

State Strategies to Improve Energy Resilience through Distributed Technologies

January 9, 2020



Introduction to



- ▶ **Matt Rogotzke**, Policy Analyst, Energy, Infrastructure & Environment Division, National Governors Association Center for Best Practices



Today's Panelists

▶ **Moderator:**

▶ **Matt Rogotzke**, National Governors Association

▶ **Panelists:**

▶ **Mike Harryman**, Office of Oregon Governor Kate Brown

▶ **Adam Schultz**, Oregon Department of Energy

▶ **Virginia Castro**, Office of Energy Efficiency & Renewable Energy, U.S. Department of Energy



Presentation

- ▶ **Mike Harryman**, State Resilience Officer, Office of Oregon Governor Kate Brown
- ▶ **Adam Schultz**, Senior Policy Analyst, Oregon Department of Energy



Oregon Department of **ENERGY**

Oregon's Energy Resilience Activities

**Mike Harryman &
Adam Schultz**

January 9, 2020
NGA Webinar

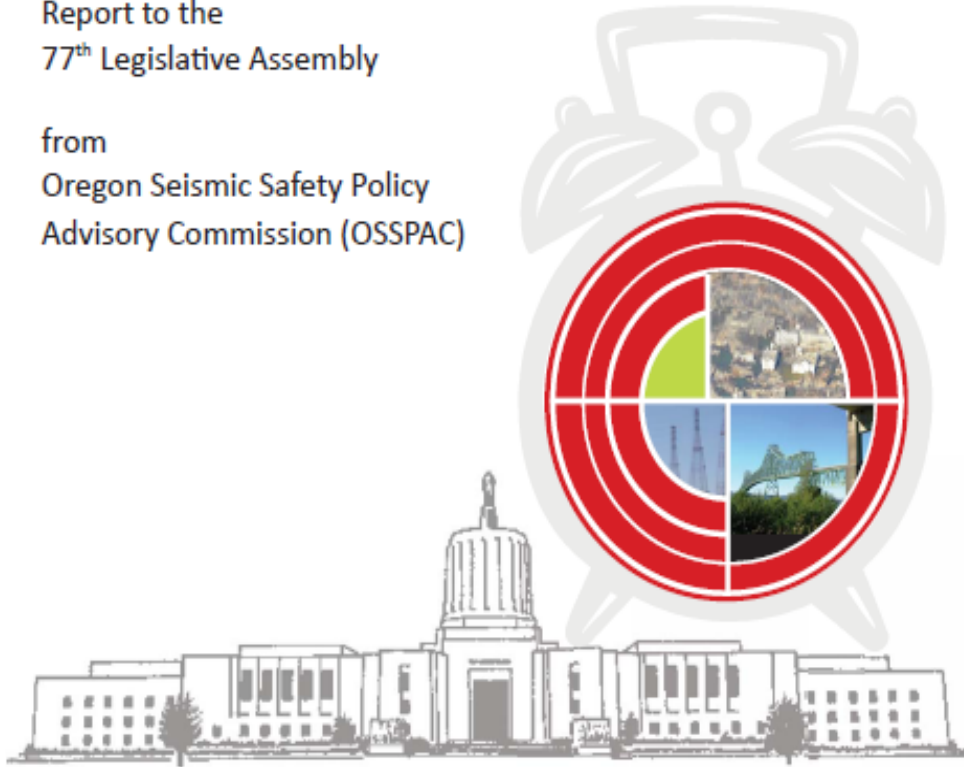


The Oregon Resilience Plan

Reducing Risk and Improving Recovery
for the Next Cascadia Earthquake and Tsunami

Report to the
77th Legislative Assembly

from
Oregon Seismic Safety Policy
Advisory Commission (OSSPAC)



Salem, Oregon
February 2013

- **The Oregon Resilience Plan – February 2013**
 - Report to the 77th Legislative Assembly
 - Oregon Seismic Safety Policy Advisory Commission (OSSPAC)
 - 50-year plan
- **Senate Bill 33 Task Force – October 2014**
 - Implementation recommendations
- **HB 2270 – July 2015**
 - Created State Resilience Officer – ORS 401.913
 - In the Office of Governor
- **Confirmed by State Senate on May 25, 2016**
 - Article III, section 4, of the Oregon Constitution




Building Resilience in Oregon

The Oregon Resilience Plan



Reducing Risk and Improving Recovery
for the Next Cascadia Earthquake and Tsunami

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Salem, Oregon
February 2013



Encouraging Homeowner Resilience through Earthquake Insurance and Seismic Retrofit

OSSPAC Publication 18-01
September 25, 2018



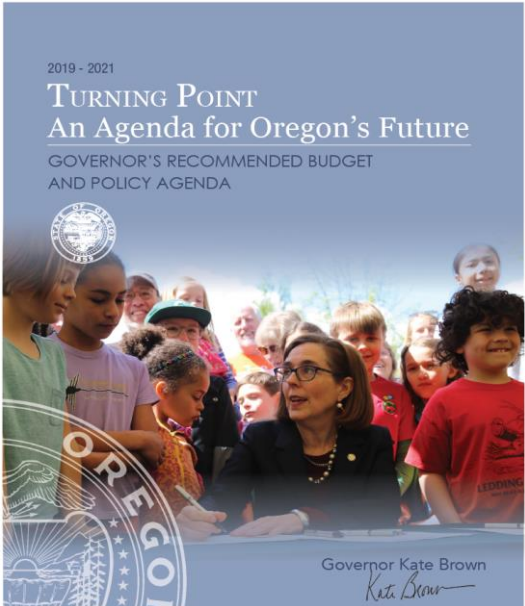
Mass Care and Mass Displacement after a Cascadia Subduction Zone Earthquake

OSSPAC Publication 18-02
September 25, 2018

2019 - 2021

TURNING POINT An Agenda for Oregon's Future

GOVERNOR'S RECOMMENDED BUDGET
AND POLICY AGENDA




Governor Kate Brown
Kate Brown



Resiliency 2025: Improving Our Readiness for the Cascadia Earthquake and Tsunami

Kate Brown, Governor
Mike Harryman, State Resilience Officer

October 16, 2018



STATE OF OREGON
Office of the Governor
KATE BROWN



CEI Hub Mitigation Strategies Increasing Fuel Resilience to Survive Cascadia

OSSPAC Publication 19-01
December 11, 2019

Governor's Resiliency 2025 Vision

*Improving Our Readiness for the Cascadia
Earthquake and Tsunami*

Released in October 2018

Part of the Governor's Recommended
Budget

This policy agenda focuses on six Key
Strategies

1. Continue state investments in seismic upgrades of schools and emergency services buildings throughout Oregon.

2. Develop a plan for the Critical Energy Infrastructure Hub to prevent and mitigate catastrophic failure and ensure fuel supplies and alternate energy sources are available to responders and the public.

3. Implement a statewide earthquake early warning system by 2023.

4. Work with local governments, community groups and the American Red Cross to ensure that 250,000 vulnerable homes have 2-week ready supplies in the next three years.

5. Strengthen local emergency management organizations and develop more robust logistical staging bases, local supply chains, and more earthquake and mass displacement insurance options.

6. Update the Oregon Resilience Plan in 2021 to reflect current best practices, community input, and academic research, including a specific plan for the Oregon Coast.



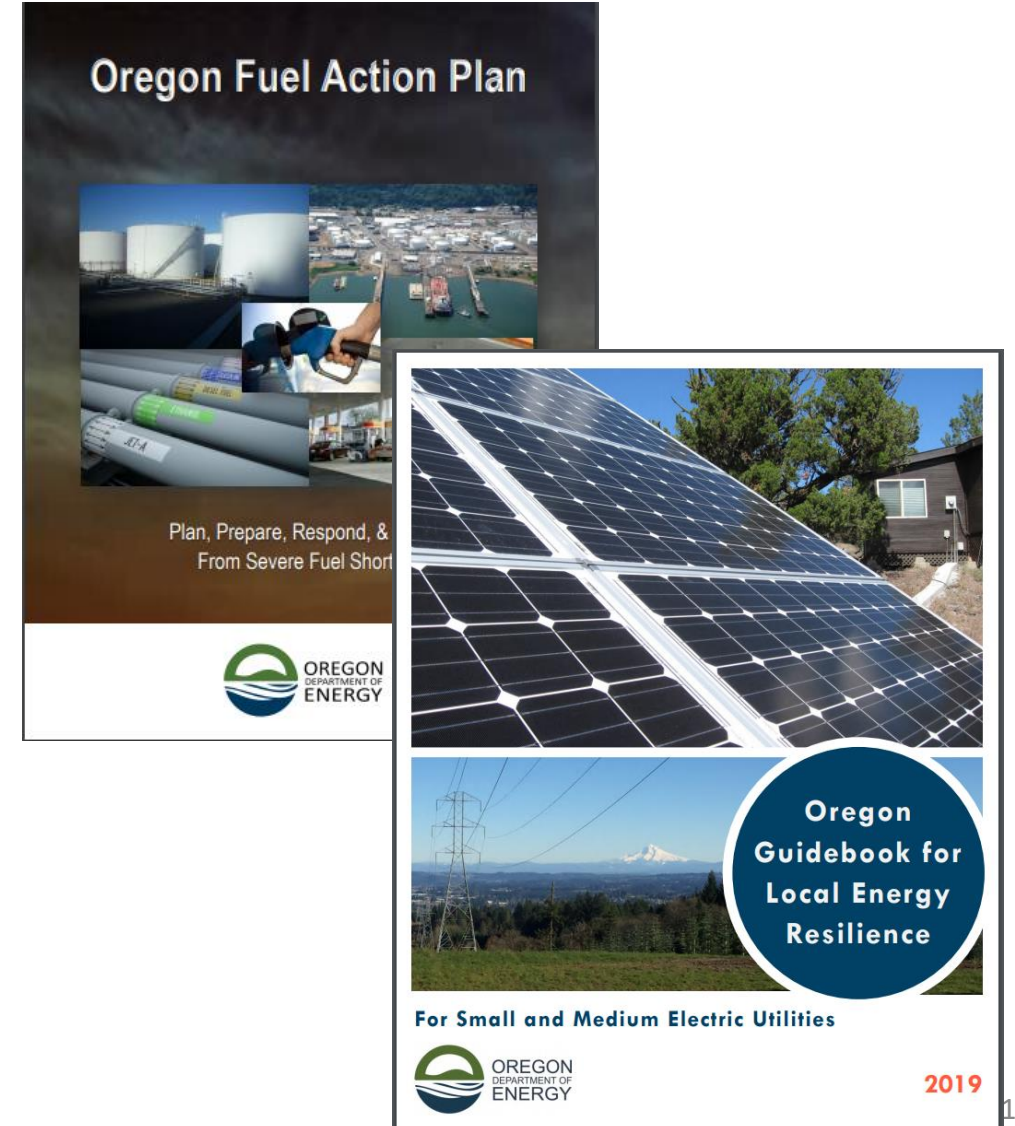
ODOE's Role: Energy Resilience

ODOE's Role: Energy Resilience

ESF 12: ODOE is designated as co-lead agency for Emergency Support Function 12 and is the lead for the petroleum sector.

Oregon Fuel Action Plan: Published by ODOE in 2017. Details how the state will respond to an event that causes severe shortages of liquid fuels to ensure adequate supplies will be provided to emergency and essential service providers.

Resilience Guidebook: Published by ODOE in 2019. Focused on improving local energy resilience through coordination between public electric utilities and other essential service providers at the community level.






Oregon Guidebook for Local Energy Resilience

Overview of Electric Utilities in Oregon



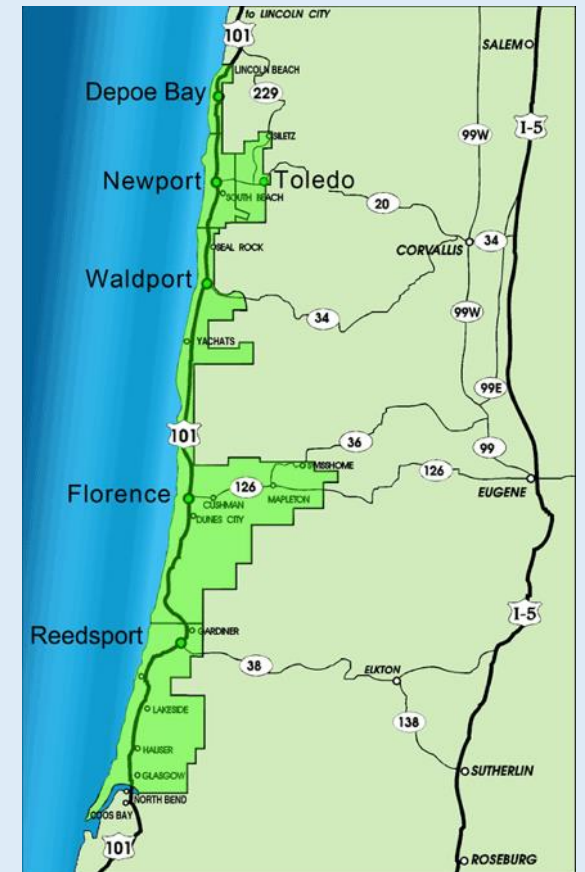
INVESTOR OWNED UTILITIES

-  Idaho Power Company
-  PacifiCorp (Pacific Power & Light)
-  Portland General Electric (ENRON)



Oregon Guidebook for Local Energy Resilience

- NGA sponsored Policy Academy 2017-18
- Oregon Department of Energy worked with Central Lincoln People's Utility District to develop the Guidebook as a resource for small public utilities



Yaquina Bay Bridge, Newport, OR

Why resilience?



Photo:
ODOT



statesman journal

PART OF THE USA TODAY NETWORK

Jun 14, 2019 | Pacific Power will consider shutting off power in Oregon to avoid wildfires in 'extreme weather'



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

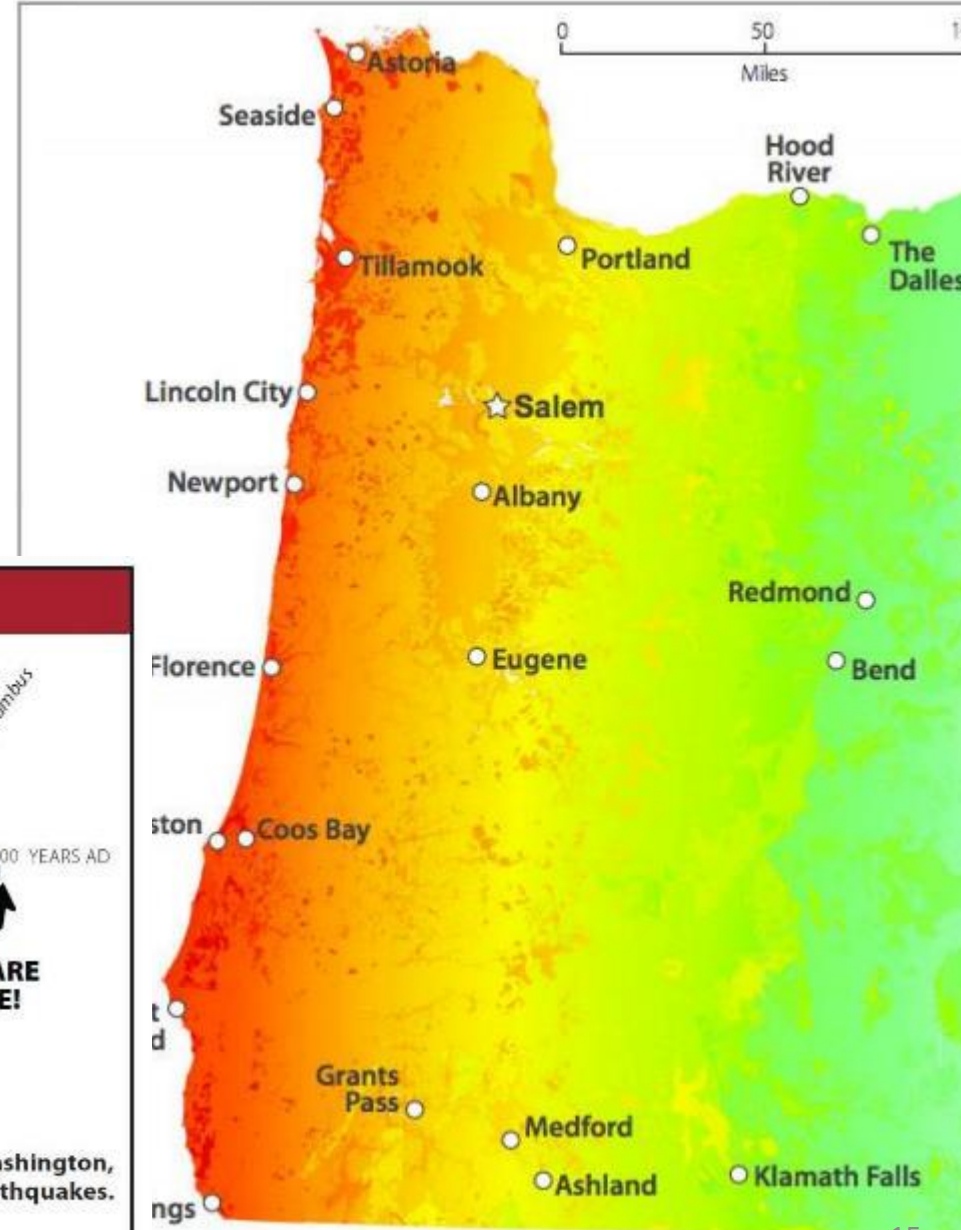
“...it will take millions of dollars to repair the sewer and water systems for this town [Elkton] of 200 people. And the local utility company, **Douglas Electric Cooperative**, is looking at about \$6 million in damages. **Nine days after the storm, about 4,600 of its customers didn't have electricity...**”

Why resilience?

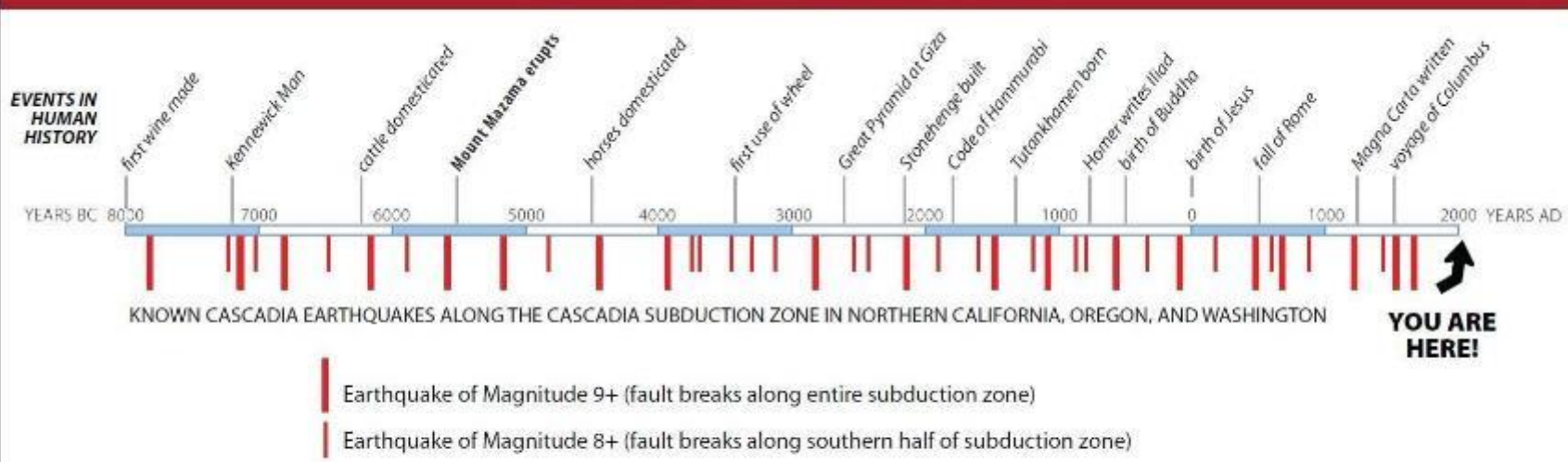


Sep 15, 2016 | Unprepared: Will we be ready for the megaquake in Oregon? ([video](#))

ShakeMap for SIMULATED M9 Cascadia earthquake



CASCADIA EARTHQUAKE TIME LINE



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.

Guidebook for Local Energy Resilience

1

Business Continuity Planning: Tangible steps that utilities specifically can take to make their organizations more resilient

2

Community Energy Resilience: Coordinating with local governments and communities to increase the resilience of energy supplies needed to deliver critical community services

3

Federal and State Emergency Planning: Understanding the broader context of federal and state emergency management planning and where the utility fits in

Guidebook: Designed as a Resource



**Definitions
adopted by
ODOE**



**Examples
from local
utilities**



**Links to
related online
content**



**Actions
utilities can
take**



**References to
other
resources**

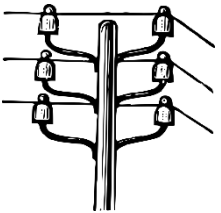
1

Business Continuity Planning



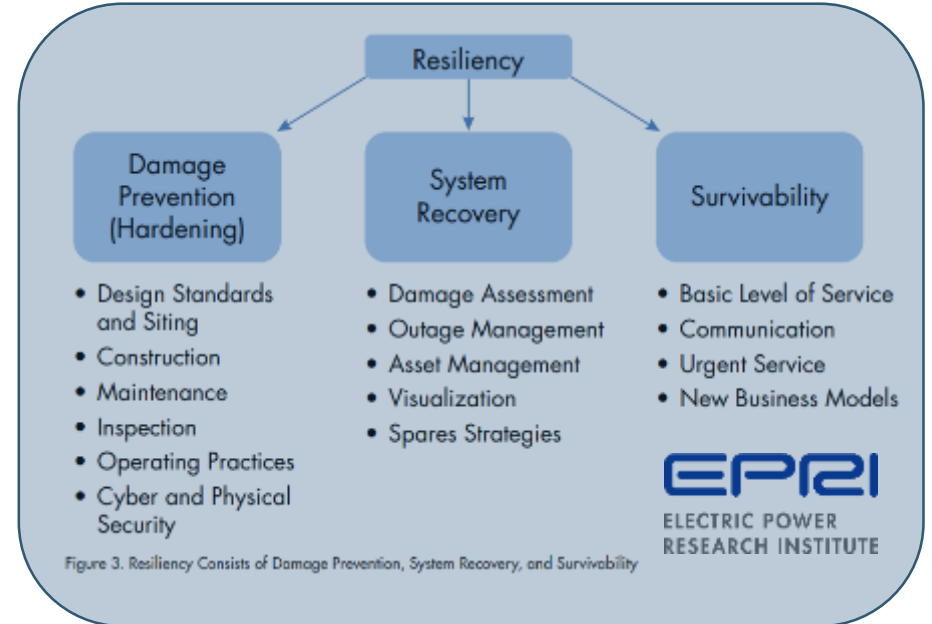
- **People:** Culture of preparedness; trainings; succession and devolution planning; Go Bags; mutual aid; digitization of personnel records; ongoing education

- **Facilities:** Facilities assessment; alternate sites; retrofits; on-site power



- **Infrastructure:** Vulnerability assessment; relocation of assets; sensors; digitization of engineering records; shutdown protocols; stockpiling

- **Communications:** Contact information; crisis plan; redundancy; out-of-region partnerships; alternative communication systems



2

Community Energy Resilience

“The ability of a specific community to maintain the availability of energy needed to support the provision of energy-dependent critical public services to the community following non-routine disruptions of severe impact or duration to the state’s broader energy systems.”



Prioritizing Community Energy Resilience

Emergency Event

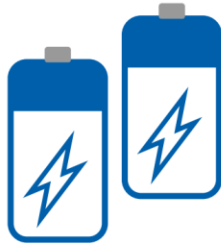


Extended power & water outages

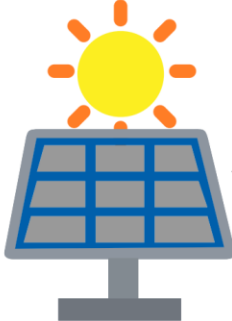


Back-up Power Sources

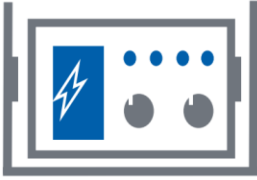
1 Battery Energy Storage System



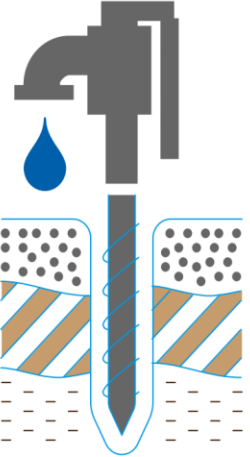
2 Solar Panels



3 Natural Gas Generator



Groundwater Well



Bring your container to fill up



Emergency Water Station & Microgrid (Howard Elementary)

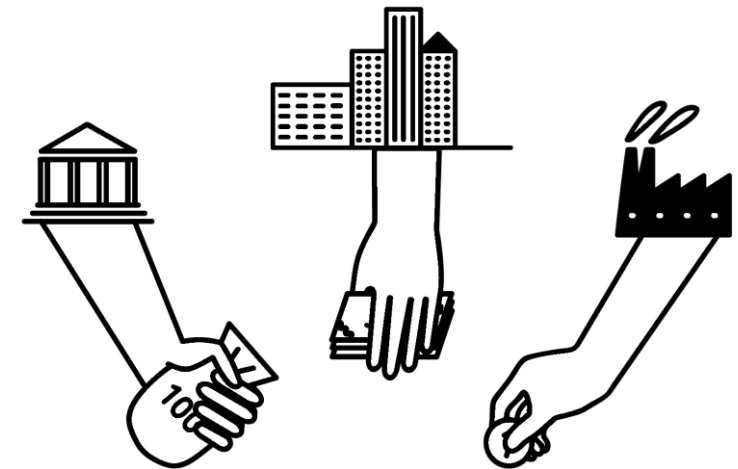
Next Steps

Continuing the Conversation: Oregon Department of Energy plans to continue (and expand) conversations about local energy resilience with utilities, local governments, and other stakeholders

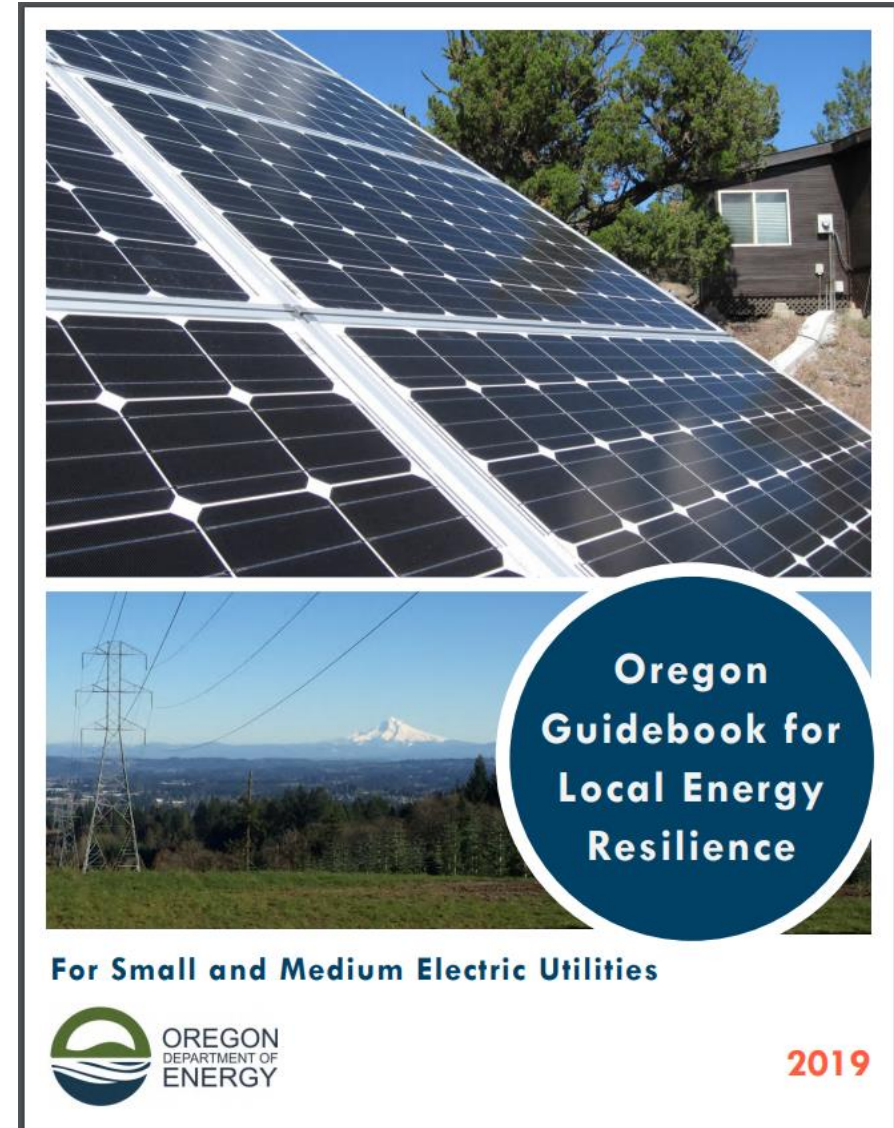


Valuation Framework: A need for technical assistance has been identified to develop a framework for quantifying the value of energy resilience investments

Funding Mechanisms: Multiple funding streams may be necessary to allocate the costs of the diverse benefits that these projects can deliver—from clean energy and capacity contributions, to ancillary services for the grid, to community resilience following major events



Guidebook Available Online



Thank you

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Presentation

- ▶ **Virginia Castro**, Technical Energy Project Officer,
Office of Energy Efficiency & Renewable Energy,
State Energy Program, U.S. Department of Energy



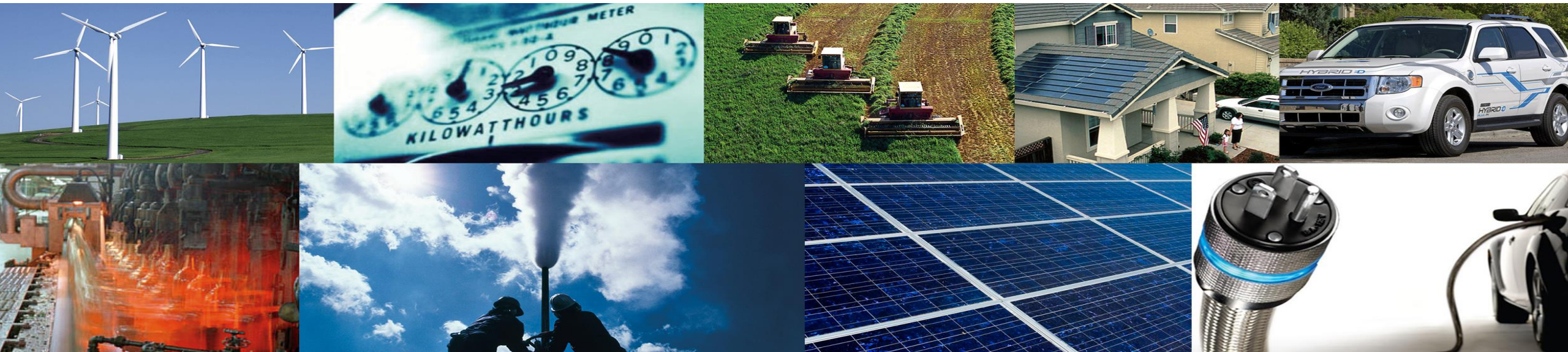
U.S. DEPARTMENT OF
ENERGY

Office of
**ENERGY EFFICIENCY &
RENEWABLE ENERGY**

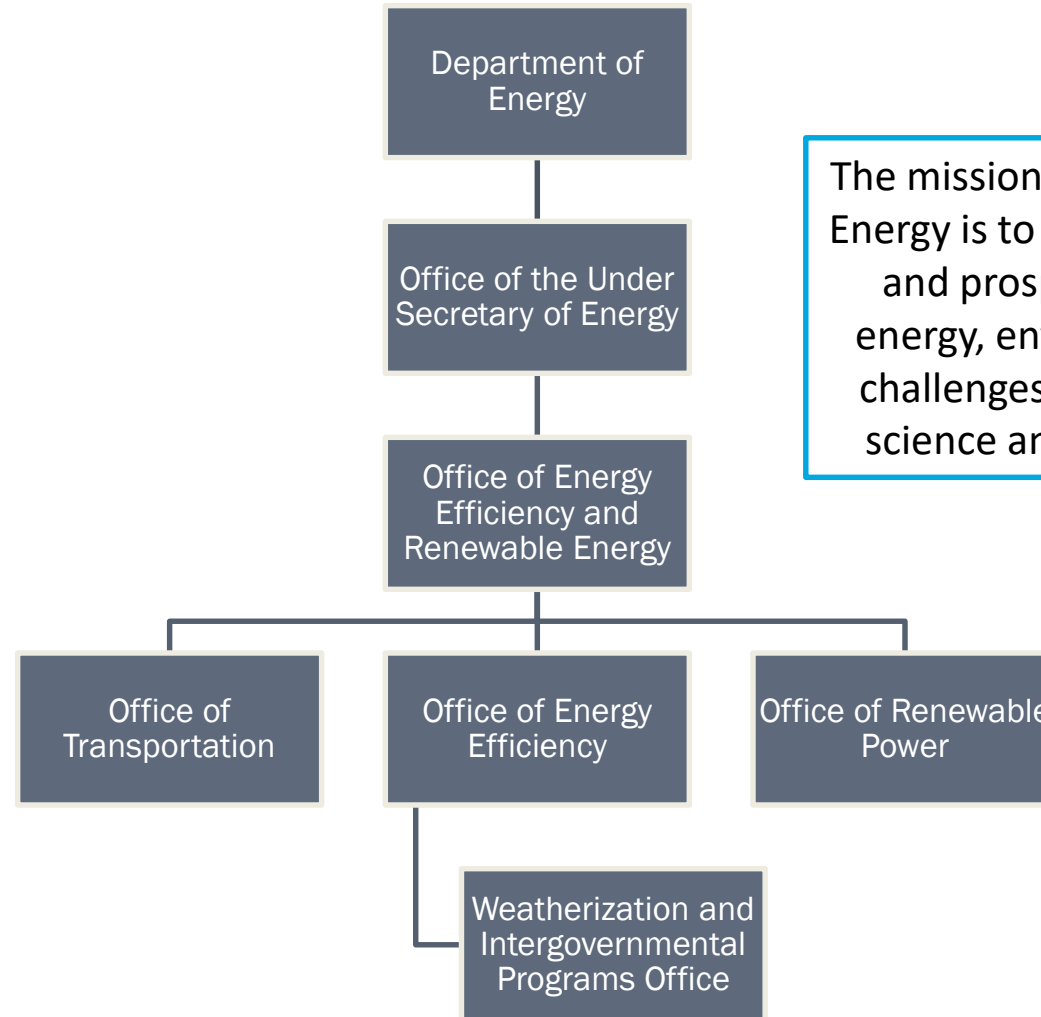
State Energy Program

Distributed Generation Energy Resilience Projects

January 9, 2020

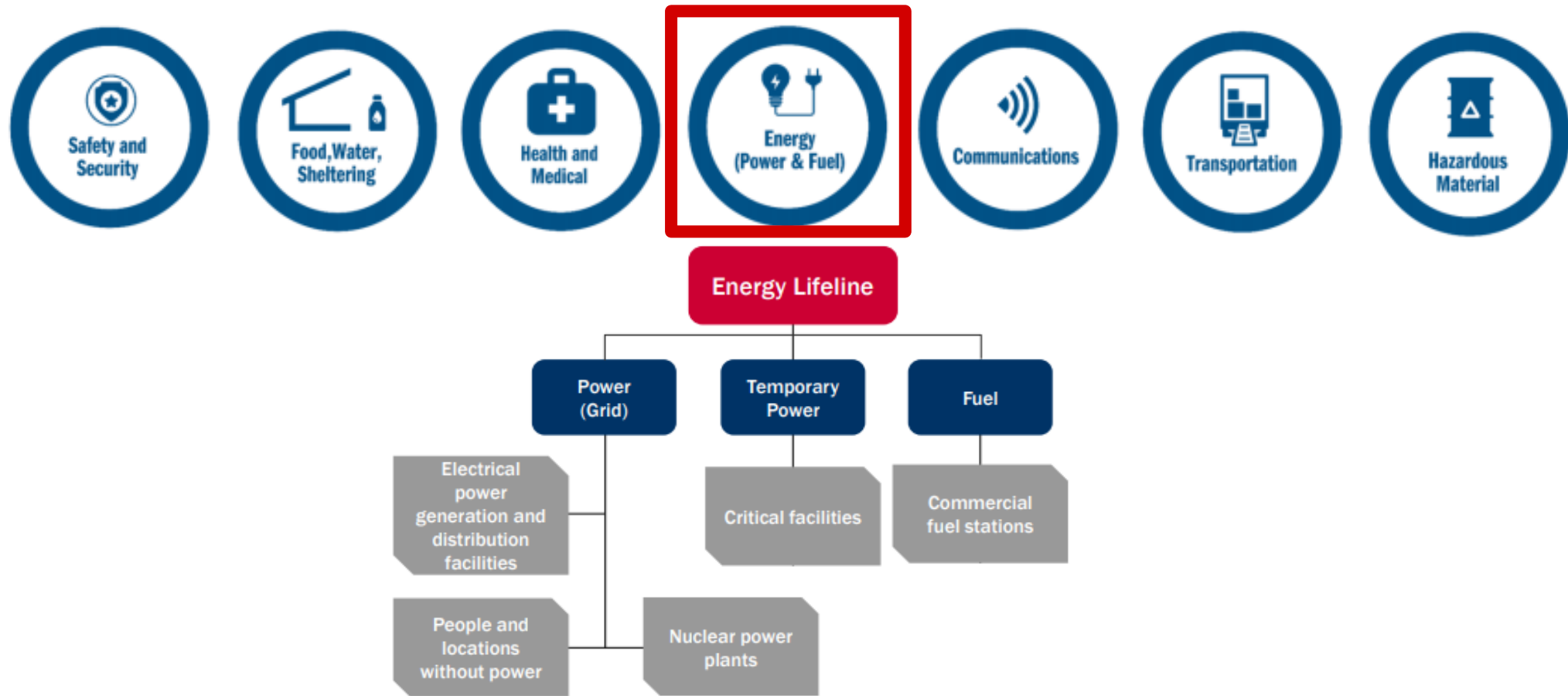


U.S. Department of Energy Organizational Chart



The mission of the U.S Department of Energy is to ensure America's security and prosperity by addressing its energy, environmental and nuclear challenges through transformative science and technology solutions.

FEMA's Energy Lifeline & DOE Role



Weatherization & Intergovernmental Programs (WIP) Office

State Energy Program



Partnerships and Technical Assistance



Weatherization Assistance Program



Strategic & Interagency Initiatives



Weatherization & Intergovernmental Programs (WIP) Office



We enable
STRATEGIC INVESTMENTS
in energy efficiency and renewable energy
technologies through the use of
INNOVATIVE PRACTICES across the
United States and a wide range of
stakeholders, in **PARTNERSHIP** with
state and local organizations and
community-based nonprofits.

RESULTS:



Saving
taxpayer
dollars



Making full use
of domestic
energy
resources



Cutting
energy
waste

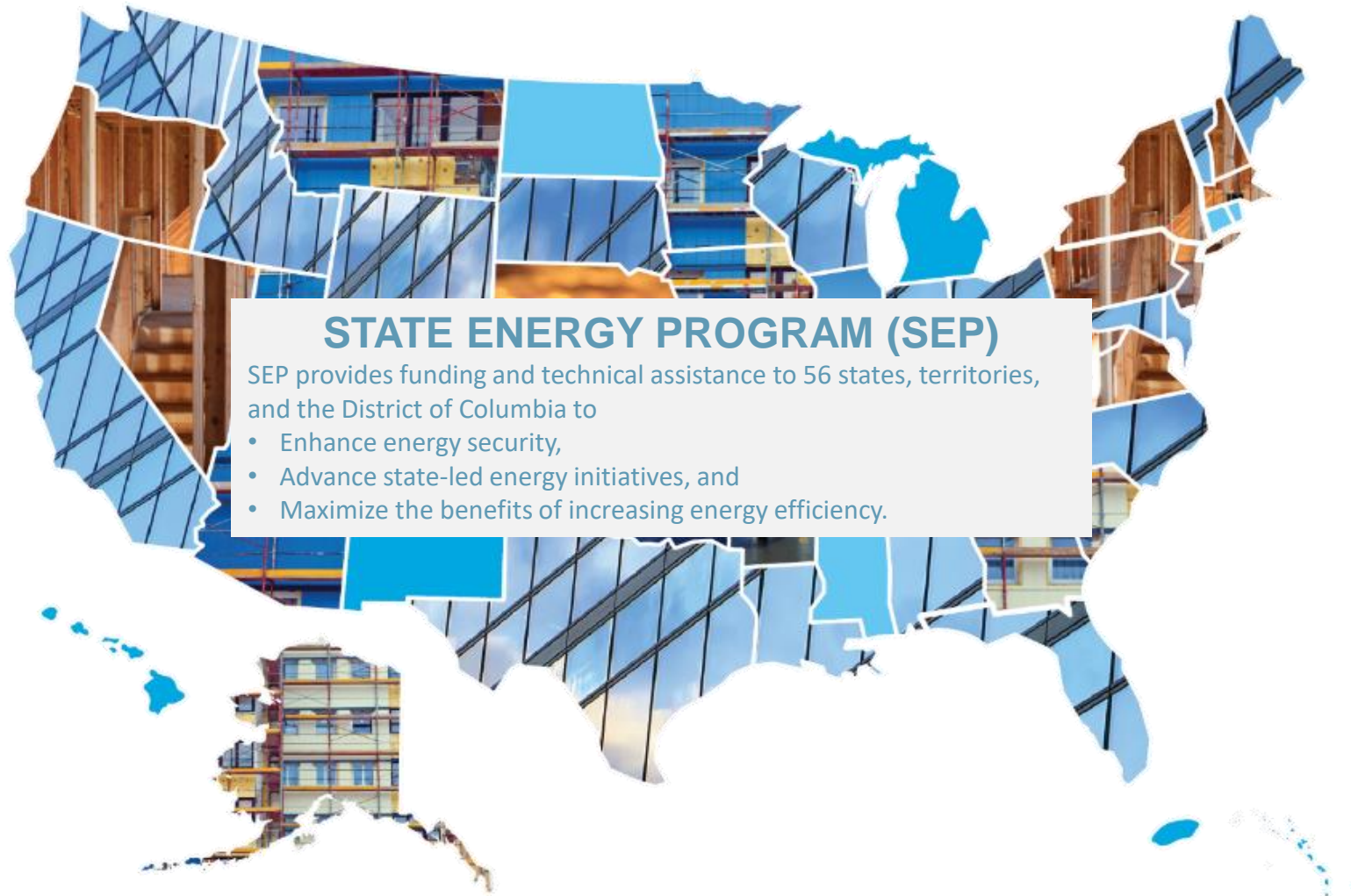


Improving
energy
independence
and security



Furthering the
development of
energy
infrastructure

U.S. Department of Energy's State Energy Program

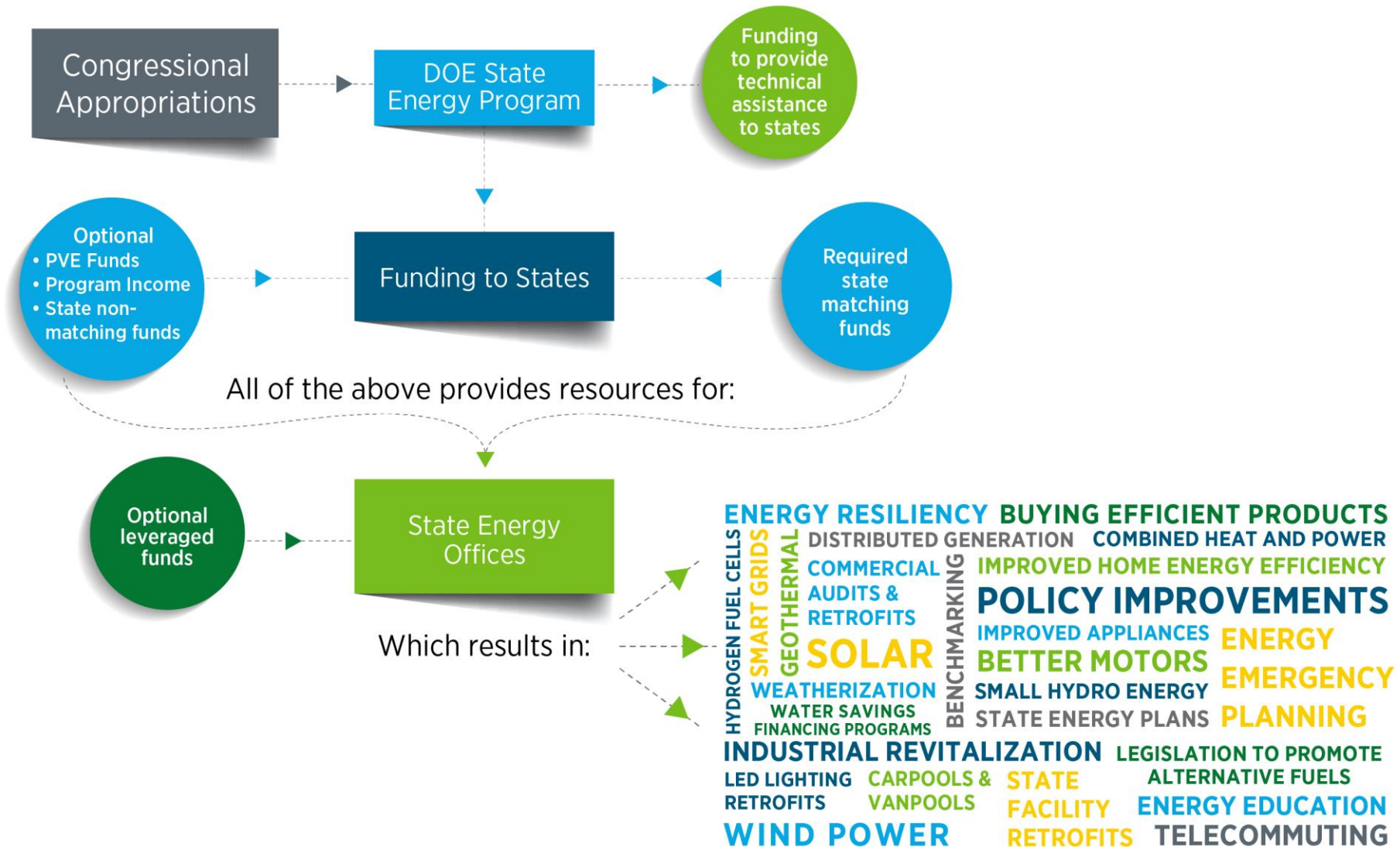


STATE ENERGY PROGRAM (SEP)

SEP provides funding and technical assistance to 56 states, territories, and the District of Columbia to

- Enhance energy security,
- Advance state-led energy initiatives, and
- Maximize the benefits of increasing energy efficiency.

State Energy Program Formula Funding



SEP: Puerto Rico PV & Storage Energy Resiliency Project

Project Year: 2018

SEP Project Cost: \$239,000

Goal: To increase residential energy resiliency and reduce energy consumption from the grid.

- **20 homes** were chosen for **PV and battery storage** based on the following criteria:
 - Previously weatherized to reduce energy consumption
 - Energy grid vulnerability (after Hurricane Maria event)
- Total 54kw of PV solar installed (2.7kw per home)
- Total battery cycling capacity 80 hours per home



A PV and battery storage system installed in Puerto Rico as part of this proj



GOBIERNO DE PUERTO RICO
Departamento de Desarrollo Económico y Comercio

SEP: Puerto Rico PV & Storage Energy Resiliency Project

Impacts:

- Participating home energy use has decreased by an average of 10–15 kWh.
- Participants feel more safe and confident in having electricity when there is an outage.
- Passive survivability has increased for participating home residents.



A PV and battery storage system installed in Puerto Rico as part of this project



GOBIERNO DE PUERTO RICO
Departamento de Desarrollo Económico y Comercio

SEP: Florida SunSmart Schools and Emergency Shelters

Project Year: 2009

SEP Project Cost: \$9.84 million with
~\$900,000 in matching funds from Florida
Utilities

Goals: Reduce energy costs for schools and
increase community resilience.

- Florida outfitted **117 schools with solar systems** that double as emergency shelters with 10 kW bimodal photovoltaic (PV) arrays with battery back-up.
- Installed more than a megawatt of solar that produce an average of 12.8 MWh annually.
- Educational kits for teachers:
 - STEM (science, technology, engineering, and math) content was designed for students to learn about renewable energy
 - Workshops for teachers and facility managers



The SunSmart Program has installed solar power systems at schools designated as emergency shelters throughout Florida.

Photo by Amy Kidd, SEP Team Lead

<https://www.energy.gov/eere/wipo/articles/sep-success-story-floridas-sunsmart-program-helps-provide-power-schools-when>



SEP: Florida SunSmart Schools and Emergency Shelters

Impacts:

- The systems have been activated during four hurricanes: Hermine, Matthew, Irma, and Michael.
- There were 40 SunSmart Schools E-shelters activated during Hurricane Irma:
 - 32 of the 40 schools lost power from the electric grid and utilized the battery system for backup power.
- Annual savings of approximately \$133,346 for the entire project or \$1,258 per school.
- Over 450 Florida teachers and 50,000 students have received education in the science and use of renewable energy technologies.



Map of Florida SunSmart Schools and Emergency Shelters





Contact Information

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Department of Energy Resources

- FEMA/WIP Webinar Presentation & Recordings
- <https://www.energy.gov/eere/slsc/fema-and-wip-webinar-series-energy-lifelines-mitigation>
- Weatherization and Intergovernmental Programs Office (WIP) Fact Sheet:
https://www.energy.gov/sites/prod/files/2019/08/f65/EERE_WIP_Overviewv6.pdf
- State Energy Program Fact Sheet:
<https://www.energy.gov/sites/prod/files/2019/06/f64/wip-sep-factsheet-0619.pdf>
- Energy Efficiency and Renewable Energy Resources for State and Local Leaders:
<https://www.energy.gov/sites/prod/files/2019/07/f64/Summer2019-SLSC-resource-guide.pdf>
- DOE's Better Buildings Initiative's resilience webpage:
<https://betterbuildingsinitiative.energy.gov/resilience>
- How Distributed Energy Resources Can Improve Resilience in Public Buildings: Three Case Studies and a Step-by-Step Guide: <https://www.energy.gov/eere/slsc/downloads/how-distributed-energy-resources-can-improve-resilience-public-buildings-three>
- Energy Efficiency and Distributed Generation for Resilience: Withstanding Grid Outages for Less: <https://www.energy.gov/sites/prod/files/2019/06/f64/EEDG-Resilience.PDF>

FEMA Resources

- FEMA Hazard Mitigation Assistance (HMA): <https://www.fema.gov/hazard-mitigation-assistance>
- FY19 Pre-Disaster Mitigation (PDM) General Information: <https://www.fema.gov/pre-disaster-mitigation-grant-program>
- FY19 PDM Notice of Funding Opportunity (NOFO) and Fact Sheet: <https://www.fema.gov/media-library/assets/documents/182171>
- Community Lifelines Implementation Toolkit: <https://www.fema.gov/media-library/assets/documents/177222>

Questions for Panelists

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