEPA*. Moreover, *these comparisons are also not an appropriate method for characterizing the potential impacts associated with a proposed action and its alternatives and mitigations* because this approach does not reveal anything beyond the nature of the climate change challenge itself: the fact that diverse individual sources of emissions each make a relatively small addition to global atmospheric GHG concentrations that collectively have a large impact[437].

This important statement clearly justifies why GHG emissions of a single project should not be excluded from being a significant effect solely based on their contribution to the global GHG emissions. The 2016 guidance advises against calculations defined as a percentage of a sector, nationwide, or global emission in order to decide whether climate change needs to be considered or not and to what extent under *NEPA*.[438] This type of calculation was often used in past EA documents. Indeed, many federal environmental impact statements did mention climate change and GHG emissions in their documents, but most subsequent discussions remained superficial. These focused primarily on the GHG

[436] *Ibid.*
[437] CEQ, "Final Guidance", *supra* note 428 at 11 [emphasis added].
[438] *Ibid.*

emissions generated by their particular project, instead of looking at the cumulative notion of these emissions. This resulted in conclusions where the contributions of the proposed project to the global GHG emissions were deemed to be insignificant, thus determining that no further actions were necessary.[439] The Final Guidance recommends certain tools and methodologies (available from the CEQ and *NEPA* documents) in order to remedy such a situation.[440] It clearly stated that GHG emissions contribute to cumulative effects and that these should be included in the EA process[441] The Final Guidance specified that the significance of the GHG emissions of a project (both direct and indirect GHG emissions) should not be determined compared to global GHG emissions, but instead, that they should include cumulative implications. As such, each individual project should determine the significance of its direct and indirect GHG emissions cumulatively. This confirms that climate change (through GHG emissions) needs to be accounted in regard to cumulative effects in the EA process. It also reinforces the notion that cumulative effects are an important part of the EA process, where it can help further the integration of GHG considerations in the EA process. As such, it is essential to consider indirect GHG emissions and the cumulative implications of those emissions.

Furthermore, the Final Guidance did not define what is considered a "significant" environmental effect in regard to GHG emissions. This leaves room for interpretation in deciding whether or not GHG emissions are to be considered as a significant environmental effect.[442] This is a common concern with EA legislation in many jurisdictions, where the

[439] Gerrard, *supra* note 17 at 20.
[440] CEQ, "Final Guidance", *supra* note 428 at 11.
[441] *Ibid* at 17.
[442] CEQ, "Final Guidance", *supra* note 428 at 9-10.

level of significance is left to the discretion of the responsible authority, potentially leaving serious environmental issues out of the EA process. However, in attempting to remedy this common concern, the CEQ has issued some regulations on the application of *NEPA*. These regulations require federal agencies to file a finding of no significant impact report when a proposed project is said to lead to no significant environmental impact. Without this report, the EA process cannot be completed and some essential information needs to be included in this report.[443] The finding of no significant impact report must provide reasons why the agency believed that no significant environmental impacts are to be expected from the proposed project.[444] This makes the federal agencies more accountable for their findings and conclusions, especially since these documents are to be made available to the public.[445]

Before the recent Executive Order withdrew the guidance documents,[446] both the 2016 and the 2014 guidance applied to all the proposed federal agency actions subject to *NEPA*.[447] However, the Final Guidance remained only that, guidance. It was not a regulation, nor did it contain legally binding requirements. Thus, it was not legally enforceable.[448] Still, the changes proposed in the Final Guidance increased predictability and certainty in the integration of GHG considerations into their EA process. This allowed for a more informed decision-making process, as well as better public understanding of the potential climate

[443] Weiland, Horton & Beck, *supra* note 420 at 156.
[444] 40 CFR § 1508.13 (1970); US Environmental Protection Agency, *Environmental Assessment/Finding of No Significant Impact* in "National Environmental Policy Act Review Process" (2017), online: <https://www.epa.gov/nepa/national-environmental-policy-act-review-process#ea> [US EPA, "No Significant Impact"].
[445] 40 CFR § 1501.4(e) (1970).
[446] US, "Withdrawal", *supra* note 385.
[447] Wentz, "Draft NEPA", *supra* note 433 at 58.
[448] CEQ, "Final Guidance", *supra* note 428 at 1-2.

change impacts resulting from federal projects.[449] The recommendations in the Final Guidance also helped avoid delays in projects by minimizing uncertainty and controversy associated with certain actions.[450] Furthermore, and more applicable in this research, the Final Guidance can act as inspiration for similar measures in other jurisdictions.[451]

[449] Wentz, "Draft NEPA", *supra* note 433 at 58.
[450] *Ibid* at 63.
[451] *Ibid*.

## CHAPTER 7: RECOMMENDATIONS ON THE LEGISLATIVE INTEGRATION OF GHG CONSIDERATIONS IN THE CANADIAN EA PROCESS

Climate change and GHG considerations have been recognized as having an important place in the EA process, but currently these considerations are not an explicit requirement under any EA legislation in Canada. This state of affairs can lead to significant diversity in the way it is integrated in the EA process throughout the country. Though certain legislative provisions do offer possibilities for the inclusion of GHG considerations in the current process, they remain fairly general. Additional provisions guiding and better structuring this integration are needed and would offer a more thorough and consistent consideration of GHG emissions in the EA process. Since climate change is a global issue, a common global approach with consistent integration is needed, especially in light of the entry into force of the Paris Agreement.

This chapter puts forward recommendations for furthering the integration of GHG emissions in the Canadian EA process. These recommendations are grouped into six subsections, related to EA legislation: purpose clause, definitions, classification, inside an EA, regulatory power, and discretionary power. Legislative changes to the current EA regime have been identified as a way to improve considerations of climate change and GHG emissions in the Canadian EA process.[452] Such changes would help ensure the integration of these considerations and would help avoid the irregularities that can arise under the current EA legislation in Canada. The proposed recommendations are based on the previous chapters of this research: the literature review on the matter, the review and analysis of current Canadian EA legislation, the Energy East case study, and the

[452] O'Gorman, *supra* note 159 at 16.

comparative analysis of European and American EA legislation. These chapters highlighted challenges and shortcomings; the recommendations set out below provide ways to answer them.

### 7.1 Purpose Clause

As seen in the previous sections, the purpose clause can be a useful tool for furthering the integration of GHG emissions in the EA process. Though it does not constitute part of the act or regulation *per se*, the purpose clause is still recognized by courts as a means to give legal interpretation to their associated acts and regulations (which is not the case with directives and other guidance documents). Including GHG considerations in this section of EA legislation would help clarify the importance of such considerations in the EA process.

Not all EA legislation includes a purpose clause, but where such clauses are included, some key notions need to be mentioned in order to solidify and clarify the integration of GHG emissions. All purpose clauses should refer to three fundamental environmental notions: sustainable development, precautionary principle, and cumulative effects. Although some Canadian EA legislation does mention these notions, such is not always the case. *CEAA 2012* specifically advises that the precautionary principle should be followed in its application [453] and that federal authorities should strive to promote sustainable development. [454] Nova Scotia goes a step further in specifically stating that, "the precautionary principle will be used in decision-making"[455]. This is especially important

[453] *CEAA, 2012*, *supra* note 64, ss 4(1)(b), (g), 4(2).
[454] *Ibid* s 4(h).
[455] *EA NS supra* note 245, s 2.

to help set boundaries to the often significant discretionary power of the responsible authority in its decision-making process under an EA. Such specific provisions are recommended to better guide the application of EA legislation.

Regarding cumulative effects, *CEAA 2012* specifically recommends its consideration in all EAs[456], which is not the case for all the provincial EA legislation. Among those who do mention cumulative effects, most do not require their consideration and none explicitly references GHGs or climate change in their consideration.[457] Unfortunately, this results in an often inadequate consideration of cumulative effects in the EA process.[458] Cumulative considerations have been a common concern in most EA legislation and processes across Canada. Many are advocating the need for additional consideration of cumulative impacts in the EA process.[459] A more defined structure for the EA process would help ensure this much needed degree of consistency in addressing GHG considerations.

The integration of these key notions offers a good starting point to guide the EA process, but a specific provision on climate change should also be included in the purpose clause of any EA legislation. It is recommended that such a provision should define climate change and explain the importance of the issue on regional, national, and international fronts, prescribing the need to act on the matter. Provision (13) in *Directive 2014/52/EU* offers an

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[456] *CEAA, 2012*, *supra* note 64, s 4(1)(i).
[457] *EAA BC*, *supra* note 280, s 11(2)(b); *RREIAR QC*, *supra* note 261, s 3*(c)*.
[458] A John Sinclair, Meinhard Doelle & Peter Duinker, "Looking Up, Down, and Sideways: Reconceiving Cumulative Effects Assessment as a Mindset" (2017) 62 *Environmental Impact Assessment Review* 183 at 188 [Sinclair, Doelle & Duinker]; Lindgren & Dunn, *supra* note 275 at 297.
[459] Quebec, *Rapport du comité sur la modernisation de la procédure d'évaluation et d'examen des impacts sur l'environnement et du processus de participation publique* (Quebec: 12 December 2014) at 13 [Quebec "Rapport modernisation"].

interesting starting point for introducing the notion of climate change in the purpose clause. The provision states that, "[c]limate change will continue to cause damage to the environment and compromise economic development. In this regard, it is appropriate to assess the impact of projects on climate (for example greenhouse gas emissions) and their vulnerability to climate change".[460] Including climate change and GHG considerations in such a way through the purpose section of the legislation would help to further the consideration of climate change and GHG emissions according to the three above-mentioned principles.[461]

By including these specific principles in the purpose clause, it would reinforce the importance of the principles in the application of EA legislation. The EA process would thus be applied considering the notions inherent to sustainable development and the precautionary principle, while striving to limit the impacts of climate change.

### 7.2 DEFINITIONS

Definitions play an important role in the interpretation and the application of all legislation. This is also true for EAs, where definitions can add responsibilities or offer exemptions for certain projects. Various definitions are found in the existing EA legislation. Some have certain merits, while others are insufficient. The definitions section of any legislation is crucial for its application. Some of these definitions and notions can be useful in the integration of GHG considerations in the EA process. These include: climate change, GHG,

[460] *Directive 2014/52/EU*, *supra* note 389, art (13).
[461] Jiricka, *supra* note 58 at 86.

significant, environmental effect, and cumulative effect. All of these definitions can be interpreted broadly or narrowly, which can considerably alter the EA process.[462]

Above all, the definition section of the EA legislation in each jurisdiction should include a definition on climate change. Climate change is a complex notion and providing a definition in the EA legislation would provide additional help in its integration. For example, the IPCC refers to climate change as

> a change in the state of the climate that can be identified (e.g. using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. It refers to any change in climate over time, whether due to natural variability or as a result of human activity[463].

Another useful definition is the one used by the UNFCCC, which describes climate change as "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods." [464] These definitions could be used as a reference in the EA legislation of each jurisdiction. The set definition of climate change could vary in each jurisdiction, but should include notions of changes to the environment caused by human activities and refer to GHG emissions. Other notions that could be included are the one related to the global characteristic of climate change; regional, national, and international agreements; mitigation and adaptation measures. To further clarify this, a separate definition on GHG should also be included in all EA legislation.

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[462] Manitoba Law Reform, *supra* note 400 at 29.
[463] IPCC, *Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, Rajendra K. Pachauri & Andy Reisinger, eds (Geneva, Switzerland: IPCC, 2007) at 30.
[464] UNFCCC, *supra* note 22, art 1.2.

This definition can take guidance on the one found in *EA MB* and should list all GHGs. Additionally, a clear link should be made between GHGs, climate change, environmental effects, and cumulative effects. Manitoba is currently the only jurisdiction in Canada that includes such a definition in its EA legislation.[465] Although commendable for including these important terms, the definitions found in the EA legislation of Manitoba could still be enhanced and Canadian legislation could look to the EU and the US for guidance on how to define these fundamental terms. Under the *Canadian Environmental Protection Act*, the federal government already recognizes carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride as toxic substances.[466] This reinforces the need for proper integration of GHG considerations into the EA process.[467] Explicitly mentioning these gases in all EA legislation would clarify what is expected in regard to GHG considerations.

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[465] GHG is defined as:

> any of the following gases:
>
> (a) carbon dioxide,
> (b) methane,
> (c) nitrous oxide,
> (d) hydrofluorocarbons,
> (e) perfluorocarbons,
> (f) sulphur hexafluoride,
> (g) any other gas prescribed by regulation

*EAMB*, *supra* note 245 s 1(2).

[466] Benidickson, *supra* note 33 at 402, see *Canadian Environmental Protection Act, 1999*, SC 1999, c 33, Schedule 1 [*CEPA,1999*].

[467] A substance is defined as being toxic

> if it is entering or may enter the environment in a quantity or concentration or under conditions that
>
> (a) have or may have an immediate or long-term harmful effect on the environment or its biological diversity;
> (b) constitute or may constitute a danger to the environment on which life depends; or
> (c) constitute or may constitute a danger in Canada to human life or health.

*CEPA,1999*, *supra* note 466, s 64.

This section of any EA legislation should also define what should be considered as a significant environmental effect. The notion of significance is a pivotal notion in the EA process and further clarifications are needed, especially regarding climate change and GHG emissions. The definition of what "significant" means should be broad enough to encompass a variety of environmental effects, but should also be specific enough to clearly include climate change impacts as significant environmental effects. The words "climate change" and "greenhouse gas" could both be used in this definition. Nova Scotia is the only jurisdiction in Canada providing a definition of the term "significant".[468] Including such a definition helps to increase consistency in its application in the EA process.[469] The definition used in Nova Scotia refers to the magnitude of the effect, the duration of the effect, and the degree of reversibility of the effect, which could all be relatable to GHG considerations. The Nova Scotian definition offers a good starting point, but the definition should also include a direct mention of climate change and GHG emissions. Directly mentioning climate change and GHG emissions here is especially important in the application of the EA legislation, where many EAs in the past have deemed climate change and GHG emissions as non-significant environmental effects.[470] The CEQ Final Guidance

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[468] "significant" means, with respect to an environmental effect, an adverse effect that occurs or could occur as a result of any of the following:

(i) the magnitude of the effect,
(ii) the geographic extent of the effect,
(iii) the duration of the effect,
(iv) the frequency of the effect,
(v) the degree of reversibility of the effect,
(vi) the possibility of occurrence of the effect".

*EAR NS*, *supra* note 251, s 1(1).

[469] Manitoba Law Reform, *supra* note 400 at 29-30.

[470] From past EA projects review, it is easy to conclude that each project GHG emissions are not significant because the calculations are comparing the total estimated GHG emissions from a specific project to the global GHG emissions. As Peel importantly states, "[a]pplied this way, almost any projects can be seen as simply a 'drop in the ocean' in global climate change terms. This approach ignores the cumulative effects of project-related GHG emissions". Peel, *supra* note 8 at 353, 356; O'Gorman, *supra* note 159 at 18.

goes a little further in describing the notion of significance. It specifically states that the significance of GHG emissions of a project (both direct and indirect GHG emissions) should not be determined compared to the global GHG emissions, but instead should include cumulative implications.[471] This means that each individual project should determine the significance of its direct and indirect GHG emissions cumulatively (in a global context).[472] Using clear and consistent definitions in the legislation would avoid ambiguous and inconsistent applications of the definition of "significance", especially in regards of GHG emissions.[473] Such a definition would ensure that GHG emissions can clearly be included in what is considered as a significant environmental effect.

Identifying the level of GHG emissions for a project that would be deemed to be "significant" would be an invaluable addition to EA legislation.[474] "Significant" GHG emissions could be anything over a legally set standard of emissions, which would trigger the significance factor in this definition, based on the magnitude of the effect. Also, since GHG emissions can have a long lifetime expectancy and considering that their effects can cause severe and irreversible impacts[475], any GHG emission would automatically satisfy the significance factor based on the duration of the effect and the degree of reversibility of the effect. Such an approach would simply trigger GHGs as significant environmental effects, but other measures in the EA legislation would still allow the flexibility to decide

[471] CEQ, "Final Guidance", *supra* note 428 at 11.
[472] Here, the GHG contribution of a project would be assessed on a global scale, as opposed to each project only assessing its own GHG emissions. As Krueger mentions, the proper question to ask would be: "combined with global GHG emissions, what is the magnitude of a project's impact?" Kruger, *supra* note 255 at 174.
[473] Ohsawa & Duinker, *supra* note 165 at 232.
[474] Peel, *supra* note 8 at 353.
[475] IPCC 2014, *supra* note 1 at 8, 87.

if these emissions are justified or not (for example: if the project helps to reduce GHG emissions or if the project is deemed to be urgent).[476]

Another fundamental definition found in EA legislation refers to "environmental effect". Although some legislation defines this important notion, none specifically links it to climate change or GHG emissions. Climate change and GHG emissions should be mentioned in the definition of "environmental effect" in all EA legislation. It should be clear that GHG emissions can indeed be considered as an environmental effect, leaving no room for interpretation and then omitting it as part of the EA process. The words "climate change" and "greenhouse gas" could both be used in the definition of what is to be considered as an "environmental effect". Ensuring that climate change and GHG are explicitly mentioned and listed in what is to be considered as an environmental effect would avoid the ambiguity that is often associated with the current definitions. This would help strengthen the legally binding requirement to consider GHG emissions in the EA process.

"Cumulative effect" is another important notion that is currently found in the definitions section of some EA legislation. However, to date, a lot of criticism has been levelled for not giving the notion adequate consideration in the EA process.[477] In order to ensure

[476] As Kruger explains, "[t]he goal of these efforts is not to force a finding of significance every time a project with considerable GHG emissions is proposed. It is to articulate an ecologically based definition of significance. Where GHG emissions are found to be significant, it is open to an [Responsible Authority] to justify a project in the circumstances. Where justification is not forthcoming, mitigation measures can be used to minimize project emissions towards insignificance. Coupled with the CEAA's procedural requirements, incremental developments in the regulatory sphere or through judicial doctrine could result in future EA decisions that are more consistent with climate change science." Kruger, *supra* note 255 at 183.
[477] Lindgren & Dunn, *supra* note 275 at 297.

consistency and rightful consideration among project proponents and EA decision-makers, cumulative effects should be clearly mentioned and included in the EA legislation of each jurisdiction, with an explicit reference to climate change and GHG emissions.[478] The definition of cumulative effect needs to explicitly state that GHG emissions are included in what is considered as a cumulative effect, based on the nature of the GHGs and on climate change impacts. To help with this definition, the CEQ Final Guidance definition of cumulative effects can be used. There, it is defined as the "impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions"[479]. It also explicitly states that, "[a]ll GHG emissions contribute to cumulative climate change impacts"[480]. Such a strong and clear link between GHG emissions, climate change, and cumulative effects is needed in EA legislation. This would help clarify the integration of cumulative effects in the EA process, in regard to climate change and GHG emissions.

The definition section in all legislation is essential for ensuring the proper implementation thereof. In dealing with complex matters such as climate change, clear fundamental definitions are needed. Such fundamental definitions are: climate change, GHG, significant, environmental effect, and cumulative effect. All EA legislation should include these definitions to ensure a consistent and clear integration of climate change and GHG emissions in the EA process across the country.

[478] Lindgren & Dunn, *supra* note 275 at 298.
[479] CEQ, "Final Guidance", *supra* note 428 at 17.
[480] *Ibid.*

### 7.3 CLASSIFICATION

Using a classification system can serve as a means of imposing more stringent procedures on projects with more important anticipated environmental effects and it can also be a means for allowing projects with fewer anticipated environmental effects to follow a less stringent EA process. Minimal mandatory requirements for EAs are necessary to ensure a consistent process[481] and for a more harmonious process among all Canadian jurisdictions. Different classification systems are already used in the EA legislation of various jurisdictions throughout Canada, but the responsible authorities through the use of their discretionary powers can often waive these systems.[482] Albeit necessary in the EA scope, such legislative powers do not promote consistency in the EA process. It must be noted that by simply using and adjusting these pre-existing systems, it would be possible to add new procedures specifically related to GHG emissions in the EA process.

Current classification systems need a more defined structure with respect to the exemption of "environmentally friendly" projects. By streamlining the EA process, there is a risk of having most projects approved without undergoing the full long-standing requirements of an individual EA. In Ontario, it has been reported that 90% of the undertakings subject to the *Environmental Assessment Act* of Ontario have obtained their approval through the streamlined approval process (under the Class EA process).[483] Additionally, these types of classification systems do not always take into account all the factors included in each specific project. Since climate change is a complex issue, different types of projects might

[481] Manitoba Law Reform, *supra* note 400 at 29.
[482] *Ibid.*
[483] Lindgren & Dunn, *supra* note 275 at 295.

lead to different effects on climate change or might be affected differently by the impacts of climate change. Bearing all this in mind, there is also the additional concern about the planning and cumulative effect aspects of the EA.[484] Each project has its own particularities that need to be considered before receiving approval. Certain "preapproved" projects[485] in such classification systems would benefit from a more in-depth EA process, even though at first blush they might appear to result in minimal environmental effects. As is the case in many other jurisdictions, courts have been hesitant to intervene to impose individual EAs for proposed projects or to change the EA category or schedule that applies to a proposed project.[486] As such, some of these projects, at first deemed to be environmentally friendly, could in fact result in serious effects on climate change or on the environment from aggravated climate change impacts.[487]

Further clarification and structure are also needed in the Manitoba EA legislation, the only Canadian EA legislation specifically mentioning GHGs. Indeed, even if GHG emissions are to be considered by the responsible authority in the decision-making process, there are no requirements or prescribed minimal standards as to how they should be integrated into the EA process. Are all GHG emissions considered as a "significant environmental effect"? Are all GHG emissions equal? If there is a threshold approach, are projects with emissions

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[484] *Ibid*.
[485] In Ontario, projects that fall under the Class EA process are "preapproved", as long as the project proponent fully complies with the prescribed Class EA requirements and other obligations of the legislation. *Ibid* at 284.
[486] *Ibid* at 295., citing *Hollinger Farms No. 1 Inc. v Ontario (Minister of Environment)* (2007), 29 OAC 303 (Div Ct), 2007 CanLII 40545 (ON SCDC).
[487] For example, a municipal tree replacement project could replace native tree species resistant to the local environment with non-native species that might not be adapted to the local environment. This could lead to increased runoffs and erosion, which in turn would mean greater projected climate change impacts for the area.

below the threshold automatically awarded or denied a permit of authorization? Are there standards or criteria that must be respected and, if so, what are they? What alternatives are considered? What does the "must take into account" requirement really demand of the responsible authority? All of these questions and more should be addressed in a further regulation aimed at enhancing the clarity and conformity of GHG considerations as they relate to all EAs. Even if the EA legislation of Manitoba is commendable for integrating climate change and GHG components, some shortcomings still remain with respect to the integration of those components.

Another important issue relating to the use of a classification system in the EA process is the lack of regular updates normally brought to these lists.[488] In order for such a system to be thorough and inclusive of all possible environmental effects, a regular and mandatory review and update of the lists provided in each EA legislation would be necessary.

### 7.4 INSIDE AN EA

In order to ensure a more effective integration of climate change and GHG considerations in EAs[489], it is essential to look at how and when they are considered in the EA process. The earliest phases of the EA process have been said to be the most effective point at which climate change and GHG considerations can be integrated, as it is easier and also allows to limit the financial burden that might come from the addition of such considerations.[490]

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[488] Quebec "Rapport modernisation", *supra* note 459 at 1, 5, 15, 18; Conservation Council of NB, *supra* note 6 at 1-2; M-A Bowden, "Environmental Assessment Reform in Saskatchewan: Taking Care of Business" (2010) 21 JELP 261 at 263 [Bowden].
[489] Sok, Boruff & Morrison-Saunders, *supra* note 22 at 320-21.
[490] OECD, *supra* note 26 at 9.

Therefore, this integration should be done during the screening and scoping phases. Ideally, bearing in mind the proposed recommendations, all project proponents would have to consider the GHG emissions from their project. This also fosters a more fluid integration. All EA projects should also calculate their GHG emissions in the context of the current provincial and federal GHG emissions and reduction plans. Various recommendations are included here and are grouped into four subsections: calculations of GHG emissions in all EAs, methodologies, climate EA, and coordination and harmonization in the EA process. These specific recommendations will offer a more consistent and thorough integration of GHG considerations in the EA process.

### 7.4.1 Calculations of GHG Emissions in All EAs

It is recommended that all projects subject to the EA process in Canada should be required to provide calculations on the GHG emissions associated to their proposed projects. As required in *Directive 2014/52/EU*, where GHG and climate impacts are listed as significant adverse effects, a requirement for GHG calculations should be added in all Canadian EA legislation. [491] This general requirement must be imposed on all projects and its implementation should be required at the very beginning of the EA process, in order to

[491] Annex IV specifically mentions:

> 4. [a] description of the factors specified in Article 3(1) likely to be significantly affected by the project: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, *climate (*for example *greenhouse gas emissions*, *impacts relevant to adaptation*), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.
> 5. A description of the likely significant effects of the project on the environment resulting from, inter alia:
> …
> (f) the impact of the project on *climate* (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to *climate change*.

*Directive 2014/52/EU*, *supra* note 389 at *Annex*, *Annex IV*, art 4-5(f) [emphasis added].

ensure a more effective and successful integration. Instead of simply qualifying the GHG emissions associated with each project, specific calculations quantifying the estimated GHG emissions from each project are required. These calculations and their sources would also need to be provided as part of the EA process. In order to ensure consistency, the responsible authority would need to provide the calculations methods, tools, and references necessary to make these calculations. In making these calculations, it would be ideal to consider all GHG emissions: direct, indirect, upstream and downstream. The identification of both direct and indirect climate change impacts is to be considered in the assessment.[492] This would ensure consistency across Canada, while still respecting the Canadian project-by-project EA process. However, because these calculations are not currently required in all proposed projects, a gradual implementation is recommended. The federal government has already started to require that some projects submit their direct upstream GHG emissions.[493] Upstream and direct GHG emissions should be the first calculations required under all EA processes. Calculation and other tools are readily available from the federal government. Provincial governments could also add their own methodologies and references, as they see fit. The legislation could prescribe that indirect and downstream emissions would be added to the requirements after a few years. This type of gradual integration is not unusual and it would provide an adjustment period to both industry and governmental bodies, giving them the time necessary to adapt and develop the adequate tools and methodologies needed to fulfil their responsibilities. This approach is currently

[492] Peel, *supra* note 8 at 351-52.
[493] Canada, Environnement et Changement climatique Canada, "Méthodologie provisoire pour estimer les émissions de GES en amont", by Helen Ryan (17 March 2016), online: <http://www.bape.gouv.qc.ca/sections/mandats/oleoduc_energie-est/documents/GES2.pdf>.

used in Europe with *Directive 2014/52/EU*.[494] A gradual integration has been said to help ensure a proper and effective transition between the old EA process and the new EA process,[495] which would then allow for a higher level of environmental protection, including greater protection for global environmental issues, such as climate change.

In order to address some of the shortcomings of GHG considerations in the EA process, fixed mandatory minimal requirements should be prescribed in EA legislation in order to set boundaries to the EA content, thus enhancing consistency in the EA process.[496] It is therefore recommended that a fixed minimal threshold approach should be implemented in all Canadian EA legislation. This recommendation would have the federal government set a national minimal standard for GHG emissions in all EA processes across the country.[497] Provincial governments would then be free to set their own more stringent thresholds in their own legislation and policies on climate change and GHG emissions.[498] This type of approach is not unusual and was recently used in Canada with the ratification of the Paris Agreement, as well as with the adoption by Parliament of a minimum price on carbon.[499] This approach is further detailed here.

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[494] *Directive 2014/52/EU*, *supra* note 389, art (39).
[495] *Ibid.*
[496] Manitoba Law Reform, *supra* note 400 at 29.
[497] The federal government has many ways to act to legislate GHG emissions and one of them is to act through *CEPA*. As the federal government already recognizes six GHGs as toxic substances under *CEPA*, this provides the federal government with a certain power to regulate on GHG emissions and climate change. Laskin, *supra* note 35 at 3-17.
[498] Constitutionally, a province may adopt additional legislative requirements that supplement the requirements of federal legislation. Laskin, *supra* note 35 at 3-3.
[499] Government of Canada, News Release, "Government of Canada Announces Pan-Canadian Pricing on Carbon Pollution" (3 October 2016), online: <https://www.canada.ca/en/environment-climate-change/news/2016/10/government-canada-announces-canadian-pricing-carbon-pollution.html>;
Government of Canada, Backgrounder, "Pricing carbon pollution in Canada: how it will work", (21 June 2017), online: <https://www.canada.ca/en/environment-climate-change/news/2017/05/pricing_carbon_pollutionincanadahowitwillwork.html>.

First, it is essential to start by defining what a threshold is, especially in regards to climate change and GHG emissions.

> Thresholds are limits beyond which changes resulting from cumulative impacts become of concern; they are typically expressed in terms of carrying capacity, goals, targets, and/or limits of acceptable change. These thresholds reflect and integrate scientific data, societal values, and concerns from affected communities. A threshold can be the maximum concentration of a certain nutrient in a body of water beyond which an algal bloom will occur, the concentration of pollutants in an airshed beyond which health of nearby communities could be adversely affected, or a maximum amount of linear infrastructure in a landscape before visual impacts become unacceptable.[500]

Therefore, regarding climate change and GHG emissions, a threshold approach would translate into setting a minimal annual limit of GHG emissions to be released per year (most often referred to in terms of $CO_2e$ per year). Any project set to emit GHG emissions surpassing this threshold would trigger the need to provide additional information as part of the EA report of the project.[501] The quantity of GHG emissions that would trigger the need for mandatory additional information would be directly referenced in the EA legislation. To be successful, the threshold needs to be set at a level that is significant[502] and needs to be applied in all EA legislation in Canada[503]. Trigger-based approaches have been used in EAs in Canada on different matters for a number of years[504] and can be a useful way to ensure proper integration of GHG considerations.[505] Such as in the case

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[500] International Finance Corporation, *Good Practice Handbook: Cumulative Impact Assessment and Management Guidance for the Private Sector in Emerging Markets* World Bank Group Working Paper No 86492 (2013) at 47 [IFC].
[501] Byer *et al*. 2012, *supra* note 23 at 2.
[502] Finding the significance level means setting the threshold at a level that is not too high or too low. This is where the greater potential for successful GHG reductions threshold lies to better address climate change. Kruger, *supra* note 255 at 174.
[503] To ensure a harmonized and consistent process, but also to prevent project proponents that might be tempted to move their proposed projects to another jurisdiction where there are lower or no specific thresholds in regards of climate change considerations.
[504] For example, see the standards set for contaminants in *Environmental Protection Act*, RSO 1990, c E.19.
[505] The CEQ explains that using a threshold approach such as described here allows to pull in the large stationary sources of potential GHG emitters, while also limiting the number of smaller projects, which

where Canada has placed a price on carbon, it is recommended that the federal government show leadership by setting a standard to be respected by all federal EAs and inviting provincial governments to adopt more stringent standards on their own, using the federal standard as a baseline. This would ensure consistency in all jurisdictions, thus providing a greater chance of success in addressing the issue of climate change.

To determine the standard to be set by the federal government, many options can be used. The numbers or percentages used to define acceptable levels could be based on the reduction target set forth by the federal government in its international commitments.[506] Another option would be for the federal government to set a fixed threshold. Such an approach was suggested as part of CEQ Draft Guidance on *NEPA* in 2010 and in other research.[507] This is the approach recommended in this research, as it was proposed in the CEQ Draft Guidance of 2015, where the threshold of 25 000 T $CO_2$e was recommended.[508] The 25 000 T $CO_2$e threshold was later criticized for being too broad, with many advocating that the 25 000 T $CO_2$e was not sufficient to ensure the inclusion of tangible climate change and GHG considerations in the EA process. This ultimately led to the complete removal of the threshold from the 2016 Final Guidance. In Canada, different

reduces administrative resources. A threshold approach should also help clarify how GHG emissions and climate change are to be included in the EA process, which should also reduce the numbers of litigation issues that are based on uncertainty. US, Council on Environmental Quality, *Revised Draft Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Reviews*, 29:247 Fed Reg, (24 December 2014) at 77818 [CEQ, *Revised Draft Guidance*]; Kruger, *supra* note 255 at 176.

[506] Using this type of target, projects proponent would have to demonstrate that their project allows for a reduction of 30% of GHG emissions, compared to a business as usual calculations, or that the design of their project allows for a 30% GHG emissions reduction (compared to another design of the same project).

[507] Ohsawa & Duinker, *supra* note 165 at 230.

[508] CEQ, *Revised Draft Guidance*, *supra* note 505 at 77807.

jurisdictions have set different thresholds in their legislation to define reporting requirements for GHG emitting facilities. However, these thresholds are not legally part of the EA process.[509] These other statutes and regulations could be used to help set the minimal national standard. At the present time, there are no known Canadian thresholds for GHG emissions in EAs.[510]As such, based on the current GHG emissions reporting thresholds for facilities in Canada (varying between 10 000 T $CO_2e$ to 50 000 T $CO_2e$) and based on previous research suggesting an ambitious target, it is recommended that the national standard be set at 10 000 T $CO_2e$. This number is the lowest GHG emissions reporting threshold established in Canada, set forth by the province of Quebec and thereafter adopted by Alberta in 2018.[511] Using the lowest required threshold set for reporting GHG emissions in Canada would allow for compliance with the precautionary principle, referenced in the purpose section of the EA legislation.

Since climate change always involves uncertainties and complex issues, a precautionary approach is recommended for addressing climate change.[512] From there, each jurisdiction could simply use that minimal threshold in the EA process or adopt its own more ambitious threshold.[513] Because information relating to climate change is in constant evolution, the proposed threshold could change and a regular review process should be provided for in

[509] For example, see: Alberta (*Specified Gas Reporting Regulation*, Alta Reg 251/2004), Nova Scotia (*Quantifications, Reporting and Verification of Greenhouse Gas Emissions*, NS Reg 29/2018), Ontario (*Quantification, Reporting and Verification of Greenhouse Gas Emissions*, O Reg 143/16), and Quebec (*Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere*, CQLR c Q-2, r 15).
[510] Ohsawa & Duinker, *supra* note 165 at 230.
[511] Alberta Government, *Specified Gas Reporting Standard – Specified Gas Reporting Regulation*, version 9.0, 12 March 2018 (Alberta: Government of Alberta, 2018), s 2(1).
[512] IFC, *supra* note 500 at 46.
[513] O'Gorman, *supra* note 159 at 18.

the EA legislation.[514] Once projects trigger a given threshold, they would then follow a different EA process: the climate EA. This more stringent EA process, as described below, would require additional information to be included in the EA process.

Using a threshold approach is not unheard of and has been suggested on the international front in the *Guidelines on IA* from the CBD. In these guidelines, the CBD recommends the use of threshold values for the screening process.[515] This approach predefines threshold values in order to determine the type of EA needed for specific projects.[516] This is similar to the approach proposed here, which would indirectly promote climate-safe projects. Projects deemed more climate-friendly (with lower expected GHG emissions) would require the completion of fewer steps and requirements as part of their EA process. It follows that project proponents would have a greater incentive to develop such type of projects.[517] Projects emitting fewer GHG emissions would not trigger the thresholds described in the legislation and would be allowed to follow a more streamlined EA process than that required of other projects with greater estimated GHG emissions. This simplified EA process can be perceived as an added motivation to promote and develop climate-friendly projects and discourage other projects that are more climate-sensitive. Not only would the threshold approach ensure a greater consistency in the integration of GHG considerations into the EA process, it would also generally promote the development of more climate-friendly projects.

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[514] Quebec "Rapport modernisation", *supra* note 459 at 1, 5, 15, 18; Conservation Council of NB, *supra* note 6 at 2; Bowden, *supra* note 488 at 263.
[515] CBD, "*Guidelines on IA*", *supra* note 149, s 11-13.
[516] For example, an EA would be mandatory for proposed project in specific areas, such as protected areas, important ecological corridors or habitat of threatened species. *Ibid*, s 11-13, Appendix 1.
[517] Gerrard, *supra* note 17 at 24.

Using a trigger-based approach that initiates a climate-sensitive approach as part of the EA process will provide clear boundaries to better integrate climate change and GHG emissions in the process, while also respecting other climate-change-related processes (such as sustainability assessments, strategic EAs and other climate change action plans).[518] Since the classification system often falls under the regulatory power of the Minister, it could be fairly simple to add these considerations in a regulation.

It is recommended that a trigger-based approach be used here, based on predicted GHG emissions for each proposed project. Projects anticipated to release greater GHG emissions than the set threshold would have to follow additional steps and requirements as part of their EA process. Projects with lesser-estimated GHG emissions would then have to follow a simplified EA process. This type of approach indirectly encourages the development of projects with lesser GHG emissions, therefore encouraging more climate-friendly initiatives.

As noted in the Energy East case study and in other past EA projects as well, GHG emissions associated with a proposed project have often been deemed not to be significant.[519] Drawing from the CEQ Final Guidance, another recommendation would be to add a report of no significant impact to the Canadian legislative requirements in the scope of an EA.[520] If a project is deemed to result in no significant environmental impact, a report must be submitted in order for the project to gain approval. Such reports would

[518] Sok, Boruff & Morrison-Saunders, *supra* note 22 at 323.
[519] Ohsawa & Duinker, *supra* note 165 at 231.
[520] Weiland, Horton & Beck, *supra* note 420 at 156.

need to include the reasons why no environmental impacts are expected and would be made available to the public. Here a project proponent would have to justify why the GHG emissions of the proposed project were deemed to be non-significant. This approach encourages accountability and transparency in the EA process, and it would also increase the confidence of the public in the EA process, an important goal identified during the federal EA review process.

These additional legislative requirements would increase the level of information provided by the project proponents in their submissions as part of the first stages of the EA process, and they would help make the decision process more thorough and effective. Adding these requirements to the legislation would provide the structure and boundaries needed to ensure that GHG emissions are indeed considered in the EA process. It would also ensure that it is consistently integrated, both by the project proponent and by the responsible authority.[521] The addition of these requirements would set the boundaries that are often needed in light of the significant discretionary power held by the responsible authorities.

### 7.4.2 Methodologies

Defining what should be included in an EA is an important part of EA legislation. This practice defines where requirements are made and whether they are mandatory. It is also where a trigger-based approach can be further defined. Here, the legislative authority can take the time to define the methodologies upon which the EAs should be developed. This is especially relevant to climate change matters, since project proponents often feel

[521] Arabadjieva, *supra* note 29 at 165.

misguided and uncertain with respect to the approach they should be using for calculating GHG emissions or when preparing different climate scenarios for their proposed project.[522] EA legislation should offer further guidance for project proponents when drafting their EA documents. The EA legislation should include a calculation guide; proposed sources for estimating GHG emissions; proposed sources for climate scenarios; and, proposed sources for finding comparable measures. Such provisions can be included in annexes to existing EA legislation and need to be reviewed regularly in order to ensure the proper use of data in EAs, especially since climate change knowledge and data are continually evolving.

Additionally, the references behind the information provided in the EA should also always be disclosed. Indeed, the source of information behind the climate data (such as the GHG emissions calculations) and justification of each result obtained by the project proponents is crucial to deliver adequate EA documents.[523] Such measures encourage transparency and accountability. Even when no or limited climate change effects or GHG emissions are expected, it is essential that the project proponent provide detailed explanations on how the results were obtained (along with an explanation of the choices of models, methodologies and references for their data) and the degree of confidence for each of these models and data.[524] This allows the responsible authorities to have access to the most complete information and gives them the necessary tools for a sound decision-making process.[525]

[522] Agrawala *et al*, 2012, *supra* note 21 at 34.
[523] Byer *et al*. 2012, *supra* note 23 at 3.
[524] *Ibid*.
[525] OECD, *supra* note 26 at 12.

### 7.4.3 Climate EA

As mentioned previously, it is recommended that certain projects subject to an EA process follow a more detailed EA process, the climate EA. The climate EA process would be undertaken as part of the regular EA process already in place in each jurisdiction, but it would help provide additional information regarding climate change for projects that trigger certain climate change thresholds (such as GHG emissions). Therefore, once a project has triggered the nationally set threshold for GHG emissions, it would follow the additional requirements prescribed for a climate EA. A climate EA would require details about the composition, magnitude and intensity of the GHG emissions projected for each element and phase of the project.[526] This approach would include listing the types of GHGs that will be emitted during the proposed project. Here, a complete estimate of GHG emissions would be required (including direct, indirect, upstream and downstream GHG emissions).[527]

In addition to detailing the expected GHG emissions of a project, a climate EA would also require the project proponent to clearly identify mitigation measures.[528] The mitigation aspect of an EA can be crucial because projects that have identified potential significant environmental effects can still be approved based on their proposed mitigation measures.[529] Such mitigation measures should include alternative measures of reducing GHG emissions in all applicable elements and phases of the project.[530] This assessment would then need to

[526] Byer *et al*. 2012, *supra* note 23 at 2.
[527] *Ibid*.
[528] *Ibid*.
[529] Kruger, *supra* note 255 at 180.
[530] Byer *et al*. 2012, *supra* note 23 at 2.

provide comparable measures to evaluate the project (such as sectoral, industry best practices and reduction targets of the jurisdictions and industries involved in the project).[531] It is recommended that these mitigation and alternative measures, as well as the use of comparable measures, be made mandatory requirements under EA legislation as part of the climate EA process.

In order to ensure limited environmental effects, changes are also needed at the implementation phase. The implementation stage is where monitoring measures are to be put in place. It is during that stage that it is important to monitor the proper environmental indicators and to describe how these will be brought back in the decision-making process.[532] The environmental success of a project relies heavily on its implementation and monitoring. However, EAs have frequently been criticized for their failure to ensure a proper monitoring and enforcement process to prevent significant or even irreversible damages.[533] As part of the climate EA process, submitted documents would need to clearly identify the measures to be implemented in relation to impact monitoring, evaluation, management and communication.[534] Monitoring measures should include yearly reports to the responsible authority detailing activities related to the project and providing up-to-date information on the mitigation and adaptation actions of the project (for example, which mitigation measures were implemented, which are in development, and the degree to which these measures actually prevented the release of GHG emissions). GHG considerations can be integrated in all phases of the EA process and, as such, adjustments need to be made

[531] *Ibid.*
[532] Peel, *supra* note 8 at 353.
[533] *Ibid.*
[534] Byer *et al*. 2012, *supra* note 23 at 3.

accordingly to ensure the most effective integration possible. This stage of the EA process is essential to ensure a successful integration of GHG considerations in the EA process and, most importantly, to ensure the implementation of the required mitigation and adaptation measures as part of the climate EA process.

### 7.4.4 Coordination and Harmonization in the EA Process

The proposed recommendations made in this research are based on and take their strength from a coordinated and harmonized approach across the country. Such an approach, with the federal and provincial governments working together, ensures greater consistency and better integration of GHG considerations in the EA process. The approach follows through with the goal of cooperation and coordination identified at the federal level, in *CEAA 2012*. *CEAA 2012* recognizes the importance of a uniform and harmonized EA process across Canada.[535] Specifically, section 105 states that the Agency has the goal to promote a uniform and harmonized EA process throughout the country and within all levels of governments. This is fundamental for the Agency since this goal specifically surpasses jurisdictional borders and clearly identifies the importance of promoting conformity across Canada. This approach further reinforces the similar notions expressed in the purpose section of *CEAA 2012* and demonstrates the importance of having a consistent nationwide EA process.

A more structured and harmonious approach should be put in place in Canada. Such an approach would take inspiration from the EU, with provisions specifically mentioning the

[535] *CEAA, 2012*, *supra* note 64, s 105.

need for a harmonized EA process, taking root at the legislative level with the EU directive.[536] This approach is said to ensure efficiency and a sustainable growth in the EU.[537] There, *Directive 2014/52/EU* sets the tone with the introduction of minimal requirements at the EU level, and Member States are then encouraged to set more stringent measures of their own, in their own jurisdictions.[538] It is recommended that the Canadian federal government play a more important role in order to ensure conformity in the integration of GHG components in the EA process across Canada, while still respecting the jurisdictional powers and authorities of all levels of governments. Like in the EU, the Canadian federal government should set the minimal obligation and require consistent GHG considerations in all its EAs, while promoting such an approach in all other jurisdictions. Using a coordinated and harmonized approach across the country would allow for GHG emissions to be addressed more consistently throughout all Canadian jurisdictions.

### 7.4.5 Cumulative Effects

Cumulative effects have been on the forefront of EA critiques in the last few years. Their integration has often been criticized for being weak and inconsistent.[539] While GHG considerations can easily be included in the EA process without the consideration of cumulative effects, they can still prove to be a valuable tool to further the integration of

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[536] *Directive 2014/52/EU*, *supra* note 389, art (1), (6).
[537] *Ibid*, art (6).
[538] *Ibid*, art (1).
[539] Bram Noble, "Cumulative Environmental Effects and the Tyranny of Small Decisions: Towards Meaningful Cumulative Effects Assessment and Management" (2010) Natural Resources and Environmental Studies Institute Occasional Paper No 8, University of Northern British Columbia, Prince George, BC, Canada, online at: <http://wizard.unbc.ca/record=b1907145~S3*eng> at 4-5; Sinclair, Doelle & Duinker, *supra* note 458 at 183.

GHG considerations in the EA process. The cumulative nature of GHG emissions has led to the impacts of climate change being observed throughout the world today and these impacts are projected to worsen over time. In order to ensure consistency and rightful consideration among project proponents and EA decision-makers, cumulative effects should be clearly mentioned and included in the EA legislation of each jurisdiction, with an explicit reference to GHG emissions.[540] This means that EA legislation should ensure that GHG emissions are explicitly mentioned and included in the definition of what is considered to be a cumulative effect.

Even if the consideration of cumulative effects has been said to be better suited for SEAs, their use in project-level assessments (like those considered in this research) are still important and relevant.[541] Indeed, projects that are assessed together as a whole often result in findings of effects proving to be considerable or significant.[542] The consideration of cumulative effects has been described as a central tool for sustainability and it is recognized as a best practice in EA.[543] The CBD mentions that both direct and indirect impacts should be taken into account in an EA, as well as cumulative impacts.[544] These include "cumulative threats and impacts resulting either from repeated impacts of projects of the same or different nature over space and time"[545]. Environmental effects need to be

[540] Lindgren & Dunn, *supra* note 275 at 298.
[541] Sinclair, Doelle & Duinker, *supra* note 458 at 185, 192; Manitoba Law Reform, *supra* note 400 at 15.
[542] Jane Holder, "The prospects for ecological impact assessment" in Jane Holder & Donald McGillivery eds, *Taking Stock of Environmental Assessment – Law, policy and practice* (New York: Routledge-Cavendish, 2007) 259 at 268 [Holder].
[543] Manitoba Law Reform, *supra* note 400 at 15.
[544] CBD, "*Guidelines on IA*", *supra* note 149, s 8(a), 28(a), 31(d).
[545] *Ibid*, s 31(f).

considered as a whole and this gives additional importance to the consideration of cumulative effects.[546]

Limited legal requirements exist in Canada regarding cumulative effects in EA. Alberta and the federal government offer some models of legislative integration of cumulative effects in EAs, but those provisions fail to also mention GHG and climate change.[547] This has led to the completion of many EAs whose conclusion was that their projected GHG emissions were not significant. However, that is not the case when these are considered cumulatively with other past, current and future projects.[548] The US courts specifically "ruled that even incremental contributions to an environmental problem, such as the contribution of project's GHG emissions to climate change, 'cannot legally be dismissed as *de minimis* or inconsequential'"[549]. As such, GHG emissions should always be considered as a whole and as cumulative effects (in being part of a group of communities or individual projects).[550]

In many cases, project proponents are able to identify and explain how their proposed project will contribute to cumulative effects in the area and this type of assessment should be added to current legislation as part of the submissions required of the project proponents for an EA.[551] By ensuring that information from other projects are publicly available,

[546] Holder, *supra* note 542 at 268.
[547] *CEAA, 2012*, *supra* note 64, s 19(1)(a); *EPEA AB*, *supra* note 245, s 49(d).
[548] Byer *et al*. 2012, *supra* note 23 at 2.
[549] Mahony, "Ontario", *supra* note 104 at 9-13, citing D. Owen "Climate Change and Environmental Assessment Law" (2008), 33 Colum J Envtl L 57 at 60-61.
[550] Byer *et al*. 2012, *supra* note 23 at 2.
[551] Manitoba Law Reform, *supra* note 400 at 15-16.

governmental agencies would be able to assist project proponents when preparing their EA documents.[552] A stronger legislative framework is needed to facilitate and allow for a more consistent approach in incorporating cumulative effects assessment,[553] which would allow to further integrate GHG considerations.

It is recommended that cumulative effects be included in all EA legislation, recognizing their importance as environmental effects, and that they specifically include GHG considerations. The legislation needs to be clear on the matter to avoid ambiguous applications that, in the past, have led to findings of non-significance in previously completed EAs. Consideration of cumulative effects should especially be made mandatory as part of the EA process for large developments or projects with potential for the creation of widespread and extensive effects (some of these projects already voluntarily include this assessment).[554]

### 7.5 REGULATORY POWER

Regulatory power is a critical tool to foster the integration of GHG considerations in the EA process. Instead of amending all EA legislation, the existing regulatory powers can be used to add regulations (or provisions to existing regulations) on the integration of GHG considerations. This would help clarify the integration of GHG emissions in the current EA process, without going through the often lengthy process of adopting new legislation. It would also allow for a more rapid consideration of GHG emissions in the EA process,

[552] *Ibid* at 16.
[553] *Ibid* at 15.
[554] *Ibid*.

especially given the ongoing federal review process. Since addressing climate change is an urgent issue, the implementation of a regulatory approach would provide the quickest legislative response on this integration. It would also provide the much needed and legally binding requirements that are currently lacking for the integration of climate change and GHG emissions. In adopting regulations or new regulatory provisions on the integration of climate change and GHG emissions, legislators would make the consideration of GHG emissions legally mandatory in the jurisdictions covered by those regulations. Not only would this approach help clarify the integration of climate change and GHG emissions, but it would also help ensure consistent integration in all EAs and across these jurisdictions.

Regulatory powers can also offer distinct opportunities to further increase and clarify the integration of climate change and GHG emissions in the federal EA process.[555] Currently, no federal legislation explicitly makes the integration of GHG considerations mandatory in the EA process. Therefore, it is recommended that amendments be made to the existing

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[555] "83. The Governor in Council may make regulations

(*a*) amending Schedule 1 or 3 by adding or deleting a body or a class of bodies;

(*b*) prescribing, for the purposes or paragraph 15(*c*), the federal authority that performs regulatory functions and that may hold public hearings;

(*c*) exempting any class of proponents or class of designated projects from the application of section 59;

(*d*) varying or excluding any requirement set out in this Act or the regulations as it applies to physical activities to be carried out

…

(*e*) prescribing anything that, by this Act, is to be prescribed;

(*f*) prescribing the way in which anything that is required or authorized by this Act to be prescribed is to be determined; and

(*g*) generally, for carrying out the purposes and provisions of this Act.

84. The Minister may make regulations

…

(*b*) prescribing the information that must be contained in a description of a designated project;

(*c*) respecting the procedures, requirements and time periods relating to environmental assessments, including the manner of designing a follow-up program.

*CEAA, 2012*, *supra* note 64, ss 83-84.

legislation in order to ensure that GHG emissions are included in the description of a project subject to an EA. Such amendments can easily be made by the responsible authority, according to the regulatory powers provided under the EA legislation of each jurisdiction. As noted previously, the responsible authority often has the power to make amendments to regulations or even make new regulations under the existing legislation.[556] This would provide another way to ensure the consideration of GHG components in EAs. Amending the existing regulation to clearly prescribe GHG considerations would allow for a more comprehensive and consistent inclusion of these considerations in the EA process.

EA legislation often includes broad regulatory powers such as the possibility of adopting regulations detailing specific procedures or standards that would require compliance with certain EA documents.[557] This power to regulate would be a useful way to clarify how GHG considerations can be integrated into the EA process. For example, through this power, the responsible authority could impose specific standards regarding GHG emissions. Such standards or procedures would help project proponents in developing their EAs, but also ensure a consistent integration of GHG considerations in the entire EA process. These important regulatory powers give the responsible authorities the power to regulate many significant issues relating to EA and provide responsible authorities with "great flexibility in determining environmental standards, and, thus, environmental

[556] For example, *CEAA, 2012*, *supra* note 64, s 84.
[557] "42. (1) A regulation may adopt by reference, in whole or in part, with such changes as the Lieutenant Governor in Council considers necessary, any document, including a code, formula, standard, protocol or procedure, and may require compliance with any document so adopted". *EAA ON*, *supra* note 248, s 42(1).

policy"[558]. This latitude has been found in all EA legislation throughout Canada and can be described as a double-edged sword. With the availability of such an important and flexible regulatory power, the protection of the environment and of the public is not always guaranteed and can instead be discarded in favour of the interests of industry.[559] By adopting regulatory provisions detailing procedures and standards for EA documents, this important power could be better structured ensuring better GHG considerations and consistency in EAs. This approach goes back to the importance of EA legislation to recommend clear methodologies for the integration of climate change and GHG emissions, as recommended previously.

### 7.6 DISCRETIONARY POWER

The use of discretionary power is a delicate issue. On the one hand, it can provide the much-needed flexibility when dealing with issues that remain uncertain, thereby allowing the responsible authority to include the latest science and technology in the EA process, as well as public sentiments and national priorities. On the other hand, it can result in EAs that are inconsistent and that are less stringent on various issues (such as climate change).[560] Such inconsistency can then result in the implementation of projects having significant environmental effects. The fine line between both these extremes can then become a challenging balancing act. Ensuring enough flexibility to account for evolution in science and cultural practice is necessary, but it should not be done at the expense of the environment. Therefore, a fixed structure surrounding these discretionary powers is

[558] Neil J. Brennan, "Impediments to Environmental Quality and New Brunswick's Clean Environment Act: An Argument for a New Statute" (1997) 7 J Env L & Prac 93 at 106 [Brenann].
[559] *Ibid.*
[560] Pardy, *supra* note 63 at 147.

needed. This would help ensure minimal consistency in the EAs undertaken and it would also limit the possible overuse of that power by the responsible authority. For example, as is the case in the US,[561] EA legislation should impose the requirement to file a mandatory report of no significant effect for all projects deemed to have no such effects. Essentially, the report would need to include the reasons why no significant environmental effects are to be expected from the proposed project. Without this report, the EA process could not be considered complete. Such a requirement would help ensure consistency in the findings and conclusions of the responsible authorities during the EA process and would also greatly increase transparency and accountability in the EA process. Requiring the completion of such a report would foster an improvement in the structure of the discretionary powers of responsible authorities, where they would be bound to provide a publicly available report justifying why a project is expected to lead to no significant environmental effects. Instead of simply stating that a project would result in no significant environmental effect, the responsible authority would nonetheless have to explain its decision.

Another recommendation is to add a legislative requirement for the responsible authority to submit an exemption report for projects being proposed for exemption from specific EA conditions. Such reports would require an explanation of the reasons why the exemption is needed and which conditions would be required for the project to be approved. It would also need to be publicly available for comments before the approval of the project. This would only apply to projects triggering the GHG emissions standard or projects listed as designated activities in their particular jurisdiction. Projects expected to surpass the

[561] 40 CFR § 1508.13 (1970); US EPA, "No Significant Impact", *supra* note 444.

nationally set standard for GHG emissions would not be able to be approved with an exemption unless an exemption report was completed. This would allow for the preservation of the integrity of the EA process, while also increasing its transparency.

Some degree of flexibility is essential when dealing with EA. The CBD specifically states that flexibility is particularly important in the screening phase of the EA process, and that this flexibility must be used in *combination* with expert judgment.[562] The measures recommended here would allow for the protection of the still needed flexibility in dealing with EA projects, but would additionally increase the accountability and transparency that are also needed in the current EA process. By imposing the filing of reports of no significant environmental effects and for exemption projects, the EA legislation will also help increase environmental protection. Indeed, by imposing another checkpoint for the development of projects before their approval, these additional provisions will help structure the discretionary power provided in EA legislation in Canada.

### 7.7 SYNTHESIS – GHG CONSIDERATIONS IN EA LEGISLATION

From the proposed recommendations, the ideal EA process would allow the federal government to set the tone in its EA legislation, with provincial EA legislation taking the matter even further and enabling the provinces to integrate their own GHG considerations. Clearer definitions and provisions that would directly refer to GHG considerations need to be included in the present EA legislation to allow for their consistent and more thorough integration. A threshold approach is recommended, where a mandatory climate EA process

[562] CBD, "*Guidelines on IA*", *supra* note 149, s 10(d).

would be triggered when projects estimate their GHG emissions to be above a predetermined standard. The climate EA would define the additional requirements necessary for assessment, before the EA process could be completed.

As with many legislative changes, a transitional approach is recommended. This would ensure that the various aspects of this integration are tailored and ready for this new EA process. As seen with the EU directive, transitional measures are proposed to ensure a proper and effective transition between the old EA process and the new EA process.[563]

[563] *Directive 2014/52/EU*, *supra* note 389, art (39).

## CHAPTER 8: CONCLUSION

Climate change is the greatest environmental issue of our time. It will have a variety of serious impacts throughout the world. Strong actions are needed to limit and reduce its projected impacts. These impacts are now considered as a certainty by the IPCC (in regards of the possibility of the projected impacts happening).[564] In fact, some impacts of climate change have already been observed throughout the world.[565] The IPCC reports that the effects of climate change: will be extensive; will affect the entire planet for hundreds of years; and will be irreversible.[566] International agreements were put in place over 20 years ago to help address the issue and, more recently, the Paris Agreement reiterated the importance of addressing climate change on the global front.

With climate change impacts already taking their toll on the world, the IPCC sounded the alarm with the release of a new report in 2018 urging jurisdictions from around the world to promptly act on climate change.[567] In this report, the IPCC reveals that the commitments made under the Paris Agreement are not enough to respect the 1.5°C target of the agreement.[568] Even with this alarming report, the IPCC expresses that there is still time to act, but that it will require immediate ambitious actions along with critical international

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[564] IPCC 2014, *supra* note 1 at 2-31.
[565] *Ibid*.
[566] IPCC 2014, *supra* note 1 at 2-31.
[567] IPCC, "Summary for Policymakers" in *Global warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* Valérie Masson-Delmotte, *et al*. eds., (Geneva, Switzerland: World Meteorological Organization) at SPM-21-22, SPM-24-25 [IPCC 2018].
[568] The 2015 Paris Agreement specifically states that the average global temperature increase should be limited to "well below 2°C", with efforts made to further limit the increase to 1.5°C. *Paris Agreement*, *supra* note 2, at Annex, art 2.1(a). IPCC 2018, *supra* note 567 at SPM-24-25.

cooperation.[569] Part of these actions includes the adoption of legislative measures fundamental to the consideration of climate change as legislative actions provide a means for jurisdictions to clarify and ensure conformity in their commitments to act on climate change.

For decades, EA has been used as a tool to help protect the environment and has long been recognized in international agreements as an important tool to help achieve GHG reduction targets set out by state members. Yet, very little legislation has actually integrated climate change and GHG emissions into their EA processes. Addressing climate change through this pre-existing mechanism has its challenges, but adopting legislation on the matter can provide the structure needed to help overcome them. More than ever, legislative integration is needed to meet the urgency to act on climate change. The more traditional approach, which relied on guidelines, directives and other similar documents, has thus far produced very limited results. Not only are legislative changes necessary to better reflect and clarify the integration of climate change and GHG emissions in the EA process, these changes are also urgently needed to limit the potential impacts of climate change of every new proposed project.[570] With the ratification of the Paris Agreement in October 2016 and the ongoing federal review process on EA, this appears to be the perfect opportunity to adopt legislative changes for the integration of GHG emissions in the EA process.

In Canada, both the federal and provincial governments have adopted legislation to structure the EA process within their jurisdictions. Although no provisions explicitly

[569] *Ibid* at SPM-30-31.
[570] Sok, Boruff & Morrison-Saunders, *supra* note 22 at 323.

prevented or prohibited the integration of GHG considerations, there was also no provisions specifically requiring their considerations. Manitoba is the only Canadian EA legislation that mentions climate change and GHG emissions, but it remains non-mandatory. As currently written, GHG considerations could be included in the EA process throughout Canada, but as these considerations are not currently a legally binding requirement for all EA projects, they can still be ignored or have been inadequately considered in the past.[571]

Even though TransCanada recently abandoned its Energy East project, the case study still revealed significant shortcomings in the federal EA legislation and its proposed interim approach. Climate change and GHG emissions were indeed considered in some parts of the application documents, but the EA documents concluded that climate change was not considered as a significant environmental effect in the Energy East project, even though certain phases of the project were not included and that the project was deemed to be a moderate GHG emitter.

Both the EU and the US have proposed ways to further integrate climate change considerations and GHG emissions into their EA legislation. *Directive 2014/52/EU* makes significant changes in the EA process, especially regarding climate change and GHG emissions. The recognition of climate change, GHGs, and their relation to significant environmental effects and cumulative effects. This shows how climate change considerations may be integrated in legislation. In the US, although the 2016 *NEPA* Final

[571] Philip H Byer & Julian Scott Yeomans. "Methods for addressing climate change uncertainties in project environmental impact assessments" (2007) 25:2 Impact Assessment & Project Appraisal 85 at 85.

Guidance has been withdrawn, it did recommend that both direct and indirect GHG emissions should be included in the EA process and also recognized that GHG emissions are to be included as cumulative effects, as climate change is a global issue. However, both jurisdictions failed to make these considerations mandatory as part of their EA process.

This research demonstrated the need for Canadian jurisdictions to further include GHG considerations into their legislation. To help address this, key recommendations were brought forward in this thesis.

Climate change and GHGs need to be clearly mentioned in the purpose clause and definition sections of EA legislation. These sections are the foundation of the legislation, setting the tone for its interpretation and application. It is also imperative to clearly and specifically acknowledge climate change as a potential significant environmental effect in legislation and in reference to GHGs.

A federally based threshold classification approach is recommended here. Using this approach, the federal government would set a GHG emissions standard in the EA process, which would then trigger a climate EA process for projects whose emissions exceed that level. A climate EA would be an integral part of the EA process, but would require additional information regarding climate change. It is recommended that the standard of 10 000 T of GHG emissions per year be used here, as it is the same rigorous threshold used in legislation for the mandatory reporting of GHG emissions by facilities. This would allow for the adoption of a harmonious approach across the country, while allowing provinces to

set their own, potentially more stringent, standards. Such an approach is recommended in order to respect the jurisdictional powers of each province, while providing a more unified EA process in regard to climate change. A legislatively set threshold approach would avoid, or at least minimize, the significant amount of subjectivity used in the current "General Guidance" document in place in Canada. The approach would help solidify the integration of GHG considerations into domestic EA legislation and processes throughout the country, resulting in a more consistent and thorough EA process.

All projects subject to an EA would need to assess its projected GHG emissions at the earliest possible stage of the EA process. These calculations should include both direct and indirect GHG emissions. When triggered, a climate EA would be required and would include: the assessment of all projected GHG emissions; the identification of mitigation measures; the use of comparables; and, the regular submission of monitoring reports. To further reinforce these proposed changes, an exemption report is also recommended (detailing why a project has been exempted from any part of the EA process), as well as a report of no significant environmental impact (for all projects reporting the absence of significant environmental effects in their activities).

As climate change action is urgently needed, regulatory powers could be used to implement these legislative changes rapidly. This would allow to add structure to the current EA process, while maintaining the flexibility that is still needed in the process. Legislative integration has the merit of clarifying the integration of climate change in the EA process, while also ensuring that all EA projects consider GHG emissions in their assessments.

Further incentives and enforcement measures might become necessary to ensure consistent and accurate GHG emissions calculations in the EA process. These steps could include mandatory mitigation measures for projects underestimating their GHG emissions. However, the legislative changes proposed in this thesis should provide the adequate structure and incentives needed to ensure a consistent and accurate calculation of GHG emissions in the EA process.

For now, the integration of climate change considerations mentioned in this thesis focuses on the calculation and mitigation of GHG emissions. This is only a starting point for climate change integration. Climate change considerations will eventually need to involve different factors, such as considerations related to adaptation. In the near future, all projects will need to assess their impact on climate change and the impact of climate change on their projects. This should gradually become the norm in all EA processes across the country and should eventually be reflected in the appropriate EA legislation.

The importance of integrating adaptation measures in the EA process has already been recognized and recommended by the CBD. Indeed, the CBD recommends an approach that identifies sensible areas where an EA is required and predefines threshold values to thereafter determine the type of EA needed, according to each specific project.[572] This trigger-based approach follows the trigger-based approach recommended here for GHG emissions and would be a logical next step in furthering the integration of climate change considerations in the EA process in regard to adaptation. This type of classification system

[572] For example, an EA would be mandatory for proposed project in specific areas, such as protected areas, important ecological corridors or habitat of threatened species. *Ibid*, s 11-13, Appendix 1.

is already used in Quebec, where certain activities and certain location of projects are included in the list of activities subject to an EA.[573] In that province, climate change factors related to adaptation measures seem to underlie this classification system. For example, activities within the two-year flood line or related to any watercourses (which could be described as climate-sensitive areas) could be included in the activities subject to an EA.[574] This type of classification allows for the consideration of more factors in deciding whether a project will be subject to an EA, resulting in a more comprehensive EA process. In addition to triggers based on location (such as those used in Quebec), it is recommended that projects with an expected lifetime span of more than 10 years would also automatically trigger the requirement to complete a climate EA as part of their EA processes. If either of those thresholds is triggered, adaptation measures would have to be considered as part of the EA process. Using a trigger-based approach to instigate the integration of adaptation measures would allow a greater and more effective integration of these measures in projects that are deemed to be more susceptible to climate change impacts. As for the approach proposed on the mitigation side, projects deemed to be more climate-friendly would also follow a streamlined EA process.[575]

Various methods are available to assess the GHG emissions of a proposed project and these should be examined. In all cases, GHG calculations should always be done in the context of the current provincial and federal GHG emissions, but also according to the GHG

[573] See for example hydroelectric generating station or fossil fuel-fired generating station (*RREIAR QC*, *supra* note 261 s 2(*l*)) and metal producing mills (*Ibid*, s 2(*n*.3)).
[574] See for example hydroelectric generating station or fossil fuel-fired generating station (*RREIAR QC*, *supra* note 261 s 2(*l*)) and metal producing mills (*Ibid*, s 2(*n*.3)).
[575] When no adaptation (or mitigation) thresholds would be triggered, the EA process would be streamlined and would not require a climate EA.

reduction plans and commitments of the jurisdictions of the proposed project. This thesis recommends that GHG calculations use the direct and indirect emissions of a project, but calculations using GHG intensity could be another possible option for GHG considerations in the EA process. "Emissions intensity is the level of GHG emissions per unit of economic activity, usually measured at the national level as GDP."[576] This approach would provide decision-makers with GHG intensity measurements, according to the unit of economic activity preferred in their jurisdiction. A GHG intensity-based approach would allow decision-makers to have further information on the context of proposed projects and their projected GHG emissions. This could allow decision-makers to favour projects that are more compatible with the legislation and policies of their own jurisdiction. For example, when faced between two projects releasing the same total GHG emissions, the decision-maker could use GHG intensity numbers to favour the project that allows for the greater employment opportunities for the jurisdiction. However, GHG intensity measurements must always be used in combination with the total GHG emissions, as a decrease in GHG intensity does not always result in an absolute GHG emissions reduction. Declines in emissions intensity have been noted in several countries, but since they were also accompanied by an increase in their GDP, this resulted in an increase in absolute GHG emissions.[577]

Another interesting possibility would be to implement GHG sectoral threshold. This would essentially serve as a classification system for GHG emissions, where projects that

[576] Kevin A Baumert, Timothy Herzog & Jonathan Pershing, *Navigating the Numbers – Greenhouse Gas Data and International Climate Policy* (Washington, DC: World Resources Institute, 2010), at 25.
[577] *Ibid* at 27.

generally emit more GHGs would have a more stringent threshold than other sectors (for example: coal-fired energy production plants versus wind energy farms). As both climate change mitigation and adaptation considerations would be included in the EA process in the future, such a measure would also be applicable for adaptation measures, where projects proposed for climate-sensitive areas (such as floodplains or coastal areas) could have more rigorous EA requirements.

Above all, it is essential to remember that climate change and GHG emissions are not the only factors to consider in the scope of an EA. "[A] project's adherence to emissions thresholds is only one part of the EA. Other environmental effects, such as water quality or the capacity of renewable resources to be affected by the project must still be examined."[578] The streamlined EA process proposed here does not exempt projects from other EA requirements.

The latest IPCC report is unequivocal: global and immediate action on climate change is needed. As the eleventh hour approaches, clear and strong legislative actions are needed, in Canada and throughout the world. Past EA legislation has proved to be too broad and has led to inadequate or simply non-existent climate change and GHG considerations. Ensuring that climate change and GHG emissions are indeed included and integrated in future EAs is an important step to help address this issue. The recommendations proposed in this thesis provide the much-needed legal structure to guide this integration, while still allowing a certain degree of flexibility that is needed when dealing with EAs and climate

[578] Kruger, *supra* note 255 at 176.

change. Even further integration will most likely be needed and as science evolves, regular updates will be necessary to ensure proper integration and consideration.

## BIBLIOGRAPHY

### LEGISLATION: CANADA

#### Federal

Bill C-69, *An Act to enact the Impact Assessment Act and the Canadian Energy Regulator Act, to amend the Navigation Protection Act and to make consequential amendments to other Acts*, 1st Sess, 42th Parl, 2018 (first reading 8 February 2018).

*Canadian Environmental Assessment Act, 2012*, SC 2012, c 19.

*Canadian Environmental Protection Act, 1999*, SC 1999, c 33.

#### Provincial: Alberta

*Environmental Assessment (Mandatory and Exempted Activities) Regulation*, Alta Reg 111/1993.

*Environmental Protection and Enhancement Act*, RSA 2000, c E-12.

*Specified Gas Reporting Regulation*, Alta Reg 251/2004.

#### Provincial: British Columbia

*Environmental Assessment Act*, SBC 2002, c 43.

*Reviewable Projects Regulation*, BC Reg 370/2002.

#### Provincial: Manitoba

*Classes of Development Regulation*, Man Reg 164/88.

*The Environment Act*, CCSM c E125.

#### Provincial: New Brunswick

*Clean Environment Act*, RSNB 1973, c C-6.

*Environmental Impact Assessment Regulation*, NB Reg 87-83.

#### Provincial: Newfoundland and Labrador

*Environmental Assessment Regulations, 2003*, NLR 54/03.

*Environmental Protection Act*, SNL 2002, C E-14.2.

#### Provincial: Nova Scotia

*Environment Act*, SNS 1994-95, c 1.

*Environmental Assessment Regulations*, NS Reg 26/95.

*Quantifications, Reporting and Verification of Greenhouse Gas Emissions*, NS Reg 29/2018.

**Provincial: Ontario**

*Environmental Assessment Act*, RSO 1990, c E.18.

*Environmental Protection Act*, RSO 1990, c E.19.

*General*, RRO 1990, Reg 334.

*Prescribed Information for the Description of a Designated Project Regulations*, SOR/2012-148.

*Quantification, Reporting and Verification of Greenhouse Gas Emissions*, O Reg 143/16.

*Regulations Designating Physical Activities*, SOR/2012-147.

**Provincial: Prince Edward Island**

*Environmental Protection Act*, RSPEI 1988, c E-9.

**Provincial: Quebec**

*Environmental Quality Act*, C Q-2.

*Regulation respecting environmental impact assessment and review*, CQLR c Q-2, r 23.

*Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere*, CQLR c Q-2, r 15.

**Provincial: Saskatchewan**

*The Environmental Assessment Act*, SS 1979-80, c E-10.1.

## LEGISLATION: EUROPE

Directives EC, *Commission Directive 2014/52/EU of 16 April 2014 amending Directive 20011/92/EU on the assessment of the effects of certain public and private projects on the environment*, [2014] OJ, L 124/1.

## LEGISLATION: UNITED STATES

*National Environmental Policy Act of 1969*, 42 USC § 4321 (1969).

40 CFR § 1508.13 (1970).

40 CFR § 1501.4(e) (1970).

## INTERNATIONAL AGREEMENTS

*Convention on Biological Diversity*, 5 June 1992, 1760 UNTS 79 (entered into force 29 December 1993).

*Kyoto Protocol to the United Nations Framework Convention on Climate Change*, 11 December 1997, 2303 UNTS 162, 37 I.L.M. 22 (1998) (entered into force 16 February 2005).

*Paris Agreement*, 4 November 2016, UN Doc 2015/10/Add.1.

UNEP CBD 2006, 8th Mtg, UN Dec VIII/28.

UNEP CBD 2006, 8th Mtg, UN Mtg Doc VIII/27/ADD.2, Annex II.

*United Nations Framework Convention on Climate Change*, 9 May 1992, 1771 UNTS 107 (entered into force 21 March 1994).

*Vienna Convention on the Law of Treaties*, 23 May 1969, 1155 UNTS 18232 (entered into force 27 January 1980).

**JURISPRUDENCE: CANADA**

*114958 Canada Ltée (Spraytech, Société d'arrosage) v Hudson (Town)* 2001 SCC 40, [2001] 2 SCR 241.

*Hollinger Farms No. 1 Inc. v Ontario (Minister of Environment)* (2007), 29 OAC 303 (Div Ct), 2007 CanLII 40545 (ON SCDC).

**JURISPRUDENCE: FOREIGN**

*Center for Biological Diversity v National Highway Traffic Safety Administration*, 538 F (3d) 1172 (9th Cir 2008).

**SECONDARY MATERIAL: MONOGRAPHS**

Aust, Anthony. *Handbook of International Law* (New York: Cambridge University Press, 2005).

Benidickson, Jaime. *Environmental Law*, 4th ed (Toronto: Irwin Law, 2013).

Bush, Elizabeth J *et al*. "Chapter 2: An Overview of Canada's Changing Climate " in Fiona J Warren & Donald S Lemmen, eds, *Canada in a Changing Climate: Sector Perspectives on Impacts and Adaptation* (Ottawa, ON: Government of Canada, 2014) 25.

Crossman, Tony. "British Columbia Climate Change Law and Policy" in Dennis Mahony, ed, *The Law of Climate Change in Canada, 2015 Student Edition* (Toronto, Canada: Canada Law Book, 2014) 5-1.

Cryer, Robert, *et al*. *Research Methodologies in EU and International Law* (Portland, OR: Hart Publishing, 2011).

Doelle, Meinhard. *The Federal Environmental Assessment Process: A Guide and Critique* (Canada: LexisNexis Canada Inc, 2008).

Foreman, Sean *et al*. "Atlantic Provinces Climate Change Law and Policy" in Dennis Mahony, ed, *The Law of Climate Change in Canada, 2015 Student Edition* (Toronto, Canada: Canada Law Book, 2014) 11-1.

Grant, John P. *International Law*, (Dundee: Edinburg University Press, 2010).

Holder, Jane. "The prospects for ecological impact assessment" in Jane Holder & Donald McGillivery eds, *Taking Stock of Environmental Assessment – Law, policy and practice* (New York: Routledge-Cavendish, 2007) 259.

Laskin, John B. "Climate Change and the Canadian Constitution" in Dennis Mahony, ed, *The Law of Climate Change in Canada, 2015 Student Edition* (Toronto, Canada: Canada Law Book, 2014) 3-1.

Mahony, Dennis. "Federal Climate Change Law and Policy" in Dennis Mahony, ed, *The Law of Climate Change in Canada, 2015 Student Edition* (Toronto, Canada: Canada Law Book, 2014) 4-1.

———. "Ontario Climate Change Law and Policy" in Dennis Mahony, ed, *The Law of Climate Change in Canada, 2015 Student Edition* (Toronto, Canada: Canada Law Book, 2014) 9-1.

———. "Overview" in Dennis Mahony, ed, *The Law of Climate Change in Canada, 2015 Student Edition* (Toronto, Canada: Canada Law Book, 2014) 1-1.

Meadow, Teresa. "Alberta Climate Change Law and Policy" in Dennis Mahony, ed, *The Law of Climate Change in Canada, 2015 Student Edition* (Toronto, Canada: Canada Law Book, 2014) 6-1.

McConville, Michael & Wing Hong Chui. *Research Methods for Law* (Edinburgh: Edinburgh University Press, 2007).

Peel, Jacqueline. "Environmental impact assessments and climate change", in Daniel A Farber & Marjan Peeters, eds, *Elgar Encyclopedia of Environmental Law: Volume 1 – Climate Change Law* (Edward Elgar Publishing: Massachusetts, 2016) 348.

Poirier, Donald & Anne-Françoise Debruch. *Introduction générale à la common law*, 3rd ed (Cowansville, Que: Yvon Blais, 2005).

Stefaniuk, John D. "Manitoba Climate Change Law and Policy" in Dennis Mahony, ed, *The Law of Climate Change in Canada, 2015 Student Edition* (Toronto, Canada: Canada Law Book, 2014) 8-1.

Weiland, Paul Robert Horton & Erik Beck. "Environmental Impact Review" in Michael B Gerrard & Jody Freemen, eds, *Global Climate Change and U.S. Law*, 2nd ed (USA: American Bar Association, 2014) 153.

**SECONDARY MATERIAL: ARTICLES**

Arabadjieva, Kalina. "'Better Regulation' in Environmental Impact Assessment: The Amended EIA Directive" (2016) 28 J Envtl Law 159.

Birnbaum, Robert. "Policy Scholars are from Venus ; Policy Makers are from Mars" (2000) 23.2 *The Review of Higher Education* 119.

Bodansky, Daniel. "The Legal Character of the Paris Agreement" (2016) 25:2 RECIEL 142.

Bodle, Ralph, Lena Donat & Matthias Duwe. “The Paris Agreement: Analysis, Assessment and Outlook” (2016) 10:1 Carbon & Climate L Rev 5.

Bowden, M-A. “Environmental Assessment Reform in Saskatchewan: Taking Care of Business” (2010) 21 J Env L & Prac 261.

Brennan, Neil J. "Impediments to Environmental Quality and New Brunswick’s Clean Environment Act: An Argument for a New Statute" (1997) 7 J Env L & Prac 93.

Burger, Michael & Jessica Wentz. “Downstream and Upstream Greenhouse Gas Emissions: The Proper Scope of NEPA Review” (2017) 41 Harvard Envtal LR 109.

Byer, Philip H & Julian Scott Yeomans. “Methods for addressing climate change uncertainties in project environmental impact assessments” (2007) 25:2 Impact Assessment & Project Appraisal 85.

Craig, Robin Kundis. ““Stationarity is dead” – Long live transformation: five principles for climate change adaptation law” (2010) 34 Harv Envtl L Rev 9.

Craik, Neil. “Transboundary Environmental Assessment in Canada: International and Constitutional Dimensions” (2010) 21 J Env L & Prac 107 at 14.

Gerrard, Michael B. “Climate Change and the Environmental Impact Review Process” (2008) 22:3 Natural Resources & Environment 20.

Herder, Matthew. “Demythologizing PHOSITA: Applying the Non-Obviousness Requirement Under Canadian Patent Law to Keep Knowledge in the Public Domain and Foster Innovation” (2009) 47 Osgood Hall LJ 695.

Hickey, Gordon M, Nicolas Brunet & Nadège Allan. "A Constant Comparison of the Environmental Assessment Legislation in Canada" (2010) 12:3 J Environmental Policy & Planning 315.

Jiricka, Alexandra *et al*. "Consideration of climate change impacts and adaptation in EIA practice – Perspectives of actors in Austria and Germany" (2016) 57 Envtl Impact Assessment Rev 78.

Greig, Lorne A & Peter N Duinker. “A proposal for further strengthening science in environmental impact assessment in Canada” (2011) 29:2 Impact Assessment and Project Appraisal 159.

Haddock, Mark. “Current Issues in Environmental Assessment in British Columbia” (2010) 21 J Env L & Prac 221.

Kruger, Toby. “The *Canadian Environmental Assessment Act* and Global Climate Change: Rethinking Significance” (2009) 47 Alta L R 161.

Lindgren, Richard D & Burgandy Dunn. "Environmental Assessment in Ontario: Rhetoric vs. Reality" (2010) 21 J Env L & Prac 279.

Mayer, Christoph. "Directive 2014/52/EU: Big Step Forward or Merely Minimum Consensus? – An Attempt to Evaluate the New EU-Regulations in the Assessment of the Effects of Certain Public and Private Projects on the Environment" (2016) I:1 Law Rev 97.

McGlade, Christopher & Paul Ekins. "The geographical distribution of fossil fuels unused when limiting global warming to 2°C" (2015) 517 Nature 187.

Ohsawa, Takafumi & Peter Duinker. "Climate-change mitigation in Canadian environmental impact assessments" (2014) 32:3 Impact Assessment & Project Appraisal 222.

Olszynski, Martin ZP. "Environmental Assessment as Planning and Disclosure Tool: *Greenpeace Canada v. Canada (A.G.)*" (2015) Dal LJ 207.

Owen, D. "Climate Change and Environmental Assessment Law" (2008), 33 Colum J Envtl L 57.

Pardy, Bruce. *Environmental Assessment and Three Ways Not to Do Environmental Law*, (2010) 21 JELP 139.

Jacqueline Peel, Hari Osofsky & Anita Foerster. "Shaping the 'Next Generation' of Climate Change Litigation in Australia" (2017) 41:2 *Melbourne University L Rev* 793.

Powell, Brenda Heelan. "The Difference a Year Makes: Changes to Canadian Federal Environmental Assessment Law in 2012" (2012-2013) 37 LawNow 24.

Rajamani, Lavanya. "The 2015 Paris Agreement: Interplay Between Hard, Soft and Non-Obligations" (2016) 28 J Envtl L 337.

Sinclair, A J, M Doelle & R B Gibson. "Implementing next generation assessment :A case example of a global challenge" (2018) 72 Envtl Impact Assessment Rev 166.

Sinclair, A John, Meinhard Doelle & Peter Duinker. "Looking Up, Down, and Sideways: Reconceiving Cumulative Effects Assessment as a Mindset" (2017) 62 *Environmental Impact Assessment Review* 183.

Sok, Vonk, Bryan J Boruff & Angus Morrison-Saunders. "Addressing climate change through environmental impact assessment: international perspectives from a survey of IAIA members" (2011) 29:4 Impact Assessment and Project Appraisal 317.

Sossin, Lorne & Charles W Smith. "Hard Choices and Soft Law: Ethical Codes, Policy Guidelines and the Role of the Courts in Regulating Government" (2002-2003) 40 Alta L Rev 867.

Sullivan, Ruth. "Statutory Interpretation in a New Nutshell" (2003) 82 Can B Rev 51.

Wentz, Jessica. "Draft NEPA Guidance Requires Agencies to Consider Both GHG Emissions and the Impacts of Climate Change on Proposed Actions" (2015) 26:4 Environmental L in New York 57.

## OTHER MATERIALS

Burger, Michael & Jessica Wentz. "CEQ Issues Finale Guidance on Climate Change and NEPA with Two Key Changes from 2014 Draft" (3 August 2016), *Sabin Center for Climate Change Law – Climate Law Blog* (blog), online: <http://blogs.law.columbia.edu/climatechange/2016/08/03/ceq-issues-final-guidance-on-climate-change-and-nepa-with-two-key-changes-from-2014-draft/>.

Byer, Philip *et al*. *Climate Change in Impact Assessment: International Best Practice Principles. Special Publication Series No 8*. (Fargo, USA: 2012, International Association for Impact Assessment).

Conservation Council of New Brunswick. "Environmental Impact Assessment in New Brunswick – The Need for Reform", Position paper (2004).

Delach, Aimee *et al*. *Reasonably Foreseeable Futures: Climate Change, Adaptation and the National Environmental Policy Act*, Defenders of Wildlife (Washington, DC: Defenders of Wildlife, 2013) online: <http://www.defenders.org/publication/reasonably-foreseeable-futures-climate-change-adaptation-and-national-environmental>.

Johnston, Anna. "Executive Summary" (Summary of the *Federal Environmental Assessment Reform Summit* prepared by West Coast Environmental Law, August 2016).

Noble, Bram. "Cumulative Environmental Effects and the Tyranny of Small Decisions: Towards Meaningful Cumulative Effects Assessment and Management" (2010) Natural Resources and Environmental Studies Institute Occasional Paper No 8, University of Northern British Columbia, Prince George, BC, Canada, online at: <http://wizard.unbc.ca/record=b1907145~S3*eng>.

Rodgers, Caroline (Ontario Centre for Climate Impacts and Adaptation Resources). "Incorporating Climate Change into Decision-Making Processes" (Presentation delivered at the Ontario Association for Impact Assessment, Toronto, 24 October 2013) [unpublished] (online: <http://www.oaia.on.ca/2013conf/presentations/06a-RODGERS.pdf>).

Sabin Center for Climate Change Law. "Climate Deregulation Tracker", Columbia Law School, Columbia University, online: <http://columbiaclimatelaw.com/resources/climate-deregulation-tracker/>.

Wentz, Jessica. *Assessing the Impacts of Climate Change on the Built Environment under NEPA and State EIA Laws: A Survey of Current Practices and Recommendations for Model Protocols*, Sabin Center for Climate Change Law (New York: Columbia Law School, 2015), online: <http://columbiaclimatelaw.com/program-areas/environmental-assessment/eia-protocols/>.

**Dictionary**

*Merriam-Webster*, 2017, online at: <http://www.merriam-webster.com/dictionary/>, *sub verbo* "significant".

*Merriam-Webster*, 2017, online at: <http://www.merriam-webster.com/dictionary/>, *sub verbo* "substantial".

**Energy East Documents**

Energy East Pipeline Ltd., "Supplemental Application to Participate Process: Notification of Application to Participate in National Energy Board Hearing – Energy East Pipeline"

(31 March 2016), online: <http://www.ceaa.gc.ca/050/documents-eng.cfm?evaluation=80073>.

Energy East Pipeline Ltd., "Volume 1: Consolidated Project and Asset Transfer Applications" in *Energy East Project Consolidated Application* (Calgary, Alberta: TransCanada, May 2016) i.

Energy East Pipeline Ltd., "Volume 11: Environmental and Socio-Economic Overview" in *Energy East Project Consolidated Application* (Calgary, Alberta: TransCanada, May 2016).

Energy East Pipeline Ltd., "Volume 14: Project and Assessment Overview" in *Energy East Project Consolidated Application Environmental and Socio-Economic Assessment,* (Calgary, Alberta: TransCanada, May 2016).

Energy East Pipeline Ltd., "Volume 20: Assessment Summary and Conclusions" in *Energy East Project Consolidated Application Environmental and Socio-Economic Assessment* (Calgary, Alberta: TransCanada, May 2016).

Energy East Pipeline Ltd., "Volume 21: Environmental Protection Plan – New Pipeline" in *Energy East Project Consolidated Application Environmental and Socio-Economic Assessment* (Calgary, Alberta: TransCanada, May 2016).

Energy East Pipeline Ltd., "Volume 22: Greenhouse Gas Technical Data Report" in *Energy East Project Consolidated Application Environmental and Socio-Economic Assessment* (Calgary, Alberta: TransCanada, May 2016).

**Government Documents: Canada**

Canada, Environnement et Changement climatique Canada, "Méthodologie provisoire pour estimer les émissions de GES en amont", by Helen Ryan (17 March 2016), online: <http://www.bape.gouv.qc.ca/sections/mandats/oleoduc_energie-est/documents/GES2.pdf>.

Canada, Expert Panel – Review of Environmental Assessment Processes, *Building Common Ground: A New Vision for Impact Assessment in Canada – The Final Report of the Expert Panel for the Review of Environmental Assessment Processes* (Ottawa: Canadian Environmental Assessment Agency, 2017).

Canada, National Energy Board, "2014-10-30 – Application for Energy East, Asset Transfer and Eastern Mainline (OH-002-2016)", Regulatory Documents, online: <https://apps.neb-one.gc.ca/REGDOCS/Item/View/2540913>.

Canadian Environmental Assessment Agency, "Basics of Environmental Assessment" (25 March 2015), online: <http://www.ceaa.gc.ca/default.asp?lang=en&n=B053F859-1>.

Canadian Environmental Assessment Agency, "Energy East Project" (10 October 2017), online: <http://www.ceaa.gc.ca/050/details-eng.cfm?evaluation=80073>.

Carver, Deborah, *et al.* "Inter- jurisdictional coordination of EA: Challenges and opportunities arising from differences among provincial and territorial assessment requirements and processes", A commissioned report prepared for the Canadian Environmental Assessment Agency through the Environmental Planning and

Assessment Caucus (20 November 2010), available online at: <http://rcen.ca/caucus/environmental-planning-and-assessment/resources>.

Department of Environment and Climate Change, *Canada Gazette*, "Estimating upstream GHG emissions" (19 March 2016) 150:12, online: <http://www.gazette.gc.ca/rp-pr/p1/2016/2016-03-19/html/notice-avis-eng.php#nl4>.

Environment and Climate Change Canada, Statement, "Minister of Environment and Climate Change marks Canada's Ratification of the Paris Agreement" (5 October 2016), online: <https://www.canada.ca/en/environment-climate-change/news/2016/10/minister-environment-climate-change-marks-canada-ratification-paris-agreement.html>.

Federal-Provincial-Territorial Committee on Climate Change and Environmental Assessment, *Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners*, November 2003, online: <https://www.canada.ca/en/environmental-assessment-agency/services/policy-guidance/incorporating-climate-change-considerations-environmental-assessment-general-guidance-practitioners.html>.

Government of Canada, Backgrounder, "Interim Measures for Pipeline Reviews" (27 January 2017), online: <https://www.canada.ca/en/natural-resources-canada/news/2016/01/interim-measures-for-pipeline-reviews.html>.

Government of Canada, "Better rules to protect Canada's environment and grow the economy" (18 April 2018), online: <https://www.canada.ca/en/services/environment/conservation/assessments/environmental-reviews.html>.

Government of Canada, "Energy East and Eastern Mainline – Have your Say!" (5 April 2017), online: <https://www.nebenergyeast.ca> .

Government of Canada, *Environmental and Regulatory Reviews – Discussion Paper*, June 2017, online: <https://www.canada.ca/en/services/environment/conservation/assessments/environmental-reviews/share-your-views/proposed-approach/discussion-paper.html>.

Government of Canada, "Environmental and Regulatory Reviews: Proposed Approach" (29 August 2017), online: <https://www.canada.ca/en/services/environment/conservation/assessments/environmental-reviews/share-your-views/proposed-approach.html>.

Government of Canada, "Review of Environmental and Regulatory Processes: What We've Done and Where We're Going" (29 September 2017), online: <https://www.canada.ca/en/services/environment/conservation/assessments/environmental-reviews/environmental-assessment-processes/whatwehavedone-wherewearegoing.html>.

Government of Canada, Backgrounder, "Pricing carbon pollution in Canada: how it will work" (21 June 2017), online: <https://www.canada.ca/en/environment-climate-change/news/2017/05/pricing_carbon_pollutionincanadahowitwillwork.html>.

Government of Canada – National Energy Board, "Application for the energy East Project and Asset Transfer" (17 May 2016), online: <https://apps.neb-one.gc.ca/REGDOCS/Item/View/2995824>.

Government of Canada – National Energy Board, "Energy East Project", (22 November 2017) online: <http://www.neb-one.gc.ca/pplctnflng/mjrpp/nrgyst/index-eng.html>.

Government of Canada – National Energy Board, "National Energy Board starts the clock on Energy East Pipeline Project" News Release (16 June 2016), online: <https://www.canada.ca/en/national-energy-board/news/2016/06/national-energy-board-starts-the-clock-on-energy-east-pipeline-project.html>.

Government of Canada – National Energy Board, "Ruling No. 1 – Consequences of the Energy East Hearing panel's recusal and how to recommence the Energy East Hearing" (27 January 2017), online: <https://apps.neb-one.gc.ca/REGDOCS/Item/View/3179115>.

Government of Canada – National Energy Board, "The NEB'S Lifecycle Approach to Protecting the Environment" (21 June 2017) online: <http://www.neb-one.gc.ca/sftnvrnmnt/nvrnmnt/lfcclpprch/index-eng.html#s2>.

Government of Canada – National Defense, "Energy East Hearing to restart from the beginning" News Release (27 January 2017), online: <https://www.canada.ca/en/national-energy-board/news/2017/01/energy-east-hearing-restart-beginning.html>.

Government of Canada, News Release, "Government of Canada Announces Pan- Canadian Pricing on Carbon Pollution" (3 October 2016), online: <https://www.canada.ca/en/environment-climate-change/news/2016/10/government-canada-announces-canadian-pricing-carbon-pollution.html>.

Government of Canada, Statement, "Government of Canada Moves to Restore Trust in Environmental Assessment" (27 January 2016), online: <https://www.canada.ca/en/natural-resources-canada/news/2016/01/government-of-canada-moves-to-restore-trust-in-environmental-assessment.html?=undefined&wbdisable=true>.

Indigenous and Northern Affairs Canada, "Environmental assessments in Canada's North" (2016), online at: <http://www.aadnc-aandc.gc.ca/eng/1466431262580/1466431344459>.

National Energy Board – Government of Canada, "Memorandum of Understanding between Environment and Climate Change Canada and the National Energy Board for the Establishment of a Public Engagement Process for the Assessment of Upstream Greenhouse Gas Emissions related to the Energy East Project (MOU)" (1 December 2016), online: <https://www.neb-one.gc.ca/bts/ctrg/mmrndm/2016nvrnmntclmtchngcnd-eng.html>.

O'Gorman, Dean Stinson (Canadian Environmental Assessment Agency). "Integrating Climate Change and Environmental Assessment: Canadian Experiences" (Presentation delivered at the IAIA Special Symposium on Climate Change and Impact Assessment,

at the World Bank, Washington, DC, 15 November 2010), online: <http://conferences.iaia.org/washingtonDC2010/proceedings.html>.

Privy Council Office – Government of Canada, "Guide to Making Federal Acts and Regulations: Part 3 – Making Regulations" (2 December 2009), online: <http://www.pco-bcp.gc.ca/index.asp?lang=eng&page=information&sub=publications&doc=legislation/part3-eng.htm>.

**Government Documents: Provincial**

Alberta Government, *Specified Gas Reporting Standard – Specified Gas Reporting Regulation*, version 9.0, 12 March 2018 (Alberta: Government of Alberta, 2018).

Manitoba, Manitoba Law Reform Commission, *Discussion Paper: Manitoba's Environmental Assessment and Licensing Regime* (Winnipeg, Manitoba: The Manitoba Law Reform Commission, January 2014).

Nova Scotia, Environment, "Guide to Considering Climate Change in Environmental Assessments in Nova Scotia", February 2011 online: <https://novascotia.ca/nse/ea/pubs.asp>.

Quebec, *Rapport du comité sur la modernisation de la procédure d'évaluation et d'examen des impacts sur l'environnement et du processus de participation publique* (Quebec: 12 December 2014).

**Government Documents: US**

US, Council on Environmental Quality, *Final Guidance on Greenhouse Gases and Climate Change*, (Washington, DC: Executive Office of the President, 2016).

US, Council on Environmental Quality, *Revised Draft Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Reviews*, 29:247 Fed Reg, (24 December 2014).

US Environmental Protection Agency, *Environmental Assessment/Finding of No Significant Impact* in "National Environmental Policy Act Review Process" (2017), online: <https://www.epa.gov/nepa/national-environmental-policy-act-review-process#ea>.

US, Office of the Federal Register, *Withdrawal of Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews* Notice by the Council on Environmental Quality (5 April 2017) online at: <https://www.federalregister.gov/documents/2017/04/05/2017-06770/withdrawal-of-final-guidance-for-federal-departments-and-agencies-on-consideration-of-greenhouse-gas>.

**International Materials**


Baumert, Kevin A, Timothy Herzog & Jonathan Pershing. *Navigating the Numbers – Greenhouse Gas Data and International Climate Policy* (Washington, DC: World Resources Institute, 2010).

International Finance Corporation, *Good Practice Handbook: Cumulative Impact Assessment and Management Guidance for the Private Sector in Emerging Markets* World Bank Group Working Paper No 86492 (2013).

IPCC, *Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, Rajendra K Pachauri & Andy Reisinger, eds (Geneva, Switzerland: IPCC, 2007).

IPCC, *Climate change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, Rajendra K Pachauri & Leo Meyer, eds. (Geneva, Switzerland: IPCC, 2014).

IPCC, "Summary for Policymakers" in *Global warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* Valérie Masson-Delmotte, et al. eds., (Geneva, Switzerland: World Meteorological Organization).

OECD, Environment Directorate, *Incorporating climate change impacts and adaptation in Environmental Impact Assessments: Opportunities and Challenges* Environmental Working Paper No 24, ENV/WKP (2010) 10 (2010).

UN Environment – Convention on Biological Diversity, "Impact Assessment - Background", online at: <https://www.cbd.int/impact/background.shtml>.

———. "Introduction", online: <https://www.cbd.int/intro/default.shtml>.

———. "List of Parties", online: <https://www.cbd.int/information/parties.shtml>.

———."The Convention", online: <https://www.cbd.int/convention/>.

United Nations, "Convention on Biodiversity", online at: <http://www.un.org/en/events/biodiversityday/convention.shtml>.

United Nations Framework Convention on Climate Change, "Paris Agreement – Status of Ratification", accessed on 18 April 2018, online: <https://unfccc.int/process/the-paris-agreement/status-of-ratification>.

UNFCCC, "Status of Ratification of the Convention", online: <http://unfccc.int/essential_background/convention/status_of_ratification/items/2631.php>.

UN Secretariat of the Convention on Biological Diversity & Netherlands Commission for Environmental Assessment, *Biodiversity in Impact Assessment, Background Document to CBD Decision VIII/28: Voluntary Guidelines on Biodiversity-Inclusive Impact Assessment* (Montreal, Canada: 2006).

**Media**

Bell, Jillian. "Energy East pipeline: What you need to know – Here's why emotions are running so high on both sides of the debate", *CBC News* (26 January 2016) online: <http://www.cbc.ca/news/canada/energy-east-pipeline-explained-1.3420595>.

Lewis, Jeff & Shawn McCarthy. "TransCanada asks NEB to halt federal review of Energy East pipeline", *The Globe and Mail* (7 September 2017) online: <https://beta.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/transcanada-seeks-halt-to-federal-review-of-energy-east-pipeline/article36204721/?ref=http://www.theglobeandmail.com&>.

Randall, Tom. "Wind and Solar Are Crushing Fossil Fuels – Record clean energy investment outpaces gas and coal 2 to 1" *Bloomberg* (6 April 2016), online: <https://www.bloomberg.com/news/articles/2016-04-06/wind-and-solar-are-crushing-fossil-fuels>.

**APPENDIX 1 – TABLE 3: ENERGY EAST KEYWORD RESEARCH**

**Table 3: Energy East Keywords Research**

| | VOLUME 1: APPLICATION AND PROJECT OVERVIEW |
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| Key words identified | GHG; emissions; climate change. |
| Discussion on CC | "2.14.1 ASSESSMENT OF PROJECT EFFECTS AND DETERMINATION OF SIGNIFICANCE<br>…<br>The ESA also concludes that the Project could potentially have significant adverse cumulative effects on:<br>…<br>□ greenhouse gas emissions – the Project contributes to a pre-existing significant adverse effect of GHG emissions on climate change. The Project contribution on its own is small in the global context.<br>Energy East accepts the findings of the ESA to-date, and will adhere to the recommendations and mitigation measures ultimately identified in the ESA, including the EPPs for the Project." |
| Discussion on mitigation action | |
| Discussion on adaptation (project and environment) | |

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| Recommendations on mitigation/adaptation | "Energy East accepts the findings of the ESA to-date, and will adhere to the recommendations and mitigation measures ultimately identified in the ESA, including the EPPs for the Project." |
| Finale decision influenced by cc considerations | |
| QUESTIONS! | |
| Comments and Observations | |

| | VOLUME 5: CONVERSION DESIGN – SECTION 2 (PIPELINE CONDITION ASSESSMENT) |
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| Key words identified | Weather |

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| Discussion on CC | "2.5 HAZARDS AND HAZARD ASSESSMENTS<br>Hazards the conversion pipelines might be subject to, and for which the pipelines are being assessed in the EA, include:<br>…<br>□ weather and outside forces (geotechnical)"<br><br>"2.5.9 Weather and Outside Force Hazard Assessment<br>This assessment is intended to determine whether there have been or will be outside forces acting on the conversion pipeline. Phased geologic hazard assessments have been completed along the entire pipeline. These assessments considered potential unstable slopes, seismic hazards, ground subsidence, and collapsible or expansive soils along the alignment.<br>Given the increased consequence of an oil pipeline failure in a watercourse compared with a gas pipeline failure, phased hydrotechnical hazard assessments were completed along the length of the conversion portion of the Project to identify potential scour or erosion hazards that may impact the integrity of the pipeline (see Appendix 5-1).<br>Appropriate measures to mitigate potential geologic and hydrotechnical hazards that may impact the integrity of the pipeline will be implemented, as required, during detailed design."<br><br>"2.6.1.8 Weather and Outside Force (Geotechnical)<br>During the phased geologic hazard assessments, some locations along the conversion segment of the pipeline were identified as having moderate or high potential for landslide hazards. These locations are either under instrumented slope monitoring or will undergo additional evaluations during ongoing assessments of the conversion integrity program. Based on the findings of the monitoring exercise and evaluations, Energy East will implement appropriate remedial measures at locations where potential landslide hazards may impact the integrity of the pipeline.<br>Areas of potential collapsible/expansive soil and subsidence are inspected regularly by aerial surveillance for potential threats to the pipeline.<br>Phased hydrotechnical hazard assessments that were completed along the alignment identified water crossings with high and moderate potential for scour. Further assessments, including depth of cover surveys, will be completed on all water crossings with high potential for scour. The water crossings with |

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| | moderate potential for hydrotechnical hazards will continue to be managed as part of conversion integrity program."<br><br>"2.6.2.8 Weather and Outside Forces (Geotechnical)<br>During phased geologic hazard assessments, some locations along the conversion segment of the pipeline were identified as having moderate or high potential for landslide hazards. These locations are either under instrumented slope monitoring or will undergo additional evaluations during ongoing assessments of the conversion integrity program. Based on the findings of the monitoring exercise and evaluations, Energy East will implement appropriate remedial measures at locations where potential landslide hazards may impact the integrity of the pipeline.<br>Areas of potential collapsible/expansive soil and subsidence are inspected regularly by aerial surveillance for potential threats to the pipeline.<br>Phased hydrotechnical hazard assessments that were completed along the NOL identified water crossings with high and moderate potential for scour and erosion. Further assessments, including depth of cover surveys, will be completed on all water crossings with high potential for scour. The water crossings with moderate potential for hydrotechnical hazards will continue to be managed as part of the conversion integrity program."<br><br>"2.6.3.8 Weather and Outside Forces (Geotechnical)<br>During the phased geologic hazard assessments, some locations along the conversion segment of the pipeline were identified as having moderate or high potential for landslide hazards. These locations are either under an instrumented slope monitoring or will undergo additional evaluations during ongoing assessments of the conversion integrity program. Based on the findings of the monitoring exercise and evaluations, Energy East will implement appropriate remedial measures at locations where potential landslide hazards may impact the integrity of the pipeline.<br>Areas of potential collapsible/expansive soil and subsidence are inspected regularly by aerial surveillance for potential threats to the pipeline.<br>Phased hydrotechnical hazard assessments that were completed along the alignment identified water crossings with high and moderate potential for scour. No water crossing with high potential for scour was identified on the NBSC. The water crossings with moderate potential for hydrotechnical hazards will |

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| | continue to be managed as part of conversion integrity program.” |

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| Discussion on mitigation action | |
| Discussion on adaptation (project and environment) | |
| Recommendations on mitigation/adaptation | |
| Finale decision influenced by cc considerations | |
| QUESTIONS! | Do these considerations of weather events only consider historic datas or do they also take into account the projected impacts resulting from climate change? |
| Comments and Observations | |

| | VOLUME 11: ESA |
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| Key words identified | Climate, greenhouse/ghg, emission. |

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| Discussion on CC | **Section 3 – Method and Findings:**<br>"3.2.2 Cumulative Effects<br>…<br>Cumulative effects were determined to be not significant except for wildlife and wildlife habitat and greenhouse gas emissions. For these two VCs, the Project contributes to pre-existing significant adverse cumulative effects for:<br>…<br>• greenhouse gas emissions – the Project contributes to a pre-existing significant adverse effect of GHG emissions on climate change. The Project contribution on its own is small in the global context."<br><br>"Table 3-3: Potential Project Interactions, Valued Component Selected and Rationale …<br>Atmospheric Environment Greenhouse Gases (GHGs): Construction and operations activities could contribute to increases in GHGs."<br><br>**Section 6 – Environmental Regulatory Consultation:**<br>"Engagement and consultation with environmental and related offices in both federal and provincial jurisdictions was initiated in April 2013 with officials who might be involved in the regulatory review and approvals processes or construction phases of the Project. Their input, issues and concerns on environmental issues were taken into account during field assessments and when developing the ESA for the Project, and will continue to be taken into account as the Project progresses.<br><br>In broad summary, engagement with these offices from April 2013 to December 2015 has included Project-related discussions on mitigation for:<br>…<br>• air emissions and greenhouse gases"<br><br>"6.2 PROVINCIAL OFFICES<br>…<br>6.2.4 Ontario<br>… |

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| | From April 2014 until December 2015, Energy East continued to engage and consult with environmental and related offices in Ontario to address a variety of environmental matters as outlined below:<br>…<br>□ discussions with the Ontario Ministry of Environment and Climate Change on power requirements for pump stations, and the environmental effects associated with gas turbines in Ontario"<br><br>"6.3 ONGOING ENGAGEMENT WITH FEDERAL AND PROVINCIAL OFFICES<br>Engagement and consultation remains ongoing and is planned with environmental and related offices at the provincial and federal levels to address a variety of environmental matters, including:<br>…<br>□ environmental mitigation for watercourse crossings and water quality, vegetation and wetlands, acoustics and aesthetics, air emissions and GHGs, and cumulative effects on the environment" |

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| Discussion on mitigation action | |
| Discussion on adaptation (project and environment) | |
| Recommendations on mitigation/adaptation | |
| Finale decision influenced by cc considerations | |
| QUESTIONS! | |
| Comments and Observations | |

| | VOLUME 12: RISK ASSESSMENT |
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| Key words identified | Weather; |

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| Discussion on CC | **Section 3: FACILITIES RISK ASSESSMENT**<br>"3.3 CREDIBLE WORST CASE SCENARIOS<br>3.3.1 Consequence Results<br>…<br>The most significant third party offsite effects for scenarios deemed credible worst case were associated with pool fires within the tank area at the Saint John tank terminal. For this hazard event, it was determined that heat radiation effects beyond the tank terminal's property line were possible. Potential impact to properties were assessed, such that these properties were calculated to see heat radiation levels of between 4 kW/$m^2$ and 12.5 kW/$m^2$ at distance of 86 m and 352 m outside of the property line, respectively. Thus, these properties could see damage after an extended exposure to the fire under worst case weather conditions. These findings are considered to be conservative, as the tank terminal is elevated above the properties and would see less heat radiation than calculated. It was further found that these potential events would not physically affect adjacent industrial operations near this site."<br><br>**Section 4:** MARINE TERMINAL AND SHIPPING RISK ASSESSMENT<br>"4.5 DESIGN, CONSTRUCTION AND OPERATION MITIGATION<br>As noted in Section 1.5, the risk assessment that was performed was based on the design basis of the facilities and their anticipated operation which include a number of design and operational means of reducing the potential for accidents or malfunctions at the marine terminal including:<br>…<br>• Marine terminal operation mitigation measures outline in Volume 7, Section 5, of the Consolidated Application, including:<br>  ○ marine terminal weather monitoring and established protocols for heavy weather"<br>"4.6 RESPONSE, REMEDIATION, AND THIRD-PARTY DAMAGE ESTIMATES<br>As previously noted, each spill situation is unique and factors such as the weather, product, release location, and nearby receptors involved in the incident can lead to significant variations in the overall costs associated with an incident." |

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| Discussion on mitigation action | |
| Discussion on adaptation (project and environment) | |
| Recommendations on mitigation/adaptation | |
| Finale decision influenced by cc considerations | |
| QUESTIONS! | There are no definitions of what is considered as “heavy weather” and if any of these considerations of weather events include the projected impacts resulting from climate change in regards of weather variations. |
| Comments and Observations | The proponent seems to be aware that inclement weather conditions could have an impact on the final risk assessment and makes mention of “worst case weather” and “heavy weather” conditions. However, these terminologies are not precisely defined and the proponent makes no mention of the projections of extreme weather event resulting from climate change impacts. Are these considered in “worst case weather” and “heavy weather” conditions or are they not included in this risk assessment? |

| | VOLUME 14: PROJECT AND ASSESSMENT OVERVIEW |
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| Key words identified | Weather events; GHG; emissions; |

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| Discussion on CC | **Section 2 – Project description:**<br>"2.5 Pipeline Construction<br>2.5.3 Watercourse Crossing Methods<br>2.5.3.3 Construction and Mitigation Strategies<br>Construction and mitigation strategy considerations in selecting a pipeline crossing method include:<br>…<br>• environmental considerations (e.g., extreme weather events, navigation or number of tankers on the water)"<br><br>**Section 3 – Regulatory Context:**<br>The proponent mentions the NEB Filing Manual, which contains a list of filing requirements in regards of the project. The proponent discussed some of the requirements and indicates where these can be found in its Consolidated Application. Here are some requirements of the filing manual related to climate change:<br>"Physical and Meteorological Environment<br>…<br>4. Describe the local and regional climate. Also identify the potential for extreme weather events, such as wind, precipitation, and temperature extremes.<br>o Volume 15, Parts A to E, Section 2: Atmospheric Environment<br>o Volume 17, Part A, Section 2: Atmospheric Environment<br>o Volume 17, Part B, Section 2: Atmospheric Environment<br>o Volume 18: Effects of the Environment on the Project<br>…<br>GHG EMISSION<br>1. Provide an assessment of the construction-related GHG emissions and justification of the methods used in the assessment.<br>o Volume 20, Section 6: Greenhouse Gases<br>2. For projects that result or may result in an increase in GHG emissions during operations or maintenance:<br>• describe and quantify GHG emissions. Include a methods used for the quantification, rationale, and assumptions used in the estimation; |

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| | • describe the sources (e.g., point emissions, area sources, flaring and incineration emissions, and fugitive sources);<br>• describe the measures to be implemented for continuous improvement of GHG emissions management; and<br>• describe participation in provincial/federal reporting programs or provide rationale why participation is not required.<br>o Volume 20, Section 6: Greenhouse Gases"<br><br>**Section 4 – Alternative Means of Carrying Out the Project:**<br>"4.15 Québec Marine Terminal Initial Screening<br>4.15.1 Initial Screening<br>4.15.1.6 Île Verte<br>Meteocean Conditions<br>No ice formation analysis was found at the Île Verte site. As for the climate description, the ice characteristics at Île Verte are expected to be similar to those encountered at Cacouna. The 100-year return period ice thickness should then be around 120 cm."<br><br>**Section 6 – Assessment Methods:**<br>The project proponent developed a table titled "Evaluation of Potential Effects for Pipeline, Pump Stations, and Tank Terminals" (found in Appendix A) where there is a discussion on GHG. The proponent explains the pipeline might have an effect on the atmospheric environment because of its potential project effect of increasing GHG emission. This is motivated by stating that "[p]ipeline construction [and operation] could contribute to increases in GHG emissions" and that this parameter is measured in carbon dioxide equivalents ($CO_2e$). The proponent also mentions that "Pump Stations and other facilities (e.g. pressure control station, delivery meter stations), including permanent access roads could also contribute to the potential project effect of an increase in GHG emission. The proponent states that "Pump station construction [and operation] could contribute to increases in GHG emissions" and that this parameter is also measured in carbon dioxide equivalents ($CO_2e$). The proponent also explains that tank terminals, including their permanent access roads could also contribute to the potential project effect of an increase in GHG emission. The proponent explains that "[t]ank terminal construction [and |

operation] could contribute to increases in GHG emissions" and that this parameter is also measured in carbon dioxide equivalents ($CO_2e$).

In the "Evaluation of Potential Effect for the Marine Terminal Complex" (found in Appendix B), the proponent explains that the Marine Terminal Complex (Onshore and offshore) could have an effect on the atmospheric environment because of its potential project effect of an increase in GHG emissions. The proponent stats that the "[m]arine terminal complex construction [and operation] could contribute to increases in GHG emissions" and that this parameter is measurable in carbon dioxide equivalents ($CO_2e$).

Finally, the proponent state that the marine shipping could have an effect on the atmospheric environment because of its potential project effect of an increase in GHG emissions. The proponent mentions that the "[m]arine shipping could contribute to increases in GHG emissions" and that this parameter is measurable in carbon dioxide equivalents ($CO_2e$).

**Section 8 – Decommissioning and Abandonment:**

The proponent summarizes the effects of Decommissioning and Abandonment of the Project in Table 8-2 of this section and atmospheric environment (air quality and GHG gases) are mentioned, where it is explained that "[e]quipment operation required for clearing, excavation and reclamation of sites along the ToR and at aboveground facilities could result in local temporary increases in air quality contaminants. Decommissions and abandonment activities could result in greenhouse gas emissions".

That table is followed by a sub-section on that matter.

"8.4.7. Atmospheric Environment (Air Quality and Greenhouse gases)
During decommissioning and abandonment, equipment and support vehicles used in the disassembly, removal or infilling of the pipeline and facilities will generate small amounts of dust and criteria air contaminants. These air contaminant emissions will be localized to the area where aboveground facilities are being removed (e.g., tank and marine terminals, pump stations, valve sites) or where sections of the pipe will be cut and capped (e.g., road crossing, major water crossings). These activities will occur on an intermittent basis, will be transient and spread amongst various pieces of equipment and activities around

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| | the site, and will be short term at any given location. Emissions are expected to be minimal, and the resulting effects can be managed to acceptable levels using standard mitigation. Effects of decommissioning and abandonment on the atmospheric environment are considered negative, short term, moderate magnitude, localized and reversible once work is complete. Residual effects on the atmospheric environment are predicted to be not significant.<br>Equipment and support vehicles used during decommissioning and abandonment will also emit small amounts of greenhouse gas (GHG) emissions. The amount of GHG emissions will be small compared with GHG emissions generated during construction and operation of the Project, as well as compared with provincial, national and global totals. GHG emissions during decommissioning and abandonment would not substantively influence provincial, national or global totals or cause a detectable change in atmospheric carbon dioxide concentrations at the provincial, national or global levels. Consequently, effects of GHG emissions from decommissioning and abandonment activities related to the Project will be negative, short term (i.e., only occurring during decommissioning activity), regional and of low magnitude. However, as for all GHG emissions (regardless of the amount), the effects are considered irreversible because breakdown in the atmosphere occurs over a long period (>100 years). GHG emissions from decommissioning and abandonment are predicted to be not significant.<br>Once project operation ceases, GHG emissions from natural gas turbines that provide power to the eight pump stations in northern Ontario and GHG emissions from marine shipping will no longer occur."<br><br>"Table 8-4 Effects of Deactivating the Assiniboine River Crossing<br>Atmospheric environment (Air quality and Greenhouse gases)<br>• Clearing, excavation and reclamation of the RoW next to the river could result in local temporary increases in air quality contaminants.<br>• Deactivation activities could result in GHG emissions."<br><br>"8.6.7 Atmospheric Environment (Air Quality and Greenhouse Gases)<br>Deactivation activities will generate emissions that could affect local air quality and will also generate GHG emissions. These emissions will be small and associated with equipment used to prepare the sites where the pipes will be exposed, cut and capped on both sides of the crossing. Standard mitigation with respect to equipment maintenance and operation typical of construction activities will be applied during |

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| | deactivation. With the application of standard mitigation, effects on the atmospheric environment will be negative, localized, short term, low magnitude and reversible. Residual effects are predicted to be not significant. GHG emissions from equipment operation will be small and will cease once deactivation activities are complete and will not measurably contribute to provincial or national GHG emissions. Residual effects are predicted to be not significant."<br><br>**"Table 8-5 Residual Effects Characterization for Deactivation of the Assiniboine River Crossing**<br>Atmospheric Environment (Air Quality and Greenhouse gases)<br>Mitigation outlined in the Project-specific EPP for construction is appropriate for deactivation."<br>• With no monitoring or follow-up deemed as required. |

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| Discussion on mitigation action | "Standard mitigation with respect to equipment maintenance and operation typical of construction activities will be applied during deactivation. With the application of standard mitigation, effects on the atmospheric environment will be negative, localized, short term, low magnitude and reversible. Residual effects are predicted to be not significant." |
| Discussion on adaptation (project and environment) | |
| Recommendations on mitigation/adaptation | |
| Finale decision influenced by cc considerations | GHG emissions will be insignificant and will not "measurably contribute to provincial or national GHG emissions". |
| QUESTIONS! | |
| Comments and Observations | |

| | VOLUME 18: EFFECTS OF THE ENVIRONMENT ON THE PROJECT |
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| Key words identified | Weather/weather event. |

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| Discussion on CC | **1. Introduction**<br>"Throughout the planning, design and implementation stages of the Project, the risk of these effects are considered and mitigated, including:<br>…<br>• construction scheduling (avoiding historical periods of severe weather, where possible)"<br><br>**2. Potential Effects**<br>"Engineering design of aboveground facilities will follow the requirements of the National Building Code of Canada, as well as any required provincial regulations, that considers geological hazards (e.g., seismic events) and severe weather events that could have adverse effects on project construction and operation."<br><br>"3.3 Extreme Snow Events and Ice Storms<br>Warm weather and low-pressure systems interacting with cold Arctic air over a region can cause extreme snowfall events and ice storms. Extreme snow events are characterized by intense cold, strong winds and reduced visibility. Extreme snow events are most likely to occur during February, based on historical trends (Environment Canada 1990). Ice storms can occur in late fall and winter.<br><br>Construction could be halted during an extreme snow event or ice storm if safety becomes a concern. During operation, extreme snow events and ice storms could affect the response time for emergency response personnel to reach a site of an accidental release, and could slow or delay maintenance activities. However, emergency response planning activities take such weather events into account. Extreme snow events and ice storms might also affect access to facilities during operation, but should not adversely affect underground pipelines. Regular maintenance schedules might need to be adjusted during extreme snow events and ice storms; however, delays are expected to be of short duration."<br><br>"3.5 High Winds<br>High winds (often associated with severe weather events) are not a direct threat to buried pipeline. High winds could result in the suspension of some construction or operation activities because of safety concerns, though delays are likely to be of short duration." |

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| | **4. Assessment of Potential Effects**<br>"The Project will employ best management and engineering practices and, as such, the Project will be designed to withstand extreme environmental stressors. "<br><br>Environmental Condition: Weather (with proposed mitigation measures)<br>"Extreme temperatures<br>• employ temporary work shutdown<br>• develop contingency plans for severe weather effects<br>• use additional personal protective equipment (PPE) to protect workers<br>• adjust construction schedule, if necessary<br>• reschedule maintenance and monitoring activities<br>• develop contingency planning for period of power outages<br><br>Extreme precipitation events<br>• employ temporary work shutdowns<br>• develop contingency plans for severe weather effects<br>• use additional PPE to protect workers<br>• adjust construction schedule, if necessary<br>• reschedule maintenance and monitoring activities<br>• develop contingency planning for period of power outages<br><br>Extreme freezing rain and sleet events<br>• employ temporary work shutdowns<br>• develop contingency plans for severe weather effects<br>• use additional PPE to protect workers<br>• adjust construction schedule, if necessary<br>• reschedule maintenance and monitoring activities<br>• develop contingency planning for period of power outages<br><br>Blizzards |

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| | • employ temporary work shutdowns<br>• develop contingency plans for severe weather effects<br>• use additional PPE to protect workers<br>• adjust construction schedule, if necessary<br>• reschedule maintenance and monitoring activities<br>• develop contingency planning for period of power outages<br><br>Lightning<br>• employ temporary work shutdc<br>• develop contingency plans for severe weather effects<br>• develop contingency planning for period of power outages<br>• have fire evacuation and control measures in place<br><br>Extreme winds<br>• employ temporary work shutdowns<br>• implement additional erosion control measures to avoid topsoil loss<br>• reschedule maintenance and monitoring activities<br><br>Tornadoes<br>• develop specific emergency response and evacuation plan<br>• employ temporary work shutdowns<br>• reschedule maintenance and monitoring activities<br>• develop contingency planning for period of power outages<br><br>Maritime conditions (e.g., high tides, storm surge and sea ice)<br>• design marine infrastructure to accommodate tides and predicted metocean conditions in the Bay of Fundy and Saint John Harbour.<br><br>Wildfires<br>• employ temporary work shutdowns |

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| | • assess local conditions and adapt fire control for site conditions<br>• adjust construction schedule, if necessary, to avoid fire season<br>• ensure adequate fire control for site conditions<br>• reschedule maintenance and monitoring activities, if high risk of fires exists<br>• incorporate wildfire into emergency response planning"<br><br>"4.2 Residual Effects and Determination of Significance<br>Through application of mitigation—to be determined during detailed engineering and design—potential adverse effects of the environment on the Project are predicted to be not significant. Prediction confidence is high because of past project experience, application of best management practices and engineering design that meets or exceeds industry standards. |

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| Discussion on mitigation action | Measuring the probability of extreme snow events and other severe weather events based on historical data (some dating back to 1990)! |
| Discussion on adaptation (project and environment) | "4.2 Residual Effects and Determination of Significance<br>Through application of mitigation—to be determined during detailed engineering and design—potential adverse effects of the environment on the Project are predicted to be not significant. Prediction confidence is high because of past project experience, application of best management practices and engineering design that meets or exceeds industry standards. |
| Recommendations on mitigation/adaptation | |
| Finale decision influenced by cc considerations | Most of the impacts forecasted are based on historical data (meteorological facts and past project experience), which does not include considerations of the projected impacts resulting from climate change. |
| QUESTIONS! | |
| Comments and Observations | |

| | VOLUME 20: ASSESSMENT SUMMARY AND CONCLUSIONS |
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| Key words identified | Climate; Weather; Emission; GHG |

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| Discussion on CC | **2.5 Cumulative Effects**<br>2.5.1 Types of Cumulative Effects<br>"The most common ways that a natural resource-based industrial physical activity might contribute to biophysical cumulative effects is through the direct loss or modification of existing landscape, creation of new or improvement of existing access, addition of project related vehicles or vessels, and discharge or emissions from the project (e.g., sediment, air or water constituents, noise, light).<br><br>A cumulative effects interaction might occur at a distance from a project because:<br>• the project effect is transported away (typical for air and waterborne effects)<br>• a project affects a VC that itself moves away to interact with another physical activity (typical for wildlife and fish)<br>• a project component moves away from other project components (typical for marine shipping)<br>• another physical activity's effect directly overlaps the project (typical for soils)"<br><br>**Section 3 – Summary of Effects on Valued Components:**<br>"The effects on soil quality and soil loss are not anticipated to result in a change in agricultural capability class. Mitigation to reduce or avoid effects on soil capability include implementation of established guidelines and principles for soil stripping, salvage and stockpiling; prevention of admixing of poor-quality spoil material and higher-quality topsoil; and avoiding rutting and compaction during adverse weather conditions. In addition to the mitigation in the EPP, a specific *Cahier des mesures générales d'atténuation en milieux agricole et forestier* (Guide on general mitigation measures in agricultural and forest areas) should be developed for Québec, based on discussions between the *Union des producteurs agricoles* (UPA) and Energy East, for implementation on UPA member properties within the agricultural designated area. With the implementation of recommended mitigation, residual effects on soil capability are predicted to be not significant."<br><br>**Section 5 – Accidents and Malfunctions:**<br>**5.3 Marine**<br>5.3.1 Hydrocarbon Spill |

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| | "Stochastic modelling is two dimensional modelling used to understand the potential extent of surface and shoreline oiling as a result of a hypothetical oil spill occurring during loading of oil or during outbound shipping. Three oil types (representing light, medium, and heavy crude oil) under a range of weather and marine conditions are examined for 33 different spill locations, which were selected based on results of a navigational risk assessment completed for the Project. The results of the stochastic modelling are used to inform the selection of spill locations for the deterministic modeling portion of the EHHRA, based on credible worst case spill scenarios.<br>…<br>The adverse environmental effects of accidental crude oil spills in the Bay of Fundy environment would be either not significant, or significant depending on the receptor (ecological or human health) in question but not likely to occur, as a result of:<br>• mitigation put in place to reduce the likelihood of an accident<br>• emergency response measures established to reduce the environmental effects of a spill."<br><br>**Section 6 – Greenhouse Gases:**<br>"The Project will not use refrigerants or $NF_3$, and any electrical equipment that contains SF6 will be subjected to periodic monitoring for leaks, therefore these GHG species are not included in the quantification of the Project's GHGs emissions or in further assessment."<br><br>**6.1 Assessment Scope**<br>6.1.1 Federal<br>"In the Copenhagen Accord meeting in January 2010, the Government of Canada set a target of reducing GHG emissions by 17% by 2020 (compared with 2005 levels) (Environment Canada 2013a). As outlined in Canada's Sixth National Report on Climate Change, 2014 (Environment Canada 2013b), the federal government is in the process of implementing a sector by sector regulatory approach to reduce national emissions.<br>…<br>The most recent emissions reduction targets established federally in early 2015: it targets a reduction of 30% below 2005 levels by 2030 (Environment Canada 2015c). |

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| | The Project is subject to requirements under the *National Energy Board Act*. For the specific requirements related to the atmospheric environment, see the NEB Filing manual, Table A-4. The filing requirements that pertain to Project GHGs are:<br>• an assessment of air contaminant emissions and greenhouse gases from construction equipment and vehicular traffic<br>• a quantitative assessment of potential greenhouse gases generated by activities and systems associated with the Project<br>• a description of mitigation measures<br>• a description of participation in relevant air emission tracking and reporting programs, as applicable<br><br>The federal government, through Environment Canada, requires annual reporting of GHG emissions from facilities that release 50,000 t (50 kt) $CO_2e$ or more per year from stationary combustion, industrial processes, venting, flaring, fugitives, on-site transportation, waste and wastewater sources. Carbon dioxide from biogenic sources, such as the combustion of wood waste, is not considered when determining whether a facility meets the 50 kt $CO_2e$ reporting threshold.<br><br>In addition to federal and provincial regulations and initiatives, the following GHG assessment guidance is provided from the Canadian Environmental Assessment Agency (CEA Agency): *Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners* (The Federal-Provincial-Territorial Committee on Climate Change and Environmental Assessment 2003). This is described in Section 6.1.9.3."<br><br>6.1.2 Alberta<br>"The province of Alberta set three quantitative emission reduction targets in *Alberta's 2008 Climate Change Strategy* (ESRD 2014):<br>• 20 megatonne (Mt) reduction by 2010 (forecasted to result from a 22% reduction from 1990 provincial emissions intensity)<br>• 50 Mt reduction by 2020<br>• 200 Mt reduction by 2050 below business-as-usual emissions (approximately 14% below 2005 emissions) |

…
Under the amended Specified Gas Reporting Regulation (Government of Alberta 2010) and the *Specified Gas Emitters Regulation* (SGER, Government of Alberta 2013) of the *Climate Change and Emissions Management Act*, facilities in Alberta emitting over 50 kt $CO_2e$ are required to annually report their GHG emissions, and facilities over 100 kt $CO_2e$ are required to reduce their annual emission intensity (total annual emissions per unit of production) by 12% from their 2003-2005 baseline emission intensity. New facilities that began operation in 2000 or later and have completed less than 8 years of commercial operation have a graduated reduction obligation of 2% per year starting in their fourth year of commercial operations to a reduction obligation of 12% below the emissions intensity of their third year of operation.

To comply with the SGER, companies have the following choices:
• improve the efficiency of their operations, if possible
• purchase Alberta-based offset credits
• contribute to the Climate Change and Emissions Management Fund, at $15/t over the 12% emission intensity obligation
• purchase or use Emission Performance Credits (credits that are generated within the SGER system by companies who achieve better than their reduction target).

Although the SGER in its current form expired at the end of 2014, the Alberta government has given every indication that the program will continue in some form into the future and continued to apply it in 2015 reporting. (ESRD 2013b).

Alberta has revised its GHG reduction targets and compliance costs; they will be implemented in the 2016 reporting year (Government of Alberta 2015)."

6.1.3 Saskatchewan
"Saskatchewan has also set three quantitative emission reduction goals, in the *Saskatchewan Energy and Climate Change Plan 2007* (Saskatchewan Ministry of the Environment 2007) and subsequent amendments (Saskatchewan 2009):
• stabilizing emissions by 2010

• 20% reduction of current emissions (2006 levels) by 2020
• 80% reduction of current emissions (2004 levels) by 2050

Their approach focuses on five components:
1. conservation and efficiency measures by industry, business, and homeowners
2. $CO_2$ capture and storage measures
3. increased use of renewable energy
4. reduction of $CH_4$ and other emissions in the oil and gas industry, and $CH_4$ and $N_2O$ emissions in the agriculture industry
5. creation of more natural carbon sinks in provincial forests and soils.

Under the *Management and Reduction of Greenhouse Gases Act*, facilities emitting more than 50 kt of $CO_2e$ annually will be required to reduce emissions to meet provincial targets. This act has not yet been proclaimed (Saskatchewan Government 2014). Based on the most recent communication from the Province of Saskatchewan, their position is to wait until the federal position is understood, and then develop the legislative and regulatory tools needed to achieve provincial targets (Government of Saskatchewan 2016)."

6.1.4 Manitoba
"In 2008, Manitoba's *Climate Change and Emissions Reduction Act* set a target of reducing emissions to 6% below 1990 levels by 2012.

Manitoba was predicted to be 3,300 kt short of achieving their 2012 target, according to *Manitoba's Report on Climate Change for 2012: Progress Update on Manitoba's Emission Reductions* (Manitoba Conservation and Water Stewardship 2012). There are currently no new targets established.
In 2010, the province ran a consultation process on instituting a market-based cap and trade system for capping and reducing emissions. No system has been initiated at this time."

6.1.5 Ontario

"In the 2007 report, *Go Green: Ontario's Action Plan on Climate Change* (MOE 2007), Ontario established three GHG emissions reduction targets (as $CO_2e$):
• 6% below 1990 levels by 2014
• 15% below 1990 levels by 2020
• 80% below 1990 levels by 2050

In 2009, large emitters (with emissions greater than 25 kt $CO_2e$) in Ontario began reporting GHG emissions to the MOE, under the *Greenhouse Gas Emissions Reporting* amendment to the *Environmental Protection Act* (EPA). The Greenhouse Gas Emissions Trading amendment was passed the same year, which established the foundation for Ontario's cap-and-trade program.

In early 2013, the MOE posted, *Greenhouse Gas Emissions Reductions in Ontario: A Discussion Paper on the Environmental Registry* (MOE 2013), to engage the public in the development of a greenhouse gas emissions reduction program.

A revised Climate Change Discussion Paper released in April 2015 by the Ontario Ministry of Environment and Climate Change indicated that Ontario will implement a cap and trade system similar to that in Québec; however, implementation dates and mechanisms have not yet been published (MOE 2015)."

6.1.6 Québec
"The key component of Québec's, 2013-2020 *Climate Change Action Plan* (Government of Québec 2012) is a new cap-and-trade system which has been designed to achieve a $CO_2e$ emission reduction target of 20% below 1990 levels by 2020, as established in 2009. The cap and trade system is harmonized with the system in place in the state of California.

Beginning in 2013, Québec facilities with annual GHG emissions equalling or exceeding 25 kt $CO_2e$, and distributers of electricity produced outside Québec whose electricity production emissions equal or exceed 25 kt$CO_2e$ were subject to the cap and trade system (Government of Québec 2014). The second compliance period began in 2015 and will apply to any distributer of fossil fuels with annual combustion

emissions greater than or equal to 25 kt $CO_2e$. By 2015, this system is expected to cover approximately 85% of GHG emissions in Québec."

6.1.7 New Brunswick
"New Brunswick's "Climate Change Action Plan 2007-2012" (New Brunswick Climate Change Secretariat 2007) set the following targets (on a $CO_2e$ basis):
• reducing GHG emissions to 1990 levels by 2012
• reducing GHG emissions 10% below 1990 levels by 2020

The province planned to achieve these targets through the following activities and sectors:
• energy efficiency and renewable energy
• transportation
• waste management
• industrial sources and future energy opportunities

The latest climate change action plan (2014 – 2020) was released (New Brunswick Climate Change Secretariat 2014). This action plan indicates that the province achieved its 2012 target, and has set a 2050 target of 75% to 80% below 2001 levels.

*Responsible Environmental Management of Oil and Natural Gas Activities in New Brunswick: Rules for Industry* (New Brunswick Department of Environment and Local Government 2013) outlines that proponents of oil and gas wells, batteries, gas conditioning plants, and compressor stations must submit an annual emissions inventory to the province that describes predicted emission rates and predicted annual tonnage releases."

6.1.8 Summary of GHG Reporting Thresholds
"Table 6-1

| Organization | Reporting Threshold (kt $CO_2e$ per year) |
|---|---|
| Alberta | 50 |
| Ontario | 25 |

| | |
|---|---|
| | Québec 10<br>Federal 50<br>”<br>QC= 10kt $Co_2e$/year or 200L for any distributer of fossil fuels (http://www.mddelcc.gouv.qc.ca/air/declar_contaminants/)<br><br>6.1.9 Boundaries for the Assessment<br>6.1.9.1 Spatial Boundaries<br>“The spatial boundaries considered in this assessment include direct emissions of GHGs related to the construction and operation of the Project. These emissions are assessed in the context of provincial, national, and global GHG emissions.”<br>+<br>6.1.9.2 Temporal Boundaries<br>“Temporal boundaries have been established by determining the period of time over which the effects of the Project are to be considered. These include periods of construction and operation.”<br><br>6.1.9.3 Administrative and Technical Boundaries<br>“In addition to federal and provincial regulations and initiatives, the GHG assessment is completed with guidance from the Canadian Environmental Assessment Agency (CEA Agency) entitled, *Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners* (The Federal-Provincial-Territorial Committee on Climate Change and Environmental Assessment 2003). This is the most recently published guidance. The CEA Agency facilitated the development of this national guidance for the consideration of climate change in environmental assessments. The guidance recommends that to consider climate change in the context of an ESA, net changes in GHG emissions as a result of a project be evaluated and detailed mitigation be considered for the project in comparison to the industrial sector for the project, and to characterize project emissions as *low, medium* or *high* (though these descriptors are not quantitatively defined in the guidance). See Section 6.5.2 for definitions of low, medium (or moderate) and high emitter magnitudes for this Project. Where project emissions are medium (referred to as moderate herein) or high, preparation of a GHG Management Plan is required.” |

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| | The proponent identified that according to the CEAA guidance, "the contribution of an individual project to climate change cannot be measured". "Therefore, evaluation of Project residual effects will focus on estimation of GHG releases, mitigation and evaluation of Project GHG releases in relation to provincial, federal and global GHG totals (The Federal-Provincial-Territorial Committee on Climate Change and Environmental Assessment 2003)."<br><br>6.2 Baseline Summary<br>"An understanding of the existing provincial, national and global greenhouse gas (GHG) emissions is required when putting Project-related GHG emissions into context. The GHG emissions from other facilities in Canada are also considered, in order to assess whether the Project's GHG emissions are low, moderate or high with respect to the CEA Agency guidance Environment Canada (2015d). The most recent provincial and global data as of December 2015 are used for baseline data."<br><br>6.2.1 Approach and Methods<br>"Provincial and national GHG emissions were obtained from the Environment Canada National Inventory Report for 1990–2013 (Environment Canada 2015e). Facilities that reported emissions of more than 50 kt $CO_2e$ to Environment Canada for the 2013 reporting year were reviewed to support establishment of low, moderate and high emitter levels (Environment Canada 2015d).<br>An estimate of global GHG emissions is based on the Climate Analysis Indicators Tool (CAIT), developed by the World Resources Institute. CAIT has compiled estimates of global GHG emissions from sources such as the U.S. Energy Information Administration, U.S. Environmental Protection Agency and the International Energy Agency (WRI 2015).<br>…<br>A literature search was performed for published emissions for these existing crude oil pipelines; however, GHG emissions from individual pipelines were not available from the Environment Canada, Alberta or Ontario programs. As such, GHG emissions from existing crude oil pipelines could not be established. It is therefore assumed these facilities do not exceed the reporting thresholds for provincial or federal reporting."<br><br>6.2.2 Overview of Baseline Conditions |

6.2.2.1 Greenhouse Gases

"Baseline emissions of GHGs are available on a provincial and national basis from the Environment Canada national reporting system. …

In 2012 (most recent year of data), global emissions of GHGs were estimated to be 44.8 billion tonnes, excluding emissions from land use change and forestry (WRI 2015). Therefore, Canada's contribution to global GHG emissions in 2012 was 1.6%.

…

In 2013, 487 facilities reported emissions of more than 50 kt $CO_2e$ to Environment Canada (see Table 6-4). These data provide a facility-based emissions profile for Canadian operated facilities (emissions on a per facility basis) and indicate that 50% of reporting facilities emitted approximately 150 kt $CO_2e$ per year each; 10% emitted more than 1,100 kt CO2e per year each."

**6.2 Potential Effects**

"For the purposes of this assessment, an effect is an increase of GHGs in the atmosphere.

For a list of Project activities contributing to GHG emissions, see Table 6-5. These are associated with construction and operation of the pipeline, pump stations, tank terminals, and marine terminal. As stated above, the potential effects are assessed for the entire Project.

Greenhouse gas emissions are a VC because of the potential contribution of greenhouse gases from construction and operation of the Project to Canada's overall contribution to GHG emissions and climate change. The measurable parameter for GHG emissions is carbon dioxide equivalents ($CO_2e$). Carbon dioxide equivalents are calculated from GHGs from the Project ($CO_2$, $CH_4$, $N_2O$) based on consideration of the global warming potential (GWP) of various GHGs in comparison to the GWP of $CO_2$. Project activities and physical works that could contribute to releases of GHGs and can be evaluated using $CO_2e$ are provided in Table 6-5.

As identified in guidance provided by the Canadian Environmental Assessment (CEA) Agency on assessing climate change in environmental assessments, "the contribution of an individual project to

climate change cannot be measured". Therefore, evaluation of Project residual effects focuses on estimation of GHG releases, mitigation and evaluation of Project GHG releases in relation to provincial, federal and global GHG totals (The Federal-Provincial-Territorial Committee on Climate Change and Environmental Assessment 2003)."

6.3.1 Sources
"The assessment of GHGs includes substantial GHG emissions associated with the Project scope as defined in the Project Description (see Volume 14, Section 2).

Construction emissions from the combustion of fuel in construction equipment are included as Project related emissions. Construction emissions associated with vented natural gas during the conversion part of the construction are considered to be Project-related emissions.

Emissions from operation of the Project include emissions from combustion ($CO_2$, $CH_4$, $N_2O$) as well as small amounts of fugitive emissions. GHG emissions occur from:
• fugitive leaks from pipeline transport ($CO_2$, $CH_4$).
• fugitive leaks from oil product tank storage ($CO_2$, $CH_4$).
• combustion in natural gas-fired generators at eight pump stations in northern Ontario ($CO_2$, $CH_4$, $N_2O$).
• organic vapour combustion during marine loading ($CO_2$, $CH_4$, $N_2O$).
• marine diesel combustion in marine vessels while at berth and during shipping ($CO_2$, $CH_4$, $N_2O$).

Energy East will not have ownership or be directly responsible for emissions that will be generated and released from third-party power generation, therefore these are not included in the scope of the ESA. Nonetheless, mitigation of these emissions is proposed through energy efficient design where feasible (see Section 6.4).

Fugitive and venting emissions of vapours from the pump stations (e.g., leaks from valves, flanges and connectors, venting of natural gas systems) may occur but are not considered substantial in relation to the overall Project or other sources of GHGs provincially or nationally. This is consistent with previous pipeline assessments including the TransCanada Keystone GP Ltd. (2007) and KXL (2009) pipeline

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| | projects. Quantification of these emissions is therefore excluded from the assessment.<br>The pump stations will have backup diesel generators which would release GHGs during operation, however the generators will operate on a stand-by basis only, and therefore emissions would not be substantial in comparison to other Project GHG emissions and would thus not affect the conclusions of the assessment. Therefore, the pump station stand-by generators are not assessed further in relation to GHGs."<br><br>6.4 Mitigation<br>"The following mitigation measures are recommended to avoid or minimize potential effects during construction and operation:<br>• equipment is well-maintained<br>• reduce idling of equipment, where possible<br>• where practical and applicable, use multi-passenger vehicles for the transport of crews to and from job sites.<br>• while emptying existing gas lines to be repurposed, make efforts to minimize direct venting of gas through the use of pull down compression. Portable pull down compression used to recover residual natural gas in conversion sections will avoid the release of approximately 2,000 kt of GHG emissions that otherwise would be vented to atmosphere.<br>• salvage merchantable timber from land clearing when safe to do so, and in areas close to communities and business, to reduce biomass burning.<br>• reclaim the RoW following construction and allow vegetation to regrow leaving space for maintenance and safety activities.<br><br>During operation:<br>• incorporate best available technology economically achievable (BATEA) to reduce GHG emissions in the design, wherever practical. The use of this technology and the use of best practices throughout the Project will serve to reduce emissions at the source.<br>• choose pipeline components to reduce pressure losses within the piping systems and enhance pipeline efficiency. These include the use of ultrasonic meters, elbow meters, straightening vanes, full bore valves, and contoured fittings. |

• power pump stations across Canada with natural gas or electricity, which are generally considered lower GHG intensive alternatives to diesel or heavier fossil fuels. Turbine unit selection at pump stations should be chosen to improve operational flexibility.
• terminal tanks should have welded decks equipped with both primary and secondary seals consistent with the Canadian Council of Ministers of the Environment (CCME) Guide EPC-87E (1995) requirements for controlling VOC emissions (including methane) from storage tanks (i.e., a mechanical shoe seal with a rim mounted wiper seal).
• implement routine equipment maintenance and inspection, in accordance with existing regulations and industry best practice to reduce fugitive releases of GHGs."

**6.5 Residual Effects and Determination of Significance**

6.5.1 Residual Effects Characterization

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**Table 6-6 Residual Effects Characterization – Greenhouse Gases**

| **Criteria** | **Criteria Definitions** | |
|---|---|---|
| Direction | The expected long-term trend of the effects | Positive GHG emissions will decrease |
| | | Negative GHG emissions will increase |
| | | Neutral No change from baseline conditions and trends |
| Magnitude | The expected change in a measurable parameter relative to baseline case | Low Change is measurable, but within normal variability of national and global GHG trends. Less than 50 kt CO2e annually. |
| | | Moderate Change occurs that causes an increase with regard to baseline but is considered moderate in consideration of national and global GHG releases annually. 50 kt CO2e-1,000 kt CO2e annually. |
| | | High Change occurs that are considered substantive relative to national GHG releases annually. Greater than 1,000 kt CO2e annually. |
| Geographic Extent | The geographic area within which an effect of a defined magnitude is expected to occur | PDA Effect is limited to the PDA (i.e., construction RoW and footprints associated with constructing the Project) |
| | | LAA Effect extends to the LAA |

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| | RAA Effect extends to the RAA<br>Duration The period of time that is required until concentrations of measureable parameters return to baseline conditions or the effect can no longer be measured or otherwise perceived Short-term Effect is measurable for less than 1 month<br>Medium-term Effect is measurable for greater than 1 month but less than 2 years.<br>Long-term Effect is measurable for greater than 2 years but less than 10 years<br>Permanent Effect is permanent (measurable for greater than 10 years)<br>Frequency The number of times during a project or a specific project phase that an effect will occur<br>Single event A measurable effect will occur once during the construction, operation and reclamation phases of the Project<br>Multiple irregular event A measurable effect will occur during construction and infrequently during the operation and reclamation phases of the Project<br>Multiple regular event A measurable effect will occur frequently during the construction, operation and reclamation phases of the Project<br>Continuous A measurable effect will occur continuously during the construction, operation and reclamation phases of the Project<br>Reversibility Reversible A measurable effect will occur; proposed mitigation measures will result in no further effect after the operation phase of the Project<br>Irreversible A measurable effect will occur; and will continue for a prolonged period after the operation phase of the Project ceases.<br>Ecological and Socio-economic Context The general characteristics of the area in which the project is located Not Applicable<br><br>Ecological and socio-economic context is typically defined in ESAs for VCs where this context can be defined in relation to the region where the effect will occur. As GHG releases have a global effect and ecological and socio-economic context is highly variable globally, this criterion is not applicable to assessment of GHGs and climate change.<br><br>This assessment considers residual effects on greenhouse gas emissions after the application of recommended general mitigation measures." |

6.5.2. Assessment Methods
"The Project will result in GHG emissions, thereby contributing to provincial, national and global GHG emission totals [ISN'T THIS CONTRADICTING WHAT WAS SAID EARLIER?].
…
Annual project GHG emissions are ranked according to the following:
• low emitter: Less than 50 kt $CO_2e$ emitted annually
• moderate emitter: Greater than or equal to 50 kt $CO_2e$ but less than 1,000 kt (1 Mt) $CO_2e$ emitted annually
• high emitter: Greater than 1,000 kt $CO_2e$ emitted annually

As the CEA Agency guidance does not quantitatively define relative emitter levels, these categories have been established in consideration of the federal reporting threshold and magnitudes of emissions reported by facilities operated in Canada during 2013 (~~see Table 6-4~~). The "low" emitter is set at the federal reporting threshold and the "high" emitter is set based on the 90th percentile of facility emissions reported above the 50 kt threshold.

The CEA Agency does not provide guidance on determination of significance and instead focuses on increasing attention to GHG emissions and stimulating consideration of less emission-intensive ways to realize projects (The Federal-Provincial-Territorial Committee on Climate Change and Environmental Assessment 2003). For this assessment, emitter levels are used to determine if a GHG Management Plan is required under the CEA Agency guidance (see Section 6.1.9.3)."

6.5.3 Assessment Results
6.5.3.1 Construction

(See vol. 22)
"Construction will involve burning relatively small amounts of diesel fuel in vehicles and heavy equipment, resulting in some releases of GHGs. Surface preparation includes vegetation removal, grading, and trenching, in preparation for the lowering-in of the pipeline. Other heavy equipment is used to string

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| | together sections of pipe and lower the pipeline into the trench. Following hydrostatic testing, the trench is backfilled with soil.<br><br>For emissions related to the pipeline construction, an emission factor of 220 t CO2e per kilometre of pipeline is applied. This factor is the highest GHG intensity per kilometre of pipeline from previous TransCanada pipeline assessments (NOVA Gas Transmission Ltd. 2012). An emission factor is an estimated relationship between the amount of contaminant produced per unit of raw material or production (in this case emissions per kilometer of pipeline constructed).<br><br>Project construction emissions associated with the pump stations, marine complex and tank terminals are calculated based on estimates of equipment and operating hours during construction. Construction of inwater infrastructure in Saint John, NB would result in some GHG emissions, however; these emissions would be small compared to those quantified for other construction activities (e.g., pipeline, tank terminals and pump stations) and are not further assessed.<br><br>This information is used with recognized emission factor sources, including the U.S. EPA's NONROAD program for off-road equipment (U.S. EPA 2008), U.S. EPA's MOBILE6.2C program for on-road vehicles (U.S. EPA 2006a), and U.S. EPA's AP 42 Compilation of Air Pollutant Emission Factors for stationary combustion (U.S. EPA 2014a).<br><br>Details on the specific emission factors and construction equipment (including horsepower and operating hours) are provided in the Greenhouse Gas Technical Data Report (Volume 22).<br><br>Table 6-7 provides estimates of GHG emissions from Project construction activities. Annual emissions are determined by dividing total construction emissions by the number of years of construction. In addition to an annual estimate of emissions, the total GHGs released over the construction period are provided.<br>…<br>In addition to combustion-generated GHG emissions during construction, some venting emissions will occur. Some natural gas remaining in the conversion sections prior to conversion will need to be vented |

as all the gas cannot be feasibly recovered. Prior to venting, Energy East will have recovered approximately 123 million cubic metres of natural gas from the conversion sections through the use of portable pull down compressors. The recovered gas is equivalent to a reduction in annual $CO_2e$ emissions from about 414,000 passenger vehicles (approximately 2,000 kt $CO_2e$) (U.S. EPA 2014b). The use of pull down compression is therefore estimated to reduce the amount of vented GHG emissions by over 80%. Quantities of GHGs released from the conversion are estimated using information on gas pressure, temperature, and pipeline characteristics. The estimated emissions are in Table 6-8.

…

Comparing annual construction emissions (which occur over approximately 2.58 years) to 2013 annual provincial reported emissions, the percentages of provincial totals are 0.4% or less (see Table 6-9). Average annual construction emissions are 386 kt $CO_2e$ over the construction period, approximately 0.05% of Canada's annual emissions (2013) and 0.001% of global emissions (2012)."

Summary

"As presented in Table 6-9, the total of 996 kt $CO_2e$ will be released into the atmosphere over approximately 2.58 years, from the combustion of fossil fuels in construction equipment during the construction of the pipeline, pump stations, tank terminals, and marine terminal complex. The annual emissions associated with construction equipment are 217 kt $CO_2e$ per year of construction (Table 6-7). In addition, as presented in Table 6-8, 438 kt $CO_2e$ will be released during conversion of natural gas pipelines (GHG emissions from venting), over the construction period. Total construction emissions associated with the Project are 996 kt $CO_2e$ (over approximately 2.58 years). The average annual emissions for the Project construction are 386 kt $CO_2e$.

On this basis, during construction, the Project is considered a moderate emitter (50 to 1,000 kt $CO_2e$ annually). Greenhouse gas management for construction will be included as part of the environmental protection plan (EPP) for the Project and key mitigation is summarized in Section 6.4. The construction emission estimates are conservative in nature and do not directly incorporate potential reductions from mitigation. The annual construction emissions (386 kt $CO_2e$) are approximately 0.05% of national

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| | emissions in comparison to 2013 totals. The largest contribution of annual construction emissions provincially to provincial emissions is just under 0.4% in New Brunswick; the lowest contribution is 0.01% in Alberta (see Table 6-9). Annual average construction emissions are 0.001% of global emissions. As methods for estimation of construction GHG emissions vary widely, an industry profile comparison is not considered relevant. Mitigation is also recommended (Section 6.4) during construction to control and manage GHG releases."<br><br>6.5.3.2 Operation<br>"Releases of GHG emissions during operation of the Project occur from various sources are summarized in Table 6-10. This section provides estimates for each identified GHG emission source during operation. Further details of calculations and assumptions are included in the Greenhouse Gas Technical Data Report (see Volume 22).<br>…<br>Comparing annual Project emissions to 2013 annual provincial reported emissions, the percentages are 0.7% or less (see Table 6-10). Annual Project emissions are 440 kt $CO_2e$ per year, which is approximately 0.06% of Canada's annual emissions (2013) and 0.001% of global emissions (2012, reported at 44,815,500 kt$CO_2e$)."<br><br>6.5.3.1 Pipeline emissions<br>"Fugitive GHG emissions from operation of the pipeline across all provinces are estimated to be 8.6 kt $CO_2e$ per year, based on emission factors presented in an International Panel on Climate Change (IPCC) background paper (IPCC 2000) and the quantity of oil to be transported per year."<br><br>6.5.3.2 Pump Stations<br>"Estimates of releases of GHGs from the combustion of natural gas at the eight pump stations (located in northern Ontario) with natural gas-driven generators are based on default heating values and emission factors from the Western Climate Initiative (WCI 2012). Volumes of fuel consumed at pump stations are estimated based on the power rating of the engines and conservatively assuming continuous operations (8,760 hours per year). The estimated GHG emissions are 282 kt $CO_2e$ per year. |

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| | Fugitive and venting emissions may occur at the natural gas-driven these facilities, however based on experience, these emissions are not substantial in comparison to combustion emissions and can be managed through modern design and operational procedures. These emissions have not been estimated as estimation methodologies typically rely on Leak Detection and Repair (LDAR) surveys and other data collected during operation.<br><br>The pump stations will have back-up diesel generators; however, these generators will operate on an as needed basis (during power outages); therefore, an accurate estimate of diesel combustion emissions is not available. Emissions from these back-up generators would normally be very small compared to pump station annual operation emissions."<br><br>6.5.3.3 Oil Product Storage Tanks<br>"There are three tank terminals associated with the Project: they are in Hardisty, Alberta; Moosomin, Saskatchewan; and Saint John, New Brunswick. Releases of GHGs occur from the headspaces of the oil product storage tanks at these locations because of evaporation of volatile components of the oil products contained in the tanks. It is necessary for safe operation that the vapour space be vented to the atmosphere. The estimated fractions of the vapour that consist of methane and carbon dioxide are used to estimate GHG emissions from tank venting. Estimated GHG emissions from tanks use the U.S. EPA TANKS program based on information from Energy East (e.g., tanks diameter, throughput) (U.S. EPA 2006b). This is considered a conservative approach. Total fugitive GHG emissions from the tanks are estimated at 0.21 kt $CO_2e$ per year."<br><br>6.5.3.4 Marine Terminal<br>"Combustion of diesel from ocean-going vessels (OGVs) while berthed and during transit will release GHGs. The three types of OGVs that will visit the Saint John terminal are Aframax, Suezmax and Very Large Crude Carriers (VLCCs). Releases of GHGs from vessels are based on typical ship parameters (e.g., engine power), the number of calls and hours spent during each call as developed specifically for this Project. Vessel and tug emissions estimates used engine loads and emission factors from a report by the Canadian Chamber of Shipping (CCS 2007, Moffat & Nichol 2014). The annual GHG emissions from fuel combustion by berthed vessels at the Canaport Energy East marine terminal is 3.8 kt $CO_2e$ and |

summarize by vessel type in Table 6-11.
…
Vapour combustion units are also a source of GHGs at the Saint John MTC. The vapours emitted during tanker loading are directed to the combustion units, where the gases are burned with a small amount of propane. The vapour combustion units oxidize oil vapours (volatile hydrocarbons, including methane) to carbon dioxide (to mitigate potential air quality issues). Combustion of methane to carbon dioxide reduces its global warming potential from 25 to 1 in the calculation of $CO_2e$. Annual GHG emissions from the vapour combustion units at the marine terminal, including the organic vapour and propane combustion, are 109 kt $CO_2e$ per year."

6.5.3.5. Marine Shipping
"Table 6-12 provides the annual GHG emissions from fuel combustion by vessels in transit (in designated shipping lanes) to and from the Canaport Energy East marine terminal (including associated tugboat emissions). The transit length is between the marine terminal and the Territorial Sea Maritime Zone, approximately 144 km (78 nautical miles).
…
[Tug GHG emissions include emissions during the following activities: attendance of vessels from the pilot boarding station to the turning basin, assistance of vessels during the manoeuvring process (berthing and departure), attendance at berth]"

Summary

"As presented in Table 6-11, the total of 440 kt $CO_2e$ per year will be released into the atmosphere, from the combustion of fossil fuel combustion in pump stations, pipeline fugitive emissions, tank venting, ships at berth, VCUs, and marine shipping.

Note that marine shipping emissions (39 kt $CO_2e$ annually) are not reportable under current federal and provincial programs (therefore they would not affect provincial or federal totals going forward) and would be "owned" by the shipping corr

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| | Based on the emissions presented in Table 6-10, Project operation is anticipated to release approximately 440 kt $CO_2e$ per year of GHG emissions. The contribution of Project emissions to provincial emissions (Table 6-10) ranges from 0.0002% to 0.7% annually. The Project annual total represents 0.06% of national emissions (in comparison to 2013 national totals) and 0.001% of global emissions (in comparison to 2012 global totals).<br><br>A comparison of the provincial emissions to the provincial and federal reporting thresholds is also shown in Table 6-13. Marine shipping emissions are not included as they are not owned or reportable by Energy East.<br>…<br>[Marine shipping emissions are not included because they are not owned by Energy East and therefore are not reportable by Energy East under existing legislation.]<br>…<br>Project GHG emissions in Ontario are anticipated to be above the provincial reporting threshold and hence emissions are required to be estimated and reported to the provincial government. Project GHG emissions in Ontario and New Brunswick are anticipated to be above the federal reporting threshold and hence emissions in these provinces are required to be estimated and reported to Environment Canada annually.<br><br>Based on this assessment and including mitigation as outlined in Section 6.4, the Project is estimated as a moderate emitter (440 kt $CO_2e$ per year). No GHG emissions summaries for operational crude oil pipelines or marine terminal complex could be found; therefore, no industry profile comparison was completed. Also, making direct comparison of emissions estimates from various types of crude oil transportation facilities is not considered appropriate as each facility is unique and various GHG estimation techniques can be applied. As the Project is considered a moderate emitter, a GHG management plan will be developed. Incorporation of best available technologies for energy efficiency into the design is recommended where feasible (as detailed in Section 6.4)."<br><br>6.5.4 Determination of Significance<br>"As identified in guidance provided by the CEA Agency on assessing climate change in environmental |

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| | assessments, "the contribution of an individual project to climate change cannot be measured". Therefore, evaluation of Project residual effects focuses on estimation of GHG releases, mitigation and evaluation of Project GHG releases in relation to federal and global GHG totals. As the effect on climate change from the contribution of a single project cannot be accurately measured or attributed, it is not reasonable to conclude a significant adverse residual effect on atmospheric GHG concentrations or climate change from a single project's GHG emissions. The characterization of the Project's residual effects in relation to GHG releases are as follows:<br>• direction is negative because the Project will emit GHGs during construction and operation<br>• magnitude is moderate. The Project is considered a moderate GHG emitter, requiring a GHG management plan to mitigate GHG releases. The average annual construction emissions, which include construction equipment and natural gas venting, are 386 kt $CO_2e$; these emissions are approximately 0.05% of national emissions relative to 2013 levels, and 0.001% of total global emissions, relative to 2012 levels. Project operation GHG emissions (440 kt $CO_2e$ per year) represent 0.06% of national emissions (in 2013) and 0.001% of total global GHG emissions (in 2012).<br>• geographic extent is the RAA. The effects of GHG emissions are not limited to any spatial boundaries and GHGs mix well in the atmosphere; therefore, the geographic extent is considered to be global. Most GHGs will require 100 years or more to chemically breakdown in the atmosphere. GHGs from construction of the Project will not continue after construction is completed.<br>• frequency is multiple regularly occurring events during construction and continuous during operation<br>• duration is permanent.<br>• reversibility- the effects of GHG emissions are determined to be irreversible within the next century, but reversible after chemically breaking down in the atmosphere.<br><br>As summarized above, releases of GHGs from the Project are expected to be relatively small in comparison to national and global emissions during construction and operation. Use of best practices is proposed to reduce releases of GHGs as much as practical during construction and operation (see Section 6.4). Based on the categories of emitters defined in Section 6.5.2, the Project is ranked as a moderate emitter for construction and operation. Therefore, a detailed GHG Management Plan is required and will be prepared by Energy East upon Project approval. |

The effects of Project releases of GHGs on atmospheric GHG concentrations and the residual effects of a change in climate from GHGs from the Project alone are rated not significant for construction and operation as the effect would not be measurable. Prediction confidence is high because, although the methods used for estimates are approximate and based on preliminary design information, the estimates are considered sufficiently accurate to evaluate and define the magnitude of GHG emissions from the Project (low, moderate or high emitter) and confidence is high that a significant effect on climate change from a single project would not occur."

**6.6 Cumulative Effects**

"This section considers the overall cumulative effect of Project GHG releases on climate change. Scientific consensus has been established that it is very likely that GHG emissions from anthropogenic sources are altering the global climate (IPCC 2013). As concentrations of GHGs in the atmosphere increase, there has been corresponding warming of the atmosphere, oceans, and related systems. The global atmospheric concentration of $CO_2$ was approximately 405 ppm in March 2016 (NOAA 2016). It has been established, and widely agreed upon in the scientific community, that concentrations above 450 ppm of $CO_2$ in the atmosphere would exert a substantial climatological effect on atmospheric and oceanic circulatory systems globally, and potentially incur serious environmental and socio-economic effects (IPCC 2013). The concentration of $CO_2$ has increased to unprecedented levels compared to the last 800,000 years, with documented consequences to climate systems (IPCC 2013); thus, it is recognized that there is already a potentially significant cumulative environmental effect from global GHG emissions on climate change.

It is acknowledged in the scientific community and amongst policymakers that no individual activity is responsible for global effects on climate due to GHG emissions. Instead, it is the multitude of GHG sources, sinks, and reservoirs around the world that contribute to the potentially significant global cumulative effect. The contribution of the Project on its own will be small in a global context (0.001%) and would not contribute measurably to climate change.

Adaptation to climate change has been identified as a required action in addition to mitigation of GHG emissions (reducing emissions), on the basis that globally the current trajectory of global annual and

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| | cumulative emissions of GHGs is inconsistent with estimated reduction targets required to control global warming (IPCC 2013b). Adaptation experience is accumulating across regions in the public and private sector and within communities. Governments at various levels are starting to develop adaptation plans and policies and to integrate climate-change considerations into broader development plans to reduce the effect of climate change on natural systems and built infrastructure. Adaptation and mitigation choices in the near term will affect the risks of climate change throughout the 21st century (IPCC 2013b).<br><br>Project design and operation will comply with GHG emission programs and policies federally as well as in each province in which it has operations and should incorporate mitigation of GHG releases where feasible (Section 6.4)."<br><br>**6.7 Monitoring and Follow-up**<br>"As noted above, the Project is predicted to release quantities of GHGs such that federal and/or provincial reporting of GHG emissions may be required (to be confirmed during operation). Energy East has the responsibility to quantify GHG emissions in accordance with the regulations in force and report emissions when required.<br><br>As a moderate level emitter of direct GHG emissions, Energy East is responsible for developing a GHG Management Plan in accordance with the CEA Agency guidance." |

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| Discussion on mitigation action | Will develop a GHG Management Plan… but what does that really entails? And it will be only be prepared once the project is accepted, so not even considered by the NEB for the EA process. Therefore, very limited mitigation actions provided and there is no way of knowing how much or in what way these mitigation actions are actually planning to reduce GHG emissions resulting from the project. |
| Discussion on adaptation (project and environment) | Mention of adaptation, but only a general conversation in how climate change is best addressed by mitigation and adaptation actions taken together. No concrete example of how climate change adaptation measures are integrated into this project. Considerations of extreme/severe weather events, but no mention of consideration of extreme/severe weather events that would be resulting from climate change. Using information from historical data and past projects and not projected climate change impacts. |
| Recommendations on mitigation/adaptation | |
| Finale decision influenced by cc considerations | |
| QUESTIONS! | |
| Comments and Observations | |

| | VOLUME 21: ENVIRONMENTAL PROTECTION PLAN FOR THE EE PIPELINE LTD.<br>EE PIPELINE PROJECT – NEW PIPELINE |
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| Key words identified | Greenhouse/GHG; emissions; weather |

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| Discussion on CC | "8.0 PIPELINE CONSTRUCTION<br>8.1 General Environmental Protection Measures<br>Introduction<br>The general environmental protection measures provided below are applicable to all work areas throughout the construction phase. These general measures are followed by detailed specifications for each phase of new pipeline construction.<br><br>Objective<br>The objectives of these mitigation measures are to avoid and reduce the potential negative environmental effects associated with general pipeline construction activities.<br>…<br><br>Specific Measures<br>Activity/Concern: *Atmospheric Environment and <u>Greenhouse</u> Gases*<br>Mitigation Measures:<br>□ 23. Vehicles and equipment will be turned off when not in use, unless weather and/ or safety conditions dictate the need for vehicles and equipment to remain turned on and in a safe operating condition.<br>□ 24. Vehicle and equipment idling times shall not exceed one hour when temperature is between 25˚ C and 5˚ C, which will allow workers to have a comfortable rest location and address safety issues with working under more extreme conditions.<br>□ 25. Vehicle and equipment engines will be properly maintained according to the manufacturer's specifications.<br>□ 26. Burning of construction debris or refuse will not be permitted unless permits or approvals are granted. Where timber or brush is going to be burned the appropriate permits and approvals will be obtained.<br>□ 27. The Company and its Contractor's commitment to minimizing un-wanted emissions and specific mitigative requirements will be communicated to Project personnel in the Project kick-off meeting, site orientations, daily meetings as required, Project environmental handbook and Environmental |

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| | Protection Plan.<br>□ 28. Where practical, use multi-passenger vehicles for the transport of crews to and from job sites.<br>…<br><br>Activity/Concern: *General Topsoil Salvage Requirements*<br>Mitigation Measures:<br>…<br>□ 10. A soils specialist will be available as needed to work with the Environmental Inspector(s), inspection team and Contractor to address soils resource issues as they may arise during topsoil stripping operations, as well as during adverse weather conditions to ensure the soils resources are protected and equivalent land productivity is maintained.<br>…<br><br>Activity/Concern: *Topsoil Stockpile Erosion Control*<br>Mitigation Measures:<br>…<br>□ 17. Should high winds or heavy rains damage the tackifier during construction, the Environmental Inspector(s), in consultation with the Construction Manager, may implement contingency measures as outlined in the Adverse Weather Contingency Plan (Appendix F).<br>…<br><br>Activity/Concern: *Adverse Weather*<br>Mitigation Measures:<br>26. In the event of adverse weather that could result in rutting and/or compaction, the Environmental Inspector(s), in consultation with the Construction Manager, may implement contingency measures as outlined in the Adverse Weather Contingency Plan (Appendix F). A soils specialist and/or regulatory personnel may be consulted.<br>27. Following an adverse weather event, the Contractor will confirm the efficacy of sediment and erosion control measures and whether corrective action is required. The Environmental Inspector(s), in consultation with the Construction Manager will implement contingency measures as outlined in the |

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| | Adverse Weather Contingency Plan (Appendix F).<br>28. Where poor weather conditions and Project activities have the potential to cause increased sedimentation, modify or suspend the construction stage until weather conditions abate or effective mitigation procedures have been implemented and follow the Adverse Weather Contingency Plan (Appendix F).<br>…<br><br>Activity/Concern: *Adverse Wea*<br>Mitigation Measures:<br>…<br>□ 8. Monitor weather reports and watercourse flow before beginning construction to determine if no risk of heavy precipitation exists for the expected duration of the work. The construction schedule should be modified in accordance with local weather and site conditions to the extent practical.<br>…<br><br>Activity/Concern: *Topsoil/Strippings Replacement*<br>Mitigation Measures:<br>…<br>30. Postpone replacement of topsoil/strippings during wet weather or high winds to prevent erosion and/or damage to the soil structure.<br>…<br><br>Activity/Concern: *Seeding and Revegetation*<br>Mitigation Measures:<br>…<br>46. Seeding will follow as close as possible to final clean-up and topsoil/surface material replacement pending seasonal or weather conditions.<br>…"<br><br>"9.0 POST-CONSTRUCTION MONITORING |

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| | …<br>Process<br>The Project will follow Energy East's Post-Construction Monitoring Program (PCMP), which ensures compliance with specific reclamation performance expectations and conditions, as well as addresses the requirements of any follow-up program under the Canadian Environmental Assessment (CEA) Agency. Mitigation methods will be based on the principle that success of land reclamation is measured against adjacent representative site conditions while taking into consideration the status of reclamation of the time of assessment.<br><br>Preliminary assessments are conducted during the most appropriate time of the season, which depends on the various biophysical resources and their growth stage or life cycle. This is usually in the spring/summer, and involves identifying deficiencies and proposing recommendations for corrective actions.<br><br>The program will entail specifically designed evaluation criteria depending on the concerns and issues that were highlighted through the ESA, or encountered during the construction process. Seasonal influences and/or species life cycle or habitat periods may require evaluations to be conducted during specific periods throughout the year.<br><br>Deficiencies discovered or opportunities for enhancement will result in developing proposed recommendations for corrective actions. The remedial actions are to be implemented as soon as practical during the most appropriate season, preferably summer, but may be outside this timing window due to environmental timing restrictions (reproductive periods, migration periods), field and weather conditions, or social and public concerns. A final assessment would then be scheduled for the fall, or as deemed appropriate to ensure the remedial actions are stable and successful."<br><br>…<br>APPENDIX F – CONTINGENCY PLANS<br>2.0 ADVERSE WEATHER CONTINGENCY PLAN<br>"The Environmental Inspector(s) is responsible for monitoring and implementing all procedures and will |

liaise with the appropriate regulatory agencies, when required. If necessary, a meeting will be held in the field to ensure that all involved parties mutually understand concerns.

Where adverse weather conditions and activities have the potential to cause adverse environmental effects, the Environmental Inspector(s) will suspend that phase of the operation until weather conditions abate or effective mitigation procedures have been implemented. The following represents mitigative measures that may be applied. Specific environmental mitigation is subjective and dependent upon specific right-of-way conditions and the Project schedule.

The following table outlines mitigative measures that allow for the continuation of activities and reduce potential adverse environmental effects.

**WIND EROSION**

**Mitigation Options to Consider**

1 Uniformly apply mulch or tackifier to topsoil/strippings piles and/or other areas affected by wind erosion.

2 Water identified areas when activities or sufficient winds have created the potential for topsoil/strippings erosion.

3 Apply straw to topsoil/strippings and/or other areas where winds have created the potential for soil erosion. Straw sources are subject to landowner or regulatory approval, and must be approved by the Environmental Inspector(s). When clean straw is unavailable, seeding a clean, unpalatable annual crop at half the normal rate is acceptable.

**WATER EROSION**

**Temporary Berms / Silt Fence**

1 Temporary berms, silt fence and/or other appropriate mitigative measures (e.g., wattles, erosion control matting) will be implemented along the trench crown, surface material piles, and/or other areas where the potential for water erosion has been identified.

2 To prevent ponding and/or erosion, cross right-of-way drainage will be maintained. Appropriate measures (e.g., sumps, pumping excess water) to prevent deleterious material

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| | from entering a watercourse will be implemented, when and where required.<br>**Right-of-way Maintenance / Stabilization**<br>1 During adverse weather conditions, Energy East will direct the Contractor to reduce unnecessary traffic and the number of vehicles on the right-of-way. Better planning of activities will be required by the Contractor to either tighten up, or spread out the work crews as warranted (e.g., close proximity of ditching, lower in, and backfill operations). To reduce effects, a one trip in, one trip out philosophy will be implemented for all right-of-way access.<br>2 Traffic will be restricted to the right-of-way. The appropriate regulatory agency will need to approve any off right-of-way activities.<br>3 The traffic pattern on the right-of-way will be changed to avoid repeated driving in the same areas.<br>4 Under adverse weather conditions, the Contractor will be required to back-blade the right-ofway during and at the end of the day. Back-blading of the right-of-way fills in tire tracks, thereby assisting in the prevention of water erosion and re-establishing a firm working right-of-way surface.<br>5 Under adverse weather conditions, topsoil/surface material and/or subsoil may be stripped and placed at the edge of the right-of-way if approved by the Environmental Inspector(s). Topsoil, surface material and/or subsoil will be redistributed evenly across the right-of-way during clean-up.<br>6 Under spring thaw condition and/or where identified by Energy East, and in consultation with the appropriate Regulatory Representatives, vehicle watercourse crossing techniques may be modified and/or replaced with other appropriate crossing techniques.<br>7 When available and practical, tracked equipment may be required for specific activities.<br>8 Work in highly sensitive areas may be stopped and shifted to less sensitive areas.<br>9 If all mitigation fails, Project activities may be suspended until adverse weather conditions abate, thereby incurring a schedule delay. Project shut-down will be based upon discussions between the Construction Manager, Contractor, Environmental Advisor and the appropriate regulatory agencies. Recommencement of work must be authorized by the Construction Manager, in consultation with the Environmental Inspector(s) prior to restart. |

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| | 3.0 FLOOD AND EXCESSIVE FLOW CONTINGENCY PLAN<br><br>"The weather conditions will be monitored by the Environmental Inspector(s) on a daily basis. If a major storm is predicted or occurs, qualified personnel will inspect all watercourse crossings where construction is in progress or has been completed, to determine whether any corrective actions need to be implemented.<br><br>The appropriate regulatory agencies will be notified when required, as soon as practical, by the Environmental Inspector(s) or Construction Manager, that contingency measures have been implemented (see Appendix B of this EPP).<br><br>At watercourses where an isolated crossing method is recommended, the proposed isolation crossing techniques may not be feasible during periods of excessive flow or unusually wet seasons.<br>The following contingency measures will be implemented progressively or individually, as warranted, if excessive flow or flood conditions are anticipated prior to commencing watercourse crossing construction.<br>1. Assess the capability to handle the expected flow rate with the proposed crossing method. If use of the proposed crossing method is determined to be feasible by Energy East, the crossing will proceed.<br>2. Defer water crossing construction to a later time when flows have subsided, if it is determined by Energy East that the proposed crossing method is not feasible.<br>3. Alternatively, where the expected flow rates and window limitations combine to preclude the proposed crossing method, request approval from the appropriate regulatory agencies to use an alternate crossing method.<br><br>The following contingency measures will be implemented progressively or individually, as warranted, if excessive flow or flood conditions should occur during watercourse crossing construction.<br>1. Assess the capability to handle the anticipated flow rate with the proposed crossing method. If use of the proposed crossing method is determined to be feasible by Energy East, the crossing will proceed.<br>2. Increase the quantity of materials required to perform the crossing. Reinforce or replace the isolation and/or bypass structure(s) if necessary.<br>3. Withdraw all equipment or tanks containing fuel, oil or other hazardous materials from potential flood |

areas.
4. Remove all stationary and mobile equipment deployed at the crossing site to a safe area above the anticipated high water level.
5. Remove any instream flume or dam equipment that may impede streamflow, as safe work conditions allow.
6. Relocate all topsoil/strippings piles at the direction of the Environmental Inspector(s).
7. Relocate spoil piles, to the extent feasible, to a position above the anticipated high water level.
8. Evaluate vehicle crossing structure to determine whether adequate free-board is present on bridges and adequate capacity is available in culverts. Take corrective measures as appropriate to avoid flooding of adjacent lands.
9. Import sandbags and place strategically to help stabilize and add height to banks to prevent flooding of nearby areas, especially where vegetation has been removed."

"8.0 CONTAMINATED SOILS CONTINGENCY PLAN

During these activities, it is possible that soil (and accompanying water) suspected of contamination from known or unknown sources might be encountered. The purpose of this contingency plan is to set out the recommended steps for consistent, safe and environmentally responsible handling of contaminated soil (and accompanying water).

The following mitigation will be implemented for known and unknown contaminated sites.
…
Concern: *Unknown Contaminated Sites*
Mitigative Options: …
9. Energy East's Contractor will secure the area and any suspect excavated soil, and any unnecessary contact/disturbance of the soil will be avoided. Potential securing methods include:
• placing the excavated soil on a impervious liner
• covering the excavated soil with an impervious membrane to isolate it from weather events"

"14.0 EROSION AND SEDIMENT CONTROL PLAN

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| | The Erosion and Sediment Control Plan addresses conditions encountered during construction and post construction, where applicable for Pump Stations. The effective use of sediment and erosion control measures during construction is dependent upon timely intervention by:<br>• anticipating conditions that initiate the response; and<br>• responding to the event.<br><br>The mitigative measures in the following sections have been developed and will be employed to meet the following objectives:<br>…<br>• To ensure preventative measures are implemented where weather events threaten the integrity of erosion and sediment control measures employed on the Project;" |

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| Discussion on mitigation action | |
| Discussion on adaptation (project and environment) | |
| Recommendations on mitigation/adaptation | |
| Finale decision influenced by cc considerations | |
| QUESTIONS! | |
| Comments and Observations | No mention if these weather events were identified based on historical data (which from previous volumes it seems to be) and if they include considerations of cc projected impacts. These weather events do not seem to consider adaptation measures as part of their contingency plan for their project. |

| | VOLUME 22: TECHNICAL DATA REPORTS<br>GREENHOUSE GAS TECHNICAL DATA REPORT |
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| Key words identified | Greenhouse/GHG; emissions; climate change. |

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| Discussion on CC | "1. INTRODUCTION<br>The Project consists of a pipeline that will transport crude oil products from Hardisty, Alberta, with additional oil products received from Saskatchewan, to refineries in Quebec and New Brunswick, and a marine terminal in New Brunswick. Associated infrastructure includes tank terminals in Alberta, Saskatchewan and New Brunswick, and pump stations across the extent of the Project route.<br><br>The expected emissions from the Project of GHGs are described in this report. A GHG is any gas that contributes to climate change. Common GHGs, including those specified in some regulatory jurisdictions, are carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide ($N_2O$), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride ($SF_6$), and nitrogen trifluoride ($NF_3$). HFCs and PFCs are used mainly as refrigerants, $SF_6$ is commonly found in electrical equipment, and $NF_3$ is used in the plasma etching of silicon wafers. The Project will not use refrigerants or $NF_3$, and any electrical equipment that contains $SF_6$ will be subjected to periodic monitoring for leaks, therefore these GHG species are not included in the quantification the Project's GHGs emissions.<br><br>Greenhouse gases absorb heat radiated by the earth and subsequently warm the atmosphere, leading to what is commonly known as the "greenhouse effect". The degree of warming attributed to specific chemical compounds is characterized as the global warming potential (GWP), relative to carbon dioxide. The discussion below uses GWPs from the IPCC Fifth Assessment Report; these are 1, 25, and 298 for $CO_2$, $CH_4$ and $N_2O$, respectively (IPCC 2013). Because GHGs contribute differently in terms of the "effect" to the greenhouse effect, the unit of tonnes of carbon dioxide equivalent (t $CO_2e$) is used to express the total quantity of GHGs, weighted according to the specific gases. The unit of t $CO_2e$ is calculated by multiplying the tonnage emission of each GHG by its global warming potential (i.e., tonnes of $CH_4$ are multiplied by 25), and then summing the contributions from $CO_2$, $CH_4$ and $N_2O$.<br><br>1.1 Purpose<br>The purpose of this TDR is to further describe the existing conditions of GHGs in the domain of the Project (provinces and Canada) as well as the estimates of GHG releases expected from the Project. This TDR supplements the information and findings of the Consolidated ESA, including the details of the methodology used to collect and calculate GHG related information. |

1.2 Spatial Boundaries
The release of GHGs to the atmosphere may cause effects that are different from other regulated air contaminants. The effect of GHG releases on the atmosphere is not limited to the specific airshed where they are emitted; rather they contribute cumulatively to global climate change. The spatial boundaries described in Volume 20, Section 6 (Greenhouse Gases) are large and include releases of GHGs considered on a provincial, national (Canada), and global scale.

2 METHODS
Existing data from recognized sources (listed in Section 2.1) characterize historical GHG emissions in the provinces, nationally, and on a global scale. The GHG emissions for the Project were estimated using methodologies and emission factors from the United States Environmental Protection Agency (U.S. EPA), Intergovernmental Panel on Climate Change (IPCC), and Environment Canada, and as used and developed in previous environmental assessments for other projects. The following sections describe the specific data sources further.

2.1 Existing Data Sources
Information on existing provincial and national GHG emissions was obtained from the Environment Canada National Inventory Report for 2013 (Environment Canada 2015a) as well as the federal GHG Reporting Program (Environment Canada 2015b). Information on global GHG emissions was obtained from the World Climate Institute Climate Analysis Indicator Tool (World Resources Institute 2015). These resources provided the most recent published data available as of December of 2015.

2.2 Calculation Methodologies
The methodologies for estimating GHG emissions from construction and operation of the Project are described in the sections below. An example of each completed calculation is provided in Appendix A."

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[This report is mainly technical information to explain the numbers presented throughout the other volumes of the consolidated application. They focus solely on the construction and operation phase of the

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| | project, without mention of the general impact over GHG emissions from the crude oil extracted and/or discussing adaptation measures in regard to climate change impacts.] The entire volume could be cited in this table, because it is all relevant to climate change and GHG emissions, but it offers little or no new information that was not already presented earlier in regard to climate change considerations for the project (it simply offers the methodology followed to obtain the GHG emission numbers that were presented in earlier volumes of the consolidated application of the Energy East project). This is an important volume that provides valuable information to understand the calculations and methods used to get the GHG emissions estimated for the project. Such details and information is very helpful in assessing an EA application and demonstrates thorough considerations of various factors. However, it still ignores the important issue of the general contribution of the crude oil transported to GHG emissions and the general climate change situation. Additionally, it does not provide adaptation measures which have been said to go hand in hand with mitigation measures in regard to climate change responses. |

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| Discussion on mitigation action | |
| Discussion on adaptation (project and environment) | |
| Recommendations on mitigation/adaptation | |
| Finale decision influenced by cc considerations | |
| QUESTIONS! | |
| Comments and Observations | |

## APPENDIX 2 – FIGURE 1: MAP OF THE PROPOSED ENERGY EAST PIPELINE PROJECT

### Figure 1: Map of the Proposed Energy East Pipeline Project

Source: National Energy Board, Feb 2016, online at: <http://www.neb-one.gc.ca/pplctnflng/mjrpp/nrgyst/mg/mp-eng.pdf>, accessed 6 June 2016.