OREGON DEPARTMENT OF ENERGY

Informational Hearing
House Committee on Energy & Environment

Energy Sector Disaster Preparedness and Response

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May 19, 2021

Solar array in Keizer, Oregon

OREGON DEPARTMENT OF ENERGY

Leading Oregon to a safe, equitable, clean, and sustainable energy future.

Our Mission

The Oregon Department of Energy helps Oregonians make informed decisions and maintain a resilient and affordable energy system. We advance solutions to shape an equitable clean energy transition, protect the environment and public health, and responsibly balance energy needs and impacts for current and future generations.

What We Do

On behalf of Oregonians across the state, the Oregon Department of Energy achieves its mission by providing:

- A Central Repository of Energy Data, Information, and Analysis
- A Venue for Problem-Solving Oregon's Energy Challenges
- Energy Education and Technical Assistance
- Regulation and Oversight
- Energy Programs and Activities

2020 Energy Report

Goal of the Report

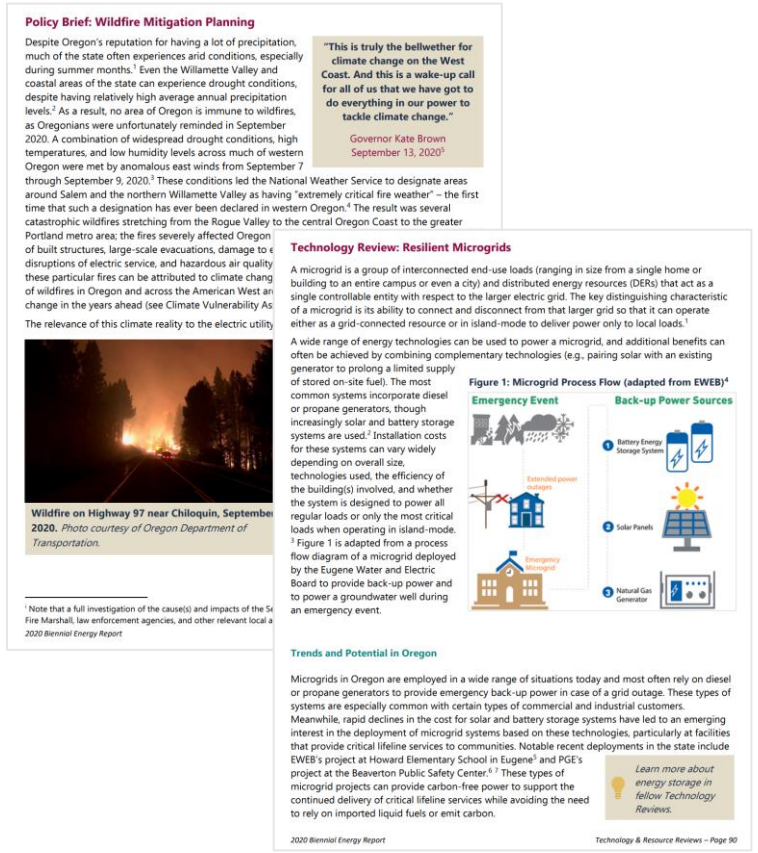
Pursuant to ORS 469.059, provide a comprehensive review of energy resources, policies, trends, and forecasts, and what they mean for Oregon.

Scoping the Report

Shaped by a data-driven process, equity considerations, and input from stakeholders and the public.

Designing the Report

Shorter briefs on a wider variety of energy topics, tear-away style. Themes cross sections for general 101 or technology reviews and deeper-dive policy briefs.



Policy Brief: Wildfire Mitigation Planning

Despite Oregon's reputation for having a lot of precipitation, much of the state often experiences arid conditions, especially during summer months.[1] Even the Willamette Valley and coastal areas of the state can experience drought conditions, despite having relatively high average annual precipitation levels.[2] As a result, no area of Oregon is immune to wildfires, as Oregonians were unfortunately reminded in September 2020. A combination of widespread drought conditions, high temperatures, and low humidity levels across much of western Oregon were met by anomalous east winds from September 7 through September 9, 2020.[3] These conditions led the National Weather Service to designate areas around Salem and the northern Willamette Valley as having "extremely critical fire weather" – the first time that such a designation has ever been declared in western Oregon.[4] The result was several catastrophic wildfires stretching from the Rogue Valley to the central Oregon Coast to the greater Portland metro area; the fires severely affected Oregon of built structures, large-scale evacuations, damage to disruptions of electric service, and hazardous air quality these particular fires can be attributed to climate chang of wildfires in Oregon and across the American West ar change in the years ahead (see Climate Vulnerability As

"This is truly the bellwether for climate change on the West Coast. And this is a wake-up call for all of us that we have got to do everything in our power to tackle climate change."

Governor Kate Brown
September 13, 2020[5]

The relevance of this climate reality to the electric utility

Wildfire on Highway 97 near Chiloquin, Septembe 2020. *Photo courtesy of Oregon Department of Transportation.*

[1] Note that a full investigation of the cause(s) and impacts of the Se Fire Marshall, law enforcement agencies, and other relevant local a

2020 Biennial Energy Report

Technology Review: Resilient Microgrids

A microgrid is a group of interconnected end-use loads (ranging in size from a single home or building to an entire campus or even a city) and distributed energy resources (DERs) that act as a single controllable entity with respect to the larger electric grid. The key distinguishing characteristic of a microgrid is its ability to connect and disconnect from that larger grid so that it can operate either as a grid-connected resource or in island-mode to deliver power only to local loads.[1]

A wide range of energy technologies can be used to power a microgrid, and additional benefits can often be achieved by combining complementary technologies (e.g., pairing solar with an existing generator to prolong a limited supply of stored on-site fuel). The most common systems incorporate diesel or propane generators, though increasingly solar and battery storage systems are used.[2] Installation costs for these systems can vary widely depending on overall size, technologies used, the efficiency of the building(s) involved, and whether the system is designed to power all regular loads or only the most critical loads when operating in island-mode.[3] Figure 1 is adapted from a process flow diagram of a microgrid deployed by the Eugene Water and Electric Board to provide back-up power and to power a groundwater well during an emergency event.

Figure 1: Microgrid Process Flow (adapted from EWEB)[4]

Trends and Potential in Oregon

Microgrids in Oregon are employed in a wide range of situations today and most often rely on diesel or propane generators to provide emergency back-up power in case of a grid outage. These types of systems are especially common with certain types of commercial and industrial customers. Meanwhile, rapid declines in the cost for solar and battery storage systems have led to an emerging interest in the deployment of microgrid systems based on these technologies, particularly at facilities that provide critical lifeline services to communities. Notable recent deployments in the state include EWEB's project at Howard Elementary School in Eugene[5] and PGE's project at the Beaverton Public Safety Center.[6,7] These types of microgrid projects can provide carbon-free power to support the continued delivery of critical lifeline services while avoiding the need to rely on imported liquid fuels or emit carbon.

Learn more about energy storage in fellow Technology Reviews.

2020 Biennial Energy Report *Technology & Resource Reviews – Page 90*

https://energyinfo.oregon.gov/ber

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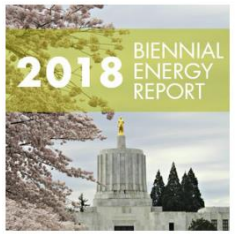
2018 Report: Policy Deep Dive on Energy Resilience



Full Report
(large file)

Introduction
Exec. Summary

Chapter 1
Energy Numbers

Chapter 2
Climate Change

Chapter 3
Renewable Energy

Chapter 4
Transportation

Chapter 5
Resilience

Chapter 6
Energy Efficiency

Chapter 7
Consumers

Chapter 8
Recommendations

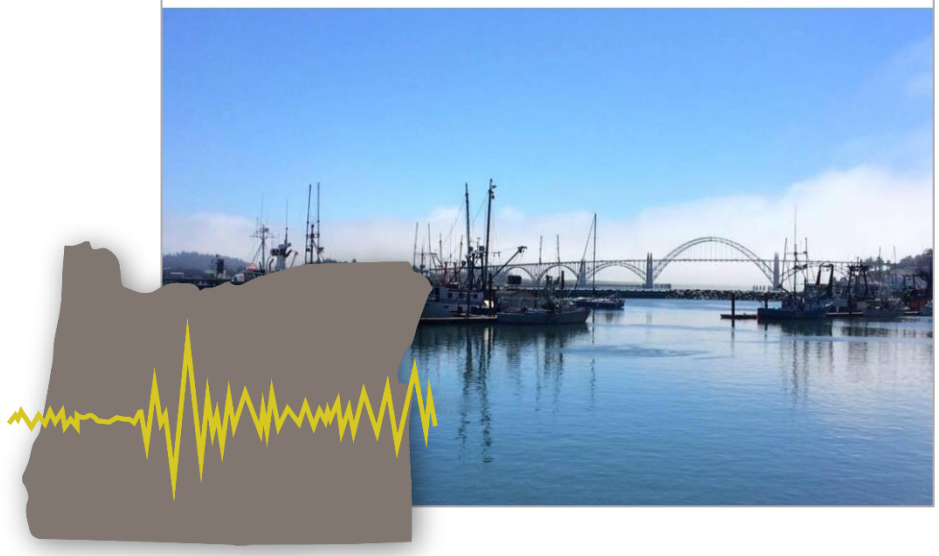
CHAPTER 5: RESILIENCE

The prospect of a major earthquake and tsunami may seem so overwhelming that preparation – by individual Oregonians or their state government – is too big of a task.

But we can do this and we will do it together.

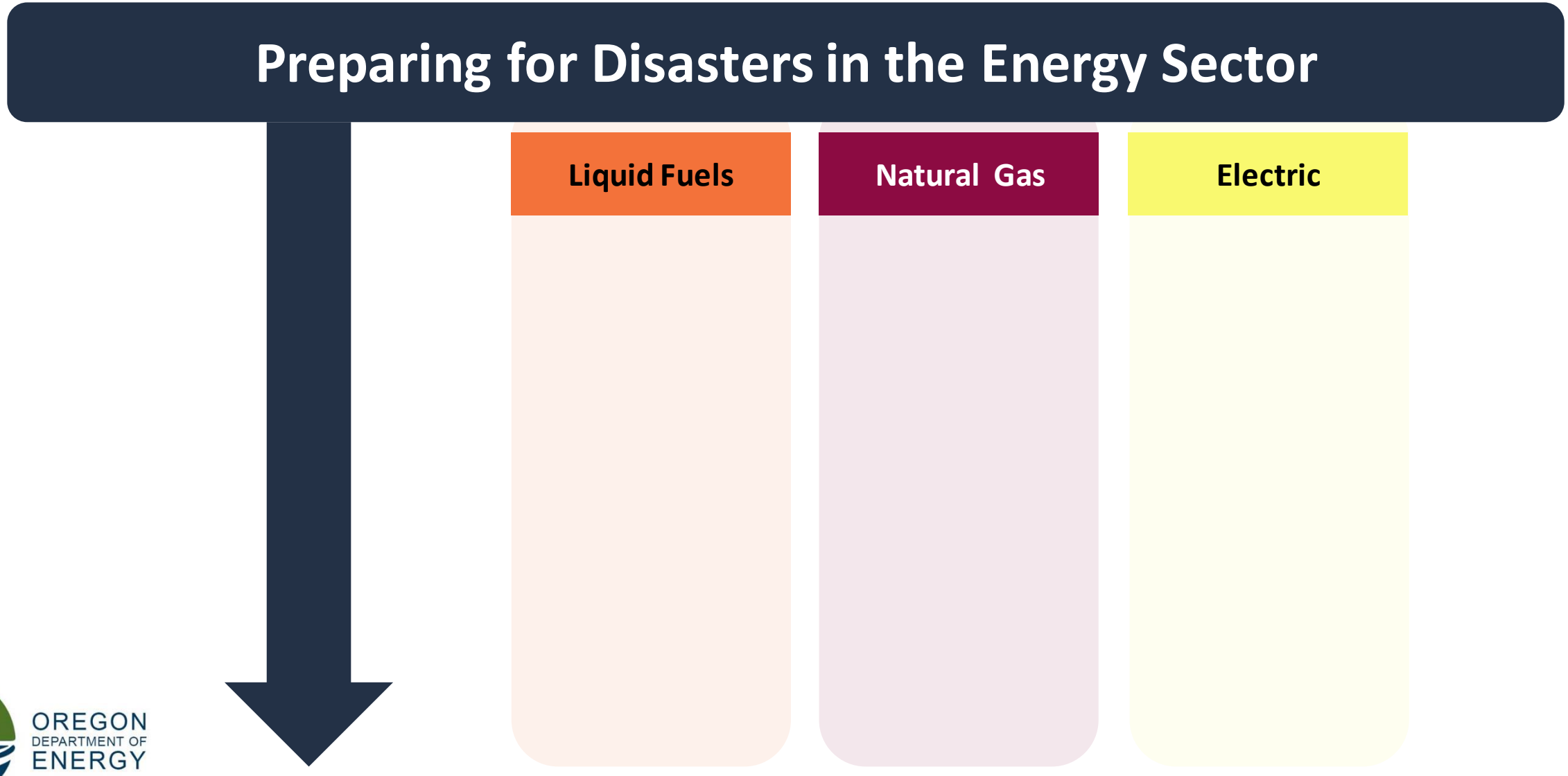
We must build a better prepared and more resilient Oregon, one step at a time.

— Governor Kate Brown, 2016[1]



https://energyinfo.oregon.gov/2018-ber

Overview of Energy Sector Preparedness



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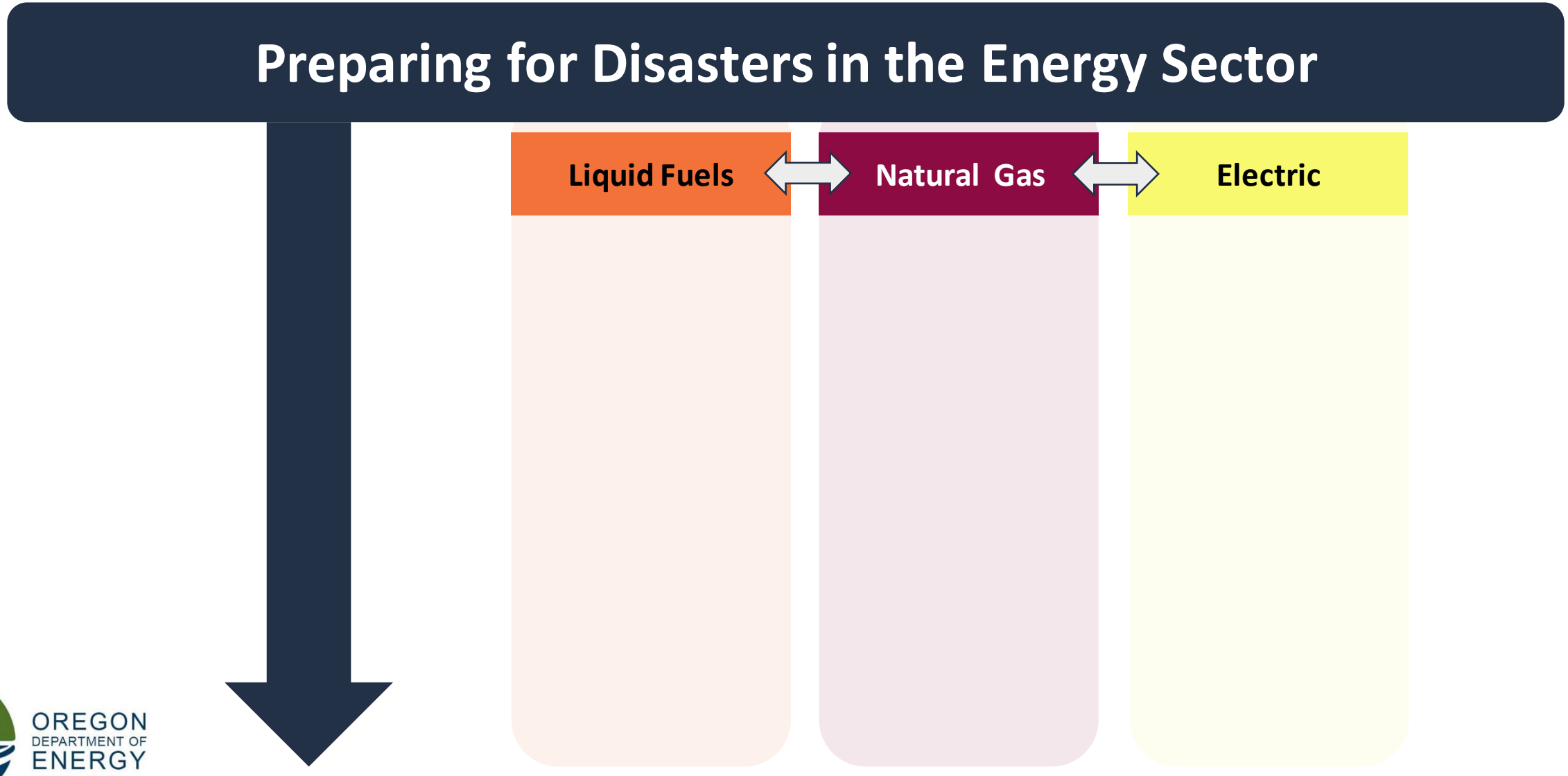

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Overview of Energy Sector Preparedness

Preparing for Disasters in the Energy Sector

Liquid Fuels ⟷ **Natural Gas** ⟷ **Electric**

System Level:

- What are the risks to the liquid fuel distribution system?
- Will the electric transmission system withstand a wildfire or seismic event?
- How can we harden bulk energy infrastructure?
- Can we improve the organizational resilience of energy providers?

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Community Level:

- Will my community continue to have access to essential services?
- Can local infrastructure be hardened to improve community energy resilience?
- Can deploying local energy resources improve resilience?

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Preparing for Disasters

statesman journal
PART OF THE USA TODAY NETWORK

September 9, 2020 | Wildfires have burned nearly one million acres in Oregon.

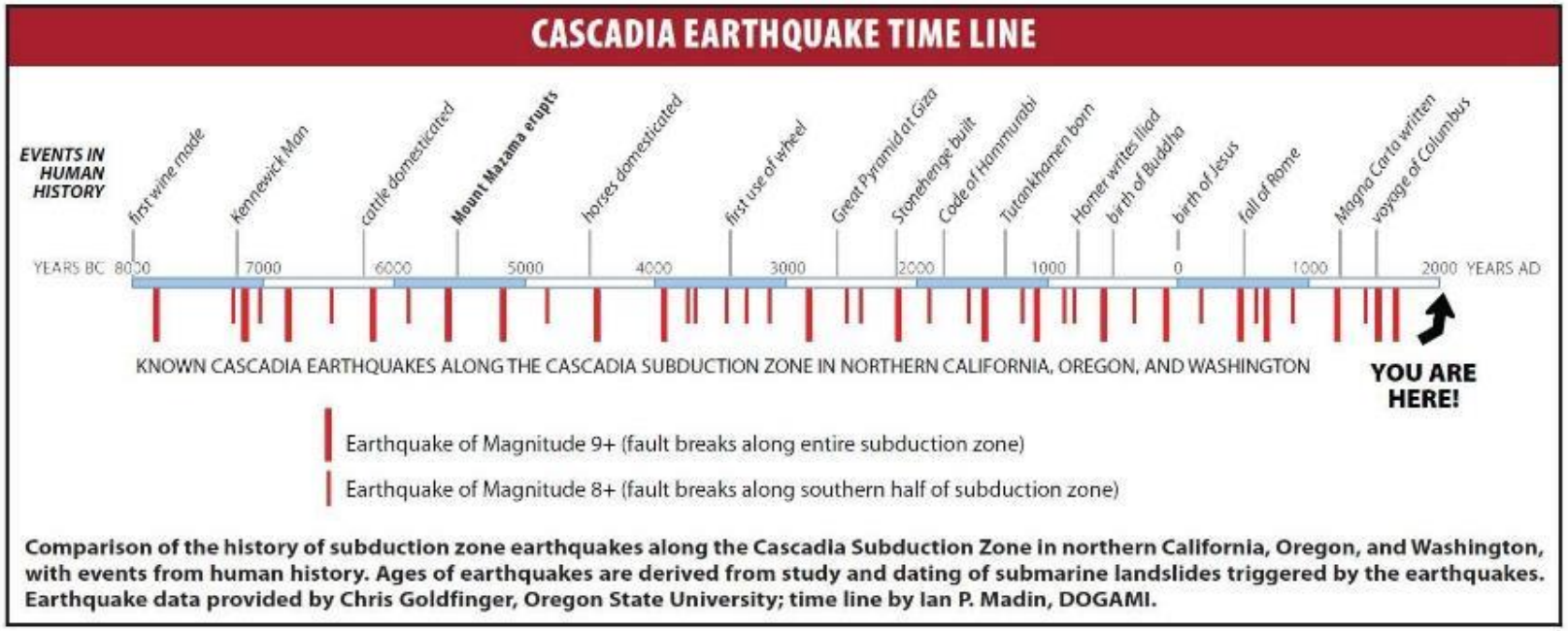
OPB

Mar 7, 2019 | When Disaster Struck, This Tiny Oregon Town Was Out On Its Own

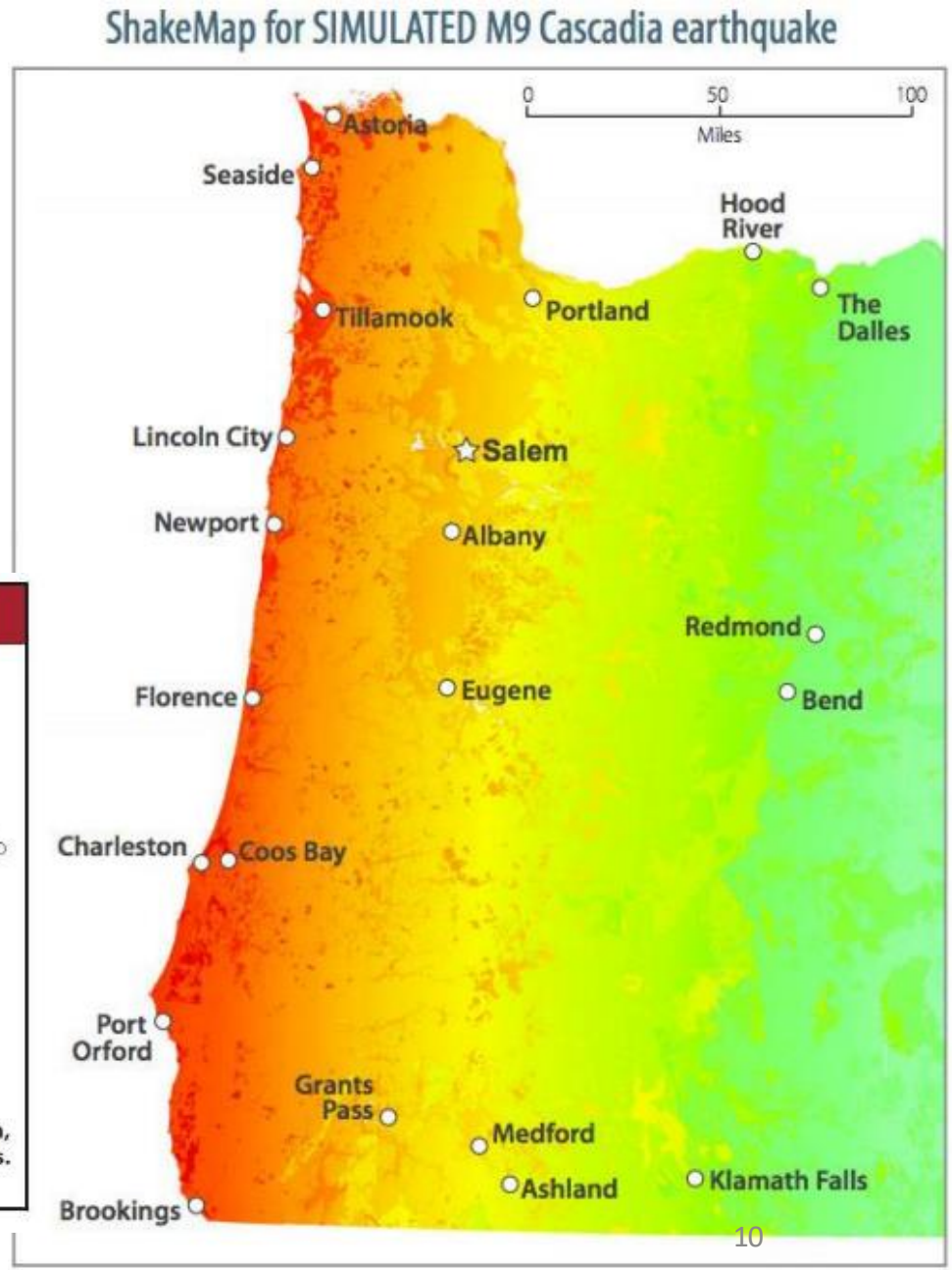
". . .it will take millions of dollars to repair the sewer and water systems for this town [Elkton] of 200 people. And the local utility company, Douglas Electric Cooperative, is looking at about $6 million in damages. Nine days after the storm, about 4,600 of its customers didn't have electricity. . ."

Preparing for Disasters

Sep 15, 2016 | Unprepared: Will we be ready for the megaquake in Oregon? (video)



Comparison of the history of subduction zone earthquakes along the Cascadia Subduction Zone in northern California, Oregon, and Washington, with events from human history. Ages of earthquakes are derived from study and dating of submarine landslides triggered by the earthquakes. Earthquake data provided by Chris Goldfinger, Oregon State University; time line by Ian P. Madin, DOGAMI.



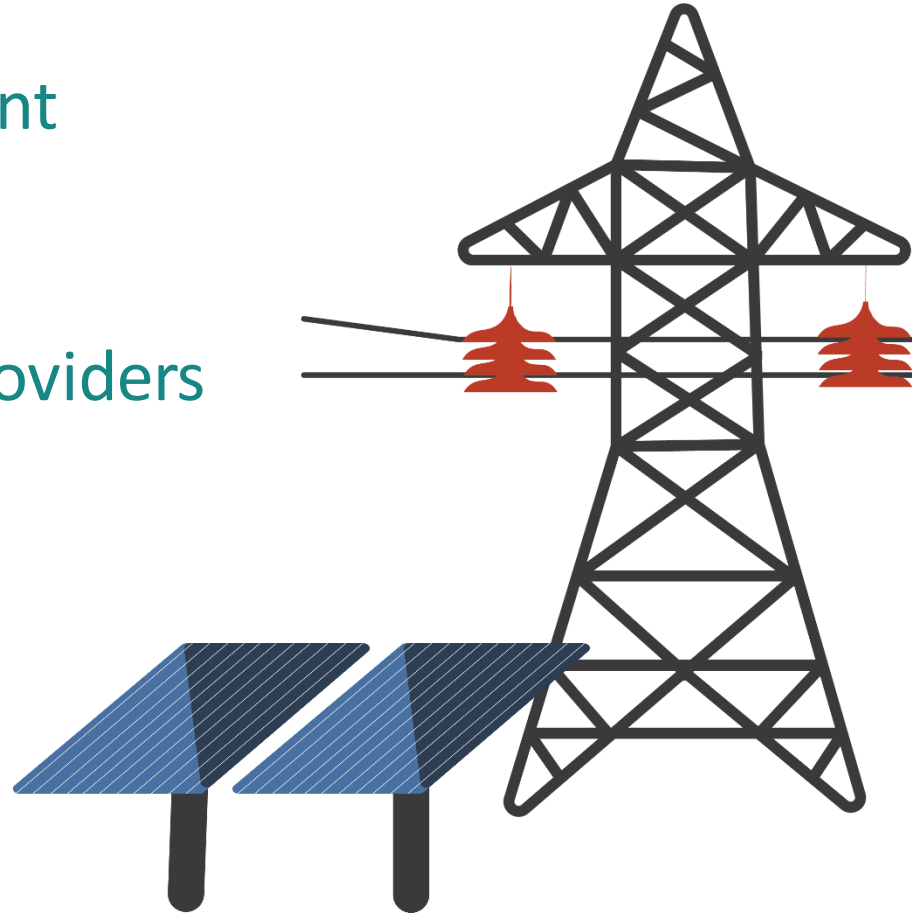
…Not all Disasters are Natural

Associated Press

May 8, 2021 | Cyberattack shuts down pipeline company serving U.S. East Coast (link)

What can be done to prepare?

- Re-locating infrastructure out of high-risk areas
- Hardening infrastructure to make it more resilient
- Developing more local sources of energy
- Improving organizational resilience of energy providers
- Plan for the worst-case
- Trade-offs: At what cost?



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Examples: How can we improve energy resilience?

Relocating or Hardening Infrastructure

Source: E&E News / Duke Energy

Source: Bedford Reinforced

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Examples: How can we improve energy resilience?

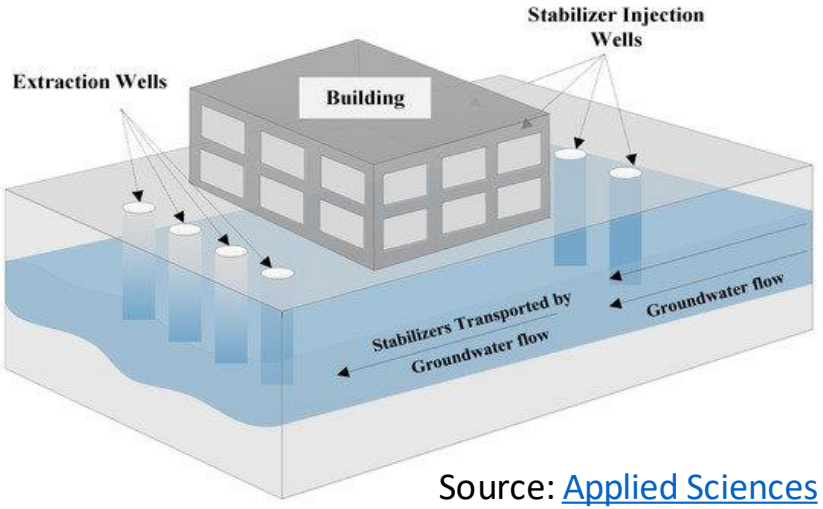
Seismic Retrofits

Source: OSSPAC CEI Hub Mitigation Strategies

Base isolation of transformers

Source: BPA

Soil stabilization



Source: Applied Sciences

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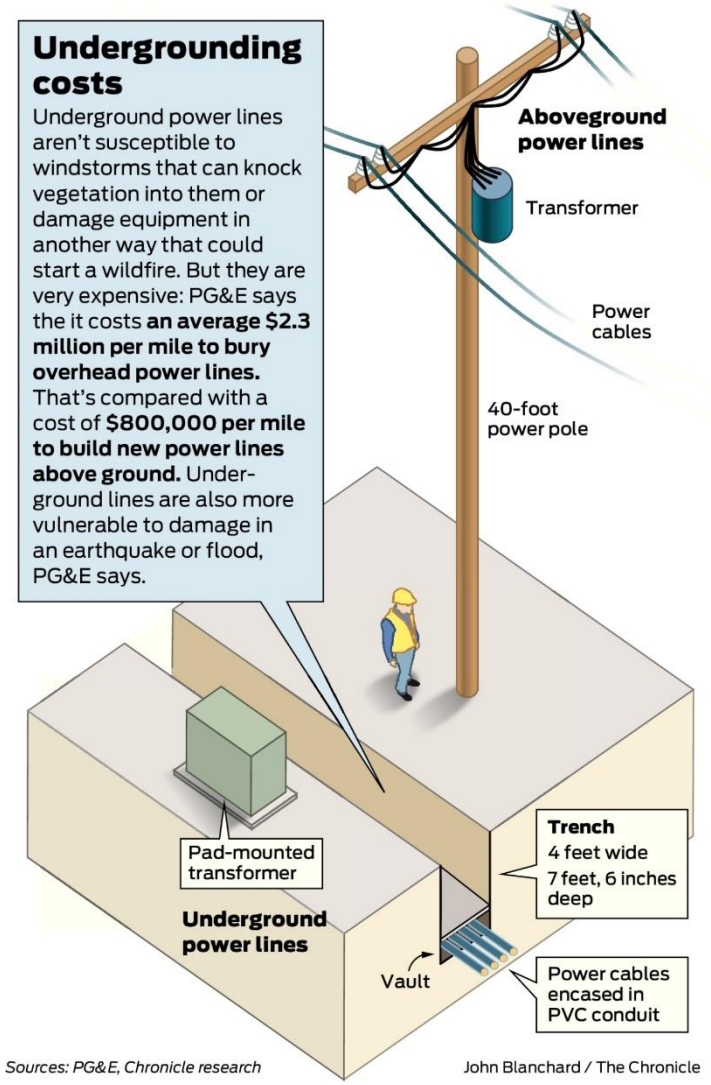
Examples: How can we improve energy resilience?

Undergrounding Power Lines

Source: Haugland Group



Source: PG&E, SF Chronicle

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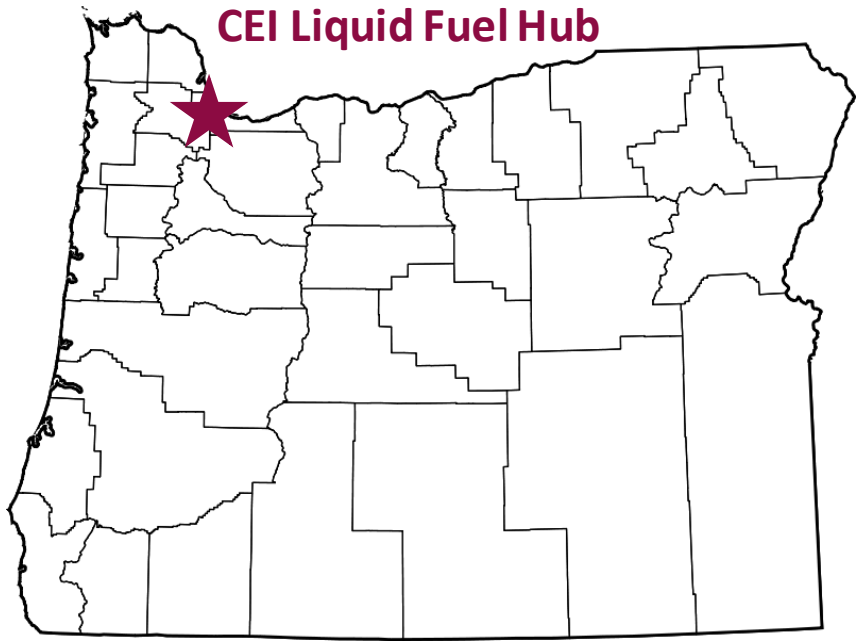
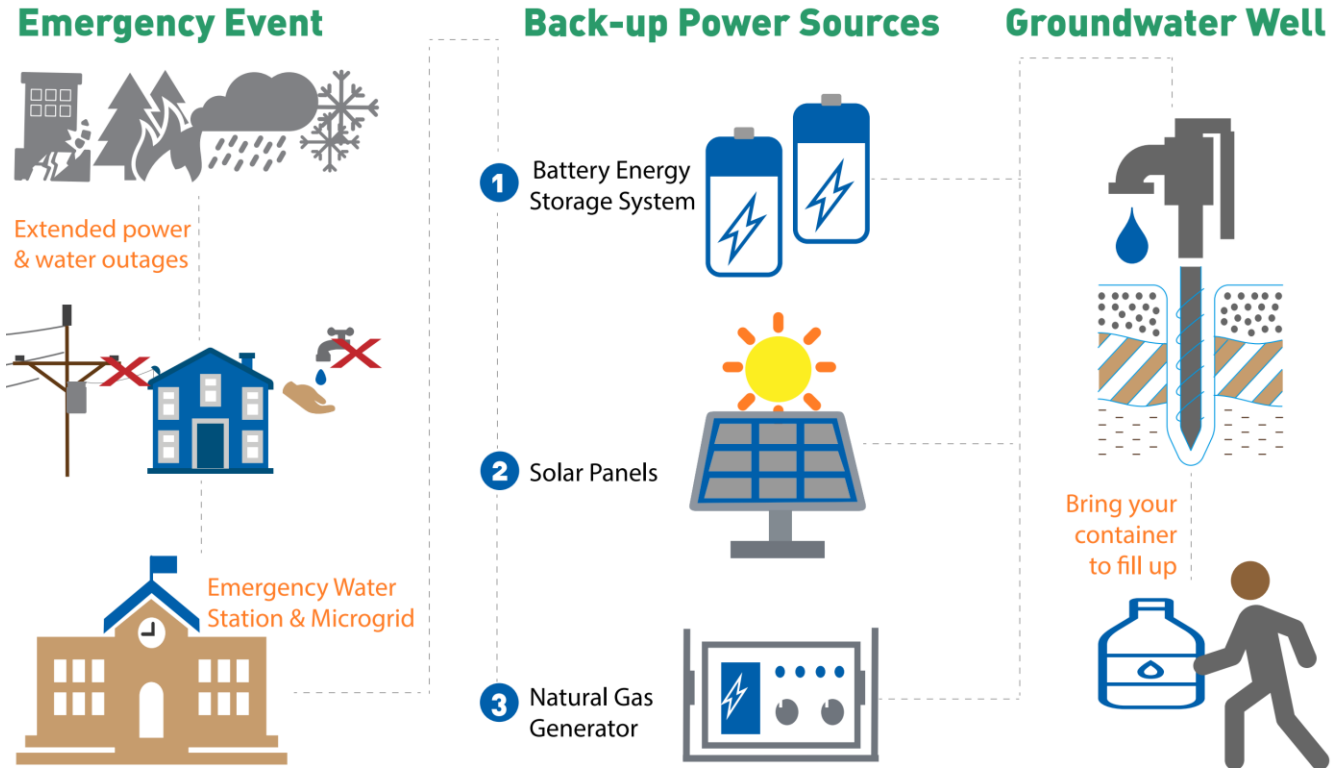
Examples: How can we improve energy resilience?

Increasing geographic diversity of energy resources





Source: EWEB

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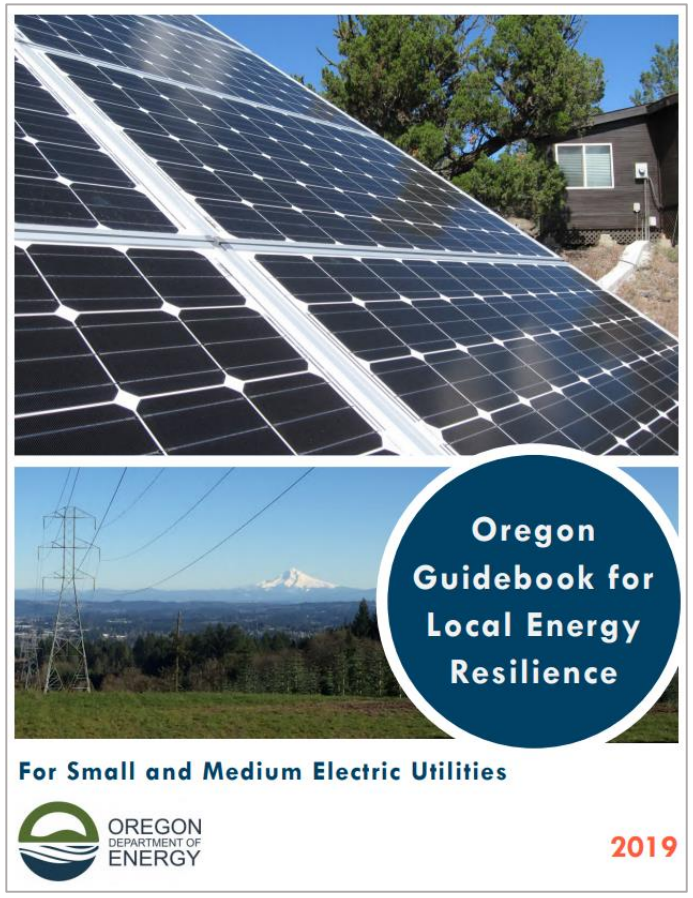
Preparing People, Not Just Infrastructure



Sharing Steps to Improve Organizational Resilience:

- Develop culture of preparedness (regular trainings and education)
- Establish and use mutual aid agreements
- Digitize personnel and facilities records
- Develop clear succession and devolution plans
- Maintain current crisis plan with emergency contact information
- Develop redundant communication systems

Developed in collaboration with: CENTRAL LINCOLN A COMMUNITY-OWNED ELECTRIC UTILITY

Building Energy-Resilient Oregon Communities:
Collaboration Required

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ODOE Emergency Response Roles

Nuclear Emergencies

- Coordinating agency for nuclear emergencies
- Columbia Generation Station
- Hanford Site
- Radioactive material transportation

Petroleum Fuels

- Develop and maintain a statewide contingency plan in response to petroleum shortages that affect Oregon
- Implement the plan during emergencies; scalable response
- Focus preparations for Cascadia Subduction Zone earthquake

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Interdependence of Infrastructure

Emergency Prep and Response Capabilities are Interdependent

- Communications
- Roads and bridges
- Airports
- Electric power: generation, transmission, distribution
- Petroleum and natural gas pipelines
- Out-of-state oil refineries
- Ports
- Water and wastewater
- People

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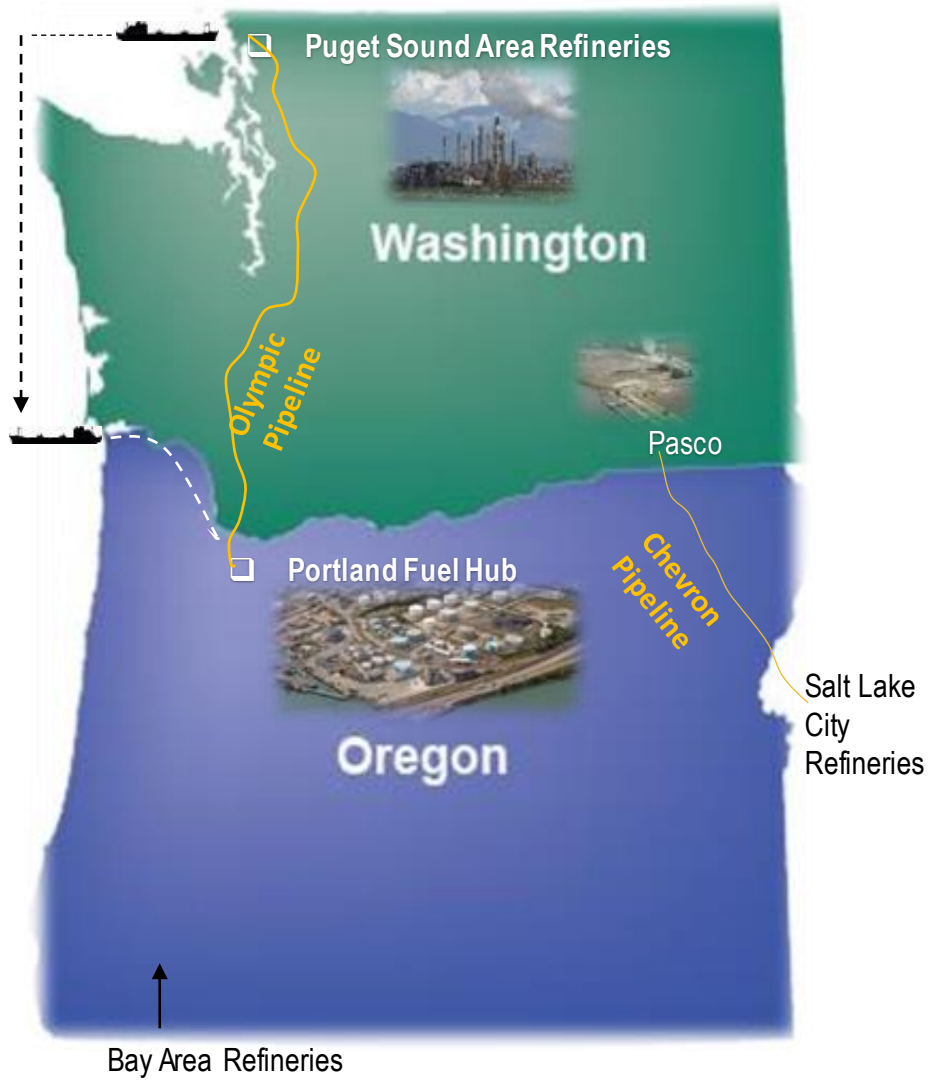
Oregon's Refined Petroleum Products

Oregon imports 100% of refined petroleum products

- Washington refineries supply 90%, mostly via Olympic Pipeline to Portland fuel hub
- Pipelines from Portland fuel hub to PDX and Eugene
- Small quantities from California and Utah
  - Pipeline from SLC to Pasco, trucked into Oregon
  - Truck from California to Oregon
- More information available:
  - https://energyinfo.oregon.gov/blog/2021/5/13/road-trip-where-oregon-gets-its-transportation-fuels
  - https://energyinfo.oregon.gov/ber



Oregon Fuel Action Plan

Create new temporary fuel supply chains into Oregon and establish new delivery systems into affected areas

- Provides coordination structure, emergency prep, and response
- Provides structure for fuel allocation that identifies pre-approved priority users of fuel and user responsibilities
- Identifies state and county priority lifeline routes to support fuel deliveries
- Pre-designates Fuel Points of Distribution for receiving emergency fuel
- https://www.oregon.gov/energy/safety-resiliency/Pages/Petroleum.aspx

Scalable for all Hazards

Recent emergency fuel response activities: COVID-19, Wildfires, and Winter Storms

COVID-19

- Coordinated hours of service waivers
- Obtained 14,000 masks and 1,075 thermometers for critical fuel workers

2020 Wildfires

- Coordinated hours of service waivers
- Ensured ethanol deliveries by rail to Eugene
- Assisted cardlock facility to obtain conditional use license to sell fuel to residents

2021 Ice Storm

- Coordinated fuel deliveries to critical facilities
- Coordinated increased fueling limits for first responders at cardlock facilities

Preparation Exercises

FEMA Cascadia Rising 2022 Exercise (June 2022)

- Government, military commands, Tribal Governments, and the private sector in OR, WA and ID coordinate simulated field response operations

US DOE Clear Path IX Exercise (June-August 2021)

- All levels of government and energy industry participate in a series of virtual energy sector tabletop exercises

Regular Nuclear Safety Exercise Drills

- Columbia Generating Station
- Hanford Site

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Questions/Comments?

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