



# Cutting carbon emissions from electricity generation



Robert J. Procter

Portland, OR, United States

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## ABSTRACT

Oregon's Clean Electricity and Coal Transition Plan does not prohibit delivery of coal-fired electricity to retail loads. Coal-fired electricity cannot be excluded from retail delivery given the interconnected Western grid. It also mandates new renewable performance standards that are the costliest approach of the policies reviewed. Cost adders tied to carbon emissions from all thermal generation are an effective approach to carbon reduction.

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## 1. Introduction

Science has settled the question of the impact human activity has on climate change. The issue of how best to reduce carbon emissions remains a ripe area for investigation. Nationally, electricity generation accounts for approximately 30% of total annual carbon emissions. Due to significant amounts of hydro power and 35 years of energy efficiency investments, the Pacific Northwest (PNW) is about twice as efficient as the U.S. overall. However, electric generation still accounts for about 32% of the PNW's total annual carbon emissions.<sup>1</sup>

In an effort to further reduce carbon emission from electric generation, Oregon enacted a law in March 2016 titled *The Clean Electricity and Coal Transition Plan* ("the Plan"). It has been heralded as the first of its kind in the nation and has received glowing press reports.<sup>2</sup> However, the facts are quite a bit less encouraging. What

follows is a review of relevant sections of Oregon's new law, including an assessment of whether California's experience provides insights to its effectiveness, and an evaluation of alternative carbon-related policies in the PNW.

Section 2 provides an overview of two relevant sections of the Plan.

Section 3 examines if coal plant divestiture in California resulted in coal plant closures. In light of testimony presented before the Oregon legislature, it is important to determine if a positive correlation exists between divestiture and coal plant closure, and if so, whether or not that result is suggestive of possible results of the Plan.

In light of news reports stating that the Plan prohibits electricity from coal-fired generating plants from serving retail load, Section 4 illustrates why it is impossible to prohibit coal-generated electricity from reaching retail loads.<sup>3</sup> In the process, it also identifies the sufficient condition for such an effort to be successful.

Section 5 explores the potential consequences of the Plan for retail rates in Oregon and carbon emission reductions. Finally, in Section 6 I present four conclusions with general applicability.

<sup>1</sup> E-mail address: [6020bob@gmail.com](mailto:6020bob@gmail.com) (R.J. Procter).

<sup>2</sup> "Carbon Emissions – a Northwest Perspective," PNUCC, July 2014, p. 6. See: [http://www.pnucc.org/sites/default/files/Carbon%20Emissions%20-%20a%20Northwest%20Perspective%20July%202014\\_0.pdf](http://www.pnucc.org/sites/default/files/Carbon%20Emissions%20-%20a%20Northwest%20Perspective%20July%202014_0.pdf).

<sup>3</sup> Oregon Public Radio (OPB) ran a story with a narrative that reflected the environmental community's pitch. OPB's report noted that the Plan "... put an expiration date of 2025 on all coal-fired power coming into the state and ... require[s] utilities to replace electricity from coal with power that is 90% cleaner." Other examples include the following headlines: "Oregon Passes Historic Bill to Phase Out Coal and Double Down on Renewables (NRDC)"; "Oregon Set To Become First Coal-Free State (Huffington Post)"; "Oregon Gov. Kate Brown signed one of the nation's most aggressive pieces of pro-climate legislation into state law Friday (U.S. News and World Report)"; and "How Oregon plans to quit coal (CS Monitor)." PAC's press release correctly stated its first key fact as requiring the removal of coal-fueled generation from Oregon rates by 2030.

<sup>3</sup> One example is an email dated Dec. 21, 2015, from Angus Duncan to Ruchi Sadhir. Duncan advises Sadhir that in his meeting with the governor the prior day he indicated that the "... emerging coal+renewables agreement ..." is moving along and he was "... working with the two utilities ..." on what effect the agreement will have on their "... share of Oregon's GHG [Green House Gas] inventory."

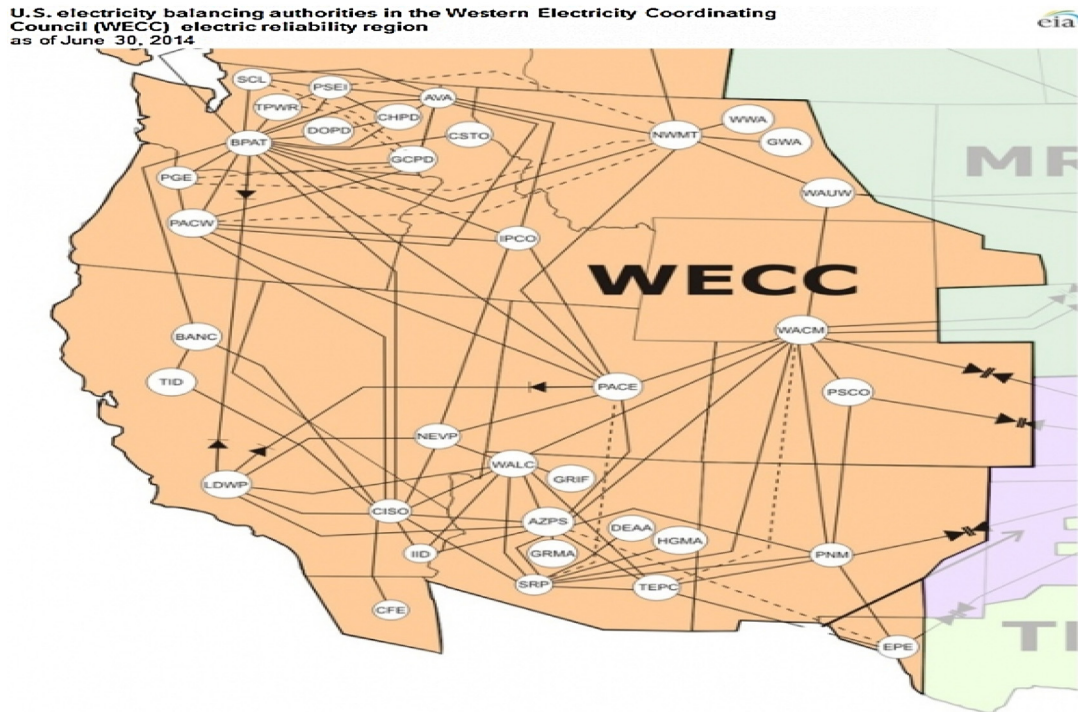


Fig. 1. Balancing authorities within the U.S. portion of WECC.

## 2. Oregon's clean electricity and coal transition plan

Retail loads in Oregon are met with electricity from a variety of generation types, much of it hydro. However, Oregon's two largest investor-owned utilities (IOUs), PacifiCorp (PAC) and Portland General Electric (PGE), both own coal plants. PGE has one coal plant and PAC operates several, which are listed in the [Appendix A](#).

The Plan was released to the public on Jan. 27, 2016, as HB 4036 (House version of SB1547-B). The first reading occurred on Feb. 1. Both bills were the product of behind-the-scenes negotiations between PAC, PGE, and a variety of consumer, environmental, and renewable resource advocates. The governor's staff worked closely with the parties once the bill was introduced. Email correspondence between the governor's energy advisor, Ruchi Sadhir, and Angus Duncan, president of the Bonneville Environmental Foundation and chair of the Oregon Global Warming Commission (OGWC), is illustrative of the extent of those behind-the-scenes discussions.<sup>3</sup>

Some confusion over what the Plan actually mandates can be attributed to wording of the title for Section 1, "ELIMINATION OF COAL FROM ELECTRICITY SUPPLY." The Plan does not mandate coal plant closure. Nor does it prohibit coal-fired electricity from serving retail load. Section 1(2) mandates that coal must be removed from a utility's allocation of electricity on or before Jan. 1, 2030. However, allocation of electricity is defined in Section 1(1)(a) as "... for the purpose of setting electricity rates, the costs and benefits associated with the resources used to provide electricity to an electric company's retail electricity consumers that are located in this state." Therefore, what the Plan mandates is that coal-fired generating plant *costs* (with some exceptions) must not appear in retail rates after Jan. 1, 2030.

The Plan also set higher RPS for 2025 and thereafter.<sup>4</sup> The life span of new renewable energy certificates (REC) was shortened to

five years (with exceptions), while existing and "golden" RECs have no expiration date. The requirements on electricity service suppliers were clarified. Storage costs can now be recovered automatically. Finally, there is a temporary off-ramp from the higher RPS if rates are expected to rise by more than 4%.

## 3. Coal in California and Oregon

In testimony before the legislature, Angus Duncan (Duncan) argued that mandated divestment in California resulted in the retirement of an equivalent amount of coal-fired generation. He argued that it is therefore reasonable to expect that same result from the Plan.<sup>5</sup> To his credit, he offered one caveat: if coal plant owners are able to re-dispatch their plants, it's possible that carbon emissions would be unchanged. He considered that unlikely.

It is worth noting that California still relies on coal-fired generation. Over the 2007–2014 period, in-state coal-fired generation remained fairly constant in percentage terms until 2013. As for the out-of-state fraction, it took a dip in 2012 before recovering in 2013 and dropping to 6% in 2014. Lastly, coal-fired electricity could also be embedded in market purchases. Evidence suggests that they are unable to determine the feedstock for approximately 15% of energy imported to California.<sup>6</sup>

AB1890, passed in September 1996, required the state's three IOUs to divest their generating resources (except hydro, nuclear, and existing QF contracts). That led to approximately 19,000 MW of generating capacity being acquired primarily by five merchant generation firms. Then, publicly owned utilities were required to

<sup>3</sup> "Carbon Effects of Clean Electricity and Coal Transition Plan, HB4036" testimony presented by Angus Duncan on behalf of the Oregon Global Warming Commission, before the House Committee on Energy and the Environment, Feb. 4, 2016.

<sup>6</sup> WECC covers eleven states, the two westernmost Canadian provinces, and the northern part of Baja California. Within that immense geographic area, coal comprised 26% of the approximately 234,000GWh of net generation. See: "2015 State of the Interconnection Reliability," WECC, See: <https://www.wecc.biz/Reliability/2015%20SOTI%20Final.pdf>.

<sup>4</sup> The percentage of retail load to be met by renewables increased from 25% to 27% in 2025, plus new RPS requirements of 35% by 2030, 45% by 2035, and 50% by 2040.

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