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RE: DRAFT REVIEW OF RELATED UPSTREAM GREENHOUSE GAS EMISSIONS ESTIMATES FOR THE TRANS MOUNTAIN EXPANSION PROJECT (TMX)

Enclosed herewith: Comments on Draft Review of Related Upstream GHG Emissions for the Trans Mountain Expansion Project.

*Please note that the enclosed document is a **revised** version of the substantially identical material submitted earlier today. Kindly substitute this submission for the previous filing.*

Submission from:

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Comments on Draft Review of Related Upstream GHG Emissions for the Trans Mountain Expansion Project

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Introduction

On May 19, 2016, the Liberal Government released a document called the *Review of Related Greenhouse Gas Emissions Estimates for the Trans Mountain Expansion Project (TMX)* (also known as the Kinder Morgan pipeline). It was completed less than 60-days after details of the assessment procedure were announced on a government website. No members of the public had any access to the process. It was a closed process. It did not involve public hearings, or witnesses, or an opportunity for interveners to submit evidence.

The report can be found at: http://www.ceaa-acee.gc.ca/050/documents/p80061/114550E.pdf

The Kinder Morgan assessment report is the disappointing culmination of a long-standing effort by many Canadians to persuade the Federal Government to include in the pipeline approval process an examination of the impact of rising CO_2 emissions from oil sands production. The National Energy Board (NEB) is the government agency responsible for regulating and approving all oil and gas pipelines in Canada. It controls the entire environmental review process for pipelines. During the past three years, the NEB has repeatedly refused to consider the problem of greenhouse gas emissions.

Before looking in detail at the Kinder Morgan assessment report, it is helpful to recall the events of the past few years. The story begins with the NEB's inquiry into the Northern Gateway pipeline.

On December 18, 2013, the NEB recommended that the Northern Gateway pipeline be built. The pipeline is designed to ship 525,000 barrels of diluted bitumen a day to the port of Kitimat on the B.C. coast, located at the head of a tidal inlet that leads to the Pacific. At the start of its lengthy two-volume decision, the panel explained its approach.

> *This volume of our report, Connections, is about connections and linkages … between the economy and the environment …*
>
> *Our task was to recognize those connections. We weighed them and balanced them to answer the fundamental question: would Canada and Canadians be better off or worse off if the project goes ahead?"*
>
> — *Report of the Joint Review Panel for the Enbridge Northern Gateway Project, Volume 1, Connections*, p.1 (emphasis added)

The task of the panel, in its own words, was to decide whether Canada and Canadians would be "better off or worse off if the project goes ahead". The panel identified various economic benefits and environmental negatives. The environmental negatives it considered concerned mainly the risk of oil spills in the interior of British Columbia and along the coast, and damage to animal habitats along the pipeline route.

The positive linkage the NEB "weighed and balanced" was that building the Northern Gateway pipeline will expand the industry's capacity to export bitumen, and will therefore allow the industry to continue to increase bitumen production.

Building new pipelines would allow continued growth of oil sands extraction in Alberta. That was the primary rationale for the panel's recommendation that the Northern Gateway project proceed.

One important "linkage" the NEB panel was unwilling to recognize, or even discuss, is that expanding oil sands production will result in growing levels of CO_2 emissions because of the energy-intensive methods of extraction. The panel refused to allow any witnesses to provide evidence about the quantity or consequences of CO_2 emissions from expanding bitumen production in Alberta. The panel gave this explanation for its decision to exclude all evidence about the problem of carbon emissions:

> *Many people said the project would lead to increased greenhouse gas emissions and other environmental … effects from oil sands development. We did not consider that there was a sufficiently direct connection between the project and any particular existing or proposed oil sands development … to warrant consideration of the effects of these activities.*
>
> — *Connections,* Volume 1, p. 17 (emphasis added)

It is important to keep in mind that there exists no other environmental review process of any kind in Canada - either at the Federal Government level or in the province of Alberta – that weighs the effects of the growth of CO_2 emissions caused by expanding oil sands production. There is currently no limit on oil sands emissions, either by individual facility or industry-wide.

Soon after the Northern Gateway decision was announced, a second pipeline project from Alberta to the Pacific coast began to work its way through another NEB inquiry: the Kinder Morgan expansion involves a proposal to increase the capacity of the existing Kinder Morgan pipeline, from 300,000 barrels per day (bpd) to 890,000 bpd. The Kinder Morgan case raises the same issues of expanding oil sands production and continued emissions growth.

Almost two years ago, in a ruling in the Kinder Morgan case on July 23, 2014, the NEB refused to consider evidence about what the government and industry refer to as "upstream emissions". Upstream emissions are the CO_2 and other GHG gases released into the atmosphere during extraction and processing in Alberta, before the oil sands bitumen is shipped by pipeline.

Faced with this rejection of any kind of inquiry to assess the impact of emissions, many of Canada's most senior scientists and energy economists and others have called for a moratorium on further oil sands expansion. They want us to look carefully at the evidence. They have asked for a halt to further oil sands growth until a public accounting is done to ascertain *whether rising CO_2 emissions from oil and gas extraction over the*

next fifteen years can be reconciled with our existing commitments to achieve a deep reduction of Canada's total GHG emissions.

During the Federal election campaign in the fall of 2015, the Liberal Party made a promise that it would "include an analysis of upstream impacts and greenhouse gas emissions" for any project that fell under a federal environmental assessment.

On January 27, 2016, the new government announced a modification of the existing pipeline approval process. The government declared that in the case of the two major pending pipeline applications – Energy East and the Kinder Morgan project – the "project reviews will continue within the current legislative framework." That decision by the Liberal Government meant that in making recommendations whether to approve the two current projects, the NEB is allowed to continue to exclude evidence about greenhouse gas emissions, as it had already done in the Northern Gateway case, and by its 2014 ruling in the Kinder Morgan case.

Instead, the Liberal Government promised that it would add a new process, a separate procedure that would in some way deal with the issue of emissions. The new procedure was very briefly described in the January announcement, in these few words:

> *Assess the upstream greenhouse gas emissions associated with this project and make this information public.*
>
> — *Interim Measures for Pipeline Reviews*, January 27, 2016

Details of the Liberal Government's new assessment procedure were not released to the public until March 19, 2016. The new procedure is supposed to look at the impact of a new pipeline on Canada's total GHG emissions.

The assessment of upstream emissions for the proposed Kinder Morgan pipeline was completed very quickly. The report was released on May 19, 2016, which was less than 60 days after details of the procedure were published. While the assessment procedure was being completed it received no public attention, because it was a closed process. There were no public hearings.

The main finding in the assessment report is that the Kinder Morgan pipeline will cause only a "minimal" impact on Canada's GHG emissions. That conclusion is qualified by various assumptions about future oil prices, and some talk about "uncertainties".

On the same day, May 19, the NEB released its own decision recommending that the Federal Government proceed with the construction of the Kinder Morgan project.

So we now have two separate reports relating to the Kinder Morgan pipeline. Media attention on May 19 and since has focused on the NEB's decision, which recommends that Kinder Morgan be built. The NEB's decision appears to many people to be the most consequential decision, and it *is* consequential. In British Columbia, including in many aboriginal communities, the risks of pipeline failure on land and in the river systems, and

the effects of heavy oil tanker traffic on marine life, and marine spills, drive much of the broad public interest, and concern.

The assessment report has had little public scrutiny. But the report will be used to persuade Canadians that the Kinder Morgan project will not make our emissions problem worse. We need to take this report very seriously.

The Liberal Government's assessment procedure (March 2016)

On March 19, 2016, the Liberal Government quietly released details of the Interim Measures to assess emissions associated with pipeline projects and "make this information public". A notice published in the *Canada Gazette* explains the new procedure:

> *The assessment of upstream GHG's will consist of two parts: (A) a quantitative estimation of the GHG emissions released as a result of upstream production associated with the project, and (B) a discussion of the project's potential impact on Canadian and global emissions.*
>
> — "Estimating upstream GHG emissions", *Canada Gazette,* March 19, 2016. (http://www.gazette.gc.ca/rp-pr/p1/2016/2016-03-19/html/notice-avis-eng.php#nl4)

The document describes the steps that should be followed to carry out each part of the assessment. It refers to these steps as "the methodology".

The "methodology" for Part A of the assessment is not complicated. The first step is to calculate the "estimated throughput" (i.e., how much diluted bitumen or other type of oil will be carried per day, per year, and over the lifetime of the pipeline). Part A of the assessment will therefore calculate the total GHG emissions "associated with the project" – which means the amount of CO_2 emissions that will be generated every year in the course of producing the amount of bitumen that *could* be transported to markets by the new pipeline.

But that information is already mostly available to the public. We already know, from the Government of Canada's own published data, that between 2013 and 2030 the annual level of emissions from oil sands production is projected to rise by about another 54 Mt (see Figure 1). The rising emissions level is driven by the expected growth of oil sands production. A recent study by the Pembina Institute has calculated that, based on the 1.1 million barrels per day (bpd) capacity of the Energy East pipeline, completion of that project will enable future expansion of oil sands production that would generate up to 30 Mt of new annual emissions.

The question we need answered is whether emissions increases of that magnitude from expanded oil sands production (and from other oil and gas sector activities) during the next fifteen years can be reconciled with Canada's promised reduction by 2030. Part A will not answer that question.

If we turn to Part B of the assessment, we are told it will provide "a discussion of the project's potential impact on Canadian and global emissions".

But if we read the notice in full, we can see that the "methodology" designed for Part B is formulated in a particular way, which significantly limits the scope of the inquiry:

> *The second part of the analysis discusses the conditions under which the Canadian upstream emissions estimated in Part A could be expected to occur even if the project were not built.*
>
> — *Canada Gazette*, March 19, 2016

The above wording means that in looking at the impact of a proposed pipeline project, for example Kinder Morgan, the assessment must only ask this question: will the future increase in oil sands production (and therefore the future increase of emissions) made possible by the additional transport capacity of this pipeline occur *even if the pipeline is not built*? Clear guidance is given on what steps the assessment must follow to answer that question:

> *The second step involves evaluating the technical and economic potential for alternate modes of transportation to be used in the absence of the proposed project.*

The notice does not use the word "rail" or "railways". But everybody familiar with discussions during the past few years about the options available to the industry – about how the oil sands industry can continue to increase production if new pipelines are not available – is aware that rail transport is the alternative. Rail is the only alternative.

The assessment is therefore required to evaluate whether rail transport would be an economically viable method to transport increased bitumen production to market: explicit instructions are given that the assessment shall evaluate the "economic and technical potential" of the alternate mode of transport. Rail transport is more expensive than pipelines (about US$10 more per barrel). The crucial question for the assessment procedure is whether long-term oil prices will be high enough to cover the extra cost, "in the absence of the proposed project."

If rail transport is a viable alternative, then Part B of the assessment can decide that the increased production that would be carried in the proposed pipeline (calculated in Part A) *will be produced anyway*, even if the pipeline is not built. The assessment will be obliged to conclude that approval of the new pipeline will not make emissions any worse – because the increased production would still occur even if there were no new pipeline. It could all be transported by rail.

The March 18, 2016 notice is absolutely clear about the method the assessor must follow:

> *As an example, when considering whether Canadian GHG emissions would increase as a result of a crude oil pipeline project, the primary factor will be the*

potential increase in Canadian upstream oil production that would be expected to occur if the pipeline were not built.

So if an assessment determines that future oil sands production would be able to profitably expand without the proposed pipeline – because rail would be economical as the alternate mode of transport – the assessment will be expected to find that Canadian GHG emissions will not increase as a result of the pipeline project.

The terminology in the assessment procedure is that the pipeline will cause no "incremental emissions".

This is an entirely artificial approach. GHG emissions increase whenever production expands, no matter how the oil is transported to market. Our concern should be about the increasing level of annual emissions from the expansion of oil sands production, whether that growth is made possible by new pipelines or rail.

Evidence: the cost of shipping oil by rail and future oil prices

A short time after the assessment procedure was announced on March 19, 2016, the Liberal Government completed (and released to the public) emissions assessment reports on two pipeline projects.

The first, relating to a project called Line 3, was released on April 25, 2016. It was described as the "first example of an upstream greenhouse gas assessment using Environment and Climate Change Canada's proposed methodology published on March 19, 2016". That assessment relates to the expansion of Enbridge's Line 3, which runs between Alberta and Superior, Wisconsin. That project, less well known to Canadians than Energy East and Kinder Morgan, involves an expansion of the pipeline's existing capacity from 370,000 bpd to 760,000 bpd.

The second assessment report was released on May 19, 2016. It concerns the proposed expansion of the Kinder Morgan pipeline between Edmonton and the Port of Vancouver. The project will expand the capacity of the existing pipeline by an additional 590,000 bpd, from 300,000 bpd to 890,000 bpd.

The analysis followed in both reports is identical. Lengthy sections of both reports are the same, word for word. Apart from calculating different amounts of "throughput" and different calculations for the associated emissions (because Kinder Morgan adds more shipping capacity), all of the evidence about future long-term oil prices, the cost and availability of rail as an "alternate transport mode", and supply costs is identical. That is not surprising. The only difference in the two cases is the amount of bitumen that each will carry.

Before turning to look closely at the Kinder Morgan report, it may be helpful to identify the nature and source of several key points of evidence relied on in both of these assessments. Because the two reports are identical in method and in their conclusions, I will not deal further with the specifics of the Line 3 assessment report.

Crucial evidence in both cases concerns the cost per barrel of using rail transport for bitumen, compared to the cost per barrel of using pipelines. Rail transport is about $10 per barrel more expensive than pipelines. The assessments must also take into account the expected future level of world oil prices, looking ahead about twenty-five tears – to decide whether oil prices will be high enough so that rail could be a viable "alternate mode of transport" to allow profitable expansion of oil sands production up to 2040, on the hypothetical assumption that no pipelines are built. The issue, in both assessments, was whether oil prices in future would be high enough to cover the extra cost of using rail transport.

The focus of the assessment reports is therefore not so much on emissions from oil sands production, but on the costs of shipping oil by rail and on future oil prices.

The assessment relies on the National Energy Board (NEB) for key parts of the evidence on those issues. The main source of recent NEB data used in the assessment procedure is a major report called *Canada's Energy Future 2016: Energy Supply and Demand Projections to 2040*, published by the NEB on January 27, 2016.

The NEB's forecast is that long-term oil prices will increase to about $US78 by 2020 and will continue to rise gradually to US$102 by 2040. That is the NEB's Reference Case oil price forecast using West Texas Intermediate (WTI) crude oil prices, which are a benchmark for North American oil prices.

In the same *Canada's Energy Future 2016* report, the NEB also produced an analysis (which it called the "Constrained Oil Pipeline Capacity Case") showing that rail transport would be a viable substitution for pipelines over the period up to 2040. The Constrained Case is based on the same oil price projections as in the Reference Case – that is, prices increasing to about US$80 by 2020 and continuing to rise gradually after that.

In the Constrained Case scenario, the NEB found that more than 90% of projected future growth of oil sands production between now and 2040 would occur *even without any new pipelines* – assuming that world oil prices move up in line with the NEB forecast.

The NEB's January 27, 2016 report therefore provides essential evidence to support an argument that building new pipelines will not increase emission. The rationale is that if the pipeline were not built, oil sands production would increase anyway (or at least 90% of the increase would occur anyway) because rail transport can be substituted as a more expensive, but still affordable, method of transport.

The Kinder Morgan assessment report

The emissions assessment report for the proposed Kinder Morgan pipeline project was released on May 19, 2016.

On that same day, the NEB's own report was made public. The NEB recommended that Kinder Morgan be approved. There are, therefore, two parallel procedures and two separate reports. One, the report prepared by the NEB, does not include any discussion of

GHG emissions caused by upstream bitumen production. The NEB during its inquiry process did not allow any testimony or scientific evidence about emissions or their impact on the climate system.

The second report is supposed to inform Canadians about the impact of the emissions.

In the case of Kinder Morgan, the project will expand the capacity of the existing pipeline to Vancouver by another 590,000 bpd, up to 890,000 bpd. The assessment report concludes that the volume of emissions associated with 590,000 bpd of bitumen production, which is the additional capacity provided by the proposed expansion of the Kinder Morgan pipeline, could range from 13.5 up to 17 Mt CO_2eq per year.

The Kinder Morgan assessment report follows the methodology described above. On the opening page of Part B of the analysis, the report confirms the approach:

> *If oil production was expected to occur in the absence of the project, the pipeline project would not enable incremental oil production and would therefore have no impact on upstream GHG emissions in Canada.*
>
> — *Report*, B.1, p. 14

That formula is repeated in the concluding part of the report, after taking into account the available evidence about future oil prices and the costs of rail transport, and other details of the evidence:

> *If longer term oil light oil prices were greater than USD $80 in real terms, a number of projects would likely already be expected to be strongly profitable and a large amount of oil sands growth would be expected to occur regardless of whether the oil was moved by pipeline or rail.*
>
> — *Report*, B.4.3.2.3, p. 32

The second quote does not go so far as to say there would be "no impact". But the results of the full analysis are summarized in Table 6 of the report. The summary describes the amount of incremental emissions caused by the Kinder Morgan pipeline at prices above US$80 as "minimal".

We can follow the various steps of analysis. The entire document is only 35 pages long.

The report accepts that rail transport costs about $10 more per barrel than using pipelines. With respect to evidence about expected future long-term oil prices, the report adopts the NEB's recent projections (*Canada's Energy Future 2016*), using the NEB's reference case, mentioned above, which projects a price of about US$78 by 2020, rising to US$102 in 2040.

It accepts that if future oil prices are in that range, rail transport would be a viable alternate method of transporting all of Alberta's increased production to market. In reaching that result, the Kinder Morgan assessment relies specifically on the NEB's

Constrained Case, which found that more than 90% of the projected future growth of oil sands production between now and 2040 would occur, *without any new pipelines*.

The assessment also agrees that large-scale rail transport is feasible in terms of existing railway infrastructure. It finds that current "rail loading capacity" for oil in western Canada is over 1 million bpd, which is four times more than the highest level of crude-by-rail during the past few years. Therefore railway shipping is readily available, but it is more expensive.

After reviewing the costs of rail transport and other details of oil sands production costs, the Kinder Morgan report turns to the main question, laid out in the March 19, 2016 methodology: "whether Canadian GHG emissions would increase as a result of the crude oil pipeline project."

The assessment looks at the expected growth of oil sands production up to 2040, based on three future oil price scenarios. Under each oil price scenario, the report discusses whether rail transport would be a viable alternate method of moving oil to export markets. Rail transport is more likely to be an affordable substitute for the proposed pipeline at higher oil prices.

In the case of the low price scenario, the assessment says that if oil prices remain under US$60 per barrel for the long term, then after 2020 no substantial oil sands growth is expected at all. At those low prices, rail will clearly not be economical. Even building new pipelines would not encourage growth of production, according to the report. We can ignore the Low Price scenario.

If long-term oil prices are taken to be mid-range (defined in the Line 3 report as US$60-$80 per barrel) but do not rise above that level, then the construction of new pipelines will encourage some expansion of oil sands production, according to the assessment's analysis. In this mid-level price range, *rail transport would be too expensive to make any new oil sands projects profitable*, except for a limited number of projects if oil prices are at the top end of that range (i.e., close to US$80). In contrast, in the mid-range price level, new pipeline projects that offer a relatively inexpensive way to move bitumen to market would encourage some growth of new oil sands production, which would not otherwise occur. So at this mid-range price level, the assessment agrees that new pipelines, if approved, would cause some increase in Canadian GHG emissions. They would cause some "incremental emissions" – that is, an increase of emissions caused or enabled by the pipeline, which would not occur if the pipeline were not built.

The mid-range (US$60-$80) is the only scenario where the assessment agrees that building new pipelines would potentially cause some incremental emissions. The amount is not quantified.

The third scenario is the most important. It is described as the high price range. It assumes long-term oil prices will reach a level above US$80 per barrel (consistent with the NEB's recent long-term forecast). At this higher price level, future expansion of oil sands production will be substantial – and so will emissions growth.

The assessment concludes that if long-term oil prices move above US$80, any "incremental emissions" caused by new pipelines will be "minimal". In other words, at that price range, building new oil pipelines to move expanding oil sands production to export markets *will not increase the level of Canadian GHG emissions*.

The reason is that at prices above US$80, oil sands production can profitably expand *even if no new pipelines are built* – because in this higher price range, rail transport is economically viable. In this oil price range, the extra cost of rail transport is not a deterrent. Producers will be willing to invest in new projects even without new pipelines. That is the reasoning followed by the assessment report.

Of course, in reality the oil will not be moved by rail, not much of it. Under the assessment's methodology, once there is a finding that the proposed pipeline will not cause an increase in emissions (because it could be moved by rail), the pipeline will be approved. Following the same reasoning, another one or two pipelines will easily be approved after Kinder Morgan. By 2040 production will have doubled to 4.8 million bpd. It will all be moved by pipeline. Nobody wants to use rail. It costs more. In 2015, crude-by-rail exports averaged 105,000 bpd, less than 3% of Canada's total production. In the Liberal Government's assessment routine, the railways are mainly imaginary – like straw dogs in an ancient ritual, in this case a ritual to persuade Canadians that emissions will not increase if we build more pipelines. It is a game of language.

The Kinder Morgan assessment report does not directly offer an opinion on which of the three oil price scenarios is likely to most accurately describe the future outcome. The report provides a "discussion" of the possible outcomes, which depend on the future oil price scenario selected; the Liberal Government will make the final decision. By December 2016, the government will announce whether or not it will approve the Kinder Morgan project.

If the government wants to approve the Kinder Morgan pipeline, it can choose the high price range as the most likely story of how world oil prices will behave over the next twenty-five years. It will be able to point to the NEB's long-term oil price forecast published January 27, 2016 in *Canada's Energy Future 2016* as evidence supporting that view of future oil prices. In that way, the Kinder Morgan assessment report can be used to justify the conclusion that building Kinder Morgan will cause only a "minimal" increase in Canada's GHG emissions. The Liberal Government will then be able to approve the project and defend its decision by declaring that Kinder Morgan will not increase emissions – or by saying that any emissions increase is uncertain and probably minimal.

We are left with a paradox. On the one hand, the assessment assures us that new pipelines will not increase emissions. One the other hand, the assessment informs us with a fair degree of precision that the volume of new bitumen production that can be transported by the expanded Kinder Morgan pipeline, whether it is in fact carried by the pipeline of by rail, will release into the atmosphere an additional 13.5 Mt to 17 Mt CO_2 every year.

Failure of the assessment to answer the important question

The Liberal Government promised that the assessment procedure would provide a "discussion of the project's potential impact on Canadian and global emissions". Has it fulfilled that promise?

As we have seen, the Kinder Morgan assessment report concludes that the proposed pipeline to Vancouver, if built, would cause only "minimal" incremental emissions, if future oil prices are in the high price range. It offers a more nuanced picture of future emission increases if future prices are in the middle price range. Overall, whatever happens, the potential emissions impact of the Kinder Morgan project will be small or indeterminate, according to the report.

Despite that, the report admits oil sands emissions will continue to increase, and they will be the main driver of growth in Canada's total emissions:

> *The growth in emissions to 2030 is driven largely by growth in the upstream oil and gas sector and, in particular, from the oil sands. ECCC projections indicate that GHG emissions from the oil sands could increase from 62 Mt in 2013, to 90 Mt in 2020 and up to 116 Mt in 2030.*
>
> — *Report*, section B.2.1, p.17

The increase will occur because expanded bitumen production will generate additional CO_2 and other greenhouse gases, whether it is moved by pipeline or by rail. But the Liberal Government's assessment procedure will not count those emissions increases if the amount of expanded production *could be transported by rail*.

The projections quoted in the assessment report are taken from *Canada's Second Biennial Report on Climate Change*, which is the most recent publicly available government forecast of Canada's emissions up to 2030, published by Environment and Climate Change Canada in February 2016. Oil sands data from that report are shown in Figure 1. These projections already take into account an anticipated slowdown in the rate of growth of bitumen production during the next fifteen years as a result of changes in the oil market since July 2014. So this is a realistic summary of what we can expect, based on the current forecast of production growth:

Figure 1: Oil sands emissions (Mt CO_2eq)

2005	2013	2020	2030	Change 2005-2030
32	62	90	116	+84

Source: *Canada's Second Biennial Report on Climate*, Environment and Climate Change Canada (February 2016), Table A6, p. 23.

The report acknowledges that Canada's total emissions are expected to continue to increase to 2030:

> *ECCC projects that Canada's total annual GHG emissions will increase to 815 Mt in 2030 from 726 Mt in 2013, under its reference or current measures scenario as reported in Canada's Second Biennial Report on Climate Change.*
>
> — *Report*, section B.2.1.1, p. 16

If Canada approves just two new pipelines, by sometime in the 2020s we will have added between 1 million and 1.5 million bpd of new capacity, depending on which projects are built. The Kinder Morgan and the Line 3 projects will together add 1 million bpd of shipping capacity. The volume of new production represented by the combined capacity of those two projects will generate between 23 Mt and 30 Mt of GHG emissions per year.

Approval of the Energy East pipeline will add another 1 million bpd of capacity.

The question of fundamental importance is this: can continued expansion of oil sands production (whether it is carried by rail or pipelines) be consistent with Canada's commitment to reduce our total emissions 30% below the 2005 level by 2030?

The flaw in the assessment process is that the new Liberal Government – like the previous Conservative Government – has refused to allow a proper environmental review to look at the important question: *what is the impact of expanding bitumen production on Canada's total emissions*?

The Kinder Morgan assessment report agrees that the most recent projections show that our total emissions by 2020 will be 768 Mt. A 30% reduction below the 2005 level means that Canada's annual emissions level must be reduced to 525 Mt by 2030. To meet that target, the absolute reduction in Canada over the next decade will need be at least 200 Mt in total, a cut averaging about 20 Mt per year – *if we can halt all further increases by 2020 and start making deep reductions as early as 2021*. The cuts may need to be more. The cuts will have to be taken from one sector or another.

Can we cut Canada's annual emissions level by 200 Mt between 2020 and 2030) – an average of about 20 Mt per year – if oil sands emissions are still rising every year? Is it possible?

The Kinder Morgan report does not answer that question.

If the answer is negative, Canadians should be told. The supposed task of the assessment was to provide a "discussion of the project's potential impact on Canadian and global emissions" (see the March 19, 2016 notice).

The challenge: emissions reductions in other economic sectors by 2030

If we look carefully at the Government of Canada's most recent projections up to 2020 and 2030 for the entire economy, we can see the magnitude of the challenge. The data in Figure 2 is reproduced from the report released by the Government of Canada in February 2016, *Canada's Second Biennial Report on Climate Change*:

Figure 2: Emissions projections to 2020 and 2030 (Mt CO_2eq)

	2005	2013	2020	2030	Change 2005-2020	Change 2005-2030
Oil and Gas	157	179	210	242	+54	+85
Electricity	121	85	74	58	-48	-64
Transportation	169	170	169	164	0	-5
EITE	89	76	90	107	+1	+18
Buildings	87	86	96	109	+9	+21
Agriculture	71	75	74	76	+3	+5
Waste and Others	54	54	54	59	0	+5
Total	**749**	**726**	**768**	**815**	**+18**	**+66**

Source: *Canada's Second Biennial Report on Climate*, Environment and Climate Change Canada (February 2016), Table A5, p. 22.

The projections in Figure 2 are probably the most favourable emissions outcomes we can presently count on without major changes in policy. This is the most up-to-date information we have, and it is the only evidence that the Government of Canada has chosen to publicly disclose to us.

Even a cursory look at the numbers shows how oil and gas emissions are outstripping every other sector. The only economic sector in Canada projected to achieve deep cuts between 2005 and 2020 is the electricity sector, which is expected to achieve a total reduction of 48 Mt – or possibly a little more than that. But over the same time period, everything gained in the electricity sector will be swallowed up by a 54 Mt net increase in the oil and gas sector.

The same pattern continues up to 2030.

The projections shown in Figure 2 do not appear, and are not discussed, in the assessment report. The report refers only briefly to the annual totals forecast for 2020 and 2030.

It is easy for a government to say that these are just "current measures" numbers, and that they will get lower when new policies are introduced.

The challenge is whether Canada can change this pattern, and how soon. Can we obtain reductions, from among the seven economic sectors, that are collectively large enough to meet the target? How can we do that if oil and gas sector emissions are still rising?

It is helpful to look at two specific examples: the transportation sector and the buildings sector. They illustrate why rapid cuts in the other sectors will not be easy.

The transportation sector accounts for 23% of Canada's total emissions and is the second largest emitting sector (after the oil and gas sector). Looking at the overall pattern of transportation emissions, the trend is flat, with no reduction at all between 2005 and 2020. Between 2020 and 2030 transportation emissions are expected to decline slightly to 164 Mt – an absolute reduction of 5 Mt over twenty-five years.

A 30% reduction to the transportation sector emissions would mean a cut of 50 Mt by 2030. There is no reason why the reductions must be taken pro rata from all seven economic sectors. But if one sector cannot contribute a share of the reductions, other sectors would have to make deeper cuts.

At present we have in Canada a major federal policy aimed at containing transportation emissions – the *Passenger Automobile and Light Truck Greenhouse Gas Emission Regulation*, introduced in 2010. The regulation imposed emissions standards (more or less identical to the equivalent U.S. standards) on passenger vehicles for model years 2011 to 2016. A new set of standards will apply to model years 2017 to 2025. In addition to the regulations, we have had for many years the benefit of general improvements in vehicle fuel efficiency. On average, passenger vehicles in Canada are burning less fuel to travel the same distances.

All of that ought to be reducing transportation emissions.

But there are weaknesses and gaps in Canada's policy. Between 2005 and 2013, the annual level of emissions from "cars, trucks and motorcycles" (which covers about 90% of all emissions from passenger transportation in Canada, excluding only aviation, rail, and bus) did not decline at all. It was flat. In the same period, emissions from freight transport (which includes rail and heavy trucks) increased 5 Mt (*Second Biennial Report*, February 2016, Table A11, at page 24). That basic trend is expected to continue to 2020: passenger transport emissions will go down 7 Mt, while freight transport emissions will increase by 5 Mt. Emissions increases from freight transport are outpacing annual savings in passenger transport, or at least cancelling out the improvements.

GDP growth is a major factor that drives our transportation emissions levels, especially heavy-duty trucks and rail transport. We desire economic growth, but in the absence of policies that effectively curb freight transport emissions, growth brings higher emissions.

Reversing the growth of emissions in freight transport, which is linked so closely to the flow of economic activity in a growing economy, will require massive changes in infrastructure. Once we decide to make those changes, it will take time.

The second example is the buildings sector.

Looking at the Government of Canada's buildings sector data back to 2005, the overall trend has been more or less flat. The sector has not achieved any absolute carbon reductions, and is not expected to do that within the next five years – or within the next fifteen years, if the Government of Canada's projection to 2030 is accurate.

New technologies and improved design (insulation, heating systems, and densification of cities) are already available to dramatically increase energy efficiency in buildings. In the case of new buildings, the impetus to incorporate these improvements is reinforced by more stringent building codes and municipal standards. But we cannot easily, or rapidly, obtain the benefits of new low-emissions systems in all our buildings because the replacement of older structures is painfully slow. The problem is that buildings are "generational". A defining feature of this sector is that these kinds of structures are planned to last for fifty years, or very much longer.

Therefore, "turning around" the buildings sector is a slow process.

Based on the *Second Biennial Report* data, total emissions in the buildings sector between 2013 and 2020 are expected to increase by 9 Mt, and rise by another 13 Mt between 2020 and 2030. Almost all of that increase will occur in the commercial buildings subsector.

In a growing economy, the amount of commercial floor space expands. Expanding commercial floor space (which increases the demand for heating and air conditioning) is "the principal driver of emissions" in this sector, according to *Canada's Emissions Trends 2014*. Continued efficiency improvements in building technology are not enough to bring about any actual cut in the emissions level. The reason is that while emissions per square foot are declining (at least for new buildings), the growing area of new commercial floor space is expanding the total volume of emissions, and outpacing the efficiency gains.

Now let us look again at the overall picture:

If oil sands expansion continues, there will obviously be no scope for emissions reductions in the oil and gas sector either, which accounts for 25% of Canada's total emissions. Based on current policies, the transportation sector promises no significant reductions. Those two sectors together account for almost 50% of annual emissions. If half of all emissions in Canada are locked up in two large sectors, one of which is increasing and the other is projected to contribute little to the needed cuts, how can we meet the 2030 target? Where do the cuts come from?

In the end, the Kinder Morgan assessment report offers no explanation of how Canada can reconcile a continued increase in oil and gas sector emissions between now and 2030, and at the same time cut total emissions down to about 525 Mt by that year.

The case of Alberta

The assessment acknowledges that the government's most recent emissions projections (as provided in *Canada's Second Biennial Report* February, 2016) show that our total emissions are expected to rise to 815 Mt by 2030 (see Figure 2). The gap between the current projection and the reduction target is enormous.

But instead of providing some analysis and evidence to explain how that gap might be closed during the next fifteen years, the assessment report suggests, in a brief half-page of commentary, that the government's current projection showing emissions rising to 815 Mt by 2030 may be overstated. The report argues that additional carbon-reduction policies very recently announced by some provincial governments are not taken into account in the government's *Second Biennial Report* projections, and that they make a difference:

> *This scenario is based on historical data and actions taken by governments, consumers and business up to 2013, as well as the estimated future impacts of existing policies and measures that have been put in place as of September 2015 (without taking into account the contribution of the land use, land use change, and forestry sector).*
>
> — *Report,* B.2.1.1, "Canada's GHG Emissions Projections", p.16.

It is true that that the projections published in *Canada's Second Biennial Report* in February 2016 are based on what is called a "current measures" scenario. The future emissions level estimated for each sector up to 2030 takes into account only the *existing carbon-reduction policies* that had already been adopted or announced by September 2015. That was the cut-off date for including the future impact of new policies in calculating the projections published in the *Second Biennial Report*.

But the assessment report fails to provide any estimate of how much the new measures announced after September 2015 might reduce Canada's total GHG emissions by 2030. We are just given generic assurances that the new measures will "have an impact".

The first part of the paragraph deals with some new policy measures announced in Alberta, on November 20, 2015:

> *A number of recently announced provincial government policies, such as those outlined in Alberta's Climate Leadership plan, will have an impact on Canadian GHG emissions, but were not reflected in Canada's Second Biennial Report on Climate Change as the details of those policies were not available at the time of publication. Albert's Climate Leadership plan includes a commitment to cap emissions from oil sands facilities at 100 Mt in any years, reduce methane emissions from oil and gas operations by 45% by 2025, set performance standards for large industry emitters, and apply a carbon levy to fuels.*
>
> — *Report*, B.2.1.1, p.16-17

"Will have an impact on Canadian GHG emissions": how much of an impact? Why has this assessment not done its own analysis to find out how much impact these measures will have to on the growth of oil sands emissions? The available Government of Canada projections, only four months old, tell us that oil sands emission are expected to rise from 62 Mt in 2013 to 116 Mt in 2030 – an average increase of more than 3 Mt per year over fifteen years (see Figure 1). How much will Alberta's promised policies reduce that?

The assessment offers no evidence or analysis to answer that question.

Figure 3 reproduces the Government of Canada's projections for the province of Alberta's total emissions, published in the *Second Biennial Report*. These projections do not take into account the impact of the new carbon-reduction policies announced in Alberta's new *Climate Leadership Plan*:

Figure 3: Province of Alberta – emissions projections to 2020 and 2030 (Mt CO_2eq)

	2005	2013	2020	2030
Alberta	234	267	297	320

Source: *Canada's Second Biennial Report on Climate*, Environment and Climate Change Canada (February 2016), Table A24, p. 29.

Having suggested that new carbon-reduction policies in Alberta will make a difference, the assessment report fails to provide any estimate of how much Alberta's expected annual emissions by 2030 might be reduced as a result of the province's new plan.

Fortunately, we can obtain some fairly detailed answers to that question if we go to the Province of Alberta's *Climate Leadership, Report to Minister*, published on November 20, 2015.

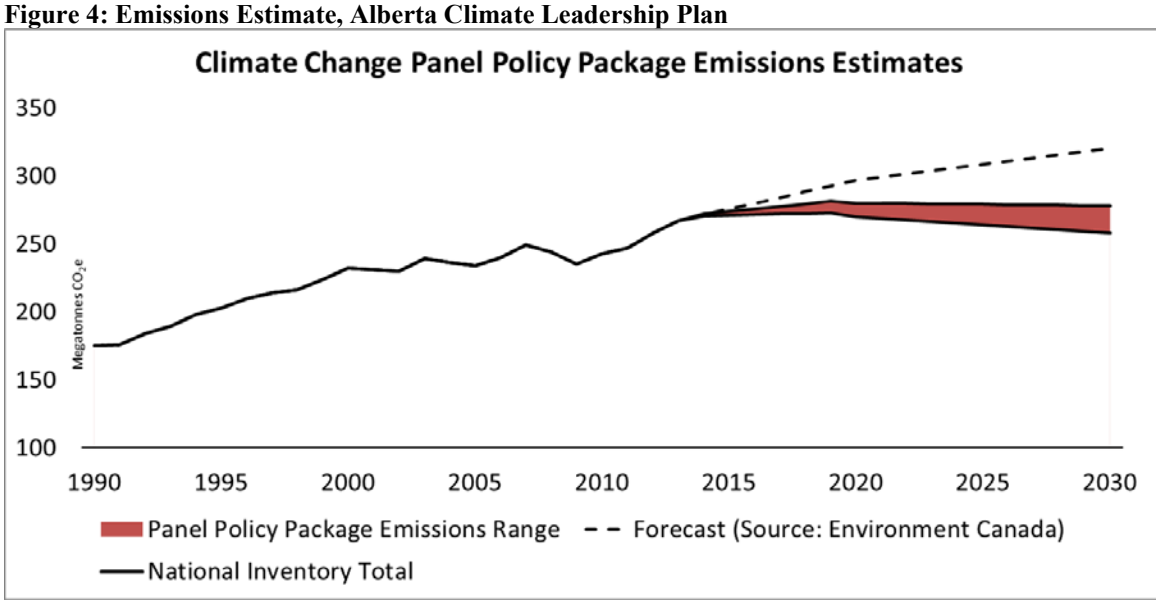
The Alberta plan does include several important initiatives.

Firstly, the province will phase out all coal-fired electricity generation by 2030. Alberta's thirteen coal-burning plants currently contribute about 40 Mt annually to Canada's total emissions. That source of electricity will be replaced in part by natural-gas-fired plants (which will generate fewer emissions while producing the same amount of electricity), and in part by renewable power sources. By 2030, that transition away from coal-based electricity will reduce the province's emissions by at least 14 Mt below the current projection, depending on the share of renewables. If renewable provide a high proportion of the replacement power, the emissions reduction will be higher than 14 Mt.

Secondly, according to Alberta's *Climate Leadership Plan*, successful implementation of methane reduction in the oil and gas industry and the adoption of new carbon pricing measures that will apply to oil sands operations are expected to reduce Alberta's total annual emissions in 2030 by 20 Mt: methane reduction will accounts for about 12 Mt of that, and reduction of oil sands emissions as a result of the carbon tax will account for about 8 Mt.

According to the *Climate Leadership* report, by 2030 these measures – together with several other new initiatives in Alberta – are expected to reduce Alberta's total annual emissions by about 50 Mt, below the currently projected level: from 320 Mt down to 270 Mt. The outcome is depicted in Figure 4 which was published in the Alberta document:

Figure 4: Emissions Estimate, Alberta Climate Leadership Plan



Source: *Climate Leadership Plan: Report to Minister,* November 20, 2015.

We can see, however, that despite Alberta's promised new measures, by 2030 Alberta's total emissions, about 270 Mt, will be more or less same as they are now. Between 2013 and 2020, the level of annual emissions will rise by about 30 Mt. Between 2020 and 2030 the level will decline by about the same amount, 30 Mt. The problem is that most of Alberta's promised reductions after 2020 will be offset by the continued increase of oil sands emissions between 2015 and 2030.

Under the new plan, by 2030 Alberta's emissions will still be above the 2005 level (which was 234 Mt; see Figure 3). Our national commitment is that Canada's total GHG emissions will be 30% below the 2005 level by 2030. Alberta will contribute nothing to that.

The Kinder Morgan assessment report does not refer to any details of the data or analysis in the *Climate Leadership Plan*. It simply makes the claim that the policies outlined in the Alberta plan "will have an impact on Canadian GHG emissions".

The *Climate Leadership Plan* document is candid about the limitations of what the new measures will achieve:

> *Many will look at these emissions reductions and claim that our policies will not place Alberta on a trajectory consistent with global 2°C goals, and in some sense this is true – the policies proposed for Alberta in this document would not, if applied in all jurisdictions in the world, lead to global goals being accomplished. However, more stringent policies in Alberta would come at a significant cost to*

> *the province. Due to lost competitiveness, with negligible impact on global emissions due to carbon leakage. As a panel, we have looked at this challenge and concluded that while we do not have an architecture that, in the short-term, will be consistent with meeting global goals, the approach we are proposing will position Alberta to make a meaningful contribution in the longer-run.*
>
> — *Climate Leadership Report to Minister*, p. 11 (underlining added)

The main achievement of the Alberta plan, if it is fully implemented, is that after about 2020 it will halt further increases in its overall emissions. But a substantial decline in emissions from electricity generation, due to the shutdown of coal-fired plants, will be offset by the continued rise in oil sands emissions.

Under the *Climate Leadership Plan*, the percentage reduction by Alberta over the entire ten years after 2020 will be about 11%. It will simply roll back the additional emissions that will be added between 2015 and 2020.

How does Alberta's *Climate Leadership Plan* impact on Canada's total emissions up to 2030, and on our capability to achieve a 30% reduction by that deadline? The Kinder Morgan assessment report does not answer that question.

The basic problem is that Alberta contributes a disproportionately large share of Canada's total emissions. Alberta's total annual emissions (267 Mt in 2013) comprise about 37% of Canada's total emissions. That share is expected to increase to almost 40% of the national total by 2020.

If Alberta cannot contribute anything substantial to the needed "deep cuts" between 2020 and 2030 (its own cuts will be limited to about 11%), can the other provinces, representing only 60% of Canada's total emissions, accomplish that task by themselves?

The answer is troubling. The burden of deep emissions cuts will be shifted almost entirely to the other provinces. In order to reduce Canada's annual emissions level to 524 Mt by 2030 (and assuming realistically that deep cuts do not actually begin until 2021), the other provinces would have to cut their share of Canada's emissions by about 45%, all within ten years. And even if that were possible, a successful outcome assumes that Alberta would simultaneously fulfill its own plan, which will require it to halt all further increases in its total provincial emissions after 2020 and deliver a reduction of about 11% to its own emissions over the following ten years.

Cuts on that scale in the other provinces will be beyond our capability.

The Kinder Morgan assessment provides no evidence or analysis that examines the potential of other provinces to abruptly commence deep and rapid emissions cuts of that kind. It does not discuss the details of any new carbon reduction policies in the other provinces.

Finally, the promised "cap" on oil sands emissions announced by the Alberta government on November 20, 2015 will not make a significant difference.

If Alberta does enforce a "cap" of 100 Mt on oil sands emissions (a maximum upper limit on the annual level of emissions from all oil sands extraction and processing), the maximum will be only 16 Mt less than the current projection, which is an annual level of 116 Mt by 2030. Alberta's *Climate Leadership* plan already envisions that the annual level of oil sands emissions will be reduced 8 Mt as a result of the beneficial effects of new carbon tax. If we assume the new carbon tax in Alberta will achieve that goal, then by 2030 the annual level of oil sands emissions will be 108 Mt. Seven or eight years from now, when oil sands emissions reach an annual level 100 Mt, the proposed cap will not make much difference. The level of oil sands emissions in 2015 was about 70 Mt – so another 30 Mt of increases lie ahead, before the cap has any impact.

The future increase of oil sands emissions above the 2015 level may amount to another 40 Mt, even with the benefit of the cap. The assessment report does not mention that the cap may in fact be set as high as 110 Mt, because it sets aside an extra allowance to cover a further increase of emissions from the possible expansion of bitumen upgrading.

British Columbia and other provinces

The assessment report does refer to British Columbia in a general way, but says nothing about the future prospect of any emissions reductions in B.C. It offers only this single sentence:

> *British Columbia has announced that it will be updating its Climate Change Plan and has recently concluded public consultation.*

Having chosen to mention B.C., the report does not mention that B.C. is on track to miss its own 2020 reduction target. Figure 5 shows the current projections for B.C., taken from the *Second Biennial Report*:

Figure 5: Province of British Columbia – emissions projections to 2020 and 2030 (Mt CO_2eq)

	2005	2013	2020	2030
British Columbia	64	63	72	83

Source: *Canada's Second Biennial Report on Climate*, Environment and Climate Change Canada (February 2016), Table A24, p. 29.

B.C.'s emissions target for 2020, established by the *Greenhouse Gas Reduction Targets Act* enacted in 2007, was 43.5 Mt.

The assessment omits any reference to the fact that the B.C. government is currently attempting to establish a liquefied natural gas (LNG) industry in the province, which is a highly carbon-intensive industry.

If just two or three LNG plants are built and start up production during the early 2020s in B.C, they will add an additional 20 Mt to 40 Mt in new emissions during the next decade

– an average increase of 2 Mt to 4 Mt every year for ten years, an astonishing number in the context of this discussion. If the B.C. government is successful in its LNG ambitions, the new industry will be the largest new source of emissions growth in Canada in the next decade.

The Government of Canada's current projections include provision for a single LNG plant in operation by 2030, releasing 4 Mt of annual emissions by that year. Therefore, anything more than a single plant will substantially add to our projected increases.

The proposed LNG facility that is the closest to obtaining final approval from the Federal Government is known as Pacific NorthWest LNG. The proponent plans to build a $12 billion dollar facility for liquefaction of natural gas near Prince Rupert, on the north coast. In February, 2016, the CEAA released its Draft Environmental Assessment report on the Pacific NorthWest project, confirming that this single plant, together with the associated emissions from processing of the natural gas to supply the facility, will generate 11.4 Mt to 14.0 Mt of CO2 every year – for 30 years. That single project, if approved, will rank among the top emitters in Canada, equal in scale to the two worst emitting facilities in Canada, both of which are in Alberta.

There is nothing in the Kinder Morgan assessment report that changes the picture shown in Figure 5. B.C.'s emissions are on a rising trend.

The report cherry-picks policies and highlights vague promises that support the view that Canada's total GHG emissions will be reduced in future. But it provides no evidence or analysis to support that view. The report makes a generic claim that "other provinces are also planning new actions", and offers this mollifying assurance:

> *British Columbia has announced that it will be updating its Climate Leadership Plan and has recently concluded public consultations. Other provinces are also planning new actions that will have implications for oil and gas emissions. In addition, on March 3, 2016, First Ministers adopted the Vancouver Declaration on Clean Growth and Climate Change, in which they commit to develop a concrete plan to achieve Canada's international climate commitments and become a leader in the global clean growth economy. As these plans get defined and take effect, they will be incorporated in future emissions projections and future upstream GHG assessments.*
>
> *— Kinder Morgan report*

This is not a serious assessment. It hails "these plans" – and even applauds a commitment to *develop a plan* – but it gives us no idea of what measures might be adopted, and no analysis of what their impact might be. It assures us that once these plans "get defined" they will be taken into account by future upstream assessments. The point is that *no plan has yet been developed* that shows us how Canada's annual emissions by 2030 could be reduced. A plan would tell us what kind of annual reduction we can expect to achieve from each sector (i.e., transportation, buildings, industries etc.) – *and it would show us*

whether or not some continued growth of oil sands emissions through the 2020s can be consistent with achieving the required overall reductions.

The Kinder Morgan assessment provides no explanation to help us understand whether we can reconcile rising emissions from expanding oil sands production with our objective of achieving deep emissions cuts by 2030.

Commitments by the Government of Canada

In our attempt to look candidly at our emissions situation, it is helpful to clarify exactly what Canada's commitments are, and how they are related.

On December 11, 2010, when it signed the Cancun Agreements, the Conservative Government acknowledged in writing that there is an upper safe limit for atmospheric warming, and agreed that the 2°C warming threshold is based on scientific evidence:

> *We agree that deep cuts in global emissions are required according to science, and as documented by the IPPC Fourth Assessment Report with a view to reduce global emissions so as to hold the increase in global temperature below 2 degrees Celsius, and take action to meet this objective consistent with science and on the basis of equity.*
>
> — Copenhagen Accord, U.N. Framework Convention on Climate Change. United Nations, 18 December 2009, section 2
> http://unfccc.int/resource/docs/2009/cop15/eng/l07.pdf

In the Copenhagen Accord, Canada committed to limit the increase in average global temperature below 2°C. The commitment went further: Canada and other countries agreed that "deep cuts in global emissions are required" in order to meet that goal. When the Copenhagen Accord was signed in 2009, it did not specify the size of the "deep cuts" that each country would be obliged to make. That was a major criticism of the Copenhagen agreement when it was made.

But Canada subsequently agreed that we would reduce our national emissions (that is, *all* emissions caused by activities within our borders) by 30% by 2030, below the 2005 level. That pledge was formally made by the Conservative Government on May 15, 2015, and was re-affirmed by the Liberal Government at the climate conference in Paris in December 2016. That is the second part of our commitment.

The two commitments are inextricably linked. In the first, we pledged to make "deep cuts", without any specified size or deadline; in the second we voluntarily agreed on the reduction percentage and we agreed to a deadline for achieving that.

There is one more feature that explains the link between the two-part commitment: there is broad agreement that a 30% cut of emissions on a global scale by about 2030 would bring the world onto a path that will allow us to keep warming under 2°C. There is some uncertainty, expressed by some leading scientists, whether those reductions are deep

enough and rapid enough. Put another way, the 30% reduction is probably the minimum of what we need to do. But accepting the broad view, Canada's 30% target, if we meet it, will be a fulfillment of our original commitment under the Copenhagen Accord, to make deep cuts that keep us under 2°C. Further cuts of that kind, and likely deeper cuts, would have to continue for another twenty years after that to reach a safe outcome.

A grave failure of the Kinder Morgan assessment report is that it remains absolutely silent about the science that underlies our commitments. If one single paragraph had been devoted to the scientific evidence, it could have helped to explain to Canadians the importance of our short-term emissions reduction goal – and the essential importance of the time frame.

A problem of time: the scientific evidence

The accumulating concentration of CO_2 is measured in parts per million (ppm), indicating the number of CO_2 molecules per million molecules of other gases in the atmosphere. An atmospheric carbon concentration level of 450 ppm is broadly equivalent to a 2°C increase in global average temperature. That conclusion is based on the correlation, recognized by the scientific evidence, between increases in the CO_2 concentration level and warming of the atmosphere.

The pre-industrial atmospheric carbon concentration level, up to about 1780, was 280 ppm.

A comprehensive review of the long-term record of atmospheric carbon levels is found in *Climate Change 2013: The Physical Science Basis*, which is the first part of the Fifth Assessment Report (AR5) prepared by the International Panel on Climate Change (IPCC). The study was prepared by a group of scientists who assessed the most recent available findings about physical changes in the global climate system, including measurements of atmospheric gases.

> *The atmospheric concentrations of carbon dioxide, methane, and nitrous oxide have increased to levels unprecedented in at least the last 800,000 years. Carbon dioxide concentrations have increased by 40% since pre-industrial times, primarily from fossil-fuel emissions and secondarily from net land use change emissions. The ocean has absorbed about 30% of the emitted anthropogenic carbon dioxide, causing ocean acidification.*
>
> — *IPPC, 2013*: Summary for Policymakers, B.5 at page 11 (# 3)

The atmospheric concentration of carbon dioxide reached 400.26 ppm in 2015**.** The average rise currently is about 2.5 ppm per year. Since before the beginning of human life on earth and up to the start of industrialization in about 1780, the CO_2 concentration level was never *higher* than 280 ppm. It had been stable at that level for about 12,000 years, since the end of the last Ice Age. In the period since 1958 the level has risen 84 ppm, an unprecedented increase**,** more than twice the amount of the increase during preceding hundred and fifty years of industrialization. The third part of the IPPC's Fifth Assessment

Report, *Mitigation of Climate Change* (published in 2014), includes an examination of the most recent research about the expected increase of atmospheric carbon levels over the next few decades and up to 2100. Half of all human-caused carbon emissions have occurred since 1970:

> *About half of cumulative anthropogenic CO_2 emissions between 1750 and 2010 have occurred in the last 40 years (high confidence).*
>
> — IPPC, 2014, *Summary for Policymakers*, SPM.3, p.7

If we are thinking about the short-term goals to manage climate disruption, the paramount issue is *how long do we have* before the atmospheric concentration of carbon dioxide and other GHGs drive warming above the 2°C threshold. We must keep in mind that the accumulation of CO_2 in the atmosphere is permanent, so once the concentration reaches a certain level it cannot be reversed. There is no going back. That is why what we do in the next five to fifteen years is of such importance.

In examining that issue, scientists add together the warming effect of all the GHGs, principally carbon dioxide, methane, and nitrous oxide. The combined concentration is measured as "CO_2 equivalent" (CO_2eq). The most recent comprehensive studies indicate that if we do nothing, the combined concentration level will exceed 450 ppm by 2030:

> *Baseline scenarios (scenarios without explicit additional efforts to constrain emissions) exceed 450 parts per million (ppm) CO_2eq by 2030 and reach CO_2eq concentrations between 750 and more than 1300 ppm CO_2eq in 2100.*
>
> — IPPC, 2014, *Summary for Policymakers*, SPM 3, p. 8 (emphasis added)

Baseline scenarios ("business-as-usual" scenarios) are studies that calculate future levels of accumulated GHGs in the atmosphere, based on the assumption that countries around the world *do not significantly reduce their current patterns of coal and oil consumption.* If we continue on the present path, we will likely exceed the 450 CO_2eq level by 2030.

The final question is this: what is the highest $C0_2$eq concentration level in the atmosphere consistent with keeping global average surface warming under the 2°C threshold? The answer given by multiple studies is that 450 ppm is the safe upper limit:

> *Mitigation scenarios in which it is likely that the temperature change caused by anthropogenic GHG emissions can be kept less than 2°C relative to pre-industrial levels are characterized by atmospheric carbon concentration levels in 2100 of about 450 ppm CO_2 (high confidence).*
>
> — IPPC, 2014, *Summary for Policymakers*, SPM.4.1. p. 10

The above quotes are taken from the *Summary for Policymakers* that is included in each volume of the IPPC report. The Government of Canada approved the language of both documents. The above statements therefore summarize the key findings of science that have already been acknowledged by our government – and they indicate the nature of the

scientific evidence that that we would expect to see in a proper environmental assessment of the pipeline projects.

In terms of policy, the immediate goal is to keep the concentration level from exceeding 450 ppm by 2030. After that, we will have to work very hard to keep it under that level.

The time frame is therefore an essential part of the commitment. The target date of 2030 is significant because the CO_2 released every year into the atmosphere accumulates. It does not dissipate. The concentration of carbon in the atmosphere is increasing every year, and it is approaching a dangerous level. Our short-term goal is to slow down the annual rise of the carbon concentration level. The longer-term goal involves a complex transition to an economy that will be increasingly less dependent on carbon-based fuel (so that eventually the carbon concentration level will stop rising altogether). The long-term goal will take time, because it requires massive technological innovation and deep changes in our in industrial and transportation systems to eliminate large-scale carbon emissions. Therefore, both goals must be pursued simultaneously. Success in the short-term goal is vital because it will curb the rising level of the GHGs in the atmosphere, keeping the concentration level below 450 CO_2eq, while giving us time to solve the longer-term transition.

No honest discussion about Canada's options for natural resource development can take place without acknowledging the science. It is an essential part of understanding the implications of what we decide to do.

Once we understand the framework of time, it is reckless to argue that Canada should continue the *expansion* of the oil sands industry if continued growth for another decade will put at risk our chances of meeting Canada's emissions target by 2030.

The assessment was supposed to be a deliberative and consultative document, one that would give us advice: "a discussion of the project's potential impact on Canadian and global missions".

The trick of the Kinder Morgan assessment report is that throughout its entire 36-page length it is silent about whether the continued growth of oil sands emissions between 2015 and 2030 will put our commitment at risk. That is the important question. We did not get an answer.

A betrayal of the public interest

We did not get an answer because the question was not asked. The procedure in this assessment was designed to avoid the difficult questions about emissions, just like the procedure of the NEB hearings during the past three years.

The assessment was a closed process. It was not a public inquiry, providing an opportunity for cross-examination. There was no public access. There were no witnesses on the stand, just written reports, many of them prepared by the government's own agencies – most importantly by the NEB itself, the same agency that in July 2014

excluded all evidence about the climate impact of emissions at its own inquiry into the Kinder Morgan project. No members of the public were in the room when the methodology was decided on.

The government also controlled the evidence. The government's March 19, 2016 notice explained what kind of evidence could be relied on in the assessment procedure: it stated that that "publicly available data provided by the proponent will be used" in the assessment. The "proponent" is the pipeline owner. No representatives of the public were present to demand the right to call evidence. Canada's leading scientists could have testified about the rapidity of the rising level of atmospheric carbon and the implications of failing to meet our emissions reduction target – but they were not asked. The procedure did not have any judicial independence, or any independence at all. It was an administrative procedure, run by government employees, who were given direction by the politicians and their staff members.

If the Liberal Government honestly believed that there is a way to reconcile the continued growth of oil and gas sector emissions for another fifteen years while simultaneously cutting Canada's total GHG emissions to an annual level of 525 Mt by 2030, the ethical burden was on the government to demonstrate the feasibility of that, in this assessment of the Kinder Morgan pipeline. The performance of that duty requires absolute candour on the part of the government. The demonstration would have to be based on evidence that could be scrutinized and tested in public view. It would address the problem of time. It would be supported by analysis that could show us persuasively that the other six sectors of the economy can deliver the needed reductions, within the next decade, and that we have a realistic chance of achieving those reductions.

Each country that signed the Copenhagen accord, and each country that subsequently submitted a reductions target to the United Nations Framework Convention on Climate Change (UNFCCC) in advance of the Paris Conference in December 2015, has bound itself to make deep cuts to all GHG emissions within its national borders. The oil and gas industry is not an exception to that. In Canada, *all* emissions within our borders count toward our total. We can choose to make the required cuts in any economic sectors: we could, for example, decide to exempt the oil and gas sector from any obligation to cut emissions, but then we would have to take deeper cuts from other sectors. Our obligation is to cut Canada's total GHG emissions 30% below the 2005 level by the target date. The goal is to reduce our annual emissions to 525 Mt – a number that is not once mentioned in the Kinder Morgan assessment report.

Conclusion

No amount of public consultation or input can fix this broken assessment report.

The draft assessment report fails to answer the key question: can the continued growth of oil sands production up to 2040, enabled by building Kinder Morgan, be consistent with Canada achieving its commitments to reduce our total GHG emissions?

The first defect in the report is the methodology – that is, the elaborate GHG emissions accounting scheme released on March 19, 2016 that explicitly instructs the parties conducting the assessment that they must avoid counting the increased emissions from the expanded volume of bitumen that will be carried by the proposed pipeline, if the same amount of increased production could be economically transported by rail. If the Government of Canada were genuinely concerned about the impact of rising CO_2 emissions from oil sands production between now and 2040, this assessment would focus on the impact of the increased emissions. Instead, it focuses on the irrelevant issue of whether the expanded production, *which will in fact be shipped by pipeline if the project is approved*, might theoretically be transported by rail.

If we strip out the methodology, eliminating all the nonsense about imaginary rail transport, it is clear that Kinder Morgan alone will cause a 12 Mt to 20 Mt increase in the annual level of Canada's emissions by enabling a substantial expansion of oil sands production. Kinder Morgan and Line 9 combined will cause a 23 Mt to 30 Mt rise in Canada's annual emissions level. Over the next ten years, that is an average increase of about 2.3 Mt to 3.0 Mt every year.

But even if we strip out the methodology, the assessment is still useless. Although we know the Kinder Morgan pipeline expansion will add another 13.5 Mt to 17 Mt to our annual emissions, the assessment report still completely fails to answer the question of fundamental importance: *what is the impact of a 13.5 Mt to 17 Mt increase in oil sands emissions on Canada's ability to cut our annual level of our total emissions 30% by 2030?*

The report does not even offer an opinion on whether a reduction that comes halfway to the target is feasible within the next fifteen years. It does not sketch out, even in an approximation, whether we might get emissions down to 740 Mt or 680 Mt.

The reason we are concerned about the impact of increasing carbon emissions is because of their *accumulating impact on the earth's climate system.* Therefore, the only meaningful criteria or method to assess the significance of rising emissions in Canada from expanding oil sands production is to examine whether the expected increase is consistent with our commitment to make deep emissions cuts to keep global warming under the 2°C threshold.

The only measurable way to answer that question is to ask if the rising level of oil sands emissions will prevent us from successfully cutting our total GHG emissions 30% by 2030. That is our specific commitment to put Canada's emissions on a pathway that will

be consistent with the 2°C goal. That is Canada's measure of success or failure. It has a deadline, and it has a number. The number is 524 Mt.

The assessment fails to answer the essential question: can rising CO_2 emissions from expanding oil sands production over the next fifteen years be reconciled with *our existing commitment* to cut our total emissions to 524 Mt by 2030? The report is completely silent about the feasibility of meeting Canada's target by 2030.

That failure of the assessment procedure cannot be remediated, because there is a third flaw, which concerns the evidence. The assessment report omits – or refuses to admit and consider – the kind of evidence that is essential if we want to answer that important question. For example, the assessment fails to include any emissions studies or projections showing that the other six economic sectors in Canada (e.g., transportation, buildings, electricity generation, emissions-intensive industries etc.) will be able to achieve large enough emissions reductions to get us to the 2030 target, *if oil and gas sector emissions continue to grow.* There is no expert analysis or any other evidence cited in the draft report to demonstrate that we can simultaneously grow oil sands production and meet our 2030 target.

There is no record. There was no hearing. There were no witnesses. The basic problem is the evidence.

The assessment also fails to consider the available scientific evidence to properly understand – and to explain to Canadians – the narrowing time-lines that we have to arrest the accumulation of CO_2 and other gases in the atmosphere. Canadians are invited to acquiesce in the building of new pipelines to expand oil sands output, but we are denied the kind of evidence we need to make an informed decision.

We appropriately lose all confidence and trust in a process that is marked by so many failures to ask probing questions, and so many failures to bring forward crucial evidence.

One egregious section of the report merits special attention: section B.2.5, at p. 22. In that section, only about one page in length, the assessment adopts, without dissent, the NEB's forecast that Canada's oil sands production will continue to grow from 2.4 million bpd in 2014 to 4.8 million by 2040. *No evidence is provided about the expected annual level of oil sands emissions by 2040*. Section B.2.5 does not comment on whether, or how, that growth could be reconciled with our specific 2030 reduction target, to cut our total emissions to 524 Mt.

But looking at the long-term period up to 2040, the report acknowledges that there is an issue about *whether long-term growth of the oil sands can be consistent with a 2°C world*. That is an easier question for the assessment, because it is framed in terms of the long-term future: there is no deadline, and no measurable definition of Canada's success or failure in contributing to the 2°C outcome (the only available measure of Canada's contribution to the global 2°C outcome is our commitment to a 30% reduction by 2030). In section B.2.5, the report looks at several sources, summarizes four of them, and declares that the expert evidence is *uncertain* whether the oil sands industry can survive

long-term in a world that that moves to keep warming below 2°C – the answer is "not clear", says the report.

The Liberal Government's assessment report therefore admits that continued growth of oil sands production to 2040 may turn out to be *inconsistent* with a 2°C world. That is the closest we come to the truth in this entire document. Despite that finding, the assessment report (which is really our government's voice) endorses the NEB's ambitious projection that oil sands production will double by 2040.

If we know that the evidence is "not clear", a decision to adopt the NEB's 2040 growth projection is reckless and unconscionable. We are being invited to embark on a path of oil sands expansion that offers perhaps a 50-50 chance of being compatible with our long-term 2°C goal. And the odds may be worse.

The final defect lies in the procedure itself. Not just the methodology. The entire process was conducted in secret. There was no public access. It had no elements of judicial independence. We do not know who wrote the draft report. We had no chance to challenge the evidence. In the case of section B.2.5, we do not know who selected the sources of information and concluded that the evidence is "not clear" on the single most important question facing all of us – we know nothing about their competence, experience, or qualifications, and we do not know who they work for

Had there been a proper inquiry process, most of the grave errors that have irreparably tainted the Kinder Morgan assessment could have been avoided.

Appendix

Section B.2.5: the assessment admits that the evidence is uncertain.

The Kinder Morgan assessment report includes a short section, slightly over one-page in length, entitled "Canadian Climate Change Commitments and Oil Sands Production" (section B.2.5 at pages 22-23). It opens by summarizing the emissions reduction commitments made by Canada, re-affirmed recently in the December 2015 Paris Agreement:

> *Under this agreement, countries committed to the long-term goal to limit average temperature rise to well below 2°C and pursue efforts to limit the increase to 1.5 degree C. Under UNFCC, Canada committed to a target of reducing emissions 30% below 2005 levels by 2030.*
>
> *— Kinder Morgan assessment report, p. 22*

The impressive title of the section, and the opening words, suggest that it might provide some important answers about whether the continued expansion of oil sands production can be consistent with our commitments.

But the assessment report is again a disappointment. After the opening words, the section does not again mention Canada's commitment to cut our total emissions 30% by 2030 – with one meaningless exception, which we will examine in a moment. There is no discussion in this section about whether the 30% reduction target is feasible if Canada continues too expand oil sands production. The subject is dropped.

The section does discuss the world's "long term goal to limit temperature rise to well blow 2°C", but the discussion it is *not about whether Canada will keep its commitment* to make "deep cuts" to keep warming below 2°C. The discussion is about what will happen to the oil sands industry if the *rest of the world* decides to actually make the deep emissions reductions required between now and 2030 to keep warming under 2°C.

It is a discussion about whether Canada's oil sands can survive – and continue to grow – if the rest of the world decides during the next fifteen years to take the 2°C commitment seriously. The subject of this section is not concern about rising emissions. It is concern about the ability of the oil sands industry to continue to grow in a world that might decide to buy less oil.

A rapid decline of oil consumption over the next twenty years would bring lower world oil prices, and will endanger the survival of Alberta's oil sands industry. The oil sands industry, because of the massive facilities required to extract the bitumen – and because of the huge amounts of natural gas required to generate the heat and steam needed in the process - is a very high-cost producer of crude oil. If world oil prices are going to substantially decline over the next few decades, the continued growth of oil sands production will cease to be viable, or at least it will become problematic. So a rapid decline of global oil consumption is a threat to the future of the oil sands growth.

Section B.2.5 of the Kinder Morgan assessment is one of the most important sections in the entire report. It is a prognosis about the future well-being of the oil sands industry, arguing confidently that it can continue to grow between now and 2040. The section claims that oil consumption all over the world, and especially in Asia, will remain strong at least for another twenty-five years. Based on that forecast of strong oil demand, this section justifies the view that that long-term future oil prices will be relatively high - above US$80 during the next two decades after 2020.

The assessment report accepts that the NEB's January 27, 2016 Reference Case forecast (*Canada's Energy Future 2016*) of future long-term oil prices up to 2040 is a reasonable and well-founded projection, and that it provides realistic guidance on how oil prices and global oil consumption will perform over the next twenty-five years. Based on the NEB data, the assessment accepts that oil prices will reach U$78 by 2020, and will gradually increase to US$102 by 2040, and that oil sands production will increase to 4.8 million bpd by 2040, a doubling of the 2014 production level.

The NEB forecast is a *business-as-usual* projection. That means that it does not take into account any likelihood that the world's promised carbon reduction efforts between now and 2040 will have an appreciable impact on reducing total global oil consumption. A business as usual projection assumes that *there will be no substantial reduction in the way we use oil, or in the level of global demand for oil.* No great changes in technology or policies in other countries will reduce the global appetite for oil. The assessment frankly admits its approach: "the analysis in this report uses a forecast based on the NEB that incorporates current policies and commercialized technologies" (p. 23).

The "business as usual" assumption has a decisive impact on expected long-term future oil prices: if we assume that oil demand is going to continue to increase broadly in line with our past experience, projections of long-term world oil prices will be relatively high. Growing demand results in higher prices. In contrast, if we assume that the world's largest economies between 2020 and 2040 will take aggressive and successful actions to keep warming below the 2°C threshold, total oil demand will likely decline – and oil prices will be lower.

Therefore, the Kinder Morgan assessment is based on a key assumption: between 2020 and 2040 the major economies will not significantly reduce their use of crude oil.

Section B.2.5 directly addresses the fact that virtually all countries in the world –and certainly the largest advanced economies – have promised to take strong action to reduce carbon emissions. The global commitment is to make "deep reductions" to keep warming below 2°C. Many countries, like Canada, have made specific reductions commitments, with deadlines. The question is whether those promised reductions will result in an early decline of global oil consumption – and what will be the impact on Alberta's oil sands?

In answer to that, the assessment report does *not* say that other countries will necessarily refuse or neglect to make deep reductions to their emissions: it merely says that those reductions, if they occur, will not much affect oil consumption, at least not for another twenty-five years.

The assumption of the assessment report is that, globally, there will be no substantial shift away from oil as the primary source of energy for the transportation sector, not for many years.

At page 23, the assessment refers to a number of research studies to defend its choice to adopt the NEB's forecast. The studies all involve emissions scenarios, which are aimed to understand how rapidly the future global carbon emissions must be reduced in order to keep within the 2°C threshold. We know that we must curtail the burning of coal, oil, and natural gas eventually. Oil accounts for about 33% of all energy-based emissions globally (coal accounts for about 42%, natural gas 19%). The question in all of these studies is: how soon do we need to curb the use of oil, and how rapid and deep will the annual cuts to global oil production need to be?

Leading scientific research institutes and teams of climate scientists and energy economists have developed hundreds of these scenarios. They are called "mitigation scenarios" because they assume that the carbon reduction policies adopted in future (e.g., replacing coal-fired electricity with natural gas, large-scale development of wind and solar energy, new technologies that improve energy efficiency etc.) will increasingly lower the annual emissions level, below the business-as-usual trend. They will "mitigate" the current trend. The mitigation scenarios calculate how rapidly we can achieve deep cuts. Different scenarios use different combinations of policies.

Many scenarios indicate that annual reductions of global oil consumption (and production) must start by at least 2020, to give the world a chance to stay below the 2°C threshold.

But the Kinder Morgan assessment does not agree that *Canada* will have any need to cut its oil sands production. Indeed, as we have noted, it adopts the NEB's forecast that that projects a doubling of oil sands production from 2.4 million bpd in 2014 to 4.8 million by 2040.

The report points out that the numerous mitigation scenarios are based on "vastly different assumptions around technological progress", which is true. Some scenarios assume rapid technological innovation, allowing a much more rapid transition away from traditional fuels (electric cars would be an example). Some assume there will be rapid economic growth, which accelerates the rise of emissions – and which will defeat a portion of the reduction efforts. Others envision very small emission reductions in next ten years and much deeper cuts later. Others assume that emissions from coal-fire electricity generation will be cut first, but that high levels of oil consumption will continue for decades.

Of course, oil consumption will eventually have to start a deep decline. If oil use accounts for about 33% of all global energy-based emissions, we cannot cut total emissions very much without reducing oil consumption, sooner or later.

A leading example of a mitigation scenario is the "450 Scenario", developed by the International Energy Agency (IEA). It is specifically focused on determining how rapidly

the production and consumption of crude oil will have to decline, in order to stay with the 2°C limit. The 450 Scenario proposes a very gradual decline of oil use, but even it accepts that the world's total oil consumption must start to decline by 2020.

After pointing to disagreement among the various studies about *the timing of the need to start reducing oil use*, the assessment report decides, in light of all the uncertainties, that "the impact on Canadian oil sands production is not clear" (page 23 top).

In other words, according to the assessment report, it is not clear whether the global effort to reduce fossil-fuel emissions will substantially slow down the growth of Canada's oil sands industry, at least in the period up to 2040.

In order to demonstrate the uncertainty and the range of opinion on that issue, the report discusses a number of different scenarios. It summarizes four of them. We quote here the language the assessment uses to describe each of these four studies:

Several of of the studies clearly show that oil sands production growth "is not fully consistent" with a world in which warming is limited to 2°C:

> *For example, a 2014 study found that Canadian bitumen production could increase to 4.1 MMbbl/d in 2035 and be consistent with a 2°C target, but only with rapid deployment and scale-up of carbon capture and storage (CCS) technology from 2020 and decarbonization of energy inputs*
>
> — *Report*, p. 23: referring to McGlade C., and Ekins, P. (2014): "Un-burnable oil: an examination of oil resource utilization in a decarbonised energy system", *Energy Policy*, 64. 102-112

Thus the McGlade and Eikins study found that in a world that is taking concerted action to keep within the 2°C threshold, oil sands production could grow as high as 4.1 million bpd, provided the industry rapidly adopts CCS technology and other carbon reduction technologies. In comparison, the NEB's projection, relied on by the assessment report, envisions that oil sands production will reach 4.8 million bpd by 2040.

A second study, done a year later by the same authors, concluded that if the world moves seriously to adopt policies to keep warming within the 2°C threshold, oil sands production would have to be curtailed. Even then, the ability of the industry to operate will require large-scale adoption of CCS technology:

> *In a 2015 study with a longer timeframe for analysis, the same authors found that, even with widespread CCS deployment from 2025, Canadian oil sands production would be significantly curtailed. The author concluded that 74% of Canadian crude oil reserve would have to remain unexploited, to be consistent with a 2°C target and estimated that without CCS, all bitumen production in Canada would have to cease by 2040 to be consistent with a 2°C target.*

— *Report*, p. 23: referring to McGlade, C., and Ekins, P (2015): "The geographical distribution of fossil fuels unused when limiting global warming to 2°C", *Nature*, 517(7533), 187-190.

A third source summarized in the assessment report is the IEA:

> *Other projections show that oil sands production could continue to expand from current levels while still limiting warming to 2°C: for example, the International Energy Agency's (IEA) World Energy Outlook's 450 Scenario.*

We will return to discuss the 450 Scenario on a moment. It is an influential study. It is cited in the assessment report as supporting the view that oil sands production can continue to expand. The assessment does not mention the fact that the 450 Scenario does stipulate, as one of its assumptions for a successful outcome, that global oil consumption must start to decline by 2020.

The fourth study is called "Pathways to deep decarbonization in Canada", published in 2015. The assessment describes that report in this way:

> *A recent report by Carbon Management Canada concluded that Canada's 2030 reduction target is one of several possible emissions reduction pathways consistent with a 2°C objective. The report assumes the significant innovation of currently unknown technology, and highlights the importance of low carbon extraction techniques for the oil sands and carbon capture and storage for Canada's decarbonisation aspirations.*
>
> — *Assessment Report*, p.23

The above paragraph is the only place in this entire section where Canada's 30% reduction target for 2030 is mentioned at all.

But if we carefully read this summary of the Carbon Management study, it certainly does not say that Canada is on track to meet it 2030 reduction target, and it does not say that Canada can meet that target if we continue to grow oil sands emissions. The Carbon Management report itself says nothing definitive about whether Canada can meet its 2030 reduction target if oil sands emissions continue to grow.

It does say that *if Canada successfully meets its 2030 reduction target*, that reduction would be consistent with the global effort to keep temperature rise below 2°C. The Carbon Management report does not rule out a substantial continuing role for the oil sands industry after even after 2030, but it states in unequivocal terms that GHG emissions from oil sand extraction and processing will have to be massively reduced, and very soon, and that kind of reduction will require technological innovation on a very large scale. A measure of the extreme challenge is that a successful outcome would require "currently unknown technology".

The Carbon Management report provides no support for an argument that growth of oil sands production up to 2030 is compatible with Canada meeting its commitment to cut its

emissions 30% by that date. At best, it supports an argument that with massive technological innovation, that may be possible.

As for the likelihood that large-scale technological innovation can deliver deep emissions reduction in the oil sands industry, the Kinder Morgan assessment provides no discussion about that, and offers no evidence or analysis at all about the potential of technology to do that by 2030.

It is significant that three out of four studies summarized in the Kinder Morgan assessment all explicitly agree that carbon capture and storage (CCS) technology will play an essential role in any serious efforts to limit oil sands emissions. McGlade and Ekins even give a time frame: "rapid deployment an scale-up of carbon capture and storage (CCS) technology by 2020."

But the evidence is clear that CCS is not going to be deployed in Canada on any scale by 2020. It is unlikely to be deployed by 2025. CCS may never be economically viable in the oil sands industry because it is expensive to install and operate. No evidence about the future capacity of CCS is discussed in the assessment. We return to CCS in a moment.

The section concludes by re-stating that the evidence is "not clear" whether oil sands production will be able to continue to grow up to 2040 in a way that is consistent with keeping global warming below the 2°C threshold.

Here is how the Kinder Morgan assessment report summarizes its own argument:

> *It is not yet clear what policy frameworks will be put in place globally, and it is extremely challenging to predict which technologies may be commercialized in the future. Given the difficulties in predicting these variables, the analysis in this report uses a forecast based on the NEB that incorporates current policies and commercialized technologies, Over time, new technologies and policies will be developed that will change the emissions intensity and economic feasibility of oil production in Canada and globally, as well as act to change the attractiveness of alternatives to oil*
>
> — *Kinder Morgan report*, p. 23

The report claims there is uncertainty because we do not know "what policy framework will be put in place *globally*" – as if nothing could happen that might curb oil sands production (or at least curb oil sands emissions) until an international consensus agrees to restrict the consumption of oil.

We will wait indefinitely for an international agreement that limits global oil production. It may never happen. But Canada could put in place tomorrow its own policy framework to reduce oil sands production. Of course many people will say that is impractical - if we do not produce the oil, somebody else will. In fact that is exactly what the assessment report states:

> *Given the competition for investment in oil production, it is likely that if oil sands production were to not occur in Canada, investments would be made in other jurisdictions and global oil consumption would be materially unchanged in the long-run in the absence of Canadian production growth.*
>
> — *Kinder Morgan assessment report*, p. 35

The assessment report argues that if the emissions do not occur in Canada (if we were to impose regulatory limits that halt the further expansion of our production), the same amount of emissions will occur in some other country, where oil production will expand. The Kinder Morgan assessment claims that global emissions in that case will not be reduced.

But Canada has made a commitment to reduce its *domestic emissions*. That is the commitment made by the Conservative Government in May 2016, re-affirmed by the new Liberal Government. The reduction commitment covers all emissions from the extraction and processing of bitumen. Canada is obligated to reduce our total emissions, even if it were true that some other country may increase its oil production in our place.

The assessment report is strangely silent about Canada's specific reduction obligation, which is to reduce Canada's emissions 30% by 2030. We agreed to do that. We are not released from that obligation simply because Nigeria or Saudi Arabia may decide to increase their oil output (if we reduce ours).

The assessment report is also completely silent about the policy option available to Canada to use Federal regulations could halt the rise of oil sands emissions. It would require a halt to further production increases. That would be a Canadian "policy framework". The assessment report does not discuss that option.

After announcing that it will adopt the NEB's business-as-usual projections for bitumen production and oil prices up to 2040, the report in vague terms assures Canadians that, despite continued production increases over the next twenty-five years, oil sands emissions will somehow be brought under control. This is the only portion of the entire report that addresses the important question of whether technology might enable the oil sands industry to reduce emissions, even if production continues to expand. Let me repeat the single sentence in the paragraph quoted above, which addresses the role of technology:

> *Over time, new technologies and policies will be developed that will change the emissions intensity [i.e., carbon intensity] ... of oil sands production in Canada ...*
>
> — *Kinder Morgan report*, p. 23

One sentence. No details.

The availability of these unspecified "new technologies", which it claims will reduce the carbon intensity of oil sands production, is conveniently set in the indefinite future. There

is no discussion about of why these technologies will not be able to substantially reduce emissions, for example, by the early 2020s. The truth appears to be that the efficacy, cost, and potential availability of these new technologies is so uncertain that the report is unable to offer any estimate of when, or by what amount, they might in future reduce oil sands emissions.

The only future emissions numbers cited by the report are the existing emissions projections found in *Canada's Second Biennial Report,* which tell us that oil sand emissions will rise to 116 Mt by 2030. The report offers Canadians no evidence that that new technologies by 2030 can give us a better outcome.

The Kinder Morgan pipeline, if built, will operate for 40 or 50 years. The report provides us with no projections of oil sands emissions up to 2040. Canada's *Second Biennial Report* does not include any emissions projections that go beyond 2030. The NEB's projections on volume of production and prices go as far as 2040, but do not include GHG emissions. We can only guess that the Government of Canada does not have in its possession any emissions projections up to 2040, or that it has chosen to withhold that evidence from us.

Carbon capture and storage (CSS) technology

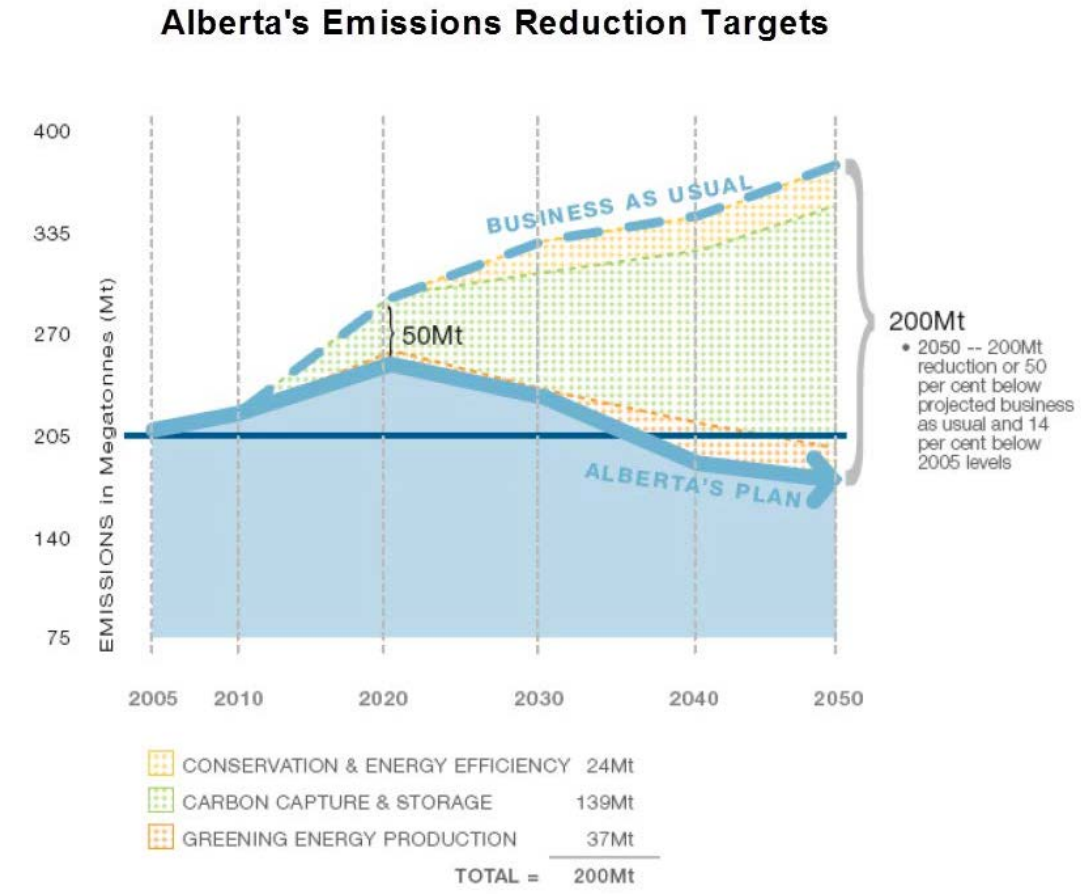
Let us look more closely at whether CCS technology can provide a solution to the problem of rising emissions in Alberta's oil sands.

While the assessment report itself makes no direct comment about the future benefits of CCS, it quotes three studies that make absolutely clear that large-scale adoption of CCS is an essential condition if the industry wants to continue to grow in a way that is consistent with the 2°C threshold.

At present, the only existing technology that can separate and remove CO_2 gas and prevent it from entering the atmosphere, albeit at enormous cost, is carbon capture and storage.

In the case of the oil sands, CCS would capture CO_2 emissions from the flue gases where the fuel for the extraction process is combusted (at the bitumen sites and at processing facilities where natural gas is burned to generate heat and steam) and thus prevent the gases from being released into the atmosphere. The captured CO_2 would be compressed into an almost liquid form, then transported by pipeline and injected deep underground for permanent storage. The technology has its detractors: it is very costly, and some people point to the risk that the CO_2 will later escape into the atmosphere.

Figure 6: Graph reproduced from Alberta's 2008 emissions plan



Source: Alberta's 2008 Climate Change Strategy

Figure 6 reproduces a graph published in 2008 by the Province of Alberta in a document called *Alberta's 2008 Climate Change Strategy*, when the province launched what it described as the renewal of its climate change policy. At the core of that ambitious new plan was a commitment to deploy CCS technology on a large scale. The premise of the plan was that bitumen production would be able to continue to expand without increasing emissions.

By 2005 Alberta's total emissions, including emissions from its growing oil sands industry, were already at 232 Mt. The dotted top line on the graph represents the pathway of Alberta's "business as usual" emissions: that line depicts the projected level of CO_2 emissions that, according to the Alberta government, would be produced in the province in the absence of any new carbon-reduction policies. The projection for Alberta's 2050 emissions is about 384 Mt: that estimate of the annual emissions level by 2050 is largely driven by the continued expansion of oil sands production up to 2050.

The bottom line on the graph ("Alberta's plan") shows that, under the 2008 plan, total emissions by 2050 were anticipated to be only 194 Mt – an astonishing 200 Mt less than

the business-as-usual outcome. Most significantly, the graph shows that by 2050, *139 Mt of that reduction* of CO_2 emissions would be achieved by the large-scale implementation of CCS.

At the heart of Alberta's 2008 plan was the ambition to continue rapid oil sands production, with the declared expectation that by 2020 the installation of CCS would avoid any further increase in the absolute level of emissions. Indeed the graph shows total emissions in Alberta were expected to begin to decline after 2020 (see the distinct bend downwards in the bottom line on the graph just above the year 2020).

The plan also promised a 50 Mt cut below the baseline projection as early as 2020, of which *more than 30 Mt was supposed to be achieved by new CCS technology installations*.

In 2014, the government of Alberta quietly abandoned its entire CCS strategy. That is a fact not known to most Canadians, and hardly touched on in public discussion.

By then, seven years had passed since the Alberta plan was unveiled. Four carbon capture projects in Alberta were originally announced. Two were later cancelled. No further government funding had ever been committed to support further projects.

On July 18, 2014, *The Globe and Mail* published an article headlined "Alberta leadership hopeful Prentice lets carbon capture go". Jim Prentice, a former federal cabinet minister then campaigning to become the new leader of Alberta's governing Conservative Party, was quoted as follows:

> *"I don't believe carbon capture and storage is the panacea," he said. "It's not capable of achieving the reductions in emissions that are required, and it is expensive, and in certain contexts, it's quite unproven."*
>
> — *The Globe and Mail*, July 18, 2014 (emphasis added)

Prentice described CCS as a "failed science experiment."

In July of 2014, just a week before Mr. Prentice made his announcement, Alberta's Auditor-General issued a scathing report confirming that the province's bold plan to install CCS in the oil sands would not meet any of the goals set for 2020. Although the plan was originally announced in 2008, virtually nothing had been done to carry the scheme into effect, according to the findings of the Auditor-General. The report confirmed that apart from the two projects nearing completion, no other CCS installations were under construction or even planned.

According to Alberta's plan announced in 2008, CCS technology was supposed to lower the province's emissions level 30 Mt below the "business as usual" level by 2020. The two existing CCS projects when they are completed will together reduce Alberta's emissions level by 2.67 Mt, less than 10% of the promised amount for the end of this decade. No further reductions by CCS technology are projected after that.

The fate of CCS in the oil sands

Not long after Alberta confirmed that it was dropping support for CCS, a panel of experts on technological innovation in the oil sands industry completed a major report called *Technological Prospects for reducing the Environmental Footprint of Canadian Oil Sands* (referred to as "*Technological Prospects"*). The study was originally commissioned by Natural Resources Canada, with the support of Environment Canada. A panel of twelve leading engineers and other experts, the majority of them from Alberta and all experienced in oil sands extraction and processing, were appointed to examine whether technological innovation has the potential to significantly reduce the environmental footprint of oil sands development.

The resulting report, which was released on May 26, 2015, reviewed the entire range of carbon reduction technologies currently available or under development, including technologies still at the experimental stage that may become commercially available within the next 15 years.

One section of the report dealt specifically with CCS. It identifies *the high cost of carbon capture technology* as the principal barrier to any large-scale adoption of the technology in the near future.

The panel's overall conclusion is significant: the report explains that if oil sands production continues to expand in line with the industry's growth forecasts outlined in 2014, *it will not be possible to achieve any significant reductions in carbon emissions until some time after 2025 or 2030*. In other words, if oil sands production levels continue to grow at a substantial rate, so will emissions. According to the panel, none of the existing or emerging technologies (including CCS) have the capability to substantially lower CO2 emissions per barrel in oil sands production, at least not for another ten or fifteen years.

In the specific case of CCS, the *Technological Prospects* report concludes that CCS technology will likely have a very limited role in future efforts to reduce emissions in the oil sands.

The panel's broad conclusion is that CCS is too expensive to be adopted during the next ten to fifteen years in the oil sands. Due to the huge capital investment needed for a single CCS installation, the technology is most promising for very large industrial sites (e.g., coal-fired electrical generating plants) that generate very high volumes of concentrated CO_2 at a single location. The report explains that, in the oil sands, the most likely future use of CCS will be in applications that capture emissions from *hydrogen production in upgraders* – a specialized high-emitting industrial activity connected to processing bitumen at open-pit mining operations. But upgraders are a relatively small part of the oil sands emissions problem in Alberta.

In comparison, the fastest expanding area of bitumen production – and therefore the fastest growing source of emissions – is in situ (underground extraction) operations, which are smaller in scale. The panel was not optimistic about the prospects that CCS can

ever become an affordable technology at these smaller-scale in situ sites, because they do not offer the needed high volume of emissions to justify the cost:

> *More expensive would be the capture of CO_2 from in situ projects because these represent smaller and geographically dispersed sources of emissions.*
>
> — *Technological Prospects*, p. 130 (emphasis added)

Even after the expensive technology is installed, operating expenses are substantial. The "capture" stage, which involves compressing huge volumes of separated CO_2 gas, is a highly energy-intensive process; that process consumes a lot of natural gas, which adds to costs (and ironically it also adds to carbon emissions at the site).

The Panel's report makes it clear that, mainly for reasons of cost, carbon capture technology is unlikely to have any significant impact on reducing oil sands emissions until after 2025-2030, and even then its future application may be limited to a relatively small portion of the industry's future emissions.

The Panel identifies another difficulty that may impede efforts in the future to adopt CCS technology:

> *... retrofitting an existing facility to capture CO_2 is generally more expensive per tonne of CO_2 sequestered than designing a new one to include CCS from the start ... This is important in a fast-growing industry such as the oil sands where the rapid pace of development may "lock in" existing capital equipment and processes.*
>
> — *Technological Prospects,* p. 128 (emphasis added)

Ten years from now (by which time CCS may become an affordable technology) it will be too costly to retrofit all the newer facilities that, in the interim, will have already begun production. We will have locked in a growing share of production that will be operating with the older, more carbon intensive methods.

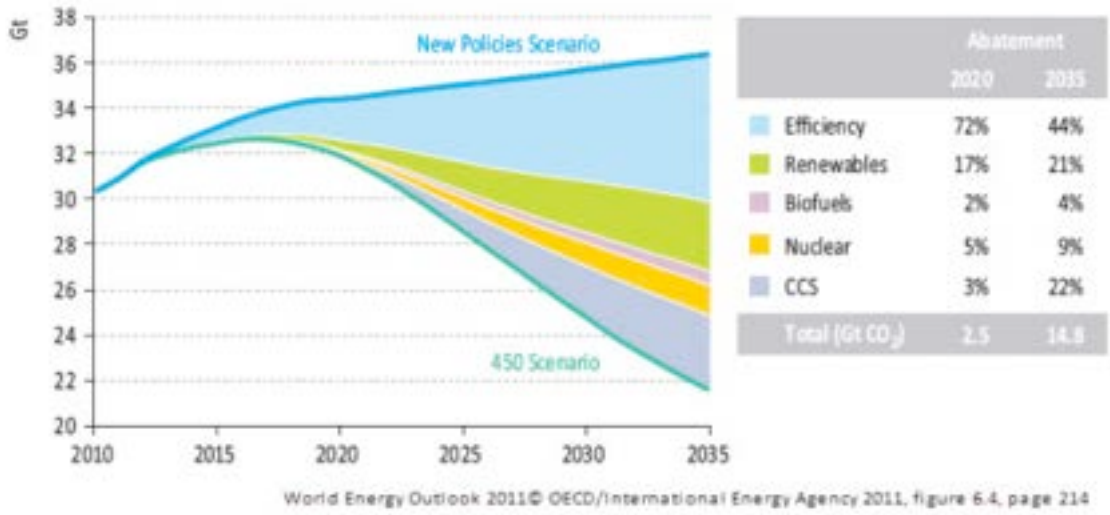
It is plain that there are now very serious doubts about whether CCS technology has any serious role to play in reducing oil sands emissions – at least not within the next ten to fifteen years. It is inexplicable that after citing three studies that explicitly count on large-scale CCS adoption as a necessary condition to reconcile possible continued growth of oil sand production with a 2°C world (e.g., McGlade and Eikins: "rapid deployment and scale up of carbon capture and storage … from 2020)", the anonymous authors of the Kinder Morgan assessment report are completely silent about CCS. They offer no evidence or analysis to suggest that the technology will have the capability to significantly reduce oil sands emission within the next decade.

The IEA's 450 Scenario

The Kinder Morgan assessment cites the IEA's "450 Scenario" as an example of a study that, according to the report's summary, "shows that oil sands production could continue to expand from current levels while still limiting warming to 2°C."

More than five years ago the International Energy Agency (IEA) developed the "450 Scenario", which was designed to determine acceptable levels for future consumption of coal, oil, and natural gas over the next twenty-five years, that would be consistent with keeping the CO2 concentration level in the atmosphere from exceeding 450 parts per million. The IEA plan envisioned that total emissions worldwide would reach their maximum annual level by 2018 and then begin a slow decline (that ambitious goal is now unattainable). Figure 7 reproduces a graph published in the IEA's report *World Energy Outlook 2011* that illustrates the concept of the plan. The plan has since been updated several times, but the basic approach is unchanged:

Figure 7: The IEA's 450 Scenario



World Energy Outlook 2011© OECD/International Energy Agency 2011, figure 6.4, page 214

The top line on the graph ("New Policies Scenario") shows a "business as usual'" trend which represents the amount of CO2 emissions assuming no new policies are introduced to cut emissions. The name "New Policies" is a bit confusing: it actually describes a dismal future situation in which governments fail to adopt any aggressive new measures to curb CO2 emissions apart from the so-called "new" policies that many governments have already announced. So this top line recognizes, as the IEA forecasts, that the world's total *energy demand* will continue to rise at least up to 2035. And it recognizes that if the world continues to produce its energy supply with the same degree of reliance on carbon-based fuels as we do now, CO2 emissions will rise as shown on the top line.

The bottom line, declining down to the right, represents the projected level of CO2 emissions if the world's main industrial countries adopt carbon reduction policies consistent with the IEA plan, the 450 Scenario.

The amount of the cut between 2018 and 2035 is shown on the graph: the plan proposes a 30% reduction in the annual level of CO2 emissions by 2035, relative to the 2011 level. Because at present emissions are still rising (albeit with a possible plateauing of global emissions in 2014 and possibly again in 2015), under the 450 Scenario annual emissions would not hit their anticipated "peak" of until about 2018 or 2020 when the impact of new carbon-reduction policies would begin to reverse the trend. Under this scenario, by 2035 emissions will be down about 30% below the 2011 level. The IEA's plan basically says that if we can get a 30% decline by 2035, we can get an 80% decline by 2050.

Most significantly, this graph (and the IEA in its written report) is not saying that we must cut *energy demand* (energy use) 30% by 2035. Nor does this graph say that we must cut economic growth. The message is we must cut *carbon emissions*. This chart explains why cutting growth and cutting carbon emissions is not necessarily the same thing. Some critics contend that we must curb economic growth in order to sufficiently cut emissions, or that we must live with a much smaller energy supply. But the IEA's 450 scenario accepts that global energy demand will continue to increase up to 2035 at least.

One essential element of the plan is stabilizing the growth of fossil-fuel consumption after 2018. The IEA plan envisioned absolute annual cuts in coal consumption during the 2020-2035 period, at 2.4% per year. That represents an absolute 36% reduction of coal consumption by 2035.

The proposed absolute cut for oil is only 0.5% per year (about a 7.5% to 10% absolute reduction over 15 years). While the size of the annual cuts is small, the reduction over fifteen years is substantial in terms of emissions.

Natural gas under the 450 Scenario continues to increase, at least up to 2035.

The proposed deep reductions in coal burning after 2020 and the more modest decline in oil consumption after that date, according to the IEA's calculations, will allow total global emissions to be lowered 30% below the 2011 level, by 2035.

The challenging question in any scenario of this kind is: what will make up for the "lost energy" resulting from the reduction of coal and oil consumption? How do we maintain the required energy supply, especially if total energy demand continues to increase? Different scenarios offer a variety of solutions. The answer, according to the IEA proposal, is depicted in the "wedges" on the right hand side of Figure "B".

One obvious alternate source of energy is renewables. In the near future, most renewable energy will be in the form of wind power and solar power. The IEA scenario is cautious in its expectations about how quickly renewable energy supply can be ramped up to substitute for the decline in coal and oil use. In the 450 Scenario, the growth of renewable energy sources up to 2035 will account for only 17% of the reduction of CO2 emissions. Renewable are the third largest wedge.

In the IEA scenario the second largest "wedge" is CCS, accounting for 22% of emission reductions by 2035. Carbon capture and storage technology offers a method of producing energy from fossil fuels in a way that eliminates about 85% of all CO2 emissions by a

process of separating the CO2 gases during the combustion of the fuel, compressing the CO2, and injecting it underground for permanent storage. The resulting power will, according to its supporters, be a form of low-carbon energy: it will still burn fossil fuel, but the amount of CO2 released into the atmosphere will be much reduced.

In this plan, by 2035 CCS is providing *about 22% of the total abatement* of CO_2 emissions. Currently, plant operators have no economic incentive to make investments to install CCS because they can dump CO_2 into the atmosphere for free. That is where a carbon tax (or a cap and trade system) has an important bearing on the chances of successfully achieving large-scale installation of CCS. The assumption that CCS will be successfully adopted on a very large scale world-wide is a huge part of the IEA's vision.

The top wedge, the largest share comprising 44% of the total, represents emissions "saved" (or avoided) solely by gains in efficiency: we get *more energy output from burning the same amount of fossil fuel*. A classic example of efficiency gains that cut down CO2 emission is improvements in passenger car fuel efficiency: gasoline consumption can decline, but people can continue to drive the same commuting distances. The same goes for improved heating efficiency in buildings, and so on.

Many of the required technologies to improve efficiency already exist. The IEA's 450 Scenario's success depends on a concerted effort to improve efficiency in all parts of the economy – including industrial processes. It is a very promising strategy, and is widely adopted in many other carbon reduction scenarios. But the hoped-for rapid pace of emissions savings through efficiency improvement will be challenging. Much of our industrial infrastructure is "generational": the economy cannot get the improved efficiencies until companies build new industrial plants, or re-build the old ones. So there are "time lags" that may be 5 or 10 years or even longer, before new technologies can be fully deployed and begin to deliver fuel efficiencies, which will reduce emissions. Nevertheless, efficiency gains are a bold and necessary strategy that will play a leading role in emissions reduction.

Oil consumption in the 450 Scenario

If successful, according to the IEA's plan, rapid emissions reductions achieved by the strategies outlined in the 450 Scenario *would avoid the need for abrupt and deeper cuts in oil consumption*. In that context, we can understand why the projected reduction of oil consumption is quite modest, only about 0.5% per year.

The IEA's assumption is that enough emissions reductions to stay within the 2°C threshold can be obtained by the other strategies: by huge efficiency gains across the economy; by large-scale adoption of CCS technology in emissions-intense industries and coal-fired electricity plants; efficiency gains; and growth of renewables energy supply. Also, under the 450 Scenario, a large portion of the required emissions reductions is from a rapid cut in coal use.

One potential problem with the 450 Scenario is that *during the period up to 2035, its success depends very heavily on the rapid adoption of CCS technology*. If that does not happen, coal-fire electricity plants will be spewing much larger quantities of CO2 into the atmosphere. In that case, the only way to keep total emissions under the 2°C threshold will be to cut oil consumption (and coal burning) at a faster and deeper annual rate. The IEA itself has been warning since at least 2013 that delayed introduction of CCS will require a more rapid cutback in global oil production:

> *For oil producers, the effect of delaying CCS would be indirect: in order to keep cumulative emissions the same in the absence of CCS, the transport sector would need to compensate by reducing emissions further through wider deployment of electric vehicles. This would reduce oil consumption by around 1.4 million — barrels per day in 2035, compared with introduction of CCS by 2020. Overall, if the introduction of CCS was delayed until 2030, then coal producing countries would lose revenue of $690 billion, gas producers would lose $430 billion, and oil producers about $230 billion.*
>
> — *Redrawing the Energy-Climate Map,* International Energy Agency, June 10, 2013, p.80 (emphasis added)

The IEA three years ago was warning governments and the oil industry that delay in introducing CCS by 2020 will necessitate a more rapid curtailment of oil use.

The IEA's 450 Scenario is oversimplified in he Kinder Morgan assessment report.

In fact, the success of the scenario is highly conditional: it is only a reliable guide to action if all of its essential conditions are met. First of all, the 450 Scenario is clearly premised on a decline of total global oil production starting in 2020, albeit a gradual decline. That basic feature of the 450 Scenario is not mentioned in the Kinder Morgan assessment. Of course some oil producing countries may continue to expand production after 2020, and others may deplete their resources faster than 0.5% per year. But overall, global oil production must decline. There is nothing in the 450 Scenario that suggest that Canada has a special right to claim, unilaterally, that it can continue to expand its oil production.

Second, the soundness of the IEA scenario – its reliability as a guide to action – depends heavily on the assumption that CCS technology is going to be adopted on very large scale around the world, starting by 2020. Canada' s own recent experience with CCS – in what was to have been the world's most ambitious CCS installation – is an indicator that a key assumption of the IEA scenario may be in doubt. There is broad recognition now that CCS installation around the world is not going to happen on any large scale by 2020. A large shortfall in expected CCS installations will have far-reaching consequences. Keep in mind that under the 450 Scenario, *CCS is supposed to provide a larger share of emissions cuts than all new wind power and solar power combined.*

If CCS technology cannot play the major emissions reduction role envisioned for it in the IEA's 450 Scenario, oil consumption will have to decline more rapidly. That would have

a significant impact on the comfortable assumption in the Kinder Morgan report that global oil use will continue to be "business-as-usual" until 2040.

Thirdly, the 450 Scenario itself is based on only a 50% chance of keeping warming under 2°C. Many other studies develop policy recommendations use scenarios based on a 66% or 80% chance of staying under 2°C. Other scenarios call for deeper and faster emissions reductions in order to have a higher level of confidence that we can stay under the 2°C threshold. For example the RCP2.6 scenario in the Fifth Assessment Report of the Intergovernmental Panel on Climate Change is premised on an 80% probability of success. The IEA explains the difference this way:

> *The RCP2.6 scenario is more ambitious than the 450 scenario in that it sets out to achieve an 80% probability of limiting the long term (using 2200 as the reference year) global temperature increase to 2°C, while the probability is around 50% in the 450 Scenario.*
>
> — *Re-Drawing the Energy-Climate Map*, p. 14

If we want to develop a plan that gives us an 80% probability of staying under 2°C, we will be obliged to accept that the decline of oil use will have to proceed more rapidly than the 0.5% per annum proposed by in the IEA's scenario.

A reckless and unconscionable report

Section B.2.5 ends up deciding that the evidence is "not clear" whether oil sands production will be able to continue to grow up to 2040 in a way that is consistent with keeping global warming below the 2°C threshold.

That means we just don't know, one way of the other: it may equally turn out that the continued expansion of the oil sands will be *inconsisten*t with that goal.

Having clearly acknowledged that the available evidence is uncertain ("not clear") about the consequences of future expansion, the assessment report nevertheless accepts the NEB's forecast that the oil sands will continue to grow until at least 2040. It adopts the NEB's forecast that oil sands production will continue to grow in the normal way up to 2040, doubling the production level from 2.4 million bpd in 2014 to 4.8 million bpd by 2040.

Curiously, in adopting NEB forecast of strong future oil sands growth, the assessment report does not offer an opinion that continued growth of oil sands production *will be consistent* with keeping within the 2°C threshold. It remains silent on that crucial point.

The report appears to be saying that because the evidence of a bad outcome is uncertain, the assessment is free to decide that oil sands production during the next twenty-five years will continue to grow in a business-as-usual way, notwithstanding there is a chance – possibly an equal likelihood – that planned oil sands expansion to 2040 will turn out to

be inconsistent with keeping warming below the 2°C threshold. That alternate outcome is brushed aside, without discussion.

If it turns out that continued oil sands growth is inconsistent with a 2°C world, by the time we find that out - perhaps sometime around 2030 - it will be too late to do anything about it.

In the absence of a high level of *certainty* that increases in the annual level of oil sands emissions over the next fifteen to twenty-five will be consistent with keeping total emissions within safe limits, a cautionary approach – an ethical approach - would be to choose an alternate path, a more prudent option: do not enable further expansion of oil sands production until we have conducted a proper assessment, until we know it can be done in a way that is consistent with our ability to meet our reduction commitments.

What is the gain these people are after? What is worth courting the risk? We are taking here about the prospective benefit of increasing Canada's oil sands production from 2.4 million bpd in 2014 to 4.8 million bpd by 2040. At the present rate of growth, oil sands output will be around 3.3 million bpd by 2020. All of this enormous conflict in Canada is about obtaining, maybe, an additional 1.5 million bpd of bitumen production after 2020, on top of the 3.3 million that the industry and its employees will already have (and on top of another 1.3 million bpd of conventional oil output). To get that additional slice of oil production, the Liberal Government appears to be willing to place a much more onerous emissions reduction burden on Canadian citizens in other provinces, and on all other economic sectors – a burden that is likely beyond our capacity. In this ill-conceived plan, the Liberal Government is willing to put at risk the chance we have to meet our important 2030 commitment. It is putting more at risk than we can imagine.

Section B.2.5 concludes that the evidence is "not clear" about whether the planned oil sands expansion to 2040 can be done in a way that is consistent with our commitment to stay within the 2°C threshold.

We should not have any confidence in that conclusion. We don't even know who wrote this report. A proper analysis, with a complete and candid examination of the evidence, would at least equally likely decide that continued growth of oil sands production to 2040 cannot be compatible with a 2°C world, and it would almost certainly decide it is inconsistent with meeting our short-term emissions goal by 2030. On the basis of a shoddy and anonymous report written in a secret process, we are being asked to embark on an expansion of oil sands production and more emissions.