

**BEFORE:
WASHINGTON BOARD OF COUNTY COMMISSIONERS**



5 March 2025

Board Chair Kathryn Harrington

We are encouraged by your STEM career in engineering and a successful transition to public service with Metro and the Washington County Board.

Why? Not many elected officials are interested in the math justification for immediate action to defend against the terrible aftereffects of the inevitable Cascadia tectonic M8 megaquake. The only math available to us, if understood by leadership, calls for near term projects that are not now being approved or funded.

- Cascadia math is not widely understood
- There is no funding strategy discussed in the 2025 legislative session in Salem
- No emergency declared
- Washington County will be 100% stranded for fuel on Day 1, taking many months to
 - bypass the collapsed CEI Hub with new fuel depots for tanker truck logistics,
 - build a replacement for the 4 failed rail bridges serving Washington County

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Potential projects that reduce the terrible aftermath of the inevitable Cascadia M8 disaster are described and justified.

Funding for these practical projects can be found in scope under the bipartisan IJA Law and the IRA Law.

Inevitable collapses in Washington State fuel refining and logistics infrastructure will strand Washington County, the County having most infrastructure failures in Oregon.

- No tanker truck deliveries from the CEI Hub – because no fuel from WA
- No rail deliveries because all bridges serving Washington Co are obsolete and cannot support fuel by rail after the Cascadia M8, leaving 660,000 stranded for fuel
- Discovering this with no preparation projects planned is not a good thing

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New PDX aviation seismic fuel tanks are moot after Olympic Pipeline failure

- Nearest aviation fuel through Boise-to-Boardman rail, or pipeline to Pasco then rail
- Upper Midwest refineries already at 95% capacity

If Cascadia M8 happens early, fuel to raise new depot infrastructure is scarce

- Build new fuel depots earlier and fast

Washington County **and** CD1 look to be “islanded” for fuel on Day 1

- Rail bridges out
- Quickly build fuel depot at Hillsboro Airport while existing bridges serve
- Simultaneously build one new Willamette rail crossing with seismic compliance after identifying an optimum rail route to Hillsboro

NOTE Burnside Bridge and Tilikum Crossing are light rail tracks

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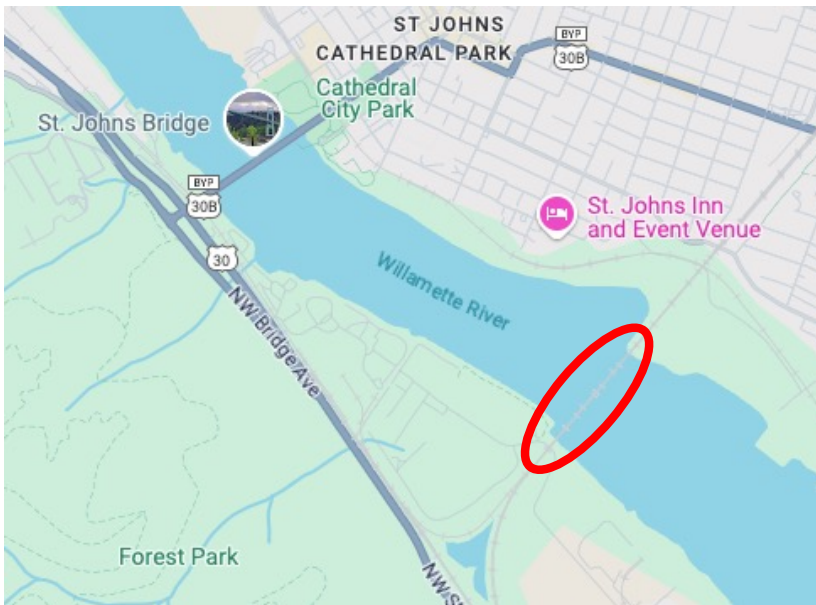
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BNSF Railway Bridge 5.1



Silver spans - 1908

Weathered rust – 1989

Cascadia threat discovered 2010

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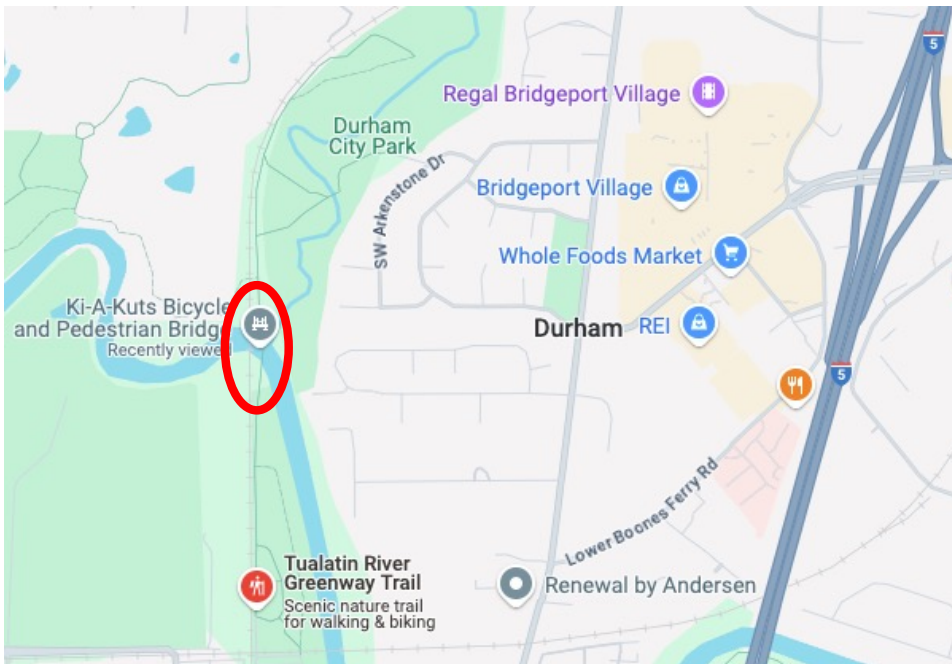
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Tualatin Railroad Bridge – Milepost 35.3



Prior to 1968
Garden Home to Wilsonville Bridge
- Tualatin River
Cascadia threat discovered 2010

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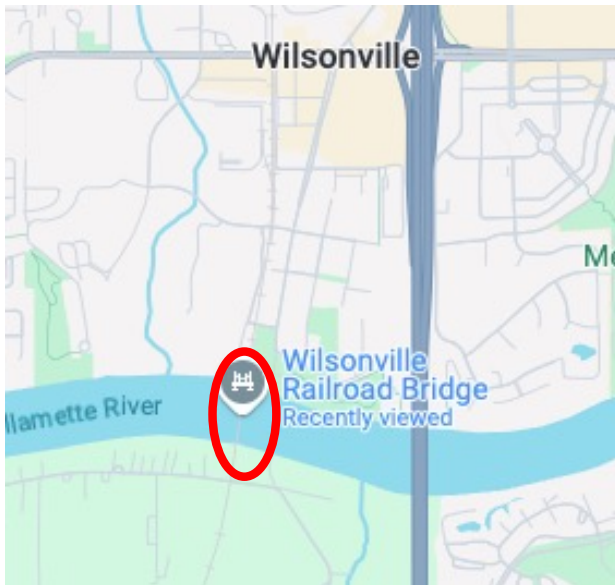
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Willamette Rail Bridge - Wilsonville



1975
Portland and Western Railroad
Cascadia threat discovered 2010

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Oak Grove – Lake Oswego
Railroad Bridge



1910
Portland and Western Railroad
Cascadia threat discovered 2010

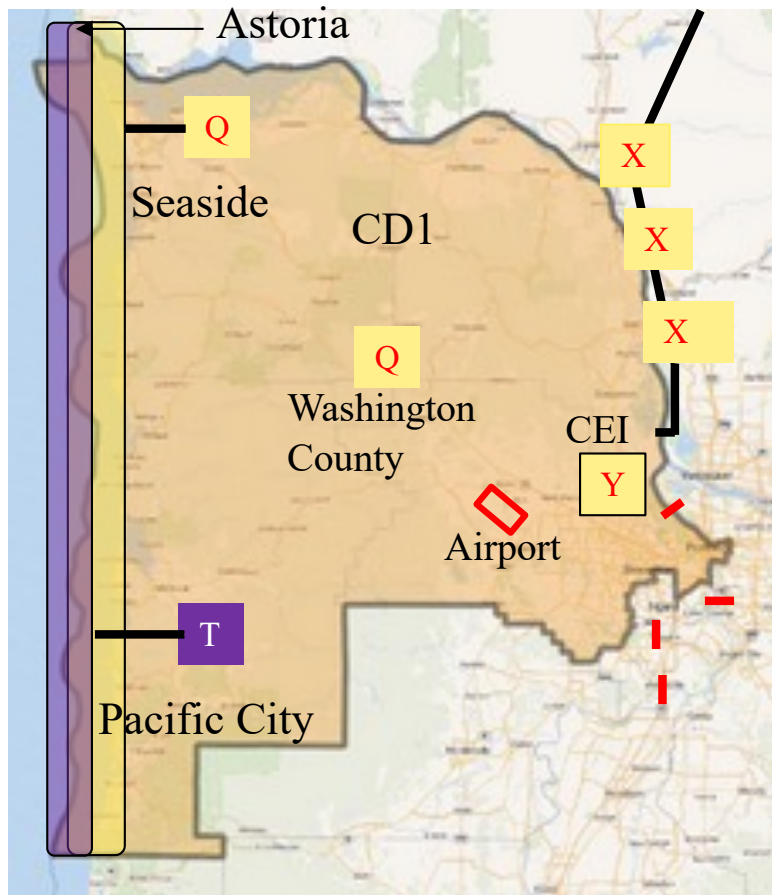
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First Congressional District on Seismic Day Zero – **and all at the same time**



- Failed rail bridges preclude fuel delivery
- X Olympic Pipeline failure
Strands Oregon
- Y CEI Hub collapse
Ends tanker truck logistics to CD1
- Q Quake collapse
Closes Columbia at Astoria Bridge
Damages coastal infrastructure
Extensive coastal road/bridge loss
Extensive utility damage
Damages Wash Co infrastructure
Damages bridges, maybe utilities
- T Tsunami
Re-damages coastal infrastructure
More coastal road/bridge loss
More utility loss

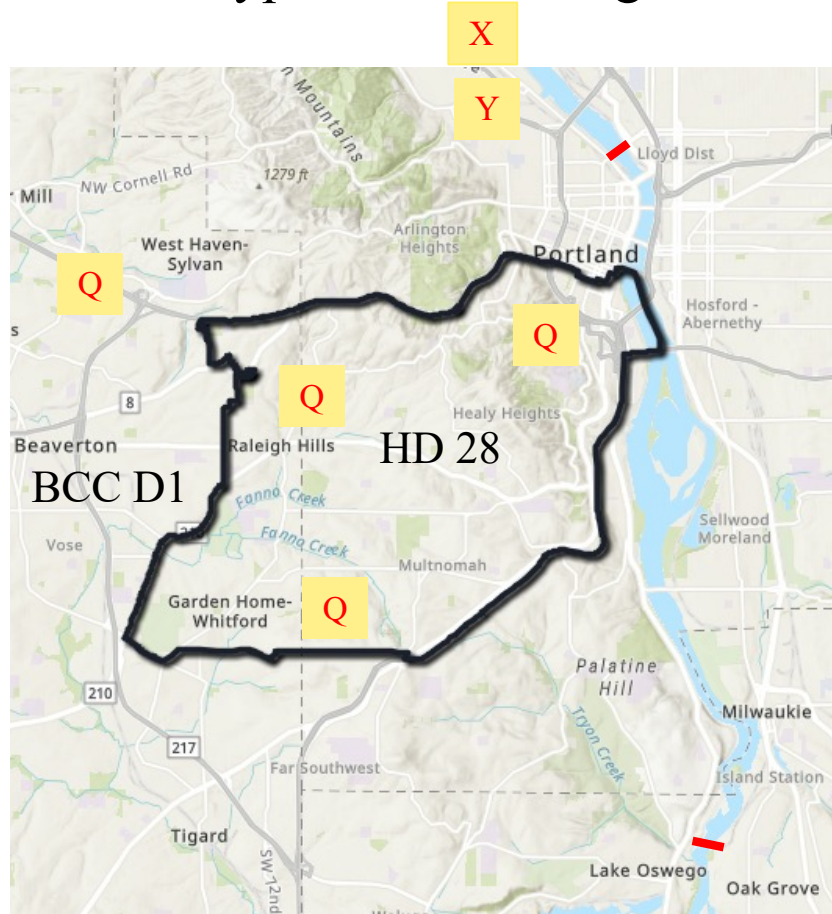
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HD 28 is typical of Washington County – **and all at the same time**



- █ Tualatin Bridge
- █ Wilsonville Bridge

Perhaps among the most vulnerable districts.

Rep Dacia Grayber is fully informed and well-placed: House Committee on Emergency Management, General Government and Veterans

- Failed rail bridges
 - End of rail fuel delivery to HD 28
- X Olympic Pipeline failure
 - Strands Oregon
- Y CEI Hub collapse
 - Ends tanker truck deliveries to HD 28
- Q Quake collapse
 - Damages inland infrastructure
 - Maybe utilities, maybe US 26 tunnel
 - Extensive inland road/bridge loss
 - Extensive utility damage

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Provide rail route to supply Hillsboro Airport fuel depot site

5 March 2025

New railbed on existing right of way 
Advanced fuel delivery route 

NOTE: Few rail accidents if any at Portland CEI Hub, with much higher traffic



 Existing rail

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Restore previous rail turn to transition from existing rail to Hillsboro Airport depot site 5 March 2025

New railbed on existing right of way 
Interim fuel delivery route 

NOTE: Few rail accidents if any at Portland CEI Hub, with much higher traffic



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5 March 2025

Fuel bladders are developed for military deployment

- Up to 200,000 gallons, same as 50ft diameter steel tank
- Lasts up to 20 years
- Supplier provides plumbing, pumps, controls
- Separate installations for aviation fuel, diesel, gasoline
- Keeps Hillsboro Airport in full operation
- Build before inevitable Cascadia M8-M9 while CEI Hub is available, maintains fuel logistics after Cascadia M8-M9 if completed in time



Available from multiple suppliers

[Example: Techno Group](#)

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Are we not looking at a Big Cascadia Botch ?

Can the DeFazio **Bipartisan Infrastructure Investment and Jobs Law** fund Oregon's urgent need for Cascadia advanced infrastructure projects?

Can the Wyden **Inflation Reduction Law** fund Oregon's urgent need for Cascadia advanced infrastructure projects?

Doesn't the Oregon Energy Strategy unlock access to US DOE infrastructure project funding as of now, **during this 2025 Regular Session**?

If Oregon does not have a better plan than the testimony to the House Emergency Committee, shouldn't it adopt that reference plan for now, and **start on project planning ASAP**?

<https://olis.oregonlegislature.gov/liz/2025R1/Downloads/PublicTestimonyDocument/139175>

Isn't the First Congressional District a total disaster zone if we grind through inch-bug legislative steps with no emergency language in proposed bills and no project starts authorized?

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Rail infrastructure relieves high demand for fuel tanker trucks and crews

Projects to make CD 1 Cascadia Ready

- At least one seismic compliant Willamette crossing that answers CD1 emergency fuel demand for aftermath first responders and rapid rebuilders crews.
 - What is the most efficient new rail delivery path? Decide the crossing location to support, once chosen.
- New 2-mile rail project to provide fuel delivery to Hillsboro Airport depot
- New Airport fuel depot, including base for relief air sorties to and from coast
- Establish early contingency wholesale/retail contracts to supply critical fuels on Day 1
- Establish contingency supply contracts with Upper Midwest fuel suppliers
- Decouple the Oregon economy from regrettable compromises coming from Big Petro by marshalling an emergency conversion to non-emitting energy

CD 1 Projects are a pathfinder for other Congressional Districts.

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There are two general math choices for evaluating the likelihood of a Cascadia M8 arriving soon.

1. Expect 37% in the next 50 years, from 2010. Not updated in 2024. Thus, the risk is not less than 37% today, as tectonic stress accumulates. This is taken from the [USGS Paleoseismicity](#) report in 2012 (it also has 16 other 50-year percent choices, with no preferred math conclusions offered – find an essay on this [here](#))
2. Expect 50% in 1946, because this is from the average repeat interval of 246 years known from the raw data tables the USGS Paleoseismicity report, added to the last M9 event in 1700. The risk is significantly higher today with no tectonic stress relief since 1700.

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What is “efficient” about getting caught short, with no ground projects in preparation for the inevitable Cascadia M8 wild card? When US DOE infrastructure funding has been authorized for years.

What is “efficient” about the world-class seismic-explorer oil industry, for at least 12 years strategically neglecting the inevitable seismic threat to THEIR infrastructure, leaving Oregon and Washington military and civilized society disabled in an instant?

US House Committee on Homeland Security, 4 March 2025

Subcommittee on Emergency Management and Technology hearing entitled,

“[Future of FEMA: Perspectives from the Emergency Management](#)

[Community.](#)” Will FEMA survive DOGE undefined “efficiency” criteria?

Any mention of Oregon?

The FEMA [National Risk Index](#) omits Cascadia megathrust risk.

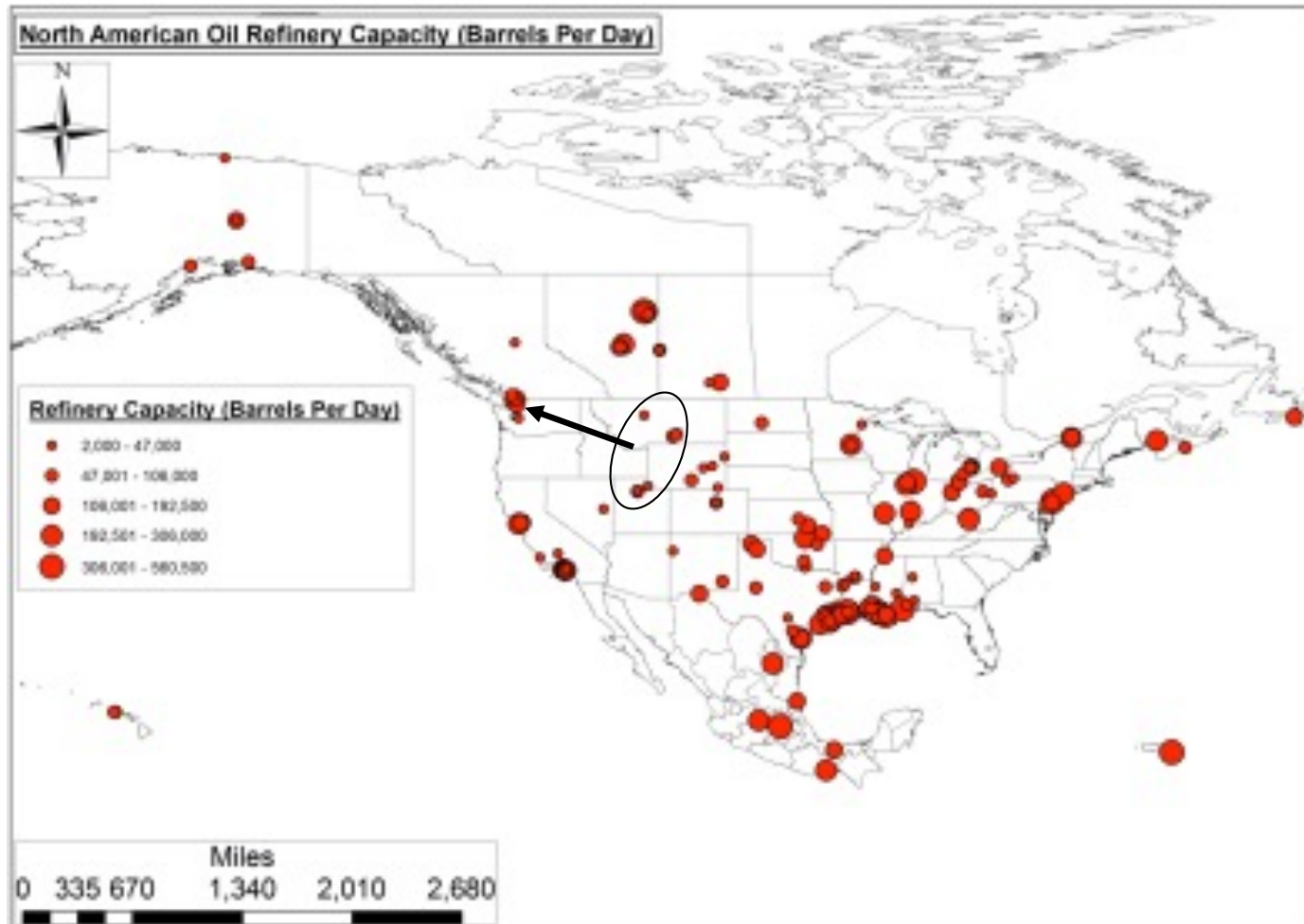
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Excess capacity of Upper Midwest refineries is unknown (within 700mi)



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Excess capacity of Upper Midwest refineries is unknown

<https://www.eia.gov/energyexplained/oil-and-petroleum-products/refining-crude-oil-refinery-rankings.php>

U.S. Refineries, Operable Capacity as of January 1, 2023, Upper Midwest					
Corporation	Company	State	Site	Barrels per calendar day	Excess Capacity
Marathon Petroleum Corp	Tesoro Refining & Marketing Co	Utah	Salt Lake City	66,000	
Phillips 66 Company	Phillips 66 Company	Montana	Billings	66,000	
CHS Inc	Cenex Harvest States Coop	Montana	Laurel	62,500	
ExxonMobil Corp	Exxonmobil Refining & Supply Co	Montana	Billings	61,500	
Chevron Corp	Chevron USA Inc	Utah	Salt Lake City	54,720	
HF Sinclair Corp	HF Sinclair Woods Cross Refining LLC	Utah	Woods Cross	39,330	
FJ Management Inc	Big West Oil Co	Utah	North Salt Lake	31,664	
Calumet Specialty Products Pa	Calumet Montana Refining LLC	Montana	Great Falls	24,600	
Silver Eagle Refining Inc	Silver Eagle Refining	Utah	Woods Cross	15,000	

Total = 421,000 bpcd

Typical excess capacity is 5%. $0.05 \times 421,000 = 21,000$ bpcd

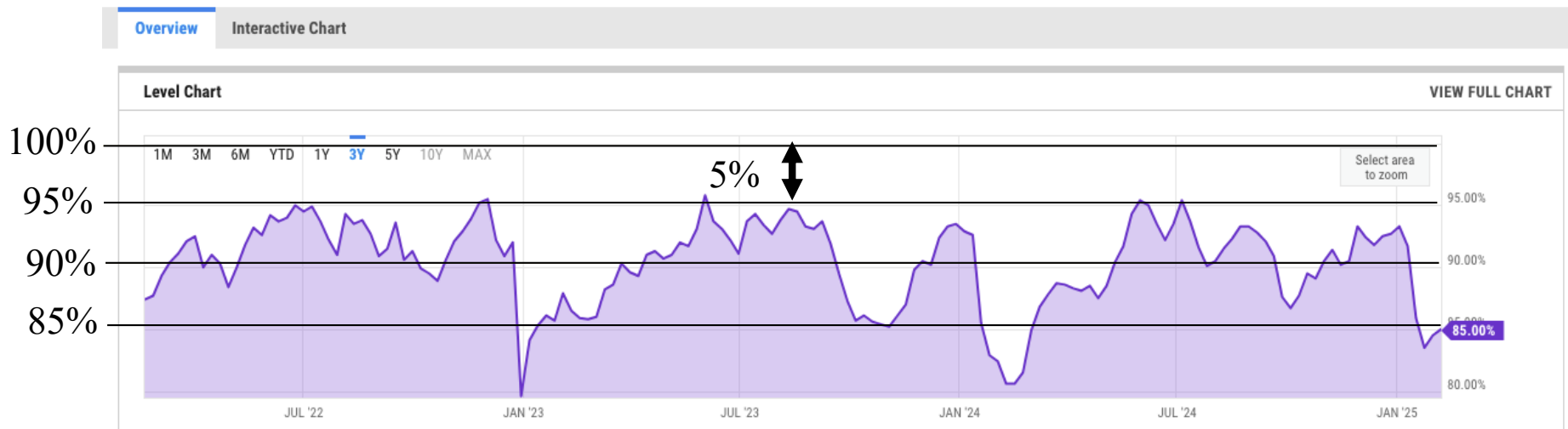
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Overall excess capacities are variable. This results in refinery totals also being variable. Here is a 3-year history of US capacity utilization. 5 March 2025

US Utilization of Refinery Capacity (I:USURCNW)

85.00% for Wk of Feb 07 2025



https://ycharts.com/indicators/us_operable_crude_oil_distillation_capacity

To answer the fuel demand for Oregon, would 5% excess capacity be adequate and sustainable long term? $5\% = 21,000 \text{ bpcd}$, $\times 42 = 882,000$ gallons per day
Oregon consumes 6,500,000 gallons per calendar day. Even more in WA

<https://olis.oregonlegislature.gov/liz/2025R1/Downloads/CommitteeMeetingDocument/291310>

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Better Energy LLC is a STEM NGO that researches better energy options, originally concerned with renewable energy technology but discovered the Cascadia threat more imminent as risk to economy and society than uninterrupted climate pollution.

You get the same perspectives as from Marsh McLennan, but without the 90,000 staff and we don't invoice for our work conducted in the public interest. Our answers can be validated by ample reference links to open-source data without the pesky delays imposed by the funding scrambles that just compound the risk.

Marsh McLennan reports to the US House Committee on Homeland Security with this [testimony](#) about working with FEMA, with ample attention to Alabama, Florida, South Carolina, Louisiana. No mention of Oregon.

Respectfully, Tracy Farwell, HD-46, Sustainability Desk, [Better Energy LLC](#)