PEMBINA institute

Waiting to Launch

The gap between Canadian oilsands companies' climate pledges and actions

Jan Gorski and Eyab El-Aini | September 2022

photo: Pembina Institute

PEMBINA institute

Waiting to Launch

The gap between Canadian oilsands companies' climate pledges and actions

by Jan Gorski and Eyab Al-Aini | September 23, 2022

Summary

It has been over a year since the Pathways Alliance, an industry grouping representing some 95% of production in Canada's oilsands, announced its three-phase plan to get oilsands operations to net-zero greenhouse gas (GHG) emissions by 2050. Although Pathways has successfully generated interest and coverage among industry and industry-watchers (including government and media) about its ability to help meet Canada's 2030 and 2050 emissions reduction targets, most details of its plans remain undisclosed, and since it was established there have been no significant decarbonization investment decisions made by its members.

Canadian oil and gas companies' free cashflow is estimated to reach $152 billion in 2022. This is the highest level of profits the industry has ever seen. However, for the first time, this boom is not being accompanied by new projects in Alberta's oilsands sector, or a significant expansion of jobs. It is also not being invested in decarbonization efforts to align with the Pathways pledges. Instead, companies are prioritizing short-term shareholder value in the form of share re-purchases and dividend payments. Companies across Canada's energy sector now have historically low levels of capital expenditure as a percentage of their free cashflow.

By 2030, Canada's oil and gas sector will be subject to intensifying global competition for low-emissions energy. This competition will be further exacerbated by long-term global oil demand outlooks indicating that demand for oil will decline by 2030, a trend identified even by oil firms. Companies that make deep and rapid emissions reductions now will be best-placed to prosper in the low-emissions, high-competition worlds of 2030, 2050 and beyond. Those that do not risk leaving behind significant underfunded financial and environmental liabilities — such as cleanup of the tailings ponds. To ensure that Albertans and Canadians do not pay the price for this in the long term, the members of the Pathways Alliance must avoid any further delay in making investment decisions and transforming their climate promises into reality.

Words and actions

In the last fourteen months, Canadian oilsands companies have made significant pledges regarding their industry's commitment to playing its part in achieving Canada's climate imperatives. These pledges have been articulated through the Pathways Alliance, an umbrella grouping originally formed in June 2021 and which now consists of the top six producers in Canada's oilsands — Suncor, Cenovus, Conoco Phillips, Canadian Natural Resources Ltd., Imperial Oil and MEG Energy — plus two existing oilsands organizations.[1]

Since its inception, the Pathways Alliance's public messaging campaign has centred on its members' commitment to leading the way on decarbonization of their industry. Pathways spokespeople are regularly quoted in provincial and national media, and the organization has a dedicated online presence. The chief executives of the member organizations are reported to meet on a weekly basis, and the pledges of the Pathways Alliance appear to have become the key point around which the oilsands industry is now coalescing on climate. It is worth noting, though, that most investment decisions[2] that will be needed to make Pathways' pledges become reality will have to be made by individual companies — not by the leaders of the Pathways Alliance.

This report examines the Pathways Alliance's public decarbonization pledges and compares them with actions that each company is currently taking on decarbonization.

Slow progress on carbon capture

In 2021, the Pathways Alliance (then known as the Oilsands Pathways to Net-Zero initiative) announced a plan to achieve net-zero emissions by 2050, including a milestone 22 Mt CO_2e reduction of absolute greenhouse gas emissions from oilsands operations by 2030.[3] They estimated that new investments in carbon capture, utilization and storage (CCUS) technology would account for almost half of their 2030 goal (10 of the 22 Mt CO_2e).

This plan received a major boost in the April 2022 Canadian federal budget, in the form of a generous 50% investment tax credit for CCUS projects.

What is the Investment Tax Credit for CCUS?

A refundable tax credit was announced in the 2022 Federal Budget[4] that is available to CCUS projects that store carbon in geological formations or cement, but not for enhanced oil recovery (EOR). The credit is only available in jurisdictions that have adequate regulation to ensure that carbon stored will be permanent. The following rates apply to eligible expenses after 2021 and before 2030:

60% for direct air capture equipment
50% for all other capture equipment
37.5% for transportation, storage, and use equipment

Rates for eligible expenses after 2030 and before 2040 are reduced by 50% as an incentive for early project investment.

Other policies provide additional incentives for CCUS projects including:

- Offsets credits used for compliance with Alberta's **industrial carbon pricing system**, the Technology, Innovation and Emissions Reduction (TIER) regulation. The price on carbon will rise to $170/tonne by 2030, and federal requirements say offsets and credits must maintain that price signal.[5]
- Starting in 2023, federal **Clean Fuel Regulations** will require gasoline and diesel primary suppliers to reduce the carbon intensity of the gasoline and diesel they produce in, and import into, Canada. There are a number of ways to comply with requirements, including actions that reduce the life-cycle carbon intensity of the fossil fuel, such as CCUS (this only applies to fossil fuels that are used domestically). Eligible actions can generate compliance credits for use or sale to other primary suppliers, to meet their compliance obligations.
- Emissions Reduction Alberta's **Carbon Capture Kickstart Program**, the only incentive program that covers front end engineering design (FEED) study costs. This is one of the few programs filling a critical policy gap, supporting CCUS projects through early-stage development and engineering.
- The federal government is examining the development of a **Carbon Contract for Difference** (CCfD) policy which would provide industry with further certainty that the carbon price will reach a level of $170/tonne.

The Pathways' CCUS plan was announced publicly several months before the existence of an investment tax credit was confirmed (with Pathways indicating that the implementation of the plan would require some government support in the form of funding). However, shortly after the federal investment tax credit was announced, Pathways members began to indicate publicly that additional government funding would be needed before final investment decisions on CCUS projects could be made.[6]

We agree that companies need a clear, stable policy environment if they are to make significant multi-year investments, such as those required for CCUS. In our previous report, *Decarbonizing Canada's Oil and Gas Supply,*[7] we pointed out that companies were waiting for further regulatory certainty from government. Assurances are required that climate regulations will not be subject to future changes that undermine the future return on investments. To this end, we regard the combination of the incentives and regulations outlined above as providing the certainty that companies require.

More recently, Pathways members have suggested that more public funding for CCUS is necessary in light of measures introduced in the United States Inflation Reduction Act,[8] and have also voiced opposition to a cap on oil and gas sector emissions that is currently being drafted by the federal government.[9] However, we would point out that U.S. incentives for CCUS have no bearing on the need for existing oilsands operations in Canada to decarbonize — given that oilsands operations in Canada cannot be transferred to the U.S. — and there is therefore no reasonable rationale for Canada to consider further subsidies for CCUS.

The Inflation Reduction Act provides production tax credits only after projects have been built and CO_2 has been captured (rather than covering a portion of the upfront cost). Other federal and state-level initiatives in the U.S. provide additional financial incentives for CCUS: for instance, several states have implemented policies to transfer carbon storage liability to the state, as well as cost recovery mechanisms for utilities or power plants that capture carbon, and tax exemptions or incentives for certain projects. Additionally, the federal Carbon SAFE program allocates funding for a diverse portfolio of CCUS projects. On the regulatory side, California's cap-and-trade system and its Low Carbon Fuel Standard include protocols for CCUS projects to qualify for credits.

However, compared to Canada, few regulations exist at the federal level in the U.S. to further incentivize early emissions reductions and shore up the long-term investment environment. Further, Environment and Climate Change Canada's plan to implement a clear cap on emissions from the oil and gas sector will add to policy certainty and stability, and we would encourage the government to retain momentum in the development of that regulation. On the investment tax credit in particular, the federal government should feel confident in clearly communicating to industry that no further public funding will become available, which in turn will allow companies to relay this information to their shareholders, and begin to move forward with the comprehensive suite of measures and incentives already on offer.

Regardless of the above discussion continuing to affect final investment decisions for CCUS projects, this should not affect the level of detail on project plans that Pathways could publish to provide further reassurance on how they intend to implement their plans. To date, no Pathways member has announced specific new carbon capture projects at any facility, or

outlined how much it plans to invest in carbon capture, or the extent to which their individual company's CCUS investment will contribute to the collective 10 Mt CO_2e reduction by 2030.

In June 2022, Pathways announced it had submitted a project proposal to the Government of Alberta for the underground hub in the Cold Lake area, where carbon will be stored via a pipeline network. The proposal stipulated that, if approved, carbon could begin to be stored underground from a number of oilsands facilities by late 2026.[10] A response from the provincial government is pending. To date, Pathways says it has identified an initial list of 11 oilsands facilities (with plans to slowly add to this list, eventually reaching 20-plus facilities) from which carbon will be captured.[11] However, the names of these facilities, as well as project details on when each individual capture plant is expected to be approved, built, and become operational, remain undisclosed.

Meanwhile, other CCUS projects announced at the same time as Pathways' are further along. The first phase of Shell's Polaris project, which was announced in July 2021, contracted out an engineering study that same year, with the company expecting to make a final investment decision in 2023 and for operations to start around "the middle of the decade."[12] The first phase of the Polaris project aims to capture 0.75 Mt CO_2 per year from Shell's Scotford refinery and chemicals plant, with the second phase increasing capture capacity to 10 Mt CO_2 per year.

Capital Power's CCUS project at its Genesee Generating Station is on a similar timeline; announced in 2021, with an engineering study underway and an expected investment decision in 2023. This project has the capacity to capture 3 Mt CO_2 per year.[13]

No announced progress on other decarbonization measures

Aside from CCUS, the June 2021 launch of the Pathways Alliance also outlined a number of other efforts to achieve the remaining 12 Mt of the pledged 22 Mt CO_2e reduction by 2030. These included measures such as process improvements, energy efficiency, and electrification.

Unlike CCUS, these measures generally have fewer barriers to progress; they are generally subject to a more streamlined regulatory process and are less capital-intensive. The execution of these measures can also be integrated into planned maintenance events. As such, these measures are available for companies to begin commercial-scale investments immediately.

However, as with individual companies' contributions to the carbon capture element of Pathways' 2030 plan, no information on how emissions reductions resulting from other decarbonization measures will be shared amongst the Pathways members has been published.

Cenovus, for example, has recently announced that it will invest $1 billion over the next five years in emissions reductions, but has not announced any project details related to this

investment.[14] To put this figure in context, this year Cenovus spent the same amount of cash re-purchasing shares in one 90-day period.[15]

Canadian Natural Resources Limited (CNRL) recently published a sustainability report that indicates $84 million invested in emissions reduction research and development efforts in 2021[16] (covering the entire emissions profile of CNRL, not only its oilsands assets). However, budget documents published by CNRL indicate that this investment was focused on small-scale incremental efforts, with no substantial absolute net GHG reduction results.[17] By contrast, CNRL expects to return $14 billion to shareholders, in dividends and share repurchases, between 2021 and 2022.[18]

Answers to a climate disclosure questionnaire recently published by MEG Energy on emissions reduction initiatives indicate $0.2 million invested in 2021.[19] In comparison, MEG Energy launched its share buyback program in Q2 2022, where it spent $139 million between April and June of 2022.[20] It has plans to increase the amount of share buybacks to reach 100% of free cashflow, as debt levels are reduced to a floor target of US$600 million. Meanwhile, MEG Energy's 2022 ESG report shows Scope 1 absolute emissions rose by 19%, and emissions intensity by 5% (from 2017 levels) over the last year.[21]

Imperial Oil has outlined a capital investment figure of $400 million annually from 2022-2026, described as "Growth/GHG."[22] However, it is not clear from information published by Imperial what portion of this is dedicated to GHG emissions reductions, nor what the absolute emissions reductions are expected to be. While Imperial has signed the collective Pathways emissions reduction pledge, it does not have its own absolute emissions reduction target. It does have a goal to reduce emissions intensity (the average amount of GHG emissions per barrel of oil produced, as opposed to total emissions released to the environment[23]) by 30% from 2016 levels.[24] However, for the projects and technologies outlined in their report, the cumulative stated emissions intensity reductions are at approximately 5.4% by 2030.[25]

A lone example of a material investment in absolute GHG reductions is by Suncor Energy, which has allocated approximately 10% of its capital budget 2021-2025 to expanding low-carbon businesses, to meet an absolute emissions reduction goal of 10 Mt CO_2e by 2030.[26] Much of the investment is in two projects: the replacement of three petroleum coke-fired boilers with two natural gas cogeneration units;[27] and renewable electricity from a wind farm (the Forty Mile project).[28] However, the emissions reductions from these projects fall outside the direct emissions from Suncor's oilsands facilities. First, a significant portion of the reductions that Suncor says will result from the cogeneration project are from selling electricity to the grid, based on the relatively lower emissions intensity of electricity generated from natural gas compared with coal. However, Alberta's accelerated phase-out of coal power (due to be fully retired in the province by end-2023; the cogeneration units are due to be commissioned in

2024), along with Canada's goal of achieving a net-zero grid by 2035, mean the actual emissions reductions will be a fraction of what was initially anticipated by the time the units come online. Second, Suncor has subsequently announced its intention to divest from all wind and solar assets early in 2023, including the Forty Mile wind project currently in development, which means the company cannot claim operational emissions reductions from renewable electricity.[29] Other measures outlined in Suncor's GHG investment portfolio include renewable fuels, solvents, CCUS/hydrogen and bitumen conversion, yet details on these investments remain undisclosed.

For ConocoPhillips, production from its Canadian assets in 2021 represented 6% of its entire global production[30], but 21% of the company's total GHG emissions.[31] [32] This is due to the higher emissions intensity of the oilsands compared to conventional oil production. While the company's specific emissions reduction investments in the oilsands are not known, 77% of all capital investment in 2021 was allocated to U.S. assets[33], compared to around 4% for Canadian assets (where the company's production has been declining).[34]

Industry remains well-placed to invest and act on its pledges

Canadian oil and gas companies' free cashflow is estimated at $152 billion in 2022.[35] This is the highest level of cash available the industry has ever seen, approximately 2.3 times the cash available compared to 2014 (when crude oil prices were at around $100 per barrel). Despite higher prices, investment levels in 2022 remained relatively low, less than a third of what oilsands companies invested in 2014.[36] Profits of five members of the Pathways Alliance have increased 3.5 times since Q1 2021 and reached record levels in the second quarter of 2022, mainly due to high commodity prices (Figure 1).[37]

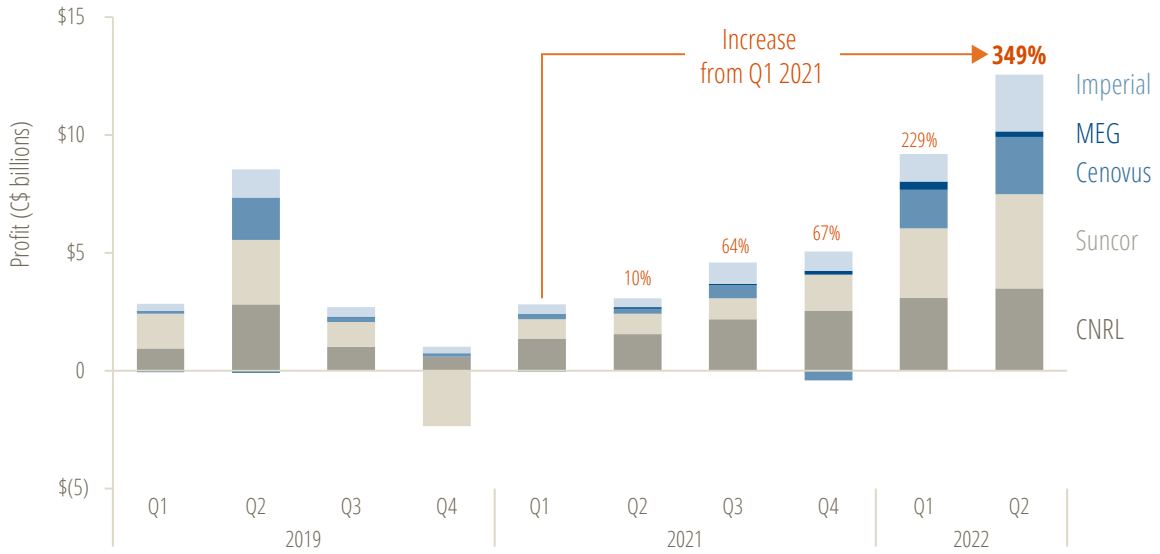

Figure 1. Profits of five members of the Pathways Alliance pre- and post-pandemic

Data source: MarketWatch[38]

Oilsands companies reluctant to bet on new production

Historically, high crude oil prices have translated into large new oilsands projects that were the source of high-paying jobs. Now, for the first time, Alberta's oilsands sector is witnessing a boom that is not being accompanied by this kind of expansion by industry. Gradually, following the collapse of the oil price in 2015, and reinforced during the oil demand shock of the COVID-19 pandemic, oil and gas investors shifted to prioritizing value over production. However, even though the industry has now seen both demand and price rebound, it is continuing with this model. According to the Bank of Canada, capital expenditure (which would typically include spending on things like new production facilities, acquisition, and upgrading of existing production facilities and equipment) as a percentage of cashflow in the energy sector — which in pre-pandemic years was regularly above 100% — is now at historically low levels (39% in 2022; see Figure 2).

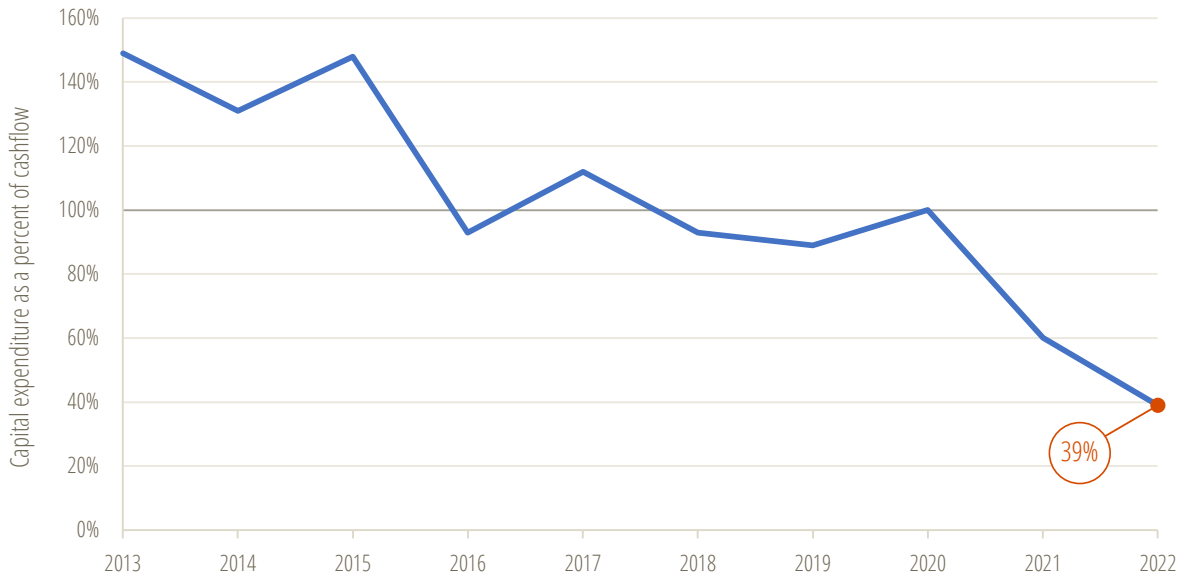

Figure 2. Capital expenditure in the energy sector as a percentage of cash flow

Data source: Bank of Canada[39]

This reluctance to invest record profits in new production is also evident in production guidance published by oilsands companies for the year 2022, which indicates near-flat production relative to 2019 levels, with no new major oilsands projects announced (see Figure 3).[40]

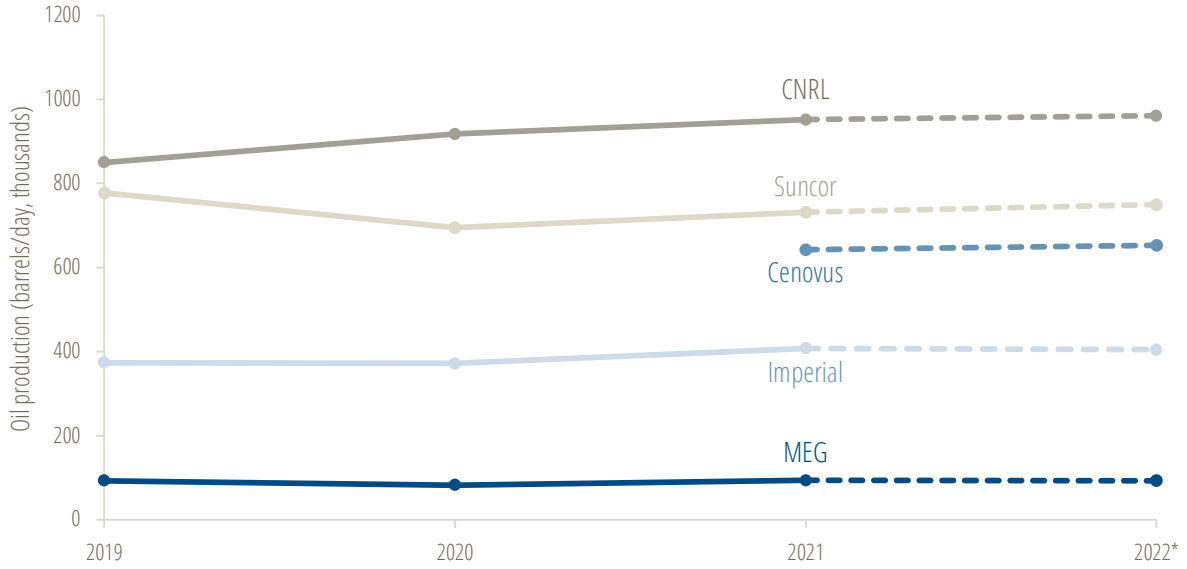

Figure 3. Overall oil production guidance in 2022[41]

Data sources: Historical production from company annual reports[42]; production guidance from company sources[43];

This choice not to invest in new production facilities appears to be a response to oil demand scenarios from credible agencies, including oil majors such as BP and Equinor, which suggest that — even if climate action remains at its current pace — demand for oil will start to decline before 2030.[44] In this way, the decision not to expand production even at a time of price boom and record profits can be understood as an indication of prioritizing short- and medium-term financial gains for shareholders in a context where the industry's long-term prospects are, at best, unclear.

However, a global context of declining oil demand precipitates particular urgency for Canadian producers to decarbonize, given that Canadian oil is the second-most carbon intensive globally (behind only Venezuela).[45] As global climate policies continue to accelerate between now and 2050, the companies that successfully make deep reductions in the carbon emissions associated with their operations will be best-placed to compete for the remaining reduced demand. As such, any delay to decarbonization of the oilsands risks undermining the long-term competitiveness and viability of the sector.

Profits going back to shareholders

The International Energy Agency (IEA) recently noted that oil and gas companies have a "once-in-a-generation opportunity" if they use their excess profits to invest in diversification opportunities, such as low-emission fuels. In the latest World Energy Investment report, the IEA notes that expected additional oil and gas profits in 2022 alone, above amounts earned in 2021, will be enough to "fund all of the investment needed in low emissions fuels under the Net-Zero scenario for the remainder of this decade."[46] However, as noted earlier, an increasing

portion of oilsands companies' free cashflow is being given to shareholders in the form of cash dividends and share re-purchases (Figure 4). With the oil price remaining significantly higher in 2022 than it was in 2021, this trend is expected to grow this year.

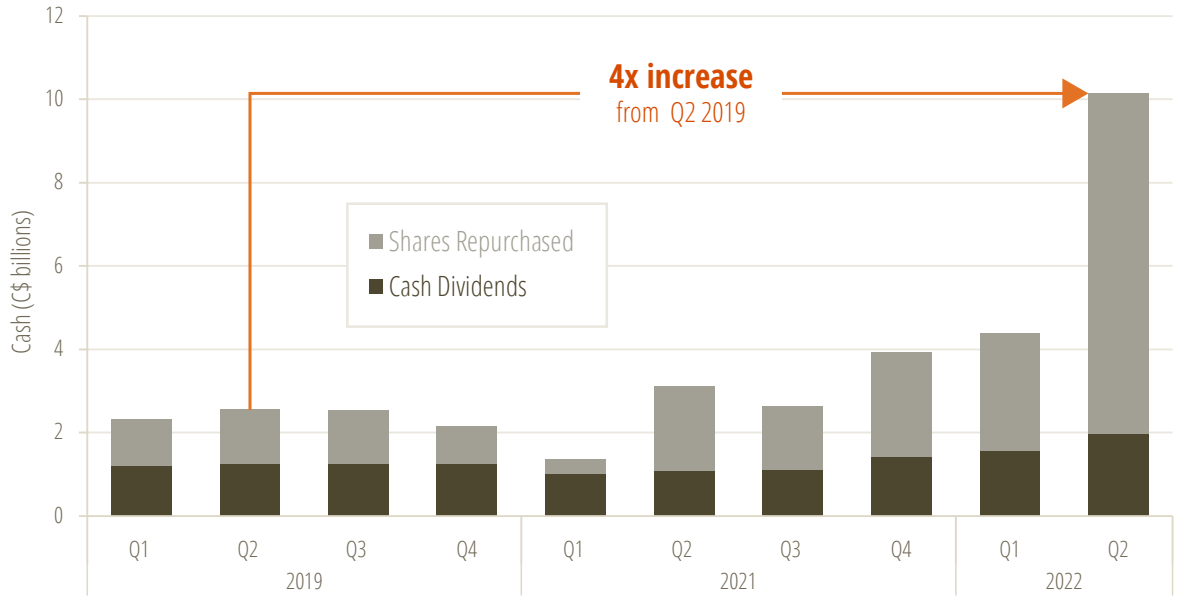

Figure 4. Cash returned to shareholders from five Pathways Alliance companies[47]

Data source: MarketWatch[48]

Conclusion

Competition for the supply of low-emissions energy is set to increase this decade, given net-zero commitments that are accelerating the shift to low-emissions economies, and a widely forecasted decline in demand for oil by 2030. Energy producers who undertake deep and rapid emissions reductions now will be more competitive in the low-carbon worlds of 2030 and 2050. While the pledges and promises of the Pathways Alliance may give the impression that action on this front is imminent or already underway, our analysis here demonstrates that oilsands companies have yet to make the necessary investment decisions — or even release sufficiently detailed project plans, with information about allocation of capital expenditure, timelines, and individual company GHG reduction targets — to provide proper reassurance about the likely pace of decarbonization in the sector.

In summary, we recommend that oilsands companies take the following steps:

- Respond constructively to the federal government's plans to implement an oil and gas sector emissions cap, which will provide additional long-term certainty for companies regarding government's (and Canadians') expectations about the need for the sector to rapidly decarbonize operations. The Government of Canada can contribute to this

certainty by clearly communicating to industry that no further public funding will become available.

- Provide more detailed plans and advance to final investment decision on CCUS projects, which could include naming the facilities and locations where carbon will be captured, and outlining the extent to which each Pathways member's CCUS investment will contribute to the collective emissions reduction target.
- Provide further detail on the range of other decarbonization measures (for example, process improvements, energy efficiency, and electrification) included in the original Pathways plan, such as how these measures will be shared amongst the Pathways members, and how the GHG reduction target will be split amongst these measures. We would also expect progress on the implementation of these measures to be rapidly accelerated.

In taking the above steps, the Pathways Alliance and its member companies can provide reassurance to Canadians that they acknowledge their sector's crucial role in Canada achieving its international emissions reduction commitments. In doing so, the oilsands industry can begin to make a meaningful contribution to this country's efforts to leading the fight against the most disastrous effects of global warming and climate change, while also making essential future-proofing investments to protect their own operations.

---

[1] In 2022 the Oilsands Pathways to Net-Zero initiative merged with two existing organizations – Canada's Oil Sands Innovation Alliance (COSIA), created in 2012, and the Oil Sands Community Alliance (OSCA), created in 2013 – and was renamed the Pathways Alliance.

[2] This refers to decarbonization projects at facilities where emissions exist, including non-CCUS projects. For CCUS investment, shared CO_2 transportation and storage represents a small portion of investment (10%-30%), which varies from project to project.

[3] Baseline year at the time of the announcement was 2018, but emissions have increased since then.

[4] Government of Canada, *2022 Budget: Tax Measures: Supplementary information*, 20. https://budget.gc.ca/2022/report-rapport/tm-mf-en.html

[5] Government of Canada, "Update to the Pan-Canadian Approach to Carbon Pollution Pricing 2023-2030." https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/carbon-pollution-pricing-federal-benchmark-information/federal-benchmark-2023-2030.html

[6] Canadian Press, "Federal tax credit not enough to get carbon capture projects built, Cenovus CEO says," *CBC*, April 27, 2022. https://www.cbc.ca/news/canada/calgary/cenovus-energy-reports-1-6b-first-quarter-profit-triples-dividend-1.6432431

[7] Jan Gorski and Janetta McKenzie, *Decarbonizing Canada's oil and gas supply* (Pembina Institute, 2022), 4. https://www.pembina.org/pub/decarbonizing-canadas-oil-and-gas-supply

[8] Emma Graney, "Oil sands industry wants tax credit review after U.S. goes big on carbon capture," *Globe and Mail,* August 29, 2022. https://www.theglobeandmail.com/business/article-carbon-capture-tax-credits/

[9] Mark Cameron, vice-president of the Pathways Alliance, said, "We think it's probably not realistic that the sector could achieve that level of reduction." Meghan Potkins, "Oilpatch fears federal emissions cap could require

production cuts," *Financial Post*, July 20, 2022. https://financialpost.com/commodities/energy/oil-gas/oilpatch-concerned-that-federal-emissions-cap-could-require-production-cuts

In addition, the Canadian Association of Petroleum Producers, of which the Pathways Alliance members are also members, has launched a webpage encouraging individuals to voice their opposition to the introduction of a federal oil and gas emissions cap: Canada's Energy Citizens, "Take Action: Federal Oil & Natural Gas Cap." https://www.energycitizens.ca/emissions-cap/

[10] Pathways Alliance, "Pathways Alliance files request for carbon storage space," June 10, 2022. https://pathwaysalliance.ca/pathways-alliance-files-request-for-carbon-storage-space/

[11] Pathways Alliance, "Pathways plan to achieve net zero emissions," November 3, 2021. https://pathwaysalliance.ca/the-pathways-vision/

[12] Shell plc, "Shell proposes large-scale CCS facility in Alberta," news release, July 13, 2021. https://www.shell.ca/en_ca/media/news-and-media-releases/news-releases-2021/shell-proposes-large-scale-ccs-facility-in-alberta.html

[13] Nephele Kirong, "Capital Power plans final decision on Alberta carbon capture project in 2023," *S&P Global Market Intelligence,* February 25, 2022. https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/capital-power-plans-final-decision-on-alberta-carbon-capture-project-in-2023-69100440

[14] Cenovus Energy, *2021 Environmental, Social and Governance Report* (2021), 38. https://www.cenovus.com/Sustainability/Reporting

[15] Cenovus Energy, "Cenovus Announces 2022 Second-Quarter Financial and Operating Results," news release, July 28, 2022. https://www.cenovus.com/News-and-Stories/News-releases/2022/2487587

[16] CNRL, *2021 Sustainability Report,* Aug 2020, 4. https://www.cnrl.com/upload/media_element/1313/5f96a94b2b5c/2021-stewardship-report-to-stakeholders.pdf

[17] Total amount of oilsands GHG reduction is not disclosed, however, the following was identified based on 2022 forecasted to be spent in 2022: $25 million for thermal in-situ (Solvent SAGD at Kirby, and other undisclosed GHG reduction projects), $10 million for in-pit extraction demonstration plant for front end engineering. Total project cost and expected GHG reductions are not disclosed. CNRL, *Corporate Presentation*, September 2022, 7,8. https://www.cnrl.com/upload/media_element/1387/2dce002761b5/p_corp_pres_september.pdf

[18] CNRL, *Corporate Presentation*, September 2022, 13.

[19] MEG Energy Corp., *CDP Climate Change Questionnaire 2022,* 57. https://www.megenergy.com/wp-content/uploads/2022/08/MEG_Energy_Corp._-_CDP_Climate_Security_Questionnaire_2022_-_EXPORT.pdf

[20] MEG Energy, "MEG Energy announces second quarter results including continued debt repayment, inaugural share repurchases and renewal of credit facilities," news release, July 28, 2022. https://www.megenergy.com/investors/news-releases/news-release-detail/?id=122714

[21] MEG Energy, *2022 ESG Performance Data Report* (2022), 5. https://www.megenergy.com/wp-content/uploads/2022/08/MEG-2022-ESG-Performance-Data-Supplement-Including-SASB-Index-FINAL.pdf

[22] Imperial Oil Limited, "Investor Day," presentation, March 10, 2022, 64. https://www.imperialoil.ca/-/media/Imperial/Files/Investor/Speeches-and-presentations/Imperial_2022-Investor-Day.pdf

[23] For a fuller explanation of emissions intensity targets versus absolute emissions reductions, see Eyab Al-Aini, Chris Severson-Baker and Jan Gorski, *Getting on Track: A primer on challenges to reducing carbon emissions in Canada's oilsands* (Pembina Institute, 2022), 27. https://www.pembina.org/pub/getting-track

[24] Imperial Oil Limited, *Advancing Climate Solutions* (2022), 2. https://www.imperialoil.ca/-/media/Imperial/Files/Publications-and-reports/Advancing-Climate-Solutions-report.pdf

[25] GHG emissions intensity reduction potential in 2030 are: 2% for non-condensable gas injection, 1.4% for SA-SAGD, 2% for CSP commercialization. The reductions of other emissions reduction efforts are not disclosed. *Advancing Climate Solutions,* 19.

[26] 10 Mt CO_2e includes GHG emissions reduction from cogeneration, renewable fuels, renewable power, solvents, CCUS/hydrogen and bitumen conversion. No details were provided on the estimated Scope 1, 2, 3 emissions reduction from each segment. Suncor Energy, *Climate Report 2022*, Aug 2022, 27. https://sustainability-prd-cdn.suncor.com/-/media/project/ros/shared/documents/climate-reports/2022-climate-report-en.pdf

[27] This is a fuel switching project from the from very high emission petroleum coke to natural gas that will co-generate both steam and electricity (thus the name co-generation, sometimes referred to as cogen). The steam and electricity will be used to run Suncor's Oil Sands Base Plant operations.

[28] Suncor Energy, *2022 Q2 Suncor Investor Information Supplemental,* August 4, 2022, 31,36. https://sustainability-prd-cdn.suncor.com/-/media/project/suncor/files/investor-centre/investor-relations-presentations-2022/2022-q2-suncor-investor-relations-supplemental-information-package-en.pdf

[29] Brandon Mulder, "Suncor divests from wind, solar in favor of hydrogen, renewable fuels in pursuit of net-zero," *S&P Global Commodity Insights*, April 5, 2022. https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/energy-transition/040522-suncor-divests-from-wind-solar-in-favor-of-hydrogen-renewable-fuels-in-pursuit-of-net-zero

[30] ConocoPhillips, *2022 Second-Quarter Earnings Supplemental package* (2022), 5. https://static.conocophillips.com/files/resources/2q22-supplemental-information.xlsx

[31] ConocoPhillips, 2021 Sustainability Performance Metrics by Country, (2022) https://static.conocophillips.com/files/pages/detailed-metrics-chart-by-country-08-16-22.xlsx

[32] ConocoPhillips, *Canada 2022 Fact Sheet.* https://static.conocophillips.com/files/resources/conocophillips-canada-factsheet-2022.pdf

[33] 77% of investment is in the U.S. which includes both Alaska at $982 million (19%) and Lower 48 at $3,129 million, (59%). Investment for Canada is $203 million (3.8%), Total investment is $5,324 million.

[34] ConocoPhillips, *2022 Second-Quarter Earnings Supplemental package*, 5.

[35] ARC Energy Research Institute, *ARC Energy Charts*, August 22, 2022, 8. https://www.arcenergyinstitute.com/wp-content/uploads/220822-Energy-Charts.pdf

[36] In 2014, oilsands investments for all purposes is estimated at $33.8 billion; in 2022 it is estimated at $10 billion. *ARC Energy Charts*, August 22, 2022, 8.

[37] The sixth member of Pathways, ConocoPhillips, has been excluded because of its much larger total size compared with the other five members — while Canadian oilsands assets represent only around 3%-5% of ConocoPhillips' entire portfolio.

In order to give a better comparison between profit levels in pre- and post-pandemic years, 2020 has been excluded from this graph.

[38] Financials for each company can be accessed at MarketWatch. https://www.marketwatch.com/

[39] Bank of Canada Business Outlook Survey — Second Quarter of 2022. https://www.bankofcanada.ca/?p=227390

[40] Some assets will increase production by optimizing existing processing facilities for higher volumes.

[41] Values for 2022 are displayed as the middle of the range between low and high estimates. Cenovus historical production is given only after its 2021 merger with Husky. Numbers include bitumen, synthetic crude oil, and natural gas liquids. Production from Kearl reflects net-equity share of 71% by Imperial Oil.

[42] Company annual reports obtained from Canadian Securities Administrators, "SEDAR." https://www.sedar.com/

[43] MEG Energy, "MEG Energy announces second quarter results including continued debt repayment, inaugural share repurchases and renewal of credit facilities."

Imperial Oil Limited, "Investor Day," 67.

Cenovus, Corporate Guidance, July 27, 2022, 1. https://www.cenovus.com/Investors/Corporate-guidance

Suncor, Corporate Guidance, August 4, 2022, 1. https://www.suncor.com/en-ca/investors/corporate-guidance

CNRL, *Corporate Presentation*, 6.

[44] Equinor, *Energy Perspectives 2021,* 22. https://cdn.sanity.io/files/h61q9gi9/global/015217b3593428c0bfaf7ad641dffb43a1a92249.pdf?energy-perspectives-report-2021.pdf

bp, *Energy Outlook 2022,* 45. https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/energy-outlook/bp-energy-outlook-2022.pdf

[45] Liang Jing et al., "Carbon intensity of global crude oil refining and mitigation potential, *Nature Climate Change* 10 (2020). https://sccs.stanford.edu/publications/journal-articles/carbon-intensity-global-crude-oil-refining-and-mitigation-potential

[46] IEA, *World Energy Investment 2022*, 108. https://www.iea.org/reports/world-energy-investment-2022

[47] Includes CNRL, MEG, Suncor, Cenovus and Imperial Oil. The sixth member of Pathways, ConocoPhillips, has been excluded because of its much larger total size compared with the other five members — while Canadian oilsands assets represent only around 3%-5% of ConocoPhillips' entire portfolio.

[48] Financials for each company can be accessed at MarketWatch. https://www.marketwatch.com/