CENTRE QUÉBÉCOIS DU DROIT DE L'ENVIRONNEMENT

NEB Modernization under the Climate Test

Partie III du rapport

Des oléoducs à la transition énergétique : approche de droit comparé pour alimenter une modernisation innovatrice de l'Office national de l'énergie

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This report is the third part of the Centre québécois du droit de l'environnement (CQDE)'s report to Natural Resources Canada entitled "Des oléoducs à la transition énergétique : approche de droit comparé pour alimenter une modernisation innovatrice de l'Office national de l'énergie. The first two parts, written in French, are in a separate document."

Founded in 1989, the CQDE aims to raise awareness and make accessible the legal tools necessary for organizations and citizens to defend their rights and ensure the implementation of environmental law in Quebec. It is the only organization that offers independent expertise in issues pertaining to environmental law in Quebec, and that gives citizens access to justice in environmental matters.

This report had to be compiled under severe time constraints. As a result, the analysis and recommendations are inevitably preliminary and subject to refinement upon further analysis.

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1. CONTEXT OF THE REPORT AND PRELIMINARY REMARKS

In Paris, our federal government promised the world that Canada would do its fair share to avoid dangerous disruption to the global climate by staying well below a global 2°C temperature increase (while pursuing efforts to limit the temperature increase to 1.5°C). This document contains recommendations to help the government fulfill this commitment through improving the way Canada evaluates new infrastructure projects and projects currently under review.

The exclusion or overly narrow consideration of climate change in recent pipeline reviews is one key reason for the crisis of confidence that shook the National Energy Board (NEB) and highlighted the need for modernization. Clearly, moving forward, assessment and decision making processes will have to include a rigorous consideration of climate in pipeline projects' assessment, approval and regulatory processes – and indeed for all projects associated with the hydrocarbon sector and other sectors with significant GHG emissions, especially major infrastructure projects.

The federal environmental assessment (EA) reform process has been an opportunity to explore opportunities for integrating climate considerations within EA processes. Indeed, important aspects of climate change need to be addressed through strategic EA and is subject to emerging federal policy development. We endorse by reference the preliminary recommendations of the report submitted by the EPA Caucus of the CEN to the CEAA Expert Panel[2] and take this opportunity to dive deeper into some of the concepts and develop them in the specific context of the NEB modernization efforts.

This part of the report will canvass the integration of climate considerations into an overall public interest determination and tools for assessment of the climate impact of a proposed project, such as scoping and analysis of climate effects. We propose an expanded information mandate for the NEB through the creation of a National Energy Transition Information Administration.

It bears stating that no ultimate best practices were identified in the international sources canvassed. Therefore, this report exposes elements of "best so far " but all approaches can be criticized as inadequate and indeed have been. International, governmental, or consensus-based sources such as the International Energy Agency (IEA), Intergovernmental Panel on Climate Change (IPCC) or the American Interagency Working Group on Social Cost of Carbon have been criticized as too conservative. For a variety of reasons that differ from organization to organization, the scale of the problem tends to be underestimated, a fact that is often highlighted in their subsequent reports. However, these institutions provide science with a degree of political consensus behind it and so provide value in terms of credibility. We rely on these sources as a "consensual minimum" to build upon.

This report does not offer a detailed assessment of the current approach to climate change

[2] Find attached as Annex 1 the EPA Caucus submission *Achieving a Next Generation of Environmental Assessment* (December 2016) specifically Theme 8 on Incorporating Climate change in EA.

of the NEB and Environment and Climate Change Canada (ECCC) under CEAA 2012, the current NEB Act, or the interim measures. The focus of the report is on how to effectively integrate climate change into federal decision-making in the energy sector.

This report had to be compiled under severe time constraints. As a result, the analysis and recommendations are inevitably preliminary and subject to refinement upon further analysis.

2. ROLE OF NEB IN THE BROADER CONTEXT OF ENVIRONMENTAL ASSESSMENT REFORM

We recommend significant changes to the role of the NEB. This report endorses the proposition that prior strategic environmental assessments, regional environmental assessments and project environmental assessments in the proposed new regime address the big picture issues, including the role of greenhouse gases (GHG) emissions in project decision-making. We recommend that the NEB not be in charge of any REAs, SEAs or project EAs for pipelines or other energy infrastructure. The core responsibility of the NEB should be to implement the EA project decision, to effectively regulate approved projects and to provide information to the various EA processes through the National Energy Transition Information Administration (NETIA).

Therefore, many of the proposals put forward in assessing the climate impacts of projects will be most relevant to the EA Authority, but also for the NEB who would be called upon to provide information to the EA processes through NETIA, and to consider climate in the regulatory process which would follow approval.

The pipeline lifecycle regulatory functions of the NEB would continue to rest with the NEB for approved projects. EA is a planning tool and precedes the regulatory process, and the NEB's regulatory process should focus on implementing the recommendations of the EA and addressing the more technical aspects of the project. The EA process would first determine at a strategic level what sorts of energy projects are in the national public interest broadly speaking in light of a full range of social, environmental and economic considerations, including our international climate commitments. Project EA's would assess the specific GHG emissions associated with proposed projects, the impact of those emissions on provincial, national, regional and global climate goals and feed that information and analysis into an overall assessment of whether the project will make a net contribution to sustainability. The NEB's regulatory process would only apply in case of a positive recommendation from the EA process and project approval by government. The NEB would likely implement conditions coming out of the EA process, and do its own technical and safety assessment to identify additional terms and conditions. On the climate side, it would likely implement, monitor, report on compliance, oversee GHG reporting obligations, impose and oversee emission reduction efforts and continuous improvement, and impose and oversee offset obligations.[3]

In Part I of this report, we propose that the information component of the NEB mandate be implemented through a National Energy Transition Administration, an independent

[3] See EPA Caucus submission to EE expert panel, December 2016 *supra* note 1 for details of "monitoring and follow up "

institution, separate from the regulatory process, which would be tasked with conducting fundamental research and public information on key challenges of the energy transition in Canada. This institution would provide accurate and credible information to EA processes at all levels in the form of transparent models for the transition and could be called upon to provide analysis in the context of specific projects.

3. DETERMINING PUBLIC INTEREST IN AN ERA CONSTRAINED BY THE FIGHT AGAINST CLIMATE CHANGE

3.1. International Developments on the Energy and Climate Nexus: Decarbonization

Energy is both fundamental for the development of human societies and the source of the greatest threat to the survival and wellbeing of these societies, climate change[4]. Citizens, governments, and courts are increasingly responding to this challenge with efforts to bring about an energy transition of the grandest scale.

The *Paris Agreement*, adopted in December 2015 at the 21st Conference of the Parties (COP21) to the United Nations Framework Convention on Climate Change (UNFCCC), was a clear recognition by the international community that much remains to be done to avoid dangerous climate change. Over 195 countries representing 97% of global GHG emissions agreed to strengthen the global response to the threat of climate change. The Agreement came into force on November 4, 2016.

The Canadian government played a constructive role during the 21st Conference of the Parties negotiations in Paris in 2015, in contrast to previous governments. Canada supported a reference to striving for 1.5°C above pre-industrial levels as the ultimate temperature goal of the UNFCCC[5]. Parties have now committed to "holding the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels".[6] In order to achieve this goal parties aim to:

> Reach global peaking of greenhouse gas emissions as soon as possible, **recognizing that peaking will take longer for developing country Parties**, and to undertake rapid reductions thereafter in accordance with best available science, so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century, on the basis of **equity**, and in the context of

[4] The Intergovernmental Panel on Climate Change has produced five assessment reports on the state of knowledge on climate change. See for example IPCC, 2014: 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 [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp.

[5] *See* Mychaylo Prystupa, *Trudeau Fights to Keep Indigenous Rights in Paris Climate Deal*, Nat'l Observer, Dec. 7, 2015, http://www.nationalobserver.com/2015/12/07/news/trudeau-fights-keep-indigenous-rights-paris-climate-deal; *see also* Bruce Cheadle, *COP21: Catherine McKenna Endorses Goal of Limiting Warming to 1.5* °C, CBC News, Dec. 8, 2015, http://www.cbc.ca/news/politics/mckenna-cop21-paris-goal-1.3355409.

[6] *The Paris Agreement*, 22 April 2016, UNTS art 2 (entered into force 4 November 2016) [*Paris Agreement*].

> sustainable development and efforts to eradicate poverty. [...]
>
> Each Party's successive nationally determined contribution will represent **a progression beyond the Party's then current nationally determined contribution and reflect its highest possible ambition**, reflecting its **common but differentiated responsibilities and respective capabilities, in the light of different national circumstances.**
>
> **Developed country Parties should continue taking the lead by undertaking economy-wide absolute emission reduction targets** [...][7] (emphasis added)

On the whole, this means developed countries have to decarbonize more rapidly while the global community needs to reach net zero GHG emissions by 2050 to meet the stated goals of the *Paris Agreement*. Further, it specifies that more than current commitments from parties are required to reach the temperature goals. Indeed, the conference of the parties to the Agreement:

> (17) Notes with concern that the estimated aggregate greenhouse gas emission levels in 2025 and 2030 resulting from the intended nationally determined contributions do not fall within least-cost 2 ℃ scenarios but rather lead to a projected level of 55 gigatonnes in 2030, and also notes that much greater emission reduction efforts will be required than those associated with the intended nationally determined contributions in order to hold the increase in the global average temperature to below 2 ℃ above pre-industrial levels by reducing emissions to 40 gigatonnes or to 1.5 ℃ above pre-industrial levels by reducing to a level to be identified in the special report [to be provided by the Intergovernmental Panel on Climate Change in 2018 on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways] 8

There are still very few studies that have assessed Canada's fair share of global emission reductions efforts under different scenarios involving the ultimate temperature target and reasonable effort-sharing principles. Much depends on assumptions about negative emissions opportunities in the future and equity principles to guide the allocation of benefits and burdens of this transition. Regardless of how these issues are resolved, the implications for Canada are stark: one study indicated reductions ranging from 90–99% would be necessary by 2030 for a 1.5C world based on a conservative effort-sharing principle. Taking a fair-share approach based on equal cumulative per capita emissions towards limiting temperature rise to 2ºC has a similar effect of requiring Canadian emissions to be near zero by 2030. Attempting to do its fair share towards a 1.5ºC goal would leave Canada with a carbon budget that would be exhausted within a few years[9]. Therefore, our existing

[7] *Paris Agreement* art 4.
[8] *Paris Agreement* preamble.
[9] Dr. Simon Donner & Dr. Kirsten Zickfeld, Canada's Contribution to Meeting the Temperature Limits in the

nationally determined contributions (NDCs) need to be viewed as a floor (not a ceiling) as Canada's commitments under Paris require it to pursue every opportunity to accelerate decarbonization, given economic, social and technical constraints.

Even before the *Paris Agreement*, at least one national court in a developed country had already concluded on the existence of a national legal duty to take actions to "stabiliz[e] greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system"[10] knowing that "such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner."[11] Developed countries like Canada have agreed to common but differentiated responsibilities, understood as including notions of responsibility for historic emissions and per capita emissions.[12] The *Paris Agreement* adds to these factors "respective capabilities" and "national circumstances".

In 2015, the Urgenda Foundation and 886 individual Dutch citizens prevailed at trial in their claim seeking to hold the Netherlands liable for its role in causing dangerous global climate change. The district court of The Hague sided with Urgenda making it the first instance in which a national court used principles from the UNFCCC regime to order a State to adopt an emission reduction target in accordance with IPCC recommendations.[13]

3.2. Emerging Duty to Transition Away from GHG Intensive Fossil Fuels

Since then, a number of specific development projects have been challenged in court on the basis of the diminishing carbon budget, unburnable carbon, and the recognition in the *Paris Agreement* that signatory countries aim to reach global peak GHG emissions as soon as possible[14] and that the world is off-course to remain within pathways to keep the climate safe. Courts are starting to enforce the additional efforts necessary where national governments have been unable to do so.

The carbon budget approach was applied in the IPCC's latest and 5th assessment report. The carbon budget is the total amount of CO_2 that can be emitted in the atmosphere between now and 2100 in order to not overshoot the "safe" temperature threshold of 2 °C with different probabilities of success.[15] Defining dangerous climate change in terms of an absolute quantity of GHGs implies absolute limits of the quantity of exploitable hydrocarbons on Earth since proven reserves far exceed

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Paris Climate Agreement (2016), online: <http://blogs.ubc.ca/sdonner/files/2016/02/Donner-and-Zickfeld-Canada-and-the-Paris-Climate-Agreement.pdf>.

[10] *United Nations Framework Convention on Climate Change,* 9 May 1992, 1771 UNTS 107, 31 ILM 849 art 2 (1992) (entered into force 21 March 1994) [*UNFCCC*], https://unfccc.int/resource/docs/convkp/conveng.pdf; *see also* Urgenda, *Urgenda Foundation v. State of the Netherlands—Legal Documents*, http://www.urgenda.nl/en/climate-case/legal-documents.php (last visited Aug. 24, 2016).

[11] *Ibid.*

[12] Roger H.J. Cox, *The Liability of European States for Climate Change*, 30 Utrecht J. Int'l & Eur. L. 125, 133 (2014).

[13] The Hague District Court (Chamber for Commercial Affairs), June 24, 2015, C/09/456689 / HA ZA 13-1396 (English translation), http://www.urgenda.nl/documents/VerdictDistrictCourt- UrgendavStaat-24.06.2015.pdf.

[14] *Paris Agreement* art 4.

[15] IPCC AR5 *Summary for Policy Makers,* 2013 at 27, online: <http://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_SPM_FINAL.pdf>.

the total atmospheric budget. The concept of unburnable carbon designates these hydrocarbons that cannot be used if we aim to avoid the risks of dangerous climate change. According to an article in Nature estimating proportions of fossil fuels from different types of productions internationally which should stay in the ground if we are to have 50% chance of avoiding 2 C of warming, 74 to 99% of Canadian oil needs to remain unexploited.[16] It is noteworthy that this study was based purely on economics. It is difficult to envisage how fossil fuel extraction in a developed country like Canada would fare better if equity, historical responsibility or other environmental factors were taken into account under the UNFCCC and art. 4 of the *Paris Agreement* reproduced above. In February 2017, a court in Norway allowed a case challenging new oil drilling permits in the Barents Sea in the arctic region to proceed to the merits on this basis.[17]

A week earlier, Austria's Federal Administrative Court had struck down the government's approval of a third runway at the Vienna airport, holding that it "would do more harm to the public interest than good, primarily because it would be contrary to Austria's national and international obligations to mitigate the causes of climate change. "[18] The court reviewed evidence of expected changes in air traffic, emissions impacts, national climate impacts, possible mitigation measures, economic benefits, national and regional efforts to reduce emissions and concluded that expected emissions increases were incompatible with national transport sector reductions targets, observing that "short-term gains in the form of commerce or jobs were easily outweighed by the likely economic consequences of a destabilized climate. "[19]

In March 2017, the South African Department of Environmental Affairs (DEA) was obliged by a court to consider climate change impacts of a proposed coal power station before granting authorisation. Because of its failure to do so, the prior approval was quashed and the DEA will have to produce a climate change impact assessment.[20] In South Africa, proposals for new coal power stations must be authorized by the pursuant to the National Environmental Management Act (NEMA).[21] Specifically, s.24(1) of NEMA requires competent authorities to "take account of all relevant factors" when making their decision to approve a proposal, including any pollution, environmental impacts, or degradation that are "likely to result", but there is no express stipulation requiring a climate change assessment in any domestic legislation.

Environmental impact statements of fossil fuel developments that fail to account for climate

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[16] McGlade & Ekins, The geographical distribution of fossil fuels unused when limiting global warming to 2 C, Nature (2015) vol 517 pp. 189-199.

[17] Sune Scheller, "Comment: Norway's Arctic oil approvals fly in the face of *Paris Agreement*", *Energydesk Greenpeace* (18 October 2016), online: <http://energydesk.greenpeace.org/2016/10/18/norwegian-government-legal-challenge-arctic-oil-drilling/>.

[18] Justin Gundlach "No 3rd Runway at Vienna Airport because Adverse Climate Impacts Outweigh Short-Term Economic Benefits: Austrian Court" (10 February 2017), Sabin Center for Climate Change Law (blog), online: <http://blogs.law.columbia.edu/climatechange/2017/02/10/no-3rd-runway-at-vienna-airport-because-adverse-climate-impacts-outweigh-short-term-economic-benefits-austrian-court/>.

[19] *Ibid.*

[20] *Earthlife Africa Johannesburg v The Minister of Environmental Affairs* [2017] (S Afr HC) at para 126, (s.31(2) NEMA) online: <http://cer.org.za/wp-content/uploads/2017/03/Judgment-Earthlife-Thabametsi-Final-06-03-2017.pdf>.

[21] *Ibid.* at para 2

impacts are increasingly struck down by courts in the United States, especially when it comes to a failure to include emissions linked with the downstream ultimate combustion of the fuels extracted or transported. In the last few years, over a dozen court cases have been filed in the U.S. challenging the approval of fossil fuel extraction and infrastructure projects, more specifically for coal[22], oil and gas[23] because the lead agency failed to consider upstream and/or downstream greenhouse gas emissions during its NEPA review.[24] An Australian court similarly rejected an assessment that did not include downstream emissions, reasoning that such an omission harms the assessment goals of ensuring intergenerational equity and overlooks the need to assess cumulative impacts and to inform decision makers of all relevant matters.[25]

Needless to say, the timing for engaging in research on the proper consideration of climate in hydrocarbon infrastructure projects such as pipelines recommended and regulated by the NEB is timely.

3.3. Human Rights implications of climate change

The United Nations Human Rights Council has issued six resolutions recognizing the harmful effects of climate change on human rights based on rights enshrined within the Universal Declaration on Human Rights, the International Covenant on Civil and Political Rights, and the International Covenant on Economic, Social, and Cultural Rights.[26] Reports on the topic have also been published by the Office of the High Commissioner for Human Rights (OHCHR) which highlight that climate change causes sea-level rise and extreme

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[22] *High Country Conservation Advocates* v. *United States Forest Serv.*, 52 F. Supp. 3d 1174 (D. Colo. 2014) (USFS must consider downstream emissions from coal combustion); *Dine Citizens Against Ruining Our Env't* v. *United States Office of Surface Mining Reclamation & Enf't*, 82 F. Supp. 3d 1201 (D. Colo. 2015) (OSM must consider downstream emissions from coal combustion); *WildEarth Guardians* v. *United States Office of Surface Mining, Reclamation & Enf't*, 104 F. Supp. 3d 1208, 1230 (D. Colo. 2015) (OSM must consider downstream emissions from coal combustion); *Guardians* v. *U.S. Office of Surface Mining, Reclamation & Enf*'t, No. CV 14-103-BLG-SPW, 2016 WL 259285 (D. Mont. Jan. 21, 2016) (OSM failed to take hard look at environmental impacts when issuing FONSI, including downstream greenhouse gas emissions).
For coal transportation, *Mid States Coal. for Progress* v. *Surface Transp. Bd.*, 345 F.3d 520, 549 (8th Cir. 2003).

[23] There has not yet been any decision regarding an agency's obligation to evaluate downstream emissions in the context of oil or gas extraction or transport. There is a pending administrative objection to the EIS for oil and gas leasing in the Pawnee National Forest (*Wildearth Guardians* v. *Casamassa* (U.S. Forest Serv., filed Jan. 2015) but no decisions have been issued at the time of writing. online:
<http://www.wildearthguardians.org/site/DocServer/2015-1-20_WG_Pawnee_Oil_and_Gas_Predecisional_Objection.pdf?docID=15202>.

[24] Michael Burger and Jessica Wentz, *Downstream and Upstream Greenhouse Gas Emissions: The Proper Scope of NEPA Review,* Colombia Law School, Sabin Center for Climate Change Law, Harvard Environmental Law Review, Vol. 41, No. 1, 2016 at p. 28. [*Burger & Wentz*]

[25] *Gray v. Minister of Planning* [2006] NSWLEC 720 at para 124 (Australia).

[26] The Sabin Center for Climate Change Law, Columbia Law School "Commission on Human Right sof the Philippines Case No. : CHR-NI-2016-0001 Petition Requesting an Investigation of the Responsibility of the Carbon Majors for Human Rights Violations or Threats of Violations Resulting from the Impacts of Climate Change: Submission in Support of Petitioners" (2016), online:
<http://columbiaclimatelaw.com/files/2016/12/Wentz-and-Burger-2016-12-Submission-Case-No.-CHR-NI-2016-0001.pdf> at 11-13 [*Sabin Center Submission on Human Rights and Climate Change*]; Canada has ratified the International Covenant on Economic, Social and Cultural Rights, UN Doc. A/6316 (1966) which includes the right to food art at 11.1. International Covenant on Economic, Social, and Cultural Rights Office of the High Commissioner for Human Rights.

weather which in turn of inflicted great human rights harms on millions of people.[27] Further, climate change could affect the human right to food with the increased risk of violent droughts, heat waves, and storms.[28] Extreme droughts in 2001 and 2002 and flooding in 2010 and 2011 reduced crop yield by as much as 50% in Canada.[29] Heat waves lead to widespread deaths on livestock and poultry production operations and reduce milk production. Further threats include weed proliferation due to heightened levels of atmospheric CO_2, increased presence of pests and pathogens, and frequency and severity of infestations of insect and disease.[30] The 1948 Universal Declaration of Human Rights enshrines the right to food in human rights law.[31]

The link between human rights and climate change was highlighted in a case from the Commission on Human Rights in the Philippines. Because of climate change, the Philippines is experiencing more violent cyclones, monsoons, droughts, and heat waves and the trend is likely to continue in the 21st century. It is clear that these incidents are interfering with the enjoyment of fundamental human rights in the Philippines.[32] The case seeks to establish the legal responsibility of "Carbon Majors", international fossil fuel corporations, including six that are operating in Canada.[33] The applicant argues that since Carbon Majors are responsible for approximately a fifth of global GHG emissions through their business activities, they have breached a legal obligation to avoid causing adverse human rights impacts.[34] Furthermore, the applicant also claims that the Carbon Majors have a duty to prevent and mitigate the human rights violations resulting from their operations.[35]

In November 2016, the United States District Court for the District of Oregon decided that 21 youth plaintiffs have standing to make a legal claim against the United States, the President, and several federal agencies for permitting and encouraging the burning of fossil fuels despite having known for 50 years that this would destabilize the climate and endanger the plaintiffs. They seek a declaration that their constitutional rights have been violated and

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[27] OHCHR, "Understanding Human Rights and Climate Change, Submission of the Office of the High Commissioner for Human Rights to the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change" (2015) at 2.
[28] Michael E. Mann et al, "Influence of Anthropogenic Climate Change on Planetary Wave Resonance and Extreme Weather Events" (2017) Scientific Reports at 7.
[29] Agriculture and Agri-Food Canada, "Impact of climate change on Canadian agriculture," online: Government of Canada, online: <http://www.agr.gc.ca/eng/science-and-innovation/agricultural-practices/agriculture-and-climate/future-outlook/impact-of-climate-change-on-canadian-agriculture/?id=1329321987305>.
[30] *Ibid.*
[31] Office of the High Commissioner for Human Rights, Universal Declaration of Human Rights, N Doc A/810 at 71 (1948) art 25. See also Office of the High Commissioner for Human Rights, Universal Declaration of Human Rights, N Doc A/810 at 71 (1948) art 25.
[32] Jessica Wentz, "Philippines Carbon Majors Investigation: Sabin Center Submission on Human Rights and Climate Change" (16 December 2016), *Sabin Center for Climate Change* Law (blog), online: <http://blogs.law.columbia.edu/climatechange/2016/12/16/philippines-carbon-majors-investigation-sabin-center-submission-on-human-rights-and-climate-change/>.
[33] Andrew Gage, "Philippines human rights climate petition names Canadian, international fossil fuel companies", (15 October 2015), *West Coast Environmental Law* (blog), online: <http://wcel.org/resources/environmental-law-alert/philippines-human-rights-climate-petition-names-canadian-internati>.
[34] *Sabin Center Submission on Human Rights and Climate Change* supra note30 at 3.
[35] *Ibid.* at 4.

an order to develop plans for CO_2 emissions reduction.[36] The injuries alleged include the harm of algal blooms to drinking water, increased wildfires and flooding jeopardizing personal safety, the need to install irrigation systems because of drought, and asthma aggravation due to forest fires.[37] The court found these grievances to be sufficiently concrete, particularized, actual or imminent so as to satisfy standing criteria.[38] When government action "affirmatively and substantially" damages the climate, which causes "human deaths, shorten human lifespans, result in widespread damage to property, threaten human food sources, and dramatically alter the planet's ecosystem" there may be a claim to due process violation.[39]

Similarly, the 1982 *Canadian Charter of Rights and Freedoms* s.15(1) right to equality and s.7 right to life, liberty and security of the person could both be a foundation for a constitutional challenge of the historical inaction of the Canadian government [40].

It is too early to tell how most of these cases will fare on the merits or on appeal, but they do militate in favour of "public interest" being defined as an urgency to avert dangerous climate change. Climate protection requires an energy transition of "exceptional scope, depth and speed."[41]

3.4. Energy Transition Pathways and Guidance

In March 2017, the IEA,in cooperation with the International Renewable Energy Agency (IRENA) released its first ever forecast based on the *Paris Agreement* goal of well below 2°C.[42] In the context of the 2017 German G20 presidency, Germany requested an IEA and IRENA report on the essential elements of an energy sector transition that would be consistent with limiting the rise in global temperature to well below 2°C, as set out in the *Paris Agreement*. This is the first report of the IEA that provides guidance on energy pathways that aim for climate safety, all previous energy forecasts having been premised on scenarios that would overshoot the well below 2°C threshold[43].

The key findings of the IEA forecast a deep transformation of global energy systems:

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[36] *Kelsey Acadia Rose et al v United States of America et al,* United States District Court for the District of Oregan, Case No. 6:15-cv-01517-TC, (2016), online:<https://static1.squarespace.com/static/571d109b04426270152febe0/t/5824e85e6a49638292ddd1c9/1478813795912/Order+MTD.Aiken.pdf> at 2 [*Kelsey Acadia Rose*].

[37] *Ibid.* at 19.

[38] *Ibid.* at 21.

[39] *Ibid.* at 33.

[40] *Canadian Charter of Rights and Freedoms*, Part I of the *Constitution Act, 1982*, being Schedule B to the *Canada Act 1982* (UK), 1982; See Karine Péloffy, "Indigenous Peoples Bringing Climate Justice to Canada" (2016) Environmental Law Institute at pp. 657 – 666. Indigenous peoples in Canada can also rely on specific protection.

[41] International Energy Agency & International Renewable Energy Agency,"Perspectives for the Energy Transition: Investment Needs for a Low-Carbon Energy System" (OECD/IEA and IRENA, 2017) at 7, online: <https://www.energiewende2017.com/wp-content/uploads/2017/03/Perspectives-for-the-Energy-Transition_WEB.pdf>. [*IEA/IRENA*]

[42] *Ibid.* at p.6

[43] The IEA 450 Scenario was based on a 50% chance of not exceeding the 2°C

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> "Limiting the global mean temperature rise to below 2°C with a probability of 66% would require an energy transition of exceptional scope, depth and speed. Energy-related CO_2 emissions would need to peak before 2020 and fall [globally] by more than 70% from today's levels by 2050. The share of fossil fuels in primary energy demand would halve between 2014 and 2050 while the share of low-carbon sources, including renewables, nuclear and fossil fuel with carbon capture and storage (CCS), would more than triple worldwide to comprise 70% of energy demand in 2050."[44]

> "A deep transformation of the way we produce and use energy would need to occur to achieve the 66% 2°C Scenario. By 2050, nearly 95% of electricity would be low-carbon, 70% of new cars would be electric, the entire existing building stock would have been retrofitted, and the CO_2 intensity of the industrial sector would be 80% lower than today."[45]

The report highlights the rather conservative policy ambitions of Canada and the US.[46] In the model developed by IRENA, the world will stop using the most challenging resources with high production costs, such as oil sands and Arctic oil. IRENA also specifies that there is a risk of path dependency and future stranded assets such as pipelines even for natural gas, which is identified as a potential bridge in the transition (for a short period if not coupled with high levels of CCS).[47]

We are witnessing the emergence of a trend in recent international accords, scientific research and jurisprudence a 21st century determination of public interest concerning the fossil fuel based economy leads to the need for a rapid and just transition to a clean energy future that steers us within the relatively safe temperature threshold identified internationally. The implications of climate change, decarbonization and energy transition, as well as for EAs of hydrocarbon developments in Canada are crucial.

Recommendation: Based on the foregoing, we put forward the centrality of a just energy transition in the public interest determination discussed in Part II of this report.

4. ENERGY TRANSITION INFORMATION ADMINISTRATION: IN DIRE NEED OF DATA, MODELS, ANALYSIS

4.1. Unavailability of Canadian Data

The research undertaken for this report highlighted a paucity of published research and many areas of difficulties and contention in existing approaches to address climate change consideration in reviewing fossil fuel projects. There is also still not enough information and context specific analysis on how we should transition away from hydrocarbons in a manner that maximizes social, economic and environmental benefits while minimizing risks and

[44] *IEA/IRENA* at p. 7.
[45] *Ibid.* at p. 8.
[46] *Ibid.* at p. 158.
[47] *Ibid.* at p. 137.

harm to our society. There isn't enough research and analysis internationally, but the situation is worse in Canada than in most other developed countries.

Researchers behind the arguably most comprehensive energy and climate modelling effort in Canada testified that the most resource intensive part of the Trottier Energy Futures Project was data collection. "Energy information in Canada is in a dire state: it is fragmented, incoherent, somewhat inaccessible, and without clear organizing principles and standards "[48] There is no authoritative and systematic compilation of data. There is specifically a paucity of data on fugitive emissions from the hydrocarbon extraction, transformation and transport. Our understanding of energy and its interaction with the economy, population health, and the environment is extremely limited.

There is a dire need for coherent, comprehensive and impartial energy information to enable public understanding and sound decision-making.

4.2. Avoid Proprietary and "Black Box" Models

Models are essential to understanding climate and energy systems. Put simply, they expand what the human brain can do. However, the assumptions fed in greatly impact the output, underpinning the crucial need to have transparent models. Unfortunately "the existing stock of energy systems model in government, academia and business are not adequate to meet the needs of sound policymaking and public understanding of energy and its interaction with the economy and the environment […] Models should be made accessible to all interested parties and fully transparent."[49]

4.3. A Clear Need for Research feeding Policy Guidance and Pathways

The government's own policy documents underscore the need for this new ETIA. Indeed, Both the Pan Canadian Framework on Clean Growth and Climate Change and Mid-Century Long-Term Low-Greenhouse Gas Development Strategy[50] released in December 2016 aim to bring about an energy future that is radically different from today in terms of energy sources and uses. Still, the Pan Canadian Framework still leaves 44 MT CO_2eq emissions above the 2030 target of 523 MT CO_2eq /year for which there are no mitigation pathways.[51]

Further, there is little federal policy direction on the role of the oil and gas sector beyond the methane regulations contemplated. This is a clear policy gap since the oil sector is the largest source of GHG emissions nationally. Indeed, a recent senatorial report highlighted: "According to Environment and Climate Change Canada projections as of November 2016, Canada must reduce annual emissions by 219 Mt CO_2eq in order to meet its 2030 target. To put this into context, it is nearly equal to Canada's entire oil and gas industry in 2030, which

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[48] Hoffman and Sigvaldason, Trottier *Energy Futures Project Submission to NEB Modernization Expert Panel*. March 29,2017

[49] *Ibid.*

[50] Environment and Climate Change Canada, *Canada's Mid-Century Long-Term Low-Greenhouse Gas Development Strategy*, 2016.

[51] *Pan-Canadian Framework on Clean Growth and Climate change: Canada's Plan to Address Climate Change and Grow the Economy,* ÎSBN: 978-0-660-07023 (Dec. 2016) at p. 44

is projected to be 233 Mt CO_2eq."[52] The reduction the entire country's population is expected to achieve is roughly equal to the expected emissions of one industry for which there is essentially no federal pathways guidance and which would take up nearly half of the national carbon budget in 2030. If we are to believe the 100MT annual cap will be imposed on Alberta's oils sands, it would still reserve roughly a fifth of the national GHG budget in 2030 to a single industry. The manifold implications of this situation must be further investigated.

The Energy Transition Information Administration (ETIA) we are proposing as a spin-off of the NEB information mandate could play a critical role in facilitating the collection and public access to the data needed, and to develop analytical tools that permit researchers and policy makers to test a range of assumptions and possible pathways.

Global models like those produced by the IEA often do not integrate territorial dimensions within a modelled region. For a large country like Canada, distances can have a non-negligible impact and must be included in Canada-specific models.[53] The federal government could learn from the experience of the United Kingdom, which apparently pioneered the most integrated framework of climate modeling, law and policy.[54] Such an institution could be especially helpful in providing research for the federal government for broader strategic policy-making beyond project assessments.

Beyond models, qualitative analysis of the political economy of energy transition should also be part of the new institution's mandate. (see section 6.3 for more details.)[55]

4.4 Note on Modelling Fossil Fuel Demand in a GHG Constrained World

The IEA/ IRENA March 2017 report is the first usable global benchmark to model oil demand in a world constrained by the fight against dangerous climate change (staying well below 2°C). Global oil demand models and project level needs assessments should reference *Paris Agreement* compatible scenarios like this one, until a new 1.5°C scenario gets issued, expected later in spring 2017. The model is not perfect, but it does move away from the IPCC " climate safe " scenarios that allowed for temporary overshooting the temperature target and implied relying on negative-CO_2 technologies deployed at scale, many of which are not yet invented or tested; an approach that should be avoided.[56]

It is also not clear enough in the IEA report that the global targets require much more rapid

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[52] Report of the Standing Senate Committee on Energy, the Environment and Natural Resources,The Honourable Richard Neufeld, Chair, The Honourable Paul J. Massicotte, Deputy Chair, *Positioning Canada's Electricity Sector in a Carbon Constrained Future,* (March 2017) online at : https://sencanada.ca/content/sen/committee/421/ENEV/Reports/Electricity_e.pdf at p.3

[53] Conversation with Kathleen Vaillancourt, modeller for the Trottier Energy Futures Project, *Trottier Energy Futures Project, Canada's Challenge & Opportunity : Transformations for major reductions in GHG emissions*, available online at : http://iet.polymtl.ca/en/tefp/

[54] See for example UK Department for Business, Energy & Industrial Strategy, Guidance on Carbon Budgets online : https://www.gov.uk/guidance/carbon-budgets ; See also UCL Energy Institute Models online at : https://www.ucl.ac.uk/energy-models/models; See also the Grantham Institute at Imperial College London online http://www.imperial.ac.uk/grantham/

[55] See for example Goldthau, A. and Sovacool, B. K. (2012). *The uniqueness of the energy security, justice, and governance problem. Energy Policy*, 41. 232–40. DOI:10.1016/j.enpol.2011.10.042

[56] *IEA/IRENA* at p. 7

GHG emission reductions in developed countries, that Canada's emissions are among the highest in the world on a per capita basis, and that we are one of the last developed countries that has failed to reach peak emissions and start the decline of its emissions. Indeed, Canada ranks 55 out of 61 countries on climate action.[57] Despite the country's small population; it is one of the 10 top emitters of GHGs in the world in absolute terms.[58]

It bears mentioning that models used by the NEB to forecast energy futures underpinning their analysis of oil demand in order to recommend pipelines and used by ECCC to estimate upstream GHGs associated with pipelines suffer from the black box problem. Further, the NEB 2016 Energy Futures, its latest report, was produced based on analysis produced in the summer of 2015, before the election of this government and the *Paris Agreement*. It does not include Canada's NDC even if it had been announced the prior spring. It mentions the *Paris Agreement*, the national and provincial policies proposed since and makes passing allusion to the Alberta 100MT cap without including any of those in the analysis of oil supply and demand. Its key assumptions include:

> "All energy production will find markets and infrastructure will be built as needed.
>
> Only policies and programs that are law at the time of writing are included in the projections. As a result, any policies under consideration, or new policies developed after the projections were completed in the summer of 2015, are not included in this analysis.
>
> Environmental and socio-economic considerations beyond the included policies and programs, are outside the scope of this analysis."[59]

The NEB can be said to at best pay lip service to the fight against climate change. Indeed, according to Normand Mousseau, physicist and co-president of the Quebec Commission on Energy Issues (2013), "one only has to look at the last NEB prospective report to be convinced of the poverty of reflection on energy at all scales of government in our country" (our translation)[60] Two export pipelines were approved in December 2016 based on this analysis. The current NEB needs serious capacity-building on the climate policy constraints modelling side, and a change in culture from a fossil fuel regulatory to an energy agency focused on facilitating the energy transition we need.

Our primary recommendation is the broader mandate of a National Energy Transition Administration that would provide this credible research and information. In the meantime,

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[57] Jan Burck, Franziska Marten & Christoph Bals, *The Climate Change Performance Index Results 2017*, at 9 (2016), available online: https://germanwatch.org/en/download/16482.pdf . Policies announced since the Trudeau government were worth one point bump from 56th place in 2016.

[58] Mengpin Ge, Johannes Friedrich & Thomas Damassa, *6 Graphs Explain the World's Top 10 Emitters*, World Resources Inst., Nov. 25, 2014, http://www.wri.org/blog/2014/11/6-graphs-explain-world%E2%80%99s-top-10-emitters.

[59] NEB, *Canada's Energy Future 2016: Energy Supply and Demand Projections to 2040*, at p. 17

[60] Normand Mousseau, *Gagner la guerre du Climat : Douze mythes à déboulonner,* Boréal, 2017 at p. 109 referring to the NEB Energy Futures 2016.

more research should be commissioned by the federal government, ideally engaging interdisciplinary teams of scientists, economists and jurists, amongst others.

Because the federal government has jurisdiction over interprovincial pollutants it is without controversy that they can assess projects' interprovincial and international effects as well as provide information on different technologies and pathways.

5. SCOPE OF INFORMATION GATHERED FOR THE CLIMATE IMPACT ASSESSMENT

As stated in the EPA caucus submission reproduced in Annex 1, we recommend that emissions assessed include:

1. life cycle emissions from the pipeline project itself (including emissions from manufacturing components, from transportation, etc.)
2. Downstream effects (i.e. the emissions from the use of the fossil fuel being extracted or transported)
3. Upstream emissions, i.e. in case of a pipeline, emissions from the exploration of the oil or gas being transported in the pipeline.

These emissions are hence tallied according to the "well to wheel "approach to which should be added emissions associated with by-products such as petroleum coke used for energy generation.[61]

It is crucial that the amount of total emissions on a life cycle basis, that is the raw data, be made available publicly before any further analysis posits that some emissions should or should not be associated with the fossil fuel infrastructure for context specific reasons explored in this section.

At a minimum, a scoping approach similar to the one set up under the U.S. National Environmental Policy Act (NEPA) and executive guidance under President Obama framework should be followed. Regulations under NEPA require federal agencies to consider direct,[62] indirect[63] as well as cumulative[64] environmental effects of proposals. They also require reviews of connected,[65] cumulative[66] and similar actions.[67]

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[61] US, United States Department of State: Bureau of Oceans and International Environmental and Scientific Affairs, *Final Supplemental Environmental Impact Statement for the Keystone XL Project* (Washington DC) at 4.14-27 [*Keystone Final SEIS*]

[62] Defined in the regulations as those that are "caused by the action and occur at the same time and place." .43 FR 56003, Nov. 29, 1978, sec. 1508.8 (a).

[63] Defined in the regulations as those that are "caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable," and which may include "growth inducing effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems." 43 FR 56003, Nov. 29, 1978, sec. 1508.8 (b).

[64] Defined in the regulations as those that result 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." 43 FR 56003, Nov. 29, 1978, sec. 1508.7.

[65] Defined as actions that are "closely related and therefore should be discussed in the same impact statements."43 FR 56003, Nov. 29, 1978, sec. 1508.25 (a) 1.

[66] Defined as actions that "have cumulatively significant impacts and should therefore be discussed in the same impact statement." 43 FR 56003, Nov. 29, 1978, sec. 1508.25 (a) 2.

The U.S. Council on Environmental Quality (CEQ) recently issued final guidance on consideration of GHG emissions and the effects of climate change in NEPA reviews. Climate analyses should include consideration of "connected actions - subject to reasonable limits based on feasibility and practicality", including "activities that have a reasonably close causal relationship to the Federal action, such as those that may occur as a predicate for a proposed agency action or as a consequence of a proposed agency action (including land clearing, access roads, extraction, transport, refining, processing, using the resource, disassembly, disposal, and reclamation)".[68]

It is arguable that even under existing law, the *Canadian Environmental Assessment Act* 2012, the NEB is required to consider climate impacts of upstream and downstream GHG emissions as *cumulative environmental effects* that are likely to result from that project in combination with other physical activities that have been or will be carried out.[69] The environmental effects at issue are those changes that *may be caused* to the environment - within a province or outside Canada – and that are directly linked or necessarily incidental to the Board's authority's exercise that would permit the carrying out a pipeline project. However, the NEB refuses to exercise this jurisdiction. In its *Ruling No.25* in the Trans Mountain Hearing, the Board stated:

> "While there is a connection between the Board's possible recommendation that the Project be approved and upstream production, in that the Project would transport a portion of that production, the Board is not persuaded that the effects from that production are directly linked or necessarily incidental to the Board's report to the Governor in Council under the NEB Act. The Project does not include upstream production and is not dependent on any particular upstream development and; therefore, any link to environmental changes caused by such upstream production is indirect and is not necessarily incidental to Project approval."

The NEB's reasons to disregard upstream and downstream emissions are very similar to the arguments that have been struck down by courts in the U.S. as will be seen below. It is noteworthy that, like the NEPA regulations, the Canadian *General Guidance for Practitioners on Incorporating Climate Change Considerations in Environmental Assessment*[70] indicates that GHG considerations should include direct and indirect GHG emissions as well as related effects without defining these. Clarity is required as to how to conduct such an assessment by answering questions such as: which raw data to collect; what is appropriate methodology;

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[67] Defined as "have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography." 43 FR 56003, Nov. 29, 1978, sec. 1508.25 (a) 3.

[68] Center for Environmental Quality, *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* at p.13-14 https://www.whitehouse.gov/sites/whitehouse.gov/files/documents/nepa_final_ghg_guidance.pdf

[69] *Canadian Environmental Assessment Act* (2012) (S.C. 2012, c. 19, s. 52), s. 19(1)(a); A82234-1, *Lettre à l'ONÉ re Décision no.1_Liste de questions*, Projet Énergie Est et cessions d'actifs et projet Réseau principal Est (2017-03-24)

[70] Canadian Environmental Assessment Agency, "Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners: 2.0 Incorporating Climate Change Considerations in Environmental Assesment" online: Government of Canada <http://www.ceaa-acee.gc.ca/default.asp?lang=En&n=A41F45C5-1&offset=3&toc=hide>.

how do the results feed into the decision-making? Further, it is important to examine cumulative impacts because emissions that appear small viewed in isolation may be significant when viewed in the light of other co-occurring impacts, or when considering their impact on a jurisdictions carbon budget and the resulting effect on the ability to proceed with other activities that may be competing for the remaining carbon budget.

Lastly, whilst assessments should use different data sources so as to provide robust results, they should also use project-specific numbers. Considering the uncertainty around the assumed product mix to be carried in a pipeline and the wide spectrum of associated production GHG intensities, the reviewing body must compel the production of confirmed shipping agreements so as to produce a more accurate estimate. In the words of a pipeline executive "Energy East is designed to carry 1.1 million barrels per day, or around 400 million barrels over the course of a year. If all of that oil is sourced from the oil sands, the GHG emissions per barrel range from 40 to 225 kilograms, depending on the producer."[71]

Further, concerning the uncertainty of volumes transported and associated production levels GHG assessments should base their estimates on scenarios that proponents use to forecast economic benefits (jobs in Alberta, federal revenues, benefit to consumer from reduced energy price, etc.) so as to be consistent and assess the climate impacts associated with those benefits.

5.1. Assessing Downstream / Combustion Emissions: Perfect Substitution Does Not Exist

U.S. Courts have consistently held that emissions from combustion are "reasonably foreseeable" when production estimates are available. For coal extraction, all the examined cases have found that there is a sufficient causal connection between the extraction and the downstream greenhouse gas emissions from the processing, transportation, and end-use of the extracted coal.[72] In their findings, the courts have rejected three types of arguments denying the causal connection between extraction and downstream emissions: the "status quo"[73] argument, the "it's not our call" argument, and the "perfect substitute" argument. The "it's not our call" argument states that there is no "reasonably close causal relationship akin to proximate cause" between the extraction of coal and emissions from downstream activities such as combustion of the coal because the agency lacks jurisdiction over those activities.[74] The inability to exercise jurisdiction on foreign combustion emission is not a defensible argument at the stage of assessing the cumulative impacts of a project.

The perfect substitute argument posits that the extraction of fossil fuels will not actually cause an increase in consumption since the same quantity of fuel would be produced elsewhere and eventually transported and consumed, even if the agency did not approve the

[71] Tracy Johnston "TransCanada CEO says don't blame pipelines for climate change " (March 2016) online at : http://www.cbc.ca/news/business/girling-ghg-emissions-1.3464363

[72] *Burger &* Wentz supra note 28 at p. 29

[73] *Dine Citizens Against Ruining Our Env't* v. *United States Office of Surface Mining Reclamation & Enf't*, 82 F. Supp. 3d 1201, 1217 (D. Colo. 2015); *S. Fork Band Council Of W. Shoshone Of Nevada v. U.S. Dep't of Interior*, 588 F.3d 718, 725 (9th Cir. 2009). The status quo argument is used by agencies to assert that continued operation of a mine will not increase the rate at which coal is extracted, and thus their activities will not increase combustion emissions with reference to the status quo.

[74] *Border Power Plant Working Grp.* v. *Dep't of Energy*, 260 F. Supp. 2d 997, 1017 (S.D. Cal. 2003)

proposal at issue.[75] The first case to specifically examine an agency's obligation to evaluate downstream greenhouse gas emissions from coal production in NEPA reviews is the *High Country Conservation Advocates v. United States Forest Service* decision from the district court in Colorado.[76] The case discussed the environmental evaluation that allowed an exception to the Colorado Roadless Rule, which protected natural roadless areas. The exception permitted the construction of a road which in turn would allow coal-related activities in an otherwise undeveloped area of national forest. The agencies had not estimated emissions from future mining operations or coal combustion.

The Court held that one couldn't both provide detailed fossil fuel production estimates as benefits and simultaneously claim that it would be too speculative to estimate emissions from that fuel which may or may not be produced or developed.[77] Direct emissions can be negligible, but open the door for reasonably foreseeable activities that will have significant indirect emissions. A pipeline is very similar to the road that was contemplated in the *High Country Conservation Advocates* case. Indeed, the construction of the road itself lead to "no direct effects on emissions or climate change" but the "reasonably foreseeable activities of [oil extraction], transportation and combustion will increase the atmospheric concentrations of GHGs." [78]

The issue of perfect substitution also arose in the U.S. State Department's review of the Keystone XL tar sands pipeline. The State Department's initial NEPA review concluded that "regardless of whether the Project permit is approved, projected oil sands production will remain substantially unchanged [...] approval [...] will not [...] substantially affect GHG emissions or contribute to climate change."[79] However, the EPA noted that this review was not based on complete and accurate economic modeling, so the State Department updated its analysis arriving at a completely different conclusion: "construction of the pipeline is projected to change the economics of oil sands development and result in increased oil sands production, and the accompanying greenhouse gas emissions, over what would otherwise occur."[80]

It is safe to assume on the basis of the foregoing that perfect substitution arguments have no place in GHG assessments and should be rejected outright. Downstream emissions must be assessed.

5.2. Approaches for Addressing Partial Substitution and Attributing Downstream Emissions

Substitution arguments can apply to upstream and downstream emissions but are more typically raised when it comes to downstream, combustion emissions. The Stockholm Environment Institute denotes three existing approaches to assessing the incremental

[75] *High Country Conservation Advocates* v. *United States Forest Serv.*, 52 F. Supp. 3d 1174, 1190 (D. Colo. 2014). [*High Country*]
[76] *Ibid.*
[77] According to the reasoning in *High Country* p. 28-29.
[78] USDA Forest Service, SDEIS *Rulemaking for Colorado Roadless Areas* online at : http://www.fs.usda.gov/roadmain/roadless/coloradoroadlessrules at p. 49
[79] EPA, *EPA Comment Letter on Keystone XL Project DEIS* at p.2 (April 22, 2013)
[80] EPA, *EPA Comment Letter on Keystone XL Project Final SEIS* at p.3 (Feb. 2, 2015)

emissions of new fossil fuel development, that is the "change in emissions between the case with the new infrastructure (project case) and the case without the infrastructure (a counterfactual case that attempts to assess what would otherwise happen if the infrastructure were not built)", these are the *literalist*, the *fatalist* and the *economist* approaches.[81]

The *literalist* perspective assumes a certain amount of fuel will reach the market and be combusted because of a project and attributes all the associate lifecycle emissions to the project without analysing what might occur in the absence of the project. When considering a pipeline project, this would be akin to the total upstream, direct and downstream emissions associated with the fuels transported by the pipeline at full capacity. This literal view is an indicator of the potential scale of emissions associated with the fuel supplied by a project and its contribution to global GHG emissions rather than a *net* emissions analysis.[82] Most assessments include this value[83] before moving on to what extent the emissions are incremental, in the sense that they would not happen without the project going forward, an economist's version of the 'but for' test.

At the other end of the spectrum, the fatalist view, typically proposed by the fossil fuel industry is that a single project has no net impact on global supply and consumption of fossil fuels, it would simply displace one for one existing supply. The fatalist perspective has two variations, which could be lumped into the upstream variation and downstream variation.

In the first – upstream – version, it is assumed the same source of fossil fuels, e.g. Canadian crude, will still reach the market by other transportation methods such as rail. In this version, net emissions are the difference between the emissions associated with the modes of transportation and the extent to which the costs of transportation affect production investment decisions. This is the approach taken by ECCCC in its upstream assessments of the TransMountain and Line 3 pipeline projects.[84]

In the second – downstream – variation, it is assumed the same amount of oil from a different source will get to the market in the absence of the project; here net GHG impact is understood as the difference in emission intensity of extracting and delivering the alternative resources.[85] This was the approach used to estimate GHGs associated with the Keystone XL pipeline by the U.S State Department which assessed incremental indirect lifecycle GHG emissions as the extraction and transport emissions of Canadian oil sands crude in comparison with other reference crudes consumed in the U.S. (well to tank approach),

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[81] Erickson, P. and Lazarus, M. (2013b). *Assessing the Greenhouse Gas Emissions Impact of New Fossil Fuel Infrastructure*. SEI Discussion Brief. Stockholm Environment Institute, Seattle, WA, US. http://www.sei-international.org/publications?pid=2384 at p. 2 [*SEI 2013*]

[82] *Ibid.* p. 3

[83] See for example US, United States Department of State: Bureau of Oceans and International Environmental and Scientific Affairs, *Final Supplemental Environmental Impact Statement for the Keystone XL Project* (Washington DC) at 4.14-36 [*Keystone XL FSEIS*]; ECCC Line 3 and TransMountain analysis for upstream emissions. Note that the ECCC methodology does not include downstream emissions.

[84] See for example ECCC Trans Mountain Pipeline ULC - *Trans Mountain Expansion Project Review of Related Upstream Greenhouse Gas Emissions Estimates Draft for Public Comments* (May 19, 2016) online at.= http://www.ceaa-acee.gc.ca/050/documents/p80061/114550E.pdf

[85] *SEI 2013* p. 4

assuming the total demand for oil in the U.S. would remain the same.[86]

In between sits the *economist* perspective, which attempts to analyze complicated supply and demand dynamic in order to estimate the net impact of a project. Simple elasticities, partial equilibrium and general equilibrium models have been deployed, each capturing increasing degrees of complexity and detail in the study of the supply and demand relationships focusing on price elasticities and market responses at different geographical scales.[87] Assumptions underlying the different models such as long-term economic responses (notably difficult to assess) as well as the definition of what constitutes a market can significantly influence the results. [88]

For example, the Stockholm Environment Institute analysis of GHG emissions associated with the Keystone XL pipeline estimated that the increased supply of oil due to the pipeline would increase global oil use by 62% of the pipeline's capacity. Such impacts would be "four to five times greater than the GHG implications of simply displacing average crudes, the approach taken by the U.S. State Department.[89]

It is important to note that models and standards may fail to account for long-term market changes triggered by the extraction of large amounts of oil, coal, or natural gas, which in turn affect GHG emissions associated with certain industries. It is erroneous to conclude that these market changes would occur whether or not the proposed action goes forward.[90] Markets react to decisions taken by environmental agencies. Markets prefer least-cost options, so adverse permitting decisions tend to raise the cost, lowering demand as a result.[91]

Many GHG estimates of fossil fuel infrastructure rely on unclear, at times baseless, assumptions about "the availability of alternative transport routes, the effect of pipeline development on the rate of oil sands production, the effect of increased oil sands production on the world oil market, and the potential impact of climate policies and carbon pricing."[92]

More fundamentally, the reliance on economic models based on rational decision-making disconnected from efforts to fight climate that assume humans only base fuel consumption decisions on prices could be seriously challenged as a framework of analysis, but this criticism goes beyond the scope of this report.[93]

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[86] *Keystone XL FSEIS* at p. 4.14-38-39.
[87] *SEI 2013*, p. 4-5
[88] *Ibid.* p. 7
[89] Erickson, P. and Lazarus, M. (2014). *Impact of the Keystone XL pipeline on global oil markets and greenhouse gas emissions*. Nature Climate Change, 4(9). 778–81. DOI:10.1038/nclimate2335.
[90] Center for Biological Diversity et al. "Re: Draft Guidance on Consideration of Greenhouse Gas Emissions and Climate Impacts under the National Environmental Policy Act" (2015) at 4 [*Re: Draft Guidance Climate Impacts NEPA*].
at p. 12.
[91] *Ibid.* at p. 13.
[92] Damon Matthews, chair of the Concordia Climate Research Lab, "Effect of the Energy East Pipeline on global greenhouse gas emissions", (Montreal: Concordia Climate Research Lab, 2016) submitted to the Bureau d'audiences publiques sur l'environnement.
[93] See for example J. B. Ruhl, " Complexity Theory as a Paradigm for the Dynamical Law-and-Society System : a Wake-Up Call for Legal Reductionism and the Modern Administrative State " 45 (1996) vol. 5, Duke Law Journal which posits that complexity theory, as evidence by the emergent rise of the environmental justice

Again, the raw data on lifecycle GHG emissions needs to be shared publicly, for any interested party carry out their own analysis on what percentage of the upstream, downstream and indirect emissions should be assigned to the project, and what assumptions lead to that conclusion. It is not likely or necessary for everyone to agree on the most appropriate methodology (which may depend on the circumstances in any event). What is critical is that there be an opportunity to have this debate in the context of the EA, that there is a rational and transparent basis for the conclusion reached, and that the choice be made in the context of the EA, not by the regulator. Over time we should be able to resolve these issues with appropriate methodologies.

We therefore recommend that assessments that go beyond the literalist approach and endeavour to assess relative substitution display all methods of attribution in a transparent manner that enables comparisons across estimates based on different assumptions so as to be able to test the influence of the assumptions on the final result.

5.3. Upstream Emissions Assessment Must be Comprehensive

All GHGs beyond CO_2 must be accounted for in assessments, including nitrous oxide, black carbon and methane.

5.3.1. Emissions assessments must disclose fugitive emissions factors

Specific attention should be given to fugitive and vented methane emissions as they tend to be underestimated by Canadian authorities. For example, methane emissions rate from B.C.'s upstream natural gas sector reported in the B.C. Provincial GHG Inventory Report (which uses the same emission factors as the National Inventory Report) is 0.27%. For comparison, analysis from the U.S. EPA estimates the methane emissions rate at 1.33% over a comparable part of the supply chain (production, processing, and transmission), or about five times as high.[94] Emissions factors were not specified in the ECCC Upstream GHG methodology or assessments conducted pursuant to it.

5.3.2. EAs of Pipeline Projects Should Include Emissions Related to Land-Use Changes

Land-use changes contribute to GHG emissions because of the suppression of topsoil and deforestation and the loss of carbon sequestration. The final Keystone XL SEIS included land use emissions as part of upstream emissions[95]

In California, the *Low Carbon Fuel Standard,* which regulates all the oil that is sold in the State, bases its GHG evaluations over the entire lifecycle GHG emissions, including indirect emissions caused by land use emissions as well as downstream emissions issued from the

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movement in the last decades, seriously undermines the predictability of the evolution of law. Humans have free will, can rewrite or disobey rules, and may do so especially in a context where the life sustaining systems of the planet are in jeopardy…

[94] Matt Horne, Pembina Institute, Woodfibre LNG Project — analysis of anticipated greenhouse gas emissions, March 1st 2016 online : http://www.pembina.org/reports/woodfibre-lng-ceaa-20160301.pdf

[95] *Keystone XL final SEIS* p. 4.14-34-35.

ultimate combustion of the fuel.[96] The California *Oil Production Greenhouse gas Emissions Estimator (OPGEE)*, an open source, transparent and accessible model, has provided GHG intensity values for production and transport of 67 types of Canadian crudes. Although the spectrum is wide, Canadian crudes GHG intensity values are amongst the highest of the petroleum products sold in California.[97]

A more recent study (2015) by academics behind the initial land use emissions estimates demonstrates that previous numbers, such as those used in the Keystone XL final SEIS, are underestimated by an important margin. This is particularly so for *in situ* extraction:

> "We found that land use and GHG disturbance of oil sands production, especially in-situ technology that will be the dominant technology of choice for future oil sands development, are greater than previously reported. We estimate additional 500 km2 and 2,400 km2 of boreal forest including carbon-rich peat lands would be disturbed from surface mining and in-situ production, respectively, between 2012 and 2030; releasing additional 107–182 million tonnes of GHG from land use alone"[98]

Given that foreign jurisdictions have been able to estimate land use emissions associated with Canadian oil extraction, we see no justifiable reason to exclude such considerations from assessments, especially in a context where preserving the carbon stocks of the boreal forest and peatlands will become a global imperative.[99] So far as we could verify, no Canadian jurisdiction assesses land use emissions associated with oil extraction.

5.4. Assess GHG Emissions Minimally for the Lifespan of the Project

Emissions assessed have to cover the entire lifespan of the project. The Keystone XL assessment used a value of fifty years, which should be considered a minimum, knowing that some pipelines have been operating or are expected to operate for longer.[100] In any case, arbitrary numbers of years for assessment, such as the 10 year used in the upstream GHG assessments of Trans Mountain and Line 3 by ECCC should be avoided.

Further cumulative emissions should be calculated for the 2020, 2030 and 2050 time horizons so as to enable a discussion of project emissions relative to our climate commitments. Assessments should also state that the climate impact of GHG emissions is likely to last for centuries beyond the project.

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[96] *California Low Carbon Fuel Standard, Final Regulation Order*, Subchapter 10, Article 4, Subarticle 7, online: http://www.arb.ca.gov/regact/2015/lcfs2015/lcfsfinalregorder.pdf

[97] *Ibid.* § 95489, Table 8, p. 89

[98] Sonia YEH, Anqi ZHAO, Sean D. HOGAN, Adam R. BRANDT, Jacob G. ENGLANDER, David W. BEILMAN, Michael Q. WANG, *Past and Future Land Use Impacts of Canadian Oil Sands and Greenhouse Gas Emissions*, 2015, page 2, online : https://itspubs.ucdavis.edu/wp-content/themes/ucdavis/pubs/download_pdf.php?id=2412

[99] UNFCC, Reporting of the LULUCF sector by Parties included in Annex I to the Convention, http://unfccc.int/land_use_and_climate_change/lulucf/items/4127.php; See also *Paris Agreement* article 5.

[100] A pipeline recently installed in Quebec has been forecasted by Ultramar to be used for 80 years. Alain Brunel, *La sous-estimation annoncée des émissions de GES*, online at : **http://www.ledevoir.com/environnement/actualites-sur-l-environnement/475566/oleoduc-energie-est-la-sous-estimation-annoncee-des-emissions-de-ges** 2016

6. HOW TO ANALYSE AND UNDERSTAND PROJECT GHG IMPACTS / ANALYSIS

6.1. Analysis Relative to Existing and Evolving National Climate Commitments

Canada's current GHG targets are to reduce emissions by 17% by 2020[101] and by 30% below in 2030[102], both compared to 2005 levels. These should be conceived as absolute floors as they will have to be updated. Any endeavour to review a project's structural impact on GHG reduction targets must consider how the national target is likely to evolve in years to come under the *Paris Agreement* stocktaking mechanism, which was specifically designed to motivate countries like Canada to increase their ambition. Canada and all other parties, will have to submit a new NDC in 2018 and then again every five years (2023, 2028, etc.) with each iteration reflecting the highest possible ambition and representing a progression over time[103] so as to reach the ultimate goal of global decarbonization by 2050.

The current NDC is not compatible with approaches linked to the Equity provision of the UNFCCC framework and will have to be updated. Both targets are absolute increases in yearly emissions compared to 1990 levels, when international action on climate change started. International experts rate these targets as inadequate in the sense that Canada is not doing its fair share to avoid dangerous climate change. [104] Further, existing policies and those announced in the Pan Canadian framework are currently not enough to achieve them.

Even if not updated, there is always the chance the Canadian NDC would be challenged in court. In *Urgenda,* the District Court of the Hague found that the small share played by the Netherlands in global GHG emissions does not diminish its duty of care to take precautionary measures[105] and issued an injunction against the state to abide by a target of 25% GHG reductions relative to 1990 levels by 2020, the minimal value identified in the 4th IPCC report as the reduction target suggested for developed countries such as Canada and the Netherlands based on climate data to prevent "dangerous climate change".[106] In effect, the developed country minimal reduction target identified in order to collectively avoid dangerous climate change and satisfy the international obligations set out in the UNFCCC

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[101] Environment Canada, *Canada's Emissions Trends* ii (2014), online: <https://www.ec.gc.ca/ges-ghg/E0533893-A985-4640-B3A2-008D8083D17D/ETR_E%202014.pdf>.

[102] Canada's INDC Submission to the UNFCCC (2015), online : http://www4.unfccc.int/Submissions/INDC/Published%20Documents/Canada/1/INDC%20-%20Canada%20-%20English.pdf.

[103] Christopher Campbell-Duruflé, Karine Péloffy, Fabiano de Andrade Correa, M. Hafijul Islam Khan & Erick J. Kassongo "The Transparency Mechanisms in the Paris outcome: an Analysis from the International Sustainable Development Law Perspective" (2016) Centre for International Sustainable Development Law CISDL at 4 with reference to article 3 and 4 of the *Paris Agreement*.

[104] *See* Climate Action Tracker, *Canada*, online http://climateactiontracker.org/countries/canada.html (last visited 27 March, 2017).

[105] Marc Loth "Climate Change Liability After All: A Dutch Landmark Case" in Tilburg Law Review 21 (2016) 5-30 at 19.

[106] Roger H.J. Cox, *The Liability of European States for Climate Change*, 30 Utrecht J. Int'l & Eur. L. 125, 133 (2014); *see also* Sujata Gupta et al., *Policies, Instruments, and Co-operative Arrangements*, *in* Climate Change 2007: Mitigation, Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change 745, 776, tbl. Box 13.7 (B. Metz et al. eds., 2008), online: <http://www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-chapter13.pdf>.

was translated by the court as a national policy floor deemed reasonable and necessary.[107]

Hence, any analysis of the relationship between a project and the national targets should be conducted knowing the targets will become more stringent over time.

6.2. Analysis Relative to Existing and Evolving Provincial Climate Commitments

At least when it comes to the impact of upstream emissions, the assessment should address provincial policies. In 2016, the Alberta Legislature passed Bill 25, the *Oil Sands Emissions Limit Act*.[108] In it, the Alberta government commits to limiting GHG emissions from oil sands. Article 2 of the act stipulates the first ever Albertan GHG emissions limit; a cap is put on emissions originating from all oil sands sites combined of 100 Mt a year "with provisions for cogeneration and new upgrading capacity."[109] The emissions that are counted towards the cap are "all greenhouse gases […] released from sources located at an oil sands site, including greenhouse gases sent off site."[110] It is unknown whether the cap covers fugitive and land use emissions. The lack of guidance on several important topics is potentially problematic.[111]

For example, existing approved, and under construction oil sands operations will exceed this limit by 20 million tonnes, even without considering the Frontier Oil sands mine.[112] The Frontier Oil sands Mine would create an additional 4 million tonnes of GHGs starting in 2026 and is expected to operate until 2067[113], beyond the global decarbonization time horizon. Between 2004 and 2014, the overall emissions intensity from the oil sands has increased by 25 per cent.[114] Also notably lacking from Bill 25 is any reference to national and global climate efforts or the *Paris Agreement*.[115] Also absent are provisions establishing the consequence for those who are in charge of assessing and permitting proposed oil sand activities or reporting requirements.[116] There is also a lack of guidance about whether current

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[107] Karine Péloffy, supra note 44 at 667.
[108] Bill 25, *Oil Sans Emissions Limit Act* , 2nd Sess, 29th Leg, Alberta, 2016, online: <http://www.qp.alberta.ca/documents/Acts/O07p5.pdf>.
[109] Alberta Government, "Capping oil sands emissions", online: <https://www.alberta.ca/climate-oilsands-emissions.aspx>.
[110] Bill 25, *Oil Sans Emissions Limit Act* , 2nd Sess, 29th Leg, Alberta, 2016, online: <http://www.qp.alberta.ca/documents/Acts/O07p5.pdf> at art 1.
[111] Nigel Bankes, "Oil Sands Emission Limit Legislation: A Real Commitment or Kicking It Down the Road?", (3 November 2016), *University of Calgary Faculty of Law ABlawg* (blog), online: <http://ablawg.ca/2016/11/03/oil-sands-emission-limit-legislation-a-real-commitment-or-kicking-it-down-the-road/>.
[112] Andrew Read & Benjamin Israel "Transition: Clean Energy Commentary from the Pembina Institute" in Oilsands Review September (2016) at 52.
[113] Pembina Institute Briefing Note at 2.
[114] Andrew Read & Benjamin Israel "Transition: Clean Energy Commentary from the Pembina Institute" in Oilsands Review September (2016) at 52.
[115] Nigel Bankes, "Oil Sands Emission Limit Legislation: A Real Commitment or Kicking It Down the Road?", (3 November 2016), *University of Calgary Faculty of Law ABlawg* (blog), online: <http://ablawg.ca/2016/11/03/oil-sands-emission-limit-legislation-a-real-commitment-or-kicking-it-down-the-road/>.
[116] Nigel Bankes, "Oil Sands Emission Limit Legislation: A Real Commitment or Kicking It Down the Road?", (3 November 2016), *University of Calgary Faculty of Law ABlawg* (blog), online: <http://ablawg.ca/2016/11/03/oil-sands-emission-limit-legislation-a-real-commitment-or-kicking-it-down-the-road/>.

emitters are entitled to a share of the 100 Mt limit, whether that share declines over time, how is that entitlement acquired, whether it is assignable, and whether there will be a market for entitlements.[117]

At the very least, even given the lack of policy guidance, an assessment should look into whether new pipeline capacity fits under this cap or would exceed it given the already installed and approved capacity.

6.3. Ensuring Projects have Positive Structural Impacts on Decarbonization

None of the approaches deployed in estimating climate impacts of hydrocarbon projects so far address one of the most significant climate impact of a project, that is: its structural impact on future actions, i.e. e. the political economy of development and the risk of locking in GHG intense technologies. Lock-in results from institutional rules of the game that render change difficult to initiate.[118]

The EA should assess the impact, over a longer time scale, of the continued supply of fossil fuels to the market, which could lead to:

> "long term 'lock-in' of specific fuels and technologies or 'lock-out' of lower-GHG technologies, either because it uses up finite capital or to the extent that it contributes to social or political norms for fossil fuels builds in a redundancy of supply that helps to increase investor confidence in the long-term prospects of that fuel, or contributes to economies of scale for fossil fuel processing technologies (especially for "unconventional" fossil fuels)".[119]

Indeed, major fossil fuel infrastructure projects enable political forces which have vested interests in pursuing further similar developments in the future and opposing the needed energy transition. On the other hand, not going forward with a project could result in alternative energy supply industries flourishing and locking in, strengthening political momentum in the opposite direction. These forces have proven to be important in the context of the German *Energiewende* or "Energy turnaround". Germany managed to reduce emissions by 27% below 1990s, no small feat for a nation with important coal deposits and a large industrial sector.[120] Still, the coal sector has proven to be a powerful opponent that can seriously hinder the future of the transition by shaping the discourse and "setting the policy agenda in order to protect their interests amid growing pressure from renewables."[121]

Therefore, a political economy perspective looking into a project's influence on climate

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[117] Nigel Bankes, "Oil Sands Emission Limit Legislation: A Real Commitment or Kicking It Down the Road?", (3 November 2016), *University of Calgary Faculty of Law ABlawg* (blog), online: <http://ablawg.ca/2016/11/03/oil-sands-emission-limit-legislation-a-real-commitment-or-kicking-it-down-the-road/>.

[118] Levin et al. "Overcoming the tragedy of super wicked problems: constraining our future selves to ameliorate global climate change "*Policy Sci* (2012) 45:123–152 at. p. 134;

[119] *SEI 2013* at p. 2

[120] Stefan Bobner, Stockholm Environment Institute, *Turning energy around: Coal and the German Energiewende*, 2016 p. 1

[121] *Ibid.* p. 5

policies or actions of other major players[122], albeit qualitative in nature is also necessary. Indeed, a project approval or refusal could have a climate impact vastly exceeding its associated emissions if it catalyzes large-scale changes, spillover effects or other systemic change.[123]Such an analysis is especially relevant in the context of not yet producing Canadian resources since "among investments in fossil fuels, those in oil production, especially in higher-cost, yet-to produce resources, are most likely to increase carbon lock-in."[124]

Analyses of a project's implications for the pace and scale of the transition towards decarbonisation, to carbon lock in of the Canadian economy or its potential impediment of other current or future actions to fight climate change should be included. Canada should avoid path dependencies that lead to future stranded assets or entrenched political forces willing to sacrifice vulnerable people and future generations in order to protect vested interests and short-term profits.

6.4. Assessing Costs and Benefits in a World Affected by Climate Change: the Social Cost of GHGs

There are important ethical considerations when monetizing climate damages, but it seems the lesser evil since the lack of monetary value for future harm, particularly environmental harm and climate harm, has tended to mean decision makers assess them as zero. Note that including a social cost of GHG analysis is not an alternative to compatibility with decarbonization pathways, it is just another metric for assessment.

The overall project decision should be made based on whether the project is making a net contribution to sustainability. That determination, in turn, has to include an assessment of the projects effect on short, medium and long term efforts to reduce GHG emissions in Canada and globally, and to reach GHG neutrality as soon as practicable. Quantifying the social cost of carbon can assist with this process, but it cannot turn the analysis into a purely monetary calculation where the economic gains of the project are weighed against the social cost of carbon, and do away with the net contribution to sustainability approach.[125]

6.4.1. Explanation of the Social Cost of Carbon and its Limitations

The social cost of carbon (SCC) is a comprehensive estimate of the present discounted value of future damages for a given year – that is, the monetized value of the net impacts, both negative and positive – from the global climate change that results from a small (1 metric ton) increase in CO_2 in that given year.[126] Models consider future expected temperature changes and other variables such as GHG concentration and translate these into physical

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[122] *SEI 2013* p. 6

[123] *SEI 2013* p. 7

[124] Erickson, P., Lazarus, M. and Tempest, K. (2015). *Carbon Lock-in from Fossil Fuel Supply Infrastructure. SEI Discussion Brief. Stockholm Environment Institute*, Seattle, WA, US. http://www.sei-international.org/publications?pid=2805 at p. 5

[125] Gibson, R.B., S. Holtz, J. Tansey, G. Whitelaw, S. Hassan. *Sustainability Assessment: Criteria and Processes*. Earthscan, 2005.; ibson, R.B. *Sustainability Assessment: Applications and opportunities.* Routledge, 2016.

[126] National Academies of Sciences, Engineering, and Medicine. 2017. *Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide*. Washington, DC: The National Academies Press. doi: 10.17226/24651 at p. 1 and 6 [*National Academies*]

impacts and monetized damages including, without being limited to, economic harm (changes in net agricultural productivity, energy use, property damage from increased flood risk) and non-economic harm (human health, the services that natural ecosystems provide to society) over long time horizons.

The SCC concept was initiated by the government of the United Kingdom in 2002 in order to assess the benefits – in terms of avoided future climate damages - of policies involving GHG reductions and was later similarly included in formal assessments in the United States in 2011 under the Obama administration.[127] The federal government of Canada adapted the approach from the US in order to develop Canadian estimates for regulatory analysis.[128] So far, values have also been calculated for the social cost of methane and nitrous oxide in the U.S. and Canada.

There are significant inherent uncertainties involved in calculating the SCC with the result that SCC tends to underestimate the cost of future climate change. For example, existing models do not fully account for various interactions and feedbacks in the human-climate system [129] such as the effect of climate change on economic growth, increased disparities between wealthy and poor regions, degree of risk aversion characterizing policy makers and the changing rate and intensity of economic damage above critical temperature thresholds.[130] Every time the estimates have been revised, their values have increased. The accuracy of estimates is likely to improve as climate research and modelling keep advancing.

Probably the most controversial aspect of the SCC is the use of the discount rate to arrive at a net present value of future damages, as it implies ethical value judgements and intergenerational equity.[131] The present value of damages is a reflection of a society's willingness to trade value in the future for value today.[132] "Small differences in the discount rate can have large impacts on the estimation of the SCC". [133] The higher the discount rate, the lower the assumed net present value of the future harm. One of the most well-known estimation of the SCC conducted by Lord Stern, former chief economist of the World Bank, was relatively high because the report used a low discount rate (1.4%)[134] compared to those used by regulatory agencies today (2.5%, 3% and 5% in the U.S.; 3% in Canada). There is no consensus on the proper discount rate, and using different rates can present difficulties if there is an attempt to compare with benefits of a project : consistency would require that the same discount rate be applied to costs and benefits that occur in the same year.[135]

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[127] Anthony Heyes et al., *The Use of a Social Cost of Carbon in Canadian Cost-Benefit Anaysis*, Canadian Public Policy, vol XXXIX Supplement 2 2013 at p. S69; Executive Order No. 13,563. 2011. "Improving Regula-tion and Regulatory Review," issued by the President of the United States 18 January 2011. Available at: http://www.gpo.gov/fdsys/pkg/FR-2011-01-21/ pdf/2011-1385.pdf.

[128] ECCC, *Technical Update to Environment and Climate Change Canada's Social Cost of Greenhouse Gas Estimates* (March 2016) online : http://ec.gc.ca/cc/default.asp?lang=Fr&n=BE705779-1#SCC-Sec3

[129] *National Academies* p. 11

[130] *Re: Draft Guidance Climate Impacts NEPA* at 7.

[131] *National Academies* p. 226

[132] *National Academies* p. 2

[133] *National Academies* pp. 221-222

[134] Stern, N. H. (2007). *The economics of climate change: the Stern review*. Cambridge, UK: Cambridge University Press.

[135] *National Academies* p. 227

In this context, it is recommended to present values using different discount rates so as to show the impact of discount rates on estimates. For this, ECCC would have to develop values for discount rates other than 3%. This would accurately reflect the value judgements inherent in the SCC process, rather than leave the false impression that the SCC is a value free number that can be plugged into a formula to determine whether a project is economically viable or will make a net contribution to sustainability.

In August 2016, the Court of Appeal for the 7th circuit confirmed the legality of the use of SCC put forward by the U.S. Department of Energy (DOE) in its regulatory cost benefit analysis of CO_2 abatement regulation.[136]

Hence, the SCC is not a concept put forward by climate activists, it is an imperfect but robust compromise that has been endorsed by governments and courts alike as a safeguard against completely ignoring the future cost of GHG emissions from proposed projects.

Within EAs, we recommend rigorous explanation of uncertainties, the use of more than one discount rate and the influence of discount rates on values, etc. In other words, a range of estimates of the SCC should be presented as a basis for engaging in a discussion of whether the project is worth proceeding with.

For broader policy-making, we refer to the recommendation made by the U.S. National Academies of Science Engineering, and Medicine 2017 report with regards to the future refinement of the concept of the SCC and regular updating of approaches, discount rates and estimates of SCC values with the best available science.

6.4.2. Legitimacy of Using a Value for Global Rather Than National Climate Damage

The global nature of impacts that result from GHG emissions regardless of where they originate means the focus should be on assessing total global damage. Using a global approach is consistent with Canada's ratification of the Paris Climate Agreement, and with the underlying approach of the *Paris Agreement* that all member states will reduce their emissions according to their responsibility, capacity, and national circumstances. The *Paris Agreement* is based on the very idea that we need to act collectively, because all our emissions have global impacts. It is also consistent with the recognition in the *Paris Agreement* that many countries who face the most severe impacts of climate change have done little to cause climate change, and that other countries (such as Canada), who have disproportionately contributed to the problem, need to offer financial and other assistance to other countries to help them mitigate, adapt, and deal with loss and damage caused by climate change. This means that we have to accept our share or responsibility for the global impact of our emissions.

Using global figures also makes sense from a national point a view. Trying to get to a national estimate of SCC would seem ill advised because the damages to a country of GHG emissions go above and beyond the direct impacts of climate change that occurs within a

[136] *Zero Zone inc.* v. *United States Department of Energy,* 46 ELR 20137, No. 14-2147 et al., (7th Cir., 08/08/2016). http://media.ca7.uscourts.gov/cgi-bin/rssExec.pl?Submit=Display&Path=Y2016/D08-08/C:14-2159:J:Ripple:aut:T:fnOp:N:1807496:S:0

country's physical borders. Climate change in other regions of the world could affect Canada, "through such pathways as global migration, economic destabilization and political destabilization"[137] There may be changes in economic conditions of trading partners. This could have important ramifications for a country like Canada, which imports a significant portion of its food produce given its cold climate. For example, in 2014, Canada imported $2.7 billion worth of produce from the State of California alone. Droughts in California can mean higher food bills for Canadians or the necessity to start importing food from countries with less stringent safety standards.[138]

We recommend using the global value of damages.

6.4.3. Use of SCC in an EA Context

The SCC has since started being used in U.S. federal environmental assessments as an estimation of global damages associated with a project's GHG emissions. The most comprehensive - yet imperfect - use of the SCC was in the assessment of the *Rulemaking for Colorado Roadless Road* [139] that followed the *High Country Conservation Advocates* decision cancelling the previous impact statement which had failed to include costs related to climate change.

In *High Country Conservation Advocates,* the court held that it is unreasonable to completely ignore "a tool [the social cost of carbon] in which an interagency group of experts invested time and expertise. Common sense [suggests] that quantifying the effect of greenhouse gases in dollar terms is difficult at best. The critical importance of the subject, however, [suggests] that a 'hard look' has to include a 'hard look' at whether this tool, however imprecise it might be, would contribute to a more informed assessment of the impacts than if it were simply ignored. "[140]

Indeed, U.S. courts have held that it is arbitrary and capricious to quantify benefits of an action and ignore its costs, even where the law does not require a formal cost-benefit analysis. Indeed, " a government agency choosing to trumpet an action's benefits has a duty to disclose its costs "[141] By deciding not to quantify costs at all, agencies effectively zero out the costs in quantitative analyses which is arbitrary and capricious since there are no estimates that assign a zero cost to GHG emissions.[142]

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[137] *National Academies* p. 12

[138] Patrick Cain, *After California: What the state's water crisis means for Canada's food security* (June 2015) online http://globalnews.ca/news/2031246/after-california-what-the-states-water-crisis-means-for-canadas-food-security/

[139] USDA Forest Service, SDEIS *Rulemaking for Colorado Roadless Areas* online at : http://www.fs.usda.gov/roadmain/roadless/coloradoroadlessrules See also Final Environmental Impact Statement for the Constitution Pipeline and Wright Interconnect Projects (CP13-499-000 and CP13-502-000) Issued October 24, 2014 online at : https://www.ferc.gov/industries/gas/enviro/eis/2014/10-24-14-eis.asp; SEe also Navajo Generating Station-Kayenta Mine Complex Project EIS online at : https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details?eisId=217901

[140] *High Country* at p. 22

[141] *Sierra Club v. Sigler*, 695 F.2d 957, 979 (5th Cir. 1983)

[142] *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin*., 538 F.3d 1172, 1217 (9th Cir. 2008) ; See also *Border Power Plant Working Grp. v. U.S. Dep't of Energy*, 260 F. Supp. 2d 997, 1028-29 (S.D. Cal. 2003)

The SCC allows an analysis of the "synergistic effects" of a proposed project's GHG emissions. It is an analytical tool to understand the approximate scale of the climate impacts of a proposal compared to alternatives and should be used regardless of whether a formal cost-benefit analysis is conducted.[143] It is not possible to understand the climate impact of a project by only accounting for its GHG emissions, without some assessment of the harm they will cause.[144] Statements in reports highlighting the small proportion of global GHG emissions that a project contributes should be discouraged since such numbers dissimulate the specific climate change impacts of a project.[145] By using SCC values, better consideration can be given to climate change by ensuring that GHG emissions are tracked *along with* the project's marginal contribution to global temperature increase and translating those temperature increases into monetized damage estimates.[146]

The SCC encourages the consideration of the cumulative impacts of climate change, though, again, it is not a substitute for cumulative effects analysis.[147] "The SCC provides an estimate of the cumulative impacts of incremental emissions: that is, the impact of a proposal's emissions when added to the past, present, and reasonably foreseeably emissions."[148] Climate change is inherently cumulative in nature and the SCC provides the necessary context for understanding data that may otherwise fail to capture the larger picture.[149] It should be used in assessments of hydrocarbon projects.

Finally and most importantly, the SCC ensures that climate impacts of a project are framed in a way that enables the public and decision makers to gain a more tangible understanding of the scale of damage that would come with a project.[150] The tangibility of this information is especially useful because it is very difficult for the public to relate to "a ton of GHG", which is quintessentially intangible and invisible. For example, previous drafts of the CEQ guidance contemplated using a level of emissions be –25,000 tons of CO_2 per year– as a threshold to require quantification of emissions; an approach removed in the final version for good reason. Indeed, 25,000 tons of CO_2 per year entail estimated global damages in the tens of millions of dollars over a twenty-year project lifespan. The difference between using emission levels as a proxy for impacts and using SCC values is significant: 25,000 tons of CO_2 per year compared to an estimated $20,000,000.[151]

[143] Center for Biological Diversity et al. "Re: Draft Guidance on Consideration of Greenhouse Gas Emissions and Climate Impacts under the National Environmental Policy Act" (2015) at 4 [*Re: Draft Guidance Climate Impacts NEPA*].
[144] *Ibid.* at 5.
[145] *Ibid.*
[146] *Ibid.*
[147] *Ibid.* at 6.
[148] *Ibid.* at 6.
[149] *Ibid.* at 8.
[150] *Ibid.* at 6.
[151] *Ibid.*

7. ADAPTATION: CONSIDERING THE EFFECTS OF CLIMATE CHANGE ON THE PROJECT AND ITS THE ENVIRONMENTAL CONSEQUENCES.

Canada should consider including a vulnerability assessment when describing the environment affected by proposed actions. As well, reasonably foreseeable climate change impacts of each alternative, including no action, should be conducted. [152] Differentiating between coastal plains, foothills, and mountains regions, the analysis should discuss the effects of climate change for temperature, precipitation, water availability, vegetation, and fire regime, broken down by month and season for some factors and assess impacts on the project and its alternatives.[153] Adaptive measures should also be included where appropriate for each alternative.[154]

CONCLUSION: REVERSE ONUS BUSINESS AS USUAL AND DEEPLY ENGAGE ETHICS

To a certain extent, a full blown monetized climate impact analysis of all energy projects, specifically GHG intensive fossil fuel projects, can be an artificial and in itself meaningless exercise. We already have enough information about the climate problem to know that climate harm already occurring is significant and the future damage is of a magnitude that seriously threatens the survival of life-sustaining systems on which human civilizations depend. This cannot be allowed to happen, no matter the economic cost. Still, to the extent that governments continue to consider allowing new fossil fuel based infrastructure or production projects, this type of analysis will be necessary, to avoid creating stranded assets and to ensure strict conditions that prevent these projects from undermining our own climate goals and our global responsibilities and commitments.

In order to minimize burdens on public institutions and proponents alike, a reversed onus approach should be used when assessing future fossil fuel developments: none should go forward unless project proponents can demonstrate they are the low GHG intensity exception that fits within the global energy shift forecasted in the coming years and decades. In other words, proponents have to demonstrate that these projects will help reduce emissions in the short term, and that they will not stand in the way of the deep reductions needed in the longer term.

The analysis recommended in this report is complex and technical compared to what is currently undertaken in Canadian EAs. However, these requirements fit with the society they are trying to transform: complex, technical, and orientated towards financial values.

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[152] For a good example, see BLM's EIA for the Alaskan National Petroleum Reserve (NPR-A) Integrated Activity Plan U.S. Department of Interior, Bureau of Land Management, *National Petroleum Reserve-Alaska: Final Integrated Activity Plan/ Environmental Impact Statement, App. C- NPR-A Climate Change Analysis: An Assessment of Climate Change Variables in the National Petroleum Reserve in Alaska* (Nov 2012), online: < https://eplanning.blm.gov/epl-front-office/projects/nepa/5251/41003/43153/Vol1_NPR-A_Final_IAP_FEIS.pdf>.

[153] U.S. Dept. of Interior, Bureau of Land Mgmt., *National Petroleum Reserve-Alaska: Final Integrated Activity Plan/Environmental Impact Statement, App. C- NPR-A Climate Change Analysis: An Assessment of Climate Change Variables in the National Petroleum Reserve in Alaska* (Nov. 2012)

[154] Memorandum on adaptive management *Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact*. Nancy H. Sutley, President, CEQ, to Heads of Federal Departments and Agencies.

Furthermore, the complexity of the analysis pales in comparison to the risk we assume as a society of approving such projects without careful consideration of their role in the energy transition that is now underway globally to mitigate climate change.

Other approaches to the needed analysis, perhaps simply stated but difficult to achieve, are also possible. The issue of effort sharing among individual countries or amongst provinces in a country involves ethical considerations:

> Many areas of climate policy-making involve value judgements and ethical considerations. These areas range from the question of how much mitigation is needed to prevent dangerous interference with the climate system to choices among specific policies for mitigation or adaptation. Social, economic and ethical analyses may be used to inform value judgements and may take into account values of various sorts, including human wellbeing, cultural values and non-human values.[155]

This awareness of the ethical dimensions of climate change policymaking is an opportunity for deeper reflection for Canadians. When it comes to ethics, experts have no comparative advantages and an ongoing public conversation is inevitable and necessary. This represents an opportunity for the government to shift from a technical to a values perspective, and to specifically incorporate indigenous voices and principles into the dialogue. Indigenous peoples have been at the forefront of protecting this territory and are amongst the first Canadian victims of climate change. They are entitled to expedient, deep, and justice-based decarbonization and adaptation. They may also hold the key to cultural tools and governance principles such as intergenerational equity that facilitate the transformation of the Canadian system to enable governance of new, more sustainable types of development, if we are willing to listen and learn...

[155] Brigitte Knopf & Oliver Geden, *A Warning From the IPCC: The EU 2030's Climate Target Cannot Be Based on Science Alone*, Energy Post, June 26, 2014 (citing Summary for Policymakers of IPCC WGIII), http://www.energypost.eu/warning-ipcc-eu-2030s-climate-target-based-science-alone.

LIST OF RECOMMENDATIONS

These recommendations should be read as complementary and more detailed than the general climate recommendations included in the EPA Caucus submission provided in Annex 1 (recommendations 24-34)

Context of NEB modernization and future role of the NEB

1. Regional environmental assessments, strategic environmental assessments and project environmental assessments should be carried out, as appropriate, in the proposed new energy decision making regime to address the big picture issues, including the role of greenhouse gases (GHG) emissions in project decision-making. These various levels of EA should be integrated to inform each other, and should collectively inform the regulatory decisions of the NEB.

2. The NEB should not be in charge of any REAs, SEAs or project EAs for pipelines or other energy infrastructure proposals prior to approval. The core responsibility of the NEB should be to implement the EA decision, and to effectively regulate approved projects.

Definition of public interest in climate context (in conjunction with Part II)

3. Public interest determinations on infrastructure and other energy proposals should take into account the human rights implications of climate change and the urgency to avert dangerous climate change. Both militate in favour of a 21st century determination of public interest centered around a rapid and just transition to a clean energy future that steers us within the relatively safe temperature threshold identified internationally.

National Energy Transition Information Authority (in conjunction with Part I)

4. The information part of the NEB mandate should become the National Energy Transition Information Administration (NETIA), an independent institution separate from the regulatory process, which would be tasked with conducting fundamental research and public information on key challenges of the energy transition in Canada.

5. This institution would provide accurate, impartial and credible information and analysis for EA processes at all levels and could be called upon to provide analysis in the context of specific projects.

6. NETIA would also conduct research for broader strategic policy-making beyond project assessments (SEAs and REAs) especially where there are obvious policy gaps, such as:

a. Canada's fair share in the global decarbonisation efforts and future Canadian NDCs.

b. National, regional and sectoral carbon budgets.

c. The role of the oil and gas sector in the energy transition.

7. NETIA would develop fully transparent and freely accessible climate, energy and economic models that allow researchers and policy makers to test a range of assumptions and possible pathways.

8. NETIA should also conduct qualitative analysis of the political economy of the energy transition.

9. NETIA should ensure that economic models used to forecast energy demand include climate policies consistent with the Paris Agreement and global decarbonisation efforts.

Scope of GHG Information Gathering

10. All life cycle emissions (upstream, downstream and direct) over the entire lifespan of the project must be included in the assessment in order to provide a global value of GHG emissions associated with the project.

11. It is crucial to assess the cumulative impact of GHGs. Emissions should be cumulatively tallied towards 2020, 2030 and 2050 time horizons so as to enable a discussion of project emissions relative to our climate commitments.

12. Assessments should include whenever possible project specific data for product mix and upstream production scenarios, and use the best available science.

13. If assessments go beyond assessing the global emissions associated with a project and attempt to identify incremental emission and relative substitution, such assessments must display all methods of attribution in a transparent manner that enables comparisons across estimates based on different assumptions so as to be able to test the influence of the assumptions on the final result.

14. Upstream GHG assessments must be comprehensive and specifically include fugitive emission factors and land use change emissions.

Climate Impact Analysis

15. The analysis part of the assessment should be conducted relative to existing and evolving national climate commitments under the Paris Agreement, understanding they will be updated to become more stringent every five years.

16. The analysis should also include provincial policies that have a bearing on upstream emissions and international policies that have bearing on downstream emissions.

17. Projects need to be assessed to ensure they have a positive structural impact on decarbonisation. Attention should be given to the project's implications for the pace and scale of the transition towards decarbonisation, to carbon lock in of the Canadian economy or its potential impediment of other current or future actions to fight climate change should be included. Canada should avoid path dependencies that lead to future stranded assets or entrenched political forces willing to sacrifice vulnerable people and future generations in order to protect vested interests and short-term profits.

18. The social costs of GHGs should be included as part of the overall analysis in order to allow decision makers to better understand the cumulative and synergistic impact of the project on global GHG emissions as well as enable the public to understand climate impacts in more tangible terms. We recommend using the global value of damages as most consistent with Canada's ratification of the Paris Agreement.

19. Regarding the social cost of GHGs, we recommend full and transparent acknowledgement of uncertainties, the use of multiple discount rates and consideration of the influence of discount rates on values, etc. In other words, a range of estimates of the SCC should be presented as a basis for engaging in a discussion of whether the project is worth proceeding with.

20. For broader policy-making and EAS, we refer to the U.S. National Academies of Science Engineering, and Medicine 2017 report with regards to the future refinement of the social cost of carbon, regular updating of approaches, discount rates and estimates of values with the best available science.

21. The effects of climate change on the project and its environmental consequences should be assessed.

Conclusion

22. In order to minimize burdens on public institutions and proponents alike, a reverse onus approach should be used when assessing future fossil fuel developments: none should go forward unless project proponents can demonstrate they are the low GHG intensity exception that fits within the global energy shift forecasted in the coming years and decades.

23. The government of Canada should enable a broad and ongoing public conversation about the ethics of climate change and include indigenous peoples' voices.