Oregon Security Plan Update

Logistics

OREGON DEPARTMENT OF ENERGY

Welcome and thank you for joining us!

- This meeting is taking place in a **hybrid** format and **will be recorded**.
- Please ensure you're muted during the presentation.
- A large amount of information will be covered in this presentation.
  - Please reference the handout for additional information (link is in the chat).
  - Slido will be used for surveys during the presentation. Please take a moment to connect using the QR code or link in the chat.
  - Please write down questions/comments to share during the Q&A section.
    - During the Q&A section, please raise your hand to ask a question or type it into the chat.

Join at slido.com #ODOENorthwest
https://app.sli.do/event/xuvZW3CMmR4CkjhugTxrni

OREGON ENERGY SECURITY PLAN NORTHWEST REGIONAL MEETING

May 14, 2024

Tom Sicilia, RG
Maxwell Woods
ODOE

Casey Steadman, PhD
Andrew Eiswerth
CNA

OREGON DEPARTMENT OF ENERGY

Agenda

- Energy Security Plan (ESP) Overview
- Project timeline & structure
- Methods Overview

Break

- Preliminary Results & Slido
  - Fuel Storage
  - Stakeholder Engagement Feedback
  - Risk Analysis results
  - Risk Mitigation Measures
- Next steps
- Energy Strategy Team
- Q&A

About the Agency

LEADING OREGON TO A SAFE, EQUITABLE, CLEAN, AND SUSTAINABLE ENERGY FUTURE

Our Mission

The Oregon Department of Energy (ODOE) 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, ODOE 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

Why are we here?

Goals for Today

1. Share project progress

2. Discuss risk assessment results

3. Solicit regional input on potential mitigation measures to reduce risks

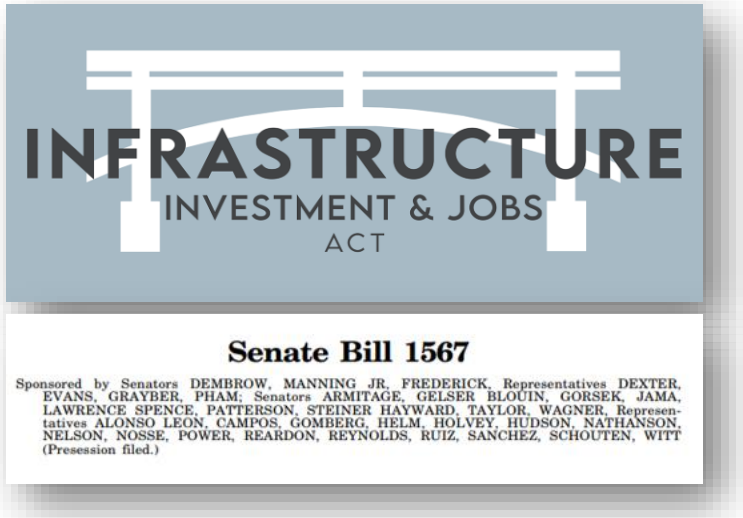
Energy Security Plan Development Team

- Oregon Department of Energy
- CNA partnering with Haley & Aldrich
- Oregon Public Utility Commission staff
- And you

State Energy Security Plans

Required Contents of State Energy Security Plans

1. Address all energy resources and regulated and unregulated energy providers
2. Provide state energy profile to include an assessment of energy production, transmission, distribution, and end-use
3. Address potential hazards to the electricity, liquid fuels, and natural gas sectors *(physical and cybersecurity threats and vulnerabilities)*
4. Provide risk assessment of energy infrastructure and cross-sector interdependencies
5. Provide risk mitigation approach to enhance reliability and end-use resilience
6. Address Multi-state regional coordination, planning, and response



What is the Energy Security goal?

To ensure a reliable and resilient supply of energy at an affordable price – through efforts to identify, assess, and mitigate risks to energy infrastructure and to plan for, respond to, and recover from events that disrupt energy supply

Energy Security Plan Development

OREGON DEPARTMENT OF ENERGY

STRATEGY

Bring together all relevant energy information into a single plan that evaluates Oregon's energy security status and provides a roadmap to improving energy security and resilience over time

Oregon Energy Security Plan: Fuel Resilience

OREGON DEPARTMENT OF ENERGY

SB 1567 – Recommend Strategy to Increase geographic diversity of fuel storage in Oregon

Senate Bill 1567

Sponsored by Senators DEMBROW, MANNING JR, FREDERICK, Representatives DEXTER, EVANS, GRAYBER, PHAM; Senators ARMITAGE, GELSER BLOUIN, GORSEK, JAMA, LAWRENCE SPENCE, PATTERSON, STEINER HAYWARD, TAYLOR, WAGNER, Representatives ALONSO LEON, CAMPOS, GOMBERG, HELM, HOLVEY, HUDSON, NATHANSON, NELSON, NOSSE, POWER, REARDON, REYNOLDS, RUIZ, SANCHEZ, SCHOUTEN, WITT (Presession filed.)

- Prioritize most vulnerable and isolated communities to Cascadia impacts
- Assess viability of expanding storage capacities at public facilities
- Assess viability of partnering with private-sector companies that support state response-recovery efforts to expand storage capacities at existing fuel sites
- Evaluate seismic resilience of existing fuel storage facilities considered for expansion
- Identify-mitigate barriers to implement geographically distributed fuel network

State Motor Pool

ODOT Maintenance Yard

City of Corvallis Public Works

Oregon Energy Security Plan Progress!

OREGON DEPARTMENT OF ENERGY

Data collection is largely complete – Thank you to all that contributed!

- **Public Sector Survey – Energy Insecurity Experiences (Feb-March)**
- **Private Sector Survey - Mitigation Maturity Matrix (March-April)**
  - **Liquid fuels terminals and distribution network**
  - **Electric utilities (IOU and COU)**
  - **Natural gas providers**
  - **Propane suppliers**

- **To track our progress - scan the QR code or check out our website**

https://tinyurl.com/OESP-info

energy.security@energy.Oregon.gov

Remaining Work

Conduct regional meetings to talk through and rank mitigation strategies

- **May 14-23**

Assess the fuel storage capacity and recommend areas to increase storage

Cross the t's and dot the i’s for a September 2024 submittal deadline

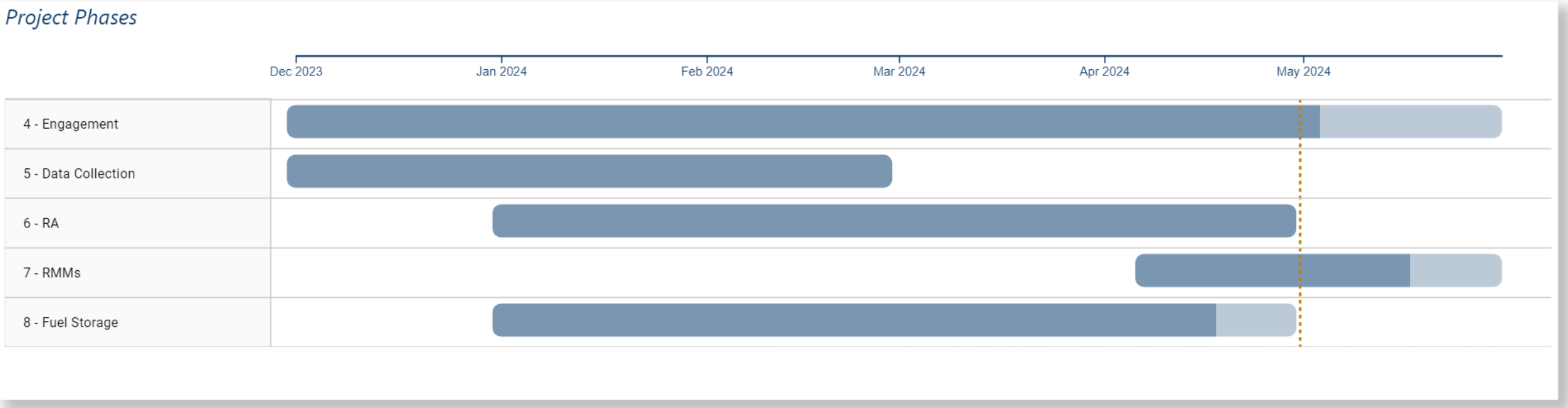
Evaluate/Update the plan every year (US DOE) and every other year (State requirement)

Project Timeline & Structure

Project Timeline

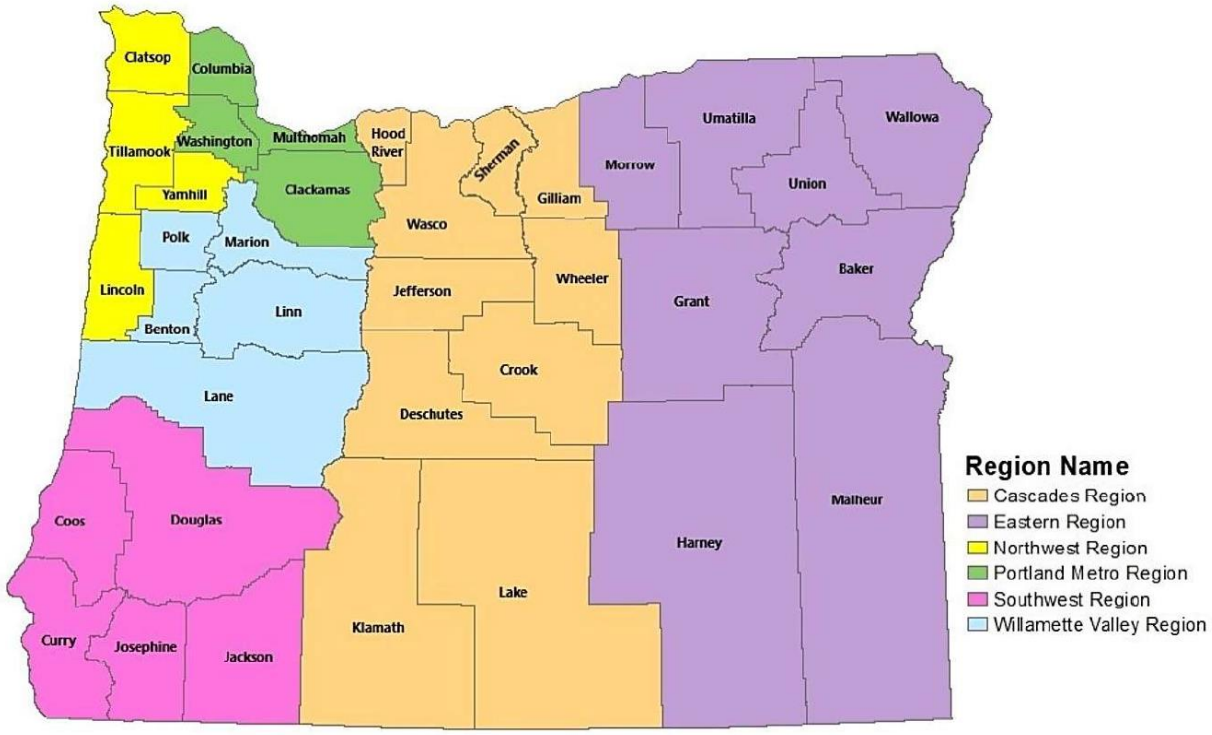
ESP Objectives

*To ensure a reliable and resilient supply of energy at an affordable price – through efforts to **identify, assess, and mitigate risks** to energy infrastructure and to **plan for, respond to, and recover from** events that disrupt energy supply*



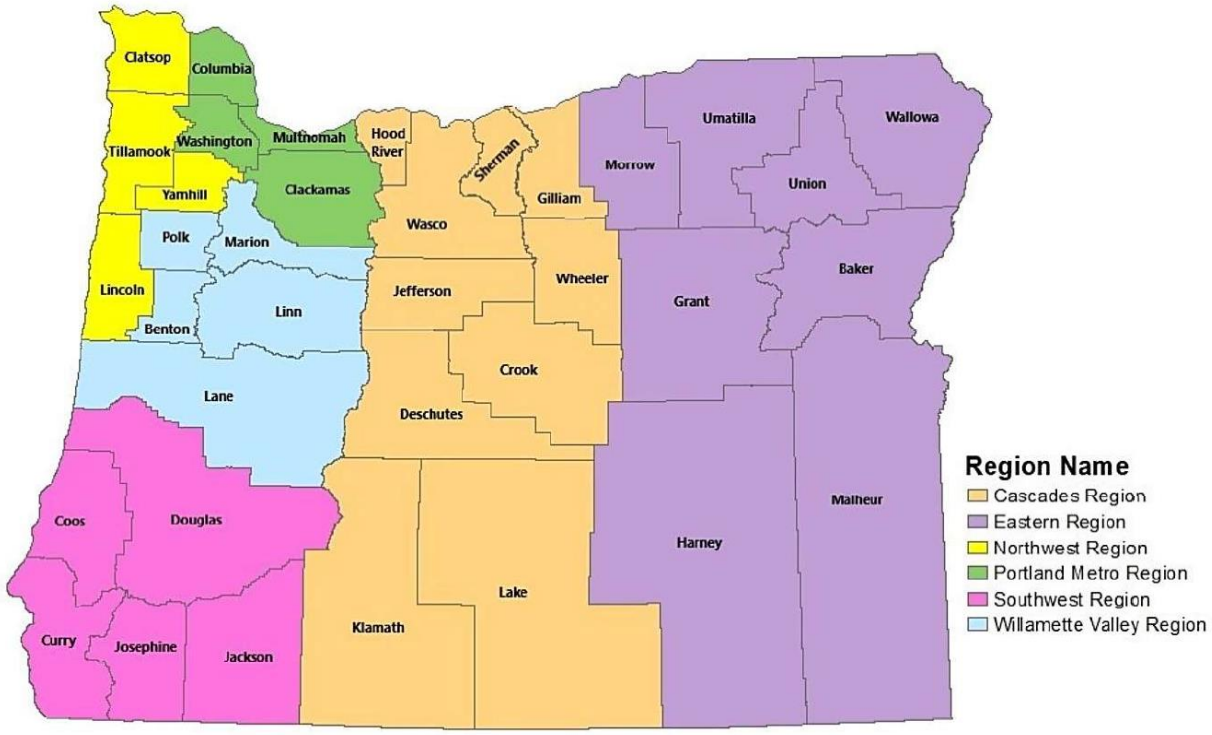
PS: Private Sector; RA: Risk Assessment; RMM: Risk Mitigation Measure

Project Structure



Note: Arrows represent Tribal HQ locations.

Project Structure

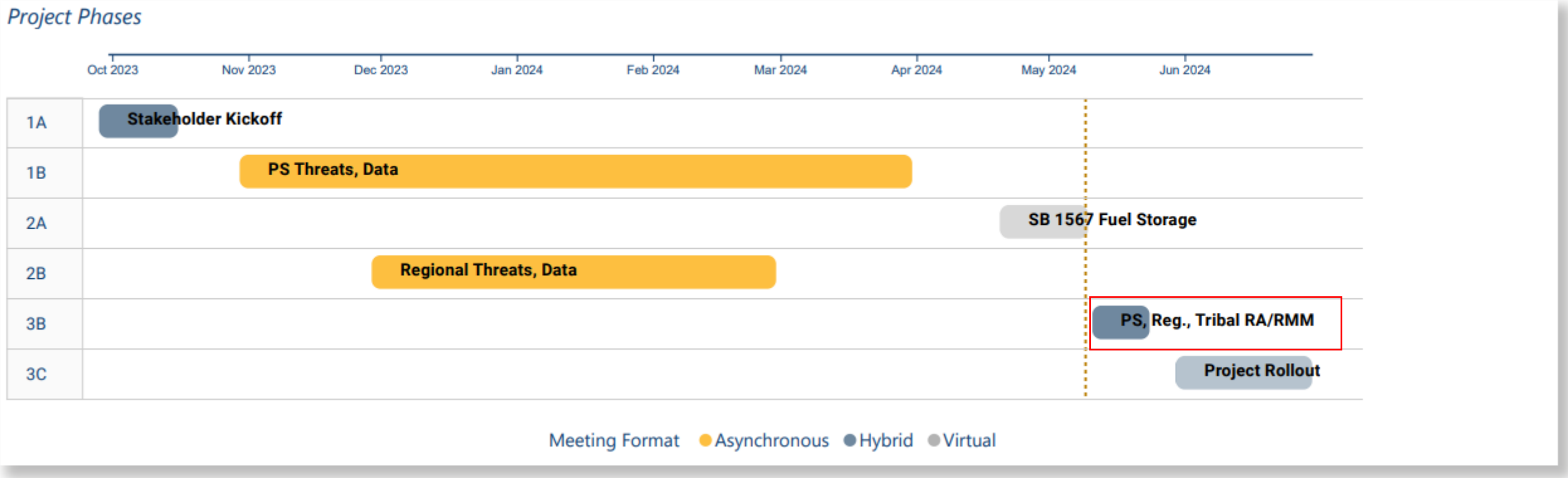


Energy Sub-sectors

- Electricity
- Natural Gas
- Liquid Fuels

Project Timeline

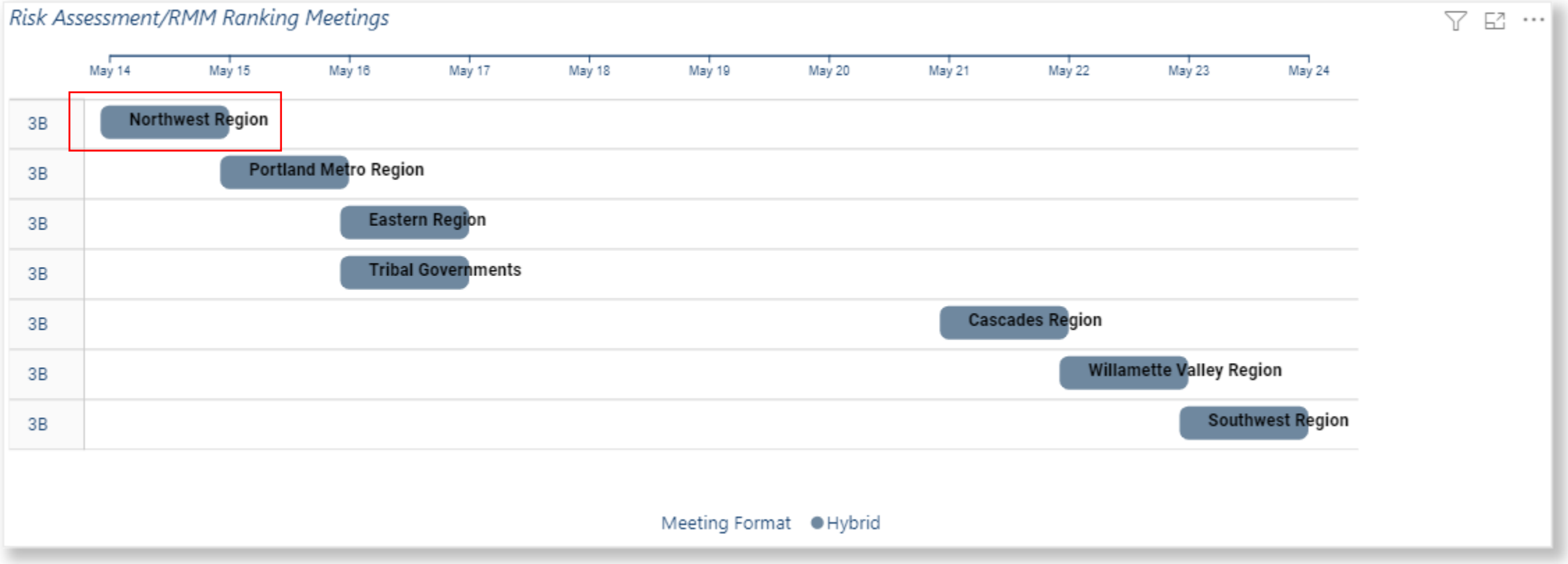
Stakeholder Engagement



PS: Private Sector; RA: Risk Assessment; RMM: Risk Mitigation Measure; SB: Senate Bill

Project Timeline

Stakeholder Engagement



RMM: Risk Mitigation Measure

Methods Overview

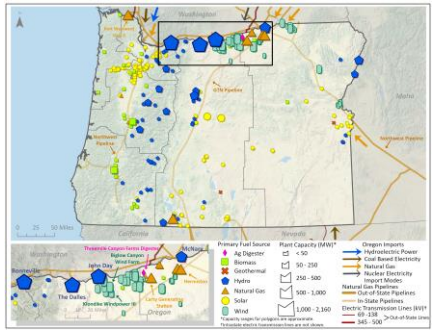
Energy Infrastructure

Electricity, Natural Gas, Liquid Fuels

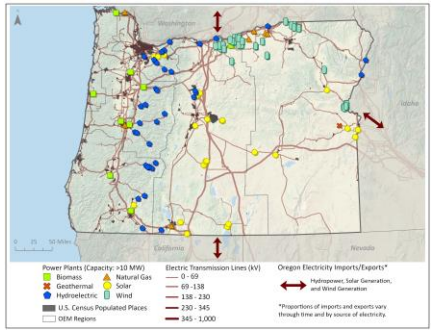
OREGON DEPARTMENT OF ENERGY

Electricity

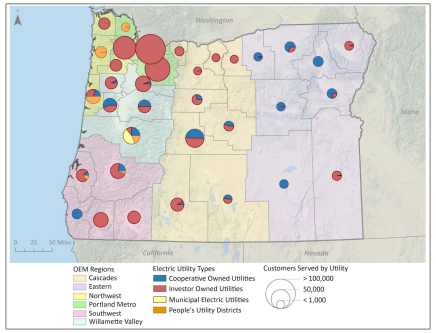
Sourcing



Transmission

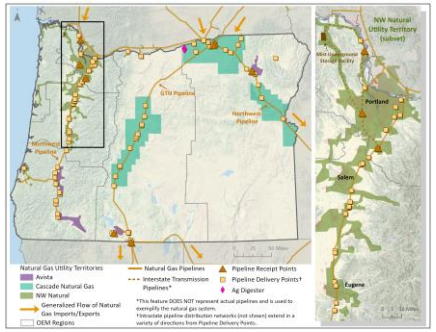


Customers



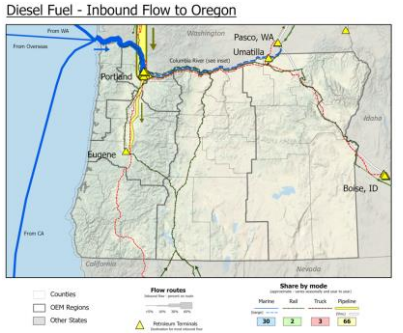
Natural Gas

All



Liquid Fuels (diesel)

Sourcing



Distribution

*Please refer to the handout for detailed maps.

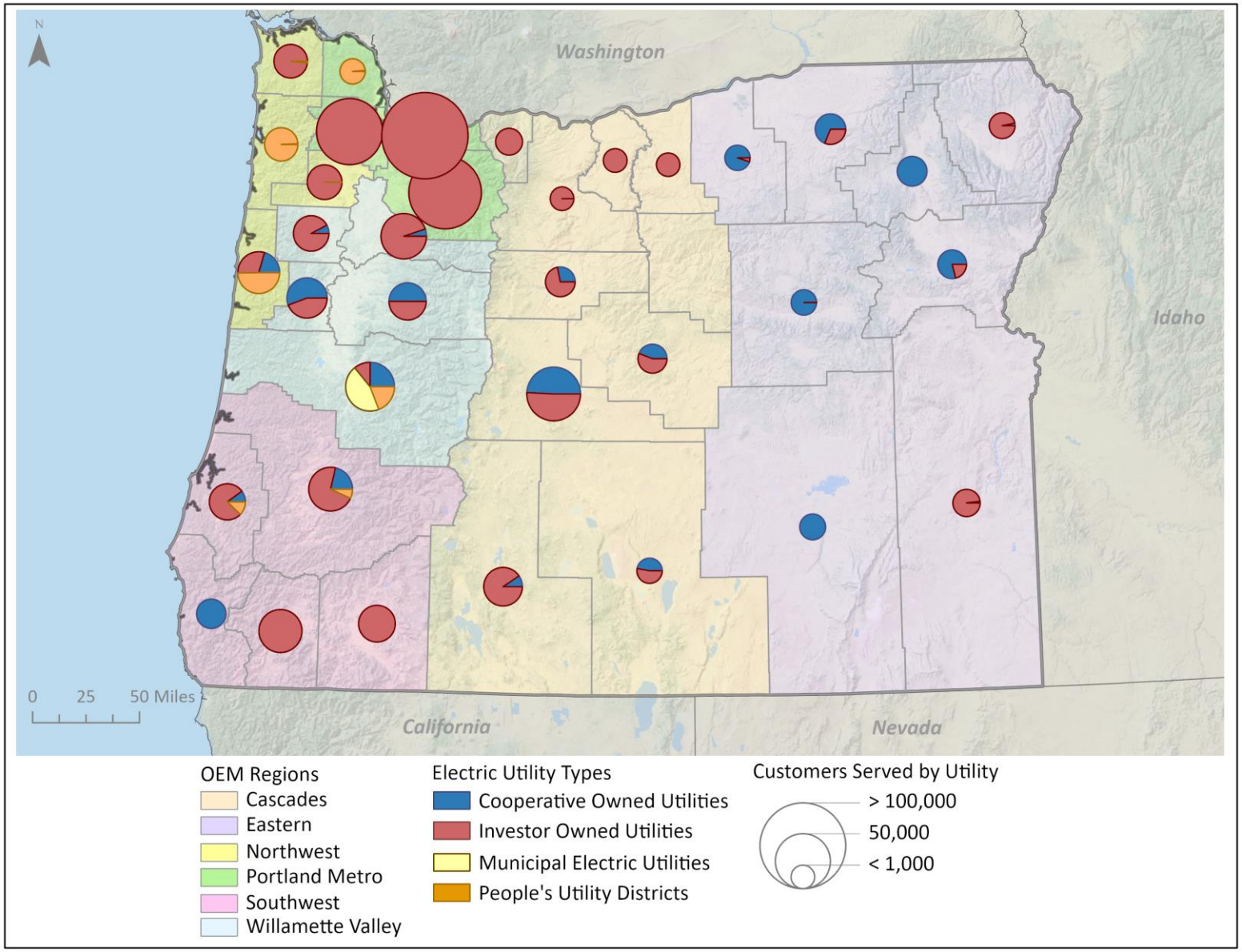
Electricity

Infrastructure – Customers

41 Total Utilities

3 Investor Owned Utilities

38 Other Utilities



OEM: Oregon Department of Emergency Management

Risk Assessment

Threats Analyzed

OREGON DEPARTMENT OF ENERGY

Natural Hazards

- Cascadia Subduction Zone Earthquake (9.0) and Tsunami (**CSZ**; includes Landslides & Liquefaction)
- **Drought**
- **Flood** (100-year)
- **Lightning**
- **Wildfire**
- **Wind Storm**
- **Winter Storm**

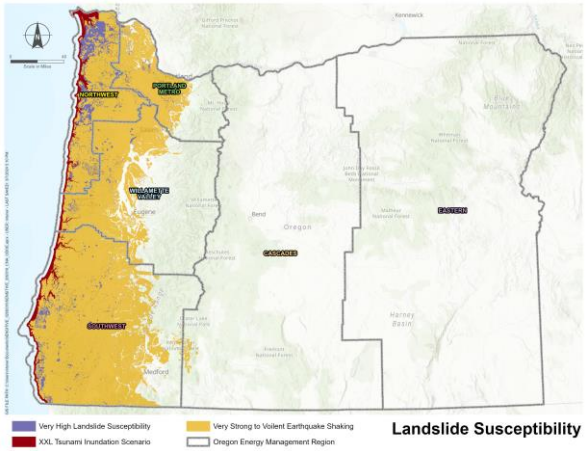
Human-Caused Threats

(intentional attacks on energy systems)

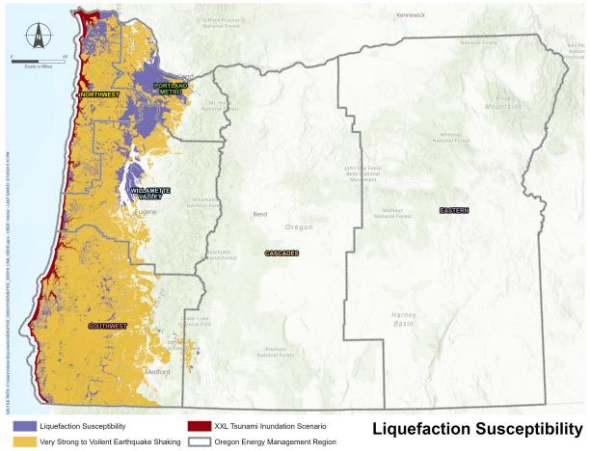
- **Cyberattacks**
- **Physical Attacks**

Risk Assessment

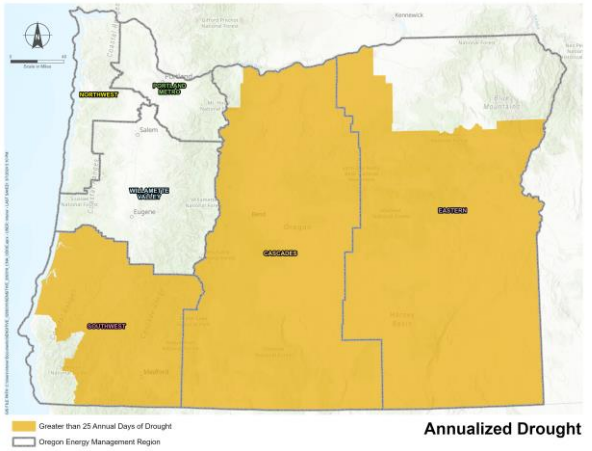
Natural Hazard Zones



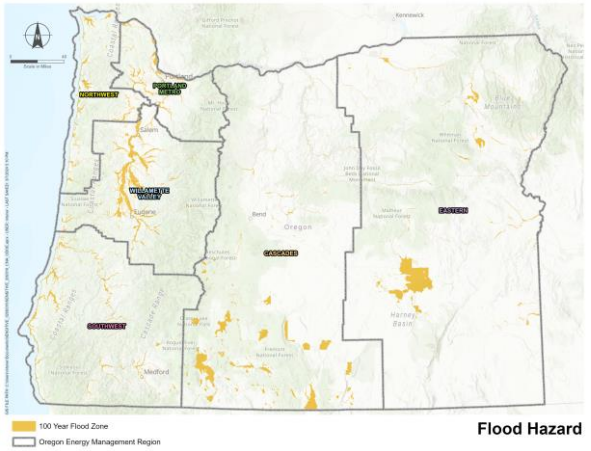
Landslide Susceptibility



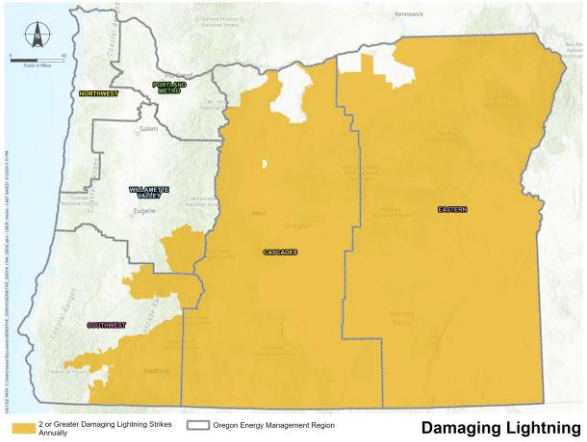
Liquefaction Susceptibility



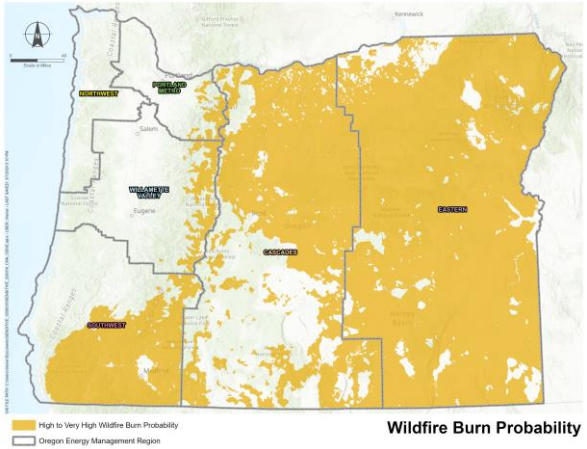
Annualized Drought



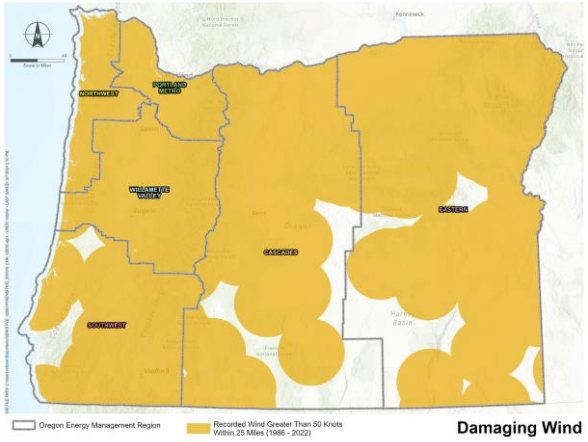
Flood Hazard



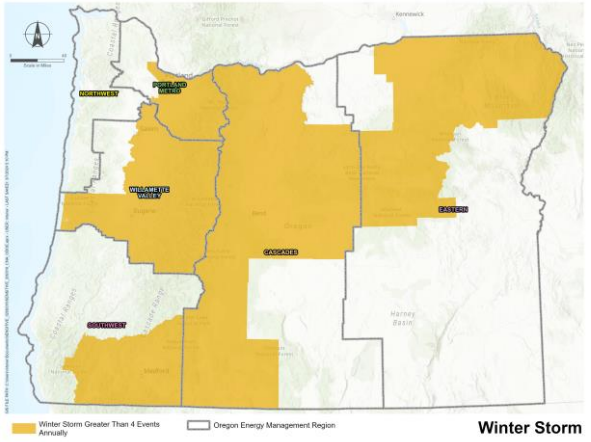
Damaging Lightning



Wildfire Burn Probability



Damaging Wind



Winter Storm

Risk Assessment

Approaches

Natural Hazards

****Technical Analysis: Liquid Fuels****

****Hybrid Survey: Electric, Natural Gas****

- Cascadia Subduction Zone Earthquake (9.0) and Tsunami (**CSZ**; includes Landslides & Liquefaction)
- **Drought**
- **Flood** (100-year)
- **Lightning**
- **Wildfire**
- **Wind Storm**
- **Winter Storm**

Human-Caused Threats

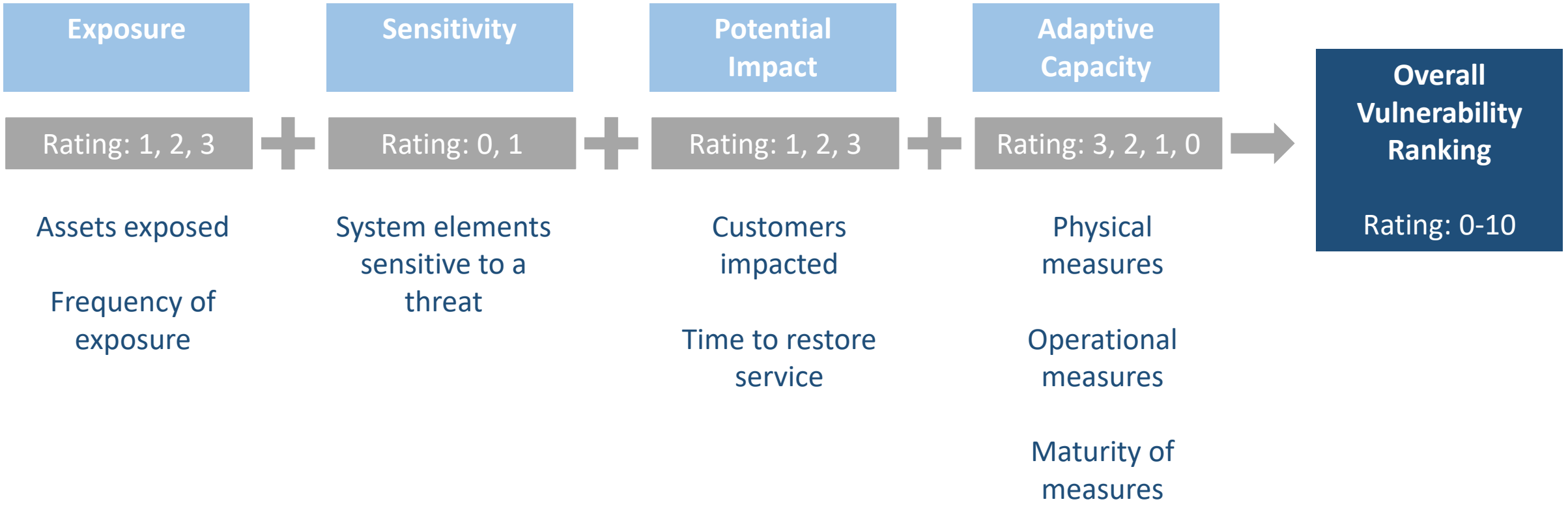
(intentional attacks on energy systems)

****Hybrid Survey: Liquid Fuels, Electric, Natural Gas****

- **Cyberattacks**
- **Physical Attacks**

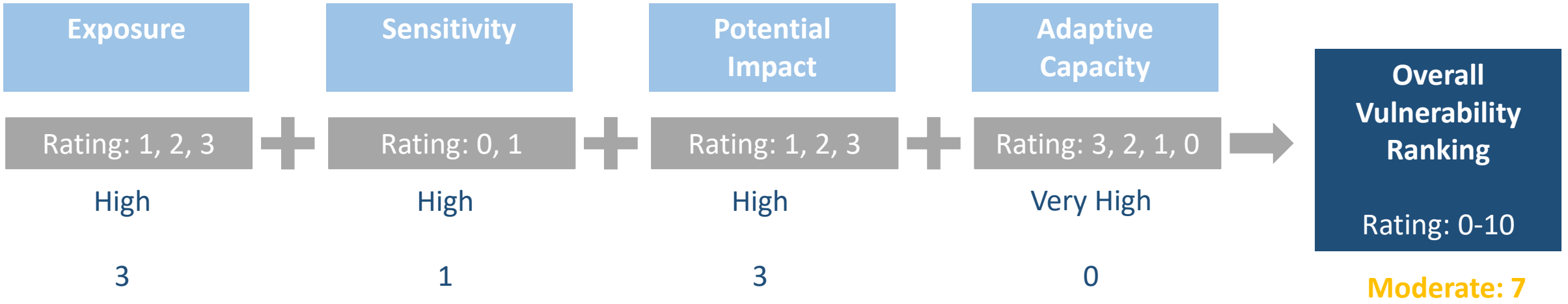
Risk Assessment

Example



Risk Assessment

Example



Overall Vulnerability Ranking Categories

Low: ≤ 5

Moderate: 6 – 8

High: ≥ 9

Break

Join at slido.com #ODOENorthwest

https://app.sli.do/event/xuvZW3CMmR4CkjhugTxrni

Preliminary Results

Increasing Fuel Capacity

OREGON DEPARTMENT OF ENERGY

Assess the fuel storage capacity and recommend areas to increase storage

DEQ

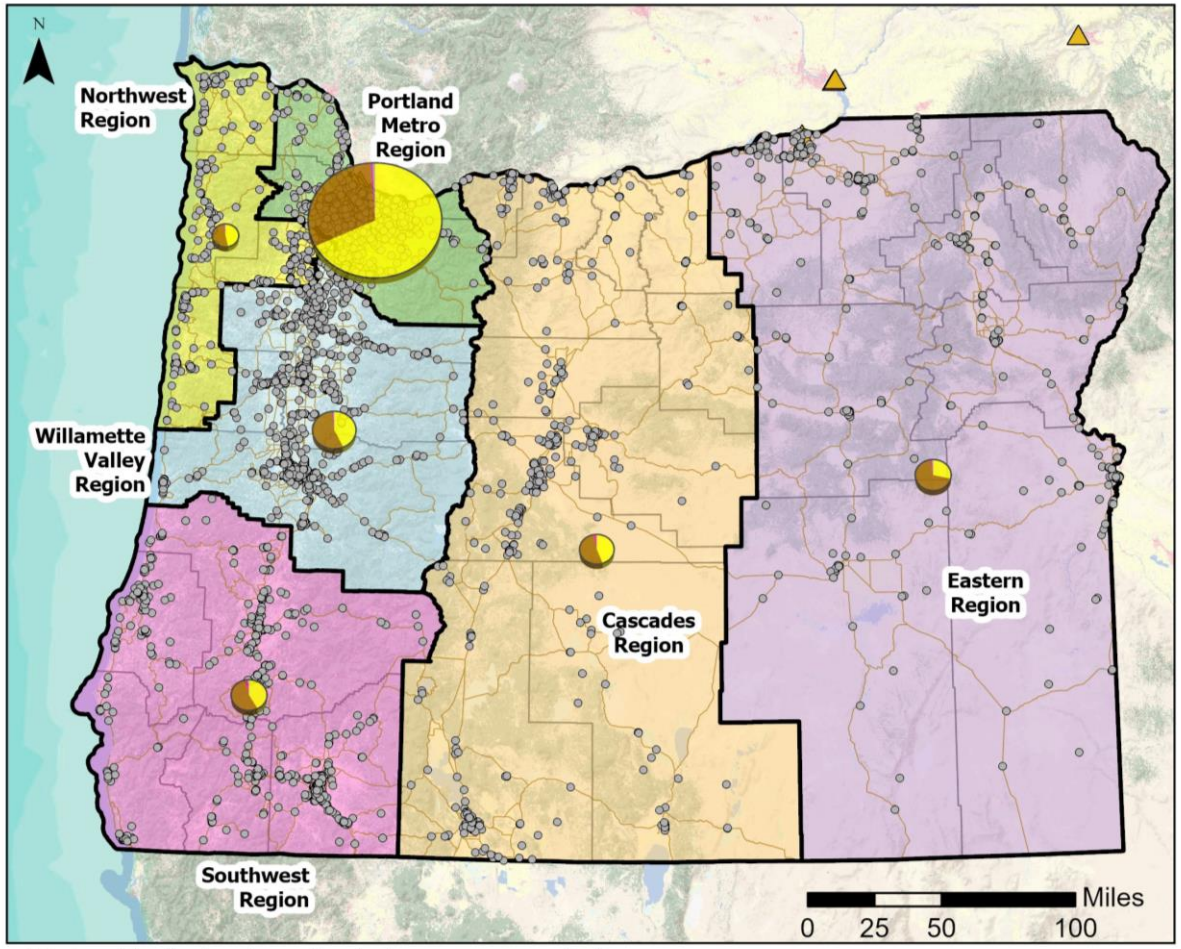
OREGON STATE FIRE MARSHAL
SERVING SINCE 1917

2024 Baseline Licensed Fuel Capacity

~414,170,000 gallons
of liquid fuels in 8,800 tanks

216,420,000 gallons gasoline
192,740,000 gallons diesel
3,430,000 gallons jet fuel
1,580,000 gallons “other”

Baseline Total Fuel Storage Capacity by Fuel Type and by Region



(Note: Excludes terminal storage capacity)

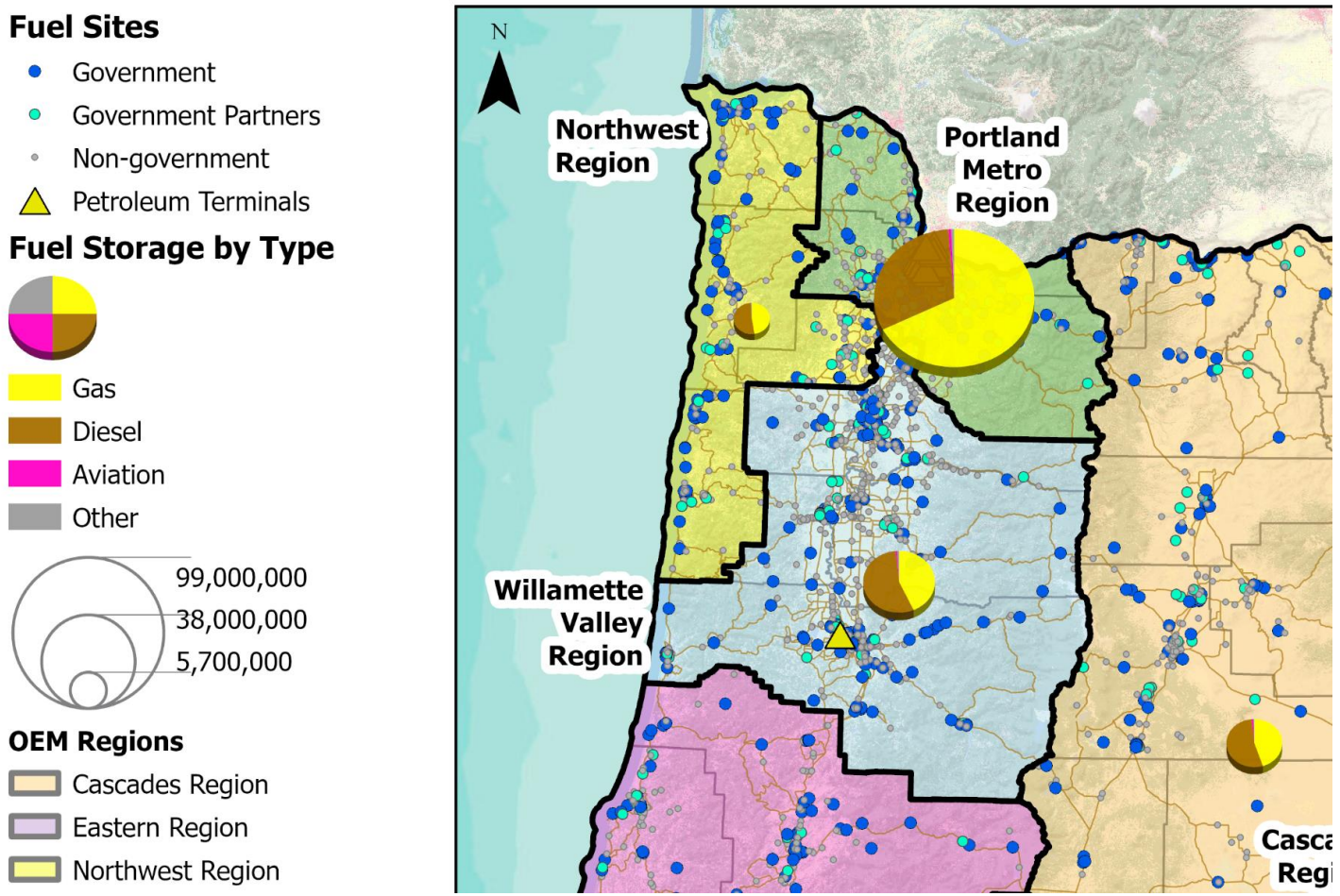
2024 Public Sector Licensed Fuel Capacity- Northwest Region

OREGON DEPARTMENT OF ENERGY

~640,000 gallons of liquid fuels in 140 tanks

~205,000 gallons gasoline
~435,000 gallons diesel

Baseline Total Fuel Storage Capacity

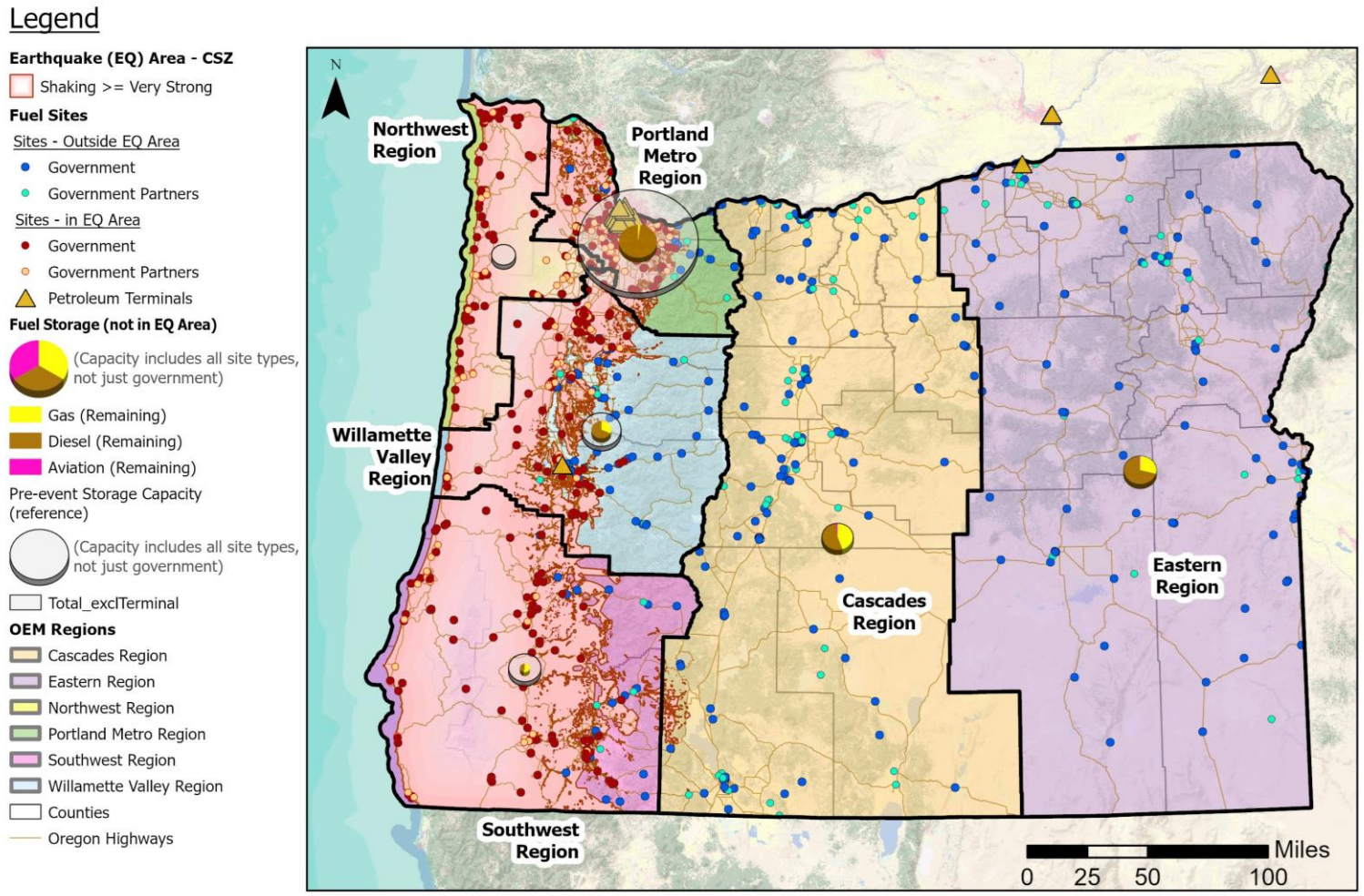


2024 Public Fuel Capacity in the NW Region

OREGON DEPARTMENT OF ENERGY

- All fuel storage is in areas likely to experience disruption during a 9.0 CSZ earthquake
- Some storage may be “hardened” against damage
- The ESP will include screening criteria for optimal fuel expansion

Post-CSZ Event Fuel Sites and Storage Capacity by Fuel Type and Region



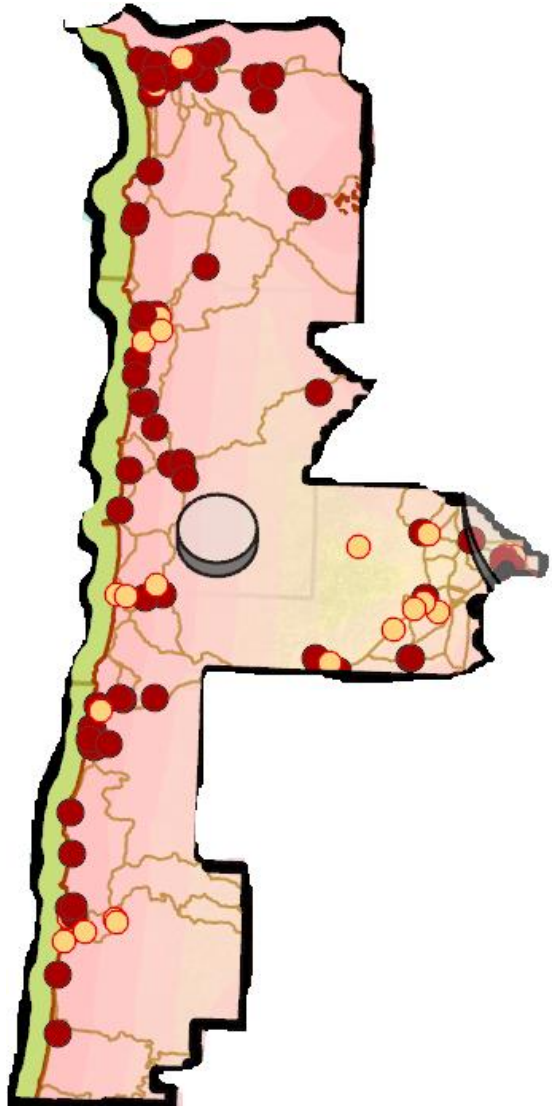
(Note: Excludes terminal storage capacity)

2024 Public Fuel Capacity Next Steps

We will need to talk to communities in the area around the best location(s) before making recommendations.

If your facility is government owned and has resilient fuel storage, please give us details.

This information may also be helpful when identifying a county fuel point of distribution (FPOD)



Check-in

Please indicate if you are interested in engaging with ODOE on efforts to increase fuel storage capacity. 1/33

Preliminary Results

Presentation Structure

OREGON DEPARTMENT OF ENERGY

Stakeholder Engagement Feedback

Respondents | Feedback | Check-in

Preliminary Results

Presentation Structure

OREGON DEPARTMENT OF ENERGY

Stakeholder Engagement Feedback

- Respondents
- Feedback
- Check-in

Risk Analysis Results

Electricity | Natural Gas | Liquid Fuels

- Respondents
- Vulnerability Matrix
- Adaptive Capacity
- Check-in

Preliminary Results

Presentation Structure

OREGON DEPARTMENT OF ENERGY

Stakeholder Engagement Feedback

- Respondents
- Feedback
- Check-in

Risk Analysis Results

Electricity | Natural Gas | Liquid Fuels

- Respondents
- Vulnerability Matrix
- Adaptive Capacity
- Check-in

Risk Mitigation Measures

All Systems | Electricity | Natural Gas | Liquid Fuels

- RMMs
- Check-in

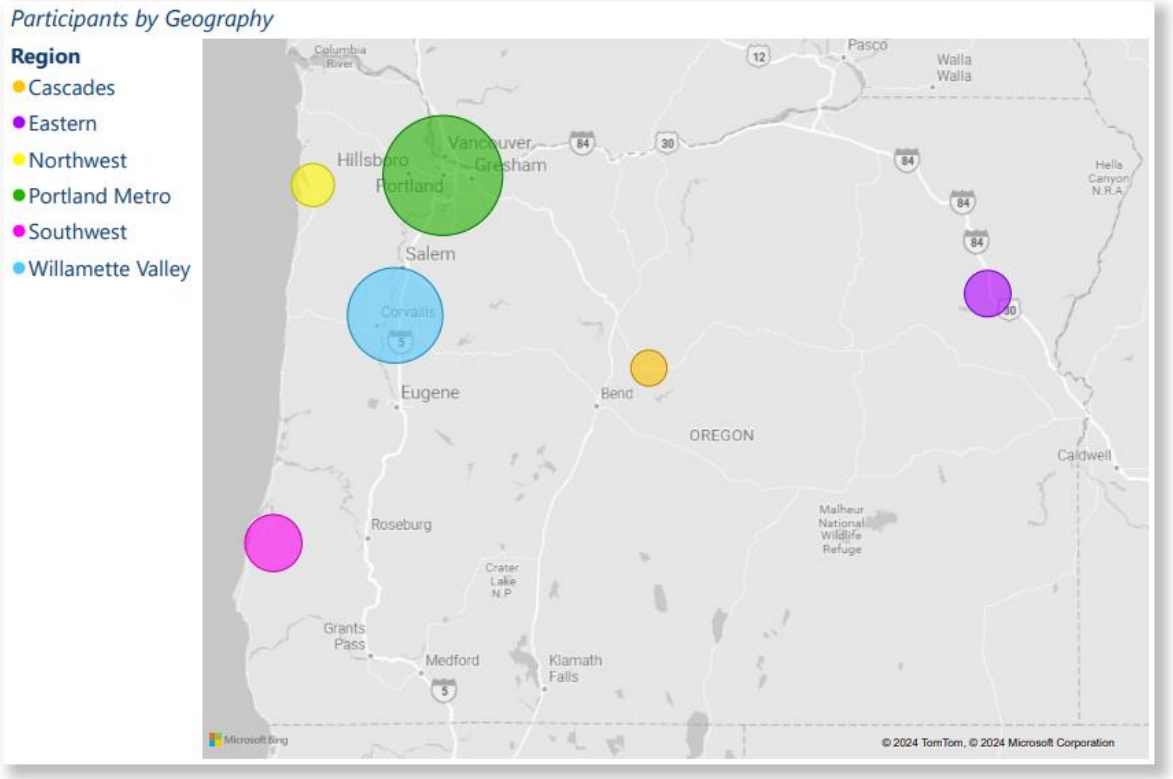
Stakeholder Engagement

Participants

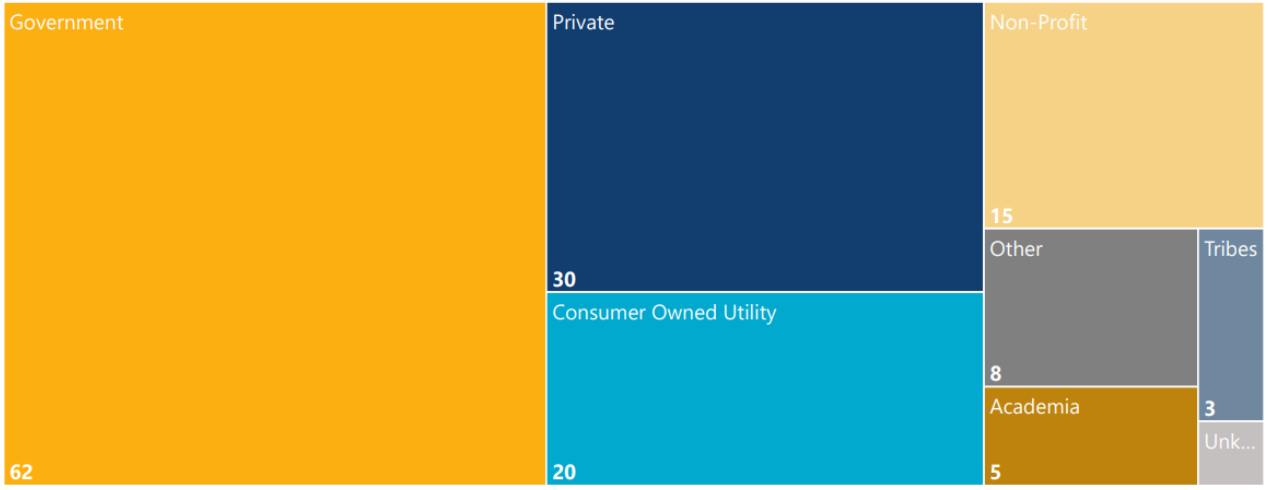
144

Cumulative Regional Participants

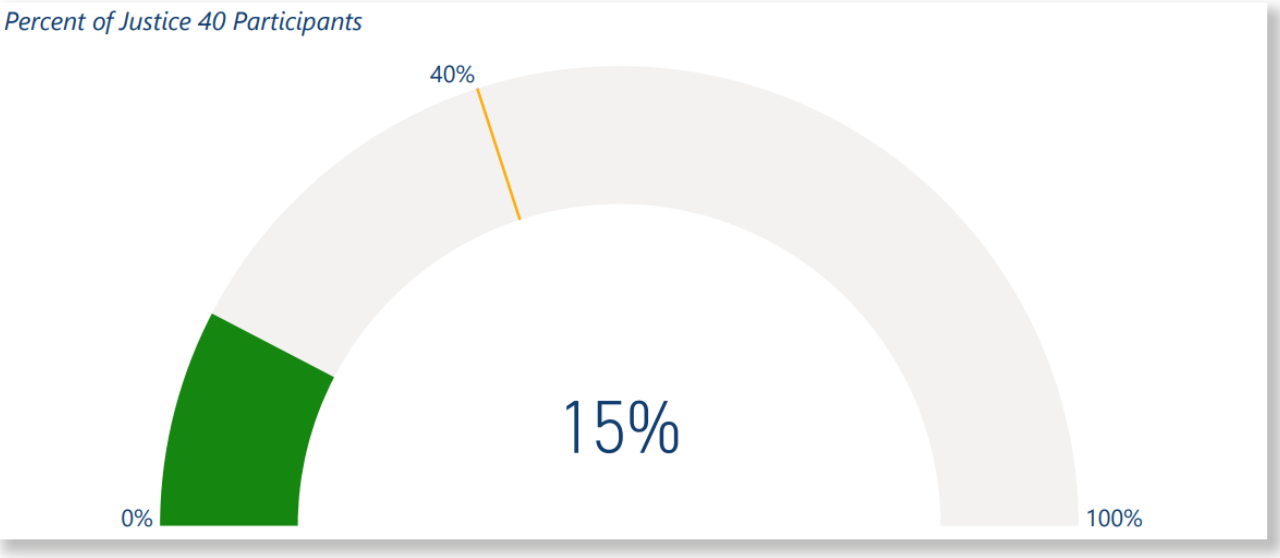
Participants by Geography



Participants by Category



Percent of Justice 40 Participants



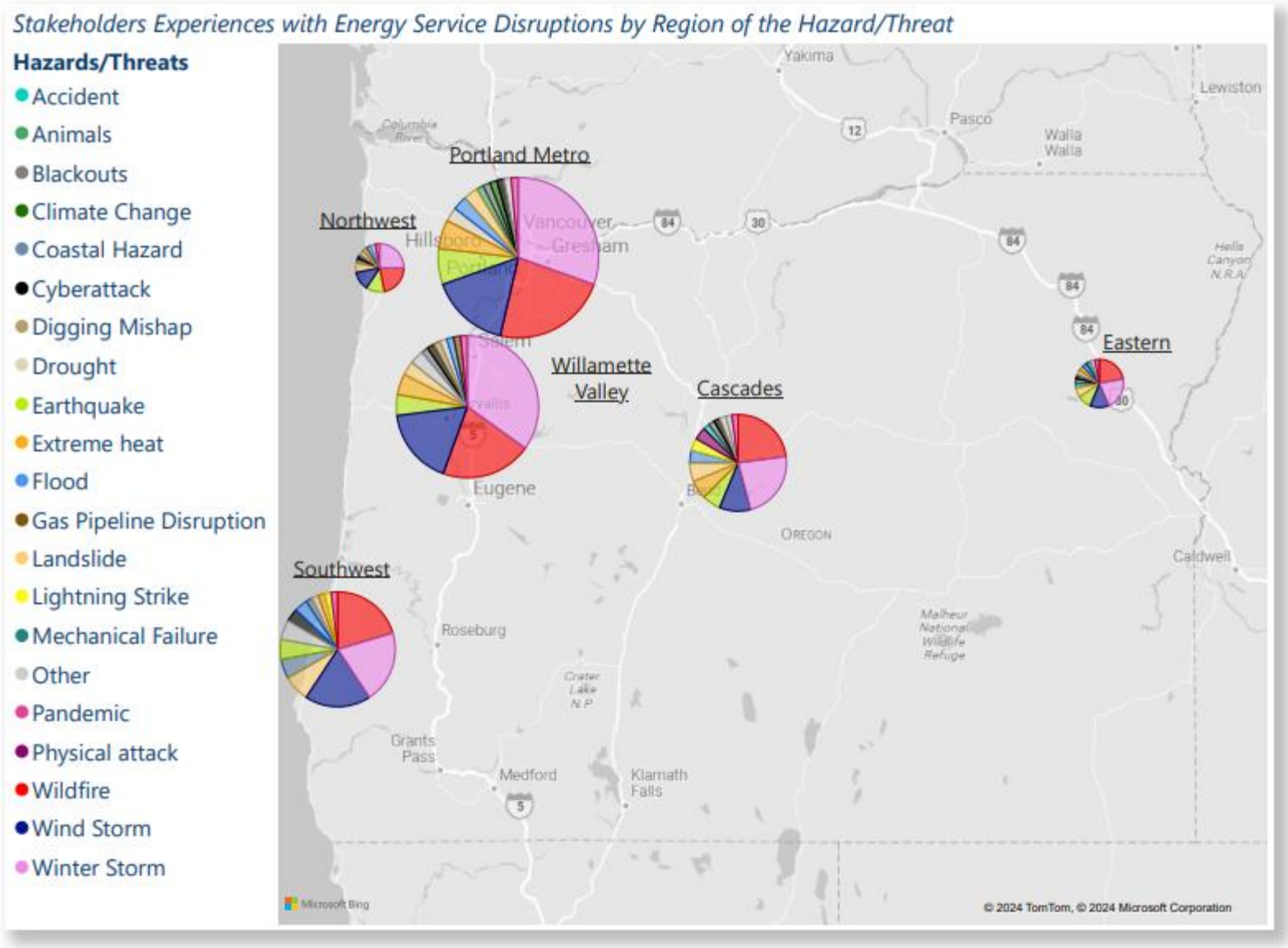
Stakeholder Engagement

Threats

59

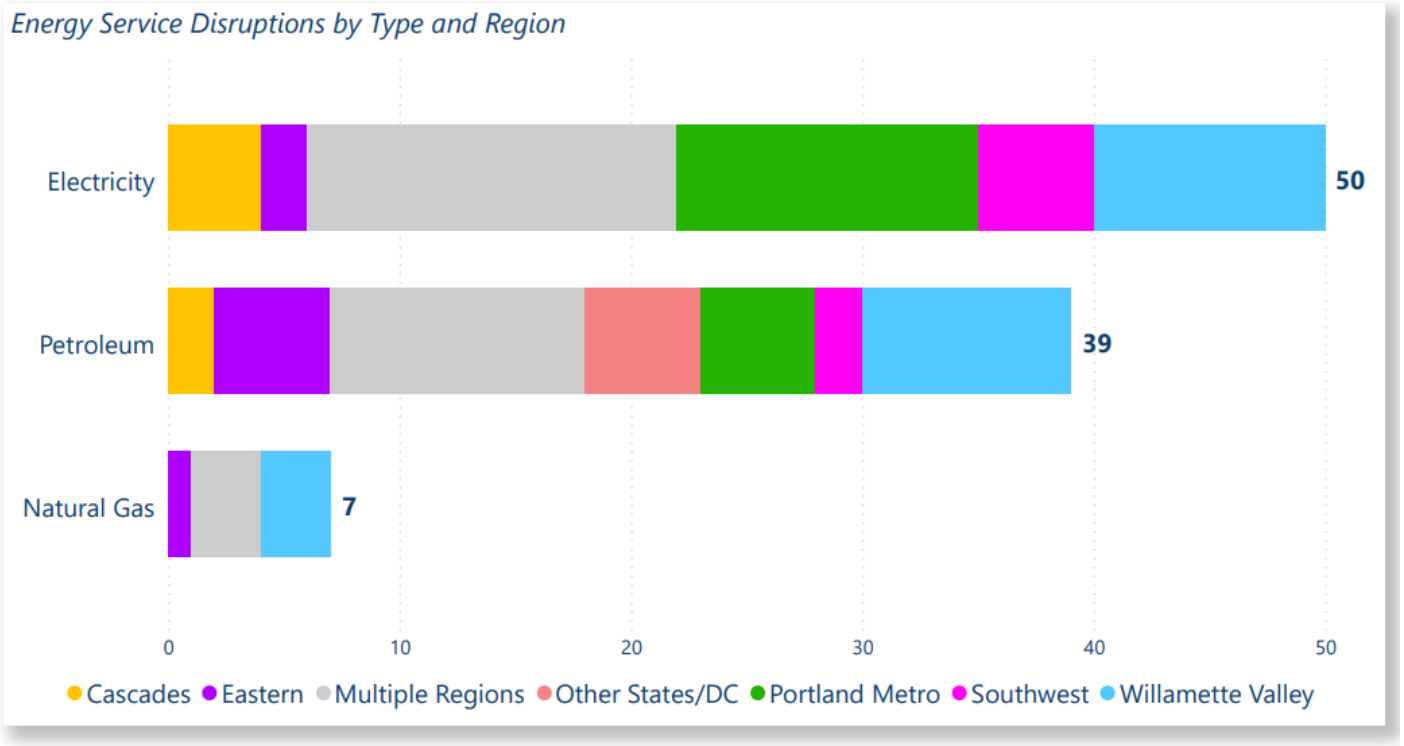
No. Stakeholders that Experienced Energy Service Disruptions

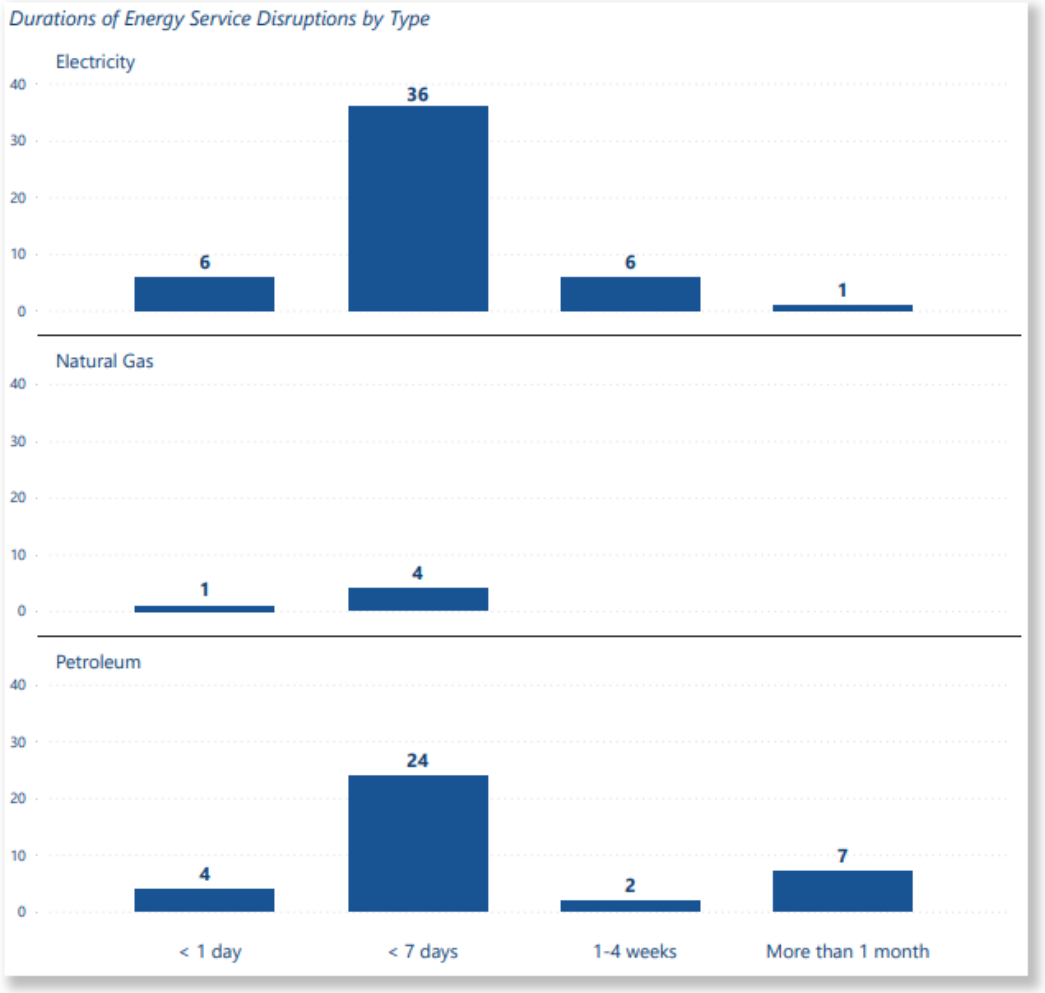
Stakeholders Experiences with Energy Service Disruptions by Region of the Hazard/Threat



Stakeholder Engagement

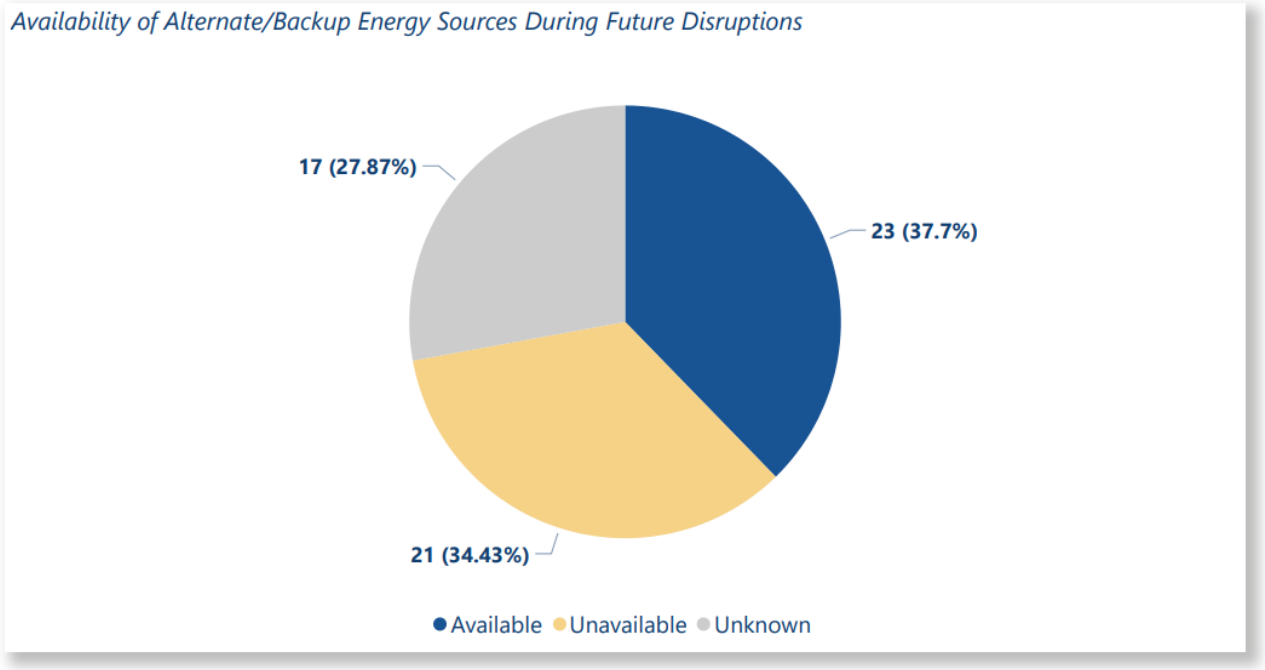
Impacts





Stakeholder Engagement

Preparedness



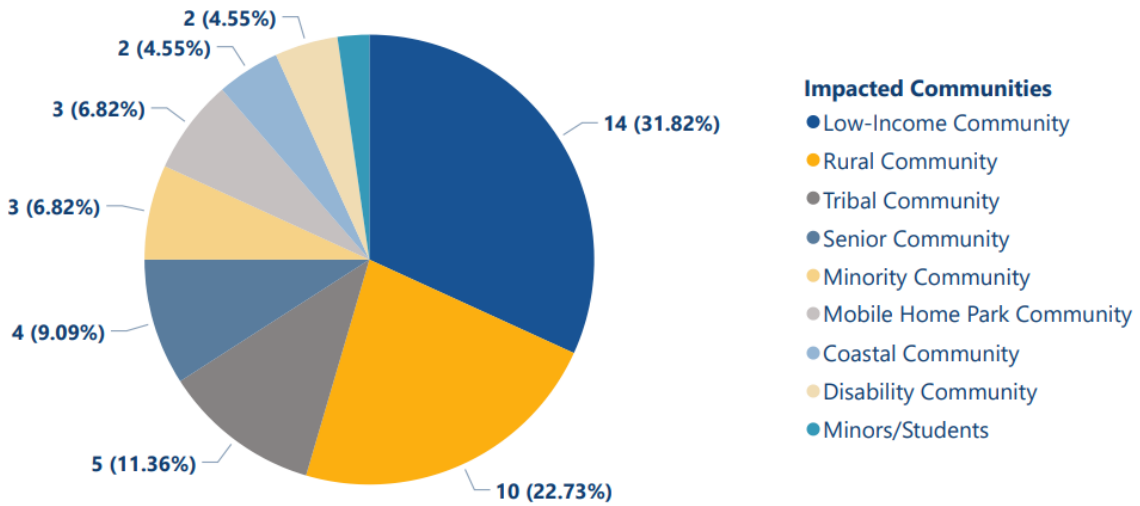
Stakeholder Engagement

Environmental Justice

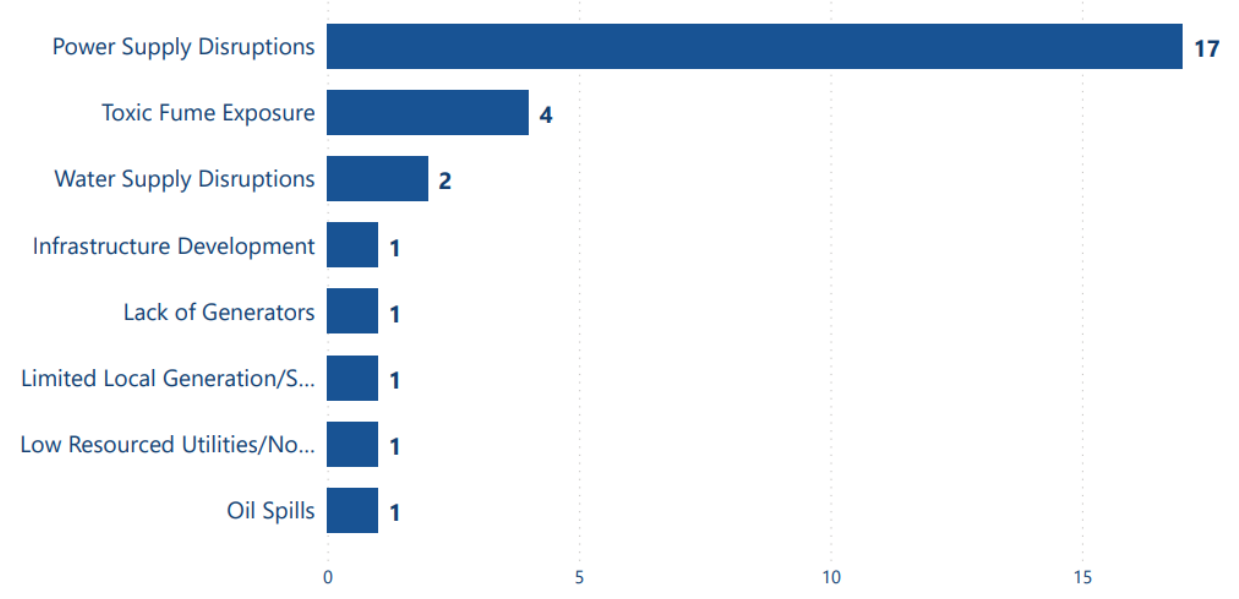
38

No. Respondents with Energy-Related EJ Concerns

EJ Communities Impacted by Energy-Related Issues



Top Energy-Related Issues That Have Negatively Impacted EJ Communities



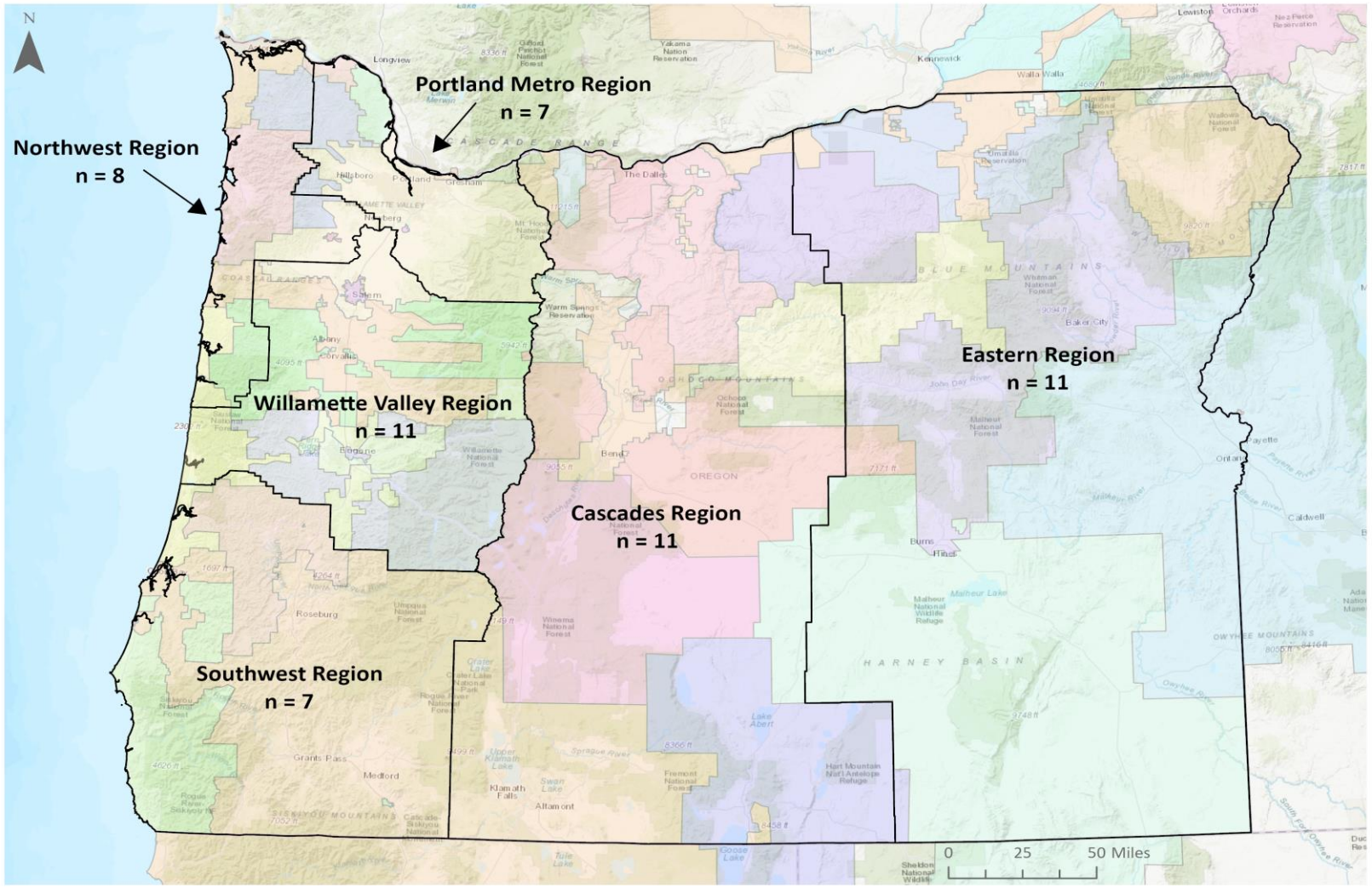
Check-in

OREGON DEPARTMENT OF ENERGY

Stakeholder feedback: Given the feedback other stakeholders have provided, please share any aspects that you strongly resonate with.	2/33
Stakeholder feedback: Given the feedback other stakeholders have provided, please share any aspects that you strongly disagree with.	3/33
Do you have any environment justice concerns specific to your region? (If no, please wait for the next section to begin).	4/33
If you answered yes, are these concerns (select multiple)	5/33
Please describe the impact.	6/33
Please describe the community(ies) impacted.	7/33
Please describe any solutions you would like to recommend to resolve these concerns. If none, please enter "none" .	8/33

Electricity

Risk Assessment



n = count of electric utilities serving each OEM region (COUs, IOUs, Municipal, PUDs).

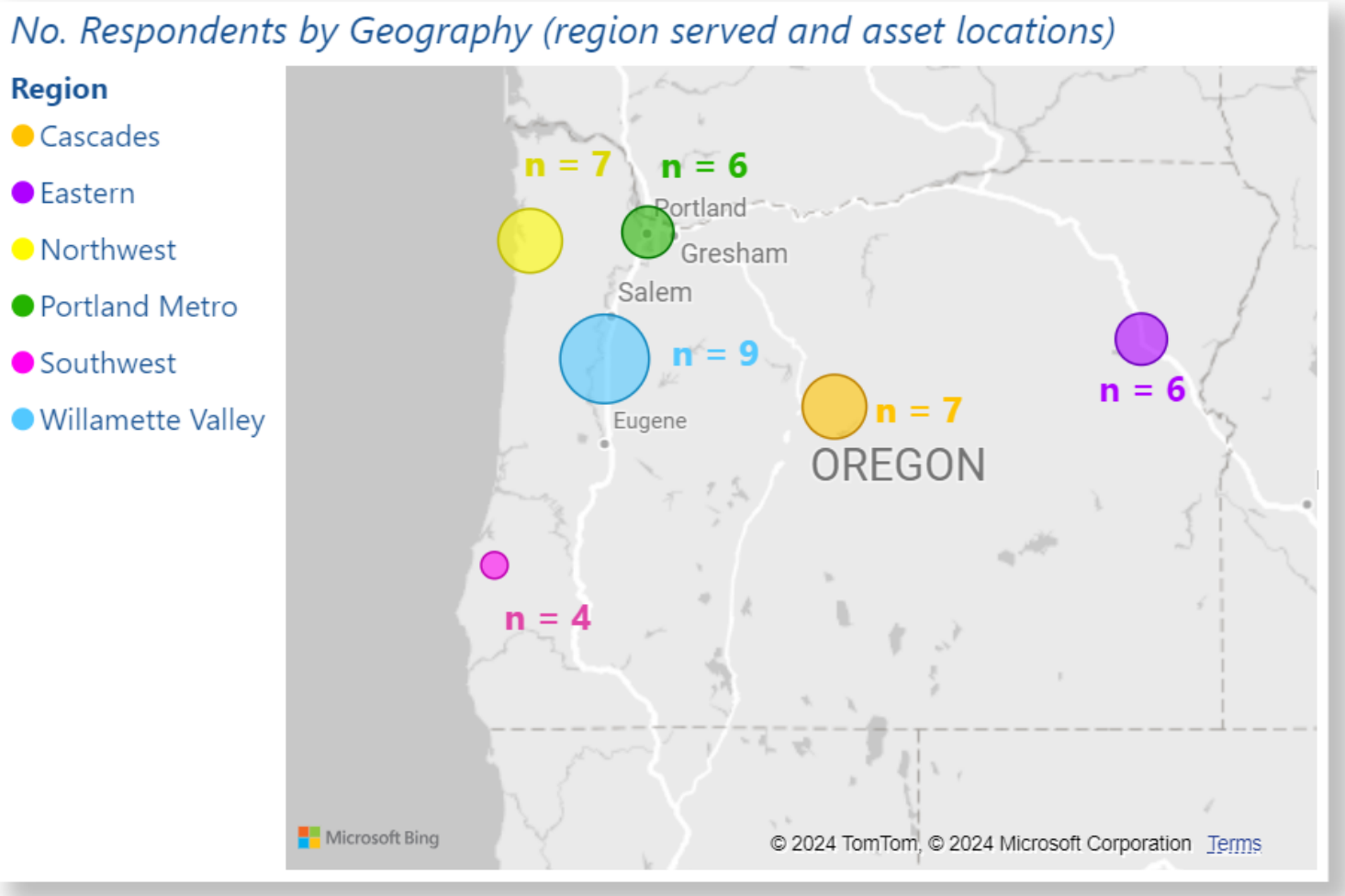
41 total utilities

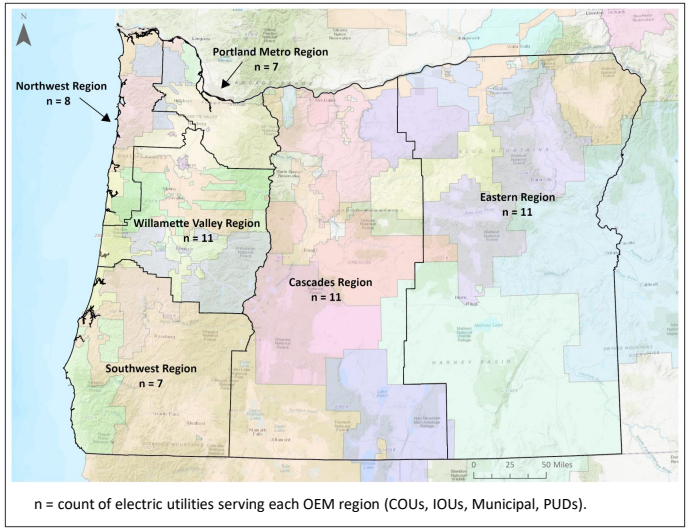
Many serve multiple regions

Electricity
Risk Assessment

20
No. Electricity Risk Assessment Survey Respondents

No. Respondents by Geography (region served and asset locations)





n = count of electric utilities serving each OEM region (COUs, IOUs, Municipal, PUDs).

Electricity

Risk Assessment – Vulnerability Ranking

Overall Vulnerability Ranking

- Low (≤ 5)
- Moderate (6-8)
- High (≥ 9)

Threats most often prioritized

- Cyberattack
- Wildfire
- Wind Storm
- Winter Storm

	Cascades	Eastern	Northwest	Portland Metro	Southwest	Willamette Valley
CSZ	4	5	5	5	6	4
Cyberattack	3	**2**	3	**2**	3	4
Drought	3	4	2	6	3	3
Flood	3	3	3	4	3	4
Lightning	5	4	2	4	3	3
Physical Attack	4	**2**	3	**2**	4	4
Wildfire	6	5	4	6	4	6
Wind Storm	6	6	5	6	6	6
Winter Storm	7	6	5	5	5	7

Underlined and bolded values indicates at least one response was unknown.

CSZ: Cascadia Subduction Zone Earthquake and Tsunami

Electricity

Risk Assessment – Vulnerability Ranking

Overall Vulnerability Ranking

- Low (≤ 5)
- Moderate (6-8)
- High (≥ 9)

Higher rankings are largely driven by Exposure and Impact

	Cascades	Eastern	Northwest	Portland Metro	Southwest	Willamette Valley
CSZ	4	5	5	5	6	4
Cyberattack	3	**2**	3	**2**	3	4
Drought	3	4	2	6	3	3
Flood	3	3	3	4	3	4
Lightning	5	4	2	4	3	3
Physical Attack	4	**2**	3	**2**	4	4
Wildfire	6	5	4	6	4	6
Wind Storm	6	6	5	6	6	6
Winter Storm	7	6	5	5	5	7

Underlined and bolded values indicates at least one response was unknown.

CSZ: Cascadia Subduction Zone Earthquake and Tsunami

Electricity

Risk Assessment – Vulnerability Ranking

Overall Vulnerability Ranking

- Low (≤ 5)
- Moderate (6-8)
- High (≥ 9)

Higher ranking is largely driven by Adaptive Capacity

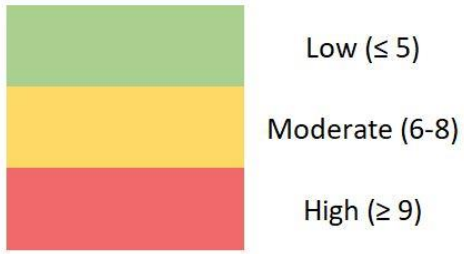
	Cascades	Eastern	Northwest	Portland Metro	Southwest	Willamette Valley
CSZ	4	5	5	5	6	4
Cyberattack	3	**2**	3	**2**	3	4
Drought	3	4	2	6	3	3
Flood	3	3	3	4	3	4
Lightning	5	4	2	4	3	3
Physical Attack	4	**2**	3	**2**	4	4
Wildfire	6	5	4	6	4	6
Wind Storm	6	6	5	6	6	6
Winter Storm	7	6	5	5	5	7

Underlined and bolded values indicates at least one response was unknown.

CSZ: Cascadia Subduction Zone Earthquake and Tsunami

Electricity

Risk Assessment – Vulnerability Ranking



Feedback is dominated by smaller utilities (not Investor Owned Utilities)

Higher rankings are largely driven by Exposure and Impact

Some responses were unknown → artificially low scores

Little variability across regions

	Cascades	Eastern	Northwest	Portland Metro	Southwest	Willamette Valley
CSZ	4	5	5	5	6	4
Cyberattack	3	**2**	3	**2**	3	4
Drought	3	4	2	6	3	3
Flood	3	3	3	4	3	4
Lightning	5	4	2	4	3	3
Physical Attack	4	**2**	3	**2**	4	4
Wildfire	6	5	4	6	4	6
Wind Storm	6	6	5	6	6	6
Winter Storm	7	6	5	5	5	7

Underlined and bolded values indicates at least one response was unknown.

CSZ: Cascadia Subduction Zone Earthquake and Tsunami

Electricity

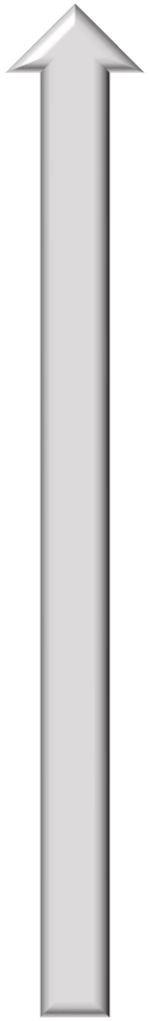
Adaptive Capacity – Human-caused Threats

Category	Protective Measure Example
Identify	Develop an organizational understanding to manage risk to systems, assets, data, & capabilities
	Identify critical processes & assets
	Document information flows
	Maintain hardware & software inventory
	Establish policies for security that include roles & responsibilities
	Identify threats, vulnerabilities, & risk to assets
Protect	Develop & implement the appropriate safeguards to ensure delivery of services
	Manage access to information (e.g., unique accounts for each employee, restricted access to critical areas)
	Protect sensitive data (e.g., encryption while stored & transmitted; hard copies stored in secure areas)
	Conduct regular backups (e.g., backup frequently & store offline)
	Protect your devices (e.g., install host-based firewalls)
	Manage device vulnerabilities (e.g., update operating system & applications regularly)
	Train users (e.g., provide frequent training on policies, procedures, roles, & responsibilities)
Detect	Develop & implement appropriate activities to identify occurrence of a security event
	Test & update processes for detecting unauthorized entities & actions on networks
	Maintain & monitor logs to identify anamolies (e.g., changes to systems or accounts)
	Know expected data flows in order to identify the unexpected (e.g., information exported from internal database & exiting network)
	Understand the impact of security events
Respond	Develop & implement appropriate activities to take action regarding a detected security event
	Ensure response plans are tested
	Ensure response plans are updated
	Coordinate with internal & external stakeholders
Recover	Develop & implement appropriate activities to maintain plans for resilience & to restore any capabilities or services that were impaired due to a security event
	Communicate with internal & external stakeholders - account for what, how, & when information will be shared with various stakeholders
	Manage public relations & company reputation

*Please refer to the handout for detailed adaptive measures.

Electricity

Adaptive Capacity – Human-caused Threats



Optimizing

Your agency has advanced risk management practices in place and is continuously improving. You assess what is working well and make changes where appropriate. You could be considered as a leader in risk management.

Embedding

Risk management is integrated into business processes throughout your agency. You can demonstrate that your risk management framework is being used and you are beginning to realize benefits.

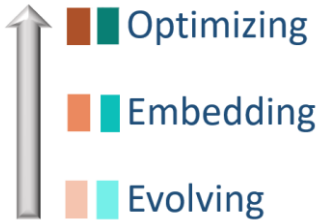
Evolving

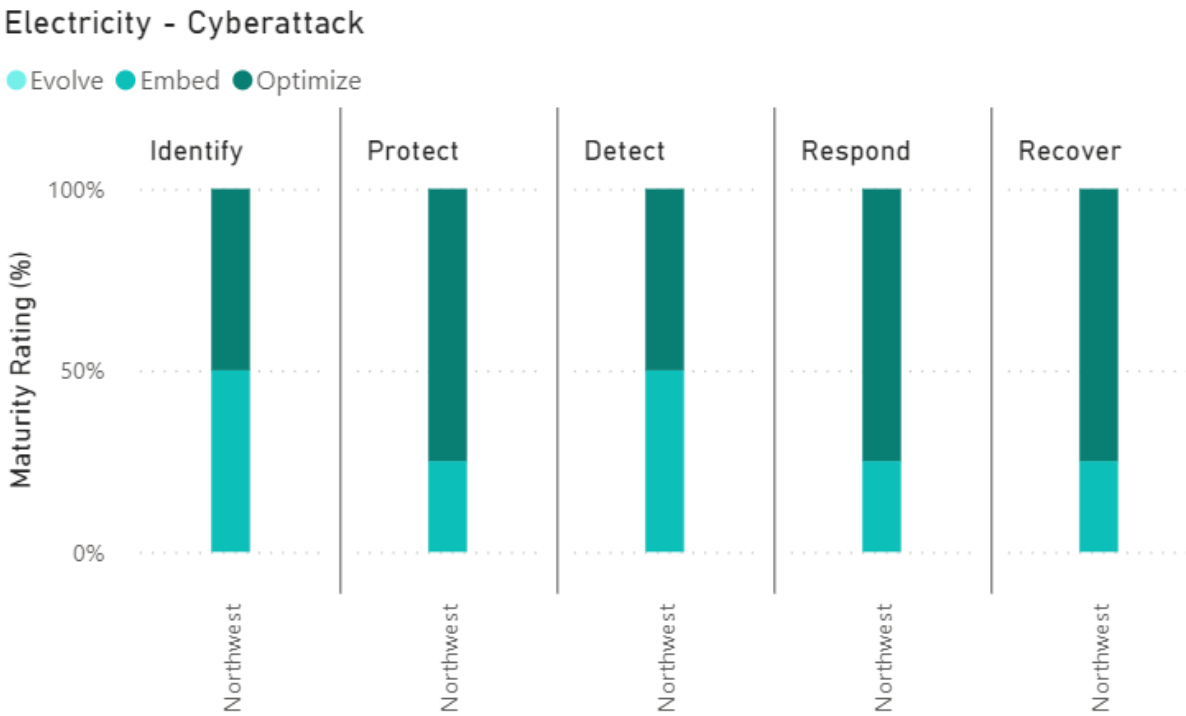
Your agency has the essential risk management framework and documentation in place.

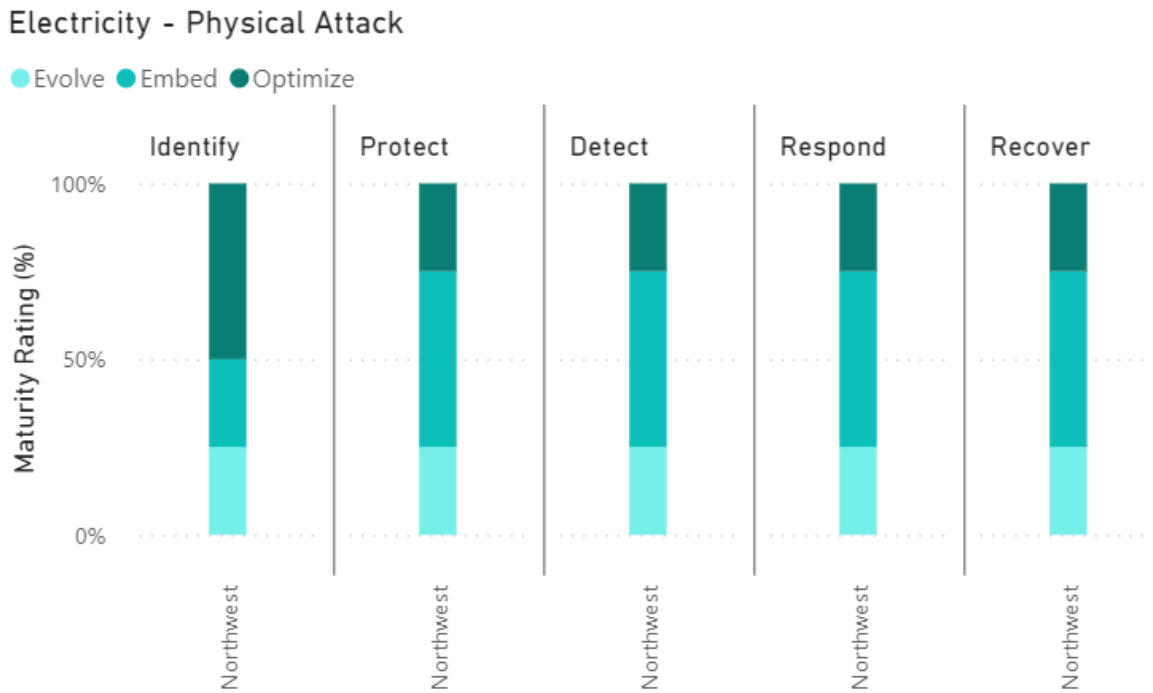
Category	Protective Measure Example
Identify	Develop an organizational understanding to manage risk to systems, assets, data, & capabilities
	Identify critical processes & assets
	Document information flows
	Maintain hardware & software inventory
	Establish policies for security that include roles & responsibilities
	Identify threats, vulnerabilities, & risk to assets
Protect	Develop & implement the appropriate safeguards to ensure delivery of services
	Manage access to information (e.g., unique accounts for each employee, restricted access to critical areas)
	Protect sensitive data (e.g., encryption while stored & transmitted; hard copies stored in secure areas)
	Conduct regular backups (e.g., backup frequently & store offline)
	Protect your devices (e.g., install host-based firewalls)
	Manage device vulnerabilities (e.g., update operating system & applications regularly)
	Train users (e.g., provide frequent training on policies, procedures, roles, & responsibilities)
Detect	Develop & implement appropriate activities to identify occurrence of a security event
	Test & update processes for detecting unauthorized entities & actions on networks
	Maintain & monitor logs to identify anamolies (e.g., changes to systems or accounts)
	Know expected data flows in order to identify the unexpected (e.g., information exported from internal database & exiting network)
	Understand the impact of security events
Respond	Develop & implement appropriate activities to take action regarding a detected security event
	Ensure response plans are tested
	Ensure response plans are updated
	Coordinate with internal & external stakeholders
Recover	Develop & implement appropriate activities to maintain plans for resilience & to restore any capabilities or services that were impaired due to a security event
	Communicate with internal & external stakeholders - account for what, how, & when information will be shared with various stakeholders
	Manage public relations & company reputation

Electricity

Northwest Adaptive Capacity – Human-caused Threats







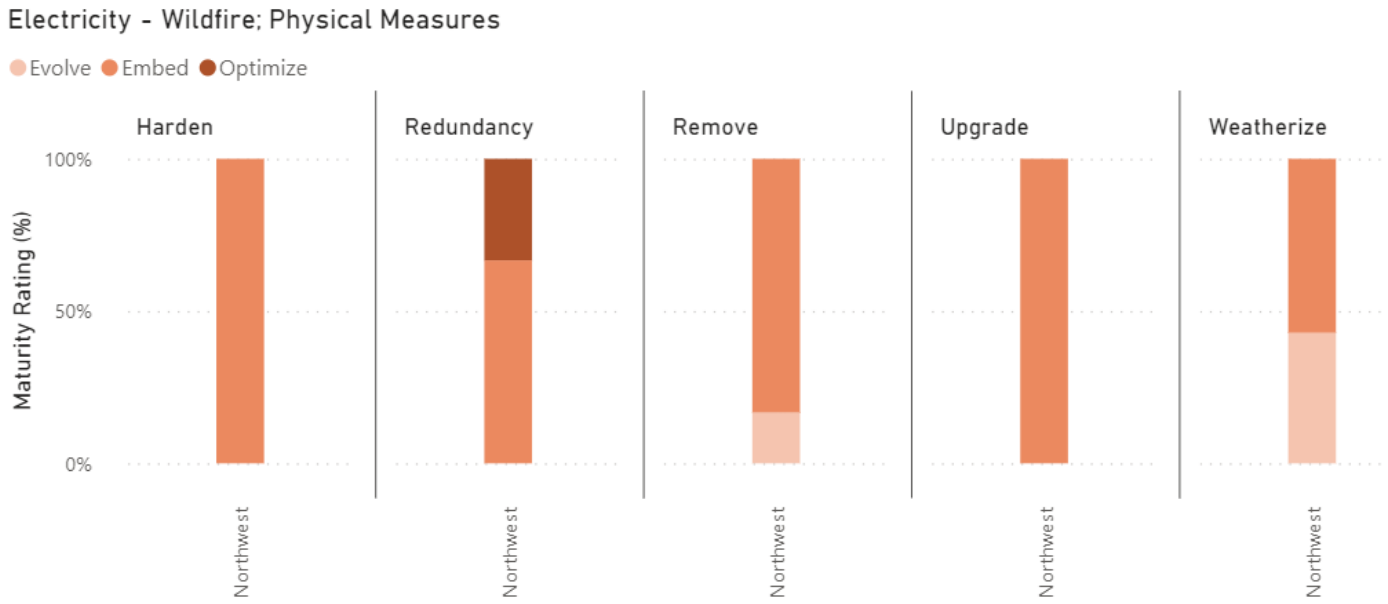
Electricity

Northwest Adaptive Capacity – Natural Hazards

Optimizing

Embedding

Evolving



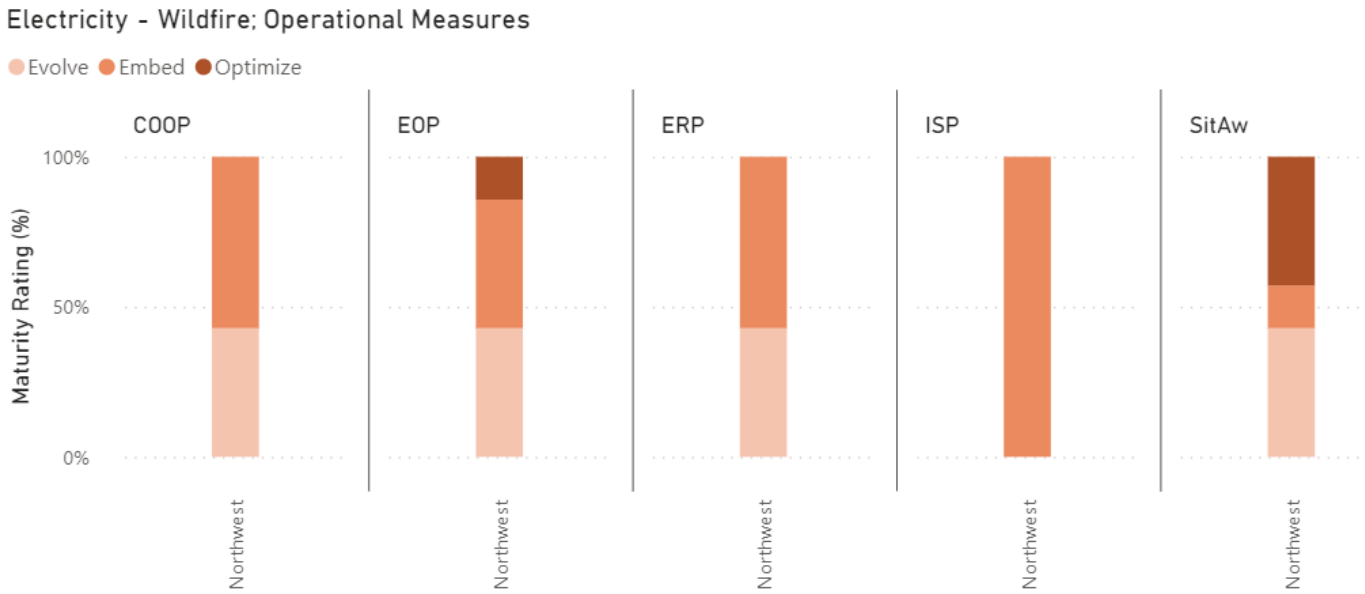
Electricity

Northwest Adaptive Capacity – Natural Hazards

Optimizing

Embedding

Evolving



COOP – Continuity of Operations Plan; EOP – Emergency Operation Plan; ERP – Emergency Response Planning; ISP – Integrity Safety Plans; SitAw – Situational Awareness

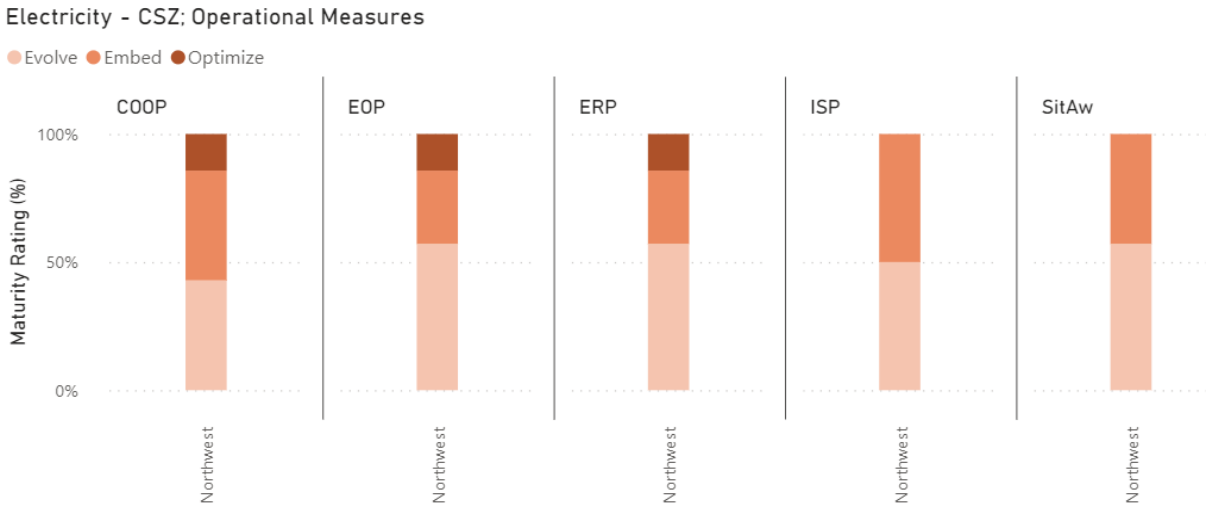
Electricity

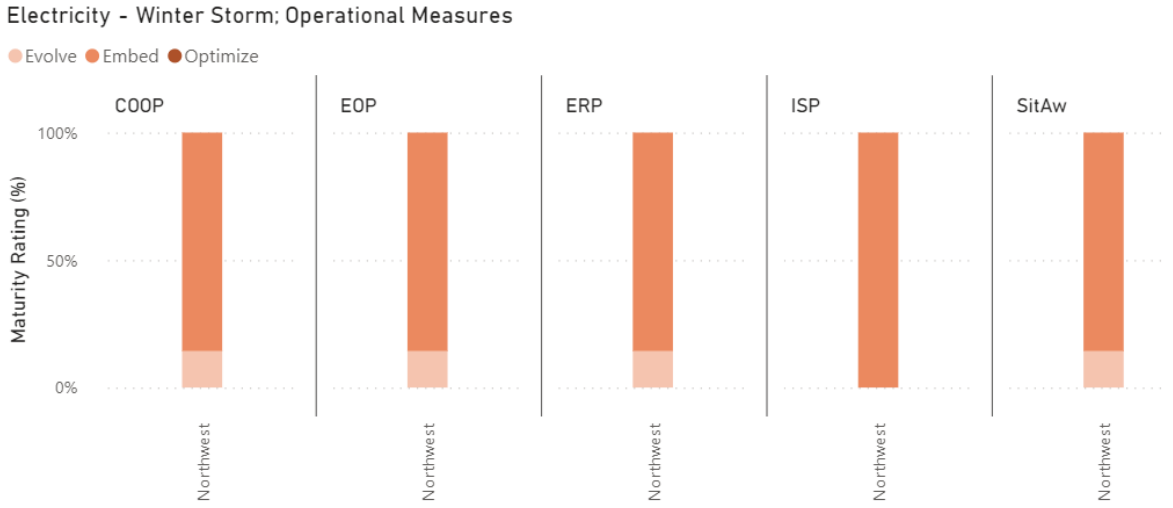
Northwest Adaptive Capacity – Natural Hazards

Optimizing

Embedding

Evolving





COOP – Continuity of Operations Plan; EOP – Emergency Operation Plan; ERP – Emergency Response Planning; ISP – Integrity Safety Plans; SitAw – Situational Awareness

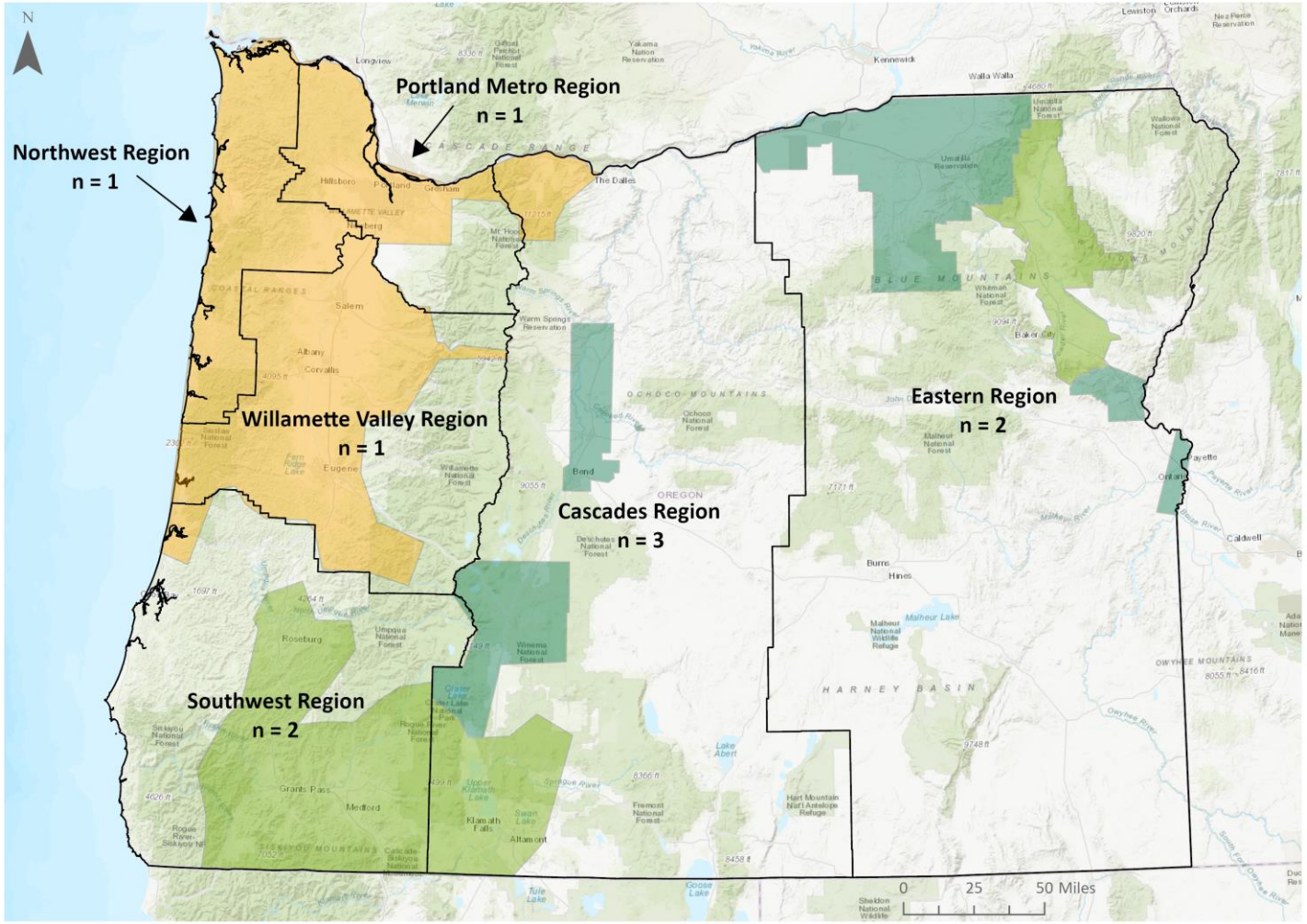
Check-in

Electricity: Given the feedback other stakeholders have provided, please share any aspects that you strongly resonate with. 9/33

Electricity: Given the feedback other stakeholders have provided, please share any aspects that you strongly disagree with. 10/33

Natural Gas

Risk Assessment



n = count of natural gas operators in each OEM region (green: Avista Utilities; teal: Cascade Natural Gas; orange: Northwest Natural Gas).

3 total utilities

All serve multiple regions

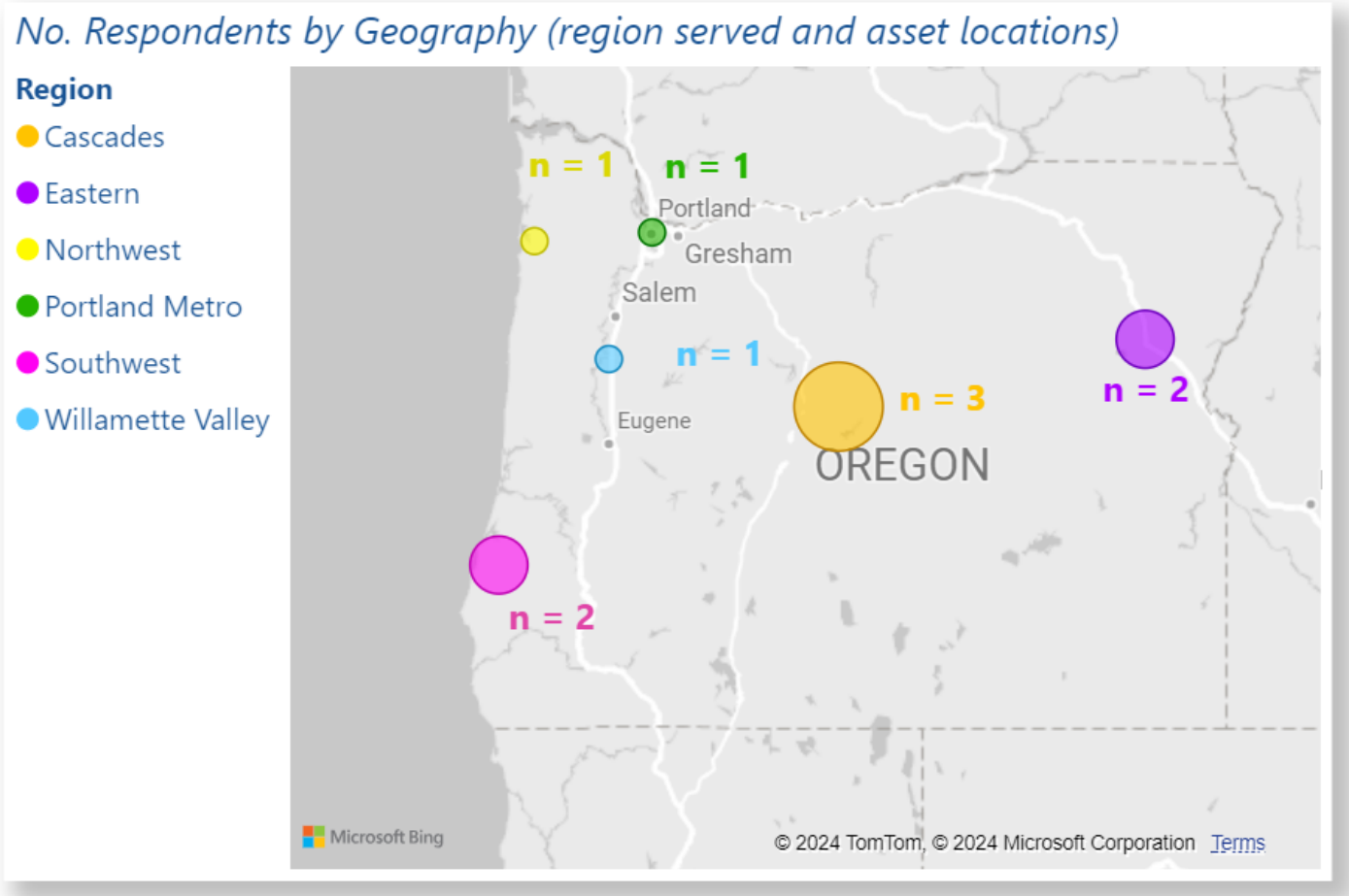
Natural Gas

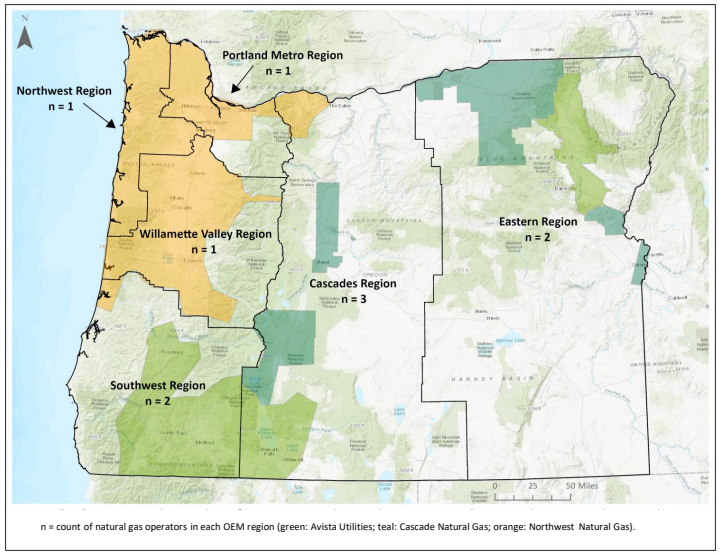
Risk Assessment

3

No. Natural Gas Risk Assessment Survey Respondents

No. Respondents by Geography (region served and asset locations)





n = count of natural gas operators in each OEM region (green: Avista Utilities; teal: Cascade Natural Gas; orange: Northwest Natural Gas).

Natural Gas

Risk Assessment – Vulnerability Ranking

	Cascades	Eastern	Northwest	Portland Metro	Southwest	Willamette Valley
CSZ	6	6	6	6	6	6
Cyberattack	2	3	2	2	3	2
Drought	N/A	N/A	N/A	N/A	N/A	N/A
Flood	4	4	4	4	4	4
Lightning	5	5	4	4	5	4
Physical Attack	4	4	7	7	4	6
Wildfire	5	5	5	5	6	5
Wind Storm	6	5	6	6	6	6
Winter Storm	4	4	4	4	4	4

N/A = no responses

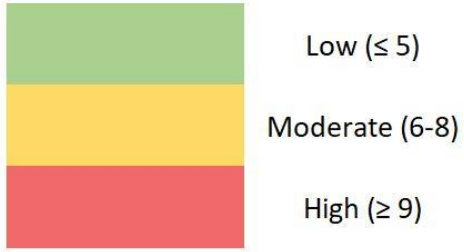
Threats most often prioritized

- Cyberattack
- Physical Attack

CSZ: Cascadia Subduction Zone Earthquake and Tsunami

Natural Gas

Risk Assessment – Vulnerability Ranking



Higher rankings are largely driven by Exposure

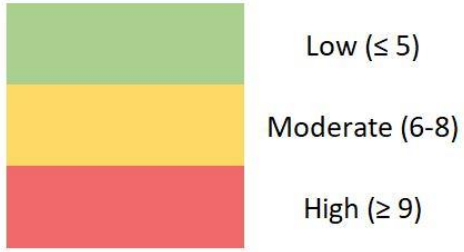
	Cascades	Eastern	Northwest	Portland Metro	Southwest	Willamette Valley
CSZ	6	6	6	6	6	6
Cyberattack	2	3	2	2	3	2
Drought	N/A	N/A	N/A	N/A	N/A	N/A
Flood	4	4	4	4	4	4
Lightning	5	5	4	4	5	4
Physical Attack	4	4	7	7	4	6
Wildfire	5	5	5	5	6	5
Wind Storm	6	5	6	6	6	6
Winter Storm	4	4	4	4	4	4

N/A = no responses

CSZ: Cascadia Subduction Zone Earthquake and Tsunami

Natural Gas

Risk Assessment – Vulnerability Ranking



Higher rankings are largely driven by Impact

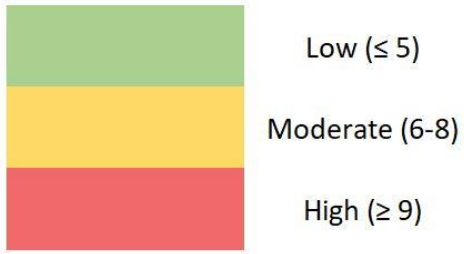
	Cascades	Eastern	Northwest	Portland Metro	Southwest	Willamette Valley
CSZ	6	6	6	6	6	6
Cyberattack	2	3	2	2	3	2
Drought	N/A	N/A	N/A	N/A	N/A	N/A
Flood	4	4	4	4	4	4
Lightning	5	5	4	4	5	4
Physical Attack	4	4	7	7	4	6
Wildfire	5	5	5	5	6	5
Wind Storm	6	5	6	6	6	6
Winter Storm	4	4	4	4	4	4

N/A = no responses

CSZ: Cascadia Subduction Zone Earthquake and Tsunami

Natural Gas

Risk Assessment – Vulnerability Ranking



Higher rankings are largely driven by Exposure and Adaptive Capacity

	Cascades	Eastern	Northwest	Portland Metro	Southwest	Willamette Valley
CSZ	6	6	6	6	6	6
Cyberattack	2	3	2	2	3	2
Drought	N/A	N/A	N/A	N/A	N/A	N/A
Flood	4	4	4	4	4	4
Lightning	5	5	4	4	5	4
Physical Attack	4	4	7	7	4	6
Wildfire	5	5	5	5	6	5
Wind Storm	6	5	6	6	6	6
Winter Storm	4	4	4	4	4	4

N/A = no responses

CSZ: Cascadia Subduction Zone Earthquake and Tsunami

Natural Gas

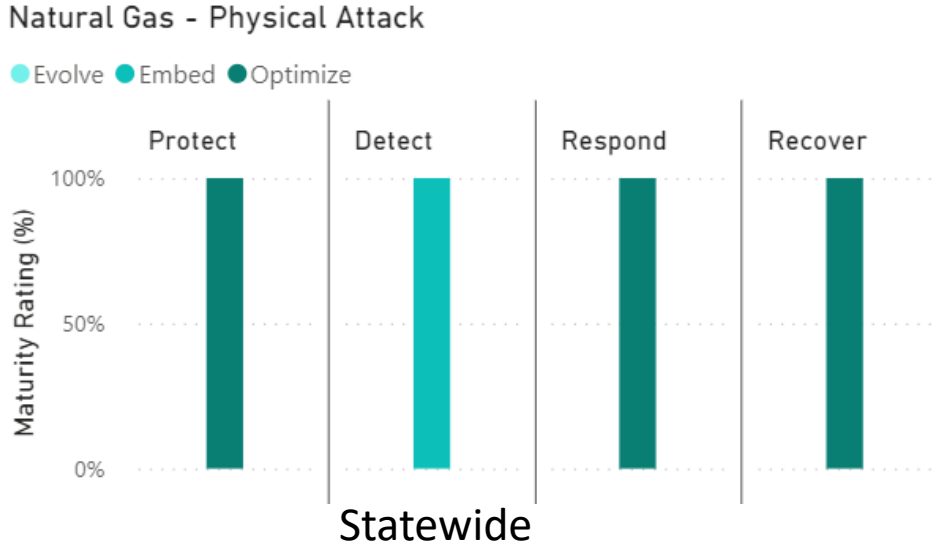
Northwest Adaptive Capacity

Optimizing

Embedding

Evolving

Statewide



Statewide

Natural Gas

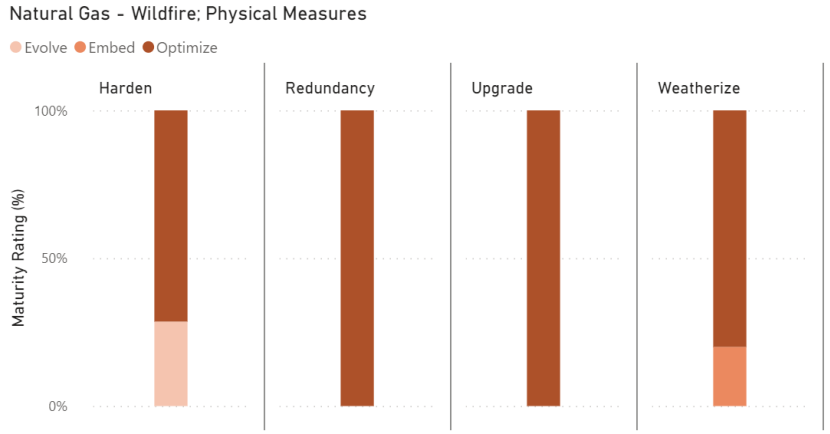
Statewide Adaptive Capacity – Natural Hazards

Optimizing

Embedding

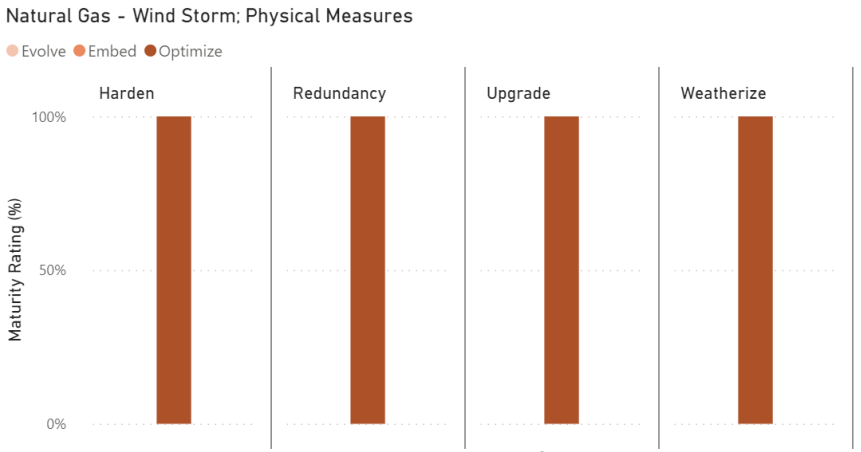
Evolving

Responses were largely Optimized



Statewide

Statewide



Statewide

COOP – Continuity of Operations Plan; EOP – Emergency Operation Plan; ERP – Emergency Response Planning; ISP – Integrity Safety Plans; SitAw – Situational Awareness

Check-in

OREGON DEPARTMENT OF ENERGY

Natural gas: Given the feedback other stakeholders have provided, please share any aspects that you strongly resonate with. 11/33

Natural gas: Given the feedback other stakeholders have provided, please share any aspects that you strongly disagree with. 12/33

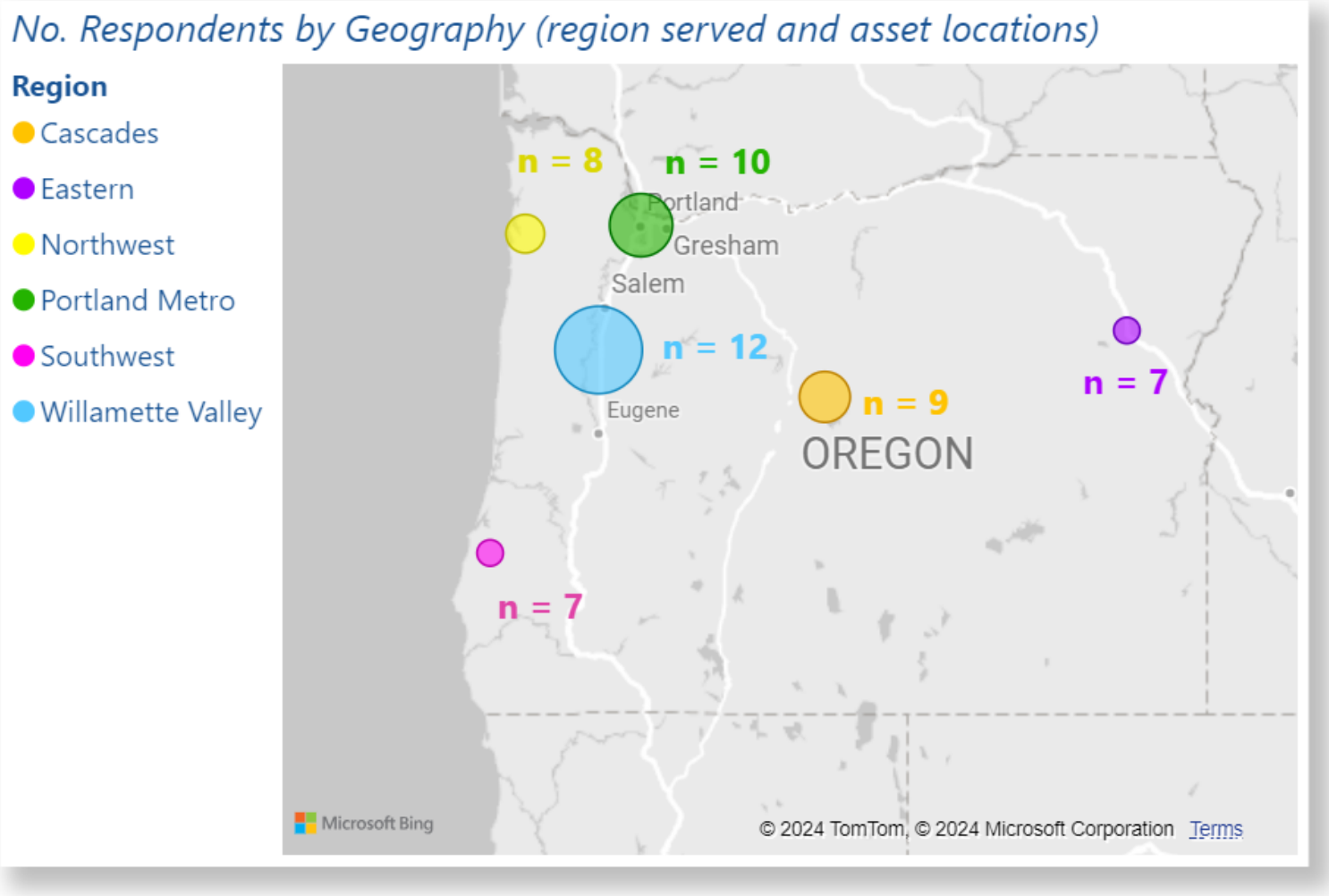
Liquid Fuels

Risk Assessment

13

No. Liquid Fuel Risk Assessment Survey Respondents

No. Respondents by Geography (region served and asset locations)



Liquid Fuels

Risk Assessment – Vulnerability Ranking

Overall Vulnerability Ranking

- Low (≤ 5)
- Moderate (6-8)
- High (≥ 9)

Threats most often prioritized

- Cyberattack
- Winter Storm

	Cascades	Eastern	Northwest	Portland Metro	Southwest	Willamette Valley
CSZ	5	6	7	7	7	7
Cyberattack	5	4	5	5	5	5
Drought	6	6	4	4	6	4
Flood	4	5	4	4	4	4
Lightning	7	8	6	6	7	6
Physical Attack	**3**	**3**	**3**	5	**3**	**3**
Wildfire	7	7	6	6	6	6
Wind Storm	7	8	7	7	7	7
Winter Storm	8	8	6	8	7	8

Underlined and bolded values indicates at least one response was unknown.

CSZ: Cascadia Subduction Zone Earthquake and Tsunami

Liquid Fuels

Risk Assessment – Vulnerability Ranking

OREGON DEPARTMENT OF ENERGY

Overall Vulnerability Ranking

- Low (≤ 5)
- Moderate (6-8)
- High (≥ 9)

Higher rankings are largely driven by Impacts

	Cascades	Eastern	Northwest	Portland Metro	Southwest	Willamette Valley
CSZ	5	6	7	7	7	7
Cyberattack	5	4	5	5	5	5
Drought	6	6	4	4	6	4
Flood	4	5	4	4	4	4
Lightning	7	8	6	6	7	6
Physical Attack	**3**	**3**	**3**	5	**3**	**3**
Wildfire	7	7	6	6	6	6
Wind Storm	7	8	7	7	7	7
Winter Storm	8	8	6	8	7	8

Underlined and bolded values indicates at least one response was unknown.

CSZ: Cascadia Subduction Zone Earthquake and Tsunami

Liquid Fuels

Risk Assessment – Vulnerability Ranking

Overall Vulnerability Ranking

- Low (≤ 5)
- Moderate (6-8)
- High (≥ 9)

Higher rankings are largely driven by Adaptive Capacity

	Cascades	Eastern	Northwest	Portland Metro	Southwest	Willamette Valley
CSZ	5	6	7	7	7	7
Cyberattack	5	4	5	5	5	5
Drought	6	6	4	4	6	4
Flood	4	5	4	4	4	4
Lightning	7	8	6	6	7	6
Physical Attack	**3**	**3**	**3**	5	**3**	**3**
Wildfire	7	7	6	6	6	6
Wind Storm	7	8	7	7	7	7
Winter Storm	8	8	6	8	7	8

Underlined and bolded values indicates at least one response was unknown.

CSZ: Cascadia Subduction Zone Earthquake and Tsunami

Liquid Fuels

Risk Assessment – Vulnerability Ranking

OREGON DEPARTMENT OF ENERGY

Overall Vulnerability Ranking

- Low (≤ 5)
- Moderate (6-8)
- High (≥ 9)

Some responses were unknown → artificially low scores

	Cascades	Eastern	Northwest	Portland Metro	Southwest	Willamette Valley
CSZ	5	6	7	7	7	7
Cyberattack	5	4	5	5	5	5
Drought	6	6	4	4	6	4
Flood	4	5	4	4	4	4
Lightning	7	8	6	6	7	6
Physical Attack	**3**	**3**	**3**	5	**3**	**3**
Wildfire	7	7	6	6	6	6
Wind Storm	7	8	7	7	7	7
Winter Storm	8	8	6	8	7	8

Underlined and bolded values indicates at least one response was unknown.

CSZ: Cascadia Subduction Zone Earthquake and Tsunami

Liquid Fuels

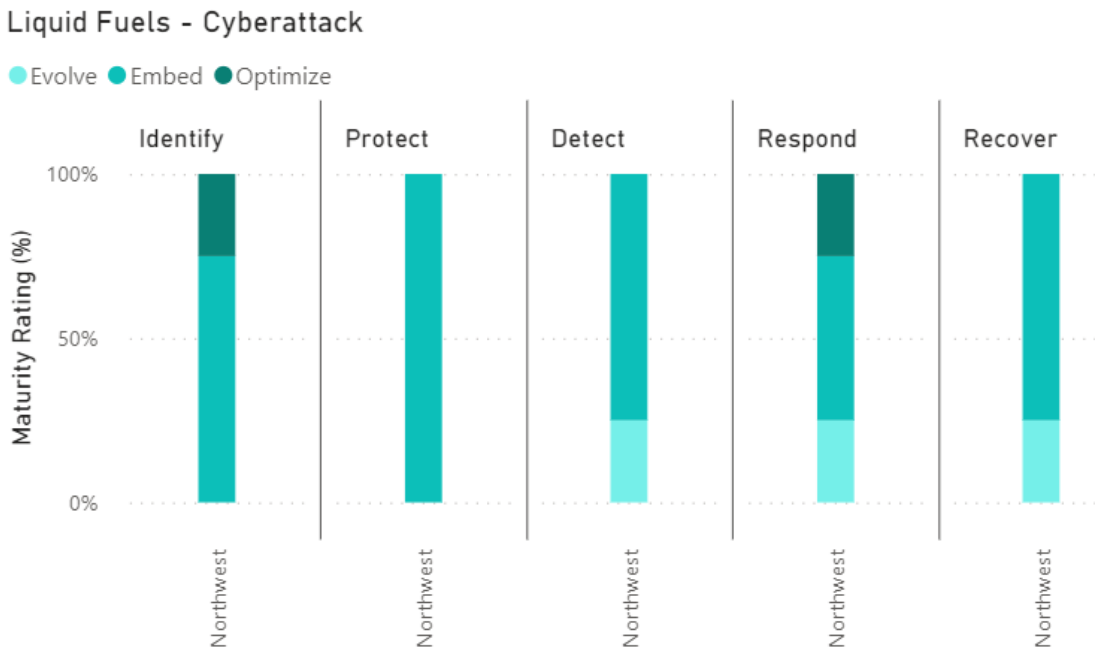
Northwest Adaptive Capacity – Human-caused Threats

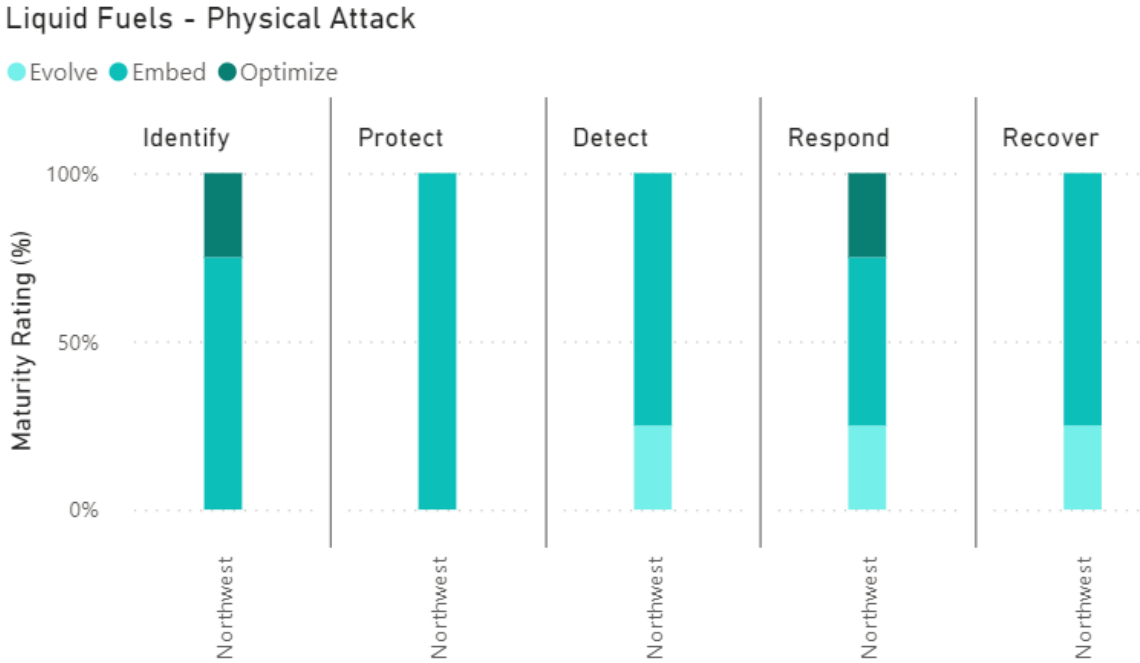
OREGON DEPARTMENT OF ENERGY

Optimizing

Embedding

Evolving





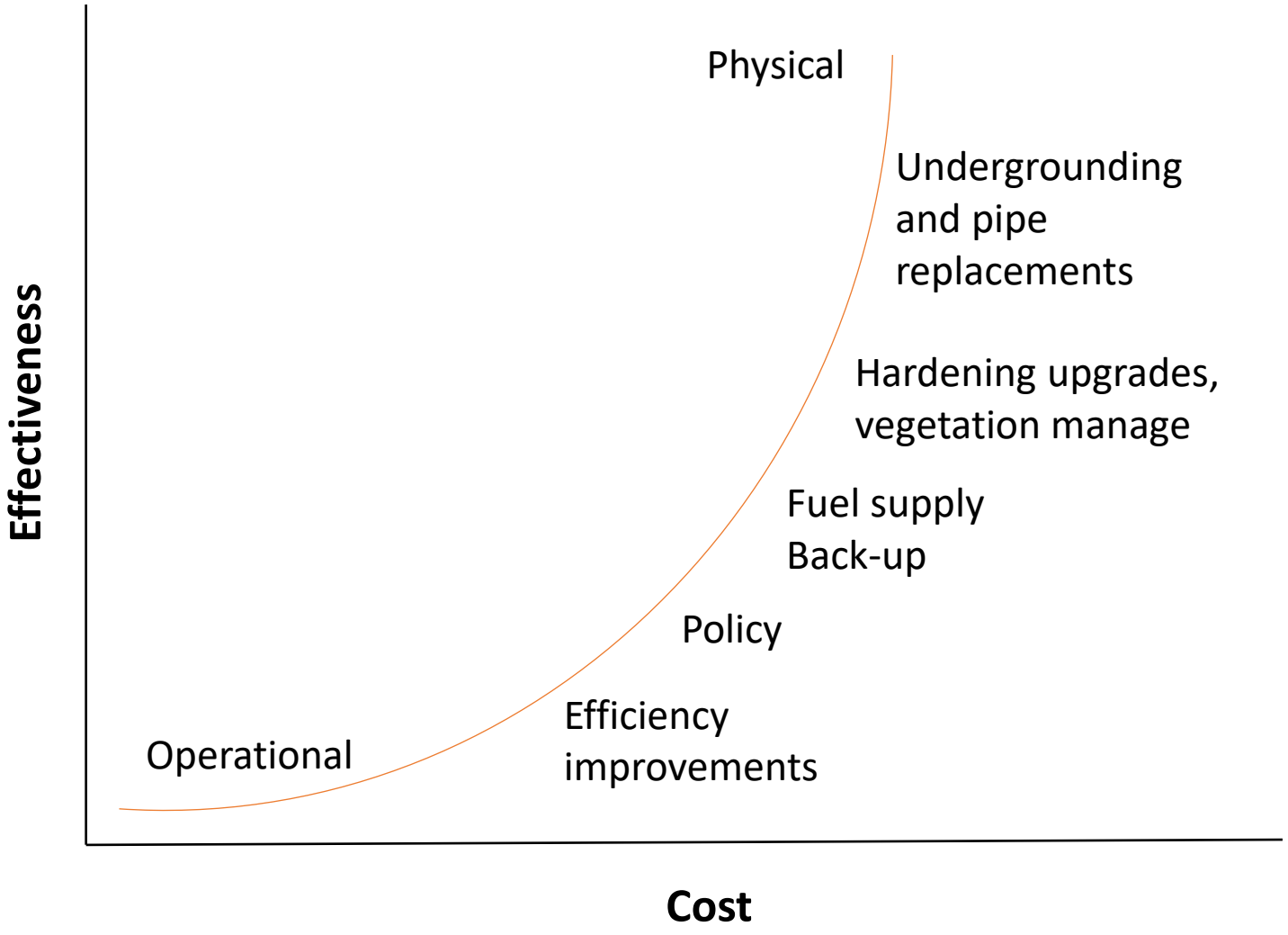
Check-in

Liquid fuels: Given the feedback other stakeholders have provided, please share any aspects that you strongly resonate with. 13/33

Liquid fuels: Given the feedback other stakeholders have provided, please share any aspects that you strongly disagree with. 14/33

Risk Mitigation Measures

Costs and Effectiveness



- **Most costly:** Physical measures have high impact, high cost
- **Least costly:** Operational measures and efficiency improvements
- **Policy changes** are impactful but take time to implement

Leddy et al. 2023; Park et al. 2016.; Sanstad et al. 2023;. Zamuda et al. 2019.

Risk Mitigation Measures

All Systems – Physical Measures

- **Drones** – develop drone inspection capabilities (and procedures)
- **Hardening** – harden and upgrade components
- **Monitoring** – establish automated and remote monitoring systems
- **Redundancy** – identify alternate facility sites (i.e.. backup operations centers)
- **Redundancy** – increase backup generator capacity
- **Redundancy** – reduce isolation of critical facilities (i.e.. backup access routes, backup communication systems)

- **Removal** - remove assets out of hazard zone
- **System Segmentation** – subdivide energy systems to more efficiently isolate damaged areas
- **Undergrounding** – replace overhead with underground cables
- **Vegetation management** – manage vegetation to minimize impacts of natural hazards
- **Weatherization** – weatherize energy system assets
- **Protect** – improve maturity of measures related to the Protect category for human-caused threats

Check-in

OREGON DEPARTMENT OF ENERGY

All Systems: 15/33

Please rank the All Systems Physical Measures in order of priority. *

Physical Measures (1=highest):

If there is an additional risk mitigation measure you recommend including, please describe. 16/33

Risk Mitigation Measures

All Systems – Operational Measures

- **AARs** – generate incident After Action Reviews
- **AI** – integrate artificial intelligence into operational plans/monitoring
- **Audits** - audit resilience strategies and recommend improvement plans
- **Inventories** – maintain inventories of equipment and inter-operability/mutual aid
- **MOUs** – develop Memorandums of Understanding with government
- **Planning** – develop scenario-driven emergency response plans including back-up communications and employee preparedness
- **Projections** – improve forecasting and situational awareness abilities

- **Reduce demand** – develop peak Demand Reduction Programs
- **Redundancy** – have secondary key suppliers in place
- **Risk Maps** - maintain baseline risk maps to inform long term investments and programs
- **Studies** – comprehensive, site-specific risks to inform Capital Improvement Plans (CIPs) and Asset Management Plans (AMPs)
- **Studies** – lifeline service delivery systems disaster resilience
- **Studies** – supply chain resilience for continuity planning
- **Training** – conduct regular training and exercises
- **Maturity** – improve maturity of measures across all categories for human-caused threats

Check-in

All Systems: 17/33

Please rank the All Systems Operational Measures in order of priority. *

Operational Measures (1=highest priority):

If there is an additional risk mitigation measure you recommend including, please describe. 18/33

Regional Mitigation Measures

Northwest - Electricity

OREGON DEPARTMENT OF ENERGY

	Cascadia Subduction Zone Earthquake	Human-caused Threats	Wildfire	Wind & Winter Storm
Physical	• **Harden sub-stations** • **Implement geotechnical and foundation interventions** and ground improvements • Improve backup power systems and redundancy (e.g., generators, redundant coastal power supply)	• Optimize implementation of measures in the Protect categories (see handout for examples)	• **Manage vegetation** • **Utilize fire resistant materials and retrofits (e.g., covered conductors, resistant poles and transmission lines)**	• **Underground transmission lines** • **Upgrade transmission and distribution lines and equipment**
Operational	• Implement advanced early warning systems with seismometers and sensors • Regularly utilize exercises and drills to identify improvement actions	• Optimize implementation across all categories – Identify, Protect, Detect, Respond, Recover – for cyber and physical threats (see handout for examples)	• **Develop protocols for de-energization for firefighting response** • Implement weather monitoring combined with public-safety shut-off programs • Implement workforce preparedness training	• **Develop SOPs for winter storm workforce response** • **Implement automated distribution** • Implement grid monitoring • Implement industry best practices through safety programs of Oregon Public Utilities Commission (OPUC)

Check-in

OREGON DEPARTMENT OF ENERGY

Electric System Priorities: 19/33
Please rank the Electric System Physical Measures in order of priority. *

Physical Measures (1=highest priority):

If there is an additional risk mitigation measure you recommend including, please describe. 20/33

Electric System Priorities: 21/33
Please rank the Electrical System Operational Measures in order of priority. *

Operational Measures (1=highest priority):

If there is an additional risk mitigation measure you recommend including, please describe. 22/33

Regional Mitigation Measures

Northwest - Natural Gas

OREGON DEPARTMENT OF ENERGY

	Cascadia Subduction Zone Earthquake	Physical Threats	Wildfire	Wind Storm
Physical	• **Design and retrofit in-ground tanks to withstand buoyant force in liquefiable soil** • **Harden pipelines (ties, flexible joints, etc.)** • **Implement containment measures for spills** • **Implement tank foundation seismic retrofits** • Improve backup power systems	• *All measures are rated as optimized*	• Implement fire protection measures (e.g., **remote-operated valves, subdivided pipeline networks that isolate damage)** • **Maintain defensible space around assets such as storage tanks** • Utilize backup generators	• Anchor equipment securely to prevent displacement or overturning during high winds • Install barriers/shields
Operational	• Coordinate with Oregon Department of Energy (ODOE) and Oregon Department of Emergency Management (ODEM) • Develop detailed vulnerability assessment of system assets • Develop Integrity Safety Plans and supply chain continuity plans • **Engage in local and state emergency transportation route planning** • Strengthen Oregon Public Utilities Commission's seismic oversight authority	• Optimize implementation of measures in the Identify and Detect categories (see handout for examples)	• Backup communications • Develop detailed vulnerability assessment of system assets • Develop scenario-driven wildfire and wildland urban interface (WUI) emergency response exercises and planning • Maintain risk maps and system modeling	• Develop detailed vulnerability assessment of system assets • Implement emergency shutdown systems • Provide incident command system training for all staff • Provide minimum design specifications for new construction and retrofitting

Check-in

OREGON DEPARTMENT OF ENERGY

Natural Gas System Priorities: 23/33
Please rank the Natural Gas System Physical Measures in order of priority. *

Physical Measures (1=highest priority):

If there is an additional risk mitigation measure you recommend including, please describe. 24/33

Natural Gas System Priorities: 25/33
Please rank the Natural Gas System Operational Measures in order of priority. *

Operational Measures (1=highest priority):

If there is an additional risk mitigation measure you recommend including, please describe. 26/33

Regional Mitigation Measures

Northwest - Liquid Fuels

OREGON DEPARTMENT OF ENERGY

	Cascadia Subduction Zone Earthquake / Liquefaction	Human-caused Threats	Wind & Winter Storm
Physical	• Apply seismic upgrades to critical infrastructure (structural intervention) • Utilize flexible connections, control valves • Increase fuel storage capacity, diversity and foundation strength	• Optimize implementation of measures in the Protect categories for cyber and physical threats (see handout for examples)	• Improve site drainage and flood protection in preparation for storms (e.g., levees, berms, storage areas) • Install weather coverings, roofs, and enclosures for critical infrastructure
Operational	• Perform seismic vulnerability studies of critical infrastructure • Protect critical facilities from landslide by identifying high risk slopes • Rely on updates to local, state, and federal regulations to guide improvements in resiliency practices	• Optimize implementation across all categories – Identify, Protect, Detect, Respond, Recover – for cyber and physical threats (see handout for examples)	• Provide debris clearing equipment staging and maintenance • Provide winter weather equipment and supplies (e.g., shovels, plows, ice melt) • Utilize feedback from exercises (drills, tabletop, or functional) and real incident responses to adjust and improve resiliency practices.

Check-in

OREGON DEPARTMENT OF ENERGY

Liquid Fuels System Priorities: 27/33
Please rank the Liquid Fuels System Physical Measures in order of priority. *

Physical Measures (1=highest priority):

If there is an additional risk mitigation measure you recommend including, please describe. 28/33

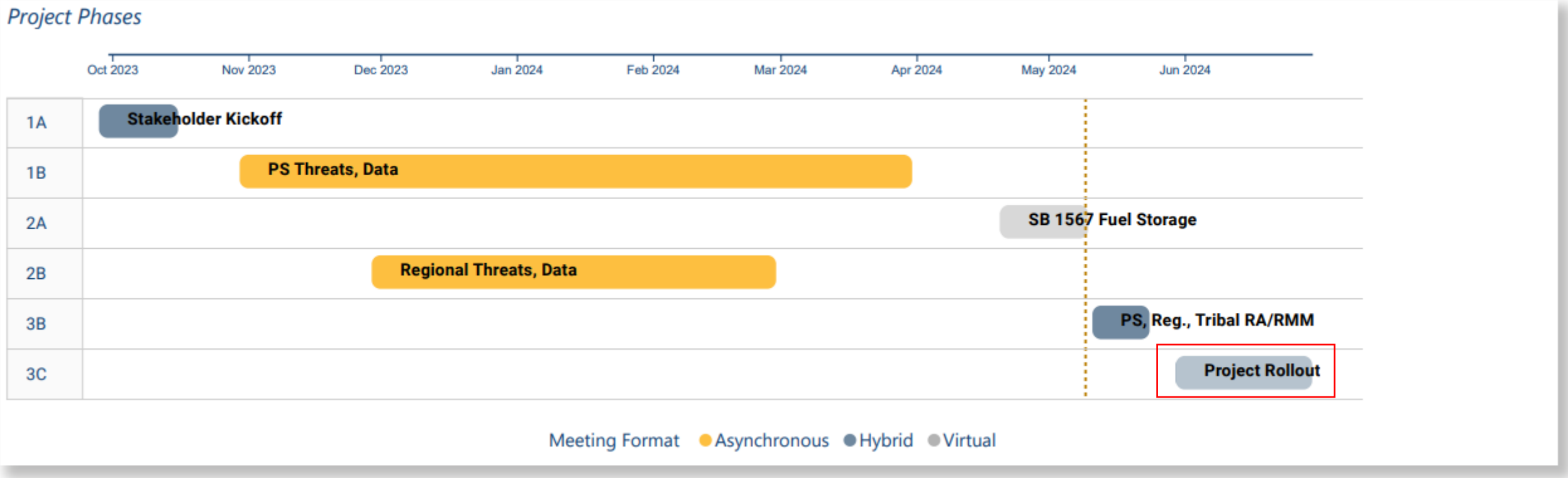
Liquid Fuels System Priorities: 29/33
Please rank the Liquid Fuels System Operational Mitigation Measures in order of priority. *

Operational Mitigation Measures (1=highest priority):

If there is an additional risk mitigation measure you recommend including, please describe. 30/33

Next Steps

Next Steps



PS: Private Sector; RA: Risk Assessment; RMM: Risk Mitigation Measure; SB: Senate Bill

Check-in

OREGON DEPARTMENT OF ENERGY

Is there anything specific about your region that wasn't reflected in the information presented today?	31/33
Do you have additional comments or feedback on the information presented today?	32/33
What can we do to better serve your needs moving forward?	33/33

HB 3630: COMPREHENSIVE STATE ENERGY STRATEGY

Directs ODOE to develop a state energy strategy identifying pathways to achieve Oregon's energy policy objectives

- Must be informed by stakeholder perspectives
- Must draw from existing resource plans, energy-related studies, and analyses

State energy strategy must account for a variety of factors, such as:

- Costs, efficiencies, feasibility, and availability of energy resources and technologies
- Economic and employment impacts
- Energy burden, affordability, environmental justice, and community impacts and benefits
- Land use and natural resource impacts and considerations
- Energy resilience, security, and market implications

OREGON DEPARTMENT OF ENERGY

Want to learn more about the Energy Strategy?

Join our webinar:	June 3, 2024 @ 1 pm Register on the energy strategy webpage
Visit our webpage:	https://www.oregon.gov/energy/Data-and-Reports/Pages/Energy-Strategy.aspx
E-mail Us:	Energy.strategy@energy.oregon.gov
Sign up for our listserv:	

Questions?

energy.security@energy.Oregon.gov

Max Woods
ESP Oversight
maxwell.woods@energy.oregon.gov
(503) 551-8209

Deanna Henry
ESP Project Manager
deanna.henry@energy.oregon.gov
(503) 932-4428

Tom Sicilia
ESP Contract Manager
tom.sicilia@energy.oregon.gov
(503) 508-8333