



Oregon

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Northwest Power and Conservation Council
851 SW 6th Avenue, Suite 1100
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RE: Comments on the Methodology for Determining Quantifiable Environmental Costs and Benefits

Dear Council Members and Staff,

The Oregon Department of Energy appreciates the Northwest Power and Conservation Council's (Council) September 10, 2014 solicitation for input on potential methodologies for determining quantifiable environmental costs and benefits in the Seventh Plan.

The mission of Oregon Department of Energy (Department) is to reduce the long-term costs of energy for Oregonians. Within our mission, 'costs' are construed broadly to include not just financial costs, but larger ones including costs to the environment and public health. Consistent with this mission, we offer support for the broad inclusion of environmental costs and benefits that are quantifiable. We recognize, however, that many of the utilities within the region conduct resource planning within the confines of their state regulatory commissions, and commission guidelines may not allow for inclusion of all environmental costs and benefits. Therefore, to balance these constraints, the Department offers recommendations that we expect are both implementable at state commissions and consistent with the Northwest Power Act.

The Department also has a significant role in siting energy resources within Oregon. We offer background on the siting frameworks used within the state and recommendations for ensuring that no duplication of efforts occurs between the Energy Facility Siting Council process that the Department staffs and the Council.

The Council requested responses to questions regarding four specific issues and considerations outlined in the Methodology for Determining Quantifiable Environmental Costs and Benefits. A summary of the Department's comments follow and the Department's detailed responses for each issue area are provided below:

1. *Should the council consider residual effects a resource might have on the environment after compliance with environmental regulations, and are methods available?*

- The Council should consider potential future environmental costs in a manner that could be implemented in an IRP process. This means that, to the extent possible, the Council should consider not just the costs of existing environmental regulations but also the costs of potential future regulations where existing regulations do not fully internalize the real and measurable environmental effects. This information should be used to help describe the environmental risks that various types of generating resources face.
 - The Council should make clear in the Seventh Plan that the costs of unmitigated damages are real, even if the Council determines in some instances that it is impractical to use residual costs when evaluating resources.
2. *Should the council estimate costs of 111(b) and 111(d) compliance? Should 111(b) costs be used as the carbon costs of new resources? What scenarios should the Council run for 111(d) and how should uncertainties be addressed?*
 - The Council should conduct analyses of EPA’s 111(b) and 111(d) regulations to both demonstrate what compliance would mean for the region and how it could potentially impact costs. This includes assessing the long-term implications of increased reliance on natural gas and renewables that may be induced by these regulations, modeling scenarios where states comply with the regulations separately or as a region, and modeling scenarios that consider the combined effects of environmental regulations (carbon, haze and mercury).
 3. *Have methods been developed to allow for quantification of environmental benefits, and is it possible to attribute these benefits in resources cost estimates?*
 - The Council should develop a framework to quantify the environmental benefits of resources, such as water quality and consumption, land use and biological carbon-sequestration, so that these can be considered in future resource planning in addition to environmental costs.
 4. *How should the Council quantify renewable resource compliance costs? Should the Council use an approach for non-hydropower renewable resources similar to the “protected areas” approach used for hydropower as recommended by state fish and wildlife and tribal agencies?*
 - The Council should rely on state regulation and permitting to curb impacts from non-hydropower resources rather than expand the protected area approach in the power plan used for hydropower resources.
 - The Council should develop a balancing framework with recommendations for use in federal and state siting processes to balance localized project impacts with long-term system benefits (e.g. reduced climate emissions) that may not be adequately considered in individual siting decisions. Oregon offers its framework as an example.
 - The Council should recommend whether hydrokinetic (damless) and tidal technologies projects should be subject to protected area restrictions.

In addition to answering the questions presented, the Department also provides recommendations for *analyzing* each issue including: how to capture residual effects of a resource, specific

modeling recommendations for 111(b) and 111(d) of the Clean Air Act (hereinafter 111(b) and 111(d) respectively), and developing a framework to quantify environmental benefits.

1. Residual environmental effects beyond regulatory controls

In its issue paper, the Council notes that environmental regulation usually controls or mitigates some, but not all of the effects a new resource has on the environment. The Council asks whether its methodology should consider the residual effects a resource *might* have on the environment after compliance with environmental regulations, and whether there are reasonable methods for quantifying the costs of such effects.

The Department recommends that the Council consider the residual effects a resource might have on the environment after compliance with environmental regulations. These costs are real, measurable, and help identify some of the tradeoffs we make as a region in power planning. However, we also recognize the methodological difficulties with quantifying costs precisely given variances in individual site conditions, and that this variation makes it difficult to generalize across the region.

Still, the greatest value to the region exists when the Council's methodology remains roughly consistent with the cost recovery methodology utilized in utility integrated resource planning (where applicable). This methodology typically only allows consideration of unregulated environmental costs to the extent that the costs may be internalized in the future. Therefore, we recommend that the Council conduct the following analyses to better capture the likelihood of future regulation costs:

- Conduct a comprehensive review of the literature on environmental damages from various types of resources, including impacts that are not currently subject to regulation. Where established methodology exists, quantify these damages.
 - Use the magnitude and specificity of those damages to determine the likelihood of future regulation to mitigate those damages.
 - Where this risk is deemed high, the Council should include scenarios necessary to comply with potential regulations, such as compliance costs that may affect dispatch or generating unit life. For example, EPA's regulations related to criteria air pollutants and impacts from water withdrawals from, and discharges into, streams and other water bodies are increasing in stringency over time. It would enhance the Council's current approach to environmental costs to provide a realistic appraisal of actual damages as a tool to forecast future regulations. This in turn will help the region better predict how regulations might affect future resource costs to rate payers.
- Use the analysis conducted above to develop a written narrative describing the environmental risks and costs that various generating resource types face.

- In addition to the suggestions above regarding residual effects, we suggest that the Council use a more robust methodology to look at costs of *existing* environmental regulation. For example, rather than examining regulations individually, the Council could assess the impacts of the combined effect of existing federal rules (e.g. mercury, water intakes, regional haze, and forthcoming power plant carbon emission rules) on existing coal-fired plants.

Document and, Where Possible, Quantify Environmental Costs

In its draft, the Council considers whether residual environmental effects exist when the relevant regulatory body has determined that further reduction in environmental effects is not necessary to protect the public interests, or that the additional costs of further reduction significantly outweighs the benefits. While regulators often conduct cost-benefit analyses to determine acceptable trade-offs between costs to industry and environmental degradation mitigated, in many cases it is impossible to say whether these analyses have struck the right balance, in part because the tradeoff is usually implicit. Even where the analysis is explicit, disagreement may still exist. For example, in the case of carbon emissions, one could argue that the EPA's social cost of carbon estimates used in developing its forthcoming power plant rules under 111(d) could significantly underestimate the cost of climate change, yet 111(d) is a technology-based standard that was not intended or portrayed as a response to the full cost of climate change. The trends in scientific assessments, such as those conducted on a regular basis by the Intergovernmental Panel on Climate Change, have with subsequent reports shown greater levels of risk and higher expected costs from climate change over time, and thus greater expected future costs.¹

In many cases, the costs to the environment or public welfare above and beyond those associated with regulatory compliance, so-called "residual effects," are damages that can be quantified, albeit with varying degrees of specificity depending on the type of damage in question. The implication in the Council's Issue Paper, that those damages might not actually be costs because regulators have determined that those marginal impacts are not cost-effective to mitigate, is inconsistent with quantifying environmental externalities. We recognize that the question for the Council is whether those residual effects should be somehow internalized in its methodology, but we suggest that the Council make clear in the Seventh Plan that the costs of unmitigated damages are real, even if the Council determines in some instances that it's impractical to use residual costs when evaluating resources.

2. Environmental effects of resources not yet subject to regulation, especially carbon dioxide emissions

¹ *The Department notes:* The costs of complying with environmental regulations are often lower than estimated at the policy-setting stage. For example, upon implementation of federal limits on sulfur dioxide emissions from power plants costs of compliance were less than EPA estimates during the rulemaking process. *Note also,* that the current social cost of carbon estimate are an upward revision from previous calculations.

In its issue paper, the Council asks several questions about how to assess the costs of 111(b), alternate approaches to develop environmental cost estimates for new carbon-emitting resources, as well as how to address 111(d) requirements for existing carbon-emitting resources in the Seventh Plan.²

The Council has a valuable role in helping states meet their long-term goals as federal regulations continue to influence the region's power sector. In general, the Department supports the carbon dioxide quantification methodology utilized in Sixth Plan and requests that the Council conduct a similar exercise in the Seventh Plan. EPA's proposed 111(d) rule would require the power sector to reduce carbon emissions, However, EPA's proposed rule would not reduce carbon emissions to a level commensurate with putting the region on track to meet scientifically-recommended emissions limits or Oregon's aspirational greenhouse gas emissions goals. The Department asks the Council to recognize the limitations of the proposed 111(d) rule to fully account for the environmental costs of carbon emissions from the power sector.

Nationwide, compliance with 111(d) combined with other federal and state regulations on coal-fired power plants is anticipated to result in a significant shift to natural gas power. Despite potentially emitting less carbon than coal, natural gas has important environmental consequences over the life of investments that should be considered by the region, including (but not limited) to the life-cycle carbon emissions and potential impacts from natural gas extraction techniques, transmission, and storage infrastructure. The Council should model the implication on environment and reliability of potential reliance on gas-fired generation with consideration of EPA's new regulations for carbon emissions from new and existing power plants.

Some uncertainty about what will be included the final 111(b) and 111(d) rules still exists. However, given the importance of these rules to the future of the power sector in the region, it is critical that the Council allow adequate time in its modeling process to incorporate both. We make the following modeling requests for 111(b) and 111(d):

- Model compliance with the 111(b) and 111(d) regulations proposed in September 2013 and June 2014, respectively, to both demonstrate the impact of compliance within the region and potential energy cost impacts.

² *Within this section the Council specifically asked:* Should the Council estimate the costs of compliance with the 111(b) proposed regulations and use those estimates as the environmental costs associated with carbon emissions of new resources? If so, are there considerations and difficulties the Council should be aware of in developing cost estimates out of the proposed regulations? Alternatively, should the Council use some other approach to develop environmental cost estimates for new carbon-emitting resources, such as the use of an environmental-damage or social-cost-of-carbon approach? Should the Council consider in the planning process compliance with 111(d) regulations? If so, what scenarios should the Council run and why? How should the Council deal with some of the uncertainties and complications of the proposed 111(d) regulations, such as the difficulty with the baseline used in the proposed rule, and the fact that this and other aspects of the proposed regulations may change in the final regulations, and the relationship of the regional approach to power planning by the Council to the state-by-state approach of the proposed regulations? Alternatively, should the Council take a different approach (other than assuming compliance with 111(d)) to understand and factor in the carbon costs of the existing system?

- Specifically, include an analysis of the long-term implications of investments, such as increased use of natural gas and renewables, implied by compliance with these regulations, on our ability to meet regional energy needs and environmental goals.
- Model a scenario in which all four states comply with the proposed 111(d) regulations separately with their individual state targets as set by EPA, *and* a separate scenario in which the region as a whole complies with a combined regional target constructed from the weighted averages of the four individual state targets. This will help policymakers determine whether there is benefit to pursuing regional compliance with the regulations, versus separately complying as individual states.
- Model a coal plant closure and redispatch scenario that includes the combined effects of 111(d), regional haze, and mercury rules.

Finally, in response to the Council’s question 2(d) regarding the uncertainties surrounding 111(d), it is our view that the Council should plan for the fact that the final rule will be released late in the planning process and ensure that planning includes a broad enough range of scenarios, including both those that are more and those that are less stringent than the draft rule, to make it likely that the final rule is encompassed by them. The potential impact of the regulation is profound enough to warrant special consideration by the Council.

3. Quantifiable environmental benefits

In its issue paper, the Council notes that the Northwest Power Act specifies that the methodology used should determine quantifiable “environmental benefits” as well as environmental costs of new resources, but that for the most part the Council has not been able to identify or quantify the environmental benefits of new resources in past Plans. The Council then asks how to attribute environmental benefits in resource cost estimates.³

Adopt a Framework for Quantifying Environmental Benefits Associated with Specific Key Impacts

The Department recommends that the Council develop a framework for environmental impacts that forms a baseline for the Council’s integration of benefits. While the Department agrees that a new resource has the potential to avoid some unquantified costs from an existing resource,⁴ this approach does not fully capture the potential benefits of the new resource. There are also

³ *Within this section the Council specifically asked: Have methods and information developed in recent years that would allow for the quantification of environmental benefits to a broader degree for the resource cost estimates? Is it possible to quantify these kinds of environmental benefits? And can these benefits be said to be the “direct” benefits of and “directly attributable” to the new resource, or are the benefits incidental or indirect as the result of contingent behavior choices? If the environmental benefits of a new resource in displacing existing activities cannot be quantified or cannot be said to be directly attributable to the new resource, and thus not part of the methodology, how should the Council give due consideration to these environmental benefits in the plan?*

⁴ Such as noise pollution and traffic congestion or the environmental impacts of an existing resource on visual amenities, biodiversity, quality of open space, and ecosystem services.

environmental benefits associated with water use, improved direct and indirect land use and biological carbon-sequestration that can be quantified in a manner distinct from an inverse quantification of harm. Incorporating these benefits when distinct from harms would ensure there is no double counting of the quantified benefits of renewable resources.

Developing a framework for quantifying environmental benefits would likely require a robust stakeholder process. For this reason, the Department is not able to recommend a specific framework and instead provides resources to support a Council-led effort. The following resource may be helpful in developing the framework: U.S. Environmental Protection Agency's Integrated Planning Model

4. Environmental effects of new renewable resources

In its issue paper, the Council notes that renewable generating resources have different effects on the environment than fossil-fueled and nuclear generating plants, and asks a number of questions about how to quantify renewable resource compliance costs or use alternate approaches to protect environmental resources.⁵ In particular, the Council asks whether it should use an approach for non-hydropower renewable resources similar to the “protected areas” approach used for hydropower.

The Department asks that the Council consider the role and effect of Protected Areas in light of new technologies. We also ask that the Council not adopt Protected Areas for technologies other than hydropower and establish a framework for balancing local project impacts and benefits with long-term impacts from climate change. Finally, we offer background information on the siting process within Oregon, which evaluates and addresses potential environmental risks of new generating resources.

Role and Effect of Protected Areas in Oregon, in Light of New Technologies

In 1988, the Council adopted a program that designated 44,000 miles of Pacific Northwest streams as “Protected Areas” — streams that the Council believes should be off-limits to new hydroelectric development. Regulators, in particular the Federal Energy Regulatory Commission,

⁵ *Within this section the Council specifically asked:* For renewable resources such as wind, solar, biomass, and wave power generating plants, how should the Council, in its methodology, properly identify the environmental effects of renewable resources, identify the relevant regulatory schemes that address those effects, and quantify the resource compliance costs? Or, should the Council take a different or additional approach to identifying and quantifying the environmental costs of renewable resources in the methodology? State fish and wildlife agencies and tribes recommend the Council use a process for non-hydropower renewables similar to the Council's “protected areas” for new hydropower development. Is that an appropriate role for the Council, and do others agree with the agencies and tribes that this should be a priority use of the Council's and the region's resources? How would the Council and the region conduct and fund such an assessment, which could take years? Whether or not the Council uses the Seventh Power Plan to initiate such a major assessment effort, how should the Council give due consideration to these effects in the resource strategy for the plan?

have not authorized new dams and diversions in these Areas.⁶ The state of Oregon also uses Protected Areas as both a way to judge which new hydropower facilities are eligible for the state Renewable Portfolio Standard⁷ and for incentives through the public purpose charge funds administered by the Energy Trust of Oregon.⁸

Since the adoption of Protected Areas for hydropower development and hydroelectric projects, new lower-impact water power technologies have become commercialized, including hydrokinetic (damless) and tidal technologies. Hydrokinetic opportunity sites are highly coincident with Protected Areas, and we recommend that the Council determine whether or not hydrokinetic projects should be subject to the prohibitions in Protected Areas for hydroelectric development designated in the 1988 process.

The Council should clarify whether it intends to apply the exclusion to any technology that uses water to create power, including new lower-impact technologies such as hydrokinetic and tidal. Because Oregon ties its incentive programs and renewable energy mandates to the Areas, more action would be needed than Council clarification to resolve the ambiguity – but Council clarification is the right place to start.

Do Not Adopt Protected Areas for Resources Other than Hydropower, Rely Instead on State Siting Processes

The Department does not support expansion of the Protected Areas approach to other renewable resources. We agree with the Council that to undertake such an effort would be a complex resource and time-intensive process. The Department’s experience in creating a Territorial Sea Plan for marine energy⁹ underscores the tremendous and difficult challenge of adopting a statewide technology-specific spatial plan that bars development as opposed to creating opportunity areas.¹⁰ The Department instead supports avoidance, minimization, and mitigation.

While the Protected Area approach serves vital, if conflicting, functions as both a regulatory bar and as a method for distinguishing high-caliber hydropower developments, it is not appropriate for other renewable resources. Protected Areas are exclusively an environmental screen with no

⁶ The Department understands that while no new development has been authorized, FERC does not consider Protected Areas a legal barrier and will not deny preliminary permits for proposed projects in Protected Areas.

⁷ OR REVISED STATUTES § 469A.025 4(a)

⁸ OR REVISED STATUTES § 757.600 27(d)

⁹ Territorial Sea Plan Part 5, *available at* http://www.oregon.gov/LCD/OCMP/pages/ocean_tsp.aspx. (last visited Oct. 27, 2014).

¹⁰ In question 4a, the Council includes “wave” as a resource for which the Council could characterize environmental effects. We note that there is not yet understanding, much less consensus, on environmental impacts from wave energy devices as only a handful of devices have been deployed nationally for more than a few weeks at a time. We also note that even with this lack of data, Oregon has already developed a spatial plan for ocean energy development that attempts to account for potential use conflicts and effects.

energy inputs or valuation. They do not assist in siting other than creating avoidance areas, and they do not create opportunities or benefits to site in the lowest impact areas.

Reducing environmental impacts from non-hydropower resources is best addressed in regulation and permitting, not within the Power Plan. Regulation and permitting allow for site-specific protection of environmental resources through avoidance, minimization, and mitigation. For example and as explained in detail below, Oregon evaluates potential environmental risks as part of state siting processes that incorporate state-level environmental concerns within regulatory schemes from water right standards, county plans that incorporate statewide planning goals, and standards-based site certificates from the Energy Facility Siting Council.

Finally, and most importantly, the premise for creating Protected Areas for hydropower – that the region heavily relies on hydropower and was in danger of going past a tipping point in balancing power values with affected environmental values – is not true for any other resource.

Establish a Framework for Balancing Localized Project Benefits and Impacts with Long-Term Impacts from Climate Change

Instead of focusing on prohibitions, the Council should create a tool for assessing tradeoffs. The region needs a tool or policy framework to assess the tradeoffs and connect the discrete process of siting individual projects with the larger environmental benefit of reducing emissions, particularly carbon dioxide emissions. On one hand, a renewable energy project causes immediate, direct, and local resource impacts. At the same time, it reduces greenhouse gas emissions by displacing existing fossil-fueled power generation, which reduces the long-term impacts on that same resource (thereby causing benefits). While the Council’s methodology addresses the reduced emissions by counting them as costs to the fossil-fueled resource, assessments of individual renewable resources for siting purposes seldom make the connections between these two effects of renewable generation.

The accounting bridge between projects and climate change mitigation must be built, otherwise we risk the *tyranny of small decisions*, in which series of seemingly logical short-term decisions lead to undesirable regional or global outcomes. To date, there have been only modest attempts at evaluating emissions benefits in NEPA assessments for specific projects¹¹ and in developing an action plan to restore endangered species.¹²

¹¹ The Council on Environmental Quality issued a draft framework for National Environmental Policy Act (NEPA) documents that encourages decision-making agencies to consider climate change impacts and GHG emissions, within reason. <http://energy.gov/nepa/downloads/draft-nepa-guidance-consideration-effects-climate-change-and-greenhouse-gas-emissions>

¹² In its September 2014 draft recovery plan for two endangered corals, the National Marine Fisheries Service called for reducing emissions as a response action in order to slow the threats of ocean acidification and warming waters. NATIONAL MARINE FISHERIES SERVICE, Draft Recovery Plan (Sept. 2014), http://www.nmfs.noaa.gov/pr/recovery/plans/elkhorn_staghorn_corals_draft2014.pdf

The Council has a unique and important role in considering the environmental impacts from regional renewable resource power development.

Overview of Existing Siting Frameworks in Oregon

The existing process for siting energy facilities in Oregon is robust and determining the viability of a site for energy facility development requires substantial work. The process includes, but is not limited to, determining the value of the energy resource, accessibility, transmission connectivity, and various potential environmental and social impacts.

Oregon has maintained strong regulatory frameworks at both the state and local jurisdictional level for more than thirty years. We offer a summary of siting regulations within Oregon as an example of how the state permitting process protects environmental resources during energy facility siting.

The state Energy Facility Siting process is a consolidated review that incorporates all applicable state and local jurisdictional policies, goals, standards and permits into a single process with a single decision maker — the Governor-appointed and Senate-confirmed Energy Facility Siting Council (EFSC). This process is standards based, and places the burden of proving that a site meets all applicable standards on the applicant. Key standards include:

- **Land Use:** EFSC ensures that all applicable local jurisdictional standards as well as applicable statewide planning goals are met.
- **Protected Areas:** EFSC limits the siting and impacts of energy facilities on specifically designated federal and state protected areas such as national parks, scenic areas, and wildlife refuges.
- **Fish and Wildlife Habitat:** The Oregon Department of Fish and Wildlife policies for habitat categorization and mitigation are adopted by reference as EFSC standards.
- **Threatened and Endangered Species:** EFSC ensures that impacts to plant and wildlife species that are designated by the state as threatened and endangered species are avoided or mitigated and that any impacts do not cause a significant reduction in the likelihood of survival or recovery of the species.
- **Historic, Cultural and Archaeological Resources:** EFSC ensures that the construction and operation of the facility, taking into account mitigation, does not result in significant adverse impacts.

Most large scale energy facilities that are not under state jurisdiction are located in farm and forest zones and are reviewed by counties. Counties in Oregon comply with mandatory statutes and administrative rules for energy facilities sited in farm and forest zones, which results in

regulatory consistency throughout the state. All local comprehensive plans, and land use and development ordinances must comply with Oregon's 19 Statewide Planning Goals.¹³

In addition, technology allows potential developers to assess environmental constraints early in the siting process. As the use of geographic information systems has become more prevalent, both governmental and non-governmental agencies are providing valuable geo-spatial information on their websites. This allows potential developers the ability to download the information and overlay it on their potential project site to assess potential constraints at no cost. Early access to this information should encourage developers to avoid known environmentally and historically significant areas of impact to minimize the time and costs associated with the regulatory process. As reference, we have provided examples of information that is currently available in Appendix A.

In summary, the Department recognizes that not all externalities can be quantified, and that not all externalities that the Council could quantify are consistent with state commission methodologies within its territory. However, the approach outlined in our response is both quantifiable and achievable while remaining consistent with the role of the Council and the Northwest Power Act.

Thank you for the opportunity to provide comment,

/s/ Jess Kincaid

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¹³ *Key planning goals include:* Goal 1, Citizen Involvement: This insures the opportunity for citizen to be involved in all phases of the planning process. Goal 2, Planning: This establishes a land use planning process and policy framework as a basis for all decisions and actions related to use of land and assures an adequate factual base for decisions and actions. Goal 5, Natural Resources, Scenic and Historic Areas, and Open Spaces: This insures protection of natural resources and conserves scenic and historic areas and open spaces. Conditional Use: All energy facilities with the purpose of generating power for public use by sale are required to go through a conditional use review. Conditional use review is a robust local jurisdictional review process which includes standards for natural and cultural resource protection consistent with the statewide planning goals.

APPENDIX A

Summary of Energy Developer Support Tools

Regulatory and Permitting Information Desktop (RAPID) toolkit – A collection of publicly available information about permits and regulations affecting energy and bulk transmission project development.

<http://en.openei.org/wiki/RAPID>

Oregon Department of Fish and Wildlife Compass – An online system of maps to help you make informed land use decisions related to fish and wildlife habitats as you plan energy, transportation, conservation and other large projects.

<http://www.dfw.state.or.us/maps/compass/index.asp>

Oregon Department of Geology and Mineral Industries HazVu: Statewide Geohazards Viewer – The HazVu map provides a way to view many different geohazards in the state of Oregon.

<http://www.oregongeology.org/sub/hazvu/index.htm>

National Wetlands Inventory Wetlands Mapper – Integrates digital map data with other resource information to produce timely and relevant management and decision support tools.

<http://www.fws.gov/wetlands/Data/Mapper.html>

Oregon Department of Transportation TransGIS – This GIS map includes statewide transportation management system's data, Statewide Transportation Improvement Program (STIP) projects and environmental data.

<https://gis.odot.state.or.us/transgis>

Oregon Department of Revenue Map Project (ORMAP) – Parcel maps

<http://www.ormap.net>

Flood Vulnerability Assessment Map – Flood hazard information from FEMA has been combined with EIA's energy infrastructure layers as a tool to help state, county, city, and private sector planners assess which key energy infrastructure assets are vulnerable to rising sea levels, storm surges, and flash flooding

<http://www.eia.gov/special/floodhazard/>

Western Electricity Coordinating Council Transmission Line Maps

<http://www.wecc.biz/library/Pages/Interconnection%20Maps.aspx>

Western Electricity Coordinating Council Transmission Planning Tool – This web mapping application provides the ability to view and access the environmental/cultural risk classification Data Layers developed by WECC stakeholders as part of the Regional Transmission Expansion Planning project.

<http://184.169.179.203/flexviewers/WECC3/index.html>

User’s Manual for the WECC Transmission Planning Tool

http://www.wecc.biz/committees/BOD/TEPPC/External/WECC_Env-Cult_Data_Viewer_Users_Manual.pdf

National Renewable Energy Laboratory – Provides access to an extensive collection of renewable energy resource data, maps and tools for biomass, geothermal, solar and wind resources.

<http://www.nrel.gov/redec>

Renewable Northwest – This is an interactive map of renewable energy projects.

http://rnp.org/project_map

Department of Defense Clearinghouse – This is a one-stop-shop for comprehensive, expedited evaluation of energy projects and their potential effect on Department of Defense operations.

<http://www.acq.osd.mil/dodsc>

Federal Aviation Administration – Obstruction Evaluation – This is required for facilities based on height or proximity to airports, as well as other factors.

<https://oeaaa.faa.gov/oeaaa/external/portal.jsp>

Advisory Council on Historic Preservation – Section 106 Applicant Toolkit – If your project has a federal component, you may need to comply with Section 106 of the National Historic Preservation Act, which requires federal agencies to consider the effects on historic properties of projects they carry out, assist, fund, permit, license or approve.

<http://www.achp.gov/apptoolkit.html>