

Oregon Department of **ENERGY**

Local Energy Resiliency: Coastal Oregon

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Overview: Oregon Department of Energy

- Oregon Department of Energy (ODOE) is a state agency **created in 1975** following the 1973 oil embargo
- ODOE employs **84 full-time staff** and is comprised of four core divisions:
 - Nuclear Safety & Emergency Preparedness
 - Energy Planning & Innovation
 - Energy Facility Siting
 - Energy Development Services
- **Key ODOE responsibilities include:** Providing technical assistance to improve energy efficiency; overseeing Oregon's role in the clean-up efforts at the Hanford nuclear site; providing policy expertise on state and regional energy issues; providing technical and financial resources for renewable energy and efficiency projects; and helping public agencies to meet their energy goals.



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

Existing Resiliency Efforts in Oregon

- ODOE's Strategic Framework
- Energy Assurance Plan
- Oregon Resilience Plan
- BPA and Oregon utilities

Energy Resiliency: Current Efforts

ODOE's Strategic Framework (2015-2019)

- **Strategic Area #4**: Improve the resiliency of Oregon's energy system
- **Builds upon and supplements existing work** by state and local agencies, the utilities, and Bonneville Power Administration
- ODOE **supports and encourages energy resiliency projects** in regional and utility planning processes (e.g., IRPs, smart grid, etc.)
- Different areas of focus: liquid fuels; natural gas system; bulk electric transmission system; local electric distribution systems

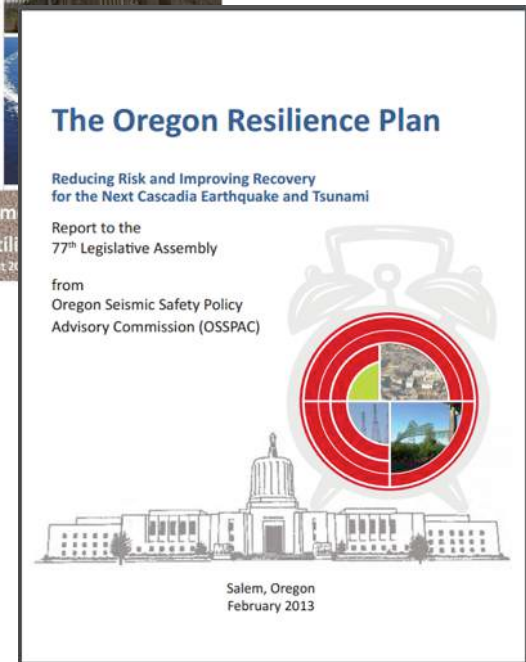
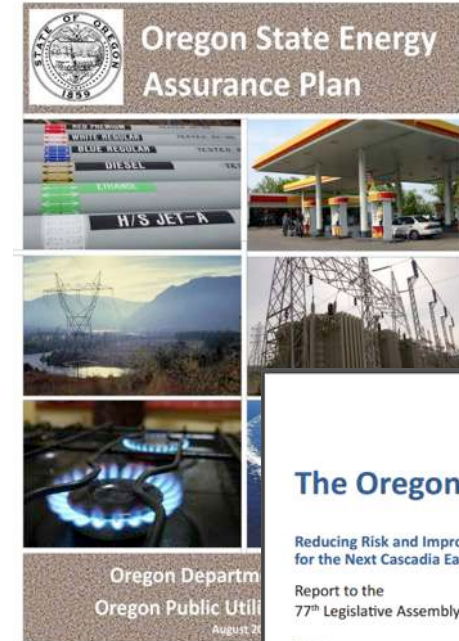


Energy Resiliency: Current Efforts

State-level Energy Resiliency Efforts

• Major Areas of Focus:

- **Liquid fuels:** Nearly 100% imported into the state via barge or pipeline and storage sites vulnerable
- **Electricity:** Many areas of the state dependent on transmission delivery, often over long distances
- **Transportation:** Bridge and road network vulnerabilities
- **Buildings:** Need for seismic upgrades to building stock and relocation to more seismically sound locations
- **Coordination:** Need to better align and coordinate public agency resiliency efforts



Energy Resiliency: Current Efforts

BPA and Utility Resiliency Planning

- **Relocating critical operations** out of liquefaction and tsunami zones
- **Seismically retrofiting** critical substations and transmission assets
- Prioritization plans for the **restoration of power** to customers
- Necessary **focus is on investments in large-scale assets** that serve the greatest number of customers
- **Smart grid** investments could be leveraged for local energy resiliency



Local Energy Resiliency: What's next?

- 20th Century View
- New technologies
- Local energy resiliency in Oregon
- NGA project with CLPUD

Local Energy Resiliency in the 20th Century



1200 kW Diesel Generator

- **On-site Diesel Generation**
Diesel generators are the primary source of local resilient power today
- **Advantages**
Widely available technology that is well understood by most industry sectors
- **Disadvantages**
Air emissions profile; dependent on re-supply of liquid fuels; lack flexibility; 50% failure rate following Superstorm Sandy

New Technologies: Distributed Energy Resources

Rapid technology advancements with distributed energy resources (DERs) have created new cost-effective options for local energy resiliency

Solar PV

- NREL finds that distributed PV is less than \$3/watt in 2016, down from over \$7/watt in 2009
- 4GW+ of distributed PV installed in USA, more than 10x as much as 2009

Storage

- < \$200/kWh nearing reality
- Cost has fallen 4x over last decade
- Increase in production likely to drive costs even lower

Smart Grid

- Two-way comms.
- Advanced load controls
- Distribution automation
- Enables aggregated DER solutions

Other

- Fuel cells
- Dynamic loads
- Distributed bioenergy
- Electric vehicles

New Efforts Underway in Oregon

Grid Edge Demonstration Project

- \$295k funding from US DOE and Oregon DOE
- Microgrid investments at three critical infrastructure sites:
 - Operations Center
 - Water pumping station
 - Communications tower
- Technology includes solar PV and 500 kW battery storage installation



Resilient Power Working Group

- Collaborative work group between City of Portland, PGE, ETO, ODOE, and others
- Focused on deploying solar+storage
- PGE investing \$90k / City investing \$23k to install solar+storage at Fire Station No. 1
- Evaluating opportunities to include solar + storage in city's existing resiliency plans



Roadmap for Local Energy Resiliency

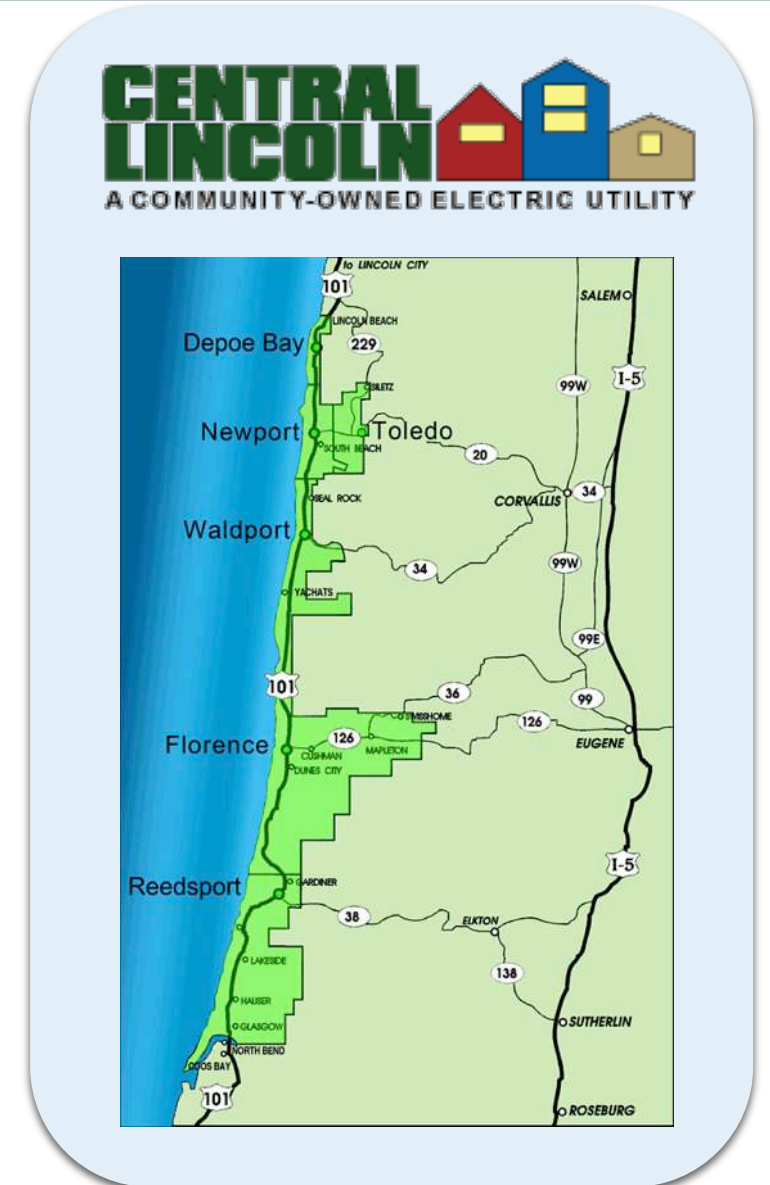
Statewide local energy resiliency assistance

- What role for the Oregon state government to provide assistance?
- Supplement existing efforts that are focused on enhancing the resiliency of fuels infrastructure and electric transmission network
- Developing a framework for local energy resiliency:
 - Identifying **critical public infrastructure**
 - **Prioritizing resilient power needs** for that infrastructure
 - Identifying **location specific considerations** (e.g., technology and geography)
 - Identifying innovative best practices for **financing microgrid investments**

Roadmap for Local Energy Resiliency

Statewide local energy resiliency assistance

- NGA sponsored Policy Academy 2017-18
- Oregon Department of Energy working with CLPUD to develop roadmap for deploying DERs to enhance local energy resiliency



Key Challenges: Getting from here to there

Key Challenges

- Financing the Deployment of DERs

- ✧ How can local jurisdictions **monetize DER value streams** (e.g., capacity benefits, ancillary services, demand response) during “blue sky” conditions?
- ✧ Opportunities for **public-private partnerships**?
- ✧ What **role for direct utility investment** with regards to the deployment of microgrids to support the resiliency of critical public infrastructure?
- ✧ **Grant-funding** for targeted investments in demonstration projects

- Coordination and Prioritization

- ✧ **Enhanced coordination of priorities** across levels of government (federal, state, county, and local) and with utilities necessary to address systemic risks.
- ✧ Recognition of **need to incorporate local energy resiliency in routine planning operations** at all levels of government and within utilities.

Thank you!



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