



DEPARTMENT OF  
**ECOLOGY**  
State of Washington

## **Report to the Legislature on Greenhouse Gas Emissions Performance Standard, Periodic Review**

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# **Report to the Legislature on Greenhouse Gas Emissions Performance Standard, Periodic Review**

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Air Quality Program  
Washington State Department of Ecology  
Olympia, Washington

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# Table of Contents

	<u>Page</u>
Executive Summary .....	vi
Introduction.....	3
Overview of the laws .....	3
Need, Applicability, and Effectiveness of Chapter 80.70 RCW.....	9
Need for this law .....	9
Applicability of this law.....	10
Effectiveness of this law .....	10
Need, Applicability, and Effectiveness of Chapter 80.80 RCW.....	13
Need for this law .....	13
Applicability of this law.....	13
Effectiveness of this law .....	15
Conclusion and Recommendations.....	18
Recommendations for Chapter 80.70 RCW .....	18
Recommendations for Chapter 80.80 RCW .....	19
Appendices.....	20
References.....	20

# Executive Summary

The Washington Department of Ecology (Ecology) is required to report to the Legislature on the need, applicability, and effectiveness of the requirements of the Revised Code of Washington (RCW) Chapters 80.70 and 80.80. Chapter 80.70 RCW requires that a portion of carbon dioxide (CO<sub>2</sub>) emissions from new power plants be offset by purchasing emission reductions (“carbon credits”) or by implementing emission reduction projects. Chapter 80.80 RCW requires that the power obtained from certain types of power plants meet an emission limit on the greenhouse gases (GHGs) associated with that power. The report is due every five years or upon implementation of a federal or state law or rule regulating the CO<sub>2</sub> emissions of electric utilities.

Since the last review, there have been two federal regulations issued that would limit GHG emissions from fossil fuel-fired power plants: the Clean Power Plan and the New Source Performance Standard (NSPS). Both were appealed to the U.S. Environmental Protection Agency (EPA) for administrative reconsideration and court cases were filed after the issuance of these regulations. The court cases are currently in abeyance awaiting review and revision by the current EPA Administrator. The Administrator has proposed repealing the Clean Power Plan and replacing it with the Affordable Clean Energy (ACE) rule. In 2017, the Administrator announced a review of the NSPS to consider whether to suspend, revise, or rescind that rule.

At the state level, Ecology issued the Clean Air Rule (CAR) (Chapter 173-442 Washington Administrative Code (WAC)) in 2016 to reduce GHG emissions from a number of sources, including existing power plants. The interactions between these laws and the CAR are addressed in the CAR, with the most direct effect being that certain types of carbon credits can count for both Chapter 80.70 RCW and CAR compliance. As of this writing, implementation of the CAR is suspended while Ecology appeals an adverse Superior Court decision.

Ecology finds that under current conditions, Chapters 80.70 and 80.80 RCW continue to be needed as tools to limit GHG emissions from new power plants and mitigate any increase in GHG emissions from certain power plants.

Ecology has identified options and recommendations for consideration by the Legislature for Chapter 80.70 RCW and Chapter 80.80 RCW. Ecology is not planning to introduce legislation to implement the identified options and recommendations.

## Recommendations for Chapter 80.70 RCW

Ecology finds that Chapter 80.70 RCW does not have a federal equivalent that could be used as a replacement. In addition, Ecology finds that its CAR (currently suspended) overlaps to some degree with this RCW. To update and streamline operations of the mitigation standard for new power plants, Ecology recommends the Legislature consider the following actions:

- Transfer functions now assigned to the Energy Facility Site Evaluation Council (EFSEC) to either Ecology or the Department of Commerce (Commerce).
  - EFSEC’s responsibility for developing and maintaining the list of entities that are certified as being able to provide high-quality carbon credits for mitigation purposes (“qualified organizations”) could be transferred to Ecology. Transferring the requirement to develop and maintain the list of qualified organizations to Ecology

- would allow Ecology to better coordinate the requirements of this mitigation program with similar requirements that are part of the CAR, implementation of the standard for small energy projects, or future GHG mitigation programs.
- EFSEC's role in updating the amount that affected power plants can pay to acquire offsetting emissions reductions could be transferred to either Commerce or Ecology. Transferring the requirement to update and periodically review the mitigation cost value to either Commerce or Ecology would result in moving the process to an agency with specific expertise to perform the task.
  - Assuming the state prevails in the legal challenges to the CAR, the Legislature could restructure this law to be a contingency measure supporting the CAR's emission reduction requirements. For example, the reciprocity in counting certain types of carbon credits for both programs that exists in the CAR could also be written into the law.
  - Another way the law could be modified would be to make it a backstop to the CAR. One concept is to make it inactive unless state courts vacate the rule or Ecology rescinds the regulation.
  - Another concept is to modify the requirements to apply to all power plants in Washington (and not just new plants as per the current law) to assist the state in meeting the GHG emission reduction goals in Chapter 70.235 RCW.

## Recommendations for Chapter 80.80 RCW

Ecology recommends this law be retained. No existing state or federal law or regulation overlaps or could substitute for the requirements in this law. Ecology's CAR (which is currently suspended) supplements this law for existing power plants located in Washington through the rule's emission reduction requirements.

The current law applies to baseload power plants, which are defined as those plants designed and intended to operate at a capacity factor of at least 60 percent. While Chapter 80.80 RCW appropriately applies to the largest baseload power plants, power from wind and solar generation is creating a condition where the electric power industry is likely to have baseload generation plants operating below 60 percent capacity in the future. These units will not meet the definition of baseload in the law and do not meet the criteria to be peaking power plants.<sup>1</sup>

For this reason, Ecology recommends the Legislature consider expanding the range of power plants that are defined as baseload power plants and are therefore subject to meeting the emission performance standard. Ecology suggests the Legislature include fossil fuel-fired power plants that operate at capacity factors between 40 and 60 percent as covered generation under this law.

In addition, the Legislature may wish to clarify how GHG emissions from the Centralia Power Plant are to be addressed if the power plant were to continue operation using natural gas to fire one or both units at the plant after the required cessation of coal combustion in 2025.

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<sup>1</sup> A peaking power plant is intended to operate sporadically and for short periods. Typical capacity factors for such plants are 20 percent or less.

## **Introduction**

Ecology is required to periodically report to the Legislature on the need, applicability, and effectiveness of the requirements in Chapters 80.70 and 80.80 RCW. RCW 80.80.060 states:

For the purposes of RCW 80.80.040 through 80.80.080 and 80.70.020, the department, in consultation with the \*department of community, trade, and economic development energy policy division, the energy facility site evaluation council, the commission, and the governing boards of consumer-owned utilities, shall review the greenhouse gases emissions performance standard established in this chapter to determine need, applicability, and effectiveness no less than every five years following July 22, 2007, or upon implementation of a federal or state law or rule regulating carbon dioxide emissions of electric utilities, and report to the legislature.

Ecology consulted with Commerce and EFSEC throughout the development of this report. In addition, on February 21, 2018, Ecology adopted amendments to the rules for this program, Chapter 173-407 WAC. This rulemaking process provided opportunity for review of the core elements of these programs by a wide range of utility and other interested stakeholders as part of this public rulemaking process. The report itself went through a number of iterations incorporating comments, recommendations, and options from interested parties, Commerce, and EFSEC.

## **Overview of the laws**

### **Chapter 80.70 RCW is the Carbon Dioxide Mitigation Law**

This 2004 law requires that a portion of the CO<sub>2</sub> emissions produced by new and modified fossil fuel-fired power plants located in Washington be mitigated (i.e., offset or reduced) so that the net emissions of the plants can be shown to be reduced over time. Implementation of the law is split between EFSEC and Ecology, in conjunction with the local air pollution control authorities. This law applies to all power plants with a capacity of 25 megawatts (MW) or more, with EFSEC regulating all new power plants capable of generating at least 350 MW of power. Implementation for the smaller power plants rests with Ecology.

### **How the Carbon Dioxide Mitigation Law works**

New or modified thermal power plants larger than 25 MW must reduce or offset their CO<sub>2</sub> emissions. Before being built, a fossil-fueled thermal electric generation unit must mitigate or offset the equivalent of 20 percent of the potential CO<sub>2</sub> emissions that could be emitted by the plant over 30 years. Examples of these types of units are:

- Boilers that run on coal, oil, natural gas, or coke.
- Combustion turbines.
- Coal gasification units that produce synthesis gas or hydrogen for a fuel cell.
- Hydrocarbon reformer emissions where the hydrogen produced is used in fuel cells.

The choice of mitigation strategy must be described in a mitigation plan. A mitigation plan applies when a new power plant starts operation, when an existing plant increases its CO<sub>2</sub> emissions by 15 percent or more, or when an existing plant modifies its operations to increase its capacity by at least 25,000 kilowatts.

Mitigation plans may include any combination of a payment to a third party (a “qualified organization”) at a specified monetary rate for mitigation services to provide the necessary emission reductions (e.g., through the purchase of carbon credits), the direct purchase by the applicant of carbon credits to cover the mitigation obligation, or direct investment in an applicant-controlled mitigation project (which can include on-site cogeneration projects) that successfully reduces emissions enough to cover the mitigation obligation.

The resulting mitigation requirements are included in a Notice of Construction (NOC) issued under authority of the state Clean Air Act. Compliance with the mitigation requirements are enforced by the agency issuing the NOC (EFSEC, Ecology, or one of the local air pollution control authorities).

The following specific functions under this law are assigned to EFSEC:

- Establish and maintain a list of independent qualified organizations<sup>2</sup> (third party organizations that provide GHG mitigation services and coordinate CO<sub>2</sub> mitigation projects).
- Periodically reviewing and updating the CO<sub>2</sub> mitigation rate (a \$/ton CO<sub>2</sub> emitted<sup>3</sup> value used to determine the total cost for mitigation paid to a qualified organization or used for owner managed mitigation projects).

This law was amended in 2011 to add a provision specific to the Centralia Power Plant. The amendment exempts CO<sub>2</sub> emissions from natural gas-fired power plants located in Lewis County that replace the generation from the Centralia Power Plant from the requirements of this law.

## **Chapter 80.80 RCW is the GHGs – Baseload Electric Generation Performance Standard Law**

All baseload fossil fuel fired power plants<sup>4</sup> in Washington, or a similar power plant with an agreement with a retail utility serving customers in Washington to purchase power, must meet a GHG emission performance standard that limits the quantity of CO<sub>2</sub> and other GHG associated with that power. Renewable and nuclear-powered electricity and long-term contracts with the Bonneville Power Administration (BPA) are exempt. The law establishes a process for Commerce to update the initial standard.

Chapter 80.80 RCW has been amended three times since 2007. The first amendment in 2008 added technical corrections to the law to ease implementation. The second amendment in 2009 made technical adjustments to procedures used by the Utilities and Transportation Commission (Commission) to allow for an exemption to meeting the emission performance standard for

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<sup>2</sup> RCW 80.70.050.

<sup>3</sup> RCW 80.70.020(5)(a).

<sup>4</sup> Under both laws, a baseload power plant is defined as a plant designed and intended to operate at an annual power production of at least 60 percent of its installed capacity (aka 60 percent capacity factor). Baseload power plants covered by these laws include a coal, oil, or natural gas-fired steam electric facility (like the Centralia Power Plant) or a natural gas or oil fired simple or combined cycle combustion turbine facility.

investor-owned utilities. The third amendment in 2011 provided for special considerations of the Centralia Power Plant owned by the TransAlta Corporation.

The 2011 amendment to Chapter 80.80 RCW established a schedule by which the Centralia plant would be required to comply with the GHG emission performance standard in effect in 2021 for one unit and in 2026 for the other unit. It also established a process whereby the plant could contract with a Washington State electric utility to supply power through the end of 2025 without triggering the requirement to meet the emission performance standard. When the 2011 amendments were enacted, it was anticipated that the Centralia plant's owner would meet the emission performance standard by shutting the coal-fired units down.

## **How the Baseload Electric Generation Performance Standard Law works**

The emissions performance standard (EPS) controls the growth of GHG emissions from new, modified, and existing fossil fuel-fired power plants that change ownership. The EPS assures new electric generation acquired by Washington's utilities through long-term power purchase agreements or other long-term financial commitment meets the EPS regardless of the state where the generating resource is located.

### **Updating the Emission Performance Standard**

Under the law, Commerce has the responsibility to evaluate and update the emission performance standard every five years. Commerce reviews emissions from commercially available, combined cycle combustion turbines offered for sale in the United States.

Based on stakeholder input on the initial review in 2013, Commerce has developed and applied a series of equipment deterioration factors to the "like-new" efficiency information provided by the turbine manufacturers in order to calculate an average emission rate. If the review indicates that the standard needs updating, Commerce is directed to do so by rule.

The initial standard set in the law was 1,100 pounds (lb) of GHG per megawatt-hour (MWh). The standard established in 2013 by Commerce is 970 lb/MWh. Based on the agency's 2018 survey and input from stakeholders, Commerce recently updated the standard to 925 lb/MWh. That is now the EPS for the next five years.

### **Long-term financial commitments**

The law requires long-term financial commitments (including power purchase agreements, power plant purchases, and modifications and upgrades to owned power plants), lasting five years or more, to meet the following criteria. A change of ownership of a baseload power plant or cogeneration plant requires that the plant meet the EPS in effect at the time of ownership change. Contracts for power purchases must assure that all named power plants in the contract meet the EPS. Unspecified power sources in a long-term contract are limited to 12 percent of the total power purchased in the contract. Contracts to purchase power from the BPA are exempt.

## **Reviews by the Utilities and Transportation Commission and Boards of consumer-owned utilities**

The Washington Utilities and Transportation Commission (Commission) is required to review contracts and proposed power plant purchases from regulated utilities and determine whether the EPS would be met. A proposal may be allowed to exceed the EPS if the Commission finds it meets specific criteria given in the law.<sup>5</sup> The Commission is directed to utilize procedures developed by Ecology to make these determinations and may consult with Ecology as part of their process.

The Boards of consumer-owned utilities must do the same reviews for their long-term financial commitments and power plant development/purchases as the Commission does for the investor-owned utilities, but may not approve a project or contract that does not meet the EPS. The Boards are directed to utilize procedures developed by Ecology to make these determinations and may consult with Ecology as part of their process.

The procedures developed by Ecology to make its determinations are contained in WAC 173-407, Sections 100–300. These procedures are based on the requirements in RCW 80.80.040.

## **Treatment of the Centralia Power Plant**

The law establishes several requirements that apply solely to the Centralia Power Plant, Washington’s only coal-fired power plant. No other law addresses limiting GHG emissions from the plant. Specific requirements are:

- The two units at the plant are required to meet the EPS on a schedule in the law---one unit needs to meet the EPS if operated after December 31, 2020, the other unit after December 31, 2025.
- The plant is allowed to have a long-term financial commitment to sell power to a Washington State electric utility. The financial commitment (also called a power purchase agreement) is not subject to the EPS, provided the commitment expires by December 31, 2025.
- The plant is exempt from any other state-imposed GHG emission reduction requirements so long as it is in conformance with RCW 80.80.040 requirements to meet the emission performance standard in place by the dates noted in the first bullet above and the Memorandum of Agreement between the plant owner and the Governor.
- The plant’s owner must meet specific financial commitments listed in RCW 80.80.100. Examples of some of the financial commitments include:
  - Thirty million dollars to the affected community for economic development and energy efficiency and weatherization.
  - Twenty-five million dollars for energy technologies with the potential to create considerable energy, economic development, and air quality, haze, or other environmental benefits.

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<sup>5</sup> The specific criteria in RCW 80.80.060(4) are “(a) Unanticipated electric system reliability needs; (b) extraordinary cost impacts on utility ratepayers; or (c) catastrophic events or threat of significant financial harm that may arise from unforeseen circumstances.”

## **GHG emission laws and regulations since 2013**

In this section, we provide an overview of laws and rules that affect GHG emissions from power plants that have been enacted at the state or federal level since the last review in 2013.

Since the first review, there have been no new major laws specifically addressing climate change enacted at the federal or state level. At the state level, there have been bills proposed that would have established some form of a GHG cap and trade program or GHG emissions tax that would have affected all sources in the state. There have been similar proposals at the federal level.

There have been regulations issued at the federal and state levels since 2013. The EPA issued two regulations affecting the emission of CO<sub>2</sub> from new and existing power plants. The state also enacted a regulation that caps and reduces the allowable GHG emissions from major sources in Washington State. That regulation has been put on hold pending a court appeal.

### **Overview of each regulation and current legal status**

#### *Federal NSPS for power plants*

The federal NSPS, 40 CFR Part 60, subpart TTTT, applies to new, modified, and reconstructed baseload<sup>6</sup> power plants located in the United States. It applies to any new power plant with a nameplate rating of 25 MW or higher, including some cogeneration facilities. Under the terms of this regulation, new combined cycle gas turbine power plants would have to meet a CO<sub>2</sub> emission standard of 1,030 lb CO<sub>2</sub>/net MWh; and for new coal-fired units, a standard of 1,400 lb CO<sub>2</sub>/MWh. The current rule is under appeal<sup>7</sup> in the U.S. Court of Appeals for the District of Columbia Circuit. The court has placed the litigation in abeyance until EPA completes its reconsideration of the rule. The current rule has not been stayed and remains enforceable. In April 2017, EPA announced it was initiating a review to consider whether to suspend, revise, or rescind the rule as finalized in 2015. Note that the current Washington EPS allows fewer emissions than the federal NSPS rule.

#### *Federal Clean Power Plan for existing power plants*

The Clean Power Plan, 40 CFR Part 60, subpart UUUU, limits CO<sub>2</sub> emissions from existing power plants by establishing state by state emission budgets and allowing the states to determine how to meet those budgets. The emission budgets decline over time through 2030 and then remain steady. Washington's emission budget starts at 12,395,697 short tons of CO<sub>2</sub>/year in 2020 and reduces to 10,739,172 short tons of CO<sub>2</sub> in 2030. The EPA estimated that Washington's 2030 power plant emission budget would equate to an emission standard of 983 lb CO<sub>2</sub>/MWh. The Clean Power Plan encourages states to implement energy efficiency and clean energy policies to reduce the emissions per MWh of power generated in the state. States would

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<sup>6</sup> Chapter 80.80 RCW defines a baseload power plant as one that is designed and intended to operate at a 60 percent or greater capacity factor. This contrasts with peaking plants that are intended to operate with a capacity factor of 20 percent or less, and intermediate load plants intended to operate at capacity factors between 20 and 60 percent.

<sup>7</sup> Eighteen appeals consolidated by the Court of Appeals for the D.C. Circuit as *State of North Dakota vs Environmental Protection Agency*, No. 15-1381. This appeal is currently under an indefinite abeyance, but requires EPA to report on progress reviewing the underlying regulation every 90 days. Additional action on the case will occur once EPA has completed its review of the rule.

be allowed to join in multi-state trading organizations to most efficiently provide power to customers and help states to meet their emission budgets.

The Clean Power Plan has been stayed by the U.S. Supreme Court and is awaiting a decision by the D.C. Circuit Court of Appeals. At the time of drafting this review report, the Court has heard oral arguments, but has put the case in abeyance.<sup>8</sup> In a separate action, EPA has proposed to rescind the Clean Power Plan. Most recently, EPA has proposed a replacement policy for the Clean Power Plan known as the Affordable Clean Energy rule. As proposed, this rule would affect only coal-powered power plants and has significant qualifying factors that appear to make it unlikely that the Centralia Power Plant in Washington would be impacted. Some out-of-state power plants serving Washington electricity customers may be covered by the proposed rule.

#### *Ecology Clean Air Rule (CAR)*

In 2016 Ecology finalized the CAR, Chapter 173-442 WAC, to reduce the emissions of GHGs (CO<sub>2</sub> plus other gases). The types of sources regulated under this rule include power plants. Beginning in 2017, the rule regulates and limits emissions of GHGs from stationary sources and fuel suppliers that emit at least 100,000 metric tons. The threshold drops over time, so that by 2035 the rule will regulate and limit GHG emissions above 70,000 metric tons per year.

Compliance with this rule requires that affected sources reduce their GHG emissions by 5.1 percent of their baseline emissions in successive 3-year compliance periods, starting in 2018, with reduction requirements leveling off in 2035. Compliance may be met through emission reductions at the source or through the use of GHG reductions by other sources in Washington. The CAR will accept some mitigation required under Chapter 80.70.010 RCW and emission reductions and sequestration needed to meet the EPS. Power plants located in Washington are required to comply with the emission reduction requirements of this rule until EPA approves Washington's Clean Power Plan if that plan has comparable emission reductions. Given EPA's recent proposal to rescind the Clean Power Plan it is questionable as to whether this provision will have meaning in the future.

In 2016, Ecology was sued in Superior Court on the legality of the CAR. A federal lawsuit was also filed. The Superior Court's initial ruling in December 2017 was not in Ecology's favor, although there remained some question as to whether the rule could be implemented in part. A final written order was issued by the Superior Court in spring of 2018 that invalidated the CAR in its entirety. Implementation of the rule was suspended in December of 2017 and, as of the release of this report, has not resumed pending the outcome of the appeal. Resolution of the federal lawsuit awaits completion of the state case. Resolution of the appeal is anticipated to potentially occur in either 2019 or 2020, depending on the court's schedule.

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<sup>8</sup> Thirty-nine appeals consolidated by the Court of Appeals for the D.C. Circuit as *State of West Virginia, et al vs Environmental Protection Agency*, No. 15-1363. The Court has issued a series of 60-day abeyance orders. Oral arguments were heard in September 2016. NGO petitioners have been requesting the Court to issue its decision.

## **Need, Applicability, and Effectiveness of Chapter 80.70 RCW**

In this section, we review the need, applicability, and effectiveness of the CO<sub>2</sub> mitigation law, Chapter 80.70 RCW, and whether it should be retained. Since the last report was completed, there have been no new or expanded baseload power plant projects proposed in Washington that would require compliance with the law. As a result, the requirements of this law have not been implemented in the past five years for a new power plant.

### **Need for this law**

The purpose of the law is to provide a consistent set of emission mitigation requirements to all new or modified power plants located in Washington. Prior to enactment, emissions of CO<sub>2</sub> from power plants being permitted by EFSEC were addressed inconsistently either through the general authority of EFSEC or through the State Environmental Policy Act (SEPA). For power plants not subject to EFSEC's permitting process, there were no requirements for CO<sub>2</sub> emissions, a situation that created perverse incentives and led to a large number of power plant proposals below EFSEC's size threshold.

In response, the goals of the law were to provide a framework for addressing CO<sub>2</sub> emissions from new and modified power plants in Washington that could provide a level of consistency between the CO<sub>2</sub> emission requirements regardless of project size. The law still fulfills its original goal of providing a framework for new and modified fossil fuel power plants to mitigate a portion of their CO<sub>2</sub> emissions and treating all of the new and modified power plants in the state the same set of requirements, whether subject to EFSEC permitting or not.

More recently, under terms of the CAR, Chapter 173-442 WAC, a power plant is required to reduce emissions or obtain offsetting GHG emission reductions (in an analogous fashion to the Chapter 80.70 RCW requirements). Emissions mitigation required under Chapter 80.70 RCW may qualify as reductions that meet the GHG emission reduction requirements of Chapter 173-442 WAC if they are of certain qualifying types.

For a new power plant that would be subject to this law starting today, the total quantity of emission reductions required under the CAR are greater than the emissions subject to mitigation under Chapter 80.70 RCW.<sup>9</sup> One existing facility—the Grays Harbor Energy Center—is currently working with a qualified organization to obtain the emission reductions required by its EFSEC site certificate, a portion of which also are able to comply with the CAR.<sup>10</sup>

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<sup>9</sup> Under RCW 80.70, a combined cycle combustion turbine (a GE S107FA, 1+1 configuration) with a net heat rate of 6,090 Btu/kWh, producing 263 gross megawatts and operating at a 97 percent capacity factor would be required to mitigate 2,694,370 metric tons. WAC 173-442 would require the same plant to reduce or offset emissions by 5,888,935 metric tons over the same time period.

<sup>10</sup> Two power plants in Washington are required to mitigate their GHG emissions not because of Chapter 80.70 RCW, but rather through EFSEC site certificate conditions that pre-date the law. In practice, the mitigation requirement is almost identical, because the conditions on these site certificates formed the basis for the law.

While the requirements of Chapter 80.70 RCW may partially overlap with the requirements of the CAR in the future, there is value in modifying the law's requirements to function as a supplement or backstop to the requirements in Chapter 173-442 WAC if this rule is upheld by the courts. For example, if the CAR were to resume implementation in the future, the mitigation requirements under Chapter 80.70 RCW could be made conditional so that the equivalent emission reductions would not be required so long as they were being obtained through the CAR compliance pathways. Another concept would be to make Chapter 80.70 RCW inactive if the CAR or an equivalent regulation is in place. Maintaining both requirements, albeit in a conditional fashion, would ensure emission reductions are procured by the generating facility and that the emissions from the power plant in question are addressed.

Another concept would be to modify the requirements to apply to all power plants in Washington (and not just new plants as per the current law) to assist the state in meeting the GHG emission reduction goals in Chapter 70.235 RCW. This would require a number of significant changes to the underlying statutes for the CO<sub>2</sub> mitigation standard for new power plants.

## **Applicability of this law**

This law applies to CO<sub>2</sub> emissions from new fossil fuel-fired baseload power plants generating at least 25 MW of electricity. It also applies to modifications at existing baseload electric generating plants that increase generation or fossil fuel usage above thresholds given in the law.

According to projections in the Northwest Planning and Conservation Council's 7th Power Plan, the Pacific Northwest region is not projected to need new or additional baseload generation until around 2026 or thereafter. This projection is consistent with the recent Integrated Resource Plans filed with the Commission by Washington's three investor-owned utilities.

Chapter 80.70 RCW specifically exempts natural gas-fired generating plants located in Lewis County and owned by the owner of the Centralia Power Plant from the mitigation requirements. The exemption expires on the earlier date of either when the net station generating capacity of all natural gas-fired generation approved equals the net station generating capacity of the Centralia Power Plant, or on Dec. 31, 2025.<sup>11</sup> The air quality permit application for replacement power must be submitted before Dec. 31, 2025.

## **Effectiveness of this law**

This law has been effective in mitigating the CO<sub>2</sub> emissions from the plants that have been subject to its requirements. All facilities that have been subject to the mitigation requirements have chosen to provide funds to the Climate Trust, (formerly known as the Oregon Climate Trust), one of the qualified organizations recognized by EFSEC that receives funds for GHG mitigation projects and programs around the Northwest.

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<sup>11</sup> RCW 80.70.080.

While the law has been effective to require mitigation of emissions from the few plants that have been required to follow this law, it has not been used often. Since 2013, there have not been any new fossil fuel power plant proposals in Washington<sup>12</sup> and none of the existing plants has been modified in a manner that triggers the law's modification thresholds.

Historically, meeting the mitigation requirements by those plants that have been required to do so has been treated as a purely financial obligation. Two older plants triggered the law and the owner paid The Climate Trust about 16 million dollars to comply. The Climate Trust estimated the projects funded by these funds have offset about 2.8 million tons of CO<sub>2</sub>. Applicability has been evaluated at other power plants, but due to those plants being either being primarily wood-fired cogeneration facilities or with permitted capacity factors of less than 60 percent, no other projects have yet triggered the mitigation requirements.

The law requires EFSEC to establish and periodically update the list of independent qualified organizations that provide CO<sub>2</sub> and GHG mitigation project coordination. EFSEC has updated this list only once since it was first developed, several years after the law and EFSEC's regulation went into effect. EFSEC did subsequently issue an additional request for qualifications that received no responses.

The law provides an opportunity for EFSEC to update the CO<sub>2</sub> mitigation value every two years. In the 14 years since the law was passed, EFSEC last evaluated the cost of CO<sub>2</sub> mitigation in 2007 and chose not to update the mitigation value at that time. EFSEC has not evaluated the mitigation value since then. The original value dictated in the law was \$1.60/ton of CO<sub>2</sub>. In the meantime, the cost of CO<sub>2</sub> offset credits in compliance markets have risen to about \$15/ton of CO<sub>2</sub><sup>13</sup> and the costs on the voluntary market for CO<sub>2</sub> credits and mitigation projects is in the range of \$2.80 to \$4.00/ton<sup>14</sup> of CO<sub>2</sub>. Because the current mitigation cost value has not been evaluated for an update since 2007, it is out of date, and should be evaluated to determine if a change is appropriate. This change should be accomplished by reviewing and revising, through rulemaking, the mitigation value to match the current market costs for mitigation projects.

Because GHG policy development and implementation is not a core function of EFSEC, they have been constrained in carrying out its duties under this law. One possibility would be to transfer the requirement to maintain the list of qualified organizations to Ecology. This would allow better coordination with implementation of the emission reduction requirements of the CAR and other GHG programs, including Ecology's responsibilities to implement this standard for smaller energy projects. For example, one mechanism to acquire reductions under the CAR is through projects implemented by these same independent qualified organizations. Moving the authority to maintain a current list of these organizations would assist Ecology in its administration of the CAR (should the rule move forward in the future), allow it to more closely

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<sup>12</sup> This lack of new projects has not been due to the requirements of this law, but to the combined effects of renewable portfolio requirements in the western states, the cost of natural gas, and the low rate of load growth by the utilities serving Washington's customers.

<sup>13</sup> California and Quebec Cap and trade program, 13th auction results average price of \$15.06 for credits of 2016 and 2017 vintage and \$14.76 for credits of a 2020 vintage.

<sup>14</sup> \$4.00/ton mitigated is the costs reported for projects performed by the Oregon Climate Trust for projects in 2014. \$2.80 is the reported market cost of a CO<sub>2</sub> credit in 2016.

align implementation of the standard for large and small energy projects, and remove an unfunded task from EFSEC.

Similarly, transferring the requirement to update, as necessary, the CO<sub>2</sub> mitigation fee from EFSEC to either Ecology or Commerce's State Energy Office may make sense. In the case of Commerce, this would consolidate this function with similar energy policy and finance development requirements, such as the Clean Energy Fund, or potential similar future requirements. In the case of Ecology, this task would be symbiotic with GHG project-based work involved with the CAR and the policy role that Ecology has played in other areas where GHG project expertise has come into play, such as with SEPA and implementing the CO<sub>2</sub> mitigation standard for smaller energy projects.

## **Need, Applicability, and Effectiveness of Chapter 80.80 RCW**

In this section, we review the need, applicability, and effectiveness of the GHG EPS law, Chapter 80.80, RCW, and whether it should be retained. Since the last report was completed, there have been two projects<sup>15</sup> that have become subject to the requirements of this law.

### **Need for this law**

Washington needs this law as the primary mechanism to limit the GHGs coming from fossil-fueled baseload power plants in Washington or power plants that serve Washington retail customers. Chapter 80.80 RCW is an effective mechanism to limit the growth of the GHG emissions from electric power generated to serve Washington customers because:

- The requirement to meet the EPS by each power plant that is explicitly named in long-term power purchase agreements prevents Washington utilities from entering new, long-term contracts with out of state coal-fired power plants.
- Routine updates to the EPS assure that it does not become outdated. This encourages utilities and independent power producers to install the most up-to-date equipment in Washington and elsewhere if it is used to serve Washington customers.
- The EPS is more stringent than the emissions requirements in EPA's NSPS for new power plants, leading to lower emissions than allowed by EPA.
- Geologic and non-geologic sequestration of CO<sub>2</sub> removed from the exhaust gas of power plants is recognized as a means to comply with the EPS.
- Long-term financial agreements (such as power purchase contracts and power plant modifications) to purchase or install new generating equipment, or to purchase new generating capacity, regardless of location, are required to comply with the EPS.
- The law provides decision-making authorities in Washington knowledge of the GHG emissions resulting from new long-term financial commitments.
- This is the only law that mandates the treatment of GHG emissions from the Centralia Power Plant, including a compliance schedule for that coal plant to comply with the GHG EPS.

### **Applicability of this law**

The law as it is currently codified applies to all fossil fuel-fired baseload electric power plants<sup>16</sup> located in Washington that are new, modified to increase heat input, or are wholly or partially subject to an ownership change after July 1, 2008. Its requirements also apply to those plants in other states that are included by name in long-term power purchase contracts to serve

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<sup>15</sup> The Goldendale and the Mint Farm Generating Stations both owned by Puget Sound Energy (PSE). The projects are an upgrade that increases the fuel input to (and GHG emissions from) operation of these generating stations.

<sup>16</sup> As defined in the law, baseload power plants are those designed and intended to operate at a capacity factor of 60 percent or more.

Washington customers. As noted above, this law is the only one that directly addresses GHG emissions from the Centralia Power Plant.

Applicability to baseload power generation was an appropriate scope when the law was enacted in 2007 and when the last review was performed in 2013. At those times, any needed new generating capacity was projected to be served by new baseload generation. However, since that time the rationale for an electric utility to acquire fossil fuel-fired baseload electric generation has changed with the increase in wind and solar energy, and the need to address the periods of time when these renewable energy sources are not generating electricity. While electrical demand has increased in Washington and the Northwest, this increased demand has been primarily met through implementing energy efficiency programs required by state law, demand reduction programs, and by the utilities meeting their renewable portfolio commitments by acquiring new wind and solar generation.

In the Northwest, there has been one new large baseload electric generating project built since 2010.<sup>17</sup> This Idaho plant was not subject to Washington's EPS because it is intended to serve Idaho customers. However, if it had been subject to the emissions standard, it would have complied due to the characteristics of the combustion turbine installed.

The law's applicability to new, in-state baseload power generation, new long-term financial commitments for baseload power supply, and baseload power plant ownership changes continues to limit the growth in GHG emissions at plants built to serve Washington's retail customers. In this regard, the law continues to apply to appropriate entities and projects.

In 2008, when the law was originally enacted, renewable energy facilities were relatively rare and the renewable portfolio standards in the Energy Independence Act and the renewable energy requirements of the California power market had not yet resulted in a significant quantity of wind generation in Washington. With the growth of this wind generation in the last 10 years, there is a recognition by the investor-owned utilities and the Northwest Power and Conservation Council that new, baseload fossil fired electricity generation will likely not be needed until, at the earliest, the late 2020s.

However, there will be a need for new fossil generation resources to provide intermediate load generation<sup>18</sup> to balance intermittent and seasonal wind and solar generation and to provide peak power generation<sup>19</sup> to cover periods of high electrical demand. Both investor-owned utilities and the Northwest Power and Conservation Council anticipate this demand.<sup>20</sup> This new generating capacity is anticipated to be provided by new simple cycle combustion turbines, frame type combustion turbines, or "fast-start" combined cycle combustion turbine plants. These power plants are designed, intended, and permitted by air quality permitting authorities to operate at

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<sup>17</sup> The Langley Gulch facility built for Idaho Power/Avista is in Idaho.

<sup>18</sup> Capacity factor between 60 and 20 percent. This is predominantly generation used to replace generation from wind and solar generation that cannot be supplied by reductions in power needs gained through energy efficiency programs or through manipulation of the hydropower system.

<sup>19</sup> Capacity factor of 20 percent or less.

<sup>20</sup> For example, the 2017 Integrated Resource Plan for PSE indicates it will need 123 MW of new generation in the mid-2020s to meet a 5 percent loss of load probability and the 7th Power Plan indicates the Northwest Region will need 600 MW of new non-baseload generation.

less than baseload rates and may be a source of new GHG emissions from fossil fueled power plants because this law does not apply to these types of power plants.

Emissions of GHGs from intermediate and peaking load plants are generally higher per MWh of electricity produced compared to baseload generation. A power plant designed to operate in a peaking or intermediate load context is often a simple cycle combustion turbine or a large diesel fueled reciprocating engine. Diesel and natural gas reciprocating engine generators tend to have lower efficiencies compared to combined cycle combustion turbines. This is because these plants are usually simple cycle combustion turbines operating at a lower efficiency (ratings of 42–46 percent efficient), than the same turbines operating as combined cycle generators (ratings of 55–60 percent efficient), but have higher operating costs compared to the turbines. As these less efficient generating plants become more common, GHG emissions due to power generation will begin to increase.

Another effect of the growth in wind and solar generation has been changes to how the installed fleet of combined cycle gas turbines operates. While these units were originally designed, intended, and permitted to provide baseload generation, many of the units actually operate as intermediate load generation. This has adverse effects on their emissions, making compliance with the EPS difficult for some of the oldest turbines that are subject to meeting the standard. In establishing revised EPS, Commerce accounts for the effect of the baseload units operating in this intermediate load generating profile.<sup>21</sup>

In summary, electricity resource planning in this region projects that new generation will be needed to supply intermediate and peaking power due to the increase of wind and solar energy. Some of this generation may be supplied by existing fossil-fueled power plants and the rest by new fossil-fueled power plants. These plants, and the individual generating units at the plants, will be exempt from meeting the EPS because they are designed and intended (and permitted) to operate at annual capacity factors below 60 percent (the threshold factor to be a baseload power plant). For these reasons, Ecology suggests that, given future conditions, the law may not apply to all of the fossil-fueled generating plants and units that should be covered.

## **Effectiveness of this law**

The law continues to be effective in limiting the growth of GHGs in the production of electricity from baseload plants for consumption in Washington. No other existing program in Washington limits the emissions from an out-of-state power plant, which is included in a long-term power purchase agreement.<sup>22</sup> This requirement serves to limit the growth in GHG and other emissions associated with supplying electricity consumers located in Washington.

No other existing program applicable in Washington requires a power plant subject to a change in ownership to meet a new emissions requirement. This requirement applies whether the plant is being purchased in whole or in part by a Washington utility or by an independent power

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<sup>21</sup> See GHG emission survey and Concise Explanatory Statement Chapter 80.80.040(11) RCW Baseload Electric Generation Performance Standard 2013.

<sup>22</sup> The state of California has requirements under its GHG cap and trade program that have the effect of regulating emissions from out-of-state power plants.

producer. In the long term, this requirement will result in closure of old, out of date power plants and the installation/purchase of new generation sources that meet the EPS.

As stated in the previous section, this law may no longer apply to all of the power plants that it needs to in order to comprehensively reduce GHG emissions from the power sector. Short-term power needs for adjusting within-hour generation variability of wind and solar generation may result in the development of new thermal peaking or intermediate load generation like simple cycle combustion turbines, new reciprocating engines, or modifications to existing combined cycle combustion turbines that will allow these power sources to avoid being regulated under this law. In this regard, the law may not be as effective as it could be.

However, it is important to emphasize that the law is a particularly effective tool to prevent:

- A new coal-fired power plant from locating in Washington.
- The operators of coal-fired power plants located elsewhere to serve customers in Washington unless the plants can meet the state's GHG EPS.

The consumer-owned utilities generally have long-term contracts with the BPA for power supply. These contracts are exempt from the law. The vast majority of BPA power comes from hydroelectricity and, to a lesser extent, nuclear power. In 2016, BPA reported that its power supply was derived from about 2 percent fossil fuels.<sup>23</sup>

The investor-owned utilities have incorporated the requirements of this law and the renewable portfolio standard requirements of RCW 19.285 into their integrated resource planning and requests for proposals.<sup>24</sup> Requests for proposals for new generation issued by the investor-owned utilities include requirements that proposed new generation must meet the EPS and other state requirements. As a result, only generation conforming to the requirements would be proposed in response to these proposals, making it impossible to quantify the effectiveness of the law in reducing GHG emissions.

This law has not been superseded by the CAR (Chapter 173-442 WAC) or by the federal NSPS for new electric generating units (power plants). The CAR only addresses the direct emissions from sources in Washington, and is currently suspended pending resolution of an ongoing legal challenge. EPA's NSPS only affects new power plants. In contrast, Chapter 80.80 RCW also addresses electric power obtained from existing and new out-of-state sources. It also limits the ability of in-state power plants to be bought and sold by companies that meet the EPS.

The federal Clean Power Plan could have replaced much of this law. However, with that program proposed to be repealed under the current EPA Administrator and replaced with a

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<sup>23</sup> Washington Fuel Mix Disclosure, Department of Commerce, <http://www.commerce.wa.gov/wp-content/uploads/2018/02/Energy-Fuel-Mix-Disclosure-2016-final.pdf>.

<sup>24</sup> As an example, see page 12, third paragraph, Section 2 of PSE's 2011 All source RFP.

Avista discussed the implications of this law and other climate initiatives undertaken by Washington in its 2013 Electric RFP starting on page 4-8. A similar discussion exists in PSE's 2015 IRP starting on page 7-10 and in Appendix C of the 2017 plan. Avista has indicated RCW 80.80.040 compliance is part of the 2017 IRP carbon emission constraints in the development of their 2017 IRP (see Nov. 8, 2016, TAC 3 presentation, Carbon Prices in the 2017 Electric IRP, Slide 5).

program that initial modeling indicates will lead to either no emissions decreases or even increased emissions in Washington,<sup>25</sup> on top of the unknown legal status of the existing program, the state cannot rely on this federal rule to replace Chapter 80.80 RCW. The Washington law is also more stringent than the federal standard for existing power plants, and likely will remain so no matter what changes are made to the federal program in the upcoming years.

Finally, only this law includes a number of requirements specific to the Centralia Power Plant. The law contains a compliance schedule that requires the Centralia Power Plant to meet the EPS in effect on the dates in the compliance schedule in order to continue operation as a baseload power plant. The compliance schedule in this law for the Centralia Power Plant to meet the GHG EPS is the most effective means to end the burning of coal to make electricity in Washington. This also could be accomplished through regulatory requirements, but the certainty of a compliance schedule in the law strengthens the commitment of the state to cease burning coal to produce electricity.

When the law was amended in 2011, it was anticipated the Centralia Power Plant would comply by closing operation as a power plant or being converted to a natural gas combined cycle combustion turbine power plant.<sup>26</sup> There are additional requirements related to the sale of power and funding energy efficiency programs contained in RCW 80.80.100 through 120. Section 110 limits the ability of the state to require additional reductions in GHG emissions from the plant beyond what is required by RCW 80.80.040.

Currently, the owner of the Centralia Power Plant is investigating repowering the coal-fired units to operate on natural gas and eliminate their ability to operate on coal. They envision this would allow the units at the plant to meet the applicable GHG EPS in 2021 and 2026, allowing the plant to operate after the 2020 and 2025 dates to comply with the EPS. Under this potential operating scenario, the law is not clear if it continues to limit the ability of the state or Ecology to require further GHG emissions reductions.

This interaction effect between Section 110 of Chapter 80.80.040 RCW and other state laws and regulations has special relevance to the CAR, Chapter 173-442 WAC. As this regulation is currently enacted, it allows actions used by power plants to meet the EPS to meet its compliance requirements. Due to the requirements of RCW 80.80.110, this regulation exempts the Centralia Power Plant from all GHG emissions reduction requirements of the CAR, Chapter 173-442 WAC. If the Centralia plant were to operate in compliance with the requirements of Chapter 80.80 RCW after the compliance deadline in RCW 80.80.040(3)(c), it is unclear whether it would become subject to the requirements of the CAR. The Legislature might consider clarifications on how GHG emissions from the Centralia Power Plant are to be addressed if the power plant were to continue operation using natural gas to fire the plant after 2025.

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<sup>25</sup> See, for example, <http://www.rff.org/blog/2018/cpp-replacement-emissions-increase-source>.

<sup>26</sup> On pages 1-2 of PSE's Integrated Resource Plan it states, "In 2011, the Legislature amended the Emission Performance Standard to achieve permanent reduction of certain CO2 emissions by retiring the TransAlta coal plant in Centralia, Washington."

## **Conclusion and Recommendations**

Both Chapters 80.70 and 80.80 RCW continue to serve the purposes the Legislature intended.

Chapter 80.70 RCW still provides a framework and requirements for the mitigation of CO<sub>2</sub> emissions from new and modified fossil fuel power plants. There is no other state or federal law or regulation that provides specific, replicable requirements for mitigation of CO<sub>2</sub> emitted from new and modified power plants.

Chapter 80.80 RCW is still the only law or rule that requires named power plants listed in new long-term power purchase agreements to meet a GHG emission standard. No other law or rule puts a requirement such as this on Washington's utilities.

This law has provisions that result in more stringent GHG emission requirements for new and modified power plants than the applicable federal regulation. The current state standard of 925 lb/MWh is more stringent than the federal standards of 1100 lb/MWh (for natural gas combined cycle combustion turbines) and 1300 lb/MWh (for coal-fired power plants) in the NSPS.

The laws and their implementing regulations issued by Ecology, EFSEC, the Commission, and Commerce should be retained. The laws may need to be updated in mostly minor ways.

Ecology has identified options and recommendations for consideration by the Legislature for Chapter 80.70 RCW and Chapter 80.80 RCW. Ecology is not planning to introduce legislation to implement the identified options and recommendations.

Ecology is not introducing legislation because the recommendations affecting Chapter 80.70 RCW impact resources and processes across multiple agencies and as such, the appropriate venue for a decision to bring these recommendations forward is the Legislature. The recommendations for Chapter 80.80 RCW have energy policy implications that may interact with other legislative efforts and as such, it is logical that a decision as to whether to proceed with this recommendation be addressed in that broader policy context.

### **Recommendations for Chapter 80.70 RCW**

Ecology finds that Chapter 80.70 RCW does not have a federal equivalent that could be used as a replacement. In addition, Ecology finds that its CAR (currently suspended) overlaps to some degree with this RCW. To update and streamline operations of the mitigation standard for new power plants, Ecology recommends the Legislature consider the following actions:

- Transfer functions now assigned to EFSEC to either Ecology or Commerce.
  - EFSEC's responsibility for developing and maintaining the list of entities that are certified as being able to provide high-quality carbon credits for mitigation purposes ("qualified organizations") could be transferred to Ecology. Transferring the requirement to develop and maintain the list of qualified organizations to Ecology would allow Ecology to better coordinate the requirements of this mitigation program with similar requirements that are part of the CAR, implementation of the standard for small energy projects, or future GHG mitigation programs.

- EFSEC's role in updating the amount that affected power plants can pay to acquire offsetting emissions reductions could be transferred to either Commerce or Ecology. Transferring the requirement to update and periodically review the mitigation cost value to either Commerce or Ecology would result in moving the process to an agency with specific expertise to perform the task.
- Assuming the state prevails in the legal challenges to the CAR, the Legislature could restructure this law to be a contingency measure supporting the CAR's emission reduction requirements. For example, the reciprocity in counting certain types of carbon credits for both programs that exists in the CAR could also be written into the law.
- Another way the law could be modified would be to make it a backstop to the CAR. One concept is to make it inactive unless state courts vacate the rule or Ecology rescinds the regulation.
- Another concept is to modify the requirements to apply to all power plants in Washington (and not just new plants as per the current law) to assist the state in meeting the GHG reduction goals in Chapter 70.235 RCW.

## **Recommendations for Chapter 80.80 RCW**

Ecology recommends this law be retained. No existing state or federal law or regulation overlaps or could substitute for the requirements in this law. Ecology's CAR supplements this law for existing power plants located in Washington through the rule's emission reduction requirements.

The current law applies to baseload power plants, which are defined as those plants designed and intended to operate at a capacity factor of at least 60 percent. While Chapter 80.80 RCW appropriately applies to the largest baseload power plants, power from wind and solar generation is creating a condition where the electric power industry is likely to have baseload generation plants operating below 60 percent capacity in the future. These units will not meet the definition of baseload in the law and do not meet the criteria to be peaking power plants.<sup>27</sup>

For this reason, Ecology recommends the Legislature consider expanding the range of power plants that are defined as baseload power plants and are therefore subject to meeting the EPS. Ecology suggests the Legislature include fossil fuel-fired power plants that operate at capacity factors between 40 and 60 percent as covered generation under this law.

In addition, the Legislature may wish to clarify how GHG emissions from the Centralia Power Plant are to be addressed if the power plant were to continue operation using natural gas to fire one or both units at the plant after the required cessation of coal combustion in 2025.

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<sup>27</sup> A peaking power plant is intended to operate sporadically and for short periods. Typical capacity factors for such plants are 20 percent or less.

## **Appendices**

### **References**

Seventh Northwest Conservation and Electric Power Plan, Northwest Power and Conservation Council, Document 2016-02, February 25, 2016. This document is commonly referred to as the “7th Power Plan” or the “NWPPCC 7th Power Plan.”

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