PERFORMANCE AUDIT

Office of the Washington State Auditor
Pat McCarthy

Ensuring Climate-Resilient Infrastructure to Meet Washington's Growing Energy Needs

June 24, 2025

Report Number: 1037453

Table of Contents

State Auditor's Office contacts

State Auditor Pat McCarthy
564-999-0801, Pat.McCarthy@sao.wa.gov

Scott Frank – Director of Performance and IT Audit
564-999-0809, Scott.Frank@sao.wa.gov

Justin Stowe – Assistant Director for Performance Audit
564-201-2970, Justin.Stowe@sao.wa.gov

Melissa Smith – Principal Performance Auditor
564-999-0832, Melissa.Smith@sao.wa.gov

Deborah Stephens – Senior Performance Auditor
564-999-0929, Deborah.Stephens@sao.wa.gov

Audit Team
Kenza Abtouche, Robert Evashenk

Kathleen Cooper – Director of Communications
564-999-0800, Kathleen.Cooper@sao.wa.gov

To request public records

Public Records Officer
564-999-0918, PublicRecords@sao.wa.gov

Americans with Disabilities

In accordance with the Americans with Disabilities Act, this document will be made available in alternative formats. Please email Webmaster@sao.wa.gov for more information.

Executive Summary

State Auditor's Conclusions (page 27)

Each year, it becomes more evident that Washington's climate is changing, increasing the risks of climate hazards such as wildfires and flooding. In response, our state has taken significant steps to mitigate the emission of greenhouse gases. For example, the Clean Energy Transformation Act requires the state's electric utilities to fully transition to renewable electricity generation by 2045.

This performance audit focuses on an emerging area of concern – adapting renewable energy infrastructure to the effects of a changing climate. For example, when planning a wind farm, it is important to assess whether the site is likely to face increased wildfire risk in the future. This kind of evaluation enables project designers to incorporate fire-resistant features that can help ensure the facility functions throughout its intended lifespan.

We came to three broad conclusions regarding the climate resiliency of energy infrastructure in Washington. First, requiring vulnerability assessments, which describe how proposed projects could be affected by conditions such as higher temperatures and the associated risks of increasing wildfires. These assessments could help developers and utilities better respond to the likely risks of a changing climate. Second, the state should make use of more granular climate-science data, such as forecasts for stream flows, snowpack and drought for a particular site, when mapping risks to new projects. And finally, establishing a nonregulatory information sharing function in state government could improve the infrastructure development process.

Adapting to a changing climate will be a very complex challenge for years to come, as experts forecast its effects will only become more extreme. This report offers insights that will help make critical investments in that effort more resilient and effective.

Background (page 6)

Washington is already experiencing warmer temperatures and changing patterns of precipitation from the changing climate. As these effects worsen, so do the risks that result, such as increased droughts and wildfires, flooding and mudslides. The state has already undertaken steps to reduce greenhouse gas emissions, or mitigate climate effects, and is beginning to adapt to its changes. Changing climate conditions compromise the state's critical infrastructure sectors, such as energy, transportation and communications. Washington's electricity sector is unusually

diverse, in part because it is the largest hydroelectric producer in the U.S. The audit examined how Washington can help adapt new electricity to expected risks that the changing climate will likely pose.

The state has opportunities to ensure new electricity infrastructure, built for climate mitigation, can withstand future climate effects

(page 10)

New electricity infrastructure must be designed and built to be resilient to changing climate conditions. Vulnerability assessments help infrastructure developers and utilities respond to likely risks posed by changing climate conditions, but current processes to site and build new electricity infrastructure lack requirements to do them. Adding climate-related vulnerability assessments to environmental regulations could help inform new infrastructure decisions. Climate-related vulnerability assessments for electricity infrastructure are already required in some states and municipalities.

Vulnerabilities found through those types of assessments can be addressed in planning, siting and construction processes. For example, tying requirements for both vulnerability assessments and responses to funding rules could help ensure applicants perform both activities. Infrastructure design that considers future climate effects can ensure facilities function for their expected lifetime. As examples, the federal government and other states have begun to address future climate effects in infrastructure design.

Additional analyses of forecasted climate information could help the state adapt infrastructure to the changing climate (page 17)

Centrally compiled and analyzed climate-science data already helps Washington address adaptation and resilience. The Climate Impacts Group at the University of Washington currently disseminates scientific information about the changing climate to those who need it. By using forecasted climate information that the Climate Impacts Group already provides, the state could improve its existing efforts to map wildfire risk. With some additional resources, the Climate Impacts Group could provide additional analysis to ensure adaptation of critical infrastructure. More granular data and analyses could improve the state's responses to location- and infrastructure-specific climate risks. Collaboration between state climate experts and utility engineers could help the state develop design standards to address vulnerabilities.

Broader collaboration around climate adaptation efforts could help the state's electricity sector prepare for future climate risks (page 21)

Responsibilities for Washington's electricity industry are fragmented, making collaboration more challenging. Ownership, planning, regulation and operation of electricity infrastructure is distributed among various private, state, local, regional, tribal and federal entities. The state lacks a centralized home for energy-related responsibilities, information and tools, thereby hampering coordination. Collaboration must extend to conflict resolution that involves both the public and private sectors. A single office could facilitate collaboration and conflict resolution, and provide tools for climate adaptation. Washington already recognizes the need for better collaboration and conflict resolution tools in completing renewable energy projects.

Recommendations (page 28)

We made a series of recommendations to improve the state's efforts at adapting critical electricity infrastructure to the increasing hazards posed by the changing climate. The recommendations include creating a non-regulatory office to disseminate electricity information, promote sector coordination and address conflict resolution of new energy projects. In addition, we recommend expanding the analysis the Climate Impacts Group provides, as resources allow, so that decision-makers have the resources they need to make informed judgements. Finally, we recommend adding climate-related vulnerability assessments to planning and siting processes of new infrastructure so adaptation efforts can occur as new infrastructure in considered.

Next steps

Our performance audits of state programs and services are reviewed by the Joint Legislative Audit and Review Committee (JLARC) and/or by other legislative committees whose members wish to consider findings and recommendations on specific topics. Representatives of the Office of the State Auditor will review this audit with JLARC's Initiative 900 Subcommittee in Olympia. The public will have the opportunity to comment at this hearing. Please check the JLARC website for the exact date, time and location (leg.wa.gov/about-the-legislature/committees/joint/jlarc-i-900-subcommittee). Our Office conducts periodic follow-up evaluations to assess the status of recommendations and may conduct follow-up audits at its discretion. See **Appendix A**, which addresses the I-900 areas covered in the audit. **Appendix B** contains information about our methodology. See the **Bibliography** for a list of references and resources used to develop our understanding of topic area.

Background

Earth's changing climate poses increasing risks to Washington's communities, infrastructure, environment and ultimately, our way of life. In the last decade, the state has experienced warmer temperatures and changing patterns of precipitation. More winter precipitation is falling as rain, reducing snowpack in the mountains. Drought is now a regular phenomenon. Hotter and drier summers mean increased risk of wildfires. The Pacific Ocean is warming, and the sea level is rising along the coastline. These and other effects of climate change have damaged property and affected air quality. Given Washington's diverse landscape, climate risks vary by location, requiring tailored responses, region by region across the state.

Washington is responding to the changing climate with strategies in three areas:

- **Mitigation** – taking steps to reduce greenhouse gas emissions
- **Adaptation** – taking action to adjust to current and projected effects of the changing climate
- **Resilience** – building up the capacity of a system to maintain function in the face of climate stresses

As a state, Washington is already addressing mitigation through emission reduction targets, and has begun efforts aimed at adaptation. Adaptation will be necessary to protect all the state's critical infrastructure, and in particular, its four "lifeline" sectors – energy, communications, water, transportation – which are essential to the operations of almost all other sectors and are fundamental to the delivery of basic societal functions. The energy sector occupies a uniquely pivotal role, as it provides the power necessary for the other critical infrastructure sectors to operate.

The risks that changing climate conditions pose can compromise energy infrastructure and disrupt the supply of power, causing malfunctions in other sectors. Wildfires and extreme winds can damage transmission and distribution lines that deliver electricity. Droughts affect hydropower production, while flooding damages equipment and disrupts operations. The essential goal of climate adaptation is to ensure these systems are resilient enough to continue functioning, no matter what future weather may hold.

Our state first addressed climate mitigation and is now considering climate adaptation

Beginning in 2019, Washington state's Legislature passed a number of laws aimed at reducing greenhouse gas emissions to mitigate climate change. The Clean Energy Transformation Act requires the state's electric utilities to fully transition

to renewable or non-greenhouse-gas emitting electricity generation by 2045. In 2021, the Climate Commitment Act created a cap-and-invest program to encourage polluting industries to reduce emissions. In 2023, the Legislature passed a law requiring the Department of Ecology to update the state's climate response strategy by September 2024, and every four years thereafter.

Also in 2023, the Legislature added climate change and resiliency to the goals of the Growth Management Act, requiring county and city plans to support the state's greenhouse gas emissions goals, among other requirements.

The Legislature has also passed laws that help address climate adaptation. For example, in 2019 the Legislature established the Electric Utility Wildland Fire Prevention Task Force to increase electricity infrastructure resilience through improved coordination across agencies and information sources. The task force, led by the Department of Natural Resources (DNR), produced a series of recommendations, including:

- Create a model agreement for managing vegetation outside rights-of-way communication protocols
- Facilitate educational exchanges between DNR and electric utilities to help reduce risks of wildland fires, among other things

In 2021, the Legislature created the Utility Wildland Fire Prevention Advisory Committee to implement the task force's recommendations.

Then, in two consecutive years, the Legislature addressed issues around the decision-making processes that determine where a facility will be built. In 2022, the Legislature made the Energy Facility Site Evaluation Council a stand-alone agency with additional authority regarding the siting of clean energy facilities. In 2023, it established the Interagency Clean Energy Siting Coordinating Council, co-chaired by Ecology and the Department of Commerce. Among its assigned tasks was to identify actions the state could take to improve the siting and permitting of clean energy projects. The Council was also directed to advise Commerce in contracting for an independent third party to evaluate the state's siting and permitting processes.

Funding for climate mitigation efforts may be affected by new federal policies, efforts for adaptation less so

The Legislature provides some funding to help state agencies deliver climate-related programs. Some programs rely on grants and funding from the federal government as well. During the preparation of this audit report, the new administration in Washington, D.C., made policy changes to federal priorities and staffing around climate resilience. As of the completion of our audit work, there was no evidence that those changes will directly affect the resources required to adapt electricity infrastructure to climate effects here in our state. However, the changes are likely to continue, and may not be fully reflected in our report.

Fundamental to climate adaptation is the need for the best available science in climate research, including climate forecasting. The University of Washington's Climate Impacts Group conducts such research for the state. It receives funding from a number of public and private sources, including two federal 5-year grants to fund specific projects. One grant comes from National Oceanic and Atmospheric Administration, set to expire in 2026; the second comes from the Department of the Interior, set to expire in 2028. Both these federally funded projects are focused on climate resilience, rather than adapting infrastructure to withstand climate effects. Both federal agencies are subject to the president's workforce optimization executive order, and therefore to staffing reductions.

The state's climate resilience efforts to build more renewable energy may also be affected by federal policy changes. For example, while the Trump administration has not said which, if any, specific tax credits it will eliminate, energy tax credits could be affected. In addition, the administration has currently paused some contracts and grants, including funding for offshore wind facilities. In January 2025, President Trump's Executive Order Unleashing American Energy paused federal disbursements through the Infrastructure Investment and Jobs Act, which may affect efforts to help modernize the nation's electrical grid.

As of April 2025, Washington state and other organizations have filed lawsuits to challenge both potential staffing cuts and pauses to funding.

Washington's electricity sector is unusually diverse

Climate adaptation is important for all types of critical infrastructure, such as bridges, water treatment plants and cellular relay towers. It is particularly crucial for electricity infrastructure — generation facilities and transmission and distribution lines — given its essential role in the nation's critical infrastructure portfolio. In Washington, the state's residents and businesses are served by 60 different utilities, held privately (investor-owned) and publicly (consumer-owned), as well as by tribes. They are listed in **Exhibit 1**.

Washington has a diverse energy portfolio, more so than some states. It leads the nation in hydroelectric power, typically producing one-fourth to one-third of the country's conventional hydro each year.

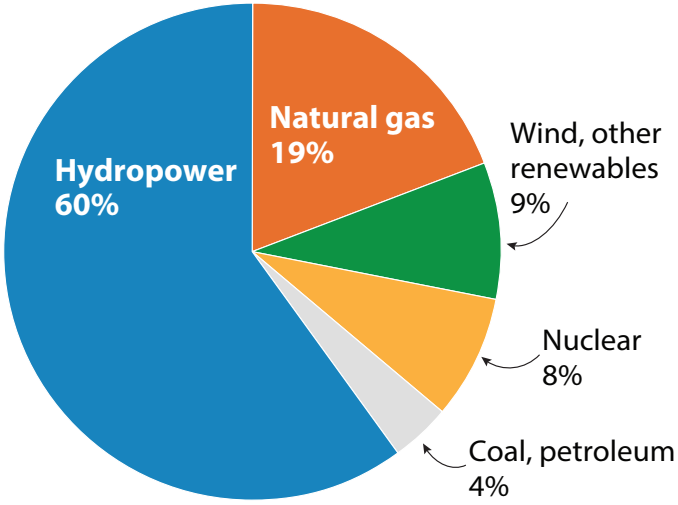
Exhibit 1 – Privately and publicly owned electricity infrastructure

Type of ownership	Number of companies
Private utilities:	
Investor-owned	3
Public (consumer) utilities:	
Public Utility Districts (PUDs)	24
Municipal, city-owned	17
Rural cooperative and mutual	14
Tribally owned utilities	2

Sources: Washington Utilities and Transportation Commission; Washington Public Utility District Association; American Public Power Association; Washington Rural Electric Cooperative Association; Kalispel Tribal Utilities website; Yakama Power website.

In 2023, the state's hydroelectric power accounted for 60% of total net generation electricity produced from both utility-scale (1 megawatt or larger) and small-scale (less than 1 megawatt) facilities, as shown in **Exhibit 2.** Burning natural gas was the second largest source of electricity production, accounting for nearly 20% of the state's total net electricity generation. Nonhydroelectric renewable resources (mostly wind), nuclear energy and coal provide almost all the rest of Washington's in-state electricity generation. That year, Washington produced about 8% of the nation's total renewable-sourced utility-scale electricity generation. It was third in the nation, after Texas and California, in utility-scale renewable generation from all sources.

Exhibit 2 – In 2023, hydropower and natural gas accounted for nearly 80% of the state's net electricity production



Sources: U.S. Energy Information Administration: EIA-860 report, 2023 final data; EIA-923 report, 2023 final data.

As for electricity usage in 2023, the residential sector accounted for 44% of Washington's electricity sales: almost three in five households use electricity as their primary heating source. The commercial sector used 33% of the state's electricity, and the industrial sector accounted for 23%.

This audit examined how Washington can help adapt new electricity infrastructure to expected climate hazards

This audit focused on climate adaptation practices for new electricity infrastructure the state is building to meet growing demand and address its climate mitigation strategies. Its purpose was to see how the state can best consider the forecasted effects of climate change when planning, siting and funding electricity generating facilities and transmission and distribution lines. We examined where in these processes climate effects are most usefully taken into consideration, to ensure that infrastructure is climate resilient to withstand the effects of a changing climate.

This audit looked at programs within seven agencies, listed in the sidebar, that are involved in planning, siting, construction or operation of new electricity infrastructure. Appendix B provides more detail about the roles the seven agencies play in energy infrastructure.

The audit answered the following questions:

1. How can Washington ensure its new energy infrastructure will withstand forecasted climate change effects?
2. What information and practices can help the state site and build climate-resilient energy infrastructure?

Seven agencies with programs reviewed in this audit

- Archaeology and Historic Preservation
- Commerce
- Ecology
- Energy Facility Site Evaluation Council
- Labor and Industries
- Natural Resources
- Utilities and Transportation Commission

Audit Results

The state has opportunities to ensure new electricity infrastructure, built for climate mitigation, can withstand future climate effects

Answer in brief

New electricity infrastructure must be designed and built to be resilient to changing climate conditions. Vulnerability assessments help infrastructure developers and utilities respond to likely risks posed by changing climate conditions, but current processes to site and build new electricity infrastructure lack requirements to perform them. Adding climate-related vulnerability assessments to environmental regulations could help inform new infrastructure decisions. Climate-related vulnerability assessments for electricity infrastructure are already required in some states and municipalities.

Vulnerabilities found through those types of assessments can be addressed in planning, siting and construction processes. For example, tying requirements for both vulnerability assessments and responses to funding rules could help ensure applicants perform both activities. Infrastructure design that considers future climate effects can ensure facilities function for their expected lifetime. As examples, the federal government and other states have begun to address future climate effects in infrastructure design.

New electricity infrastructure must be designed and built to be resilient to changing climate conditions

Existing power stations and transmission towers were not built with consideration of the rapidly changing climate conditions the state is now facing. New construction of electricity resources primarily responds to the state's climate mitigation efforts, that is, transitioning the state to clean, non-emitting and renewable energy to reduce greenhouse gas emissions. To ensure these new resources can produce and serve electricity throughout their service lifespans, new builds must be resilient to whatever our changing environment throws at them. For that to happen, we must accommodate those new and changing conditions. Existing designs must

be superseded by newer research, with appropriate responses in planning, siting and building energy infrastructure on the part of government, industry and communities.

In practical terms, this means the state's existing infrastructure must be upgraded or retrofitted so it can withstand climate-driven hazards. Similarly, as the state endeavors to reduce carbon emissions and meet growing electricity demand with new energy resources, new construction must be sited and built so that future generations can rely on it even as Earth's climate continues to change. Resilient infrastructure can continue to provide services because it has been specifically designed to better withstand, adapt and recover from whatever shocks and stresses it may face. Adapting both new and existing infrastructure means it is better protected from damage that results in repair expenses or consequent service disruptions, both of which impose burdens on customers, communities and taxpayers.

Governments have already taken steps to modernize existing aging infrastructure, such as passage of the federal 2021 Infrastructure Investment and Jobs Act which funds repairs for roads, bridges and other structures. One element of that law, the Grid Resilience and Innovation Partnerships Program, aims at improving the resilience of America's power system against extreme weather.

Whether modernizing existing equipment or building new, government planners and industrial designers and developers can address these challenges by applying five steps recommended as leading practices for climate adaptation efforts. They are:

1. **Use the best available science to forecast changes in climate conditions,** and identify the likelihood of their effects to infrastructure and the resulting consequences should they occur
2. **Complete a vulnerability assessment** to understand the exposure of infrastructure to identified climate risks, and to assess how well they are able to withstand them
3. **Respond to identified vulnerabilities by developing strategies to address those vulnerabilities.** Strategies could include reviewing and revising design or construction standards to build in climate resilience, for example by strengthening foundations or changing site orientation.
4. **Establish a framework to evaluate** whether the response was successful and improved the project's resilience
5. **Use adaptive management processes** to continue to adapt the infrastructure to changing conditions and new technologies

Because the state is in the early stages of adaptation, the report focuses primarily on those first three steps. We address step 1, using best available science to forecast changes in climate, in Chapter 2. This chapter addresses steps 2 and 3, both of which concern assessing and responding to vulnerabilities. We do not address steps 4 and 5 because they are only relevant once steps 1 through 3 have been completed.

Vulnerability assessments help infrastructure developers and utilities respond to likely risks posed by changing climate conditions

Because new electricity infrastructure is designed and built to operate for many decades, consideration of climate effects must be integrated upfront during the planning process. Doing so begins with climate-related vulnerability assessments to understand how changes in climate will likely vary the operation of the infrastructure being planned. These assessments look at the specific infrastructure and identify what may go wrong given various forecasted threats – its vulnerability to changes in climate and the hazards that may result. This analysis helps utilities, governments and developers design strategies to address those vulnerabilities for the type of facility they are considering. Assessments require the best available data and information about potential future climate hazards and how they affect specific infrastructure. Obtaining the best available information for infrastructure decision making is addressed in the next chapter.

Current processes to site and build new electricity infrastructure lack vulnerability assessment requirements

To construct most types of electricity infrastructure in Washington, utilities and developers must first seek approvals from state and local agencies. Some types, such as projects built on federal land, require some federal approvals. For state agency approvals, they may use one of three processes.

Apply through the Energy Facility Site Evaluation Council (EFSEC)

This certification is required for projects such as large, non-hydro power plants and long-distance, high-voltage electrical transmission lines. EFSEC provides a one-stop siting process for projects, and serves as the lead agency to ensure the project complies with the state's environmental law, the State Environmental Policy Act (SEPA). Projects not required by law to go through EFSEC certification may opt to do so.

Apply through the Department of Ecology's coordinated permit process

Ecology's coordinated process is fairly new, approved by the Legislature in 2023. In its process, Ecology provides consistent information about a project in one place and facilitates coordination between the project proponent, relevant agencies and tribes. The process includes coordination of the SEPA environmental review and state and local permitting for a project.

Apply through a local government

Local governments can act as the lead agency for environmental reviews in accordance with SEPA. This path can be suitable for projects that are not required to seek certification through EFSEC. Local governments are involved

in siting and building new infrastructure with local regulatory approvals, including those that fulfill the state's comprehensive planning law, the Growth Management Act (GMA).

We looked specifically at the SEPA compliance process and the GMA to understand whether either process included climate-related vulnerability assessment requirements for new electricity infrastructure. Ecology's process for SEPA compliance does not currently recommend or require the assessments. The Department of Commerce's GMA guidance, however, does address climate-related vulnerabilities.

In 2023, the Legislature added a climate and resiliency goal to GMA, requiring counties and cities that must fully plan under the law to include a climate element in their comprehensive plans.

Commerce prepared planning guidance to help counties and cities address the new climate element. Commerce recommends local governments conduct climate-related hazard risk and vulnerability assessments on their communities' assets. The guidance provides examples of policies a county or city could use to act upon an assessment's results, but does not offer examples of how to measure success. While not part of regulatory approvals for new electricity infrastructure, these recommendations can help county and city governments better prepare their infrastructure to withstand climate change.

The Interagency Clean Energy Siting Coordinating Council, created in 2023 to improve siting and permitting of new renewable energy projects, made recommendations around local government planning efforts. In its October 2024 report to the Legislature, the Council advised integrating clean energy development into local government planning and zoning work. However, none of the Council's recommendations included efforts to ensure consideration of climate effects on new infrastructure itself.

Adding climate-related vulnerability assessments to environmental regulations could help inform new infrastructure decisions

As noted above, a local government can act as the lead agency under SEPA for environmental reviews for new projects such as renewable energy facilities and new transmission. Regulatory state agencies involved in such approvals must likewise consider the project's potential environmental impacts. The project's lead SEPA agency must prepare a SEPA checklist, using a template provided in Ecology's rules, to determine if a project's impacts are likely to be significant. This helps determine whether the project requires and Environmental Impact Statement (EIS). The state could opt to ensure new electricity infrastructure projects are designed to respond to climate-driven hazards by requiring a risk assessment as part of the SEPA checklist or as part of an EIS assessment.

While adding consideration of climate effects to each electricity infrastructure project's environmental assessment process might seem out of scope for environmental concerns, this is not entirely the case. Infrastructure that fails in the future because of inadequate design may cause fires or other damage to the environment.

In fact, climate resilience has already been considered in many new infrastructure projects that require federal approval. For projects subject to federal jurisdiction, and thus federal approvals, under the National Environmental Policy Act (NEPA), project applicants must complete a federal EIS. While consideration of forecasted climate effects is not a NEPA requirement, over half of recently completed EIS documents included some type of climate-related vulnerability assessment and strategies to address likely risks.

In addition, climate resilience has been considered in at least one state environmental review for infrastructure, based on the lead agency's decision. Ecology's Draft EIS for the Chehalis River Basin Flood Damage Reduction Project identified the risk of more frequent and higher flood levels based on changing climate conditions.

Climate-related vulnerability assessments for electricity infrastructure are already required in some states and municipalities

Several states regularly use vulnerability assessments to identify climate-based risks in electricity infrastructure. Both California and New York require each investor-owned utility to submit a climate change vulnerability assessment at least every four to five years to the appropriate regulatory body, to understand potential hazard risks to the utilities.

In Washington, Seattle City Light, the state's largest municipal utility, completed a Climate Change Vulnerability Assessment and Adaptation Plan in 2015. It included strategic actions designed to minimize the effects of climate change on the utility's structures and services.

Vulnerabilities found through assessments can be addressed in planning, siting and construction processes

The third step identified in leading practices, listed on page 11, is to apply the knowledge gained in the vulnerability assessment to developing strategies to address the specific identified vulnerabilities. Washington currently lacks any requirement that developers devise plans and take actions that will address identified vulnerabilities in new energy construction. Without the reassurance the

new infrastructure is as resilient to climate change as possible, the problem it was meant to help solve may remain unsolved – the structure itself might have failed in the face of changing conditions before reaching the end of its service life.

Tying requirements for both vulnerability assessments and responses to funding rules could help ensure applicants perform both activities

One way to ensure project developers and utilities conduct risk assessments and address identified vulnerabilities in their plans is to require these two steps in applications for state grants or loans used on the project. In 2024, Commerce administered three programs that could help fund new energy infrastructure: tribal clean energy grants, community decarbonization grants, and the Washington grid modernization program. However, the agency did not recommend or require applicants to complete climate-related vulnerability assessments or demonstrate how they would address the results.

Infrastructure design that considers future climate effects can ensure facilities function for their expected lifetime

Climate effects are already considered in the design of existing infrastructure. However, considerations of climate have thus far been based on historical averages, not future expectations. Scientists generally agree that historical averages are no longer adequate to prepare infrastructure for extreme weather conditions it is likely to face in the future. Rather, engineers must now incorporate forecasted climate data into infrastructure design. Because climate effects are location specific, design should consider risks at a local level, to protect both the structure itself and the communities that surround it.

At the national level, a variety of codes and standards are available in the electric power industry for the design and construction of electricity infrastructure. Utilities use these minimum guidelines to develop their own standards. Current national standards, and likely those developed by the utilities themselves, rely on historical climate conditions to understand what the infrastructure must withstand in its lifetime. The National Oceanic and Atmospheric Administration (NOAA), the nation's largest provider of climate information, partnered with American Society of Civil Engineers (ASCE) in 2021 to help bring climate information into future national infrastructure standards.

Washington lacks design standards for electricity infrastructure that address changing climate conditions. Nonetheless, the state has an opportunity to provide utilities and developers with additional information about how climate effects will likely affect their planned structures and how they can design them to withstand those effects. See Chapter 2 for a discussion of a possible state effort to merge climate information with infrastructure engineering design.

The federal government and other states have begun to address future climate effects in infrastructure design

In 2023, the National Institute for Oceanic and Atmospheric Administration (NOAA) and America Society for Civil Engineers (ASCE) partnered with the National Institute for Standards and Technology (NIST) to hold a series of workshops focused on how communities are incorporating climate projections into their infrastructure planning. The workshop series convened practitioners who were actively developing or implementing climate-resilient design guidelines, providing a forum for them to share best practices, challenges and lessons learned.

Research for this audit identified initiatives around design standards for energy infrastructure undertaken in at least three other states:

- The **Resilient Massachusetts Action Team** developed that state's Climate Resilience Design Standards Tool. It is designed to integrate best available climate change projections and hazards data with engineering assessments and other feasibility and cost information. The interactive, web-based tool allows planners to enter infrastructure project information and obtain a preliminary climate risk screening with recommended climate resilient design standards.
- A **California** law passed in 2016 tasked a panel of scientists, engineers and architects with developing a way to incorporate forward-looking climate information into the state's infrastructure design standards.
- The **New York City Council** enacted a law in 2021 that directed the Mayor's Office of Climate and Environmental Justice to create design standards for city infrastructure projects that incorporate forward-looking climate data.

Similar efforts in Washington could help planners and developers ensure new infrastructure can better withstand the effects of climate change.

Additional analyses of forecasted climate information could help the state adapt infrastructure to the changing climate

Answer in brief

Centrally compiled and analyzed climate-science data already helps Washington address adaptation and resilience. The Climate Impacts Group at the University of Washington currently disseminates scientific information about the changing climate to those who need it. By using forecasted climate information that the Climate Impacts Group already provides, the state could improve its existing efforts to map wildfire risk. With some additional resources, the Climate Impacts Group could provide additional analysis to ensure adaptation of critical infrastructure. More granular data and analyses could improve the state's responses to location- and infrastructure-specific climate risks. Collaboration between state climate experts and utility engineers could help the state develop design standards to address vulnerabilities.

Centrally compiled and analyzed climate-science data already helps Washington address adaptation and resilience

Changing climate conditions pose new and worsening hazards in different types of terrain that will require infrastructure to be prepared to withstand and recover from. While perfect climate resilience of infrastructure is not possible, best available science provides information that can help designers and builders understand the likely effects and adapt their infrastructure plans accordingly. Here in our state, the University of Washington's Climate Impacts Group provides that data and analytical support to many other organizations and individuals, including local governments and state agencies. That support includes fundamental data, tools and guidance needed to understand, plan for and measure climate resilience. The Climate Impacts Group is also home to two federally funded climate adaptation programs and the Office of the Washington State Climatologist.

Climate Impacts Group already disseminates scientific information about the changing climate to those who need it

Through its website, the Climate Impacts Group already offers a number of resources to help advance climate risk understanding within the state. Among those resources are mapping tools that allow a user to visualize likely changes in climate

conditions, such as temperature and precipitation. These tools also allow the user to view a range of scenarios to indicate projected changes in climate hazards, including streamflow, snowpack, extreme precipitation, drought and wildfire. The user can visualize these scenarios on both a statewide level and by county.

The Climate Impacts Group also conducts analysis for individual customers that contract for specific work. One example is a report that looked at projected changes in extreme wind events and lightning risk in western Washington. The report, funded by Seattle City Light, provided the utility with information about how climate change may affect wind intensities and lightning risk in specific parts of western Washington where Seattle City Light locates its power generation facilities.

Legislation in 2023 required Ecology to work with the Climate Impacts Group to ensure the public has access to relevant scientific and technical information about climate change's impacts on the state's ecology, economy, public health and society. The Climate Impacts Group was also required to identify existing best practices and new methods to measure and evaluate climate change resilience, and report to the Legislature by June 1, 2024. That work resulted in a report titled Measuring Resilience in Support of Effective Investment in Climate Adaptation.

By using forecasted climate information that the Climate Impacts Group already provides, the state could improve its efforts to map wildfire risk

As temperatures rise and droughts become more frequent and severe, Washington is experiencing, and already addressing, increasing wildfires. In 2024, the Legislature passed a law requiring the Department of Natural Resources (DNR) to establish and maintain a statewide wildfire hazard map and base-level hazard risk maps for each county.

DNR staff said the mapping of wildfire hazards is not currently being conducted to look at future risk. Consequently, the maps will be a snapshot of risk at that time. However, efforts to site and build new infrastructure, as well as efforts to upgrade current infrastructure, need to consider future hazards posed by the changing climate. The state could benefit from the use of forecasted climate information in creating its wildfire hazard maps, so future wildfire risks can be considered and addressed at the time new infrastructure is planned and sited.

With some additional resources, the Climate Impacts Group could provide additional analysis for adaptation of critical infrastructure

The Climate Impacts Group delivers the work described above within its existing funding, provided by both federal and state sources. The Washington State Climate

Office focuses efforts on support for the state's resilience efforts. In addition to its federally-funded projects, the Group also receives a modest amount of state funding ($400,000 in fiscal year 2024).

Additional analyses led by the Climate Impacts Group could help the state ensure its new electricity infrastructure is climate resilient. Among those that could put such analyses to good use are utilities and developers, local governments and other organizations. However, the Group would likely require additional resources to expand the scope of its current work. Below we discuss two areas that would benefit from expanded efforts of the Climate Impacts Group and its main programs:

- First, more localized and infrastructure-specific analyses
- Second, helping engineers develop climate-resilient infrastructure design standards

More granular data and analyses could improve the state's responses to location- and infrastructure-specific climate risks

The Climate Impacts Group is currently able to provide county and statewide information and analyses through its "Climate Mapping for Resilient Washington" website. This site explains that its existing models are insufficiently precise to deliver projections at the scale of individual cities and towns. Developers and utilities, however, must plan and site new electricity infrastructure considering the risks that structure will likely face in a precise location. Particularly in Washington, where a single county may contain very diverse terrain, one location may be more susceptible to flooding or landslides, while another is at greater risk from fires. For that reason, forecasts of climate effects must be "downscaled," or made more precise for a localized area, if they are to be truly useful for siting and building new infrastructure.

Other states are already developing capabilities for this granularity of climate data:

- The **Minnesota Climate Adaptation Partnership**, supported by the Minnesota State Legislature, is generating downscaled climate projections through the end of the century at roughly a three-square-mile resolution. The Partnership engages with data users, including the architecture and engineering communities, to facilitate broad use of the data.
- **Cal-Adapt**, California's web-based, climate adaptation planning tool, provides access to up-to-date information and data produced by the state's scientific and research community. The Cal-Adapt tool provides forecasts downscaled to roughly a four-square-mile resolution, specifically for utilities and developers in the energy sector.

Collaboration between state climate experts and utility engineers could help the state develop design standards to address vulnerabilities

As the state considers how best to adapt energy infrastructure to withstand identified climate threats, it will likely want to reevaluate existing building standards, revising them as necessary. The Climate Impacts Group's experts are well positioned to work with engineers and other stakeholders to determine the most likely types of structure vulnerabilities and how to address them in infrastructure design or upgrades. Identifying design elements that will allow the structure to better withstand extreme weather conditions might lead to specifying materials that can keep buildings cooler or warmer, or those that are more fire resistant. Construction changes might include elevating entire structures or protecting components such as foundations that would be highly sensitive to flooding or exposure to salt water.

Broader collaboration around climate adaptation efforts could help the state's electricity sector prepare for future climate risks

Answer in brief

Responsibilities for Washington's electricity industry are fragmented, making collaboration more challenging. Ownership, planning, regulation and operation of electricity infrastructure is distributed among various private, state, local, regional, tribal and federal entities. The state lacks a centralized home for energy-related responsibilities, information and tools, thereby hampering coordination. Collaboration must extend to conflict resolution that involves both the public and private sectors. A single office could facilitate collaboration and conflict resolution, and provide tools for climate adaptation. Washington already recognizes the need for better collaboration and conflict resolution tools in completing renewable energy projects.

Responsibilities for Washington's electricity industry are fragmented, making collaboration more challenging

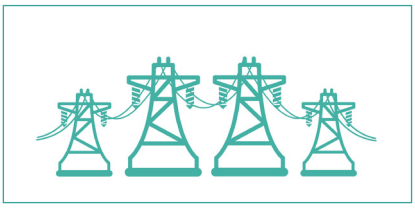
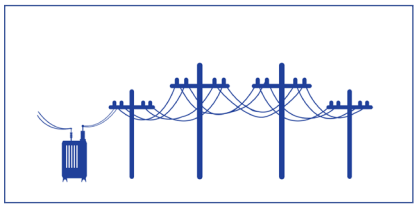
Addressing the complex challenges posed by the changing climate is already a complicated matter, calling for collaboration across state and even international boundaries. In addressing energy infrastructure in particular, Washington's efforts are also complicated by fragmented responsibilities across state, local, regional, tribal and federal bodies. There are also dozens of publicly and privately held businesses that own and operate essential energy infrastructure. Each of these entities has its own priorities and goals, customers and constituencies. Yet collaboration is essential to both climate mitigation and to adaptation, calling for sharing of data, resources and practices. To succeed, Washington will need a forum for bringing these organizations together and resolving the differences that inherently result from competing interests.

Ownership, planning, regulation and operation of electricity infrastructure is distributed among various private, state, local, regional, tribal and federal entities

Washington's electricity industry is uncommon, in part because federal agencies own roughly half the state's hydroelectric dams and most of the state's transmission facilities. In addition, resource planning is done individually by the largest electric

utilities and regionally through a public process. The illustration in **Exhibit 3** and the summary on the following page offer a high-level survey of the industry in 2025; **Appendix C** provides some additional detail about the responsibilities and organizations described here.

Exhibit 3 – Federal, regional, state and local bodies all play a role in Washington's complex electricity industry

Role	Generation	Transmission	Distribution
Owners	Investor-owned utilities	Investor-owned utilities	Investor-owned utilities
	Some consumer-owned utilities	Some consumer-owned utilities	Consumer-owned utilities
	Independent power producers	Bonneville Power Administration	
	Energy Northwest		
	U.S. Army Corps of Engineers		
	U.S. Bureau of Reclamation		
Planning	Investor-owned utilities	Investor-owned utilities	Investor-owned utilities
	Some consumer-owned utilities	Some consumer-owned utilities	Consumer-owned utilities
	Independent power producers	Bonneville Power Administration	
	Northwest Power and Conservation Council (load forecasts)	Northern Grid	
	Western Resource Adequacy Program	Western Transmission Expansion Coalition	
Regulation	State agencies	State agencies	State agencies
		Federal Energy Regulatory Commission	
		North American Electric Reliability Corporation	
		Western Electricity Coordinating Council	
Permitting	Federal agencies	Federal agencies	County and city governments
	State agencies	State agencies	
	County and city governments	County and city governments	
Wholesale marketing	Bonneville Power Administration	Bonneville Power Administration	
	Investor-owned utilities	Investor-owned utilities	
	Some consumer-owned utilities	Some consumer-owned utilities	
	Independent power producers		

Source: Auditor produced.

- **Power generating facility owners.** In addition to federally owned hydroelectric dams, remaining power-generating facilities are owned and operated by privately, publicly and cooperatively owned utility companies, and by municipal governments.
- **Planning activities.** Planning for electricity resource needs is conducted at both the individual utility resource level and the regional level. As directed by federal law, the Northwest Power and Conservation Council prepares a regional energy conservation and electric power plan, updated every five years, that allows public participation in determining how the region meets it energy needs. The law also requires the Bonneville Power Administration to follow that plan in selling power and acquiring resources.
- **Power transmission.** Electricity generated at power plants moves through a complex network of transmission lines, substations and distribution lines before it reaches customers. Most of the state's transmission grid is federally owned, planned and operated at the regional level. Some utilities own transmission lines, and all utilities own distribution lines – the last leg of the system, reaching individual customers. Northern Grid, a consortium of federal, private and consumer-owned utilities in Western states, conducts regional transmission planning across the Pacific Northwest and Intermountain West. WestTEC is a western coalition formed to develop an actionable transmission study to support the needs of the future energy grid. Thirty-seven "balancing authorities" in the geographic area known as the Western Interconnection, manage transfers of electricity across the grid; Washington is included in this region. These authorities are also utilities and transmission facility utility owners.
- **Regulation and permitting.** Multiple bodies are also involved in the regulation of electricity infrastructure. For example, rates, services and practices of investor-owned utilities operating within the state are primarily regulated by the state's Utilities and Transportation Commission. The Federal Energy Regulatory Commission (FERC), an independent federal agency, regulates the interstate transmission of electricity, natural gas and oil. The North American Electric Reliability Corporation (NERC), a not-for-profit international regulatory authority, assures the effective and efficient reduction of risks to the reliability and security of the grid. The Western Electricity Coordinating Council (WECC), a nonprofit corporation, assures a reliable Bulk Electric System in the Western Interconnection, and monitors and enforces NERC's reliability standards. Regulatory permitting of new facilities is done by agencies at the state, local and federal levels, depending on the location and type of facility.
- **Wholesale marketing and sales.** Energy marketing and sales from electricity generation facilities are done by the Bonneville Power Administration (BPA) and by utilities. BPA, a nonprofit federal power marketing administration based in the Pacific Northwest, markets and sells electrical power from federally owned hydroelectric projects in the Northwest, as well as one nonfederal nuclear plant and several small nonfederal power plants.

The state lacks a centralized home for energy-related responsibilities, information and tools, thereby hampering coordination

Washington lacks a single entity with the responsibility for facilitating coordination and collaboration efforts between all those involved in the state's electricity sector. As the state works to identify and implement adaptation strategies to ensure the future stability of its electricity infrastructure, collaboration between all organizations, both public and private, becomes increasingly important.

At present, each individual company, agency or organization disseminates its knowledge and data about the state's electricity industry individually. No central location contains comprehensive links to all facets of the electricity sector, including data, information, tools for businesses, governments and regulatory entities and other resources. As of March 2025, some technical information about the state's energy mix and the utilities themselves is available through the U.S. Energy Information Administration's website. However, it is complex for the general public to locate, access and interpret.

The University of Washington's Climate Impacts Group works with Ecology to provide online access to relevant scientific and technical information about climate change's impacts on the state's ecology, economy, public health and society. But along with scientific information, other types of easily accessible tools and information would help governments, communities, developers, utilities, tribes and other interested parties understand the electricity sector. With such resources readily available, those charged with decision making, development and implementation of infrastructure adaptation strategies would be able to make better-informed choices.

Collaboration must extend to conflict resolution that involves both the public and private sectors

Although coordination between those involved in the energy sector is essential when it comes to developing new infrastructure, conflict is often a by-product of climate mitigation and adaptation processes. One clear example is in siting of new facilities, where interests of the parties involved can diverge over environmental and financial issues, the availability of limited transmission access, community support or lack thereof, and other regulatory and non-regulatory concerns. The challenges posed by siting new renewable energy projects are well documented across the U.S. They can arise wherever efforts to meet the needs of growing populations and clean energy targets conflict with local efforts to preserve rural landscapes and regional regulatory hurdles.

This is also true in Washington, as some of the state's current renewable energy projects have experienced significant delays. One notable example is the Horse Heaven Wind Farm Project in Benton County. The developers submitted the original application in February 2021. The project was extremely complex, and faced numerous regulatory and other challenges that could not be fully resolved during its approval process. After the Governor's ultimate approval in October 2024, the project faced three lawsuits in the following two months. Other factors, too, threaten to interfere with Washington's renewable energy goals, including changes to federal policies and programs to help states further their resilience efforts.

A single office could facilitate collaboration and conflict resolution, and provide tools for climate adaptation

Locating many aspects of energy information and management within a single dedicated office could help project participants work together to solve problems in the planning, siting and building of new energy projects. Such an office could be assigned with these and other responsibilities:

- Provide information and educational materials about the energy sector in Washington
- Disseminate information about new technologies and best practices
- Provide or link to climate forecasts and research to help developers and regulators make sound decisions that ensure all infrastructure built can withstand climate change
- Facilitate coordination between public and private entities and tribes during planning and siting of new energy facilities
- Facilitate conflict resolution during siting and construction of new energy facilities when needed

To help preserve independence and trust among all involved parties and the general public, and to help navigate mission-specific agency goals that may inherently diverge, this office should not have a regulatory role in the process.

Washington already recognizes the need for better collaboration and conflict resolution tools in completing renewable energy projects

The state has clearly recognized the need for additional upfront collaboration and conflict resolution to ensure smoother and less contentious processes for renewable

energy projects.

For example, the final Interagency Clean Energy Siting Coordinating Council study made several recommendations to improve collaboration and conflict resolution, including recommendations to:

> ***"Explore development of conflict resolution tools and processes, such as mediation, for use by state agencies, local governments, clean energy project developers, communities, and tribes."***
>
> ***"Support tribes in co-creating siting and permitting tools, templates, and resources for clean energy development in areas tribes identify as no- or low-conflict sites", and***
>
> ***"Promote pre-application discussions…to discuss impacts, concerns, and mitigation options"***

Similarly, the June 2024 report prepared for Commerce by private consultancy Beveridge & Diamond offered recommendations on siting and permitting reform in Washington. It said the state should designate an agency to:

> ***"…Assemble interested parties to identify areas of agreement concerning where projects be sited…"***
>
> ***"…convene all interested parties, affected local and state agencies…"***

The report also recommended that EFSEC:

> ***"…employ mediation and other informal mechanisms to settle disputes to avoid expensive and time-consuming formal adjudications…"***

In 2023, Washington State University's (WSU) Energy Program published a report titled Least-Conflict Solar Siting on the Columbia Plateau, to help address the tension between the need for renewable energy and the risks to the region's farm and ranchland, among other risks.

By adopting the recommendations offered in these reports, Washington could facilitate collaboration and conflict resolution and provide tools for climate adaptation of the state's critical electricity infrastructure.

State Auditor's Conclusions

Each year, it becomes more evident that Washington's climate is changing, increasing the risks of climate hazards such as wildfires and flooding. In response, our state has taken significant steps to mitigate the emission of greenhouse gases. For example, the Clean Energy Transformation Act requires the state's electric utilities to fully transition to renewable electricity generation by 2045.

This performance audit focuses on an emerging area of concern – adapting renewable energy infrastructure to the effects of a changing climate. For example, when planning a wind farm, it is important to assess whether the site is likely to face increased wildfire risk in the future. This kind of evaluation enables project designers to incorporate fire-resistant features that can help ensure the facility functions throughout its intended lifespan.

We came to three broad conclusions regarding the climate resiliency of energy infrastructure in Washington. First, requiring vulnerability assessments, which describe how proposed projects could be affected by conditions such as higher temperatures and the associated risks of increasing wildfires. These assessments could help developers and utilities better respond to the likely risks of a changing climate. Second, the state should make use of more granular climate-science data, such as forecasts for stream flows, snowpack and drought for a particular site, when mapping risks to new projects. And finally, establishing a nonregulatory information sharing function in state government could improve the infrastructure development process.

Adapting to a changing climate will be a very complex challenge for years to come, as experts forecast its effects will only become more extreme. This report offers insights that will help make critical investments in that effort more resilient and effective.

Recommendations

For the Department of Commerce

To ensure developers and utilities consider the effect of the changing climate when planning new electricity infrastructure, as described on pages 12-15, we recommend Commerce:

1. Augment Growth Management Act (GMA) guidance to help city and county planners by providing the following information:
    - How to develop and conduct vulnerability assessments specific for new infrastructure being built
    - Identify strategies to address those risks and how assessment of the strategies will be measured
2. Require applicants seeking state funding to conduct vulnerability assessments and develop strategies to ensure new infrastructure will be built to withstand the forecasted effects of climate change, and provide information and guidance about how that can be accomplished.

For the Department of Ecology

To ensure developers and utilities consider the effect of the changing climate when siting new electricity infrastructure, as described on pages 13-14, we recommend Ecology:

3. Strongly recommend (and require, when sufficient forecasted location-specific climate information is available) applicants seeking to meet the state's environmental impact standards (through the State Environmental Policy Act known as SEPA) conduct vulnerability assessments and develop strategies to ensure new infrastructure will be built to withstand the forecasted effects of climate change, and provide information and guidance about how that can be accomplished.

For the Legislature

To ensure the state has forecasted climate data and information that decision-makers require to understand and adapt to potential climate effects on infrastructure, as described on pages 18-20, and to the extent funding is available, we recommend the Legislature:

4. Direct the University of Washington Climate Impacts Group to:
    - Expand its climate analysis to allow utilities and developers the ability to conduct climate vulnerability assessments that are location specific

- Convene other experts, such as engineers, to provide additional information and analyses that can help utilities and developers ensure specific types of infrastructure can be updated or designed and built to withstand various effects of climate change (infrastructure design standards)
- Develop other tools that can help inform utilities and developers understand and adapt to climate risks to infrastructure

5. Direct the Department of Natural Resources and counties to develop wildfire risk maps that take future wildfire risks into account based on forecasted climate data

To improve dissemination of information, promote coordination of the electricity industry and address conflict resolution of new energy projects, and to ensure those projects can withstand increasing hazards posed by the changing climate, as described on pages 25-26, we recommend the Legislature:

6. Designate an office without a regulatory role in planning, siting and building new electricity infrastructure to fulfill the following responsibilities:
   - Providing information and educational materials about the energy sector in Washington
   - Disseminating information about new technologies and best practices
   - Providing or linking to climate forecasts and research to help developers and regulators make sound decisions that ensure all infrastructure built can withstand climate change
   - Facilitating coordination between public and private entities and tribes during planning and siting of new energy facilities that recognizes the mission-specific goals of each participant
   - Facilitating conflict resolution during siting and construction of new energy facilities when needed

Agency Response

Note: All audited agencies are invited to send a formal response to the final draft of the audit report, to be incorporated in the published report. In this instance, the Department of Natural Resources and the Energy Facility Site Evaluation Council (EFSEC) did not do so.

STATE OF WASHINGTON

June 18, 2025

Honorable Pat McCarthy
Washington State Auditor
P.O. Box 40021
Olympia, WA 98504-0021

Dear Auditor McCarthy:

Thank you for the opportunity to review and respond to the State Auditor's Office performance audit report, *Ensuring Climate-Resilient Infrastructure to Meet Washington's Growing Energy Needs*. We each take our roles seriously and work to leverage resources for the benefit of Washington. Climate change already impacts our infrastructure and improving the resilience and reliability of our electrical grid is critical to our state's continued growth. We appreciate the State Auditor's Office evaluation of this important issue and for engaging with agencies throughout the process.

Ecology's mission is to protect, preserve, and enhance Washington's environment for current and future generations. Our agency's 2025-2029 strategic plan prioritizes reducing and preparing for climate impacts. The agency recently worked with 10 other state agencies to develop and release a new climate resilience strategy for Washington in September 2024. The strategy uses the latest science as a foundation and identifies actions that agencies will take to address the top climate change threats: drought, changing ocean conditions, flooding, extreme heat, wildfires and smoke. Moving forward, Ecology will work to establish an interagency group to coordinate climate resilience strategy implementation, including engagement with utilities, local governments, and other key partners.

One of the State Climate Resilience Strategy goals is to advance and modify infrastructure that supports natural systems; considers the needs of vulnerable communities; and provides consistent, safe, and reliable services that withstand disruptions and risks from climate impacts. The strategy works to incorporate climate resilience into all types of critical infrastructure, including energy infrastructure, through the following actions:

- Improving the use of climate change projections and resilience criteria to inform infrastructure funding and management. We are early in the process of developing guidance for infrastructure projects that seek state funding – including energy projects.
- Maintaining energy security and reliability under changing climate conditions.
- Improving resilience of state assets such as state-owned facilities.

Ecology also oversees the State Environmental Policy Act (SEPA) rules, a key tool helping agency decision-makers, applicants, and the public understand the potential impacts related to an infrastructure project, including climate impacts. The SEPA environmental review process is designed to work with other regulations to provide a comprehensive review of a proposal. This work encompasses all types of projects across the state. In 2024, cities and counties conducted over 85 percent of the state's 5,000 SEPA reviews. Ecology believes additional climate resilience

information can best be incorporated and analyzed using the existing environmental review process. Providing information, tools, and training to support this analysis as part of SEPA, where appropriate, would be a simpler and faster way than rulemaking to incorporate these considerations.

We appreciate and acknowledge the important role of the UW Climate Impacts Group (CIG) with its substantial expertise on climate impacts in Washington. The recommendations for continued investment would leverage its existing and ongoing statutory roles under Chapter 70A.05 RCW to support state agencies in their climate adaptation efforts. However, there are opportunities to further leverage and evaluate existing resources before advocating for new ones. For example, we think it makes sense to first evaluate utilities' needs and use of existing UW CIG tools before developing finer scale ones.

We also think this work should consider coordinating with and building off the work of Commerce's Energy Resilience Office and the broader interagency efforts around implementing the state's climate resilience strategy. This will allow us to identify more specific opportunities and needs, while ensuring the recommended work fits within the broader efforts already underway. In addition to the work supporting the state's climate resiliency strategy, the Washington Interagency Clean Energy Siting Coordinating Council, co-led by the departments of Commerce and Ecology, provides another important forum to coordinate on energy siting issues. This council was specifically created to support interagency coordination and improve processes for clean energy development while ensuring protection for people and the environment.

We are concerned about the capacity of the many groups who carry out this work, which further amplifies the need for a strategic and efficient approach. It is important to acknowledge federal funding cuts that have already occurred and that potential future cuts will likely affect the capabilities of UW CIG and other partners. Furthermore, ongoing support for federal data collection, analysis and modeling is at risk of being dismantled. The loss of these activities could erode the availability of critical information on climate impacts for our state and region. We should consider opportunities to build on existing efforts and approach these recommendations strategically to ensure good governance and fiscal accountability.

Improving infrastructure resiliency ensures Washington will have a robust energy system that supports a growing economy into the future. Energy infrastructure must also be developed in a way that meets regulatory requirements set by the Legislature to ensure protection for people and the environment. Incorporating this long-term view is critical, yet it is also important to consider the near-term needs to support the growth required for our state's clean energy transition.

Along these lines, the Utilities and Transportation Commission (UTC) provides three general observations related to its regulation of investor-owned energy utilities (IOUs) and recommendations regarding forecasted climate data and vulnerability assessment. First, the UTC recommends caution regarding the assumptions underlying the climate vulnerability assessment. While this report does not focus on mitigation, continued collaboration beyond the vulnerability assessment is necessary for continued mitigation efforts. The UTC also recognizes that building infrastructure is complex and time-consuming. Adding a vulnerability assessment will extend the process at a time when IOUs are under pressure to meet ambitious clean energy goals set by state law. Siting and building a new energy infrastructure remains especially challenging. Finally, in approving climate-resistant investments, it is the UTC's responsibility to also balance the public interest, including avoiding unsustainable rate increases.

The Department of Archaeology and Historic Preservation appreciates the time given to discuss its work and the need for a conflict resolution process.

We appreciate the focus on this topic and look forward to collaborating with other agencies to implement the recommendations.

Sincerely,

K.D. Chapman-See
Director
Office of Financial Management

Joe Nguyễn
Director
Department of Commerce

Casey D. Sixkiller
Director
Department of Ecology

Allyson Brooks
Executive Director
Department of Archeology and Historic Preservation

Joel Sacks
Director
Department of Labor and Industries

Brian Rybarik
Chair
Utilities and Transportation Commission

cc: Shane Esquibel, Chief Operations Officer, Office of the Governor
Franklin Plaistowe, Deputy Chief Operations Officer, Office of the Governor
Sahar Fathi, Policy Director, Office of the Governor
Jesse Jones, Director, Results Washington, Office of the Governor
Tammy Firkins, Performance Audit Liaison, Results Washington, Office of the Governor
Scott Frank, Director of Performance Audit, Office of the Washington State Auditor

Official Response to Performance Audit on Ensuring Climate-Resilient Infrastructure to Meet Washington's Growing Energy Needs – June 18, 2025

The Departments of Archaeology and Historic Preservation, Commerce, Ecology, Labor and Industries, the Utilities and Transportation Commission, and the Office of Financial Management provide this management response to the State Auditor's Office (SAO) performance audit report received on May 19, 2025.

SAO Performance Audit Objectives

The SAO's performance audit addressed two questions:

1. How can Washington ensure its new energy infrastructure will withstand forecasted climate change effects?
2. What information and practices can help the state site and build climate-resilient energy infrastructure?

Recommendations 1-2 to Commerce in brief:

SAO Recommendation 1: To ensure developers and utilities consider the effect of the changing climate when planning new electricity infrastructure:

1. Augment Growth Management Act (GMA) guidance to help city and county planners by providing the following information:
    - How to develop and conduct vulnerability assessments specifically for new infrastructure being built
    - Identify strategies to address those risks and how assessment of the strategies will be measured

STATE RESPONSE: Commerce agrees in part with Recommendation 1. It is important for counties and cities to assess how climate change affects the vulnerability of roads, buildings, and other assets within the jurisdiction's span of control or influence. Local governments, for example, should understand how electricity infrastructure is vulnerable to climate change and poses risks (e.g., wildfires) to the surrounding community. Assessing and addressing those vulnerabilities and risks, however, is the primary responsibility of utilities and other entities that build, own, and operate the electricity infrastructure. This helps ensure that there is a consistent, regional assessment of electricity infrastructure that travels through multiple cities and counties, rather than a patchwork of assessments conducted by the local governments.

In response to the recommendation's second bullet, Engrossed Second Substitute House Bill 1181 (Chapter 228, Laws of 2023) already requires local governments to consider the effects of climate change; each jurisdiction fully planning under the Growth Management Act must, at a minimum, include a climate resilience subelement in its updated comprehensive plan. To assist with this new requirement, Commerce's Local Government Division published climate element planning guidance at the end of 2023. The guidance is considered intermediate until final guidance is published at the end of 2025.

Commerce is also implementing E2SHB 1181 through agency rulemaking that will conclude this fall. Commerce's planning guidance adapts the U.S. Climate Resilience Toolkit's "Steps to Resilience" framework for conducting a vulnerability and risk assessment of infrastructure and other community assets. This framework entails assessing the exposure, sensitivity, and adaptive capacity of local assets to rate their vulnerability to climate-exacerbated hazards and impacts. Local jurisdictions then characterize risk — by factoring in the probability and magnitude of hazards impacting their assets.

The planning guidance's companion Climate Policy Explorer tool also includes more than 200 model climate mitigation and resilience goals and policies that local governments may utilize to meet local context and needs. For example, the Explorer tool's ***Policy O.04*** advises local governments to: "*Work with energy utilities to improve the safety and reliability of infrastructure vulnerable to climate change*." It explains that *"local jurisdictions could review and comment on their local power provider's plans for responding to the risks of wildfires and other hazards. Recommendations could include removing tree limbs near power lines or burying lines, establishing redundancies, and creating small-scale energy generation systems*." The policy identifies tracking metrics (e.g., number of power outages annually), hazards addressed (e.g., wildfires and extreme precipitation), co-benefits (public health and well-being), and other attributes.

Action Steps and Time Frame

- Finish implementing E2SHB 1181 via an agency rulemaking process and publish the rulemaking in final planning guidance. *By December 31, 2025*.
- Continue working with the Department of Ecology and UW CIG to review and revise the recommended implementation tracking metrics for the suite of climate measures. This work adapts the Washington State Climate Resilience Strategy's measurement framework and identifies process and outcome indicators for model climate mitigation and resilience goals and policies. *By December 31, 2025.*
- Continue working on the Washington Local Emissions Estimator ("WaLEE") to quantify the greenhouse gas reduction potential of strategies associated with the model policies. As part of this work, Commerce is also creating a scorecard for qualitative assessment of measures. This scorecard assesses co-benefits, which can help jurisdictions prioritize measures that improve climate resilience along with reducing emissions. *By June 30, 2027*.

SAO Recommendation 2:

2. Require applicants seeking state funding to conduct vulnerability assessments and develop strategies to ensure new infrastructure will be built to withstand the forecasted effects of climate change, and provide information and guidance about how that can be accomplished.

STATE RESPONSE: Commerce generally agrees with Recommendation 2, that applicants seeking state funding to build new infrastructure should conduct a vulnerability assessment and implement strategies based on climate science to mitigate risks associated with current or future conditions to ensure reliability and resilience. However, we do not currently have the resources to add a new complex and expensive requirement — such as a vulnerability assessment — to contract agreements for successful grant applicants.

A vulnerability assessment would only be a portion of the work needed to ensure the assessment is valid, and that the energy infrastructure is built and maintained to ensure energy reliability and resilience. Additionally, there would need to be a non-biased location at the state level where vulnerability assessments can be verified and compared against science-based climate science and compatible energy siting coordination data.

It's important to note that Commerce already requested legislation that would have included resources for this project. The bill did not pass during the 2025 legislative session, primarily because of funding restraints. It would have created the Clean Energy Development Office and provided funding for the Energy Resilience and Emergency Management Office (EREMO) to build and implement the GIS data analysis tool that would have been beneficial to potential energy developers, energy owners and operators, local jurisdictions, and Tribes. The proposed office would have been a similar solution to SAO's sixth recommendation to the Legislature in this report.

EREMO currently does not have the resources to engage with applicants throughout the build process or provide the ongoing collaboration that would be needed due to the nature of climate change. However, EREMO will continue to update, collect, and develop GIS data visualizations and analysis tools within limited existing resources.

EREMO is already charged with implementing RCW 43.21F.045 to "*prepare and update contingency plans for securing energy infrastructure against all physical and cybersecurity threats…*". Responsibilities include preparedness, prevention, and mitigation activities. To meet this requirement, EREMO created the energy resilience and mitigation program in 2022. This program actively works with all energy sector partners and local communities. It provides direct support for community engagement and planning technical assistance for energy resilience project planning and projects. The program has grown to meet the needs for centralized energy resilience planning and will continue to support building new resilient energy infrastructure.

EREMO is also engaged in updating existing energy infrastructure data, natural hazard data, and other sources of information. Through partnerships such as with UW CIG, we are incorporating climate data to create a publicly accessible, authoritative mapping and data visualization tool to identify proposed energy project boundaries and potential interactions with other interests. These may include military, tribal, natural hazards, climate change impacts, agriculture, habitat and species, and others.

Additionally, Commerce's Growth Management Services provides grants to local governments for many climate planning activities related to implementing E2SHB 1181 including vulnerability and risk assessments, tree canopy studies, and GHG emission inventories. Commerce's grant program and planning guidance recognize that there are varying levels of need for climate planning assistance, as some communities have completed rigorous levels of analysis prior to the development of the new climate element of their comprehensive plan, while other communities have not done any climate analysis or planning.

As part of implementing the state's new climate resilience strategy, Commerce is working with Ecology and other agencies on improving how climate change risks are considered in a variety of public funding programs for critical infrastructure. This work is in partnership with the System Improvement Team (SYNC), an existing multi-agency coordination group staffed by Commerce and focused on improvements to the state's infrastructure system. While this work is just getting underway, the goal is to ensure that publicly funded infrastructure can withstand climate change threats like wildfires, sea level rise, and flooding – now and in the future.

Over the next couple of years, we will be working with agency infrastructure funding programs and a wide range of interested parties to develop a more consistent and cohesive approach to addressing climate risks through state-funded infrastructure. This work will likely result in new guidance, tools, and, potentially, new criteria or requirements in funding applications and review processes for funding programs.

Action Steps and Time Frame

- Reassess the capacity and capability to implement and validate the requirement for successful grant applicants to conduct vulnerability assessments and leverage strategies for continued energy resilience. *By June 30, 2026.*
- Continue to actively participate in the Washington Clean Energy Siting Council. The energy resilience and emergency management office will continue to engage as requested to support alignment with clean energy goals and energy resilience and safety for building out new energy infrastructure. *Ongoing.*
- EREMO will finalize website updates to include the state's energy resilience program for electric utilities and local jurisdictions. This update will include the program's scope, offer technical assistance services, and grant funding opportunities. It will also serve as a hub for all energy resilience information from the state, and future tools will be available through this website. This work is underway with anticipated completion before the end of the calendar year. *By December 31, 2025*.
- Continue to implement the inter-agency Climate Resilience Strategy infrastructure action with existing resources in partnership with the System Improvement Team (SYNC), Ecology, and other state agencies. This work started in the spring of 2025 and will continue until the project is completed based on resource availability. *By December 31, 2026.*

Recommendation 3 to Ecology

SAO Recommendation 3: To ensure developers and utilities consider the effect of the changing climate when siting new electricity infrastructure:

3. Strongly recommend (and require, when sufficient forecasted location-specific climate information is available) applicants seeking to meet the state's environmental impact standards (through the State Environmental Policy Act known as SEPA) conduct vulnerability assessments and develop strategies to ensure new infrastructure will be built to withstand the forecasted effects of climate change, and provide information and guidance about how that can be accomplished.

STATE RESPONSE: We support the idea to consider climate change risks for projects to improve energy infrastructure resilience. However, we disagree with making a change to SEPA requirements for a narrow sector. Changes would apply to all projects, from housing to industries, not just energy infrastructure. Because SEPA is a broad law, led by many different agencies for many different governmental actions, it is carried out on a case-by-case basis.

Ecology believes updating SEPA tools and guidance to help energy projects evaluate climate change risks and vulnerabilities as part of their application may achieve the intent of SAO's recommendation without requiring rulemaking. This approach has been used successfully in the past and Ecology has staffing to support this work.

Ecology is finalizing three programmatic environmental impact statements (PEISs) for utility-scale solar energy, onshore wind energy, and green hydrogen production and storage facilities and they will be implemented by June 30, 2025. These statewide studies evaluate future conditions which include climate impacts such as increased wildfire risk from and to the facilities. State law requires these studies to be considered for any future utility-scale solar, onshore wind, or green hydrogen projects. The Energy Facility Siting Evaluation Council is developing a transmission PEIS. These environmental reviews follow the SEPA process and provide information to evaluate climate change risks for clean energy projects.

While SEPA is broad enough to be able to consider climate resiliency of infrastructure, the case-by-case nature makes it a challenge to include a uniform requirement for a specific project type within SEPA. In addition, SEPA may only reach a fraction of the infrastructure that may be vulnerable. Existing infrastructure generally will not trigger SEPA review and some new infrastructure will also be exempt from SEPA. Therefore, if a uniform requirement for climate resilient infrastructure is desired, the requirement should be done without changing the SEPA rule. Additionally, broad changes to the SEPA rule would require legislative direction and involve rulemaking. This would require additional funding and can take 18-24 months to complete.

Action Steps and Time Frame

- Finalize the PEISs for utility-scale solar, onshore wind, and green hydrogen facilities and develop guidance to support implementation *by June 30, 2025*.
- Continue to advance information on climate risks and additional guidance and tools being developed under the State Climate Resilience Strategy. *Initial review of information by Spring 2026. Target first round of climate resilience, infrastructure-specific reports, guidance and/or tools by December 2026.*
- Explore best ways to adapt information and tools on climate change risks for voluntary application to SEPA processes with engagement from other state agencies and interested parties. Develop guidance linking climate vulnerability of electricity infrastructure with existing elements of the environment in SEPA and the SEPA checklist. *Target draft for June 30, 2026.*
- Incorporate material linking climate vulnerability with existing elements of SEPA into current SEPA training workshops. *Target first trainings with new material by September 30, 2026.*

Appendix A: Initiative 900 and Auditing Standards

Initiative 900 requirements

Initiative 900, approved by Washington voters in 2005 and enacted into state law in 2006, authorized the State Auditor's Office to conduct independent, comprehensive performance audits of state and local governments.

Specifically, the law directs the Auditor's Office to "review and analyze the economy, efficiency, and effectiveness of the policies, management, fiscal affairs, and operations of state and local governments, agencies, programs, and accounts." Performance audits are to be conducted according to U.S. Government Accountability Office government auditing standards.

In addition, the law identifies nine elements that are to be considered within the scope of each performance audit. The State Auditor's Office evaluates the relevance of all nine elements to each audit. The table below indicates which elements are addressed in the audit. Specific issues are discussed in the Results and Recommendations sections of this report.

I-900 element	Addressed in the audit
1. Identify cost savings	**No.**
2. Identify services that can be reduced or eliminated	**No.**
3. Identify programs or services that can be transferred to the private sector	**No.**
4. Analyze gaps or overlaps in programs or services and provide recommendations to correct them	**No.**
5. Assess feasibility of pooling information technology systems within the department	**No.**
6. Analyze departmental roles and functions, and provide recommendations to change or eliminate them	**Yes.** This audit sought opportunities in regulatory processes where guidance or requirements will help ensure climate resilience of new electricity infrastructure.

I-900 element	Addressed in the audit
7. Provide recommendations for statutory or regulatory changes that may be necessary for the department to properly carry out its functions	**Yes.** This audit considered what data and information is needed to plan, site, build and operate new electricity infrastructure to withstand future climate effects.
8. Analyze departmental performance data, performance measures and self-assessment systems	**No.**
9. Identify relevant best practices	**Yes.** This audit reviewed leading practices to identify opportunities for improved coordination of infrastructure adaptation efforts.

Compliance with generally accepted government auditing standards

We conducted this performance audit under the authority of state law (RCW 43.09.470), approved as Initiative 900 by Washington voters in 2005, and in accordance with generally accepted government auditing standards as published in *Government Auditing Standards* (July 2018 revision) issued by the U.S. Government Accountability Office. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

The mission of the Office of the Washington State Auditor

To provide citizens with independent and transparent examinations of how state and local governments use public funds, and develop strategies that make government more efficient and effective. The results of our work are widely distributed through a variety of reports, which are available on our website and through our free, electronic subscription service. We take our role as partners in accountability seriously. We provide training and technical assistance to governments and have an extensive quality assurance program. For more information about the State Auditor's Office, visit www.sao.wa.gov.

Appendix B: Objectives, Scope and Methodology

Objectives

The purpose of this performance audit was to examine how Washington can best approach climate adaptation in the critical infrastructure sector of electricity. We looked at how the state can best consider the forecasted effects of climate change when planning, siting (which means deciding the location of new construction) and funding electricity generating facilities and transmission and distribution lines. The audit addressed the following objectives:

1. How can Washington ensure its new energy infrastructure will withstand forecasted climate change effects?
2. What information and practices can help the state site and build climate-resilient energy infrastructure?

For reporting purposes, we organized the audit results into three key findings. The messages relate to the original objectives as follows:

- The state has opportunities to ensure new electricity infrastructure, built for climate mitigation, can withstand future climate effects (pages 10-16) – This finding addresses Objective 1.
- Additional analyses of forecasted climate information could help the state adapt infrastructure to the changing climate (pages 17-20) – This finding addresses Objective 2.
- Broader collaboration around climate adaptation efforts could help the state's electricity sector prepare for future climate risks (pages 21-26) – This finding addresses Objective 2.

Scope

While many state agencies and local governments are involved in energy infrastructure, the audit focused on seven key state agencies. The audit reviewed programs involved in planning, site evaluation, construction or operation of new electricity infrastructure.

We looked at the condition of the programs as they stood during our fieldwork period; our analysis is forward-looking to what the state could do differently in the future. The organizations and their roles are listed in **Figure 1**.

Figure 1 – Audited agencies: Relevant roles concerning new energy infrastructure

Agency	Role in planning, site evaluation and building of new electricity infrastructure
Archaeology and Historic Preservation	• Issues archaeological site permits when needed • Coordinates tribal consultation for the Energy Facility Site Evaluation Council
Commerce	• Provides support to county and city governments for Growth Management Act climate-resilience goal • Administers funding from the state's capital budget for energy projects • Sits on the Energy Facility Site Evaluation Council
Ecology	• Leads optional clean energy coordinated permit process • Develops three separate programmatic environmental impact statements for green hydrogen, solar and wind • Issues water and air pollution permits • Oversees the State Environmental Policy Act rules and guidance for the state and provides technical assistance • Sits on the Energy Facility Site Evaluation Council
Energy Facility Site Evaluation Council	• Performs site evaluation, required for certain new electricity infrastructure, such as nuclear and high-voltage transmission, optional for other types • Monitors construction compliance with site certification • Develops a programmatic environmental impact statement for transmission
Labor and Industries	• Regulates worker health and safety with rules • Inspects electrical work
Natural Resources	• Develops statewide wildfire hazard area maps • Sits on the Energy Facility Site Evaluation Council • Issues leases for new electricity infrastructure on state land
Utilities and Transportation Commission	• Regulates investor-owned electrical utilities • Approves integrated resource plans • Sits on the Energy Facility Site Evaluation Council

Methodology

We obtained the evidence used to support the findings, conclusions and recommendations in this audit report during our fieldwork period (June 2024 through January 2025), with some additional follow-up work afterward.

To address both objectives, we interviewed representatives from state agencies and sent written questions to understand current activities and obtain their perspectives on the audit topic. We asked each agency about how the state ensures consideration of climate change, uses climate data, participates in state collaboratives, and perceives a broader coordination approach.

We invited tribal leaders and representatives from the 29 federally recognized tribes in Washington to an outreach meeting on June 20, 2024. Members and representatives from two tribes and four regional associations attended. We presented our audit topic and listened to attendees' perspectives.

We also reviewed criteria, practices and research from the following sources:

- **Relevant state laws and rules** – Clean Energy Project Siting (HB1216, 2023); Climate Change: Planning (HB1181, 2023); Development of an Integrated Climate Change Response Strategy (RCW 70A.05.010); Electric Companies (WAC 480-100); Electric Power System Transmission Planning: Various Provisions (HB5165, 2023); Electric Utilities: Wildfire Risk Mitigation (HB1032, 2023); Electric utility resource plans (RCW 19.280); Electric Utility Wildland Fire Prevention: Task Force (SB5305, 2019); Energy Facility Site Evaluation Council: Modification (HB1812, 2022); Energy Independence Act (RCW 19.285); Gas, Electrical, and Water Companies (RCW 80.28); Growth Management: Planning by Selected Counties and Cities (RCW 36.70A); Integrated Climate Change Response Strategy: Updates (SB1170, 2023); SEPA Rules (WAC 197-11); State Environmental Policy (RCW 43.21C); Utility Wildland Fire Prevention Advisory Committee (SB5158, 2021); Washington Clean Energy Transformation Act (RCW 19.405); Wildland Urban Interface Code (SB6120, 2024)
- **Washington state agency programs and activities** – Archaeological Site Alteration and Excavation Permit; Climate Commitment Act funding; Ecology's Clean Energy Coordinated Permit Process; Energy Facility Site Evaluation Council Site Certification; Energy Programs in Communities, Department of Commerce; Interagency Clean Energy Siting Coordinating Council; road use permits and easements over public lands; State Building Code Council; tribal coordination; Washington State Climate Resilience Strategy; Washington State Enhanced Hazard Mitigation Plan; water and air permits; worker health and safety
- **Other entities' activities related to the audit topic** – Connected West; Energy Northwest; Electric Power Research Institute; North American Electric Reliability Corporation; NorthernGrid; Northwest and Intermountain Power Producers Coalition; Northwest Power and Conservation Council; Western Electricity Coordinating Council; Western Power Pool
- **Efforts in other states** – Alaska, California, Colorado, Florida, Hawai'i, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Nevada, New Jersey, New Mexico, New York, North Carolina, Pennsylvania, Rhode Island, Texas, Washington, D.C.

- **Federal data, guidance and information** – Bonneville Power Administration; Congressional Research Service; Cybersecurity and Infrastructure Security Agency; Federal Emergency Management Agency; Federal Energy Regulatory Commission; Interconnection Innovation e-Xchange; Lawrence Berkeley National Laboratory; National Institute of Standards and Technology; National Oceanic and Atmospheric Administration; Office of Federal Chief Sustainability Officer; Pacific Northwest National Laboratory; U.S. Climate Resilience Toolkit; U.S. Department of Commerce; U.S. Department of Energy; U.S. Department of the Interior; U.S. Energy Information Administration; U.S. Global Change Research Program
- **Academic groups** – University of Minnesota Climate Adaptation Partnership; University of Washington Climate Impacts Group; Washington State University Energy Program

Work on internal controls

For objective 1, we gained an understanding of the following internal controls significant to the objective:

- The ways the state ensures people planning, siting and building new electric infrastructure consider how the infrastructure will withstand forecasted climate effects.
- How relevant state agencies collaborate with other agencies and entities on climate forecasts in their critical infrastructure decision-making.

For objective 2, we gained an understanding of the following internal controls significant to the objective:

- How the state ensures its public agencies, private entities and people have access to climate change forecasts and critical areas designations relevant to critical infrastructure.
- The framework to oversee climate resilience and adaptation in critical infrastructure.

We assessed the design and implementation of each internal control significant to our audit objectives. We identified deficiencies for each control significant to the audit objectives and determined the deficiencies were root causes for our findings.

We did not assess the operating effectiveness of internal controls.

Appendix C: Energy Industry Roles and Terms

The tables in this alphabetized appendix summarize the roles of organizations involved in Washington's energy sector, and define terms used in this audit report and in the industry in general.

Term or agency/organization name	Definitions and description of responsibilities relevant to the audit objectives
Balancing authority	Balancing authorities are responsible for managing reliable operating conditions of the electric transmission grid within a specific geographic area. Balancing authorities operate under mandatory standards issued by the North American Electric Reliability Corporation (NERC). There are 11 balancing authorities with an operating area in Washington: Avangrid Renewables LLC; Avista Corporation; Bonneville Power Administration; City of Seattle, Seattle City Light; City of Tacoma, Tacoma Power; PacifiCorp West; Portland General Electric Company; Public Utility District No. 1 of Chelan County; Public Utility District No. 2 of Grant County; Public Utility District No. 1 of Douglas County; and Puget Sound Energy.
Bonneville Power Administration	The Bonneville Power Administration (BPA) is a federal agency that sells nearly carbon-free electricity at low rates. While the administration markets the power produced, other federal agencies own and operate the facilities – eight federal dams in Washington and four on the Oregon-Washington border. The dams are owned and operated by the U.S. Bureau of Reclamation and U.S. Army Corps of Engineers. In addition to wholesale electricity, Bonneville Power Administration operates and maintains 15,000 miles of high-voltage transmission in its operating area.
Consumer-owned utility	Consumer-owned utilities are generally not-for-profit and also known as "community-owned" or "customer-owned." The term can be used to refer to a municipal electric utility formed under Title 35 RCW, a public utility district formed under Title 54 RCW, a cooperative formed under chapter 23.86 RCW, a mutual corporation or association formed under chapter 24.06 RCW, or an irrigation district formed under chapter 87.03 RCW. For example, Seattle City Light is a municipal utility that is "community-owned"; Benton Rural Electric Association is a rural cooperative utility that is "consumer-owned"; and under RCW Title 54 – Public Utility Districts are "customer-owned."

Term or agency/organization name	Definitions and description of responsibilities relevant to the audit objectives
County and city general governments	County and city governments have the primary responsibility for developing local comprehensive plans and regulations. State law requires local governments to develop comprehensive plans to protect the environment, economic development, and the health and safety of residents of the state.
Energy Northwest	Energy Northwest is a joint operating agency and consortium of 29 public utility districts and municipalities in Washington. The agency owns and operates four facilities in Washington that generate electricity from nuclear (Columbia Generating Station), hydropower, wind and solar.
Federal Energy Regulatory Commission	The Federal Energy Regulatory Commission (FERC) regulates rates and service of interstate transmission and wholesale of electricity. The commission certified the North American Electric Reliability Corporation (NERC) as the electric reliability organization for the U.S, to develop and enforce mandatory reliability standards for "reliable operation" for the grid's generation and transmission.
Federal permitting agencies	Some federal agencies are responsible for permits and approvals to ensure project developers comply with a range of federal laws, when there is federal jurisdiction. For example, Bureau of Land Management, Federal Energy Regulatory Commission and the U.S. Forest Service.
Independent power producer	Independent power producers are specialized in developing and operating power plants, in contrast to a vertically integrated utility that owns power plants and also the poles and wires that make up the grid. Traditional utilities transmit and distribute power from facilities they own through the grid to end-users, but many utilities also buy power from independent power producers.
Interagency Clean Energy Siting Coordinating Council	The Interagency Clean Energy Siting Coordinating Council is co-chaired by departments of Ecology and Commerce, and leads a group of state agencies to identify actions to improve siting and permitting of clean energy projects in Washington. The council is responsible for tracking the state's progress on efficient, effective, and responsible siting and permitting of clean energy projects; and identifying areas of additional work and any needed policy changes to help achieve the deployment of clean energy necessary to meet the state's energy goals.
Investor-owned utility	Investor-owned utilities are vertically-integrated, private utility companies. The Utilities and Transportation Commission regulates three investor-owned electric utilities in Washington: Avista, PacifiCorp and Puget Sound Energy

Term or agency/organization name	Definitions and description of responsibilities relevant to the audit objectives
Least-Conflict Solar Siting project	The Least-Conflict Solar Siting project concluded at the end of June 2023 with the publication of the "Least-Conflict Solar Siting on the Columbia Plateau" report. Washington State University Energy Program led the project and engaged relevant stakeholders, tribes and key agencies to identify least-conflict areas for utility-scale solar development. The intent was to reduce land use conflicts and minimize negative impacts to natural and working lands while increasing solar renewable energy production.
Municipal utility	A municipal utility is an electric company formed under Title 35 RCW that is owned and operated by a city, such as Seattle City Light.
North American Electric Reliability Corporation	The North American Electric Reliability Corporation (NERC) is the designated electric reliability organization, under authority of the Federal Energy Regulatory Commission. NERC develops and enforces reliability standards for generation and transmission systems. NERC delegates authority to six regional entities to enforce NERC reliability standards. The Western Electricity Coordinating Council manages the western US, including Washington. The other five entities are the: Midwest Reliability Organization, Northeast Power Coordinating Council, ReliabilityFirst, SERC Reliability Corporation, and Texas Reliability Entity Inc.
NorthernGrid	NorthernGrid is a transmission planning association that facilitates regional transmission planning across the pacific northwest and intermountain west. Its members include both jurisdictional and non-jurisdictional entities in regard to compliance with federal requirements.
Northwest Power and Conservation Council	The Northwest Power and Conservation Council is responsible for the regional power plan and fish and wildlife program to balance the northwest's environment and energy need. Created in 1980 by U.S. law, its mission is to ensure, with public participation, an affordable and reliable energy system while enhancing fish and wildlife in the Columbia River Basin in Idaho, Montana, Oregon and Washington. The Bonneville Power Administration must fund the Council's work and act consistently with the Council's plan when developing resources.
Power marketing administration	The U.S. Department of Energy's four Power Marketing Administrations are responsible for selling the electrical output from federally owned and operated hydropower dams. The Bonneville Power Administration markets the power produced by dams in Washington.

Term or agency/organization name	Definitions and description of responsibilities relevant to the audit objectives
Public utility district	Public utility districts are not-for-profit, community-owned and locally regulated utilities created by a vote of the people under RCW 54. Twenty-four PUDs provide electricity in Washington.
Reliability coordinator	A reliability coordinator oversees grid compliance with federal standards, under delegated authority from North American Electric Reliability Corporation, and can determine operational measures to prevent or mitigate system emergencies. The reliability coordinator also provides leadership in system restorations following major events. The California Independent System Operator's "RC West" provides reliability coordinator services to the balancing authorities operating in Washington.
Rural cooperative utility	Rural cooperative utilities are owned by and operated for the benefit of the members of the cooperative (consumer-owned). Generally, individuals form co-ops when they live outside the service area of an investor-owned electricity provider.
State permitting agencies	Many state agencies are responsible for permits and approvals to ensure new electricity project developers comply with a range of state laws, such as environmental impacts, protection of public resources like air and water, wildlife conservation, and preservation of historical and archaeological resources. Key state permitting agencies were included in the scope of this audit: Archaeology and Historic Preservation, Ecology, Energy Facility Site Evaluation Council, Labor & Industries, and Natural Resources. Other state agencies that may have required permits include Fish & Wildlife and Transportation.
University of Washington Climate Impacts Group	The University of Washington Climate Impacts Group builds climate resilience by advancing understanding of climate risks and enabling science-based action to manage those risks. The group was also called on by the state Legislature to ensure the state has access to relevant scientific and technical information about the impacts of climate change on Washington's ecology, economy, public health and society, including a central location for accessing this information and use of any existing climate impact tools.
Utility Wildland Fire Prevention Advisory Committee	The Utility Wildland Fire Prevention Advisory Committee provides a forum for the Department of Natural Resources, Commerce, Utilities and Transportation Commission, electric utilities, small and industrial forest landowners, and other fire suppression organizations in the state to identify and develop solutions to issues of wildfire prevention and risk.

Term or agency/organization name	Definitions and description of responsibilities relevant to the audit objectives
Western Electricity Coordinating Council	The Western Electricity Coordinating Council (WECC) is the regional entity approved by the Federal Energy Regulatory Commission to ensure compliance, monitoring and enforcement reliability standards in the geographic area known as the Western Interconnection. In addition, WECC proactively evaluates future transmission system needs across various potential energy futures, providing essential insights for long-term planning.
Western Energy Imbalance Market	The Western Energy Imbalance Market is a real-time energy market that allows participants to buy and sell power close to the time electricity is consumed. Participants include the Bonneville Power Administration, Puget Sound Energy, Seattle City Light, among others in Washington, Oregon, California, Idaho, Nevada, Arizona, Montana, Wyoming, Utah, New Mexico and British Columbia, Canada.
Western Interconnection	Local electricity grids are connected to form larger interconnection networks for reliability and commercial purposes. The physical electrical system in the U.S. consists of three such interconnections that are largely independent from each other and with minimal power exchange. Washington's electricity grids are within the Western Interconnection, which includes 37 balancing authorities. The Eastern Interconnection includes 36 balancing authorities. The ERCOT Interconnection has only one balancing authority, mostly located within Texas.
Western Power Pool	The Western Power Pool is a non-profit membership organization formed by utilities, independent power producers and energy managers to create increased grid efficiency and reliability through collaboration and coordination.
Western Resource Adequacy Program	The Western Resource Adequacy Program is regional reliability planning and compliance program provided by the Western Power Pool to its members. In February, 2023 the Federal Energy Regulatory Commission (FERC) approved the tariff for the Western Resource Adequacy Program (WRAP). WRAP will deliver a region-wide approach for assessing and addressing resource adequacy and provide an important step forward for reliability in the region.
Western Transmission Expansion Coalition	The Western Transmission Expansion Coalition, or WestTEC, is a west-wide effort to develop an actionable transmission study to support the needs of the future energy grid. The final deliverable will be a west-wide transmission needs study looking out over 10- and 20-year periods. The coalition anticipates the 10-year horizon study to be completed by September 2025, the 20-year study phase to begin in Spring 2026, and the full report finished in the first quarter of 2027.

Bibliography

Burgos E, Irby K, Williams A, Fried M, Parris A. 2024. Incorporating Climate Projections into Infrastructure Planning and Design. National Institute of Standards and Technology, Gaithersburg, MD, NIST Grant/Contractor Report (GCR) NIST GCR 24-056. https://doi.org/10.6028/NIST.GCR.24-056

Christensen, E.L, C.M. Bolte, K.S. O'Keefe, J.C. Miles, J.R. Ruggiero, J. Frank. 2024. Siting and permitting reform in Washington: a report to the Washington Department of Commerce under RCW 43.394.020(3)(a). Beveridge & Diamond, PC. https://app.leg.wa.gov/ReportsToTheLegislature/Home/GetPDF?fileName=Permitting%20Reform%20Beveridge%20%20Diamond%202024-07-23.1_b12c257d-88ee-457c-af06-c676082ddcdb.pdf

Community Resilience Planning Guide for Buildings and Infrastructure Systems, Volume II (NIST Special Publication 1190). 2016. National Institute of Standards and Technology. http://dx.doi.org/10.6028/NIST.SP.1190v2

Electricity explained: How electricity is delivered to consumers. U.S. Energy Information Administration (EIA) website accessed January 2025. https://www.eia.gov/energyexplained/electricity/delivery-to-consumers.php

Fischer, L., and A. Iriarte. 2024. Climate Hazard, Exposure, and Vulnerability Assessment 101: Course Overview – 3002029573. Electric Power Research Institute (EPRI), Inc., Palo Alto, CA. https://www.epri.com/research/sectors/readi/research-results/3002029573

Homer, J.S, A.C. Cooke, K. Kazimierczuk, R. Tapio, J. Peacock, A. King. 2023. Emerging Best Practices for Electric Utility Planning with Climate Variability: A Resource for Utilities and Regulators. Pacific Northwest National Laboratory operated by Battelle for the United States Department of Energy under Contract DE-AC05-76RL01830. https://www.pnnl.gov/sites/default/files/media/file/Final%20Report%206_7_2023.pdf

Janowitz, K. 2023. Least-Conflict Solar Siting on the Columbia Plateau. Washington State University Energy Program. www.energy.wsu.edu/RenewableEnergy/LeastConflictSolarSiting.aspx

Lala, J., L. Fischer, and D. Diaz. 2024. Climate Hazard, Exposure, and Vulnerability Assessment 101 – 3002028735. Electric Power Research Institute (EPRI), Inc., Palo Alto, CA. https://www.epri.com/research/sectors/readi/research-results/3002028735

Lala, J., L. Fischer, D. Diaz, and S. Rose. 2023. Physical Climate Data 101 – 3002026223. Electric Power Research Institute (EPRI), Inc., Palo Alto, CA. https://www.epri.com/research/sectors/readi/research-results/3002026223

Laxo, A., Hoppe, B., Roop, H., and Cipriano, P. 2023. Climate Forward? How architects and engineers are(n't) using climate projections to inform design. White paper prepared by HGA and University of Minnesota Climate Adaptation Partnership. https://hga.com/climate-forward.

Low-Carbon Energy Project Siting Improvement Report, Report and Recommendations for Improving Siting and Permitting of Industrial Clean Energy Facilities. 2022. Shorelands and Environmental Assistance Program, Washington State Department of Ecology, and Energy Division, Washington State Department of Commerce. Olympia, Washington. Publication 22-06-013. https://apps.ecology.wa.gov/publications/documents/2206013.pdf

Matthews, J.B.R. (ed.). 2018. IPCC, 2018: Annex I: Glossary. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 541-562. https://doi.org/10.1017/9781009157940.

Rand, J., N. Manderlink, W. Gorman, R. Wiser, J. Seel, J. Mulvaney Kemp, S. Jeong, F. Kahrl. 2024. Queued Up: 2024 Edition Characteristics of Power Plants Seeking Transmission Interconnection As of the End of 2023. Lawrence Berkeley National Laboratory. https://eta-publications.lbl.gov/sites/default/files/queued_up_2024_edition_r2.pdf

Selecting Climate Information to Use in Climate Risk and Impact Assessments: Guide for Federal Agency Climate Adaptation Planners. 2023. White House Office of Science and Technology Policy. Washington, D.C.

Stowe, C.R. and C.L. Raymond. 2024. Measuring Resilience in Support of Effective Investment in Climate Adaptation. Legislative report prepared by the Climate Impacts Group, University of Washington, Seattle. https://cig.uw.edu/publications/measuring-resilience-in-support-of-effective-investment-in-climate-adaptation/

Ulibarri, N., and D. Han. 2022. NEPA and climate change: consideration of climate mitigation and adaptation in infrastructure review processes. Environmental Research: Infrastructure Sustainability 2 015004. https://doi.org/10.1088/2634-4505/ac5006

Vogel, J., J. Hess, Z. Kearl, K. Naismith, K. Bumbaco, B.G. Henning, R. Cunningham, N. Bond. 2023. In the Hot Seat: Saving Lives from Extreme Heat in Washington State. Report prepared by the University of Washington's Climate Impacts Group, UW's Center for Health and the Global Environment, the Washington State Department of Health, the Office of the Washington State Climatologist, and Gonzaga University's Center for Climate, Society & the Environment. https://cig.uw.edu/projects/in-the-hot-seat-saving-lives-from-extreme-heat-in-washington-state/

Williams, B. K., R. C. Szaro, and C. D. Shapiro. 2009. Adaptive Management: The U.S. Department of the Interior Technical Guide. Adaptive Management Working Group, U.S. Department of the Interior, Washington, DC. https://www.doi.gov/sites/doi.gov/files/uploads/TechGuide-WebOptimized-2.pdf

Zamuda, C.D., C.W. Gillespie, M. Antes, and P. Donnelly. 2016. Climate Change and the Electricity Sector: Guide for Climate Change Resilience Planning. U.S. Department of Energy, Office of Energy Policy and Systems Analysis. https://toolkit.climate.gov/sites/default/files/Climate%20Change%20and%20the%20Electricity%20Sector%20Guide%20for%20Climate%20Change%20Resilience%20Planning%20September%202016_0.pdf

Zamuda, C.D., D.E. Bilello, J. Carmack, X.J. Davis, R.A. Efroymson, K.M. Goff, T. Hong, A. Karimjee, D.H. Loughlin, S. Upchurch, and N. Voisin, 2023: Ch. 5. Energy supply, delivery, and demand. In: Fifth National Climate Assessment. Crimmins, A.R., C.W Avery, D.R. Easterling, K.E. Kunkel, B.C. Stewart, and T.K. Maycock, Eds. U.S. Global Change Research Program, Washington, DC, USA. https://nca2023.globalchange.gov/chapter/5/

Zhang, Y., B.M. Ayyub, J.F. Fung et al. 2024. Incorporating extreme event attribution into climate change adaptation for civil infrastructure: Methods, benefits, and research needs. Resilient Cities and Structures 3 (2024) 103–113. https://doi.org/10.1016/j.rcns.2024.03.002

"Our vision is to increase **trust** in government. We are the public's window into how tax money is spent."

– Pat McCarthy, State Auditor

Washington State Auditor's Office
P.O. Box 40031 Olympia WA 98504

www.sao.wa.gov

1-564-999-0950

Office of the Washington State Auditor
Pat McCarthy