

# **CEI Hub: Safety and Energy Security**

## ***House Climate, Energy and Environment***

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# Recommendations and Testimony

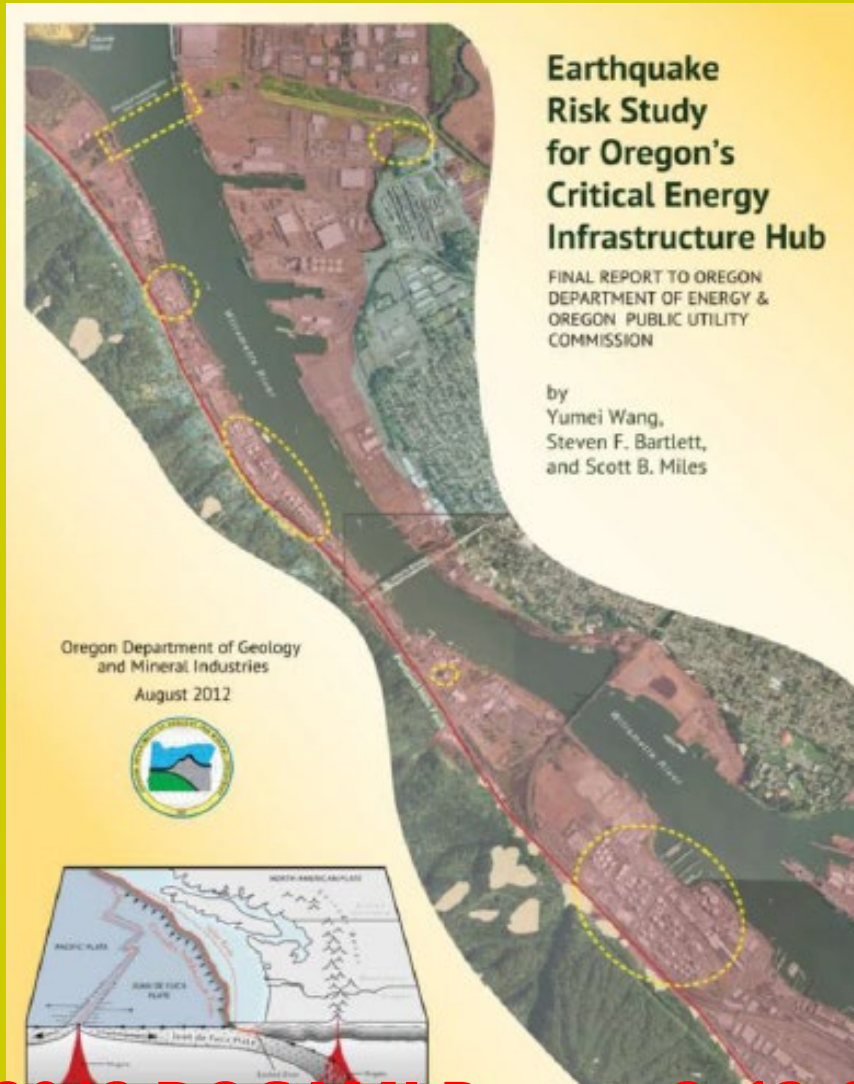
**Recommendations: State Leadership to:**

- 1) Improve safety at Critical Energy Infrastructure (CEI) Hub**
- 2) Add 33 counties for statewide safety to DEQ's program**
- 3) Develop a long term energy storage plan for CEI Hub**

**Testimony Outline:**

- Overview** from 2013 DOGAMI report to 2022 SB 1567 activities
- Unmet safety needs** at CEI Hub and bulk fuel facilities statewide
- Need for feasible, long-term energy storage plan for CEI Hub that will maintain statewide energy security during disasters**

# Oregon's Energy Sector 2013 Report



- Society increasingly relies on energy
- 5-yr State effort: DOGAMI, ODOE, OPUC
- Statewide multi-hazard evaluation of petroleum fuel, natural gas, electricity
- Identified critically important and vulnerable area for State of Oregon and named it: “Critical Energy Infrastructure (CEI) Hub”
  - Import >90% Petroleum Fuel from WA refineries for statewide distribution
  - Fuel delivery infrastructure (supply chain) is structurally deficient and vulnerable to failure
  - Fuel shortages common during/after disasters



# Cascadia Fault

## Critical Energy Infrastructure (CEI) Hub



6 mile stretch includes:

- Petroleum fuel terminals
- Natural Gas facilities
- Electrical facilities
- ***Liquefaction Risk***

**Key Finding:** Magnitude 9 Cascadia earthquake poses high risk to CEI hub (not built to survive earthquakes) and endangers ***entire*** State of Oregon

(Source: 2013 DOGAMI Energy Sector Report O-13-9) Base Map: Google Earth



# Oregon's Energy Facilities in CEI Hub

Petroleum Fuel



Natural Gas



Electricity



# CEI Hub: Liquefaction Hazards are Extremely High *Facilities Built on Dredged River Soils (“Hydraulic Fill”)*





# Examples of Liquefaction Failures

*Since 2013 report, Electricity and Natural Gas Suppliers regulated for earthquake safety by OPUC*

2010 Chile



**Liquefaction:  
Cascading Structural Failure**

2007 Japan



**Liquefaction sand boils**

Kariwa Substation

2011 Japan



**Buried tank buoyant  
due to Liquefaction**

# 2022 SB 1567 Includes Two Components

1. Dept of Environmental Quality (DEQ) responsibility on Fuel Terminals Seismic Safety in 3 (of 36) counties

[Department of Environmental Quality : Fuel Tanks and Seismic Stability : Tanks Program : State of Oregon](#)

-New regulatory program is making excellent progress.

-*“Seismic Risk Mitigation Fund”* to assist: \$0 avail. funds so state and federal funds are needed!

2. Oregon Dept of Energy (ODOE) develop an Energy Security Plan  
**Goal:** minimize fuel shortages that would harm safety, security and livability during disasters

**Due:** Legislature Sept 2024

[State of Oregon: Safety & Resilience - Petroleum Emergency Preparedness Program](#)

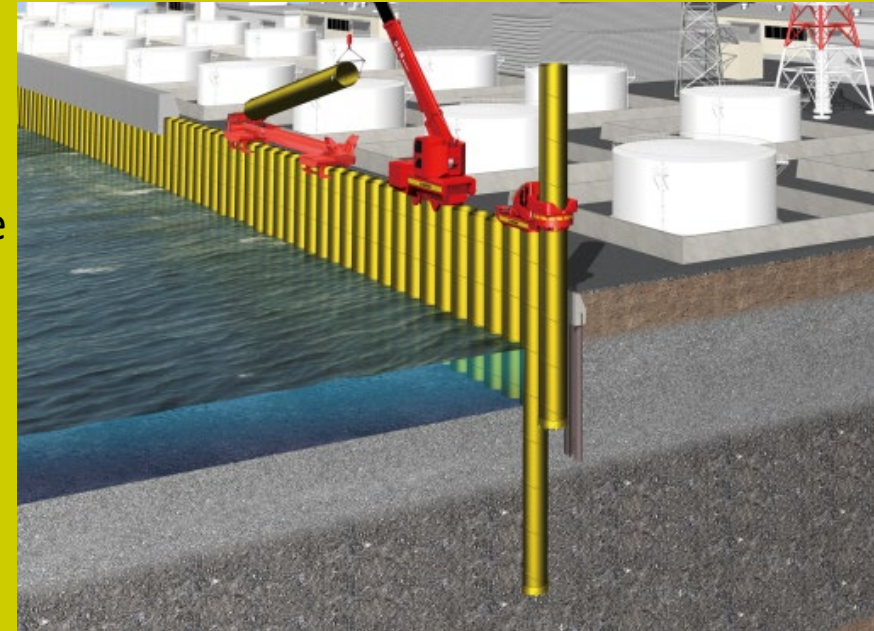


# Fuel Facilities Mitigation Concepts



Examples:  
Containment wall captures oil from broken tank (upper) and broken valve (lower)

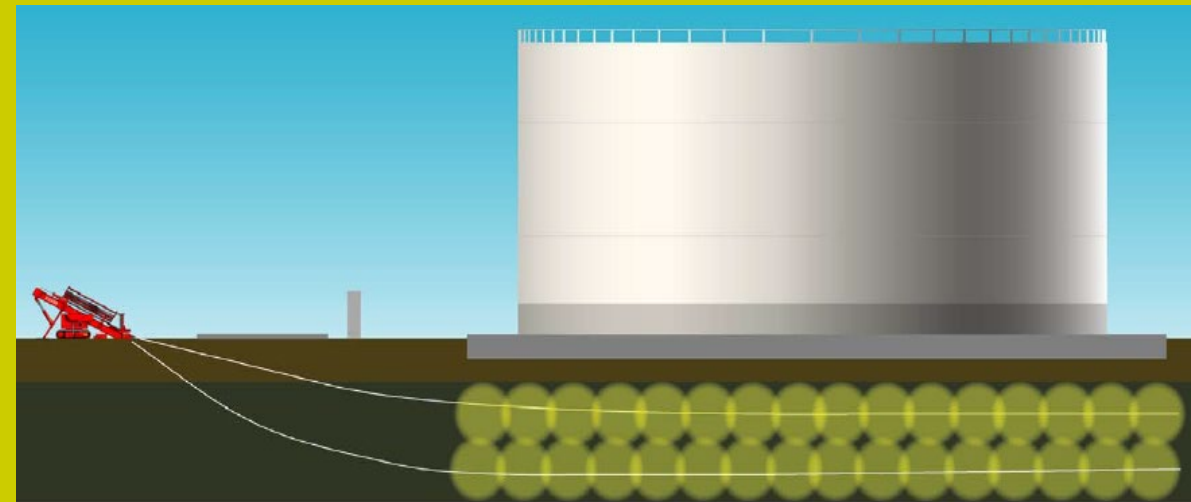
Examples:  
Mitigation to address liquefiable soil movement toward water (upper) and liquefaction mitigation under tank (lower)



Minami Soma  
2011 Japan



Source: TCLEE



Source: Masanori Hamada, Waseda University, Tokyo, Japan



# Unmet Safety Needs at CEI Hub and Statewide



- Deadly **fires** and massive oil **spills** at CEI hub remain a serious threat even with SB 1567 (*community safety* beyond individual facilities)
- Only 3 counties regulated; 33 of 36 counties not regulated for earthquake safety





# CEI Hub: Need for Long Term, Energy Storage Plan

*towards greener energy that meet disaster needs to complement ODOE's 2024 energy security plan*

Life safety!

Forest Park  
Fuel Terminals  
Fuel Load



Fire boat response oil rig  
2010 Deepwater Horizon

(Source: USCG)



# Recommendations to HCEE

- 1) **Improve safety at Critical Energy Infrastructure (CEI) Hub**
  - a. Implement earthquake early warnings (ShakeAlert system) allowing community members and fuel terminals to take protective actions before shaking arrives, such as automatically closing fuel valves
  - b. Improve fire control measures, incl. managing fires in Forest Park
  - c. Increase fuel spill response capabilities to be commensurate with actual risks. Work with Feds (EPA, USCG)

[Readers respond: Oregon's fuel on risky riverbanks - oregonlive.com](#) (Oregonian, 6/1/2023 letter to ed.)
- 2) **Add 33 counties for statewide safety and fuel security to DEQ program**
- 3) **Develop a long term, energy storage plan for CEI Hub**

# Resources

1. The State of Oregon study that first defined the 6-mi long CEI Hub area, identified the importance of facilities in the CEI hub, and the serious nature of the vulnerabilities of the facilities. **DOGAMI's Oregon Risk Study on Critical Energy Infrastructure** (Wang et al, 2013) <http://www.oregongeology.org/pubs/ofr/p-O-13-09.htm>
- 2 **OSSPAC CEI Hub recommendations to Governor and Legislature** (December 2019) [https://www.oregon.gov/oem/Documents/OSSPAC\\_CEI-Hub\\_report\\_122019.pdf](https://www.oregon.gov/oem/Documents/OSSPAC_CEI-Hub_report_122019.pdf)
3. **OPB Unprepared documentary** about Cascadia earthquakes. Includes CEI Hub (2015) [Oregon Field Guide | Unprepared: An Oregon Field Guide Special | OPB](#) 6 minute Trailer (includes CEI Hub): [https://youtu.be/g3NICXA6\\_kE](https://youtu.be/g3NICXA6_kE)
4. **OPB** article 8/17/2021 on **Multnomah County and City of Portland** CEI hub report [Report says fuel spills would be massive environmental disaster in Cascadia Subduction Zone earthquake - OPB](#) Multnomah County's Links to 2021 draft report and draft presentation.
5. **2022 Senate Bill 1567** for DEQ to regulate seismic safety of bulk fuel facilities in 3 counties and ODOE to develop energy security plan. Webpage [SB1567 2022 Regular Session - Oregon Legislative Information System \(oregonlegislature.gov\)](#)
6. **ODEQ** seismic safety program created by 2022 SB1567 [Department of Environmental Quality : Welcome Page : Seismic Stability : State of Oregon](#)
7. **ODOE** webpage related to forthcoming 2024 Energy Security Plan [State of Oregon: Safety & Resilience - Petroleum Emergency Preparedness Program](#)
8. **Unmet safety needs** identified in Y. Wang's letter to the editor Oregonian [Readers respond: Oregon's fuel on risky riverbanks - oregonlive.com](#)