



Regulatory Assistance Project
Research Brief

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Emissions Performance Standards in Selected States

T*The Regulatory Assistance Project Research Staff prepared this summary of Emissions Performance Standards (EPS) that have been adopted by various states in the US. It is designed to provide a comparative summary of key EPS components for the interested reader—rather than attempt to evaluate the relative merits of the alternative approaches discussed in the summary. Each of the state summaries includes links to applicable laws and rules.*

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An Emissions Performance Standard (EPS) establishes a maximum level of CO₂ emissions (or CO₂ equivalent) per unit of output from an electricity-generating power plant. Some have described an EPS as analogous to an energy efficiency appliance standard set for appliances such as refrigerators, where there are minimum performance standards and beyond that it is up to the market to compete, so long as they meet or exceed the minimum standard.

EPSs have been adopted or are being considered in a variety of jurisdictions. Since California adopted its EPS in 2006, Washington and Oregon have adopted EPSs. Montana has also adopted a law imposing restraints on emissions from coal plants. This summary presents an overview of recent state policies on EPSs.

California

California's EPS statute (Senate Bill (SB) 1368) was enacted in September 2006

and detailed regulations were introduced in January 2007. In SB 1368, the California Legislature concluded that an EPS was necessary to protect ratepayers and the economy from certain risks and costs and as a complement to other key policies that encouraged investment in cost-effective energy efficiency and renewable energy resources.¹

Covered Procurements

The California EPS establishes a facility threshold based on the power plant's capacity factor.² More specifically, the EPS applies to any and all long-term financial commitments³ with "baseload" facilities defined as powerplants that are designed and intended to provide electricity at an annualized plant capacity factor of at least 60%.⁴ These are facilities that essentially operate "24/7" and are not able to ramp up and down quickly, provide spinning reserves, or exhibit other operating characteristics that are associated with load-

following or peaking resources. The CPUC's Decision 07-01-039 provides a summary of the long-term commitments, both new ownership investments and new contract commitments (including renewal contracts), that are covered by the California EPS.⁵

Level of Emissions Performance Standard

Pursuant to SB 1368, the performance level of the EPS must be no higher than the emissions rate of a combined-cycle gas turbine (CCGT) powerplant but does not specify the emissions rate for a CCGT.⁶ Based on its review of emissions rates associated with various CCGT powerplants, the CPUC adopted an EPS emissions rate of 1100 lbs CO₂/MWh.⁷

Treatment of Renewables

The CPUC made an up-front determination that the following renewable resources and technologies are EPS-compliant: solar thermal electric (with up to 25% gas heat input), wind, geothermal (with or without reinjection) and generating facilities (e.g., agricultural and wood waste, landfill gas) using biomass that would otherwise be disposed of utilizing open burning, forest accumulation, landfill, spreading or composting.⁸

Calculation of Net Emissions for Combined Heat and Power

SB 1368 directed the CPUC to adopt a methodology for calculating the emissions rate associated with cogeneration facilities that recognizes both the thermal output (heat or steam) and the electrical output associated with cogeneration.⁹ The CPUC discusses its calculation of emissions associated with cogeneration in Decision 07-01-039.¹⁰

Consideration of Carbon Capture and Storage

The California EPS allows for carbon capture and storage (CCS)¹¹— but only if an investor can show it works. California's EPS statute provides that “[c]arbon dioxide that is injected in geographical formations, so as to prevent releases into the atmosphere, in compliance with applicable laws and regulations shall not be counted as emissions of the powerplant in determining compliance” with the EPS.¹² In implementing this directive, the CPUC determined that any facility that proposes to use CCS to meet the standard must present a “reasonable and economically and technically feasible plan that will result in a permanent sequestration of CO₂ once the injection project [i.e., injection of CO₂ into permanent geological storage] is operational and that the CO₂ injection project complies with applicable laws and regulations.”¹³

Citations

Senate Bill 1368 (Stats 2006, ch. 598):

http://www.leginfo.ca.gov/pub/05-06/bill/sen/sb_1351-1400/sb_1368_bill_20060929_chaptered.pdf.

CPUC Decision 07-01-039 issued on January 25, 2007 in Rulemaking 06-04-009: http://www.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/64072.htm.

Washington

Washington's Emissions Performance Standard (SB 6001) became law in May 2007, and became effective July 22, 2007. It was modeled on California's EPS (SB 1368). The key features of Washington's EPS law are summarized below.

Covered Procurements

All baseload electric generation for which electric utilities enter into long-term financial commitments on or after July 1, 2008. (“Baseload electric generation” is defined to mean electric generation from a

power plant that is designed and intended to provide electricity at an annualized plant capacity factor of at least 60%. “Electric utility” means both investor owned utilities (IOUs) and consumer-owned utilities (COUs). “Long-term financial commitment” means: 1) either a new ownership interest in baseload electric generation or an upgrade (which increases capacity) to a baseload electric generation facility; or 2) a new or renewed contract for baseload electric generation with a term of five or more years for the provision of retail power or wholesale power to end-use customers in Washington.)

Some facilities are grandfathered or do not need to comply with the standard, as follows: 1) baseload generation facilities in operation as of June 30, 2008, until they are the subject of long-term financial commitments; 2) all electric generation facilities or power plants powered exclusively by renewable resources¹⁴; and 3) cogeneration facilities fueled by natural gas or waste gas in operation as of June 30, 2008, until they are the subject of a new ownership interest or are upgraded.

In addition, the following emissions produced by baseload electric generation are not required to meet the standard: 1) emissions that are injected permanently in geological formations; 2) emissions that are permanently sequestered by other means approved by the Washington Department of Ecology; and 3) emissions sequestered or mitigated under a plan approved by the Washington Energy Facility Site Evaluation Council (EFSEC), as specified in this law.

The Commission may provide a case-by-case exemption from the EPS to address: 1) unanticipated electric system reliability needs; 2) catastrophic events or threat of significant financial harm that may arise from unforeseen circumstances.

It appears to be an open question whether the law covers out-of-state

generation. The issue is likely to be resolved by court decision or the commission’s interpretation when an actual case tests the issue.¹⁵

Level of the Emissions Performance Standard

The standard is the lower of 1) 1,100 pounds of GHG per MWh; or 2) the average available GHG emissions output as determined and updated by the Washington Department of Community, Trade & Economic Development (CTED). In order to update the standard, CTED must conduct a survey every 5 years of new combined-cycle natural gas thermal electric generation turbines commercially available and offered for sale by manufacturers and purchased in the US. CTED must use the survey results to adopt by rule the average available GHG emissions output. The survey results must be reported to the Legislature every 5 years, beginning June 30, 2013. The CTED must also consult with specified groups (such as the Bonneville Power Authority) and consider the effects of the standard on system reliability and the overall costs to electricity consumers.

Treatment of Renewables

As discussed under “Covered Procurements” above, electric generation facilities or power plants powered exclusively by renewable resources do not have to comply with the EPS. “Renewable resources” are defined (in RCW 19.280.020) as electricity generation facilities fueled by: (a) water; (b) wind; (c) solar energy; (d) geothermal energy; (e) landfill gas; (f) biomass energy utilizing animal waste, solid organic fuels from wood, forest, or field residues or dedicated energy crops that do not include wood pieces that have been treated with chemical preservatives such as creosote, pentachlorophenol, or copper-chrome-arsenic; (g) byproducts of pulping or wood

manufacturing processes, including but not limited to bark, wood chips, sawdust, and lignin in spent pulping liquors; (h) ocean thermal, wave, or tidal power; or (i) gas from sewage treatment facilities.

Language about Carbon Sequestration Technologies

As discussed under “Covered Procurements” above, emissions from certain facilities using identified carbon sequestration technologies are not required to meet the EPS. Section 5, Subsections (11)-(13) of SB 6001 include additional language regarding state review of emissions from plants employing carbon sequestration technologies.

Other Information

The EPS is enforced in the following ways. For IOUs, the Washington Utilities and Transportation Commission (WUTC) must review a long-term financial commitment in a general rate case. WUTC must also review an IOU’s proposed decision to acquire electric generation or enter into a power purchase agreement for electricity. WUTC must consult with the Washington Department of Ecology when verifying compliance with the EPS. For COUs, the utility’s governing board must review a long-term financial commitment in consultation with the Washington Department of Ecology, after which the State Auditor is responsible for auditing compliance with the EPS and the Attorney General is responsible for enforcing compliance.

Rules were adopted on June 24, 2008 by the EFSEC and Washington Department of Ecology to implement and enforce the EPS, including the evaluation of sequestration and mitigation plans. The rules are as follows:

Chapter 463-85 WAC: Greenhouse Gases Emissions Performance Standard and

Sequestration Plans and Programs for Baseload Electric Generating Facilities

Chapter 463-80 WAC: Carbon Dioxide Mitigation for Thermal Electric Generating Facilities

The EPS must be reviewed no less than every 5 years or upon implementation of a federal or state law or rule regulating carbon dioxide emissions of electric utilities.

Citations

SB 6001: <http://apps.leg.wa.gov/billinfo/summary.aspx?year=2007&bill=6001>; Washington Administrative Code rules to enforce the law: <http://www.efsec.wa.gov/rulerev.shtml#CO2>

Montana

Montana’s law regarding constraints on coal plants (HB 25) was passed in May 2007. The key features of HB 25 are summarized below.

Covered Procurements

The Commission may not approve an application for an acquisition of an equity interest or lease in a facility or equipment used to generate electricity that is primarily fueled by coal and that is constructed after January 1, 2007. This law only applies to Northwest Energy as a formerly restructured utility, and it only applies when the utility is seeking pre-approval of an electricity supply resource that is not yet procured. It also does not apply to entities not under Commission jurisdiction, such as rural electric cooperatives which serve about 1/3 of the state.¹⁶

Level of the Emissions Performance Standard

The facility or equipment must capture and sequester a minimum of 50% of the carbon dioxide produced by the facility.

Treatment of Renewables

Not applicable.

Language about Carbon Sequestration Technologies

As discussed above, affected facilities or equipment must capture or sequester a minimum of 50% of the carbon dioxide produced by the facility or equipment. Carbon dioxide captured by a facility or equipment may be sequestered off-site from the facility or equipment.

Other Information

The law applies until the state or federal government has adopted uniformly applicable statewide standards for the capture and sequestration of carbon dioxide.

The law is currently untested. The Commission updated existing rules to adopt the law, but the rules simply refer to the law.¹⁷

Citations

Montana Code Annotated 69-8-421 (section (8) quoted above):
<http://data.opi.mt.gov/bills/mca/69/8/69-8-421.htm>; HB 25: <http://data.opi.mt.gov/bills/2007/billpdf/HB0025.pdf>

Oregon

Oregon's EPS law (SB 101; Chapter 751, 2009 Laws) was signed by the Governor on July 22, 2009. SB 101 will take effect on January 1, 2010 and sections 1 through 7 of the bill will become operative on July 1, 2010.¹⁸ Like Washington's EPS law, SB 101 incorporates many of the key features of California's EPS law (SB 1368).

Level of the Emissions Performance Standard

The Oregon Public Utility Commission (OPUC) has jurisdiction over electric companies¹⁹ and electricity service suppliers.²⁰ SB 101 gives the State Department of Energy (State DOE) limited oversight authority over COUs regarding the EPS. Section 2²¹ of SB 101 establishes the level of the EPS for entities subject to

the OPUC's jurisdiction. Subsection 2(1) sets the EPS at 1,100 pounds of GHG²² per MWh for a generating facility. Subsection 2(4) directs the OPUC to review the EPS "no more than once every three years." After review, the OPUC may modify by rule the EPS²³ and the GHGs included under the EPS. (Subsections 2(4)(a) and (b)) Subsection 2(4) requires the OPUC to consult with the State DOE during its review of the EPS. Subsection 2(6) governs the OPUC's reporting requirements regarding the EPS.

Section 3 of SB 101 establishes parallel requirements for the State DOE and COUs.

Long-Term Financial Commitments

Section 4 of SB 101 relates to long-term financial commitments²⁴ made by entities subject to the jurisdiction of the OPUC. Subsection 4(1)(a) provides that "[a]n electric company or electricity service supplier may not enter into a long-term financial commitment unless the baseload electricity²⁵ acquired under the commitment is produced by a generating facility that complies with" the Oregon EPS. Subsection 4(b) provides that a facility complies with the Oregon EPS "if the rate of emissions of the facility does not exceed the emissions standard." Subsection 4(c) requires that "the total emissions associated with producing baseload electricity at the generating facility are included in determining the rate of emissions of greenhouse gases." "Total emissions" do not include "emissions associated with transportation, fuel extraction or other life-cycle emissions associated with obtaining the fuel for the facility."

Some long-term financial commitments are exempted from the EPS requirement. Subsection 4(2) provides that the EPS does not apply to emissions from renewable energy resources, certain cogeneration facilities²⁶ and facilities that have "in place a

plan, as determined by the Public Utility Commission, to be a low-carbon emissions resource, pursuant to sufficient technical documentation, within seven years of commencing plant operations.”²⁷

Subsection 4(3) authorizes the OPUC to exempt certain long-term financial commitments by an electric company or an electricity service supplier in the case of unanticipated system reliability needs, catastrophic events or significant financial harm due to unforeseen circumstances. Subsection 4(4) provides that an electric company does not need to comply with the EPS for long-term financial commitments for which the company does not seek recovery of the costs in retail sales in the state.

Section 5 of SB 101 establishes parallel requirements and authorizations for the State DOE and COUs.

Treatment of Renewables

Subsection 4(2)(a) provides that emissions from a facility that is powered exclusively by renewable energy sources is exempt from the EPS requirement. “Renewable energy sources” are listed in ORS 469A.025 which can be found at <http://www.leg.state.or.us/ors/469a.html>.

Calculation of Net Emissions for Combined Heat and Power

As discussed in the “Long-Term Financial Commitments” section above, some cogeneration facilities are exempted from the EPS requirement.

Subsection 1(11) defines “output-based methodology” as “a greenhouse gas emissions standard that is expressed in pounds of greenhouse gases emitted per megawatt-hour, factoring in the useful thermal energy employed for purposes other than the generation of electricity.”

Subsection 2(3) directs the OPUC to establish an output-based methodology for cogeneration facilities. Subsection 2(5)

provides that: “In modifying the greenhouse gas emissions standard, the commission shall:

- (a) Use an output-based methodology to ensure that the calculation of greenhouse gas emissions through cogeneration recognizes the total usable energy output of the process and includes all greenhouse gases emitted by the generating facility in the production of both electrical and thermal energy; and
- (b) Consider the effects of the emissions standard on system reliability and overall costs to electricity consumers.”

Consideration of Carbon Capture and Storage

As discussed above, some long-term financial commitments are exempted from the EPS requirement. Subsection 4(2)(c) provides that the EPS does not apply to emissions from a generating facility that has “in place a plan, as determined by the Public Utility Commission, to be a low-carbon emissions resource, pursuant to sufficient technical documentation, within seven years of commencing plant operations.” As also noted above, an OPUC staff person familiar with SB 101 indicated that this language is intended to include coal plants with a plan to capture and sequester carbon emissions within a designated period of time. There are no explicit references to CCS in SB 101.

Enforcement

Subsection 6(1)(a) provides that the OPUC “may not acknowledge in an integrated resource plan, or allow in customer rates, the costs of a long-term financial commitment by and electric company or by an electricity service supplier unless” the facility complies with the EPS. Subsection 6(1)(b) requires the OPUC to revoke the certificate of an

electricity service supplier if it serves customers in the state with baseload electricity from a facility that does not comply with the EPS. SB 101 does not include specific enforcement language relating to COUs.

Status of Rulemaking Process

Section 8 of SB 101 requires the OPUC and State DOE to adopt rules necessary to implement the new EPS. As of September 16, 2009, neither the OPUC nor the State DOE has commenced a rulemaking proceeding to implement the EPS.

Rate Impacts

Section 9 of SB 101 directs the OPUC to develop estimates of the rate impacts for IOUs to meet alternative GHG reduction levels and report its findings to the Legislature every two years. Pursuant to section 12 of SB 101, section 9 sunsets on January 2, 2020.

Citations

SB 101: <http://www.leg.state.or.us/09reg/measpdf/sb0100.dir/sb0101.en.pdf>

¹ Both the California Legislature and the California Public Utilities Commission (CPUC) concluded that if utilities or other load-serving entities were allowed to enter into new long-term commitments with high-greenhouse gas (GHG) emitting power plants, California ratepayers would be exposed to high costs of retrofits (or the need to purchase expensive offsets) under future emission control regulations. California ratepayers would also be exposed to potential supply disruptions when these high-emitting facilities are taken off line for retrofits, or retired early, in order to comply with future regulations. SB 1368, Section 1(f)-(m) at http://www.leginfo.ca.gov/pub/05-06/bill/sen/sb_1351-1400/sb_1368_bill_20060929_chaptered.pdf. CPUC Decision 07-01-039 issued on January 25, 2007 in Rulemaking 06-04-009, at page 3. http://www.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/64072.htm.

² “Capacity factor” is defined as the ratio of the annual amount of electricity produced by the power plant divided by the annual amount of electricity the plant could have produced based on maximum rated capacity (or maximum “permitted” capacity, if the permit limits maximum plant operation below the facility’s rated capacity.)

³ The California EPS is codified at Public Utilities Code section 8340-8341. “Long-term financial commitment” is defined at subsection 8340(j).

⁴ “Baseload generation” is defined at subsection 8340(a).

⁵ CPUC Decision 07-01-039 at page 6.

⁶ Subsection 8341(d).

⁷ CPUC Decision 07-01-039 at page 6.

⁸ CPUC Decision 07-01-039 at page 10.

⁹ Subsection 8341 (d)(3).

¹⁰ CPUC Decision 07-01-039 at page 10.

¹¹ Carbon capture and storage (CCS) –also referred to as “carbon sequestration”-- is an approach to mitigating GHG emissions based on capturing CO₂ from large point sources such as coal generation plants and storing it (e.g., by injecting the CO₂ into geological formations) instead of releasing it into the atmosphere.

¹² Subsection 8341 (d)(5).

¹³ CPUC Decision 07-01-039, Attachment 7, page 5. http://www.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/64072.htm

¹⁴ “Renewable resources” are defined below under the heading “Treatment of Renewable Resources.”

¹⁵ E-mail with Dick Byers, Senior Policy Advisor, Washington Utilities and Transportation Commission, 10-10-08.

¹⁶ Interview with Will Rosquist, Rate Analyst, MT PSC, 10-10-08.

¹⁷ Interview with Will Rosquist, Rate Analyst, MT PSC, 10-10-08.

¹⁸ Section 13 of SB 101.

¹⁹ “Electric company” means an entity engaged in the business of distributing electricity to retail electricity consumers in this state, but does not include a consumer-owned utility. (Oregon Revised Statutes (ORS) 757.600)

²⁰ “Electricity service supplier” means a person or entity that offers to sell electricity services available pursuant to direct access to more than one retail electricity consumer. “Electricity service supplier” does not include an electric utility selling electricity to retail electricity consumers in its own service territory. (ORS 757.600)

²¹ All “section” and subsection” references in the Oregon section of this summary are to SB 101.

²² EPS applies only to CO₂ unless modified by the OPUC. (Subsection 2(2))

²³ Subsection 2(4)(b) provides that the OPUC may “[m]odify the emissions standard based upon current information on the rate of greenhouse gas emissions from a commercially available combined-cycle natural gas generating facility that:

(A) Employs a combination of one or more gas turbines and one or more steam turbines and produces electricity in the steam turbines from waste heat produced by the gas turbines;

(B) Has a heat rate at high elevation within the boundaries of the Western Electricity Coordinating Council; and

(C) Has a heat rate at ambient temperatures when operating during the hottest day of the year.”

²⁴ “Long-term financial commitment” means an investment in or upgrade of a generating facility that produces baseload electricity, or a contract with a term of more than five years that includes acquisition of baseload electricity. (Subsection 1(10)(a))

²⁵ “Baseload electricity” is defined as “electricity produced by a generating facility that is designed and intended, at the time a site certificate is issued to the owner of the facility, to provide electricity on a continuous basis at an annual

plant capacity factor of at least 60 percent.” (Subsection 1(3)(a)) PURPA Qualifying Facilities and peaking plants are exempted from the definition of baseload. (Subsection 1(3)(b))

²⁶ These include cogeneration facilities located in the state that are “fueled by natural gas, synthetic gas, distillate fuels, waste gas or a combination of these fuels, and that is producing energy, in service for tax purposes, commercially operable, or in rates as of July 1, 2010, until the facility is subject to a new long-term financial commitment.” (Subsection 4(2)(b))

²⁷ An OPUC staff person familiar with SB 101 indicated that this language is intended to include coal plants with a plan to capture and sequester carbon emissions within a designated period of time.