

SELLING HOT AIR

Lessons from how Shell's flagship carbon capture project sold \$200M of credits for reductions that never happened



There is a familiar feel to recent attempts by oil sands executives to convince the federal and Alberta governments to cover the cost of their proposed carbon capture operations. A review of Shell's Quest carbon capture and storage (CCS) project - the first and to date only CCS project in the oil sands - shows how the promise of CCS can be used as a means to delay the energy transition while the taxpayer pays the tab.

One of the particularly outrageous aspects of Shell's Quest project is that it has sold over \$200 million (M) worth of phantom carbon credits.¹ These phantom credits were generated as part of an exclusive deal with the Government of Alberta, wherein Shell is awarded two tonnes worth of emissions reduction credits for each net tonne of carbon it stores underground.² These phantom credits provide no environmental benefit while enabling Shell and its partners to extract more oil from their oil sands operations because they don't have to pay the full carbon compliance costs.

Documents obtained under Freedom of Information legislation show that Shell requested these multiple credits in 2009 as part of negotiations with the provincial government to increase subsidies for the project.³ Once the value of these 5.7 million tonnes of phantom credits is added to the direct government grants, the public has covered 93 percent of the costs of Shell's Quest CCS project to date, allowing the emissions reduction project to earn a profit of \$126M as of the end of 2022.⁴

The Government of Alberta granted these multiple credits as part of its broader efforts to counter criticisms of the tar sands as 'dirty oil.' In 2008, the Alberta government released a carbon plan that envisaged oil extraction continuing to increase while greenhouse emissions would go down via the massive application of CCS. Quest

was launched as a pilot project that would pave the way for 30 megatonnes (MT) of CCS per year by 2020 and 139 MT annually by 2050.⁵

The reality is that in 2022, the Quest project negated (avoided) less than one megatonne of emissions.⁶ Meanwhile, total oil sands emissions have risen by 50 MT (142%) since design work on Quest began and by 16 MT (24%) since its first full year of operation in 2016.⁷ The Quest facility captures less than one third of the emissions from the oil sands upgrading facility where it is located, and less than one percent of upstream emissions from the oilsands.⁸

This pattern risks being repeated. A consortium of oil sands companies known as the Pathways Alliance is now also proposing to capture 10 to 12 MT per year, i.e. less than 15 percent of upstream emissions from the oil sands and two percent of full lifecycle emissions.⁹ That proposal, however, is premised on the federal and provincial governments paying for the lion's share of the costs, in spite of the fact that these companies are making record profits.¹⁰

The greater danger, however, is that they will once again use the promise of (publicly-funded) CCS as a public relations strategy to avoid the need to change their core business. The International Energy Agency has recently warned oil companies against excessive reliance on CCS. The IEA says that oil companies must plan to reduce oil and gas extraction, and that CCS is not a viable way to maintain the status quo.¹¹

Aligning with the Paris Agreement means scaling up renewable energy solutions while scaling back oil and gas operations. Anything less is a phantom solution that does no more to protect our climate than Shell's phantom carbon credits.

SHELL'S QUEST CCS PROJECT

The Quest CCS facility at the Scotford Upgrader - a heavy oil sands refinery located northeast of Edmonton in Alberta, Canada - is a flagship climate project for Shell.¹² The project captures carbon dioxide (CO₂) from the manufacture of blue hydrogen¹³ which is used for upgrading bitumen (also known as tar sands or oil sands) into synthetic crude oil.¹⁴

Shell Canada began working on the design of the Quest facility in 2005 and made a formal project proposal to the Alberta government on behalf of Shell, Chevron and Marathon Oil in response to the Alberta Department of Energy's July 2008 Invitation for an Expression of Interest respecting Carbon Capture and Storage Projects in Alberta.¹⁵

The project is operated by Shell (Shell Canada has been a wholly-owned subsidiary of Shell Global since 2007), but is owned by the Athabasca Oil Sands Project (AOSP) joint venture. AOSP also includes two oil sand mines (Muskeg River and Jackpine) that supply the Scotford Upgrader to produce crude oil. Shell's share of AOSP dropped from 60 percent to ten percent in 2017, so the respective ownership interests of AOSP assets are currently 70 percent Canadian Natural Resources Limited (CNRL), 20 percent Chevron Canada and ten percent Shell.¹⁶ Even though Shell sold most of its shares in AOSP to Canadian Natural Resources Limited in 2017,¹⁷ it retained its role as the operator of the Quest CCS facilities.¹⁸



CARBON CAPTURE AS A RESPONSE TO CRITICISM OF TAR SANDS EXPANSION

Carbon capture has long been advocated in Alberta as a climate solution that wouldn't require reining in the expansion of the tar sands.¹⁹ In 2008, in the face of increasing global criticism of tar sands as "dirty oil,"²⁰ the Government of Alberta introduced a new climate plan to bolster their climate credibility. The plan relied on carbon capture and storage (CCS) for 70 percent of reductions versus business as usual, envisaged capturing and storing over 30 MT per year by 2020, 75 MT by 2030 and 139 MT per year by 2050.²¹

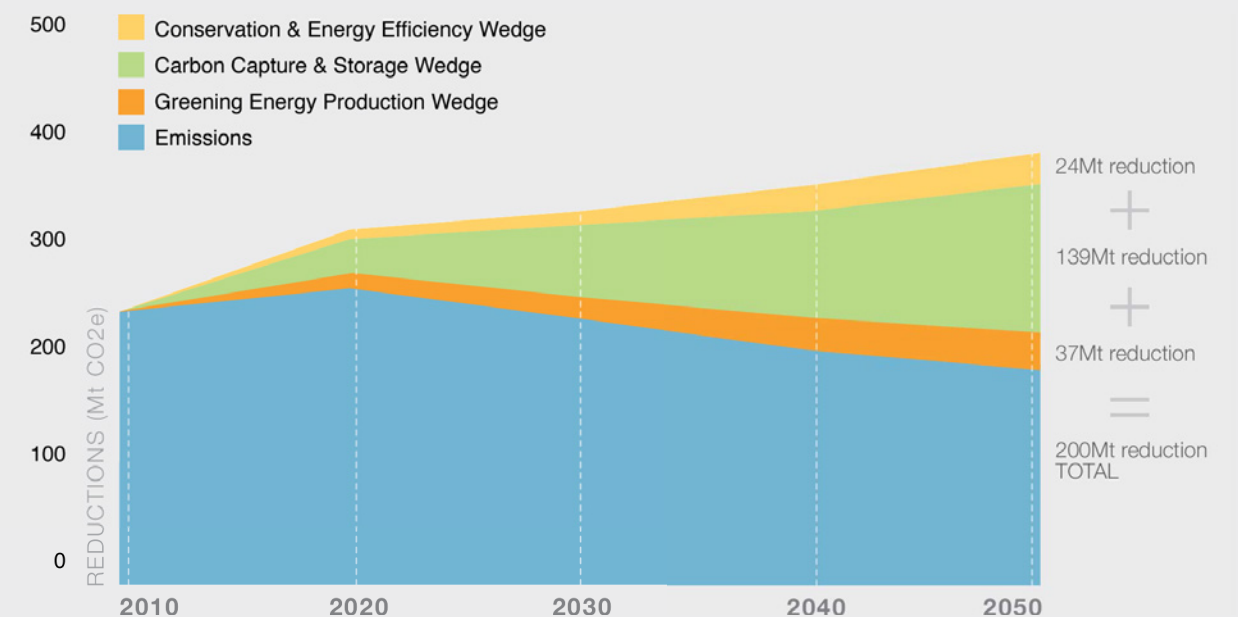
As part of this strategy, the province established a two billion dollar fund to advance large-scale carbon capture and storage (CCS) projects, with a goal to encourage the development of three to

five large scale CCS facilities that would capture and permanently store up to five million tonnes of carbon dioxide per year by 2015.²²

The Government of Alberta ultimately received 54 proposals in response to its Invitation for Expressions of Interest and invited 18 projects to submit Full Project Proposals. Eleven full submissions were received.²³

Of those 11 projects, only one - Shell's Quest project - went ahead. Planning and preliminary design of Quest began in the third quarter of 2009, construction began in the second quarter of 2012 and the plant began commercial operations in November 2015.²⁴

Greenhouse Gas Reduction Wedge Highlighting Greener Energy Production Reductions



Data source: Alberta's 2008 Climate Change strategy: Responsibility / Leadership / Action

Shell asks for multiple credits for captured carbon as an additional subsidy

Correspondence obtained under Freedom of Information legislation shows that Shell requested multiple credits for carbon sequestered by the Quest project as an additional subsidy²⁵ after claiming that the provincial government's proposal to fund 60 percent of the combined capital and operating costs was inadequate.²⁶

On December 5, 2008 (after being invited to submit a full project proposal), Shell's Vice-President of Sustainability wrote to the Government of Alberta to say: "Shell is very concerned with the proposed funding principles in section 6 of the FPIIP. CCS projects are very capital intensive, carry technical risk, and are not economically viable in the current regulatory framework and economic climate and will not proceed in the near future without considerable government incentive."²⁷

Shell proposed that government funding be provided upfront rather than spread over the life of the project and that the Government of Alberta not deduct any revenues Shell received from the sale of emissions credits from the amount of the grant.²⁸ The government ultimately agreed to not deduct the revenue from the sale of emissions credits in December 2008, saying:

"One of the changes being proposed for the final FPP is to allow the successful proponents to maintain revenue from EOR, GHG credits or other grants / funding that they may receive in support of their CCS project. The initial draft indicated that the Alberta Government would reduce their share of the funding if these other sources of revenue are realised, but the DM Committee agreed that any ability to make the projects a commercial venture should be encouraged."²⁹

Shell Canada's President then wrote to the provincial government in February 2009 to

pitch multiple credits. After congratulating the Government of Alberta on its two billion CCS fund and noting the federal government had promised to co-fund CCS projects, he wrote:

"The 2009 Federal Budget provided a step towards federal, provincial and industry alignment around an effective CCS plan. As you know, there are still significant fiscal challenges, technical and financial risks, associated with deployment of large-scale CCS projects and the costs of first-mover CCS projects are too high for industry to bear alone. However it will take the right combination of government funding, tax incentives and CO2 credits to fully realize CCS projects in Alberta.

As another enabler to CCS development, I urge the Government of Alberta to consider the awarding of multiple credits for early deployment of CCS projects... For CCS projects coming on stream before 2020, each tonne of CO2 sequestered would be granted three tonnes of GHG credits."³⁰

The direct subsidy to the project consisted of a \$745M grant from the Government of Alberta and \$120M grant from the federal government towards the estimated \$1.35B cost to build and operate the facility for 10 years.³¹

As described below, the granting of multiple credits represented an additional subsidy of over \$200M, taking the level of public funding for the Quest project (to the end of 2022) to over 90 percent. Once the additional \$200M for 'avoided emission' credits is taken into consideration, the project has turned a modest profit for its operator.

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GOVERNMENT OF ALBERTA GRANTS PHANTOM CREDITS

The Government of Alberta granted Shell's request for multiple credits, though at a rate of two for one, rather than Shell's requested three for one. The provincial government announced a multiple credit scheme in 2011 as a "short-term measure to ensure large-scale CCS projects can move forward."³² These were subsequently embedded in Alberta's Technology Innovation and Emissions Reduction Regulation³³ via a provision in section 19 of the regulation that applies only to Shell's Quest project because under section 19 of the regulation, additional credits are limited to projects operational in 2015 and Quest was the only one.

The Alberta Emission Offset System is a regulatory program that enables industrial facilities regulated under the Technology Innovation and Emissions Reduction Regulation (TIER)³⁴ to purchase and retire emission offsets to meet compliance obligations. Under the TIER, regulated facilities have to meet facility carbon emissions benchmarks (they can choose a benchmark based on industry averages or the historic emissions of the particular facility, whichever is more beneficial). Greenhouse gas emissions below the baseline are free, but for emissions above the baseline they can comply in one of three ways:

1. **Submit Alberta emission offsets (like those generated by the Quest project);**
2. **Submit emission performance credits (purchased from facilities that emit below their baseline); or**
3. **Pay a set price into the regulated fund to obtain fund credits.**

The Quest CCS project generates emission offsets. Each properly registered offset represents one tonne of carbon dioxide equivalent (CO₂e) that a TIER-regulated facility can purchase and use to effectively offset the number of excess tonnes of CO₂e it produces in a given year, relative to the applicable benchmark. Companies get all of their emissions credits below the baseline for free and only have to pay for emission above the baseline.

Section 19.5 of the TIER regulation grants Shell's Quest project 2-for-1 credits as long as the carbon price is below \$40 per tonne. This was the case from 2015-2021, but the federal carbon price rose to \$50 per tonne in 2022³⁵ and Alberta was required to match this price after the province lost its Supreme Court challenge of the federal Greenhouse Gas Pollution Pricing Act.³⁶

Under the TIER regulation, when the industrial carbon price is below \$40 per tonne (which it was prior to 2022), each net tonne of carbon sequestered ("avoided emission") gets an emissions credit for that tonne, and an "additional" (i.e. phantom) one tonne emission credit.³⁷ Between \$40 and \$80 per tonne, credits are prorated according to a formula set out in the TIER regulation. The formula is:

$$N = A \times \frac{(80 - B)}{40}$$

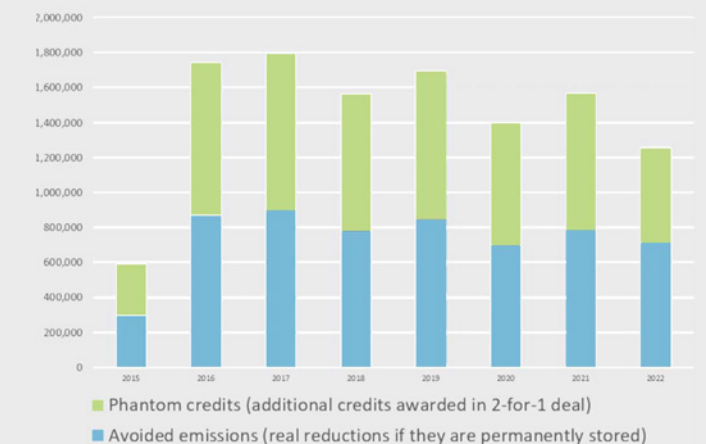
Where: N is the number of additional emissions credits being created.
A is the number of avoided emissions.
B is the carbon price that year.

According to Alberta's Emissions Offset Registry, the Quest CCS project has registered 11.6 MT of emissions credits in the 2015-2022 period.³⁸ Of these, 5.9 MT are classified as "avoided emissions" (tonnes of carbon dioxide sequestered underground minus the GHG emission resulting from the process of capturing, condensing and transporting the CO₂). The Registry also records 5.7 MT of 'additional emissions', granted under the multiple credit scheme (it is less than 50 percent because the 2022 additional credits were prorated to 75 percent of the 'avoided emissions' due to a carbon price above \$40 per tonne).

	Avoided emissions	Phantom credits	Total (tonnes CO ₂ e)
2015	295,577	295,577	591,154
2016	869,879	869,879	1,739,758
2017	896,923	896,923	1,793,846
2018	781,462	781,462	1,562,924
2019	847,490	847,490	1,694,980
2020	697,072	697,072	1,394,144
2021	784,241	784,241	1,568,482
2022	715,416	536,562	1,251,978

Data source: Alberta Carbon Registries
Quest Carbon Capture and Storage Project

Quest CCS Project Offset Credits
(tonnes CO₂e)



These phantom emissions represent a subsidy to the project, but are not real reductions as no additional carbon has been removed from the atmosphere. Phantom credits undermine the polluter pay principle because they allow oil sands operators to avoid paying the carbon price, without any related environmental benefit. This enables Shell and its partners to pump more oil from their environmentally damaging oil sands operations by making the extraction more profitable.

It is important to note that Greenpeace Canada has separately challenged the credibility of Shell's use of forest offset credits as part of Shell's 'Drive Carbon Neutral' advertising campaign,³⁹ but the issues related to forest offsets are distinct from those related to Quest's additional credits for carbon capture.

SHELL HAS MADE OVER \$200M FROM PHANTOM CREDITS

Revenue streams (Thousands of dollars)	Other incomes- Alberta innovates Grant, NRCan Funding & GoA Funding	CO2 emission offset credits	Total Revenues
2009 - 2015 (Construction)	573,345		573,345
2016	29,452	3,226	32,677
2017	30,100	32,287	62,387
2018	30,796	75,311	106,107
2019	30,050	69,956	100,006
2020	27,033	84,462	111,496
2021	29,006	62,736	91,743
2022	26,945	78,424	105,369
Total (2009-2022)	776,727	406,402	1,183,130

Data source: Table 10.4 of Shell's 2023 report to the Alberta government on the Quest Project

Shell reports on the revenue from the offset credits in Table 10.4 of its annual report on the Quest project.⁴⁰ Its most recent report states that it had received \$777M from the federal and provincial governments as of the end of 2022 (with \$29M more expected in the 2023-2025 period) and \$406M in revenue from carbon offsets.

Each year's carbon offset revenue is calculated based on the credits created in the previous year in order for the quantity to go through the verification process. In its annual report on the Quest project, Shell notes: "The value of CO2 emission offset credits reported each year do not reflect the CO2 volumes injected in that year due to the time taken to verify injection volumes and issue credits. The value of CO2 emission offset credits in 2022 [\$26.945M] relate to 1,568,482 base and additional credits serialized during the [2021] year."

The quantity of 'additional emissions' credits began to be prorated in 2022 to 75 percent of 'avoided emissions', but that hasn't yet been reflected in sales (as they are selling the 2021 credits in 2022), so additional credits represent 50 percent of the total value of \$406M (i.e. \$203M).

The TIER regulation was recently amended (see section 19.3(g) of the regulation) to make 2022 the final year where phantom credits could be claimed,⁴¹ though there is now greater flexibility in how CCS-generated credits can be used to meet compliance obligations.⁴² These changes were made following the failure of the Government of Alberta's Supreme Court challenge of the federal Greenhouse Gas Pollution Pricing Act and subsequent requirement for the provincial carbon pricing system to meet minimum federal standards (including a rising price).⁴³

Quest may still be able to sell the credits it generated in 2022 for up to \$35M. That potential revenue has not been included in the \$203M total or the calculations below.



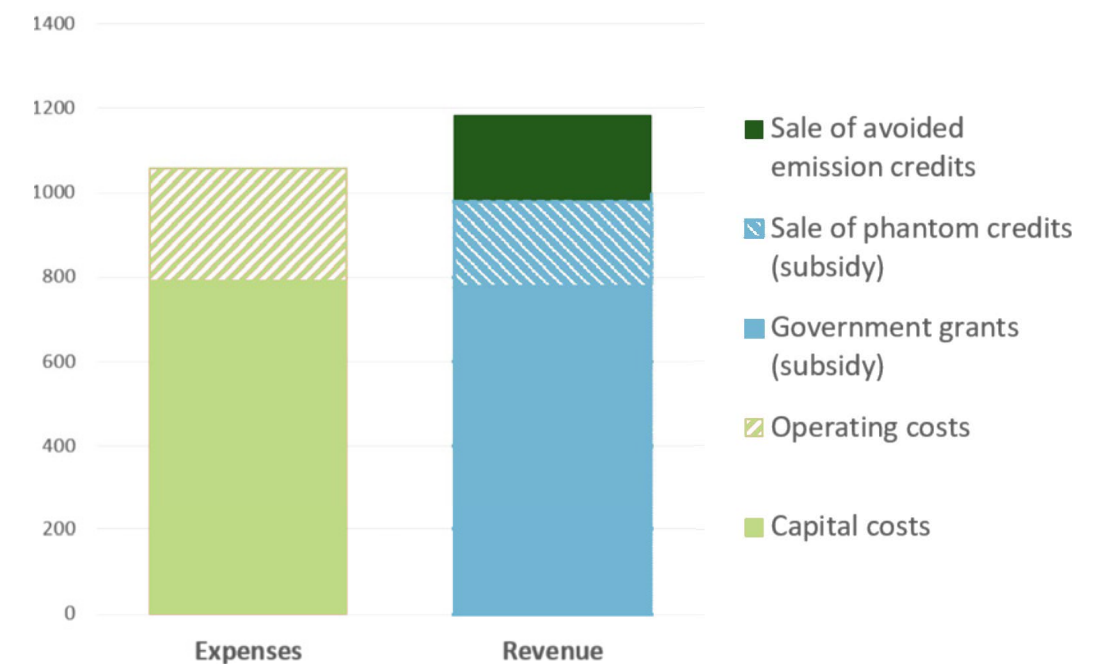
The public has paid 93 percent of Shell's cost for the Quest CCS project

In Table 10-1 of its report to the Alberta government on the Quest project, Shell reports total capital costs of \$790M for the project to reach commercial operation and in Table 10-2 it reports total operating costs (2015 - 2022) of \$267M for a total cost of \$1,056M in the 2011-2022 period.⁴⁴

Over that same period, as noted above, Shell reports receiving \$777M in government grants (the \$865M in total federal and provincial grants is spread over the first 15 years of operation of the plant). Adding in the \$203M in phantom credits, and we can put a value of \$980M on public subsidies, representing 93 percent of total costs to date.

With the addition of the \$203M in revenue from the sale of avoided emission credits, Shell has made a profit of \$126M on the Quest project in the first seven years of operation.

Revenue and Expenses for Quest CCS Project 2011-2022
(millions of dollars)



Data source: Tables 10-1 and 10-2 of Quest Carbon Capture and Storage Project: Annual Summary Report to Alberta Department of Energy 2022.

GHG EMISSIONS

The Quest project was expected to capture 1.1 MT per year, according to the final project proposal presented to the Alberta government.⁴⁵ Its performance has come close to that, averaging 1.06 MT per year in its first seven years of full operation (i.e. excluding 2015 where it only operated part of the year).⁴⁶

Yet it is important to note that avoided emissions are significantly less than sequestered emissions, averaging 0.782 MT per year over the same seven year period, i.e. avoided emissions were 26 percent lower than captured emissions.⁴⁷ This is because capturing, compressing and transporting the carbon results is energy intensive and results in new, additional emissions at the facility.

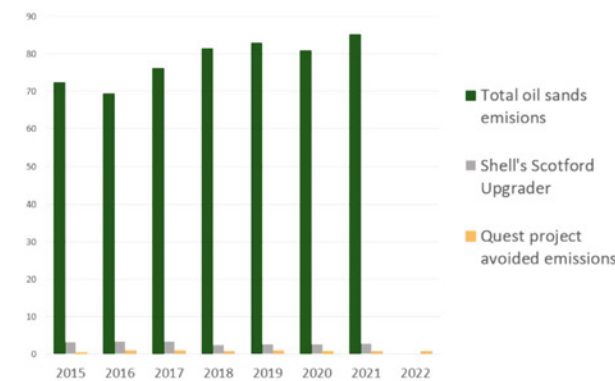
For example, in 2022 Shell reported that it had captured 0.971 MT tonnes of CO₂ at the Quest site, but released 0.231 MT CO₂ from capture, transport and storage for a total of 0.755 MT CO₂ avoided.⁴⁸ This was further reduced by 0.040 MT of waste heat credits, for a total of 0.715 MT worth of credits registered on the Emissions Offset Registry.⁴⁹

The Scotford Upgrader facility, whose emissions the Quest project is reducing, averaged 2.92 MT per year over the same period.⁵⁰ The avoided emissions from Quest thus represent 27 percent of the Scotford Upgrader facility, or less than one third.

Carbon capture has been pitched by industry and the Alberta government for a long time as a way to reduce the

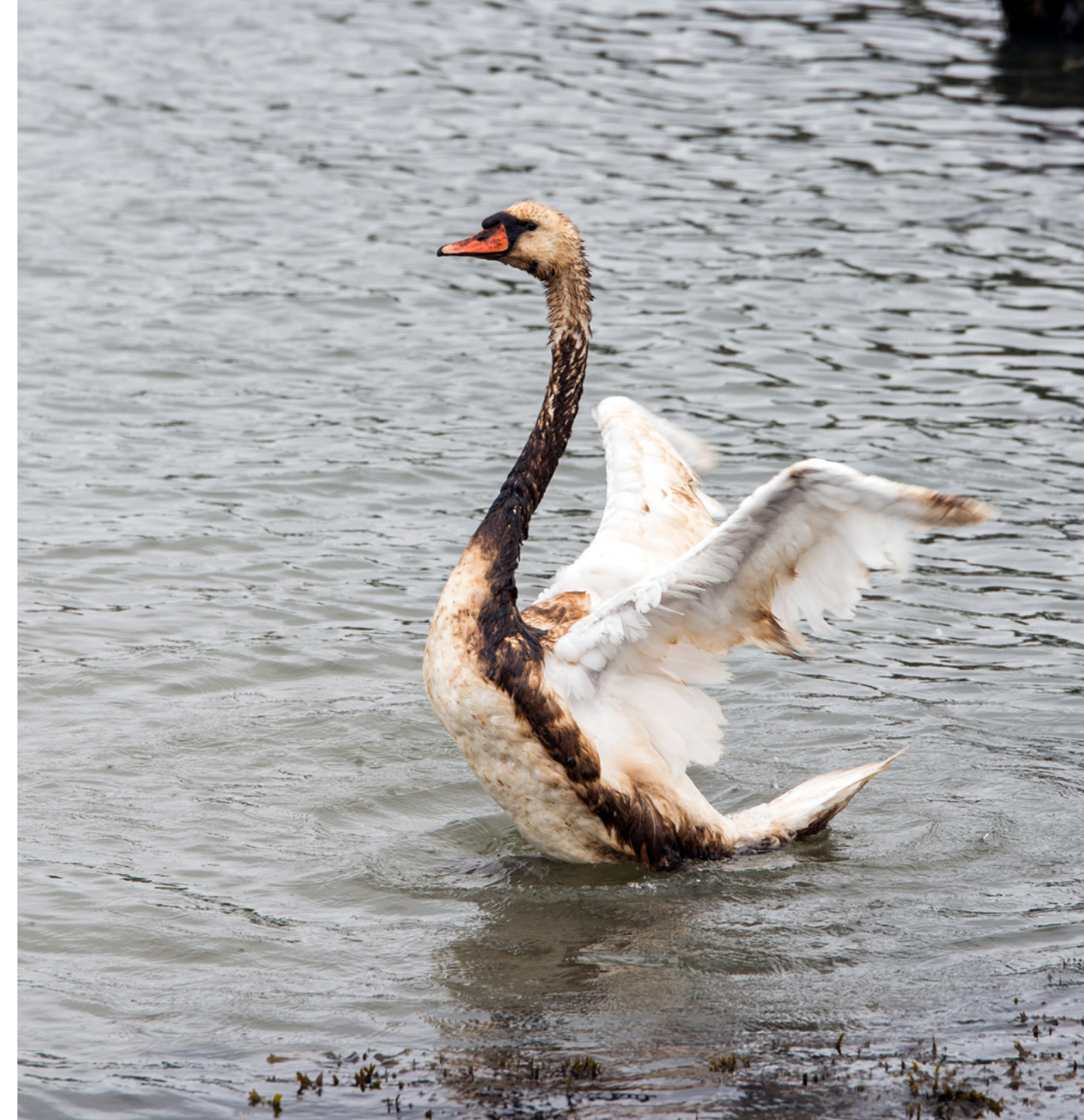
climate impact of the oil sands.⁵¹ This promise has been largely unrealized. Compared to the Alberta government's 2008 Climate Plan⁵² goal of having 30 MT of CCS by 2020, 75 MT by 2030 and 139 MT by 2050, Alberta only has less than one million tonnes sequestered per year in 2023. To put this one million tonnes in greater context, emissions of GHGs from the oil sands have risen 142% (50 MT) since design work began on Shell's Quest project in 2005, and by 23 percent (16MT) since its first year of full operation in 2016.⁵³

GHG emissions from oil sands and Shell's Scotford upgrader versus avoided emissions from Quest CCS project (MT CO₂e)



Data source: Environment Canada's National GHG Inventory and facility-level GHG database, Shell's 2022 report to Alberta government on Quest project

This failure to realize significant reductions may be a feature, not a bug, because the promise of a technological fix like carbon capture can blunt calls for transformation as part of what academics call "discourses of delay." These discourses accept the existence of climate change but justify inaction or inadequate efforts via four principle strategies, including 'push non-transformative solutions' (like CCS).⁵⁴



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DEJA VU: PATHWAYS ALLIANCE ALSO ASKS FOR GOVERNMENT FUNDING FOR CCS



▲ The Pathways Alliance, a coalition of six of the largest oil sands producers in Canada

The Quest example illustrates how CCS can be used to push non-transformative solutions. The promise of carbon capture to allow expanded oil sands extraction with reduced emissions has masked a reality where emissions grew dramatically, paid for by the public purse.

This history is at risk of being repeated.

The Pathways Alliance is a coalition formed in 2021 by the six largest oil sands producers: Canadian Natural Resources Limited, Cenovus Energy, ConocoPhillips Canada, Imperial Oil, MEG Energy, and Suncor Energy. Collectively, these companies operate about 95 percent of Canada's oil sands production⁵⁵ and are responsible for roughly 2.7 million barrels per day of oil production. The Alliance describes itself as "Canada's largest oil sands companies working together on responsible development, including achieving our goal of net-zero emissions from operations."⁵⁶ Their "foundational project" is a proposed 400-kilometre CO2 transportation line that they say could eventually link over 20 CCS facilities with a carbon storage hub in northeast Alberta.⁵⁷ This proposal would capture 10 to 12 MT of carbon per year at an estimated cost of \$16.5 billion.⁵⁸ Upstream oil sands emissions from the oil sands were 81 MT in 2021,⁵⁹ while the emissions resulting from end-use are roughly 500 MT per year.⁶⁰

Pathways Alliance member companies are not, however, proposing to cover all, or even most, of these costs themselves.⁶¹ This has led to public criticism of the companies for not moving ahead

with these projects in spite of record-breaking profits.⁶² In its 2022 budget, the federal government offered up to \$8.6B to cover 50 percent of the costs of carbon capture equipment and 37.5 percent of equipment to transport and inject the carbon,⁶³ but the oil sands companies said this would be inadequate.⁶⁴

Nevertheless, the CCS proposal has shaped public discourse. As the Pembina Institute has documented, the Pathways Alliance has successfully generated a lot of government and media interest about its ability to help meet Canada's emissions reduction targets, yet most details of its plans remain undisclosed and there have been no significant decarbonization investment decisions made by its members since it was established.⁶⁵

Industry supporters in Canada continue to use carbon capture as a rationale for extending the life of the oil and gas sector in the face of an accelerating energy transition. For example, in response to the commitment by the federal government in its 2023 Fall Economic Statement to legislate the proposed carbon capture tax credit in the coming weeks, Scott Crockatt of the Business Council of Alberta said "It is really important for the energy industry in Canada because it extends the life of Canada's largest industrial sector and maintains our competitiveness over the long term."⁶⁶

Pathways Alliance corporate members may well be waiting to make final decisions until after the next federal election in the hopes that the Conservatives

win and they won't face restrictions on greenhouse gas (GHG) emissions from the oil sands. Nevertheless, Pathways' "Let's clear the Air" advertising and lobbying campaign is already shaping public debate and public policy, including winning a potential \$8B subsidy from the federal government for CCS and up to \$5.3B⁶⁷ from the Government of Alberta.

The sheer size and scale of the ad campaign has resulted in increased scrutiny of its claims.

In 2022, a public letter from over 400 academics called on the Canadian government to not introduce tax measures to support carbon capture as they would undermine government efforts to reach net-zero by 2050. The letter stated that this would be a significant fossil fuel subsidy, that CCS for oil and gas is not a climate solution, that the technology is unproven at scale and very expensive, with a terrible track record and limited potential to deliver significant, cost-effective emissions reductions.⁶⁸

In March 2023, Greenpeace Canada successfully requested the Competition Bureau of Canada to investigate Pathways' advertising campaign for false and misleading representations to the Canadian public.⁶⁹ Evidence gathered by Greenpeace and others highlights that the Pathways Alliance is using the ad campaign to influence federal regulation and convince the public to support the continued operation of oil sands into the future. Key points in the complaint include:

1. Pathways companies claim to be "making clear strides toward net zero" while they continue to expand their fossil fuel production. In 2022, five of the six companies collectively produced a record average 3.2 million barrels of crude oil per day. Last year's record is expected to be surpassed this year. Future oil sands production is projected to grow anywhere from half a million to more than 1 million barrels per day over the next decade.
2. The Pathways Alliance justifies their fossil fuel expansion by saying they will invest billions of dollars in carbon capture and storage, despite uncertainty around the efficacy, reliability and cost of the technology.
3. The Pathways Alliance spent heavily on its "Let's clear the air" ad campaign to paint the coalition as a climate leader, yet it fails to meet its own climate commitments.
4. Individually and through industry affiliations, Pathways members have advocated, advertised, and/or spoken against climate action in Canada.⁷⁰

The International Energy Agency recently threw cold water on over-optimistic assessments of carbon capture's capacity to avoid fundamental changes for oil producing companies or regions. In its November 2023 report on the future of the oil industry, the IEA stated:

"The uncomfortable truth that the industry needs to come to terms with is that successful clean energy transitions require much lower demand for oil and gas, which means scaling back oil and gas operations over time – not expanding them.[...]"

Carbon capture, utilisation and storage is an essential technology for achieving net zero emissions in certain sectors and circumstances, but it is not a way to retain the status quo. If oil and natural gas consumption were to evolve as projected under today's policy settings, this would require an inconceivable 32 billion tonnes of carbon captured for utilisation or storage by 2050, including 23 billion tonnes via direct air capture to limit the temperature rise to 1.5 °C. The necessary carbon capture technologies would require 26 000 terawatt hours of electricity generation to operate in 2050, which is more than global electricity demand in 2022. And it would require over USD 3.5 trillion in annual investments all the way from today through to mid-century, which is an amount equal to the entire industry's annual average revenue in recent years."⁷¹

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CONCLUSION

Aligning with the Paris Agreement means scaling up renewable energy solutions while scaling back oil and gas operations, as part of a broader transformation of our energy system. Anything less is a phantom solution that does no more to protect our climate than Shell's phantom carbon credits.

The IEA is calling this a "moment of truth" for the oil and gas industry on its engagement with clean energy transitions.⁷² Their game of smoke and mirrors with carbon capture is no longer fooling anyone and they must choose between winding down their operations or rapidly transitioning to clean energy.

Greenpeace believes that those who have polluted and profited the most must be made accountable and financially support the most vulnerable people, communities, and countries in their transition to clean, renewable energy. Rather than further subsidizing their extremely profitable operations, they should be paying into a fund to compensate those who have been harmed.

Allocating scarce public funds to carbon capture distracts from true climate solutions and delays the urgent transition off of fossil fuels.

ENDNOTES

- 1 Calculation is based on cross-referencing data from the Government of Alberta’s emissions creditregistry with Shell’s annual reports to the provincial government on the Quest project. See section related to footnotes 38 and 40.
- 2 Government of Alberta (June 24, 2011). “Alberta inks deal for Shell Quest CCS project.” URL:<https://www.alberta.ca/release.cfm?xID=30771c28ee8fc-f24f-e03c-1ba374d3c893a32b>
- 3 February 10, 2009 letter from Shell Canada President to Alberta Energy. Document released underAlberta’s Freedom of Information legislation, pp 64-65of 500. URL:https://www.greenpeace.org/static/planet4-canada-stateless/2024/01/ddcfd223-foi-records-quest-ccs-project_compressed-1.pdf
- 4 Calculation based on income and expense revenue contained in Shell reports to the Government ofAlberta on the Quest project and quantity of ‘additional’ credits registered in the provincial emissionscredit registry. See sections related to footnotes 38 and 40.
- 5 Government of Alberta (2008).Alberta’s 2008 Climate Change Strategy: Responsibility / Leadership /Action, page 20. URL:<https://open.alberta.ca/dataset/e86a9861-aa19-400e-bb7a-909ef8ccfe46/resource/ad5754f4-cc7f-40bf-a2ad-0775bd83ba7e/download/4063885-2008-albertas-2008-climate-change-strategy.pdf>
- 6 Alberta Carbon Registries. Quest Carbon Capture and Storage Project.https://alberta.csaregistries.ca/GHGR_Listing/AEOR_ListingDetail.aspx?ProjectId=215
- 7 Environment and Climate Change Canada (2023). National inventory report : greenhouse gas sourcesand sinks in Canada, Table 2-12. URL:<https://publications.gc.ca/site/eng/9.506002/publication.html>
- 8 Facility-level data is available from Environment Canada’s Greenhouse Gas Reporting Program,available at<https://climate-change.canada.ca/facility-emissions/>
- 9 Pathways Alliance. “A three-phased approach to reaching our net-zero goal.” URL:<https://pathwaysalliance.ca/net-zero-initiative/planned-phases/>. See footnotes 59 and 60 for additionalcalculations.
- 10 Kyle Bakx (February 16, 2023). “Historic profits in oilpatch on track to continue as global oil demand settojump yet again: Companies want to target debt, pay shareholders rather than spend on new projects”CBC News. URL:<https://www.cbc.ca/news/canada/calgary/bakx-oil-profit-cashflow-climate-iea-1.6750496>
- 11 International Energy Agency (November 2023). The Oil and Gas Industry in Net Zero Transitions,pages 4 and 16. URL:<https://www.iea.org/reports/the-oil-and-gas-industry-in-net-zero-transitions>
- 12 Shell. Energy Transition Strategy 2021 , p.16. Available online:https://www.shell.com/energy-and-innovation/the-energy-future/shell-energy-transition-strategy/_jcr_content/root/main/section_1679944581/simple/promo/links/item0.stream/1651509559757/7c3d5b317351891d2383b3e9f1e511997e516639/shell-energy-transition-strategy-2021.pdf
- 13 Hydrogen produced from fossil gas and supported by carbon capture and storage.
- 14 Shell Canada website. About Shell Canada. Projects and Sites: Scotford.https://www.shell.ca/en_ca/about-us/projects-and-sites/scotford.html#about
- 15 September 2, 2008 letter from Shell Canada to the Alberta Department of Energy “Re: Shell CanadaEnergy Expression of Interest-Shell Quest CCS Project”. Document released under Alberta’s Freedomof Information legislation, pp 10-11 of 500.URL:https://www.greenpeace.org/static/planet4-canada-stateless/2024/01/ddcfd223-foi-records-quest-ccs-project_compressed-1.pdf
- 16 Shell Canada website. About ShellCanada. Projects and Sites: Athabasca oil sands project.https://www.shell.ca/en_ca/about-us/projects-and-sites/athabasca-oil-sands-project.html
- 17 Canadian Natural Resources Limited, Canadian Natural Resources Limited Completes the AcquisitionOf Working Interests In The Athabasca Oil Sands Project And Other Oil Sands Assets, May 31 2017.Available online:https://www.cnrl.com/upload/media_element/1094/02/0531_closing-of-aosp-acquisition.pdf
- 18 Shell Canada website. Media. News release, May 31 2017. Available online:https://www.shell.ca/en_ca/media/news-and-media-releases/news-releases-2017/completes-divestment-of-oil-sands-interests-in-canada.html#
- 19 Graham Thomson (November 29, 2019). “Carbon capture and storage: Hasn’t Alberta learned itslesson?” CBC News. URL:<https://www.cbc.ca/news/canada/edmonton/carbon-capture-storage-lesson-1.5377626>
- 20 Sarah Shenker (December 11, 2008) . “Canada’s ‘Dirty Oil’ Challenge,”BBC News. URL:<http://news.bbc.co.uk/2/hi/americas/7763365.stm>
- 21 Government of Alberta (2008).Alberta’s 2008 Climate Change Strategy: Responsibility / Leadership /Action, page 20. Amounts for 2020 and 2030 based on measuring size of wedge. URL:<https://open.alberta.ca/dataset/e86a9861-aa19-400e-bb7a-909ef8ccfe46/resource/ad5754f4-cc7f-40bf-a2ad-0775bd83ba7e/download/4063885-2008-albertas-2008-climate-change-strategy.pdf>
- 22 Government of Alberta (2008). CCS Fund Governance and Accountability. Document released underAlberta’s Freedom of Information legislation, pp 45 of 500. URL:https://www.greenpeace.org/static/planet4-canada-stateless/2024/01/ddcfd223-foi-records-quest-ccs-project_compressed-1.pdf
- 23 April 24, 2008 Alberta Energy Powerpoint presentation “Carbon Capture and Storage DM GovernanceCommittee: Preliminary Evaluation.” Document released under Alberta’s Freedom of Informationlegislation, pp 300 of 500. URL:https://www.greenpeace.org/static/planet4-canada-stateless/2024/01/ddcfd223-foi-records-quest-ccs-project_compressed-1.pdf
- 24 Natural Resources Canada. “Shell Canada Energy Quest Project”. URL:<https://natural-resources.canada.ca/science-and-data/funding-partnerships/funding-opportunities/current-investments/shell-canada-energy-quest-project/18168>
- 25 February 10, 2009 letter from Shell Canada President to Alberta Energy. Document released underAlberta’s Freedom of Information legislation, pp 64-65 of 500. URL:https://www.greenpeace.org/static/planet4-canada-stateless/2024/01/ddcfd223-foi-records-quest-ccs-project_compressed-1.pdf
- 26 December 5, 2008 letter from Shell to Alberta’s Department of Energy, “Re: Alberta Government CCSPProgram-Shell Canada Commentsto Full Project Proposals Information Package.” Document releasedunder Alberta’s Freedom of Information legislation, pp 57-58 of 500. URL:https://www.greenpeace.org/static/planet4-canada-stateless/2024/01/ddcfd223-foi-records-quest-ccs-project_compressed-1.pdf
- 27 December 5, 2008 letter from Shell to Alberta’s Department of Energy, “Re: Alberta Government CCSPProgram-Shell Canada Comments to Full Project Proposals Information Package.” Document releasedunder Alberta’s Freedom of Information legislation, pp 57-58 of 500.URL:https://www.greenpeace.org/static/planet4-canada-stateless/2024/01/ddcfd223-foi-records-quest-ccs-project_compressed-1.pdf

- 28 Ibid.
- 29 Government of Alberta. “Carbon Capture and Storage Governance Committee MeetingDec 10, 2008–Bulyea Room, Government House.” Document released under Alberta’s Freedom ofInformation legislation, p 59 of 500.URL:https://www.greenpeace.org/static/planet4-canada-stateless/2024/01/ddcfd223-foi-records-quest-ccs-project_compressed-1.pdf
- 30 February 10, 2009 letter from Shell Canada President to Alberta Energy. Document released underAlberta’s Freedom of Information legislation, pp 64-65 of 500. URL:https://www.greenpeace.org/static/planet4-canada-stateless/2024/01/ddcfd223-foi-records-quest-ccs-project_compressed-1.pdf
- 31 Government of Alberta (June 24, 2011). “Alberta inks deal for Shell Quest CCS project.” URL:<https://www.alberta.ca/release.cfm?xID=30771c28ee8fc-f24f-e03c-1ba374d3c893a32b>
- 32 Governmentof Alberta (June 24, 2011). “Alberta inks deal for Shell Quest CCS project.” URL:<https://www.alberta.ca/release.cfm?xID=30771c28ee8fc-f24f-e03c-1ba374d3c893a32b>
- 33 Technology Innovation and Emissions Reduction Regulation (Alberta Regulation 133/2019). p 42. URL:https://kings-printer.alberta.ca/documents/Regs/2019_133.pdf
- 34 The TIER replaced the Carbon Competitiveness Incentive Regulation (CCIR) on 1 January 2020. The2017 version of the CCIR is available at<https://www.canlii.org/en/ab/laws/regu/alta-reg-255-2017/132710/alta-reg-255-2017.html>
- 35 Government of Canada. “The federal carbon pollution pricing benchmark.”<https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/carbon-pollution-pricing-federal-benchmark-information.html>
- 36 John Paul Tasker (March 25, 2021). “Supreme Court rules Ottawa’s carbon tax is constitutional.”CBCNews. URL:<https://www.cbc.ca/news/politics/supreme-court-federal-carbon-tax-constitutional-case-1.5962687>
- 37 Technology Innovation and Emissions Reduction Regulation (Alberta Regulation 133/2019). URL:https://kings-printer.alberta.ca/documents/Regs/2019_133.pdf
- 38 Alberta Carbon Registries. Quest Carbon Capture and Storage Project.https://alberta.csaregistries.ca/GHGR_Listing/AEOR_ListingDetail.aspx?ProjectId=215
- 39 Greenpeace Canada (November 2021). “Driving carbon-neutral” is impossible with fossil fuels. URL:<https://www.greenpeace.org/static/planet4-canada-stateless/2021/11/a7369fc0-driving-carbon-neutral-is-impossible-with-fossil-fuels.docx.pdf>
- 40 Shell Canada Energy (March 2023, updated August 2023). Quest Carbon Capture and StorageProject: Annual Summary Report to Alberta Department of Energy 2022. Available at<https://open.alberta.ca/publications/quest-carbon-capture-and-storage-project-annual-report-2022>
- 41 The previous end-date was August 22, 2025. See an archived version ofthe regulation athttps://web.archive.org/web/20221017153634/https://kings-printer.alberta.ca/documents/Regs/2019_133.pdf
- 42 DBH Law(February 13, 2023). “Amendments to TIER System Align Alberta with Federal EmissionsReduction Approach.”<https://dbhlp.com/amendments-to-tier-system-align-alberta-with-federal-emissions-reduction-approach/>
- 43 Scott MacDougall and Janetta McKenzie (Jan. 25, 2023). “Understanding changes to Alberta’sindustrial carbon pricing system.” The Pembina Institute. URL:<https://www.pembina.org/pub/understanding-changes-albertas-industrial-carbon-pricing-system>
- 44 Shell Canada Energy (March 2023, updated August 2023). Quest Carbon Capture and StorageProject: Annual Summary Report to Alberta Department of Energy 2022. Table 10-4. Available at<https://open.alberta.ca/publications/quest-carbon-capture-and-storage-project-annual-report-2022>
- 45 Full Project Proposal for the Quest CCS Project. Submitted to Alberta Department of Energy by Shellon behalf of AOSP March 31, 2009. Document obtained under Freedom of Information Legislation, p 76of 500.
- 46 Shell Canada Energy (March 2023, updated August 2023). Table 4-1: Quest Operating Summary 2022fromQuest Carbon Capture and Storage Project: Annual Summary Report to Alberta Department ofEnergy 2022. Available at<https://open.alberta.ca/publications/quest-carbon-capture-and-storage-project-annual-report-2022>
- 47 Shell Canada Energy (March 2023, updated August 2023). Table 4-1: Quest Operating Summary 2022fromQuest Carbon Capture and Storage Project: Annual Summary Report to Alberta Department ofEnergy 2022. Available at<https://open.alberta.ca/publications/quest-carbon-capture-and-storage-project-annual-report-2022>
- 48 Shell Canada Energy (March 2023, updated August 2023). Table 4-1: Quest Operating Summary 2022fromQuest Carbon Capture and Storage Project: Annual SummaryReport to Alberta Department ofEnergy 2022. Available at<https://open.alberta.ca/publications/quest-carbon-capture-and-storage-project-annual-report-2022>
- 49 Alberta Carbon Registries. Quest Carbon Capture and Storage Project.https://alberta.csaregistries.ca/GHGR_Listing/AEOR_ListingDetail.aspx?ProjectId=215
- 50 Facility-level data is available from Environment Canada’s Greenhouse Gas Reporting Program,available at<https://climate-change.canada.ca/facility-emissions/>
- 51 Graham Thomson (November 29, 2019). “Carbon capture and storage: Hasn’t Alberta learned itslesson?” CBC News. URL:<https://www.cbc.ca/news/canada/edmonton/carbon-capture-storage-lesson-1.5377626>
- 52 Government of Alberta (2008).Alberta’s 2008 Climate Change Strategy: Responsibility / Leadership /Action. URL:<https://open.alberta.ca/dataset/e86a9861-aa19-400e-bb7a-909ef8ccfe46/resource/ad5754f4-cc7f-40bf-a2ad-0775bd83ba7e/download/4063885-2008-albertas-2008-climate-change-strategy.pdf>
- 53 Environment and Climate Change Canada (2023). National inventory report : greenhouse gas sourcesand sinks in Canada, 2023 edition. Table 2-12.Page 65. URL:<https://publications.gc.ca/site/eng/9.506002/publication.html>
- 54 Lamb, W., Mattioli, G., Levi, S., Roberts, J., Capstick, S., Creutzig, F., Steinberger, J. (2020).Discourses of climate delay.Global Sustainability, 3, E17. doi:10.1017/sus.2020.13 URL:<https://www.cambridge.org/core/journals/global-sustainability/article/discourses-of-climate-delay/7B11B722E3E3454BB6212378E32985A7>
- 55 Pathways Alliance website. Who we are.<https://pathwaysalliance.ca/who-we-are/our-history/>
- 56 Pathways Alliance website. Home.<https://pathwaysalliance.ca/>
- 57 Pathways Alliance website. Foundational Project.<https://pathwaysalliance.ca/foundational-project/carbon-capture-and-storage-ccs/>

58 Pathways Alliance. “A three-phased approach to reaching our net-zero goal.” URL:<https://pathwaysalliance.ca/net-zero-initiative/planned-phases/>

59 Environment and Climate Change Canada (2023). National inventory report : greenhouse gas sources and sinks in Canada, Table 2-12. URL:<https://publications.gc.ca/site/eng/9.506002/publication.html>

60 Calculation is based on 3.3 million barrels per day of oil sands output and the EPA’s conversion ratio of 426 kg CO₂e per /barrel of oil. URL:<https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references#>

61 Marco Chown Oved (March 10, 2023). “These oilsands companies raked in \$35B last year. Now, they’re asking for public money to help fight climate change.” The Toronto Star. https://www.thestar.com/news/canada/these-oilsands-companies-raked-in-35b-last-year-now-they-re-asking-for-public-money/article_9d109706-928b-520e-847f-fa3cc8829e12.html

62 Nojoud Al Mallees (January 25, 2023). “Oilsands execs say they can’t invest in decarbonization any faster, despite profits.” The Canadian Press. URL:<https://www.cbc.ca/news/canada/calgary/oilsands-decarbonization-alberta-investment-1.6725388#>

63 Meghan Potkins (April 7, 2022). “Trudeau proposes tax credit to cover 50% of carbon capture technology cost.” Financial Post. URL:<https://financialpost.com/commodities/energy/oil-gas/trudeau-proposes-tax-credit-to-cover-50-of-carbon-capture-technology-cost>

64 Amanda Stephenson (April 27, 2022). “Federal tax credit not enough to get carbon capture projects built: Cenovus CEO.” The Canadian Press. URL:https://www.thestar.com/business/federal-tax-credit-not-enough-to-get-carbon-capture-projects-built-cenovus-ceo/article_749c6a0e-afc5-52e8-9b31-8047c9834599.html

65 Pembina Institute. Waiting to Launch: The gap between Canadian oilsands companies’ climate pledges and actions (2022 report and 2023 update). URL:<https://www.pembina.org/pub/oilsands-waiting-launch>

66 Chris Varcoe (November 21, 2023). “Alberta energy firms ‘encouraged’ by new federal incentives for carbon capture and storage.” Calgary Herald. URL: <https://calgaryherald.com/opinion/columnists/varcoe-carbon-capture-utilization-storage-federal-fall-economic-statement>

67 Government of Alberta (November 28, 2023). “Alberta Carbon Capture Incentive Program.” URL:<https://www.alberta.ca/alberta-carbon-capture-incentive-program>

68 The letter is available at https://www.researchgate.net/publication/363485567_Letter_from_scientists_academics_and_energy_system_modellers_Prevent_proposed_CCUS_investment_tax_credit_from_becoming_a_fossil_fuel_subsidy

69 Greenpeace Canada (May 11, 2023). “Greenpeace Canada complaint spurs formal inquiry into Pathways Alliance ad campaign.” URL:<https://www.greenpeace.org/canada/en/press-release/58645/greenpeace-canada-complaint-spurs-formal-inquiry-into-pathways-alliance-ad-campaign/>

70 Greenpeace Canada (2023). Application for Inquiry into false and misleading representations made by the Pathways Alliance about their climate action and the climate impact of their business. URL:<https://www.greenpeace.org/static/planet4-canada-stateless/2023/03/8c835b91-amended-competition-bureau-submission-for-pathways-alliance-ad-campaign.pdf>

71 International Energy Agency (November 2023). The Oil and Gas Industry in Net Zero Transitions, pp. 4 and 16. URL:<https://www.iea.org/reports/the-oil-and-gas-industry-in-net-zero-transitions>

72 International Energy Agency (November 2023). The Oil and Gas Industry in Net Zero Transitions, p. 3. URL: <https://www.iea.org/reports/the-oil-and-gas-industry-in-net-zero-transitions>

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GREENPEACE

Greenpeace Canada is an independent campaigning organization, which uses non-violent, creative confrontation to expose global environmental problems, and to force the solutions which are essential to a green and peaceful future. Greenpeace's goal is to ensure the ability of the Earth to nurture life in all its diversity.

