

# EIGHT QUESTIONS FOR ALL MEMBERS OF PARLIAMENT

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## *The incompatibility between Canada's new "net-zero by 2050" climate goal and the continued expansion of oil sands production to 2045*

Since late November 2020, a series of developments have occurred that give us an opportunity to re-frame the public discussion about the Trans Mountain pipeline expansion project and whether it is consistent with Canada's climate commitments:

- An announcement on November 19, 2020, that Canada will enact legislation committing Canada to achieve "net-zero greenhouse gas emissions by the year 2050". The government is moving to pass into law a bill (Bill C-12) that will enshrine that promise in legislation.
- The release on November 24, 2020, of the *Canada's Energy Future 2020* report. This is an annual report which in past years has provided updated projections showing the expected growth of Canada's oil and gas production to 2030 and 2040. The new report provides production data to 2050. The "Reference Case" shows that expansion of Canada's total oil production will continue until 2045, when it will "peak" at 7.1 million barrels per day (bpd), more than 2.2 million bpd above the 2019 level.
- On December 8, 2020, the release of a report *Trans Mountain Pipeline – Financial and Economic Considerations – Update* by the Parliamentary Budget Officer (PBO) which addresses the financial viability of the Trans Mountain Pipeline under different scenarios that consider the impact of future changes in global demand for crude oil. The question is whether the TMX pipeline will be economically viable in the event of a marked slowdown in the future growth of oil sands production and a decline in crude oil output in Western Canada.
- On December 11, 2020, the government published a 79-page brochure titled *A Healthy Environment and a Healthy Economy*. It discusses proposed new policies and measures that the government says it will adopt in future to reduce emissions in various sectors of the Canadian economy (Transportation, the Buildings sector, Agriculture, etc.). Yet it provides very little detail or numerical analysis showing the actual reductions these promised measures will achieve. Despite the absence of detail, the *Healthy Economy* document makes a bold claim that Canada's overall emissions will be reduced to 503 million tonnes (Mt) of CO<sub>2</sub> eq by 2030. In support of that claim, the government also released a 9-page "Annex" which contains a limited amount of additional data.
- On April 15, 2021, the government released the *National Inventory Report: Greenhouse Gas Sources and Sinks in Canada 1999-2020*, documenting Canada's emissions up to 2019. The national total in 2019 reached 730 million tonnes (Mt) CO<sub>2</sub> eq. When we signed the Paris Agreement in 2015, Canada made a commitment to cut its total

emissions 30% by 2030, below the 2005 level. The 2005 level was 738 Mt. We have cut 9 Mt over the past fourteen years, a reduction of 1.2 %.

- On April 22, 2021, the government announced a new goal for the reduction of Canada's greenhouse gas emissions by 2030. The April promise is that emissions will be reduced 40% to 45% by 2030, below the 2005 level. A 45% reduction would reduce Canada's emissions to 401 Mt.
- On May 18, 2021, the International Energy Agency (IEA) published a new report, *Net-Zero by 2050: A Roadmap for the Global Energy Sector*. It examines the magnitude of the reductions in global oil production (and in coal and natural gas production) required by 2040 to give the world a realistic chance to reach a goal of net-zero emissions by 2050 and limit warming to 1.5°C. In a dramatic departure from its past approach, the new IEA study calls for *an immediate halt to any further expansion of global oil production* and deep reductions in oil consumption by 2040 on a scale that is unprecedented. For Canada, the world 4<sup>th</sup> largest oil producer, this report has enormous implications.

## CONTRADICTION: NET-ZERO EMISSIONS AND INCREASING OIL PRODUCTION

The *Canada's Energy Future 2020* report ("CER 2020 report")<sup>1</sup> published by the Canadian Energy Regulator is of special interest because it includes a new scenario, called the "Evolving Scenario," which outlines an alternative path for crude oil production in Canada involving a slightly *reduced* rate of growth over the next twenty years. That is the main feature of the new report that makes it worthy of attention. This Evolving Scenario is just a theoretical projection. It does not indicate any change in policy by the government or change in the presently expected rate of expansion.

Projections of Canada's future oil production played a crucial role at every step of the pipeline approval process that culminated on November 29, 2016, when the government by an Order in Council authorized the construction of the Trans Mountain Pipeline (TMX). Back in 2015 and in 2016, reports prepared by this same agency, then known as the National Energy Board (NEB), provided the economic rationale for approving the pipeline project. Guided by a broadly shared consensus that global oil consumption would continue to rise for another thirty years (a consensus that has now begun to dissolve) and that world oil prices would remain high for decades to come, the NEB's reports have consistently affirmed that Canada's oil sands production will continue its increase to 2040 and beyond.

The argument in favour of the TMX project, when it was approved in 2016, was based on the proposition that Canada will need additional pipeline capacity to facilitate the *expected production increases over the next two decades*.

Now that proposition is being seriously challenged.

The significance of the new *Canada's Energy Future 2020* document is that the Canada Energy Regulator, the agency of the Federal Government that regulates pipelines and energy development in Canada, has admitted that the currently projected expansion of oil sands

production to 2045 affirmed by the agency’s own most recent “Reference Case” studies and relied on by the government to justify the TMX project, cannot be reconciled with Canada’s newly announced climate commitment to achieve net-zero greenhouse gas emissions by 2050.

What appears to have triggered that public acknowledgment (or compelled the agency to address the question publicly) was the government’s decision that Canada would formally adopt “net-zero by 2050” as its new climate plan, which it announced on November 19, 2020.

Now the International Energy Agency (IEA) on May 18, 2021, has delivered an unsparing analysis showing that the long-standing belief that Canada and other global oil suppliers can enjoy *another two decades of expanding production* is untenable. The table below summarizes the IEA’s new findings showing the deep reductions required by 2040 in global oil production to give the world a realistic chance to reach the promised goal of net-zero emissions by 2050 and limit warming to 1.5°C. The production numbers are given in millions of barrels per day (mpd):<sup>2</sup>

**Figure A: IEA Net-Zero by 2050: projections (in millions bpd)**

	2020	2040	2050
Net-Zero by 2050 Scenario	90	44	24

Source: *Net-Zero by 2050: A Roadmap for the Global Energy Sector*, IEA, May 18, 2021.

World oil production in 2019 reached 98 million bpd, the highest level ever. As a result of the severe economic impact of the Covid-19 pandemic, worldwide oil consumption dropped abruptly to 90 million bpd in 2020. The IEA’s new report makes clear however that based on existing energy policies, world oil demand will move back up to 98 million bpd by 2023 and rise to around 104 million bpd shortly after 2030 and remain at about that level to 2050.

The following eight questions are focused on key elements of the government’s announced new climate policy. They identify an underlying contradiction between Canada’s declared “more ambitious” climate goals and Canada’s plans to continue to expand oil production to 2045. These questions call for the disclosure of important information by the government – information on crucial points that have not been addressed in any of the announcements and reports released by the Federal Government since November 29, 2020. These questions call for absolute candour by Members of Parliament in their communications with the public. Constituents are the foundation of our Parliamentary democracy. If constituents cannot play an informed part in political decision making on climate policy, there is no democracy.

## 1. Oil sands production expected to continue to expand for 25 more years

The new *Canada’s Energy Future 2020* report provides a detailed projection (called the “Reference Scenario”) showing that Canada’s overall oil production (including both oil sands and conventional oil) is expected to continue increasing until 2045, when it will “peak” at 7.1 million bpd, more than 2.2 million bpd above the 2019 level. Expanding oil sands production drives that growth. The CER 2020 report has also published an alternative scenario called the

“Evolving Scenario” which projects that the expansion of Canada’s oil production will continue to increase to 2039 when it will peak at 5.8 million bpd, still 900,000 bpd above the 2019 level.

Since at least 2013 a series of reports and studies by climate scientists have repeatedly advised that the ongoing growth of global oil consumption witnessed during the past 20 years is inconsistent with any climate goals including the less ambitious 2°C warming limit.

The IEA’s earlier “Sustainable Development Scenario”<sup>3</sup> warned two years ago (November 2019) that to keep the rise in the earth’s average surface temperature within a 1.8°C warming limit, the world’s oil consumption must fall 10% by 2030 and 30% by 2040.

The IPCC’s *Special Report on Global Warming to 1.5°C*<sup>4</sup> (October 2018) also concluded that deep oil production cuts will be required by 2030 to meet the promised “net-zero” goal by 2050 to stay within the 1.5°C limit. It explained that a 50% reduction of overall global emissions must be achieved by 2030 to meet that goal. The Government of Canada approved the text of the *Summary for Policy Makers* that accompanied the IPCC’s 2018 report. The *Summary* document confirms that a substantial reduction in oil consumption must be achieved on a global scale by 2030 to give us any realistic chance to keep the increase in average surface temperature within safe warming thresholds.

The IEA’s new “Net-Zero by 2050 Scenario” released on May 18, 2021, has concluded that global oil production must be reduced 50% by 2040 and 75% by 2050 to keep the increase in the earth’s average surface temperature to within the 1.5°C warming limit.

Oil accounts for 32% of all global CO<sub>2</sub> emissions from burning fossil fuels. The staggering task of achieving a 50% cut of total CO<sub>2</sub> emissions by 2030 below the 2019 level cannot be done without a substantial decline of oil production on a worldwide scale.

Neither the *Canada’s Energy Future 2020* report nor the *Healthy Environment and a Healthy Economy* document address the incompatibility between the ongoing growth of Canada’s oil sands production and the overwhelming scientific evidence that affirms the need for deep cuts in global oil consumption by 2030.

## QUESTIONS AND REQUEST:

- 1.1 Do you agree that all further *expansion* of oil sands production should end now, and that Canada must establish a plan that provides for a gradual reduction of Canada’s total crude oil production to 2030 and a deeper reduction to 2050, a plan aligned with the reduced levels of global oil output that over the next three decades will be essential to meet the net-zero emissions goal by 2050 and limit warming to 1.5°C?**
- 1.2 Will our Members of Parliament publicly acknowledge that the “Reference Case” scenario presented in the CER 2020 report of November 24, 2020 is not an acceptable or safe basis for developing Canada’s energy policy?**

## 2. Canada's oil sands expansion not consistent with global net-zero goal

As we have noted above, the *Canada's Energy Future 2020* report includes a new scenario called the “Evolving Scenario,” which outlines an alternative path for crude oil production in Canada involving a *slightly reduced rate of growth* over the next twenty years. This Evolving Scenario is just a theoretical projection. The report does not indicate any pending change in Canada's policy or plan to curb the presently expected rate of expansion, which continues to be the higher rate shown in the Reference Case.

*Canada's Energy Future 2020* doesn't offer any opinion or estimation of whether the rate of growth of oil production in Canada will eventually slow down to something like the Evolving Scenario. Neither *A Healthy Environment and A Healthy Economy* nor the Annex document released on December 11, 2020, offers any commitment to halt the further expansion of oil sands production, projected to continue to 2045 according to the new CER 2020 report.

Yet, a brief statement toward the end of the document concedes that even the slower rate of growth in future oil sands production shown in the Evolving Scenario would not be sufficient to meet Canada's recently announced “net-zero by 2050” goal:

*It is also clear that Canada's more ambitious goals, such as achieving net-zero by 2050, will require faster transition than we have witnessed historically and faster than is shown in the Evolving Scenario. Recognizing this fact, we have introduced a “Towards Net-zero” section in EF2020.*

— CER 2020 Report, page 62 (emphasis added)

That is an acknowledgement that Canada's planned trajectory of oil sands expansion is inconsistent with limiting global warming to 1.5°C.

On that important point, the government and in particular the Minister of Environment and Climate Change have remained silent for over six months since the CER report was released on November 24. They have offered no comment on how Canada's current plans to continue oil sands expansion can be reconciled with the “net-zero by 2050” goal.

We note too the new findings by the International Energy Agency in its May 18, 2021 report warning that global oil production must decline 50% by 2040, below the 2019 level.

We also draw to your attention a study published on March 9, 2021, *Evaluation of the Trans Mountain Expansion Project* (School of Resource and Environmental Management, Simon Fraser University, Thomas Gunton, Chris Joseph, Daniel Dale). Their analysis concludes that the CER's Evolving Scenario substantially exceeds future oil production levels consistent with keeping temperature increase to within the 1.5°C warming limit. It confirms the conclusion reached by the CER 2020 report.<sup>5</sup>

The CER 2020 report fails to offer any assessment of *how much lower future output levels* over the next thirty years would need to be in order to be consistent with the “more ambitious goals” promised by the government. The report is silent on that question, which is fundamental to assessing what changes in Canada's energy policy are required.

## QUESTION:

- 2.1 Do you agree that Canada’s current plans to continue to expand oil sands production as reported in the CER 2020 report exceed the levels of production that are consistent with Canada’s “more ambitious” climate goal of achieving net-zero by 2050?**

## 3. TMX pipeline expansion not required

The *Canada’s Energy Future 2020* report acknowledges that if the rate of growth of Canada’s oil production is even modestly reduced over the coming decades in line with the Evolving Scenario, the proposed new pipeline capacity provided by both the Keystone XL and by the Trans Mountain project *would not be required* (see the graph on page 44 of the report, reproduced as Figure D at page 14 of our discussion paper). According to the Canada Energy Regulator’s analysis, under the Reference Scenario all of the currently planned new pipelines will be needed. But the CER 2020 report concedes that under the Evolving Scenario, depicted by the lower red dotted line on the graph at page 44 of the report which rises more slowly to about 5 million bpd of available supply in 2035-2040, the TMX pipeline is not required.

## QUESTIONS:

- 3.1 Do you agree that under the Evolving Scenario the Trans Mountain Pipeline Expansion is not required?**
- 3.2 Do you agree the project should be cancelled? Are you prepared to make representations to the government that the TMX project be forthwith cancelled?**

## 4. The net zero target: an empty promise

The *Canada’s Energy Future 2020* document tells us that “*reaching net-zero emissions does not necessarily require eliminating all emissions*” by 2050. It promises by 2050 the ongoing level of Canada’s annual emissions (referred to as our “remaining emissions”) will be offset (“balanced”) by future technologies that it claims will have the capability to remove massive amounts of CO<sub>2</sub> from the atmosphere (“emissions removals”).

The concept assumes, or promises, that massive installations of CCUS technology (Carbon Capture, Utilization, and Storage)<sup>6</sup> and other future technologies will allow us to declare, by 2050, that we have ceased “net additions” to the cumulative amount of carbon in the atmosphere. Meeting that promise, of course, is left to the world’s children and they will bear the economic burden of that. CCUS, which has already been adopted at a limited number of sites around the world including two installations in Alberta, has the capability to capture and separate CO<sub>2</sub> from the flue gases at large industrial facilities (but it is not a “direct air removal” technology and therefore its application is limited to industrial sources at fixed sites). It has not yet proven to be economically viable for large-scale deployment. Other proposed future technologies, referred to generically as CDR technologies (Carbon Dioxide Removal) or “engineered negative emissions solutions” envision methods that will allow CO<sub>2</sub> to be directly removed from the atmosphere

(“direct air removal”) and hybrid schemes such as BECCS (bioenergy combined with CCUS). These technologies either do not exist or exist at a very small-scale experimental stage.<sup>7</sup>

Unfortunately, the government’s new promise is nothing more than an unsubstantiated and unverifiable claim that by 2050 “remaining emissions” will be equalized by “emissions removals.” The government does not disclose any numerical target for what Canada’s “remaining emissions” will be by 2050.

The “net-zero by 2050” plan does not set a goal for 2050. It offers no indicator or quantitative measure that allows us to assess whether the proposed new plan is adequate or whether it is feasible.

Unless we know how high the level of “remaining emissions” is going to be in 2050, we have no way of knowing whether this plan has an air of reality. If we knew that Canada’s annual emissions by 2050 are still going to be at a high level (the actual number in 2019 was 730 Mt) we would know that this plan is reckless and dangerous. The promised future technologies (Carbon Dioxide Removal or “CDR” technologies) do not yet exist or exist only in very small-scale experimental forms. We have no assurance that, thirty years from now, CDR will prove both effective and economically viable on the scale required to remove vast amounts of CO<sub>2</sub> from the atmosphere.

This plan, as it stands, gives the government a free licence to continue the currently planned expansion of Canada’s oil sands production, and other carbon-intensive industries (including LNG in B.C.) for another twenty-five years. Oil and gas sector emissions are the dominant source of our country’s emissions growth. The higher they go (and the longer we delay reversing this trend) the higher our “remaining emissions” will be in 2050 - and the higher the annual level of “emissions removals” would have to be after 2050 to meet “net-zero”. Under this scheme, all of the risk and the loss and suffering will be shifted to the world’s children, in exchange for our own immediate financial gain.

This plan provides nothing more than an empty promise that by 2050 Canada’s annual level of emissions (the so-called “remaining emissions”) will be fully offset by CDR technologies.

## QUESTIONS:

- 4.1 What is the government’s number or measure that tells us what the estimated level of Canada’s “remaining emissions” will be in 2050? No such number has been provided to Canadians. Alternatively, what is the government’s currently available estimate of the annual level of “emissions removals” that will be feasible by 2050?**
- 4.2 Do you know if the government has in fact developed numbers or estimates?**
- 4.3 Even if the government has no available data of that kind, do you as a Member of Parliament have any idea what the level of “remaining emissions” under Canada’s new plan is expected to be by 2050**

## 5. Crucial information not revealed by Canada's Energy Regulator (CER)

A deeply disturbing feature of the recent CER 2020 report is that it does not present us with any analysis or findings that would inform Canadian citizens of the projected future (lower) levels of oil sands output that will be consistent with a 1.5°C world.

Studies of that kind are not unusual or impossible to develop. Recent examples include the IEA's "Sustainable Development Scenario" (November 2019) and Mark Jaccard's May 2018 analysis. Those studies examine the future limits on global oil consumption that will be essential to meet future global warming limits, in those instances warming limits of 1.8°C and 2°C respectively. In the case of Canada, a study of that kind would take into account the comparatively high costs of production per barrel in Canada's oil sands industry (including future additional costs incurred to comply with emerging emissions standards). Energy economists can readily determine what levels of future oil sands production in Canada will be economically viable at the lower future crude oil prices that will prevail as global oil consumption declines to levels consistent with a 1.5°C world.

A study of that kind, addressing Canada's specific situation, would provide us with an honest assessment of what future oil sands production levels will be feasible and safe in a world committed to stay within the 1.5°C warming threshold.

The need for that kind of information about Canada's future oil production is even more acute in the light of the IEA's new "*Net-Zero by 2050 Scenario*". We now know that a responsible and safe pathway for worldwide oil production requires a 50% reduction by 2040. What production pathway does the government plan for Canada? It is essential that constituents be fully apprised of the answer.

It is inexplicable that Canada's own energy agency, or Environment Canada, or some other arm of the Government of Canada, has not developed and publicly released its own analysis of that kind. We are the world's 3<sup>rd</sup> largest oil exporter. Over 80% of our production is consumed in foreign markets. Yet our national government has apparently failed to conduct a study that would realistically inform Canadians of what the impact on the oil sands production will be, say by 2040, if the world's main industrial economies adopt strong climate policies to limit emissions.

The IEA's 2019 study shows that even to meet a 1.8°C target oil demand must decrease to 87.1 million bpd by 2030 and to 66.9 million bpd by 2040. The Jaccard study shows that to meet a 2°C goal global demand declines to 79 million bpd by 2035 and down to 69 million bpd by 2045. Based on his analysis, Dr. Jaccard was able to draw informed conclusions about the impact on Canada's oil sands industry. The IEA's new May 17, 2021, report concludes that in a scenario to meet the 1.5°C goal global oil consumption must decline to 44 million bpd by 2040.

Canada's Energy Regulator has failed to disclose an assessment or study of that kind. As we noted above, the CER 2020 report states merely that future production will have to be *some unspecified amount less than* the "Evolving Scenario":

*It is also clear that Canada's more ambitious goals, such as achieving net-zero by 2050, will require faster transition than we have witnessed historically and faster than is shown*

*in the Evolving Scenario. Recognizing this fact, we have introduced a “Towards Net-zero” section in EF2020.*

— CER 2020 Report, page 62 (emphasis added)

The report tells us only that reductions will have to be “faster” than the trajectory shown in the Evolving Scenario. It refuses or is unable to tell us what Canada’s lower level of oil production would have to be in order to be consistent with the net-zero by 2050 goal.

## QUESTIONS:

- 5.1 Has the Government of Canada developed any scenarios or studies or modelling that shows the impact on Canada’s oil sands production of a future reduction in global oil demand consistent with meeting a target of net-zero emissions by 2050 and limiting warming to 1.5°C?**
- 5.3 Are you aware of any scenario for Canada’s crude oil production that would be consistent with such a “faster transition” to achieve Canada’s “more ambitious goals”? Do you personally, as a Member of Parliament, have any idea of what that would be?**
- 5.3 Would you be prepared to make representations to the government demanding that a study of that kind be initiated without delay and that the results be shared with the Canadian public?**

## 6. Carbon capture and storage technology

One of the proposed solutions in the *Healthy Environment and a Healthy Economy* document given great prominence among suggested measures to achieve the government’s “more ambitious climate goals” is reliance on Carbon Capture, Utilization, and Storage (CCUS) technology. In the section of the document devoted to the oil and gas sector and climate policy, the government makes this pledge:

*“Develop a comprehensive carbon capture use and storage (CCUS) strategy and explore other opportunities to help keep Canada globally competitive in this growing industry.”*

— *A Healthy Environment and a Healthy Economy*, page 38<sup>8</sup>

The promise is that, in the case of the oil and gas sector (Canada’s largest emitting sector), we can achieve what the report describes as “net-zero oil sands production” by relying on CCUS to effectively lower the amount of CO<sub>2</sub> released into the atmosphere during the extraction of each barrel, while Canada continues to increase the total number of barrels we produce.

Even assuming CCUS can be economically viable in large-scale deployment and that it offers a safe and effective technological means to significantly lower GHG emissions from the *oil*

*extraction process in Alberta*, CCUS will do nothing (and is not intended to do anything) to curb the expansion of oil sands production in Alberta.

The world must dramatically reduce the annual level of CO<sub>2</sub> and other GHG emissions by 2030. Oil accounts for 32% of those emissions on a global basis.

*Canada's Energy Future 2020* ignores any discussion of the emissions impact of the “downstream” emissions from Canada’s growing oil sands, namely the emissions released outside Canada’s borders after our bitumen is shipped to the U.S. or elsewhere when the oil is burned as fuel in vehicles and during the refining process. Those account for about 85% of all the emissions from every barrel of oil we extract.<sup>9</sup> This government’s promised new plan is focused exclusively on Canada’s “upstream” emissions, namely the portion of emissions released during the bitumen extraction process within our borders. They account for less than 15% of total well-to-wheels emissions per barrel.

The government has made no commitment to limit Canada’s oil production or to meet even the very modest slowdown in future growth outlined in the Evolving Scenario. Unfortunately, the whole purpose of the proposed large-scale CCUS deployment is to facilitate the continued expansion of oilsands production to 2045. Government subsidies for CCUS are already being solicited. The *Globe and Mail* reported on March 8, 2021, “Alberta is asking Ottawa to commit to \$30-billion in spending or tax incentives over the next decade to spur the building of large-scale industrial carbon capture projects”. The request was sent by the Alberta government to Ottawa in a confidential “discussion document”, parts of which have now been published. According to *The Globe and Mail*, the Alberta government takes this position:

*The provincial government says for Canada to meet climate goals, the country will have to fund a series of carbon capture, utilization and storage, or CCUS, facilities that force CO<sub>2</sub> emissions deep into the ground, and keep them out of the atmosphere. This is especially true in emissions-heavy Alberta.*

*“There isn’t a path to net-zero without carbon capture – globally, or in Canada, anywhere,” Alberta Energy Minister Sonya Savage said in an interview.*

— *The Globe and Mail*, March 8, 2021 (emphasis added)

This stunningly negative assessment of our narrowing climate options to solve the rapidly unfolding climate catastrophe offered by the Alberta government is consistent with the prognosis given in the *Canada's Energy Future 2020*, although the energy agency’s message is given in softer language and is more equivocal. Both are saying it is too late to get to “net-zero by 2050” without massive reliance on carbon capture and storage and on other future CDR technologies that do not yet exist.

Alberta and the Government of Canada are also saying, in their different ways, that despite the unspeakable dangers we face from the unfolding breakdown of the climate system, it is essential that we continue to expand crude oil production for another twenty years. The rationale for following this dangerous path is put this way:

*CCUS, the report said, would protect high-value, difficult-to-replace industrial jobs: while also “greening” them and preserving valuable exports”. (emphasis added)*

The *Globe* reported that Canada’s Natural Resources Minister has publicly embraced this plan:

*Natural Resources Minister Seamus O’Regan told an oil and gas conference this month that CCUS technology will play a key role in lowering emissions in the oil sector.*

The IEA’s *Net-Zero 2050* report explains that the future role for CCUS will be limited to essential activities<sup>10</sup> where it will be difficult to eliminate emissions entirely, such as aviation, cement production, and iron and steel, and which are expected to still have small levels of residual emissions by 2050. One core objective of the IEA’s “Net-Zero by 2050 Scenario” is to reduce global oil production 75% by 2050 below the current level. It is beyond belief that at this moment of imminent peril the government would be actively promoting CCUS technology as a means to give Canada’s oil sands industry two or three more decades to expand its production.

## QUESTIONS:

- 6.1 Do you agree that there should be no subsidies or funding or tax incentives from the Federal Government to support the deployment of CCUS in the oil sands industry?**
- 6.2 Will you as a Member of Parliament publicly acknowledge that the recent proposal that CCUS technology be adopted on a large scale in the oil sands industry is not an acceptable or safe basis for developing Canada’s energy policy?**
- 6.3 Would you support the creation of an independent public inquiry to examine the implications of large-scale deployment of CCUS in the oil sands industry? It would inform Canadians on the implications of this scheme including the safety and integrity of the required underground sequestration of CO<sub>2</sub> which will have to be maintained securely for hundreds of years and will be a burden on our children.**

## 7. Unsubstantiated claim: oil and gas emissions to be cut by 56 Mt by 2030

On December 11, 2020, Environment Canada released new projections telling us that by 2030 emissions in the oil and gas sector by 2030 will be reduced to 138 Mt. That is 56 Mt below the government’s most recent Reference Case projections (see Figures L and P in our discussion paper at pp. 39 and 44 respectively).

This extraordinary claim by the Government of Canada that oil and gas sector emissions will be cut to 138 Mt by 2030 has not been substantiated by any analysis of data disclosed to the public. None of Canada’s successive bi-annual reports ever even hinted that emissions reductions of that magnitude could be achieved by 2030.

The new promise, made on December 11, 2020, that Canada’s total emissions will be reduced to 503 Mt by 2030 is premised on this unsubstantiated claim that oil and gas sector emissions will be cut by 56 Mt within the next nine years below the most recent Reference Case projections.

The claim is unsupported by evidence disclosed to Canadians. It misleads your constituents because it offers a level of assurance that is unfounded.

A 9-page “Annex” document<sup>11</sup> appended to the *Healthy Environment* report gives us the same 56 Mt number, again with no accounting of how it will be achieved. Table 1 in the Annex gives 194 Mt as the projected level of total oil and gas sector emissions by 2030 based on current policies (described as the “Reference Case”). Table 3 in the Annex says that total oil and gas emissions will be reduced to 138 Mt by 2030 by relying on promised new “initiatives” announced in the *Healthy Economy* document (please consider Notes 5.6 and 5.7 at p. 44 of our discussion paper).

It is helpful to compare this new low projection of 138 Mt to the data published a year ago on January 2, 2020, in Canada’s *Fourth Biennial Report*, which is Canada’s most recent official report to the UNFCCC. It gave 213 Mt as our government’s projection of the expected annual level of total oil and gas sector emissions by 2030. With the benefit of promised “Additional Measures” (new emissions reduction policies promised but not yet adopted or implemented) the January 2, 2020 report projected that oil and gas emissions could be reduced to 199 Mt by 2030. Those figures included long promised methane reductions (mainly in natural gas operations) under new provincial and federal regulations.

Reaching 138 Mt would require a further 61 Mt cut below the Reference Case number of 199 Mt given in the *Fourth Biennial Report* a little over 12 months ago.

We would have expected that the *Healthy Economy* document would have laid out the details and provided Canadians with an analysis and data to substantiate this extraordinary claim. It does not do so. Based on the January 2020 data published in the *Fourth Biennial Report*, emissions in the oil sands sub-sector are projected to rise from 81 Mt in 2017 to 110 Mt by 2030 (they rose to 84 Mt in 2018). A reduction of oil sands emissions by 56 Mt would involve an extraordinary 50% reduction of all emissions in the oil sands industry – including emissions from upgrading, mining operations, and in situ operations. That would require a radical and fundamental re-shaping of the oil sands industry, and substantial replacement of the existing technologies that it is based on.

During the past five years, reports by the government have consistently shown that the adoption of new technologies in the oil sands industry will not be able to sufficiently reduce carbon-intensity per barrel by 2030 to achieve any significant reduction in oil sands emissions by that date, assuming we maintain existing plans to continue to expand production to 2030. There is no reason to believe that innovations in the oil sands industry between now and 2030 can account for a 56 Mt cut in oil and gas sector emissions. The promise that oil and gas sector emissions can be reduced to 138 Mt by 2030 is unprecedented. It is unbelievable.

The CER 2020 report, the *Healthy Economy* document, and the Annex document contain multiple references extolling the future potential of CCUS technology. But the three documents offer no data or estimate of the share of the promised 56 Mt reduction that might be achieved by means of CCUS before 2030. None of those documents confirm whether large-scale deployment of CCUS is planned as the principal means of achieving those cuts. Canadians are left to speculate whether large-scale deployment of carbon capture and storage (CCUS) technology is the proposed solution and if it offers any realistic chance of achieving cuts on that scale by 2030.

At present, the claim made on December 11, 2020 that oil and gas sector emissions will be cut to 138 Mt by 2030 is a promise that has no proper foundation in fact – or at least not in any evidence that has been disclosed to Canadians.

## QUESTIONS:

- 7.1 How do you as a Member of Parliament account for the promised reduction of Canada’s oil and gas sector emissions to 138 Mt by 2030, a cut of 56 Mt below the “Reference Case” level given in the December 11, 2020 Annex?**
- 7.2 Do you agree that neither the *Healthy Economy* document nor the Annex data provide any details of new measures or policies that could conceivably reduce oil and gas sector emissions on that scale by 2030 and provide no numerical analysis to show that the required reductions within the next nine years are plausible?**
- 7.3 Are you aware of any document or report published by Canada or by any of the government’s departments or agencies that provides an analysis explaining how that 56 Mt reduction will be achieved?**
- 7.4 Has the government adopted a plan to undertake large-scale deployment of CCUS in the oil and gas industry? What portion of that 56 Mt reduction of oil and gas emissions by 2030 promised on December 11, 2020 is accounted for by CCUS?**

## 8. April 2021 announcement

On April 22, 2021, the Liberal Government announced that Canada by 2030 will reduce its emissions 40% to 45% below the 2005 level. But the government has not revealed to Canadians any plan or analysis to explain how these massive additional cuts might be achieved. It merely announced a new number. A 45% reduction will mean that Canada’s total emissions must decline to 401 Mt by 2030. The annual level was 730 Mt in 2019.

The April announcement unfortunately sharpens the fundamental contradiction between Canada’s avowed climate policy, which promises deep emissions cuts by 2030, and Canada’s plans to continue to expand oil production to 2045.

Just four months ago, on December 11, 2020, the government released a report with detailed projections showing that Canada would reduce its total emissions to 503 Mt by 2030 (representing about a 31% cut below the 2005 level). The 9-page Annex document appended to the *Healthy Environment and Healthy Economy* report provided details of the amount of the emissions reductions that the government claimed would be achieved in each of Canada’s seven economic sectors by 2030 (particulars of those promised cuts for each sector are set out in Note 5.6 and Figure F on page 44 of our discussion paper).

One disturbing feature of the promised reductions published in the December 11, 2020 Annex document was that the largest reduction of all, a massive 56 Mt cut of oil and gas emissions, was unsupported by any analysis or data to explain how that unprecedented large reduction could

actually be achieved (see Question 7 above). Without achieving the promised 56 Mt cut in oil and gas emissions by 2030, the government's entire scheme announced in December to lower Canada's total emissions to 503 Mt is untenable.

Now, given the April announcement, achieving the far deeper 401Mt target will require obtaining an additional 102 Mt of emissions reductions from among our seven economic sectors, beyond the reductions already promised in December 2020 to meet the 503 Mt target.

Yet our government has offered no explanation identifying which of Canada's sectors have the capacity to contribute any significant part of this additional 102 Mt cut.

Therefore, the practical and serious question that now arises is, what amount of additional emissions reductions can realistically be achieved between now and 2030 in each of those sectors? Where does that 102 Mt cut come from? Most of the sectors will not be able to contribute any meaningful share at all. A large portion of it will have to come from the oil and gas sector if we are going to have any realistic chance to meet the new reduction goal by 2030. But that would mean even deeper emissions reductions will be required in the oil and gas sector by 2030, over and above the 56 Mt cut already promised in December 2020 to meet the earlier 503 Mt reduction target.

### **Electricity, agriculture, and buildings emissions**

For example, the government's earlier promise to reduce emissions to 503 Mt *already assumes* that the electricity sector will be dramatically reduced to 11 Mt by 2030. That reduction down to 11 Mt was promised on December 11, 2020. There are no further reductions to be obtained from that sector. We have already "picked all the low hanging fruit" in the electricity sector.

In the case of the agricultural sector, during the past 15 years emissions in that sector have proven extremely difficult to reduce. They rose from 72 Mt in 2005 to 73 Mt in 2019.<sup>12</sup> The government's most recent December 11, 2020 projections offered no real improvement, showing an expected increase to 77 Mt by 2030 based on current policies (i.e., measures already implemented), and promising a lower figure of 74 Mt assuming that "new initiatives" listed in the *Healthy Environment and Healthy Economy* document are adopted. There is no reason to believe that emissions in the agricultural sector by 2030 are going to be much lower than the government's most recent and most optimistic promise four months ago, which is 74 Mt.

Buildings sector emissions in the past thirteen years have not declined at all. They rose from 84 Mt in 2005 to 91 Mt in 2019. One of the explanations for that increase is notwithstanding the increased stringency of building construction standards since 2005 and improvements in building design and new technologies allowing increased energy efficiencies per square foot, the massive scale of new commercial building construction in cities across Canada has more than offset the gains in efficiency. Improved efficiencies in buildings energy systems have been largely outstripped by the expansion of new buildings space. Under the new projections published on December 11, 2020, even with the benefit of all new "initiatives" (promised but not yet implemented) buildings sector emissions are expected to decline to only 65 Mt by 2030. That reduction is *already counted* in the government's promise four months ago that emissions can be reduced to 503 Mt by 2030.

The government's April 22, 2021 announcement that Canada by 2030 will cut its total emissions to 401 Mt presumes that we can find 102 Mt of additional reductions from among our seven economic sectors. No meaningful share of the needed 102 Mt reduction will come from any of the above three sectors. Nor from the small waste sector.

### Transportation sector

The oil and gas sector and the transportation sector are our two largest emitting sectors. Together they account for more than 50% of Canada's total. Transportation is our second largest emitting sector (after oil and gas). In Canada it comprises all passenger cars, freight transport by heavy trucks, rail, and domestic aviation, as well as coastal marine shipping.

Canada's transportation sector emissions rose from 161 Mt to 186 Mt between 2005 and 2019. That significant increase in Canada's transportation emissions has occurred notwithstanding that a decade ago, in a co-ordinated effort with the U.S., Canada introduced new regulations that have appreciably lowered the fuel consumption per kilometre for passenger vehicles. But countering that promising policy, the total number of vehicles on the road has substantially increased (driven by economic growth) drowning out the gains in fuel efficiency in passenger cars. Also, the overwhelming shift in consumer taste from fuel-efficient sedans to larger SUVs has undermined much of the gain in fuel efficiency from smaller passenger cars. Finally, electric vehicles have not yet reached large enough numbers to significantly alter the emissions numbers.

Another limiting factor is that out of Canada's total 186 Mt transportation sector emissions, about half (87.6 Mt) are accounted for by "heavy duty trucks and rail" and shipping freight by domestic aviation and marine shipping, plus passenger travel by aviation, bus, and rail. None of that is going to significantly decline over the next eight years, not until modes of shipping freight in Canada are dramatically transformed (i.e., electrified rail transport to regional distribution hubs, or other solutions). Freight transport by trucks inevitably increases with economic growth.

Recent projections to 2030 have confirmed this disappointing outlook for transportation emissions. The government's "Reference Case" published on January 2, 2020, projected a reduction to 153 Mt by 2030 (down from 186 Mt in 2019) based on "current policies", and a deeper cut to 141 Mt based on promised "Additional Measures". Even that lower number was only a 12% reduction below the 2005 level. But when the government published its most recent projections on December 11, 2020, the "Reference Case" (current policies) number jumped back up to 178 Mt. Even the speculative "announced initiatives" number for total transportation emissions by 2030 published in the Annex on December 11, 2020, has move back up to 151 Mt That represents only a 6% reduction below the 2005 level.

Given this disappointing record, which is fully confirmed by the government's own recent detailed emissions projections including the December 11, 2020 data, there is no reason to believe that any significant share of the additional 102 Mt of needed emissions cuts is going to be obtained from the transportation sector by 2030. The projected reduction to 151 Mt has *already been counted* in the calculations that promise to get us down to 503 Mt. When the government on April 22, 2021, announced its new goal to reduce Canada's emissions to 401 Mt by 2030, it did not produce any new studies or data to show that the transportation sector is now suddenly going to be able to achieve additional deep emissions reductions.

## Heavy Industry

Heavy industry is another sector in which existing carbon-intensive industrial processes present severe challenges to achieving any rapid reductions within the next nine years. Industry emissions did decline sharply after the 2008 global financial crisis (in part due to a permanent shutdown of some industrial production in Ontario), but since 2015 have remained largely unchanged in the range of 77 Mt. In the government's most recently published "Reference Case" projections (December 11, 2020) industry emissions are projected to increase to 82 Mt by 2030. The more optimistic and speculative "with initiatives" projection also released on December 11 promise industry sector emissions can be substantially cut to 61 Mt by 2030: see Note 5.6 of the discussion paper.

That promised cut to 61 Mt has therefore already been counted by the government in its claim that Canada's total emissions will be reduced to 503 Mt by 2030. No new information has been produced to show how industry can contribute an *additional reduction* of any significance by 2030 to help make up the government's new promise to cut Canada's total emissions to 401 Mt.

## The oil and gas sector

The most recent projections published by the government on December 11, 2020, promised that total oil and gas sector emissions will be substantially reduced from a projected 194 Mt in 2030 (the "Reference Case") down to 138 Mt based on "announced initiatives". Actual emissions for the oil and gas sector reached 191 Mt in 2019.

That 56 Mt reduction of oil and gas emissions to 138 Mt by 2030 promised on December 11, 2020, was unprecedented. No reduction of that magnitude has ever previously been proposed as realistic if Canada's oil and gas production continues to expand. No analysis or data is included in the *Healthy Economy* document or in the Annex released on December 11, 2020, explaining how a cut on that extraordinary scale could be feasible or what measures or "initiatives" might be capable of achieving reductions on that scale (a 56 Mt cut) by 2030. See Question 7 above.

Now, given the announcement on April 22 that Canada's reduction target by 2030 has suddenly been lowered to 401 Mt, an additional cut of 102 Mt must somehow be obtained from among the country's seven economic sectors. The question arises, is it feasible that any share of that additional 102 Mt reduction can be obtained from the emissions-intensive oil and gas sector? Even a modest share (for example a 20 Mt or 30 Mt share of the needed 102 Mt) would mean that oil and gas sector emissions will have to be reduced by as much as 76 Mt or 86 Mt by 2030 (well beyond the unprecedented 56 Mt reduction already promised by the government last December.)

The government has provided citizens of this country with no plan, no analysis, no evidence, and no reasoned explanation to show that anything remotely like a 56 Mt or an 86 Mt reduction of oil and gas sector emissions can be achieved between now and 2030. Nothing indicates that emissions reductions on that scale are achievable if Canada continues to expand oil and gas production to 2030 and beyond, as it currently plans to do. The government's promise on April 22 that Canada's emissions can be reduced to 401Mt by 2030 was made without foundation or substance. It is not credible.

## QUESTIONS:

- 8.1 Has the Government, or any department or agency of the government, developed any projections, studies, or data that identify and quantify how the promised additional 102 Mt of emissions reductions by 2030 is allocated between Canada's seven economic sectors (or among the eight sectors including LULUCF)?**
- 8.2 Is any share of the proposed additional 102 Mt of emissions reductions to 2030 expected to be obtained from the oil and gas sector? What is the amount of the needed additional 102 Mt reduction that is attributed to the oil and gas sector, and what measures are expected to achieve those additional cuts in the oil and gas sector?**

## Conclusion

These questions are important to all Canadians. They are existential questions for all children, in Canada and in all places.

Mr. Trudeau's new promise on April 22, 2021, was not accompanied by a plan. Even the most rudimentary plan would have provided Canadians with some basic details of how an extraordinary 328 Mt of emissions reduction (which is 101 Mt more than the promise made on December 11, 2020) can be achieved *within the next nine years*. During the past 14 years between 2005 to 2019, Canada's total emissions have declined 9 Mt in total. How do we get from 730 Mt in 2019 down to 401 Mt by 2030?

This promise to increase Canada's domestic emissions reduction target to 45% by 2030, even if it is plausible, will not attenuate a catastrophic outcome. The salient activity by Canada is our expanding oil production.<sup>13</sup> The promise of "net-zero oil sands production" (which is based on counting only the *domestic* emissions portion of our massive oil output) is a deception and unconscionable.

To have any realistic chance of achieving net-zero global emissions by 2050, global emissions need to be cut 50% by 2030.<sup>14</sup> Deep reductions on a global scale will have to be repeated every year for another 20 years after that. That means ongoing absolute reductions in global oil production. Lower by 2030 and lower again by 2040.

The *UN Emissions Gap Report 2017* warned three years ago that the world is presently on a path to warming of 3.2°C.<sup>15</sup>

A plan that accommodates and supports the continued expansion of Canada's oil production to 2045 and that assures Canadians, without evidence, that we can rely on future large-scale deployment of "emissions removal technologies" to offset the rising volumes of CO<sub>2</sub> emissions that will be released by our expanding oil exports to 2045 is not a safe plan.

May 25, 2021

This list of questions has been developed by David Gooderham and Jennifer Nathan in collaboration with other concerned citizens who live in several B.C. constituencies, represented by Members of Parliament from all parties. We have prepared a discussion paper that provides a detailed context for each of these eight questions. The discussion paper, *Canada's Energy Future 2020: The Incompatibility between Canada's New "Net-Zero by 2050" Climate Goal and Continued Expansion of Oil Sands Production*, April 6, 2021 can be found at <https://gooderhamnathan.com/wp-content/uploads/Paper-EF2020-Gooderham-Nathan-20210406.pdf>

## NOTES

1. *Canada's Energy Future 2020*, (November 24, 2020), Canada Energy Regulator.
2. *Net-Zero by 2050: A Roadmap for the Global Energy Sector*, International Energy Agency (IEA), May 18, 2021. This 285-page report provides the results of a comprehensive study of the cuts in global oil, coal, and natural gas consumption required to achieve net-zero emissions by 2050. The study is based on the IEA's "Net-Zero by 2030 Scenario" designed to show what changes are needed across the main energy sectors to achieve net-zero energy related and industrial process emissions by 2050, with a 50% chance of limiting the long-term average global temperature rise to 1.5°C without a temperature overshoot. It sets out details of the scale of the growth in renewable energy that will be required. It recommends that starting this year no new oil fields or gas fields be developed in the world. It describes the oil industry as entering a period of "contraction" in global terms, and projects a major decline in world oil prices by 2030 assuming the world embarks on this transition: <https://iea.blob.core.windows.net/assets/4719e321-6d3d-41a2-bd6b-461ad2f850a8/NetZeroBy2050-ARoadmapfortheGlobalEnergySector.pdf>
3. The IEA's earlier scenario, the "Sustainable Development Scenario," was published on November 8, 2019, in its annual report, *World Energy Outlook 2019*: see Table 3.1 p. 132 and Annex A.1 p. 672-673. The scenario was designed to calculate how much global oil consumption must decline below existing production levels to give us a realistic chance to limit the further increase in the earth's average surface temperature to less than 1.8°C:

*The Sustainable Development Scenario is constructed on the basis of limiting the temperature rise to below 1.8°C with a 66% probability without the implied reliance on global net-negative CO<sub>2</sub> emissions, or 1.65°C with a 50% probability.*

— *World Energy Outlook 2019*, section 2.4 at page 88 (emphasis added)

In the above quote, "without implied reliance on net-negative CO<sub>2</sub> emissions" means that the Sustainable Development scenario in estimating the reductions in fossil fuel use required to stay within the 1.8°C limit does not assume that, in future, viable technologies will be developed and deployed that will have the capacity to extract CO<sub>2</sub> from the atmosphere (technologies of that kind do not yet exist except in very small experimental schemes). Accordingly, the assumptions in the IEA's scenario are comparatively realistic, and do not depend on conjecture about future technologies. One consequence of that realism, it will be

noted, is that the IEA’s scenario does not promise any chance that its proposed reductions of global oil consumption can limit warming to less than 1.5°C. It just offers a chance to keep warming to less than 1.8°C.

Based on that realistic assumption about future technology, the IEA’s Sustainable Development Scenario concludes that to have a 66% chance of limiting warming to 1.8°C, global oil consumption would have to decline from the 2018 level of 97.7 million bpd down to 87.1 million bpd by 2030, and further decline to 66.9 million bpd by 2040. That would require a 31% cut in global oil consumption over the next 20 years, with an initial 10% cut within the next decade (and even deeper cuts in global coal burning over the same period).

The *World Energy Outlook 2019* report also includes two other scenarios that provide baseline projections showing the expected growth of global oil production up to 2030 and 2040. Baseline projections, also referred to as “business as usual” studies, calculate future demand for crude oil on the assumption that the world’s economies continue to grow using currently existing energy systems and policies, i.e., assuming our present dependency on oil, coal, and natural gas remains substantially unchanged. Figure B summarizes the oil production data for each of the three scenarios:

**Figure B: World Energy Outlook 2019: oil production scenarios: projections (in millions bpd)**

	2017	2018	2025	2030	2035	2040
Current Policies Scenario				111.5		121.0
Stated Policies Scenario	95.1	97.7	103.5	105.4	106.0	106.4
Sustainable Development Scenario				87.1		66.9

Source: *World Energy Outlook 2019*, Table 3.1, p. 132 and Annex A, Table A.1 p.672–673.

The Current Policies Scenario assumes there will be no significant changes that will impede the growth of oil demand:

*“The Current Policies Scenario shows what happens if the world continues along its current path, without any additional changes in policy. In this scenario, energy demand rises by 1.3% each year to 2040, with increasing demand for energy services unconstrained by further efforts to achieve efficiency.”*

— *WEO 2019*, Executive Summary p. 23

The “Stated Policies Scenario” shows more moderate growth in oil consumption. It incorporates existing policies already implemented, but it also takes into account additional measures *announced but not yet implemented* that are expected to moderate the growing demand for oil over the next two decades. The Executive Summary explains that the Stated Policies Scenario

*“... incorporates today’s policy intentions and targets. Previously known as the New Policies Scenario, it has been renamed to underline that it considers only specific policy initiatives that have already been announced.”*

The IEA’s two baseline projections show global oil production is expected to increase to 105.4 million bpd by 2030 and may rise to 111.5 million bpd. In 2018 it was 97.7 million.

Between 2010 and 2017, the IEA published an earlier study, the “450 Scenario”, which was then the most widely known scenario examining the scale of the reductions in global oil consumption that would be required to keep the rise in average global surface temperature within the 2°C warming limit. The 450 Scenario published in late 2015 in *World Energy Outlook 2015* (a year before Canada approved the TMX project) concluded that to have a 50-50 chance of limiting warming to 2°C, global oil production would have to start declining by 2020 and be reduced from 90.6 million bpd (the level reached in 2014) down to 74.1 million bpd by 2040, a 20% reduction over 25 years. The IEA ceased publishing the 450 Scenario in 2017, after it became the subject of broad criticism. A 50% chance of a successful outcome was an unsatisfactory guide for developing safe public policy. The 450 Scenario had also failed to address the deeper cuts that would be required to meet the more challenging 1.5°C goal, which was adopted at the Paris Conference in December 2015.

4. IPCC, 2018: Summary for Policymakers. *Global Warming to 1.5°C*.
5. A very recent study confirms the conclusion reached by the CER Report on that point: see *Evaluation of the Trans Mountain Expansion Project* (March 9, 2021) School of Resource and Environmental Management, SFU, Gunton, Joseph, and Dale. This analysis finds that the CER’s “Evolving Scenario” substantially exceeds future oil production levels consistent with keeping temperature increase to within the 1.5°C warming limit.
6. CCUS is not a new technology. In the IPCC’s *Special Report on Carbon Capture and Storage* (2005), a team of 100 specialists examined the current state of technical knowledge available about the separation of CO<sub>2</sub> in industrial settings. But only a limited number of installations have ever been completed in the world. It has been clear for a decade that the major barrier to any large-scale deployment is the extremely high cost per tonne of removing CO<sub>2</sub> from industrial facilities. An International Energy Agency (IEA) report in June 2013, *Redrawing the Energy-Climate Map – World Energy Outlook Special Report*, noted the absence of any movement towards adopting the technology. In 2008, Alberta initiated an ambitious plan that aimed to be capturing 139 Mt of CO<sub>2</sub> a year by 2050: *Alberta’s 2008 Climate Change Strategy*. The plan was abandoned in 2014, and only two installations were ever completed. In a report *Technological Prospects for Reducing the Environmental Footprint of Canadian Oil Sands* (May 26, 2015), a panel of experts, the majority from Alberta, concluded that for at least another 10 to 15 years, CCUS would not be economically feasible in the oil sands industry, and expressed doubts that it would ever play a significant role in the industry: <https://cca-reports.ca/reports/technological-prospects-for-reducing-the-environmental-footprint-of-canadian-oil-sands/> Council of Canadian Academies.
7. The IPCC 2018 Report in section C3 of the Summary for Policy Makers cautions that CDR (carbon dioxide removal) deployment on any appreciable scale “is subject to multiple

feasibility and sustainability constraints”. The environmental impacts of BECCS and bioenergy schemes on land, water, and ecosystems are discussed in C.3.4.

8. *A Healthy Environment and a Healthy Economy* (Dec 11, 2020), Environment Canada. The quote referring to “this growing industry” is found on page 38. On the same page, the document acknowledges that “*Canada’s oil and gas sector is Canada’s largest emitting sector accounting for 26% of Canada’s emissions. Without further action, emissions from the oil and gas industry are going to increase.*” The premise underlying that statement is that Canada’s oil and gas production is going to continue to grow, which is why emissions “are going to increase”. The solution proposed is CCUS technology, to permit that growth of production to continue to 2045. The document discusses climate policy and the oil and gas sector at pages 34 to 39.
9. Carbon intensity is a metric commonly used to measure the amount of GHGs emitted through a portion of the oil supply chain (i.e., emissions that occur during the extraction process alone, or covering both extraction and refining, etc.) and it is also used to calculate a total life-cycle analysis of the fuel including extraction emissions, refining, shipping (pipelines, rail, marine), and the emissions from the fuel combustion in a vehicle’s engine (the full life-cycle is called a “well-to-wheels” analysis). It is measured in kilograms of carbon dioxide per barrel of crude oil (kg CO<sub>2</sub>). In the case of the oil sands, much attention is paid in the political discussion in Canada to the extent to which carbon intensity per barrel has declined since 1990 due to technological improvements in the production process.

It is true that oil sands emissions intensity during the oil sands extraction process in Canada has declined since 1990 from 116 kg CO<sub>2</sub> per barrel in 1990 to 80 kg CO<sub>2</sub> per barrel in 2019 (those are averages for all oil sands producers): see *National Inventory Report*, April 15, 2021, at pp. 55-56). Extraction emissions, however, are less than 15% of the total well-to-wheels emissions released from each barrel of oil refined from Canada’s oil sands and ultimately burned as fuel. Comprehensive studies have examined the emissions intensity of oil from many different world oil producers. See, for example, *The oilsands in a carbon-constrained Canada*, Pembina Institute, Benjamin Israel et al., February 2020. The Pembina report shows that “well-to-wheels” emissions for all types of oil range from a low of about 450 kg CO<sub>2</sub> per barrel up to a high end of about 650 kg CO<sub>2</sub> per barrel. Canadian oil sands production is at the higher end of that range, above 550 kg CO<sub>2</sub>. Given that oil sands extraction emissions average 80 kg CO<sub>2</sub> per barrel, they account for less than 15% of the total life-cycle emissions released by each barrel Canada produces.

The same point was demonstrated seven years ago, when the U.S. government completed its *Final Supplemental Environmental Impact Statement* (SEIS) on the proposed Keystone XL pipeline, designed to carry 830,000 bpd of oil sands crude to the U.S. market. Chapter 4 includes a comparison of the carbon intensity of Canada’s oil sands production and four global sources, including a “U.S. Average” (emissions per barrel data see Table 4.14-3 at page 4.14-29 of that report). In the U.S. study, extraction emissions intensity for Canada’s oil sands was found to be 74 -105 kg CO<sub>2</sub> per barrel. The overall well-to-wheels emissions were 533 – 568 CO<sub>2</sub> per barrel. *Extraction* emissions were higher for Canada’s oil sands compared to the four other crudes, the U.S. average, Middle Eastern Sour, Mexican Maya, and Venezuelan (the latter two heavy oils were closer to the Canadian numbers). But

excluding emissions during the extraction stage, emissions during the final combustion stage were shown to be essentially identical for all types of oil. Extraction emissions were less than 15% of total life-cycle emissions, except that at the high end of the 74 – 104 kg CO<sub>2</sub> range for Canada’s oil sands the extraction share reached about 18%. Now in 2019 reduced to 80 kg on average, Canada’s oil sands extraction emissions are also less than 15%.

No amount of further technological improvements in the oil sands industry (not even large-scale adoption of CCUS at oil sands production sites) will significantly lower the total life-cycle emissions from oil sourced from Canada’s oil sands. Over 85% of the life-cycle emissions released by the oil we produce occurs after the extraction process is completed. Our national emissions accounting (i.e., the numbers reported annually by the government to Canadians) does not count that 85%. Our politicians do not talk about that 85%.

10. IEA *Net-Zero by 2050* report (May 18, 2021): section 2.5.7 and Table 2.9, pp.79 – 80.
11. Annex, Modelling and Analysis of a Healthy Environment and a Healthy Economy, December 11, 2020, Table 3.
12. *National Inventory Report: Greenhouse Gas Sources and Sinks in Canada 1999-2021* (April 15, 2021), Table 2-12 at page 57. The source for the emissions data covering the period 2005 to 2019 discussed on pages 14 to 16 is Table 2-12. Canada’s emissions in 2020 fell about 7% overall due to the economic impacts of the Covid-19 pandemic.
13. An analysis published April 16, 2021, by A. Carter and T. Dordi (Cascade Institute, University of Waterloo) calculated the total cumulative amount of the future emissions that will be released into the atmosphere from Canada’s planned oil production to 2050 (using the CER Reference Case data published November 24, 2020): see “*Correcting Canada’s “one eye shut” climate policy: meeting Canada’s climate commitments requires ending support for, and beginning the gradual phase out of, oil and gas production*” The authors conclude that Canada’s presently projected oil production to 2050 (if we allow it to occur) will add an estimated 26.1 billion tonnes (Gt) of CO<sub>2</sub> to the atmosphere over the next 30 years. Combined with an estimated 10.1 Gt of CO<sub>2</sub> generated by our projected natural gas production to 2050, Canada’s total oil and gas production over the next three decades will exhaust approximately 16% of the world’s remaining carbon budget to limit global warming to 1.5°C (the remaining carbon budget from 2020 onwards is 230 Gt). Canada represents about 1% of the world’s population. Canada wants 16% of the global carbon budget. This study also finds that, based on the Reference Case, the oil and gas sector in Canada will annually still be emitting about 200 Mt of CO<sub>2</sub> by 2050. Those are just the emissions released by the extraction and processing of oil and gas within Canada’s borders.  
<https://cascadeinstitute.org/wp-content/uploads/2021/04/Carter-Dordi-Canadas-one-eye-shut-climate-policy-1.1-April-16.pdf>
14. Two helpful sources are the IPCC 2018 report Summary for Policy Makers (SPM) at C.1. and the recent *UN Emissions Gap Report 2020* (December 9, 2020). The language used in the IPCC 2018 report is “about 45% from 2010 levels (40-60%)”. The annual level of global emissions in 2010 was 49 GtCO<sub>2</sub>eq. In the IPCC’s examination of multiple studies that calculate the magnitude of emissions reductions required to limit warming to 1.5°C, all but

one show that global greenhouse gas emissions must be cut by 2030 to an annual level of less than 35 GtCO<sub>2</sub>eq, and half of the available pathways fall within the lower range of 25-30 GtCO<sub>2</sub>eq. That is described as a 40%-50% reduction from 2010 levels (SPM, D.1.1).

Unfortunately, the annual level of total global emissions has continued to increase since 2010, rising at an average rate of about 1.3% per year (driven by economic growth and the continued reliance of the global energy system on oil, natural gas, and coal). The *UN Emissions Gap Report 2020* reported that the annual level of global emissions in 2019 reached 52.4 GtCO<sub>2</sub> (not including land-use change). Based on current policies and even *assuming* all unconditional commitments made by signatories to the Paris Agreement (including Canada) to reduce their own emissions by 2030 are fully implemented, the annual level of global emissions is still projected to reach 56 GtCO<sub>2</sub>eq by 2030. In other words, based on current policies by 2030 there will be no reduction below the 2019 level.

The *UN Emissions Gap Report 2020*, released December 9, 2020, reported that global emissions must be reduced to an annual level of 25 GtCO<sub>2</sub>eq by 2030 to keep us on a pathway giving a 66% probability to limit warming to 1.5°C.

15. An earlier edition of the *UN Emissions Gap Report*, published in November 2017, explained the crucial importance of what happens between now and 2030:

*Looking beyond 2030, it is clear that if the emissions gap is not closed by 2030, it is extremely unlikely that the goal of keeping warming to well within 2°C can still be reached. Even if the current NDCs are fully implemented, the carbon budget for limiting global warming to below 2°C will be about 80% depleted by 2030. Given the currently available carbon budgets, the available carbon budget for 1.5°C will already be well depleted by 2030.*

— *The Emissions Gap Report 2017*, Executive Summary, p. xvii  
(emphasis added)

The November 2017 report left no doubt that the full implementation of all the NDCs by 2030 was insufficient to put the world on an emissions pathway consistent with keeping warming “well below 2°C”, let alone 2°C:

*Full implementation of the unconditional NDCs and comparable action afterwards is consistent with a temperature increase of 3.2°C by 2100 relative to pre-industrial levels.*

The most recent *UN Emissions Gap Report* published on December 9, 2020, repeated that same warning. The problem is the annual level of global emissions has continued to increase during the past decade. To stay on a pathway to give us a chance to keep the increase in global average surface temperature to less than 2°C, the annual level of global emissions must by 2030 be cut to an annual level of 42 GtCO<sub>2</sub>eq. That leaves an “emissions gap” of 15 GtCO<sub>2</sub>eq that must be closed within the next nine years to meet the 2°C goal. To stay on a pathway to limit the warming increase to 1.5°C requires that the annual level of global emissions be cut by 32 GtCO<sub>2</sub>eq between now and 2030.

2030 is an unforgiving timeline.