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The Northwest's Pipeline on Rails

Crude oil shipments planned for Puget Sound, Grays Harbor, and the Columbia River.

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Summary

Since 2012, more than a dozen plans have emerged to ship crude oil by train to Northwest refineries and port terminals. Moving large quantities of oil by rail would be a major change for the Northwest's energy economy, yet most media accounts present only a fragmented view of the developments, and government regulators evaluate the projects largely in isolation from one another.

"The Northwest's Pipeline on Rails" presents the most comprehensive, region-wide review of all the oil-by-rail projects planned or currently operating in the Pacific Northwest. It finds that:

- In the Northwest, 15 refineries and port terminals are planning, building, or already operating oil-by-rail shipments.
- If all of the projects were built and operated at full capacity, they would require more than 100 loaded mile-long trains per week to traverse the Northwest's railway system. Many worry about the risk of oil spills along the region's extensive rail network, particularly in remote locations where emergency response would be challenging.
- Taken together, the oil-by-rail projects planned for the Northwest would be capable of delivering far more fuel than the region is capable of handling at its refineries. Ironically, two of the facilities that would handle oil by rail were originally built to supply renewable fuels, and a third proposal aims to blend crude oil with biofuel from foreign sources.
- The projects are largely designed to transport and handle light shale oil from the Bakken oil formation in North Dakota, but the infrastructure could also be used to export heavy Canadian oil. In fact, if all of the oil-by-rail projects were built, they would be capable of moving 1,019,872 barrels per day—nearly as much as the combined capacity of the two controversial pipelines planned in British Columbia, and 23 percent more than the planned Keystone XL pipeline, all of which are designed to ship Canadian crude.
- On the Salish Sea, five of the region's six refineries already receive oil-by-rail shipments. A trio of projects at the Port of Grays Harbor would move oil along the Washington coast. And on the Columbia River, two facilities in Oregon are already receiving oil-by-rail shipments, while two more in Washington are seeking permits to receive loaded crude oil trains, including plans for the largest such facility anywhere in North America.

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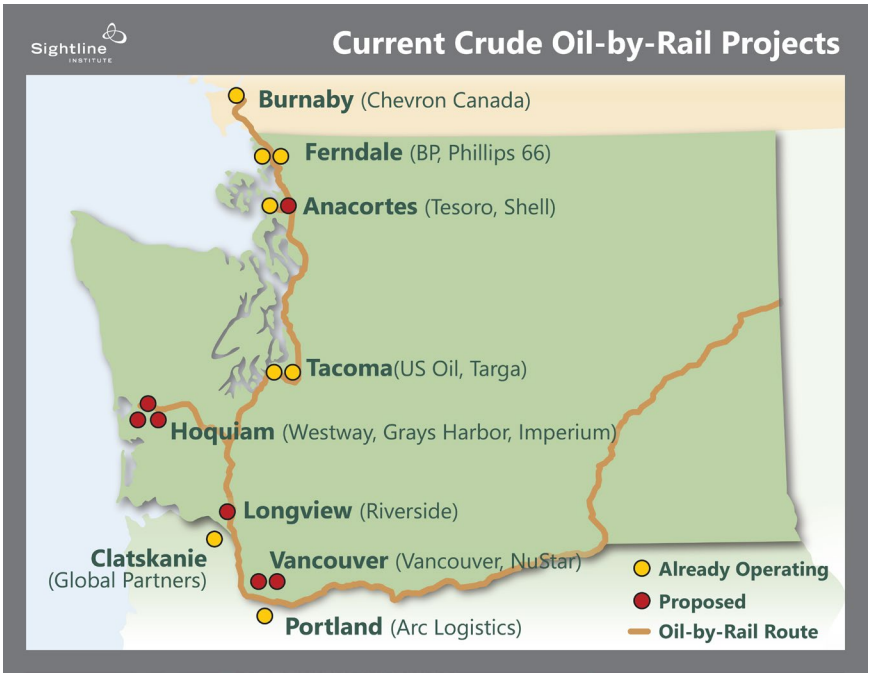
Analysis



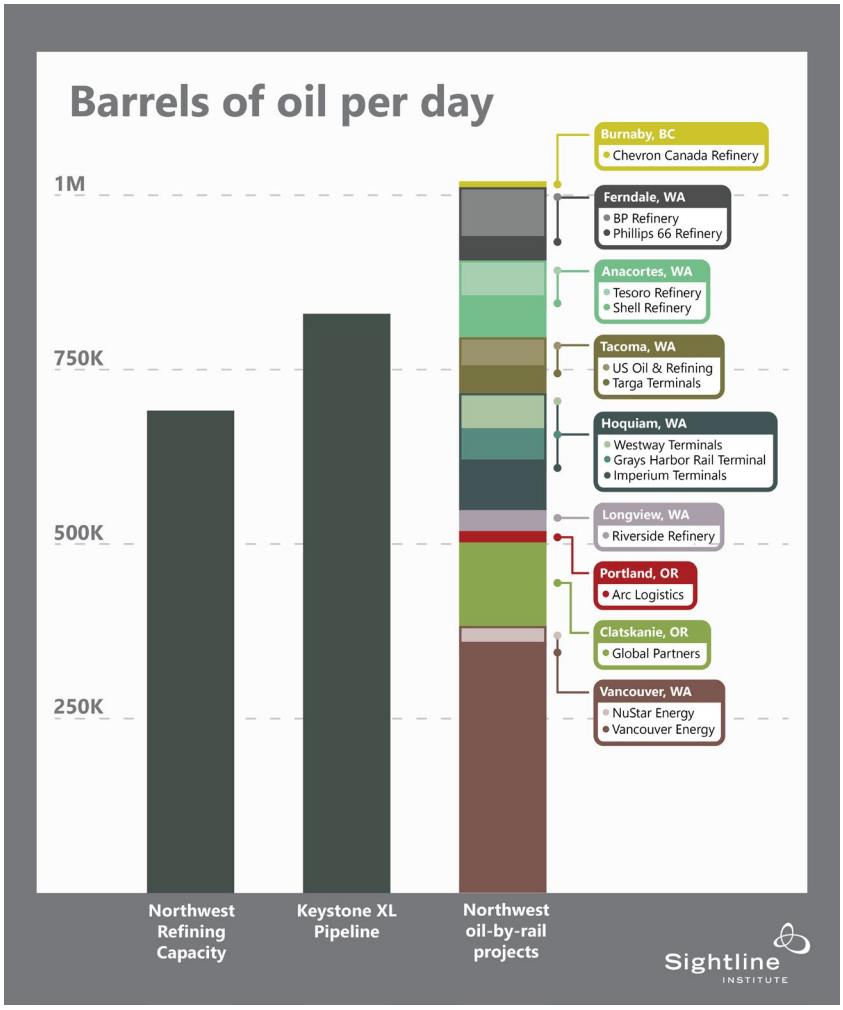
Locomotives pulling a hundred uniformly black tanker cars rolled to the shores of Puget Sound on a clear and sunny September 4, 2012. It was the first train to reach the Northwest coast bearing crude oil from North Dakota, and its arrival heralded a new era for the region's place in the global energy economy—one in which the Northwest could become a major oil transport hub.[1]

The oil had come from beneath the rangeland of western North Dakota, along a quiet and empty place sitting atop a huge oil field known as the Bakken formation. Until recently, the extensive shale oil deposits there were largely untapped because the oil was simply too difficult to extract. But new fracking and drilling techniques allowed oil companies in the Bakken to unleash a gusher of petroleum that is widely considered the most consequential American oil play in decades.

So sudden was the region's oil boom that companies found themselves with scant infrastructure to move the crude to market. Railways seized the opportunity to play a role traditionally reserved for pipelines: moving large volumes of crude oil. The rail industry embarked on a breakneck campaign of building tanker cars as refineries and ports began hatching plans to receive the product from trains.[2]

Today, oil companies are planning, building, or already operating 15 crude-oil-by-rail projects in British Columbia, Oregon, and Washington. The destinations include all six Northwest refineries, as well as nine port terminals. If all of them are built, they would be capable of delivering more than a million barrels of oil per day, a figure that far exceeds the region's total oil refining capacity. Taken together, Northwest oil-by-rail projects would have a much larger capacity than the controversial Keystone XL Pipeline.[3]

Ironically, two of the facilities that would handle oil by rail were originally built to supply renewable fuels. Imperium Renewables at the Port of Grays Harbor, Washington, was promoted to handle biodiesel, but the firm is now planning to expand its facilities to become a major player in shipping crude oil by rail.[4] And at Port Westward, near the town of Clatskanie, Oregon, a troubled ethanol facility that was supported by state renewable energy subsidies is already transferring crude oil from trains to vessels on the Columbia River.[5] A third such project would construct a refinery at the Port of Longview, Washington, also on the Columbia, that would be designed to handle one-third biofuel from international sources and two-thirds Bakken shale oil delivered by train.



A string of high profile derailments, spills, and explosions has raised widespread concern about the risks of moving large volumes of crude oil by rail. The first of these, a blast in a small town in Quebec that killed 47 people in the summer of 2013, gave way to at least nine subsequent occasions when oil train derailments unleashed towering fires.[6] Although new federal rules purport to improve safety standards for oil trains over time, the volume of crude shipped by rail has skyrocketed 50 or 60 times above the levels prior to 2010.[7]

Crude-oil-by-rail infrastructure is by no means restricted to serving the Bakken oil fields; it could also transport bitumen from the Canadian oil sands, a prospect currently impeded by serious transportation bottlenecks.[8] In Canada, pipelines planned to the Pacific Ocean are facing delay and staunch opposition, while US activists have questioned the wisdom of constructing the Keystone XL Pipeline, designed to deliver Canadian oil to the Gulf Coast. Large scale build-out of oil-by-rail projects in the Northwest could, in effect, serve as a pipeline on wheels for Canadian tar sands.

Regardless of the origin of the crude oil to be shipped by rail, the ultimate destination for the product is unclear. In some cases, oil delivered to West Coast refineries may displace existing supplies of crude such as those from Alaska's North Slope oil fields that currently arrive in tanker vessels. In other cases, the oil may be destined for export to Asia. Under current law, US crude oil can only rarely be exported overseas, but many in the oil industry are calling for Congress to lift the restriction, enabling oil

producers to sell American crude oil to China and other countries.[9] In fact, the Obama administration has already begun allowing peculiar and confusing exceptions to the law, and has failed to respond to a formal Freedom of Information Act request submitted by Sightline Institute and other organizations that would clarify official thinking about crude oil exports.[10] What's more, oil from Canada is not subject to the ban, so it is possible that the Northwest could become a transshipment hub for heavy Canadian oil destined for Asia.

Although oil-by-rail plans represent a potential transformation of the Northwest's energy economy, most media accounts take a fragmented view of the developments, while government regulators are evaluating the projects largely in isolation from one another. Until Sightline's original analysis in June 2013, no one had conducted a comprehensive project-by-project assessment of oil-by-rail facilities in the Pacific Northwest. This accounting identifies four new sites not previously included in the inventory and calculates that the region's total crude-oil-by-rail capacity could be substantially higher than thought previously: more than a million barrels per day.

Findings

Chevron Canada Refinery (Burnaby, BC)

Status: Operational

In 2013, Chevron Canada built a facility in Burnaby, BC, specifically designed to unload oil delivered by rail. Media reports indicate 8,000 barrels per day of crude oil are being offloaded, supplementing crude oil received by pipeline at the refinery.[11]

BP Refinery (Ferndale, WA)

Status: Operational

By far the largest refinery in the Northwest, BP's Cherry Point Refinery is located on Puget Sound. It can refine 230,000 barrels of oil per day. Plant managers built a $60 million railcar receiving and unloading facility that enables the refinery to accept 70,000 barrels of oil per day. It began receiving oil trains in December 2013.[12]

Phillips 66 Refinery (Ferndale, WA)

Status: Operational

Capable of processing 100,000 barrels of oil per day, the Phillips 66 Ferndale refinery is located on Puget Sound just south of Cherry Point. It is set to build a railcar receiving facility that will allow the plant to take 35,000 barrels of oil per day. The facility began operating in November 2014.[13]

Tesoro Refinery (Anacortes, WA)

Status: Operational

Tesoro's Anacortes Refinery sits on Puget Sound at March Point near Anacortes. Capable of refining 120,000 barrels per day, the company completed a $60 million rail improvement project in 2012 that allows it to receive 50,000 barrels of oil per day by railcar.[14]

Shell Refinery (Anacortes, WA)

Status: Proposed

The second largest refinery in the Northwest, with a capacity of 145,000 barrels per day, Shell's Puget Sound Refinery is located just south of the Tesoro Refinery at Anacortes. Officials there are planning a new rail loop and offloading facility that will enable it to handle 61,200 barrels per day of crude oil delivered by train. In February 2015, the Skagit County hearing examiner ruled that Shell must undertake a full environmental impact study, which officials predict will take at least a year to complete.[15]

US Oil Refinery (Tacoma, WA)

Status: Operational

Located at the Port of Tacoma, US Oil and Refining Company operates the smallest of the Northwest refineries, with a rated capacity of 39,000 barrels per day. In 2012, the plant spent $8 million building a new rail yard. Based on oil train movement data reported by BNSF Railway and figures from the Washington Department of Ecology, Sightline estimates that the facility can accept roughly 40,000 barrels of crude oil per day, on average, from crude oil trains. [16]

Targa Terminals (Tacoma, WA)

Status: Operational

Located at the Port of Tacoma, Targa Terminals has shifted focused toward crude-oil-by-rail operations, dramatically expanding their ability to simultaneously unload railcars in 2014. Permits indicate that the terminal now has handling capacity to move 40,004 barrels of crude oil per day brought in on trains and moved onto marine vessels. As of publication, Targa had not yet secured customers to use its facility and had not yet begun receiving oil trains.[17]

Grays Harbor Rail Terminal (Hoquiam, WA)

Status: Proposed

Grays Harbor Rail Terminal, a subsidiary of US Development Group, is planning to spend $80 million constructing a facility at the Port of Grays Harbor's Terminal 3. Plans call for receiving 45,000 barrels of crude oil per day by rail, storing it on-site in tanks, and transferring it to barge or vessel.[18]

Westway Terminals (Hoquiam, WA)

Status: Proposed

Westway's proposed terminal is located at the Port of Grays Harbor where it currently operates a methanol handling facility. Westway is planning to spend $60 million building five additional storage tanks, each big enough to store 200,000 barrels of oil, and developing related oil handling infrastructure. According to official project documents, the site will be equipped to move 48,918 barrels of oil per day received by trains, store it on-site, and load it onto barges or vessels. The company hoped that the site would be operational by January 2014, but legal appeals of the permits have delayed operations until 2016 at the earliest.[19]

Imperium Terminals (Hoquiam, WA)

Status: Proposed

Imperium, a biodiesel producer, is exploring a crude oil handling facility at the Port of Grays Harbor at the firm's existing site at Terminal 1. The company is proposing to spend $45 million constructing nine 80,000-gallon storage tanks and other facilities. Based on rail and handling estimates reported in its project documents, Sightline estimates that the site will be able to handle rough 73,500 barrels per day if it is completed. As with the Westway project, legal appeals have delayed construction until 2016.[20]

Riverside Refinery (Longview, WA)

Status: Proposed

Officials with Riverside Energy, a subsidiary of an ambiguous firm that claims to be based in Houston, are promoting plans to develop the first crude oil refinery on the Columbia River and the first on the West Coast in 25 years. The $800 million project would handle up to 30,000 barrels of North Dakota Bakken crude delivered by rail, in addition to 15,000 barrels of biofuel derived from international sources. The refined product would be distributed from Longview by ship.[21]

NuStar Energy (Vancouver, WA)

Status: Proposed

NuStar Energy operates fuel storage and shipping operations at several Port of Vancouver terminals. The project includes converting a 120,000-barrel methanol tank to crude oil storage and adding rail offload capacity of approximately 22,000 barrels per day of crude oil.[22]

Vancouver Energy (Vancouver, WA)

Status: Proposed

The most ambitious crude oil transshipment scheme in the Northwest is Tesoro's plan, in partnership with Savage Companies, to develop a $190 million rail complex at the Port of Vancouver with six new storage tanks. The facility would be capable of handling as much as 360,000 barrels of oil per day. Company officials originally hoped that the site would be operational by 2014, but most observers agree that permitting and review activities will delay the project's approval well into 2016.[23]

Columbia Pacific Bio-Refinery (Clatskanie, OR)

Status: Operational

Global Partners purchased a former ethanol plant at Port Westward on the Columbia River. Operators are currently receiving trainloads of crude oil, storing it on site in two 3.8 million-gallon tanks, and loading it onto vessels or barges. Although the company was legally allowed to handle only 50 million gallons of oil per year, they have blatantly violated the conditions of their permits by continuing to move far greater quantities. In August 2014, Global Partners won permission, pending appeals, to double its handling capacity to serve 50 oil trains per month, or an estimated 120,000 barrels per day.[24]

Arc Logistics (Portland, OR)

Status: Operational

In January 2014, Arc Logistics began handling crude-oil-bearing trains at its fuel terminal in Portland after it reconfigured the site. Based on publicly available financial filings, Sightline estimates that Arc Logistics is capable of handling 16,250 barrels per day in Portland.[25]

	Barrels Per Day	Trains Per Week
Burnaby, BC		
○ Chevron Canada Refinery	8,000	0.8
Ferndale, WA		
○ BP Refinery	70,000	7.0
○ Phillips 66 Refinery	35,000	3.5
Anacortes, WA		
○ Tesoro Refinery	50,000	5.0
● Shell Refinery	61,200	6.1
Tacoma, WA		
○ US Oil & Refining	40,000	4.0
○ Targa Terminals	40,004	4.0
Hoquiam, WA		
● Westway Terminals	48,918	4.9
● Grays Harbor Rail Terminal	45,000	4.5
● Imperium Terminals	73,500	7.4
Longview, WA		
● Riverside Refinery	30,000	3.0
Portland, OR		
○ Arc Logistics	16,250	1.6
Clatskanie, OR		
○ Global Partners	120,000	12.0
Vancouver, WA		
● NuStar Energy	22,000	2.2
● Vancouver Energy	360,000	36.0
○ **Already operating**	379,254	36
● **Proposed**	640,618	66
Total potential	1,019,872	102

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Methods and Sources

Oil volume figures given in this report represent a snapshot view of activities and plans as of June 2015 and are based on the best data available at the time of publication.[26] Sightline Institute's analysis does not include more speculative proposals such as the one at Prince Rupert, British Columbia. Train volumes are generic estimates by Sightline and not necessarily derived from project documents. Consistent with reports in mainstream media and industry publications, Sightline assumes in this report that a single railcar carries 700 barrels of oil and that an oil train consists of 100 railcars, which is equivalent to assuming that an average loaded train carries 70,000 barrels of oil.[27]

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Sightline Institute is a think tank providing leading original analysis of energy, economic, and environmental policy in the Pacific Northwest.

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