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MEMO

DATE: July 7, 2022

TO: Mayor Ted Wheeler
Portland City Council

FROM: Tom Armstrong, Supervising Planner

SUBJECT: Fossil Fuel Terminal Zoning (FTTZ) Amendments
Idaho Demand for Liquid Fossil Fuels

In considering whether the FFTZ amendments are equally or more supportive of the comprehensive plan as a whole, Council must consider Policy 6.48:

> **Policy 6.48 Fossil fuel distribution**. Limit fossil fuel distribution and storage facilities to those necessary to serve the regional market.

The Idaho Governor's Office of Energy and Mineral Resources, Idaho Petroleum Marketers & Convenience Store Association, Idaho Association of Commerce and Industry, Idaho State Representative Megan Blanksma and the Associated Taxpayers of Idaho submitted testimony that claims the proposed ordinance would seriously harm consumers in Oregon, Idaho and Washington by decreasing the availability of fuel in the future. The testimony urges the City to consider the entire Pacific Northwest region, and the states and communities that rely on the existing fuel terminal infrastructure. This memo documents that consideration.

The testimony claims that the City's analysis has been limited to the Portland region, which is a misinterpretation of the analysis. The BPS analysis of petroleum demand is based on data for the state of Oregon. The testimony is accurate in that the previous BPS analysis did not consider the fuel needs of Idaho (or eastern Washington). The testimony claims that Idaho is growing fast, expects increased fuel demand and as a result will need increased fuel infrastructure in Portland. This memo documents that consideration.

Key Findings

- The Idaho Office of Energy Resources' Idaho Energy Primer documents that Idaho has a relatively small transportation fuel market and only a small portion of Idaho's petroleum transportation fuels is transported through Portland.
- US EIA SEDS data shows that Idaho's petroleum consumption is less than Oregon and Washington. In 2020, Idaho's total petroleum consumption was 184.9 trillion Btu, which is 58 percent of Oregon's and 29 percent of Washington's petroleum consumption.
- US EIA SEDS data shows that Idaho's petroleum consumption grew at a compound annual growth rate of 0.7 percent from 2000-2019, whereas Oregon's consumption rate declined by -0.4 percent and Washington's rate declined by -0.05 percent.
- US EIA 2022 Energy Outlook forecast for the Mountain region forecasts higher growth rates in fuel consumption than for the Pacific region.
- Idaho is served by two pipelines in addition to barges on the Columbia River/Snake River ports. Petroleum products that are barged are supplied via the Olympic Pipeline and tankers/barges to Portland and Vancouver, where they are transferred to inland barges that bring the products upriver.
- Northern Idaho, which has about 20 percent of the population in Idaho, is served by pipeline and marine terminals in Pasco, WA and Spokane, WA, and a marine terminal in the Lewiston, ID area.
- A speculative future scenario where all of the future growth in fuel demand for northern Idaho needs to be supplied by Portland terminals shows that the forecasted decrease in gasoline consumption in Oregon and Washington would provide the needed capacity to meet the growing demand for gasoline in northern Idaho. The flat demand in distillate fuel oil does not account for the increasing renewable content that could create additional capacity to supply the marginal needs in northern Idaho.
- In addition to Portland's marine terminals, there are other ports in the Lower Columbia River that could meet any need for incremental expansion of fossil fuel storage capacity, such as Vancouver, which has an Olympic Pipeline distribution facility and marine terminal.
- The 2013 Oregon Resilience Plan included a recommendation to form a public-private partnership with the objective of reducing the state's vulnerability to seismic events by evaluating the diversification of locations for the storage of liquid fuels and identification of new liquid fuel energy corridors, which indicates a need to not become further dependent on the high risk location that is the Portland Critical Energy Infrastructure (CEI) Hub.

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Conclusion

- Northern Idaho petroleum consumption is approximately 12 percent of Oregon's petroleum consumption.
- Northern Idaho petroleum consumption is expected to increase.
- The increased demand is not solely dependent on supplies from Portland. There are multiple options available to meet future demand in the region, including other Lower Columbia River ports and pipeline terminals in Pasco and Spokane.
- The Fossil Fuel Terminal Zoning amendments only limit new fossil fuel storage tank capacity in Portland. The zoning code amendments do not regulate the direction of flow of petroleum products, nor do they regulate the ultimate destination/consumer of those products.

2016 Idaho Energy Primer

The Idaho Energy Primer is prepared by the Idaho Strategic Energy Alliance and the Idaho Office of Energy Resources. Idaho has a relatively small transportation fuel market, and has no refineries and limited pipeline infrastructure. All gasoline and diesel fuel used in Idaho is imported by truck, rail, or pipeline. Most Idaho markets receive petroleum-based fuels from refineries in Montana and Utah via two pipelines, one owned by ExxonMobil and ConocoPhillips (Yellowstone Pipeline) and the other by Tesoro Logistics LP (Northwest Products Pipeline). The Northwest Products Pipeline connects Salt Lake City with Spokane, Washington, and it has refined products terminals at Pocatello and Boise, Idaho, as well as Pasco, Washington. Additional supplies originate at three refineries in the Billings, Montana area and are transported to Spokane via the Yellowstone Pipeline. These pipelines generally operate at capacity on at least a seasonal basis, during the late spring and summer months when the demand for gasoline and diesel is at its highest.

A small portion of Idaho's supply originates at refineries in northwestern Washington. This fuel is transported to Portland via the Olympic Pipeline and marine vessels, where it is loaded onto barges and transported up the Columbia River-Snake River System to Pasco, Washington and Lewiston, Idaho.

US EIA state profile and energy estimates

https://www.eia.gov/state/seds/sep_use/tx/pdf/use_tx_ID.pdf

US EIA State Energy Data System (SEDS) is a comprehensive data set that consists of annual time series estimates of state-level energy use by major economic sectors, energy production and consumption data that are defined as consistently as possible over time and across sectors for analysis and forecasting purposes. For Idaho, the historic trend (back to 2000) shows that the energy consumption for all petroleum products has grown at a compound annual growth rate of 0.7 percent (Table 1). Distillate fuel oil (diesel) was the fastest growing component of petroleum products. Gasoline accounts for 50% of petroleum consumption, but since 1993 the

energy estimates also include fuel ethanol blended into motor gasoline, which makes it difficult to determine the total fossil fuel content of that fuel type.

Table 1. 2000-2019 Petroleum Consumption (trillion Btu)[1]

	2000	2010	2019	Compound Growth 2000-2019
Idaho				
Gasoline	80.1	83.5	96.2	1.0%
Distillate Fuel Oil	52.6	58.7	74.2	1.8%
All Petroleum	167.3	164.8	192.5	0.7%
Oregon				
Gasoline	187.2	185.1	191.7	0.1%
Distillate Fuel Oil	107.2	110.2	99.3	-0.4%
All Petroleum	379.3	352.9	351.4	-0.4%
Washington				
Gasoline	327.9	323.4	353.5	0.4%
Distillate Fuel Oil	141.6	142.0	163.2	0.7%
All Petroleum	833.2	710.3	824.2	-0.06%

Source: BPS from US EIA 2020 State Energy Data Table CT3

Table 2. 2019 Petroleum Fuel Consumption (trillion Btu)

	Gasoline	Distillate Fuel Oil	All Petroleum
Idaho	92.9	72.6	184.9
Oregon	166.2	102.3	316.1
Washington	353.5	163.2	824.2

Source: BPS from US EIA 2020 State Energy Data Table CT3

US EIA 2022 Annual Energy Outlook

https://www.eia.gov/outlooks/aeo/pdf/AEO_Narrative_2021.pdf

US Energy Information Administration produces the Annual Energy Outlook, which provides long-term energy projections. The 2022 report includes projections to 2050, and reflects current trends in energy production, delivery, and consumption technology, as well as economic and demographic trends (Table 3). It includes different assumptions regarding macroeconomic growth, world oil prices, and technological progress. A key takeaway is that the

[1] 2019 is used to account for any decreased consumption due to the COVID pandemic.

US energy intensity (energy consumed per dollar of GDP) continues to decline, even as the U.S. economy continues to expand.

Petroleum and other liquids remain the most-consumed fuel in the AEO 2022 Reference case. The transportation sector is the largest consumer of petroleum and other liquids, particularly motor gasoline and distillate fuel oil (diesel). The report finds that gasoline remains the dominant light-duty vehicle (LDV) fuel, but consumption does not return to pre-pandemic levels during the projection period out to 2050. Sales of conventional motor gasoline vehicles decrease through the projection period because of increasing sales of battery-electric vehicles (BEVs), hybrid-electric vehicles (HEVs), and plug-in hybrid-electric vehicles (PHEVs).

Jet fuel consumption is expected to grow. This growth arises from increases in air transportation outpacing increases in aircraft fuel efficiency.

US EIA data does not report non-fossil biofuels, such as ethanol or biodiesel, separately. Total petroleum data includes the volumes of fuel ethanol and biodiesel blended with motor gasoline and distillate fuel oil, respectively.[2]

Table 3. US Total Energy Consumption, All Sectors, Selected Sources

Select Sources	2025	2035	2050	Compound growth 2021-2050
Gasoline	16.74	16.05	16.79	0.1%
Jet Fuel	3.56	3.96	4.67	1.7%
Distillate Fuel Oil	8.43	7.93	7.88	-0.2%
All Petroleum	37.95	37.93	40.12	0.4%
Natural Gas	31.61	31.70	35.27	0.4%
Total	**99.84**	**100.76**	**108.68**	**0.4%**

Total US energy consumption, Reference Case, 2022 AEO Table 2
(quadrillion Btu per year)
https://www.eia.gov/outlooks/aeo/tables_ref.php

The US EIA divides the national forecast into regional forecasts, which provides another data point to compare consumption trends and forecasts that is closer to conditions in Oregon. The US EIA defines the Mountain region as Idaho, Montana, Wyoming, Colorado, Utah, Nevada, Arizona and New Mexico. The overall growth rate in total energy consumption in the Mountain region forecast is higher than the national forecast (Table 4).

[2] U.S. Energy Information Administration, State Energy Data System (SEDS): Technical notes and documentation - updates for 2020, Section 4 Petroleum, page 91.
https://www.eia.gov/state/seds/seds-technical-notes-updates.php?sid=US

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Table 4. Mountain Region, Total Energy Consumption, All Sectors, Selected Sources

Select Sources	2025	2035	2050	Compound growth 2021-2050
Gasoline	1.27	1.31	1.53	0.8%
Jet Fuel	0.30	0.35	0.41	2.2%
Distillate Fuel Oil	0.91	0.74	0.78	0.1%
All Petroleum	2.62	2.70	3.08	0.8%
Natural Gas	1.68	2.00	2.15	0.4%
Total	**7.52**	**7.83**	**8.72**	**0.6%**

Total energy consumption, Pacific region, Reference Case, 2022 AEO Table 2.9
(quadrillion Btu per year)
https://www.eia.gov/outlooks/aeo/tables_ref.php

BPS has forecasted the Idaho total energy consumption in 2050 by utilizing the forecasted growth rates for the Mountain region and applying them to the 2019 data in the US EIA State Energy Data System (Table 5).

Table 5. Idaho, Calculated Total Energy Consumption, All Sectors, Selected Sources

Select Sources	2019	2035	2050	2019-2050	Compound growth 2021-2050
Gasoline	.096	.108	.123	.027	0.8%
Jet Fuel	.008	.011	.015	.007	2.2%
Distillate Fuel Oil	.074	.075	.076	.002	0.1%
All Petroleum	.192	.216	.244	.052	0.8%
Natural Gas	.101	.107	.114	.013	0.4%
Total	**0.57**	**0.62**	**0.68**	**0.11**	**0.6%**

BPS calculation based on 2022 AEO Pacific Region Reference Case and US EIA 2021 State Energy Data System (SEDS)
(quadrillion Btu per year)
https://www.eia.gov/state/seds/sep_use/notes/use_print.pdf

BPS has forecasted the Oregon total energy consumption in 2050 by utilizing the forecasted growth rates for the Pacific region and applying them to the 2019 data in the US EIA State Energy Data System (Table 6).

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Table 6. Oregon, Calculated Total Energy Consumption, All Sectors, Selected Sources

Select Sources	2019	2035	2050	2019-2050	Compound growth 2021-2050
Gasoline	.192	.170	.150	-.042	-0.8%
Jet Fuel	.035	.050	.060	.025	1.6%
Distillate Fuel Oil	.099	.099	.099	.000	0.0%
All Petroleum	.352	.370	.390	.038	0.3%
Natural Gas	.151	.160	.170	.019	0.2%
Total	**1.03**	**1.09**	**1.16**	**0.13**	**0.4%**

BPS calculation based on 2022 AEO Pacific Region Reference Case and US EIA 2021 State Energy Data System (SEDS)
(quadrillion Btu per year)
https://www.eia.gov/state/seds/sep_use/notes/use_print.pdf

BPS has forecasted the Washington total energy consumption in 2050 by utilizing the forecasted growth rates for the Pacific region and applying them to the 2019 data in the US EIA State Energy Data System (Table 7).

Table 7. Washington, Calculated Total Energy Consumption, All Sectors, Selected Sources

Select Sources	2019	2035	2050	2019-2050	Compound growth 2021-2050
Gasoline	.353	.313	.277	-.076	-0.8%
Jet Fuel	.110	.140	.177	.067	1.6%
Distillate Fuel Oil	.163	.163	.163	.000	0.0%
All Petroleum	.824	.862	.901	.077	0.3%
Natural Gas	.263	.271	.279	.016	0.2%
Total	**2.08**	**2.21**	**2.34**	**0.26**	**0.4%**

BPS calculation based on 2022 AEO Pacific Region Reference Case and US EIA 2021 State Energy Data System (SEDS)
(quadrillion Btu per year)
https://www.eia.gov/state/seds/sep_use/notes/use_print.pdf

As shown in Figure 2 below, northern Idaho, which has about 20 percent of the population in Idaho, is served by terminals in Pasco, WA, Spokane, WA, and Lewiston, ID. BPS was unable to find data that identified how much fuel is supplied via pipeline or by barge from Portland and Vancouver to serve this market. For consideration, Table 8 presents a speculative future scenario where all of the future growth in fuel demand for northern Idaho needs to be supplied

by Portland terminals. This scenario shows that the forecasted decrease in gasoline consumption in Oregon and Washington would provide the needed capacity to meet the growing demand for gasoline in northern Idaho. The flat demand in distillate fuel oil does not account for the increasing renewable content that would create additional capacity to supply the marginal needs in northern Idaho. The code amendments include an exception to the fossil fuel storage tank limits that allows for additional storage tank capacity for jet fuel to meet the expected increase in demand.

Table 8. Northern Idaho 2019-2050 Petroleum Fuel Demand Scenario

Select Sources	Idaho 2019-2050	North. Idaho 2019-2050	Oregon 2019-2050	Washington 2019-2050
Gasoline	.027	.005	-.042	-.076
Jet Fuel	.007	.0014	.025	.067
Distillate Fuel Oil	.002	.0004	.000	.000
All Petroleum	.052	.010	.038	.077

Sources: 2022 AEO Reference Case and US EIA 2021 SEDS (quadrillion Btu per year)

Trends Analysis

The testimony raised concerns that fast population and economic (GDP) growth will result in increased demand for fossil fuels. BPS analyzed growth data from 2000 to 2020, which shows that demand for fossil fuel (petroleum) has lagged the population and GDP growth rates (Table 9 and Figure 1).

Table 9. Idaho Growth Rates – 2000-2020

	2000	2005	2010	2015	2020	Compound Growth 2000-2020
Petroleum Consumption	167.3	160.9	164.8	183.4	184.9	0.5%
Population	1,299	1,428	1,571	1,652	1,839	1.7%
GDP	47.3	56.0	58.3	63.1	73.7	2.1%

Sources: 2022 AEO Reference Case and US EIA 2021 SEDS (quadrillion Btu per year)
Federal Reserve Bank of St. Louis, Economic Research Division (billions of 2012 $), US Census Bureau

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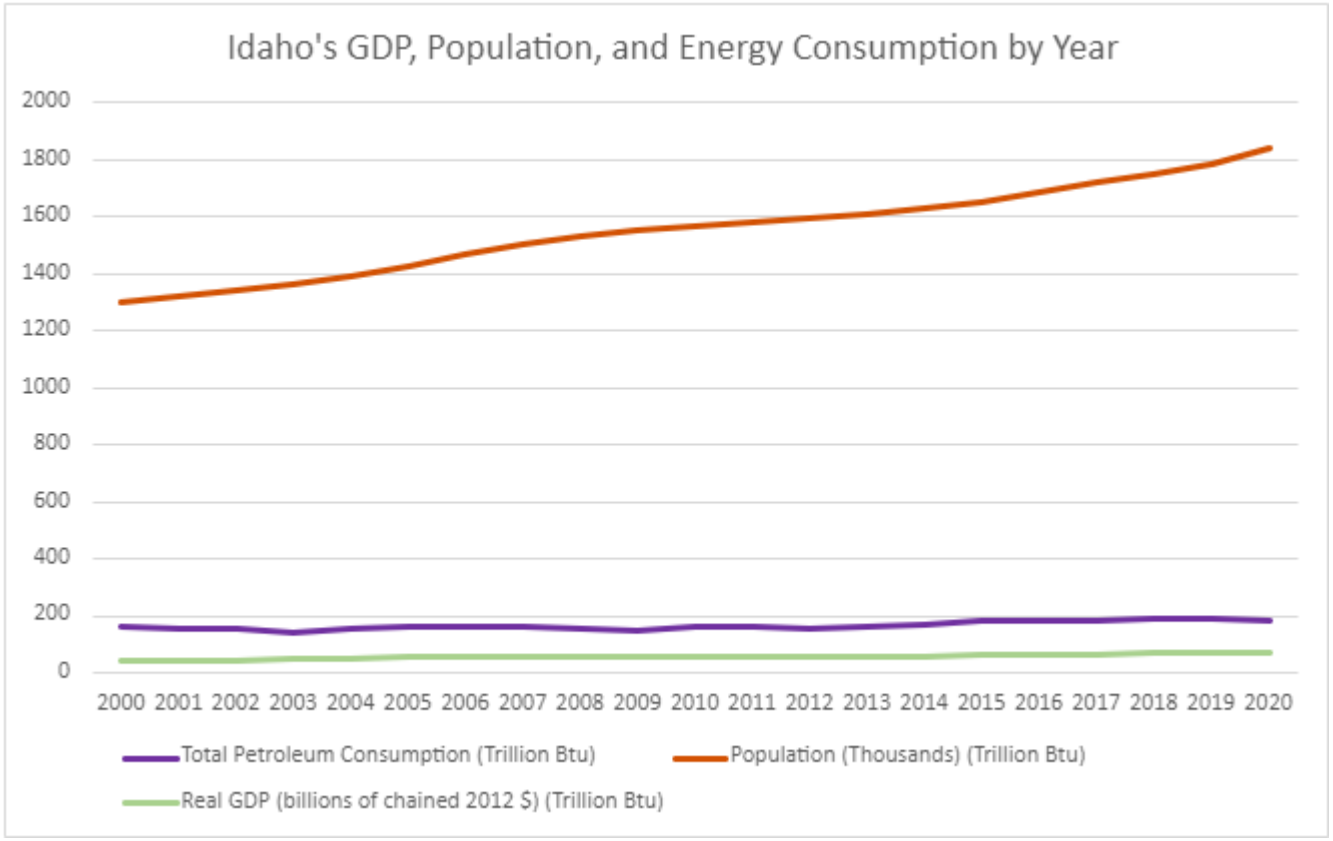
Figure 1. Idaho Growth Rates



Columbia/Snake River Distribution System

In addition to petroleum pipeline terminals in Pasco and Spokane, Washington, a portion of the refined petroleum products is delivered via barge along the Columbia/Snake River system. The Olympic Pipeline, which supplies about 75 percent of Oregon's refined petroleum products, has delivery facilities in Portland, Oregon, and Vancouver, Washington. The other 25 percent is supplied via marine vessel.

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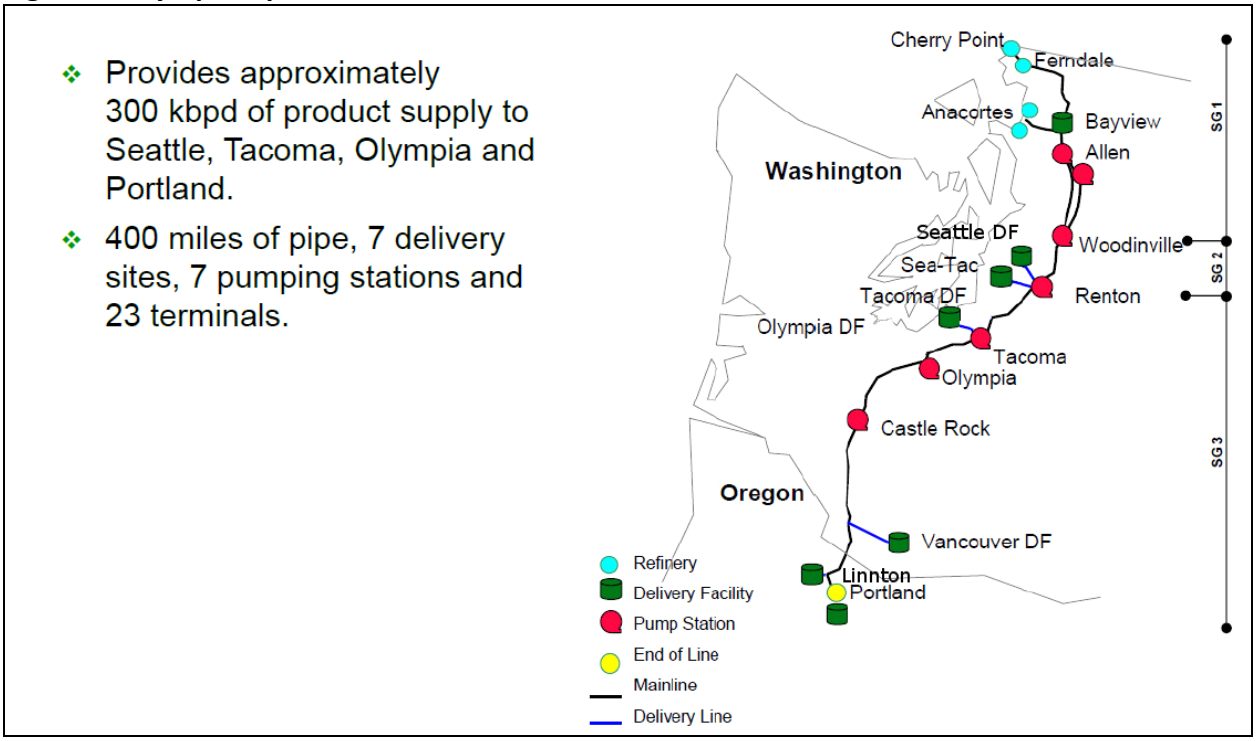
Figure 2. Olympic Pipeline



Source: https://www.bp.com/en_us/united-states/home/products-and-services/pipelines/our-pipelines.html#accordion_olympic

The Columbia/Snake River system begins at the mouth of the Columbia River and extends 465 miles to Lewiston, Idaho at the confluence of the Snake and Clearwater rivers. The deep draft portion of the navigation system is 43 feet deep and runs from the mouth of the Columbia River to Portland and Vancouver. Other ports along the deep draft channel include Longview, Kalama, and Woodland in Washington, and Astoria and St. Helens in Oregon. The inland navigation system extends from Vancouver to Pasco, and along the Snake River to Lewiston, Idaho.[3]

According to the 2021 BST Associates Portland Harbor Forecast, Portland's share of Columbia River internal petroleum products averaged 93% from 2008 to 2018. Inland waterborne movements of petroleum products averaged 2.3 million metric tons from 2002 to 2007, but declined to 1.4 million metric tons per year from 2008 to 2018. The BST Associates reference projection for waterborne shipments of petroleum products is for 2.1 million metric tons in 2040, which would indicate there is capacity in the system to meet the future demands of eastern Oregon, eastern Washington and Idaho. Even the high case is 2.4 million metric tons,

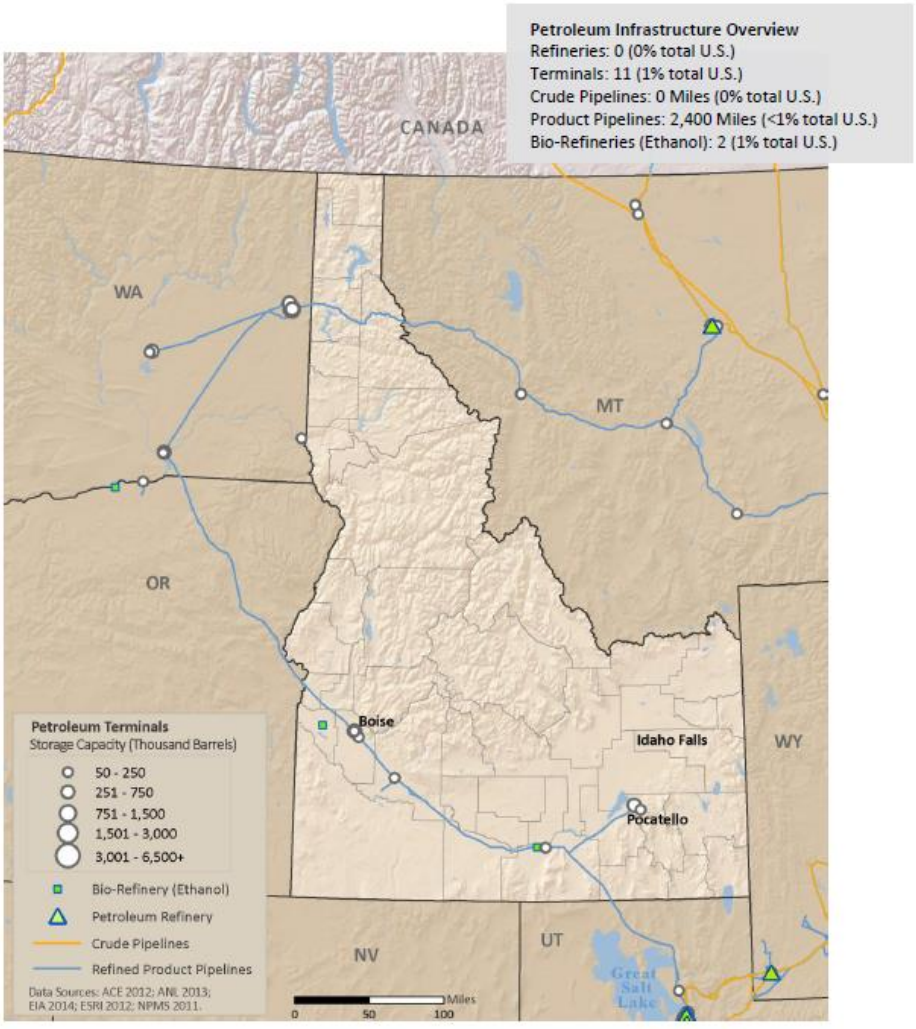
[3] 2017 BST Associates, Washington Marine Cargo Forecasts

which is only 4 percent higher than the historic average. BST Associates notes that Portland shipments of petroleum products upriver must compete on price with products delivered by pipeline to terminals in Eastern Washington.

2016 Idaho Energy Sector Risk Profile

The US Department of Energy's 2016 Idaho Energy Sector Risk Profile include a map of petroleum terminals and pipelines that shows the pipeline connections to refineries in Utah, Montana and Wyoming, as well as connections to terminals in Pasco and Spokane, Washington (Figure 3). There are marine terminals in Pasco, WA and Lewiston, ID serve the northern Idaho area.

Figure 3. Idaho Petroleum Infrastructure Overview



Source: US Department of Energy's 2016 Idaho Energy Sector Risk Profile

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Emergency Preparedness and Response

The Idaho Governor's Office of Energy and Mineral Resources claims that the ordinance would prevent the Pacific Northwest region from looking to Portland for fuel in times of emergency. This argument is undeveloped and does not explain how limits on expansion of fossil fuel storage tanks in Portland would hinder emergency response.

The 2013 Oregon Resilience Plan included a recommendation to form a public-private partnership with the objective of reducing the state's vulnerability to seismic events by evaluating the diversification of locations for the storage of liquid fuels and dentification of new liquid fuel energy corridors, which indicates a need to not become further dependent on the high risk location that is the Portland Critical Energy Infrastructure (CEI) Hub.

Also, a 2016 US Department of Homeland Security report, cited in the 2017 Washington Marine Cargo Forecasts, evaluated options to provide petroleum products in the event of a catastrophic earthquake affecting terminals in the Lower Columbia and Puget Sound. One of the options for responding to such an event would be to barge petroleum products down river from Pasco, WA – the opposite direction of product flow that the Idaho Governor's Office of Energy and Mineral Resources is concerned about.

Natural Gas Providers

Idaho is served by two interstate natural gas transmission pipelines and three natural gas distribution utilities. These pipelines provide natural gas from Canada, although the smaller Williams Gas Pipeline West has bi-directional capabilities and can provide natural gas from Wyoming if necessary.

There are three companies that provide natural gas to Idaho households and businesses: Avista, Intermountain Gas Company and Questar Gas. Avista, an investor-owned electric and natural gas utility headquartered in Spokane, Washington, provides natural gas service to customers in north and central Idaho. Intermountain Gas Company serves customers in southern Idaho. Questar Gas, a natural gas utility based in Salt Lake City, provides service to a portion of Franklin County in southern Idaho.

Small Scale Facilities

The agenda packet for a future July 12, 2022, Vancouver, WA, Planning Commission Workshop presentation included relevant information.

First, BERK Consulting found restricting storage capacity could increase consumer fuel costs, but any effects are expected to be relatively minor compared to global and national trends.

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Second, one of the facilities in Vancouver would be allowed under the Portland code amendments as a Warehouse and Freight Movement use (a terminal with less than 2 million gallons of fossil fuel storage tanks). The Tidewater Barge Lines facility is reported as having 1.3 million gallons of diesel storage capacity. This example demonstrates the economic viability of smaller facilities that are allowed under the Portland ordinance and could be permitted to respond to growing fossil fuel demand in eastern Oregon, eastern Washington and Idaho.

Fossil Fuel Code Changes– Impacted Facilities

Tidewater Barge Lines (Class 1)

- 1.3 M gallons tanks storing diesel fuel
- Miscellaneous fueling stations and tanks with lube oil, gasoline, diesel, and used oil totaling less than 20K gal

CITY OF Vancouver WASHINGTON

Fossil Fuel Facility Code Changes - 26

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Table Idaho Counties by Population

County	Population	Northern Idaho
Ada County	469,473	
Adams County	4,200	
Bannock County	86,742	
Bear Lake County	6,054	
Benewah County	9,231	X
Bingham County	46,246	
Blaine County	22,729	
Boise County	7,625	
Bonner County	44,688	X
Bonneville County	116,970	
Boundary County	12,156	X
Butte County	2,603	
Camas County	1,069	
Canyon County	223,890	
Caribou County	7,028	
Cassia County	23,847	
Clark County	885	
Clearwater County	8,735	X
Custer County	4,193	
Elmore County	27,043	
Franklin County	13,736	
Fremont County	13,111	
Gem County	17,771	
Gooding County	15,280	
Idaho County	16,511	X
Jefferson County	29,238	
Jerome County	24,074	

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	Kootenai County	161,676	X	
	Latah County	40,052	X	
	Lemhi County	7,929		
	Lewis County	3,850	X	
	Lincoln County	5,342		
	Madison County	39,725		
	Minidoka County	20,817		
	Nez Perce County	40,468	X	
	Oneida County	4,429		
	Owyhee County	11,724		
	Payette County	23,705		
	Power County	7,635		
	Shoshone County	12,700	X	
	Teton County	11,776		
	Twin Falls County	86,198		
	Valley County	11,085		
	Washington County	10,128		
	Total Population	1,754,367	350,067	20%

United States Census Bureau. B01001 SEX BY AGE, 2020 American Community Survey 5-Year Estimates. U.S. Census Bureau, American Community Survey Office. Web. 17 March 2022. http://www.census.gov/.

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