Sightline INSTITUTE

Stop Kinder Morgan Vancouver Rally by David Niddrie used under CC BY-NC 2.0

A Decade of Successes Against Fossil Fuel Export Projects in Cascadia

The region counts 40 canceled oil, gas, and coal export projects since 2012.

June 2022 | By Emily Moore, Senior Researcher

Fossil fuel executives from dozens of companies, including Kinder Morgan, Pembina Pipeline Corporation, and Enbridge, once seemed to be salivating over the idea of exporting massive quantities of gas, oil, and coal from the Cascadia coast. The hydrocarbon industry envisioned the region as a way station along a path that started at coal mines in Montana and Wyoming, tar sands in Alberta, oil wells in North Dakota, and fracked gas fields in British Columbia, and that continued beyond Cascadia to traverse the Pacific Ocean before reaching markets in Asia.

But local communities, Tribes, environmentalists, and local governments rejected calls to turn Cascadia into a fossil fuel export terminal.[1] They protested projects' abrogation of Indigenous sovereignty, the risk of oil spills and damage to sensitive ecosystems, the pollution spewing from coal trains, the climate harms of extracting, transporting, and burning hydrocarbons, and the safety hazards of transporting flammable fuels through populated areas.[2]

And for the most part, they've won.

Only a quarter of Cascadian fossil fuel export proposals survived the last decade

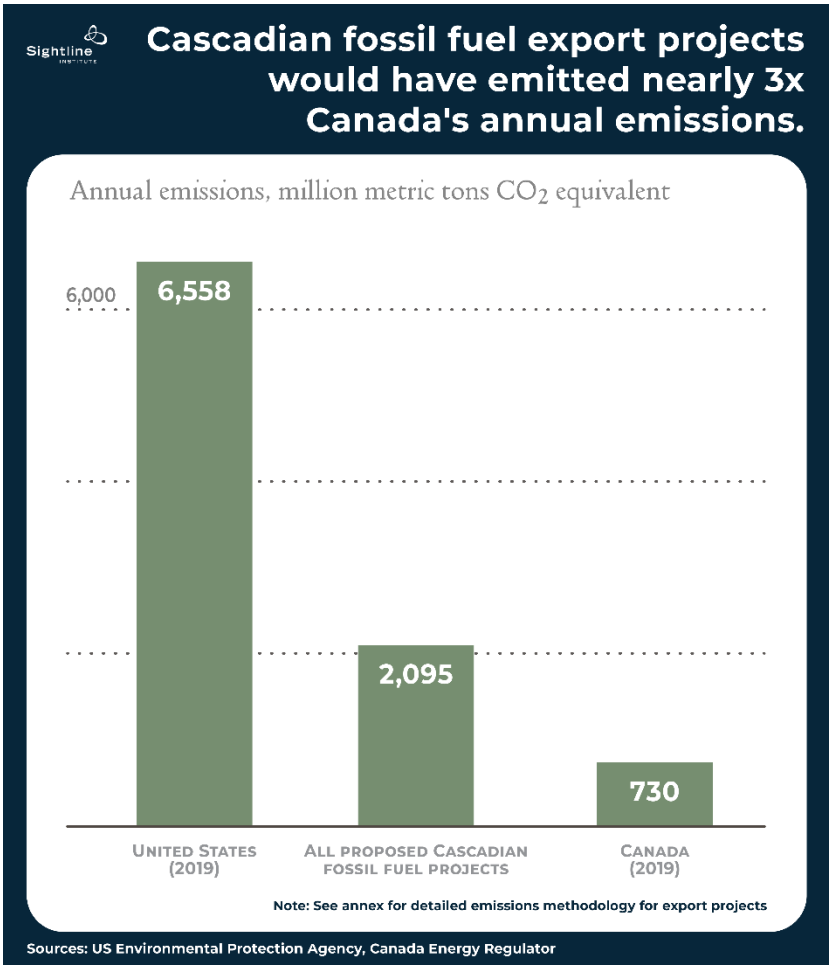
Since 2012 fossil fuel interests have schemed more than 50 large projects to export coal, oil, gas, or their derivatives from Cascadia's coast in British Columbia, Oregon, and Washington.[i] These proposals came in waves: first coal, then oil, and then fracked gas, driven by a combination of market and policy-related factors like the plummeting US demand for coal, the fracking boom of the 2010s that transformed the United States into the world's top oil and gas producer, and the Obama administration's 2015 reversal of the United States' 40-year crude oil export ban.[3] Several projects earned dubious distinctions, including the largest coal export terminal in North America and the largest oil export terminal in the United States.[4]

Today, 40 of those—a whopping 73 percent—have been canceled by project backers who faced local opposition, see-sawing energy prices, and regulatory hurdles. Fossil fuel companies completed just 6 projects of the 55 they once proposed: 3 coal export terminal expansions and 3 new propane export terminals. Nine more projects are still in the works. The chart below counts the projects by status: canceled projects are indicated in the topmost group; completed projects are in the middle; and at the bottom are projects that are neither completed nor canceled yet.

[i] This analysis includes only export-oriented projects of coal, oil, gas, liquified petroleum gas (i.e., propane), and methanol.

Proposed fossil fuel export projects would have emitted nearly three times Canada's annual greenhouse gases

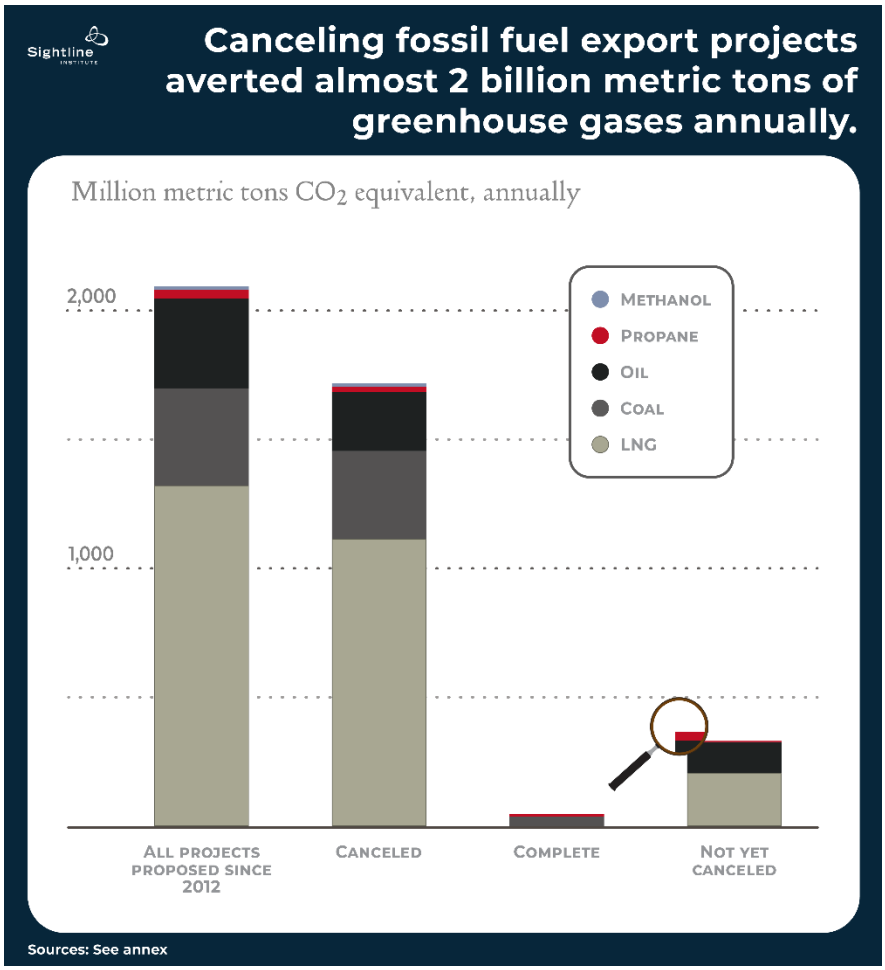
Collectively, these projects would have spelled disaster for the climate. Extracting, transporting, and burning the fuel associated with all the Cascadian fossil fuel export proposals would have spewed the equivalent of 2,095 million metric tons of CO2 into the atmosphere annually.[ii] To put that in perspective, 2,095 million metric tons is roughly 30 percent of the entire annual greenhouse gas emissions of the United States, which, at 6,558 million metric tons a year, emits more than every other country except China.[5] Or, put another way, 2,095 million metric tons is nearly three times that of Canada, the world's tenth largest emitter.[iii,6] The chart below shows the 2019 emissions of the United States and Canada in the left and right bars and the averted emissions of all the canceled fossil fuel export projects in the middle bar.



[ii] See annex for detailed methodology on emissions calculations.

[iii] 2019 figures for Canada and the United States. 2020 emissions declined due to the COVID-19 pandemic, but evidence shows they rose again in 2021. Official 2021 figures are not yet available.

But canceling 40 projects averted 1,717 million metric tons of annual greenhouse gas emissions—82 percent of the total potential emissions from all projects—as shown by the second bar from left below. Projects that did come to fruition belch the equivalent of an estimated 46 million metric tons CO2 annually, and those that are still kicking would spew an estimated 330 million metric tons into the atmosphere annually, as shown by the third and fourth bars respectively below.

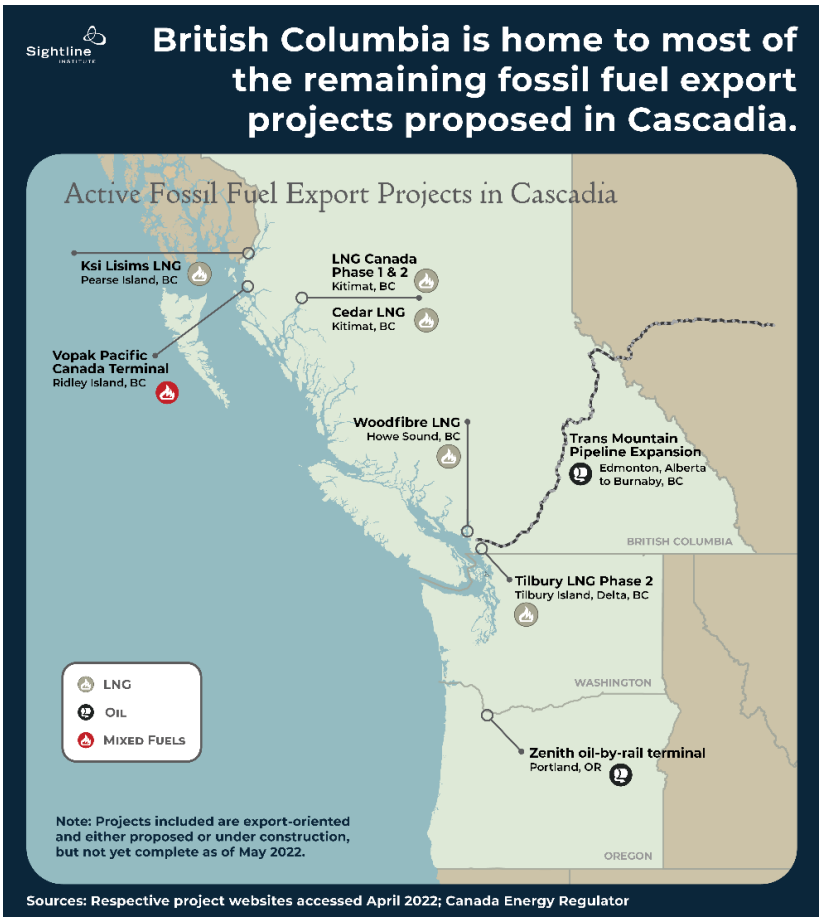


Putting aside for a moment the odious and well-documented local health and environmental justice effects of fossil fuel infrastructure projects, a skeptic might wonder whether canceling these projects really benefits the climate, which is, after all, a global system.[7] Couldn't project backers find another place from which to ship their polluting fuels if they can't do it here? In theory, yes; in practice, no. Fossil fuel export projects like those proposed in Cascadia can cost billions, depend on the ability to extract nearby resources, and take years or decades to build.[8] When a company walks away from a project in one place, it cannot easily pick up and move to another.

Plus, climate scientists have made clear that building more fossil fuel infrastructure would mean game over for meeting the Paris agreement goal of limiting warming to 1.5 degrees Celsius.[9] Emissions from fossil fuel infrastructure *already planned or in place* will catapult the world to 2 degrees of warming, according to the Intergovernmental Panel on Climate Change's (IPCC) most recent report.[10] By scrapping dozens of proposals for new fossil fuel export facilities, Cascadia contributed billions fewer tons of "locked in" carbon to the global carbon budget than it might have a decade ago.[11]

British Columbia remains an outlier

Unfortunately, Cascadia cannot claim victory just yet. Canada distinguishes itself as the last frontier for large-scale fossil fuel export projects in Cascadia; of the nine projects not yet canceled, eight are in British Columbia, as indicated by the map below. Plus, opponents continue to fight non-export focused fossil fuel projects like Tacoma LNG.[12]



Of the remaining projects, the decade-long multibillion-dollar boondoggle to expand the Trans Mountain oil pipeline would be the single largest greenhouse gas emitter. Prime Minister Justin Trudeau stands steadfastly behind the project despite ballooning costs, local opposition, and his own administration's climate commitments.[13]

And while Premier John Horgan's BC provincial government opposes the Trans Mountain pipeline, it remains friendly to projects that will liquify fracked gas from northeastern British Columbia and export it from the coast.[14] Completing the five liquified natural gas (LNG) export facilities currently proposed in British Columbia would make it all but impossible to meet the province's own climate commitments.[15]

Conclusion

Thanks to a decade-long fight by many, Cascadia can breathe a little easier knowing that it may not become a major exporter of polluting fossil fuels after all. Of an all-time high of 55 oil, gas, and coal export projects over the last decade, just nine are not yet canceled, almost all of which are in British Columbia.

But the battle is far from over; remaining export projects would collectively emit the equivalent of roughly half of Canada's entire annual emissions if they end up seeing the light of day. Several First Nations, environmental and community groups, concerned residents, and others continue to fight them every step of the way to ensure that doesn't happen.[16] If a livable future is something leaders in British Columbia and Ottawa are serious about, they will also relegate these remaining projects to history's trash can.

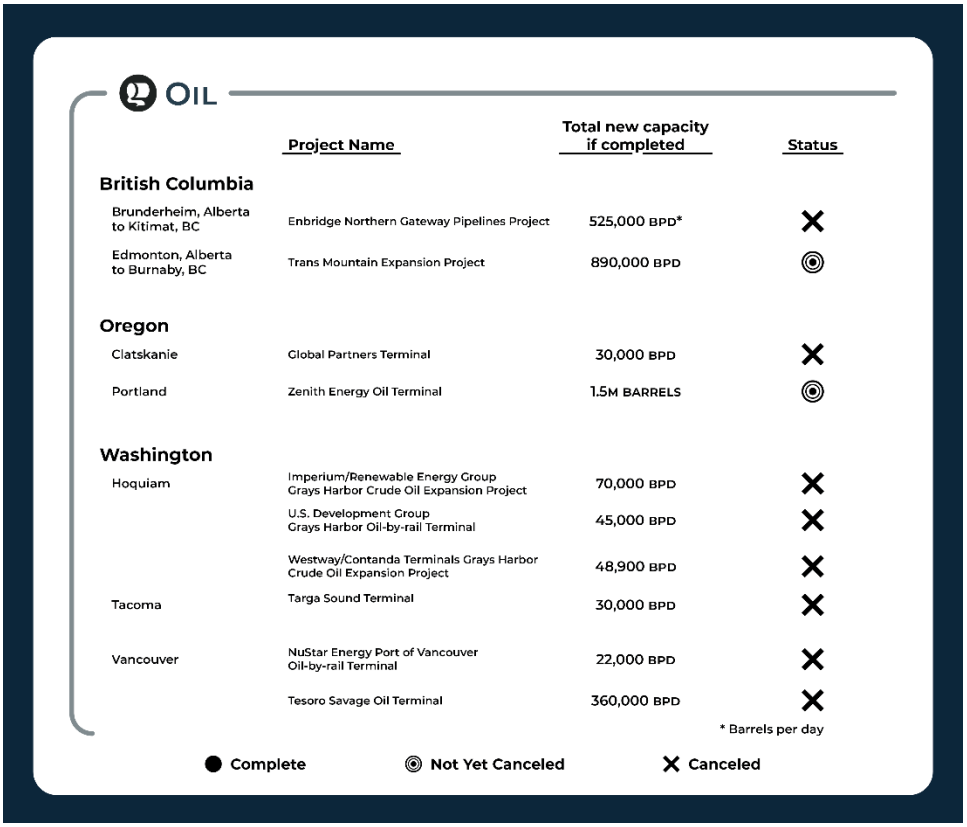
Emily Moore *is a senior researcher with Sightline Institute and head of its fossil fuel transition program. Reach her at emily@sightline.org.*

Annex: Emissions methodology

To allow for comparison across sources, Sightline relied on the 100-year Global Warming Potential of greenhouse gases.[17] This means that emissions estimates that include methane are underestimated in the near term, since methane has more than twice the Global Warming Potential over a 20-year period than it does over a 100-year period.

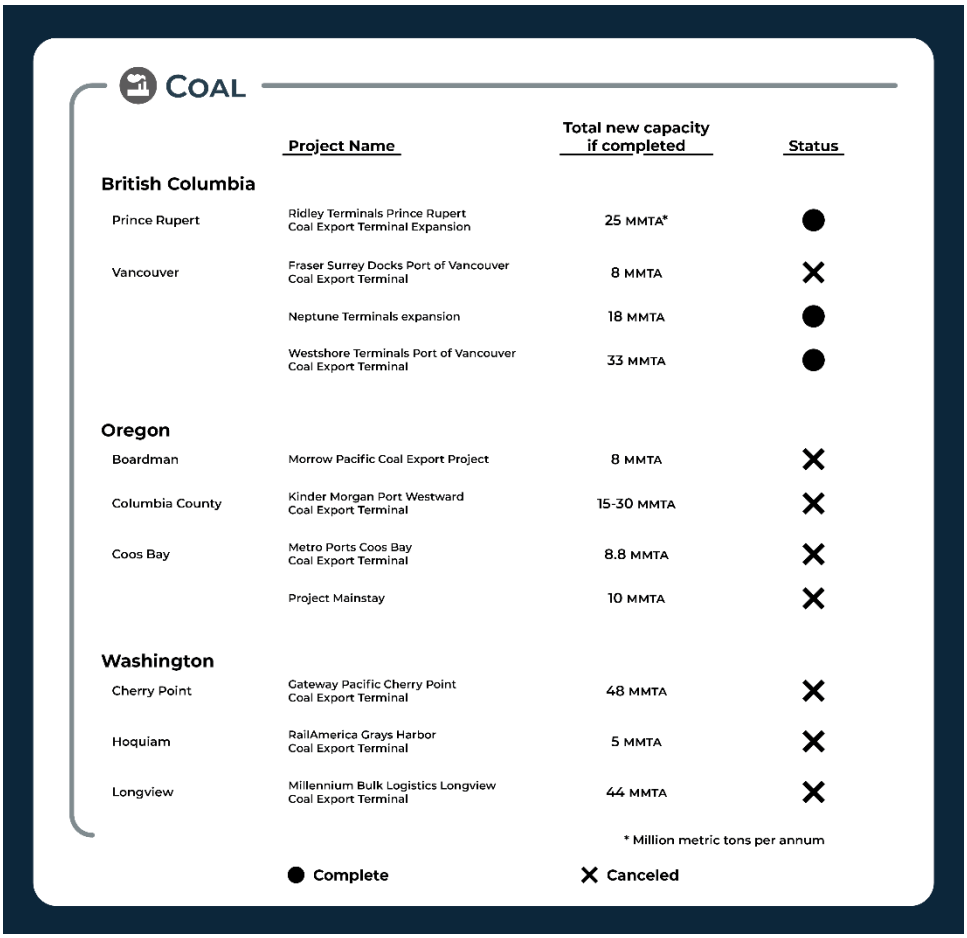
Oil

Sightline assumed that the majority of oil used in proposed oil export projects would be refined into gasoline. Sightline used US Environmental Protection Agency's (EPA) lifecycle gasoline emissions figure of 98.2 kilograms of CO2 equivalent (CO2e) per million British thermal units and the US Energy Information Agency's (EIA) estimate of the energy content of oil produced in the United States to calculate a lifecycle emissions ratio of 0.559 metric tons of CO2e per barrel of oil.[18] This may understate emissions because Canadian tar sands oil of the type flowing to and through Cascadia has among the highest emissions intensities in the world.[19]



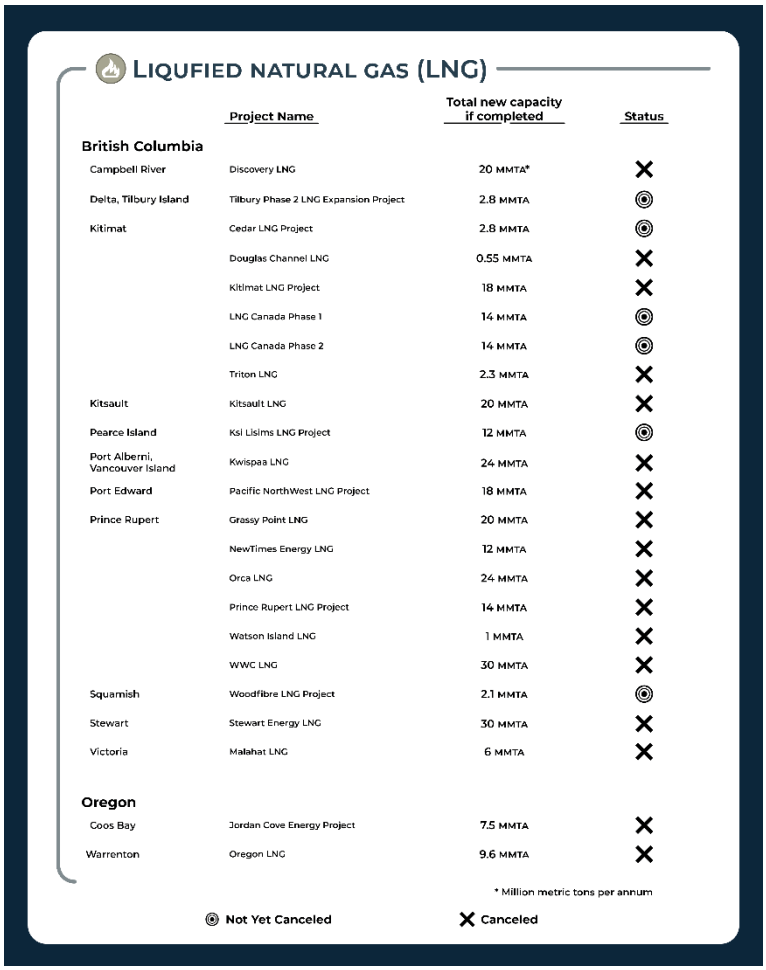
Coal

Sightline used the estimated average lifecycle emissions of Powder River Basin coal exports to select Asian markets according to a 2016 Department of Energy report (868 kilograms of CO2 equivalent per megawatt hour) and the average amount of Powder River Basin coal required to generate one MWh according to the same source, to calculate a lifecycle emissions ratio of 2.1 metric tons of CO2e per metric ton of coal exported.[20] Actual lifecycle emissions would vary depending on the coal's origin and the efficiency of the power plant where it was burned.



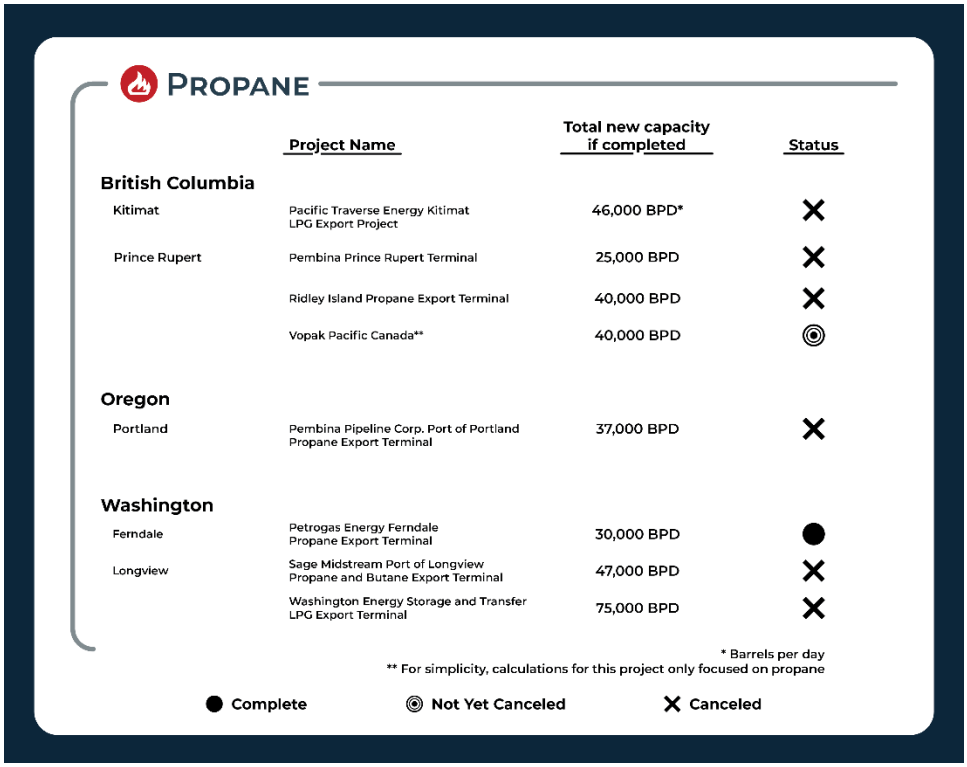
Liquified natural gas (LNG)

Sightline used the estimated average lifecycle emissions of Canadian liquified natural gas exports according to a 2018 report by researchers from the University of Calgary, Massachusetts Institute of Technology, Southern Methodist University, and Johns Hopkins University (662 kilograms CO2e per MWh).[21] Using the EIA's estimate of the amount of natural gas required to generate one kilowatt hour of electricity in the US power sector, Sightline calculated a lifecycle emissions ratio of 4.3 metric tons of CO2e per metric ton of LNG exported.[22]



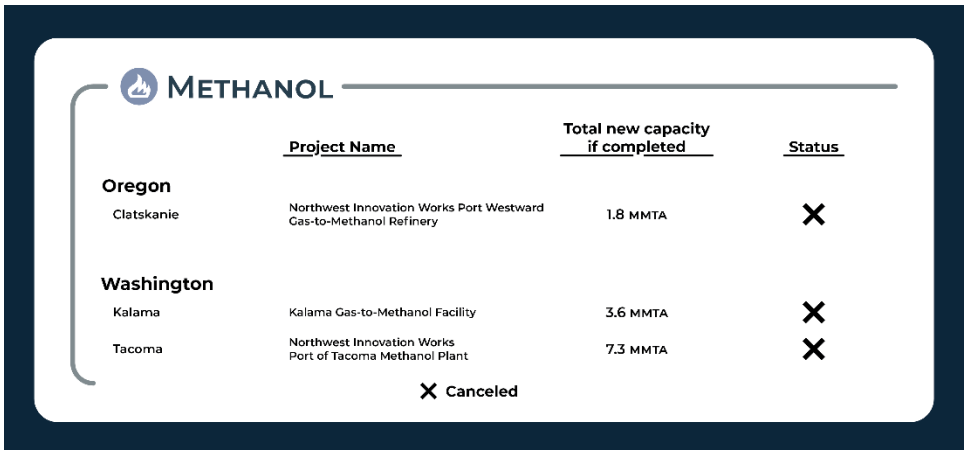
Liquified petroleum gas (LPG)

Sightline added the EIA's estimates of downstream emissions of propane combustion (5.75 kg CO2 per gallon) to upstream emissions associated with producing natural gas in British Columbia per British Columbia's provincial greenhouse gas inventory (0.006 metric tons CO2e per thousand cubic feet).[23] Combining upstream and downstream emissions, Sightline estimates lifecycle emissions of 276 metric tons of CO2e per thousand barrels of propane. Sightline relied on upstream gas emissions rather than oil since most projects proposed were located in British Columbia and would have relied upon (or do rely upon) natural gas as their feedstock. However, some projects may have relied on oil feedstock, which would change these estimates. For simplicity, Sightline assumed the full capacity of all bulk fuels export terminals would be used for propane, when in practice some were or are intended to export a variety of fuels with different emissions profiles (e.g., butane). Finally, these estimates are likely low, since they do not account for the emissions associated with the export facilities themselves or fuel transport.



Methanol

Sightline relied on Stockholm Energy Institute's (SEI) estimation of the annual greenhouse gas emissions of the methanol facility that Northwest Innovation Works proposed in Kalama, Washington (4 million metric tons CO2e).[24] For consistency with other sources, Sightline used SEI's 3 percent methane leakage rate and the 100-year Global Warming Potential scenario. Scaled to the estimated capacity of the Kalama facility, Sightline calculated a lifecycle emissions ratio of 1.1 metric tons of CO2e per metric ton of methanol.



[1] Eric de Place, Rich Feldman, Nick Abraham, et al., "Thin Green Line Activism," 14 articles, Sightline Institute, Dec., 17, 2013–June 8, 2017, www.sightline.org/series/thin-green-line-activism/; de Place, "How Northwest Communities Are Stopping Fossil Fuel Projects Before They Start," Sightline Institute, www.sightline.org/2018/04/23/how-northwest-communities-continue-to-stop-fossil-fuel-projects-before-they-start/.

[2] Robert McClure, "A Thin Green Line," Grist, Jan. 31, 2021, https://grist.org/justice/washington-oregon-british-columbia-activism-lng-coal-exports/; Eric de Place et. al, "The Risk of Northwest Oil Spills," 16 articles, Sightline Institute, Nov. 21, 2014–June 5, 2017, www.sightline.org/series/the-risk-of-northwest-oil-spills/page/2/; de Place et al., "A Crackdown on Coal Prices," 10 articles, Sightline Institute, Oct. 4, 2011–May 12, 2016, www.sightline.org/series/coal-dust-crackdown/; de Place, "Three Reasons Why the Kalama Methanol Project Would Be a Climate Disaster," Sightline Institute, April 19, 2018, www.sightline.org/2018/04/19/three-reasons-why-the-kalama-methanol-project-would-be-a-climate-disaster/; de Place et al., "Oil Train Explosions and Derailments," 25 articles, July 7, 2013–July 8, 2015, Sightline Institute, www.sightline.org/series/oil-train-explosions-and-derailments/.

[3] Taylor Kuykendall and Anna Duquiatan, "US Coal's 'Road to Extinction' May Take Well Over a Decade without Policy Push," S&P Global Market Intelligence, Feb. 2, 2021, www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/us-coal-s-road-to-extinction-may-take-well-over-a-decade-without-policy-push-62420152?utm_campaign=corporatepro&utm_medium=contentdigest&utm_source=coalsconundrum; International Energy Agency, "The US Shale Revolution Has Reshaped the Energy Landscape at Home and Abroad, According to Latest IEA Policy Review," Sept. 13, 2019, www.iea.org/news/the-us-shale-revolution-has-reshaped-the-energy-landscape-at-home-and-abroad-according-to-latest-

iea-policy-review; Gillian Rich, "Oil Export Ban Lifted as Obama Signs Spending Bill," Investor's Business Daily, Dec. 18, 2015, www.investors.com/news/oil-export-ban-lift-needs-obama-ok/.

[4] State of Washington Department of Ecology, "Millennium Bulk Terminals Longview," https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-at-Ecology/Millennium; Floyd McKay, "The Northwest's Coming Clashes over Fossil Fuel Exports," Crosscut, Dec. 9, 2015, https://crosscut.com/2015/12/big-year-ahead-in-northwests-wrangling-with-big-energy.

[5] U.S. Environmental Protection Agency, "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2020," www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2020.

[6] Environment and Climate Change Canada, "National Inventory Report 1990–2020: Greenhouse Gas Sources and Sinks in Canada, Executive Summary," 2022, https://publications.gc.ca/collections/collection_2022/eccc/En81-4-1-2020-eng.pdf.

[7] Rachel Ramirez, "The Fight Against Fossil Fuel Infrastructure Is the Fight for Healthy Communities," KCET, Dec. 17, 2020, www.kcet.org/shows/power-health/the-fight-against-fossil-fuel-infrastructure-is-the-fight-for-healthy-communities; Julia Kane, "Historically Redlined Neighborhoods Have Twice the Number of Oil and Gas Wells," Grist, April 13, 2022, https://grist.org/accountability/redlined-neighborhoods-pollution/.

[8] Omar Mawji and Brad Williams, "Review of LNG Canada Project: Delays, Policy Changes, and Rising Costs," Institute for Energy Economics and Financial Analysis, Nov. 2021, https://ieefa.org/wp-content/uploads/2021/11/Review-of-LNG-Canada-Project-Delays-Policy-Changes-and-Rising-Costs_November-2021.pdf; Emily Moore, "Five Reasons That Expanding the Trans Mountain Oil Pipeline Is Still a Colossal Mistake," Sightline Institute, March 8, 2022, www.sightline.org/2022/03/08/five-reasons-that-expanding-the-trans-mountain-oil-pipeline-is-still-a-colossal-mistake/.

[9] Dan Tong et al., "Committed Emissions from Existing Energy Infrastructure Jeopardize 1.5°C Climate Target," *Nature*, July 1, 2019, www.nature.com/articles/s41586-019-1364-3.

[10] P.R. Shukla et al., eds., "Climate Change 2022: Mitigation of Climate Change," International Panel on Climate Change, 2022, www.ipcc.ch/report/ar6/wg3/.

[11] P. Erickson et al., "Carbon lock-in from fossil fuel supply infrastructure," Stockholm Environment Institute, Sept. 23, 2015, www.sei.org/publications/carbon-lock-in-from-fossil-fuel-supply-infrastructure/; V. Masson-Delmotte et al., eds, "Global Warming of 1.5ºC," International Panel on Climate Change, 2018, www.ipcc.ch/sr15/chapter/spm/.

[12] Associated Press, "Liquefied Natural Gas Plant in Tacoma Gets OK from State Pollution Board," KNKX, Nov. 23, 2021, www.knkx.org/environment/2021-11-23/liquefied-natural-gas-plant-in-tacoma-gets-ok-from-state-pollution-board.

[13] Department of Finance Canada, "Government Announces Next Steps on Trans Mountain Expansion Project," Government of Canada, Feb. 18, 2022, www.canada.ca/en/department-finance/news/2022/02/government-announces-next-steps-on-trans-mountain-expansion-project.html; Emily Moore, "Five Reasons That Expanding the Trans Mountain Oil Pipeline Is Still a Colossal Mistake," Sightline Institute, March 8, 2022, www.sightline.org/2022/03/08/five-reasons-that-expanding-the-trans-mountain-oil-pipeline-is-still-a-colossal-mistake/.

[14] Ministry of Attorney General, "Statement on Trans Mountain Pipeline," Government of British Columbia, Sept. 1, 2017, https://news.gov.bc.ca/releases/2017AG0017-001516; Simon Little and Sean Boynton, "'Show Some Respect': Horgan Criticized for LNG Plant Visit that Skips Indigenous Leaders," Global News, Jan. 17, 2020, https://globalnews.ca/news/6428292/horgan-lng-visit-pipeline-dispute/.

[15] Emily Moore, "No, British Columbia's LNG Cannot Solve Europe's Russian Gas Problem," Sightline Institute, April 7, 2022, www.sightline.org/2022/04/07/no-british-columbias-lng-cannot-solve-europes-russian-gas-problem/.

[16] Tsleil-Waututh Nation Sacred Trust initiative, https://twnsacredtrust.ca/.

[17] US Environmental Protection Agency, "Understanding Global Warming Potentials," www.epa.gov/ghgemissions/understanding-global-warming-potentials.

[18] US Environmental Protection Agency, "Lifecycle Greenhouse Gas Results," www.epa.gov/fuels-registration-reporting-and-compliance-help/lifecycle-greenhouse-gas-results; US Energy Information Administration, "Units and Calculators Explained," www.eia.gov/energyexplained/units-and-calculators/.

[19] Vipal Monga, "One of the World's Dirtiest Oil Patches Is Pumping More Than Ever," *Wall Street Journal*, Jan. 13, 2022, www.wsj.com/articles/oil-sands-canada-dirty-carbon-environment-11642085980.

[20] Timothy J. Skone et al., "Life Cycle Analysis of Coal Exports from the Powder River Basin," US Department of Energy, National Energy Technology Laboratory, Aug. 4, 2016, https://netl.doe.gov/projects/files/LifeCycleAnalysisofCoalExportsfromthePowderRiverBasinReport_080416.pdf.

[21] Adebola S. Kasumu et al., "Country-Level Life Cycle Assessment of Greenhouse Gas Emissions from Liquified Natural Gas Trade for Electricity Generation," *Environmental Science & Technology,* January 12, 2018, https://pubs.acs.org/doi/abs/10.1021/acs.est.7b05298.

[22] US Energy Information Administration, "How Much Coal, Natural Gas, or Petroleum Is Used to Generate a Kilowatthour of Electricity?" www.eia.gov/tools/faqs/faq.php?id=667&t=2.

[23] US Energy Information Administration, "Carbon Dioxide Emissions Coefficients," Nov. 18, 2021, www.eia.gov/environment/emissions/co2_vol_mass.php; Government of British Columbia, "Provincial Greenhouse Gas Emissions Inventory," https://www2.gov.bc.ca/gov/content/environment/climate-change/data/provincial-inventory.

[24] Peter Erickson and Michael Lazarus, "Towards a Climate Test for Industry: Assessing a Gas-Based Methanol Plant," Stockholm Environment Institute, 2018, https://cdn.sei.org/wp-content/uploads/2018/02/sei-2018-db-towards-a-climate-test.pdf.