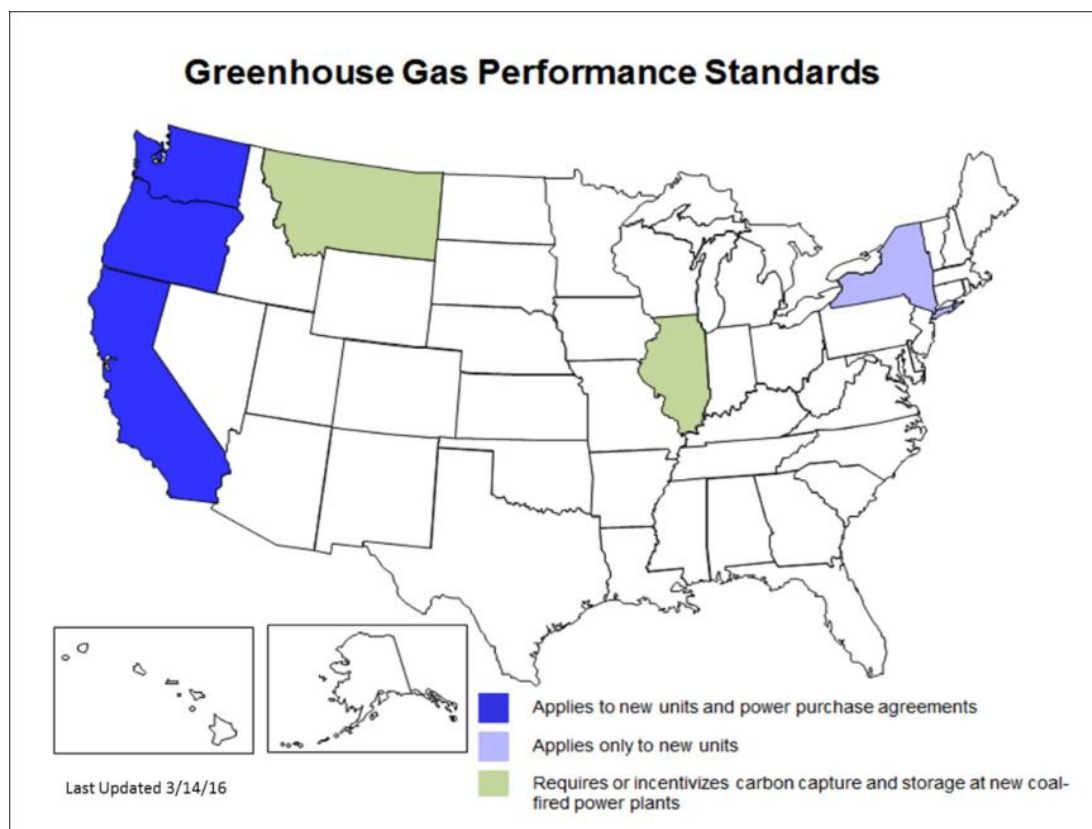


## **ii. CO<sub>2</sub> Emissions Performance Standards**

### **Description**

CO<sub>2</sub> emissions performance standards can apply either directly to EGUs or to the local distribution company (LDC) that sells electricity to the customers. (For more information about how electricity is generated and distributed, see Chapter 2 of the Regulatory Impact Analysis).

Figure 4: States with Greenhouse Gas Performance Standards



As shown above in Figure 4, , as of March 2016, four states—California, New York, Oregon, and Washington—have enacted mandatory GHG emissions standards that impose enforceable emissions limits on new and/or expanded electric generating units.<sup>54</sup> Three states—California, Oregon, and Washington—have enacted mandatory GHG emissions performance standards that set an emissions rate for electricity purchased by electric utilities.<sup>54</sup> In addition to these states, Illinois and Montana have policies to incentivize or require new coal plants to capture at least 50 percent of their CO<sub>2</sub> emissions.<sup>54</sup>

<sup>54</sup> California Energy Commission, California SB 1368, Chapter 598: Emission Performance Standards, September 29, 2006. Available at: [http://www.energy.ca.gov/emission\\_standards/](http://www.energy.ca.gov/emission_standards/). New York Department of Environmental Conservation, Part 251: CO<sub>2</sub> Performance Standards for Major Electric Generating Facilities, June 12, 2012. Available at: [https://govt.westlaw.com/nycrr/Browse/Home/NewYork/NewYorkCodesRulesandRegulations?guid=I5d3c9d90eaf b11e19f380000845b8d3e&originationContext=documenttoc&transitionType=Default&contextData=\(sc.Default\)](https://govt.westlaw.com/nycrr/Browse/Home/NewYork/NewYorkCodesRulesandRegulations?guid=I5d3c9d90eaf b11e19f380000845b8d3e&originationContext=documenttoc&transitionType=Default&contextData=(sc.Default)). Oregon Department of Energy, Oregon’s Carbon Dioxide Emission Standards for New Energy Facilities (Oregon Department of Energy, 2010). Available at: <http://www.oregon.gov/energy/Siting/docs/Reports/CO2Standard.pdf>. Washington State Legislature, Chapter 80.70 RCW: Carbon Dioxide Mitigation. Available at: <http://apps.leg.wa.gov/rcw/default.aspx?cite=80.70&full=true>. Illinois General Assembly, Public Act 095-1027, SB1987, Clean Coal Portfolio Standard Law, January 12, 2009. Available at: <http://ilga.gov/legislation/publicacts/95/PDF/095-1027.pdf>. Montana State Legislature, H.B.0025.05, An Act Generally Revising the Electric Utility Industry and Customer Choice Laws, May 14, 2007. Available at: <http://leg.mt.gov/bills/2007/billpdf/HB0025.pdf>.

## Policy Mechanics

### **Design**

States have implemented three different types of CO<sub>2</sub> performance standards that affect EGUs and/or LDCs differently. The first requires power plant emissions per electricity generated to be less than or equivalent to an established standard and is directly applicable to EGUs. The second type places conditions on the emissions attributes of electricity procured by electric utilities. It consists of standards that are applicable to LDCs that provide electricity to retail customers. A third type requires that new coal-fired power plants must capture and store a specific percentage of CO<sub>2</sub> emissions. Table 2 provides state examples for each of the types of CO<sub>2</sub> performance standards.

### **Authority**

In some states, programs are regulated through the Public Utilities Commission (California, Montana).<sup>55,56</sup> Oregon's program is regulated through the Oregon Energy Facility Siting Council.<sup>57</sup> New York's program is regulated through the Department of Environmental Conservation.<sup>58</sup> Washington's program is regulated through two different sets of entities depending on the ownership of the utilities. The Washington Department of Community, Trade & Economic Development (CTED) is responsible for updating the emissions performance standard every five years.<sup>59</sup> In addition, the Washington Energy Facility Site Evaluation Council (EFSEC) is in charge of evaluating and licensing state power plants.<sup>60</sup> Illinois's program is regulated by the Illinois Commerce Commission.<sup>61</sup>

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<sup>55</sup> California Energy Commission, "California SB 1368, Chapter 598: Emission Performance Standards" (September 29, 2006). Available at: [http://www.energy.ca.gov/emission\\_standards/](http://www.energy.ca.gov/emission_standards/).

<sup>56</sup> Center for Climate and Energy Solutions (C2ES), "Standards and Caps for Electricity GHG Emissions" (C2ES, 2015) accessed March 10, 2016. Available at: <http://www.c2es.org/us-states-regions/policy-maps/electricity-emissions-caps>.

<sup>57</sup> Oregon Department of Energy, *Oregon's Carbon Dioxide Emission Standards for New Energy Facilities* (Oregon Department of Energy, 2010). Available at: <http://www.oregon.gov/energy/Siting/docs/Reports/CO2Standard.pdf>.

<sup>58</sup> New York Department of Environmental Conservation, "DEC Adopts Ground-Breaking Power Sector Regulations to Analyze Possible Environmental Impacts and Limit CO<sub>2</sub> Emissions from Power Plants," (NY DEC, 2012). Available at: <http://www.dec.ny.gov/press/83269.html>.

<sup>59</sup> Regulatory Assistance Project, "Emissions Performance Standards in Selected States" (RAP, 2009). Available at: [http://www.raponline.org/docs/RAP\\_Simpson\\_EPSResearchBrief\\_2009\\_11\\_13.pdf](http://www.raponline.org/docs/RAP_Simpson_EPSResearchBrief_2009_11_13.pdf).

<sup>60</sup> State of Washington, "Energy Facility Site Evaluation Council" (State of Washington, 2015), accessed March 10, 2016. Available at: <http://www.efsec.wa.gov/default.shtm>.

<sup>61</sup> State of Illinois, "Illinois SB 1987: Clean Coal Portfolio Standard Law" (January 12, 2009). Available at: <http://www.c2es.org/docUploads/IL%20SB1987%20Coal.pdf>.

### ***Obligated Parties***

The emissions performance standard can apply either directly to EGUs or to the local distribution company (LDC) that sells electricity to the customer.

### ***Measurement and Verification***

Obligated parties must measure and report on electricity generation and CO<sub>2</sub> emissions on a regular basis to verify their compliance with the standard. The reporting requirements and timing varies from state to state and are typically set by the agency that oversees the program as described under authority above.

Table 2 provides an overview of different CO<sub>2</sub> performance standards, while Table 3 provides examples regarding measurement and verification requirements across California, New York, Oregon, and Washington.

**Table 2: Examples of State CO<sub>2</sub> Performance Standards**

What It Does	State Examples
Requires power plant emissions per electricity generated to be less than or equivalent to the established standard; applies to EGUs	<ul style="list-style-type: none"> <li>• <u>New York</u> (Part 251, 2012) – New or expanded baseload plants (25 MW and larger) must meet an emissions rate of either 925 lbs. CO<sub>2</sub>/MWh (output based) or 120 lbs CO<sub>2</sub>/MMBTU (input based). Non-baseload plants (25 MW and larger) must meet an emissions rate of either 1450 lbs. CO<sub>2</sub>/MWh (output based) or 160 lbs. CO<sub>2</sub>/MMBTU (input based).<sup>62</sup></li> <li>• <u>Oregon</u> (HB 3283; 1997, 2007) – New natural gas-fired power plants (baseload and non-baseload) must meet an emissions rate of 675 lbs. CO<sub>2</sub>/MWh. Cogeneration and offsets may be used to comply with the emissions standard.<sup>63</sup> Baseload power plants must meet an emissions rate of 1,100 lbs. CO<sub>2</sub>/MWh.<sup>64</sup></li> <li>• <u>Washington</u> (RCW 80-70-010; 2004, SB 6001) – New EGUs 25 MW and larger must have an approved CO<sub>2</sub> mitigation plan that results in mitigation of 20 percent of the total CO<sub>2</sub> emissions over the life of the facility; includes modifications to existing EGUs that result in an increase in CO<sub>2</sub> emissions of 15 percent or more. The CO<sub>2</sub> mitigation plan may include one or more of a list of eligible measures (includes indirect measures, such as EE/RE and offsets).<sup>65</sup> Baseload power plants must meet an emissions rate of 1,100 lbs. CO<sub>2</sub>/MWh.<sup>66</sup></li> </ul>
Places conditions on the emissions attributes of electricity procured by electric utilities; applies to LDCs	<ul style="list-style-type: none"> <li>• <u>California</u> (SB 1368; 2006) – Electric utilities may only enter into long-term power purchase agreements for baseload power if the electric generator supplying the power has a CO<sub>2</sub> emissions rate that does not exceed that of a natural gas combined cycle plant. The California Energy Commission promulgated regulations establishing an emissions rate of 1,100 lbs. CO<sub>2</sub>/MWh.<sup>67</sup> By comparison, the average emissions rate of gas plants in the U.S. is 945 lbs. CO<sub>2</sub>/MWh, while the average emissions rate of pulverized coal plants is 2,154 lbs. CO<sub>2</sub>/MWh.<sup>68</sup></li> <li>• <u>Oregon</u> (HB SB 101; 2009) and <u>Washington</u> (SB 6001; 2007) – Electric utilities may only enter into long-term power purchase agreements for baseload power if the electric generator supplying the power has a CO<sub>2</sub> emissions rate of 1,100 lbs. CO<sub>2</sub>/MWh or less.</li> </ul>

<sup>62</sup> New York Department of Environmental Conservation, “DEC Adopts Ground-Breaking Power Sector Regulations to Analyze Possible Environmental Impacts and Limit CO<sub>2</sub> Emissions from Power Plants,” (NY DEC, 2012). Available at: <http://www.dec.ny.gov/press/83269.html>.

<sup>63</sup> Oregon Department of Energy, *Oregon’s Carbon Dioxide Emission Standards for New Energy Facilities* (Oregon Department of Energy, 2010). Available at: <http://www.oregon.gov/energy/Siting/docs/Reports/CO2Standard.pdf>.

<sup>64</sup> Center for Climate and Energy Solutions (C2ES), *Standards and Caps for Electricity GHG Emissions* (C2ES, 2015), accessed March 10, 2016. Available at: <http://www.c2es.org/us-states-regions/policy-maps/electricity-emissions-caps>.

<sup>65</sup> Washington State Legislature, Chapter 80.70 RCW: Carbon Dioxide Mitigation. Available at: <http://apps.leg.wa.gov/rcw/default.aspx?cite=80.70&full=true>.

<sup>66</sup> Center for Climate and Energy Solutions (C2ES), *Standards and Caps for Electricity GHG Emissions* (C2ES, 2015), accessed March 10, 2016. Available at: <http://www.c2es.org/us-states-regions/policy-maps/electricity-emissions-caps>.

<sup>67</sup> California Energy Commission, California SB 1368, Chapter 598: Emission Performance Standards, September 29, 2006, accessed March 10, 2016. Available at: [http://www.energy.ca.gov/emission\\_standards/](http://www.energy.ca.gov/emission_standards/).

<sup>68</sup> U.S. EPA, *eGRID 2010 data files* (U.S. Environmental Protection Agency, 2014), accessed March 10, 2016. Available at: <https://www.epa.gov/energy/egrid>. See “Download all eGRID files (1996-2012) (ZIP)” link.

What It Does	State Examples
Requires that new coal-fired power plants must capture and store a specific percentage of CO <sub>2</sub> emissions	<ul style="list-style-type: none"> <li>• <u>Illinois</u> (SB 1987; 2009) – Illinois utilities and retailers must purchase at least 5 percent of their electricity from Clean Coal Facilities in 2015 and beyond. To be designated a Clean Coal Facility, new coal-fired power plants must capture and store 50 percent of carbon emissions from 2009-2015, 70 percent for 2016-2017, and 90 percent after 2017.<sup>69</sup></li> <li>• <u>Montana</u> (HB 25; 2007) – The Public Service Commission may not approve new plants constructed after January 2007 that are primarily coal-fired unless at least 50 percent of the plant’s CO<sub>2</sub> emissions are captured and stored. These requirements apply to formerly restructured utilities in the state. Northwest Energy is the only utility subject to this requirement, which serves about two-thirds of Montana.</li> </ul>

**Table 3: Examples of Measurement and Verification Requirements for CO<sub>2</sub> Performance Standards**

State	Measurement and Verification Details
California	<ul style="list-style-type: none"> <li>• The California PUC is responsible for approving any long-term financial commitment by an electric utility and must adopt rules to enforce these requirements as well as verification procedures.<sup>70</sup></li> </ul>
New York	<ul style="list-style-type: none"> <li>• CO<sub>2</sub> emissions regulations require recordkeeping, monitoring, and reporting consistent with existing state and federal regulations.</li> <li>• Each applicable emissions source must install Continuous Emissions Monitoring Systems (CEMS) subject to federal CO<sub>2</sub> reporting requirements for 40 CFR part 75, successfully complete certification tests, and record, report, and quality assure the data from the CEMS.</li> <li>• The owner or operator must report the CO<sub>2</sub> mass emissions data and heat input data on a semi-annual basis to the Department of Environmental Conservation.</li> <li>• On a quarterly basis, the owner or operator must report all of the data and information required in either 40 CFR part 60 or subpart H of 40 CFR part 75.<sup>71</sup></li> </ul>

<sup>69</sup> Illinois General Assembly, Public Act 095-1027, SB1987, Clean Coal Portfolio Standard Law, January 12, 2009. Available at: <http://ilga.gov/legislation/publicacts/95/PDF/095-1027.pdf>.

<sup>70</sup> “SB 1368 Emission Performance Standards,” California Energy Commission, accessed March 10, 2016. Available at: [http://www.energy.ca.gov/emission\\_standards/](http://www.energy.ca.gov/emission_standards/).

<sup>71</sup> New York Department of Environmental Conservation, “DEC Adopts Ground-Breaking Power Sector Regulations to Analyze Possible Environmental Impacts and Limit CO<sub>2</sub> Emissions from Power Plants” (NY DEC, 2012). Available at: <http://www.dec.ny.gov/press/83269.html>.

State	Measurement and Verification Details
Washington	<ul style="list-style-type: none"> <li>• Mitigation projects must be approved by the appropriate council, department, or authority, and made a condition of the proposed and final site certification agreement or order of approval.</li> <li>• Direct investment projects are approved if they provide reasonable certainty that the performance requirements of the projects will be achieved and that they were implemented after July 1, 2004.</li> <li>• For facilities under the jurisdiction of a council, the implementation of a carbon dioxide mitigation project, other than purchase of carbon credits, is monitored by an independent entity for conformance with the performance requirements of the carbon dioxide mitigation plan. The independent entity shares the project monitoring results with the council.</li> <li>• For facilities under jurisdiction of the department or authority, the implementation of a carbon dioxide mitigation project, other than a purchase of carbon credits, is monitored by the department or authority issuing the order of approval.<sup>72</sup></li> </ul>
Oregon	<ul style="list-style-type: none"> <li>• It is up to the Council during the certificate application phase to determine the gross CO<sub>2</sub> emissions over a 30-year lifetime of the proposed facility to determine whether it meets the CO<sub>2</sub> performance standard.</li> <li>• During the operation phase of approved facilities, there are CO<sub>2</sub> reporting requirements to the Oregon Department of Environmental Quality and US EPA.</li> <li>• New facilities must pass a 100-hour test in their first year of operation to show they meet the performance standards.<sup>73</sup></li> </ul>

**Penalties for Noncompliance**

For policies that affect new electric generating units, utilities must prove any proposed units are in compliance at the time of permitting. In Oregon, if facilities do not meet the performance standard in their first year of operation during a 100-hour test,<sup>74</sup> they must purchase offsets to account for any excess emissions.<sup>75</sup>

<sup>72</sup> Washington State Legislature, Chapter 80.70 RCW: Carbon Dioxide Mitigation. Available at: <http://apps.leg.wa.gov/rcw/default.aspx?cite=80.70&full=true>.

<sup>73</sup> Oregon Department of Energy, *Oregon’s Carbon Dioxide Emission Standards for New Energy Facilities* (Oregon Department of Energy, 2010). Available at: <http://www.oregon.gov/energy/Siting/docs/Reports/CO2Standard.pdf>.

<sup>74</sup> During the first year of operation new power plants test their equipment to ensure compliance with standards for commercial equipment. Initial CO<sub>2</sub> performance requirements can be validated during this test.

<sup>75</sup> Oregon Department of Energy, *Oregon’s Carbon Dioxide Emission Standards for New Energy Facilities*. Available at: <http://www.oregon.gov/energy/Siting/docs/Reports/CO2Standard.pdf>.

### Implementation Status

Between 2007, when California enacted the performance standard and 2013, California's carbon emissions rates fell from approximately 860 lbs. CO<sub>2</sub>e/MWh for all generation (considering both in-state and imported power) to approximately 710 lbs. CO<sub>2</sub>e/MWh.<sup>76</sup>

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<sup>76</sup> California Air Resources Board, *California Greenhouse Gas Emissions for 2000 to 2013 – Trends of Emissions and Other Indicators* (June 2015). Available at: [http://www.arb.ca.gov/cc/inventory/pubs/reports/ghg\\_inventory\\_trends\\_00-13%20\\_10sep2015.pdf](http://www.arb.ca.gov/cc/inventory/pubs/reports/ghg_inventory_trends_00-13%20_10sep2015.pdf).