The Northwest & 111(d)

October 2014

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Memorandum

To: **PNUCC Board of Directors**

From: **Phillip Popoff, System Planning Committee Chair**

Date: **October 10, 2014**

Subject: **Report completed – The Northwest and 111(d)**

PNUCC's System Planning Committee (Committee) has been diving into the details of the recently proposed EPA rule to reduce carbon emissions from the existing electric power sector. This proposed rule has the potential to affect today's power system and influence what utilities build tomorrow.

This report overviews the proposal, discusses how it addresses CO_2 emissions and touches on key issues and questions that the Committee has with the rule as currently proposed. The report is written for utility planners and PNUCC Board members. As such, it frequently delves into the technical aspects of the proposal. Readers seeking a high level summary of the report's findings should flip forward to the executive summary on page five.

The EPA is accepting comments on the proposed rule until December 1, 2014. This report can help frame some of the areas of 111(d) that could use input from Northwest stakeholders.

I hope you find this document to be useful. Please direct any questions you may have to Tomás Morrissey at PNUCC – he can be reached at tomas@pnucc.org and 503.294.1259.

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Acknowledgements

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Executive Summary

On June 2, 2014, the US Environmental Protection Agency (EPA) issued a proposal to reduce carbon dioxide emissions from the existing electric power sector under section 111(d) of the Clean Air Act.[1] The proposal sets interim and final CO_2 intensity targets for individual states. The average effect is an estimated 30% reduction in CO_2 emissions from 2005 to 2030 across the US.[2] The CO_2 intensity targets vary by state, and the baseline for setting targets is 2012.

Although the EPA sets the targets, states are ultimately responsible for creating compliance plans to meet the targets. Once the final rule is issued, and state level plans are crafted, the impact of the proposed rule will be better known.

This report was written to provide the Pacific Northwest Utilities Conference Committee (PNUCC) Board of Directors and members with background information on 111(d), with a focus on the Northwest states of Idaho, Montana, Oregon and Washington. The report discusses the proposed CO_2 intensity and mass targets, how the targets were formed and highlights questions and concerns the PNUCC System Planning Committee (Committee) has with the proposed rule's details.

Specific concerns regarding 111(d)

The Committee has identified a number of issues with the proposed rule. They are expressed in detail in the report and are also summarized below:

- The use of 2012 as the baseline year makes the targets more stringent for the Northwest states than for other states. This is because 2012 was a year with high hydroelectric generation and correspondingly low thermal generation. This issue could be resolved by including a mechanism in the final rule to adjust the baseline and targets for yearly hydropower variations.

- In setting CO_2 targets the EPA uses assumptions for renewable energy and energy efficiency acquisitions that differ from normal planning practices. This may make the targets more difficult to meet than was intended.

- There is a lack of clarity regarding how to calculate the mass targets, making it difficult for states to choose whether to use mass or intensity targets.

- The interim targets will be difficult to meet since the EPA assumes large changes to the electric power system can happen in a compressed time period.

- The proposal does not give credit for past CO_2 reduction efforts and may penalize states that acted early via more difficult CO_2 targets.

[1] The rule, RIN 2060-AR33, was proposed on June 2, 2014, and published in the Federal Register on June 18, 2014.
[2] Federal Register, Vol. 79, No. 117, p. 34832.

Timeline

The table below shows the proposed 111(d) timeline. Interested parties should note that the 111(d) comment period closes on December 1, 2014.[3]

June 2, 2014	111(d) proposed
December 1, 2014	Comments to EPA due
June 1, 2015	Final 111(d) rule expected
June 30, 2016	State 111(d) compliance plans due, 2 years of extensions available

Table 1- 111(d) timeline

Carbon dioxide targets

CO_2 footprint

The carbon footprint in the proposed EPA rule examines electric power generation and emissions within individual state boundaries. It does not take into account power traded between states (and nations). For example, all of the generation/emissions from the Centralia power plant are assigned to Washington, even though some of the plants power is sold out of state.[4] Similarly, Washington is not assigned any generation/emissions from power that it imports.

States have the option to join together and form multistate compliance regions.

111(d) intensity targets

In the proposed rule the EPA focuses on reducing electric power carbon intensity. Electric power carbon intensity is calculated by dividing CO_2 emissions by electric generation. The EPA uses pounds and megawatt hours as the units for CO_2 and electric generation, respectively.

$$Electric\ power\ carbon\ intensity\ = \frac{CO_2\ emissions\ (lb)}{Electric\ generation\ (MWh)}$$

[3] Note that the comment period originally ended on October 16, 2014.
[4] Centralia is a coal plant in Washington that operates as an independent power producer.

The proposal sets 2030 final targets and 2020-2029 interim targets based off a 2012 baseline. When creating the 2030 final targets, the interim targets and the 2012 baseline the EPA excludes existing hydroelectric generation from the above equation and assigns nuclear power 6% of its 2012 generation. [5] Due to the exclusion of existing hydroelectric and most nuclear generation, the EPA's carbon intensity values differ from values calculated by other organizations, including PNUCC and the Northwest Power and Conservation Council.

EPA's 2012 intensity baselines, average interim targets and 2030 targets for the four Northwest states are below.

	2012 Baseline (pounds/MWh)	2020-29 Interim target (pounds/MWh)	Final 2030 target (pounds/MWh)
Idaho	339	244	228
Montana	2,246	1,882	1,771
Oregon	717	407	372
Washington	756	264	215

Table 2 – EPA intensity targets

Mass based target option

States have the option to convert the intensity targets into mass based targets. If states take this approach, they must submit to the EPA the "process, tools, methods and assumptions used in the conversion of the rate-based goal…" [6] This conversion may include creating a reference CO_2 emission case and reduced CO_2 case through the use of expansion planning and production cost electric power modeling tools.[7]

Given the level of uncertainty in translating an intensity target to a mass target, the Committee has not attempted to estimate mass based targets for the Northwest states.

Choosing an intensity or mass target

States will have to choose either intensity or mass based compliance targets. Choosing a mass target caps the amount of CO_2 in-state affected generating units can produce. Differently, the intensity target has two pieces – intensity can be lowered by reducing emissions, increasing CO_2 free and/or low CO_2 intensity generation, or a combination of the above.

Choosing either intensity or mass targets is an important decision for states to make. The Committee is concerned that this important decision is currently difficult to make due to a lack of information regarding the mass targets.

[5] In some documents, such as the EPA Clean Power Plan State Goal Visualizer, the EPA excludes all non-emitting resources, including non-hydroelectric renewables, from the 2012 baseline.
[6] Federal Register, Vol. 79, No. 117, p. 34953.
[7] "Projecting EGU CO_2 Emission Performance in State Plans." EPA, 2014.

Target building blocks

The EPA applies four "building blocks" to 2012 electric power data to construct the 2030 and interim intensity targets. These building blocks are increased coal unit efficiency, offsetting coal generation with natural gas generation, building more renewable energy while preserving existing nuclear generation and acquiring more energy efficiency.

States can use, but are not confined to, the four building blocks used by the EPA to meet the targets. The proposed rule notes that the building blocks are used to create the targets, but states can use any strategy they like to meet the targets, provided the EPA approves of the strategy. Other 111(d) compliance strategies may include new natural gas units, new nuclear units, carbon pricing and thermal unit runtime limits, among other options.

Building block 1: increase coal unit efficiency

Building block 1 assumes coal units, starting in 2020, will produce the same amount of power as in 2012 but with 6% less CO_2. Montana is the only Northwest state whose target is impacted by this building block since no other Northwest state is assumed to have coal generation operating during the compliance period.[8] This building block reduces emissions without changing power generation and thus reduces electric power carbon intensity. The Committee is unsure how difficult this building block is to achieve – the difficulty, and cost, will likely differ by coal unit.

Montana	2012 baseline	2030 target assumptions
Coal annual energy (MWa)	1,649	1,649
Coal CO_2 (million metric tons)	16.0	15.0

Table 3 – Increased coal unit efficiency example[9]

[8] Oregon and Washington will, under current planning, have coal units operational during some of the interim target years, but the EPA assumes in building block 2 that they will be fully offset by natural gas.

[9] Note that the values in this table, and some other tables in the document, have been converted to average energy (MWa) and million metric tons of CO_2. This is done for ease of interpretation.

Building block 2: offset coal generation with natural gas generation

Building block 2 assumes coal generation can be offset by natural gas generation starting in 2020. It is only applied to states that had combined cycle combustion turbine (CCCT) natural gas plants running at a statewide capacity factor of under 70% and operational coal units in 2012.

The EPA assumes that CCCTs can run more and offset coal generation until statewide CCCT capacity factors hit 70%, or until all statewide coal generation is zeroed out, which ever happens first. Since CCCTs produce power with 2-3 times less CO_2 than coal units per megawatt hour, this lowers CO_2 emissions without changing power generation, thus reducing CO_2 intensity.

This building block does not affect Idaho which has no coal plants or Montana which has no CCCTs. The EPA assumes that in Oregon and Washington CCCTs can run more often and offset all coal generation.

The table below shows how EPA applies building block 2 to Oregon and Washington. Note that the target CCCT generation is equal to the sum of 2012 coal and CCCT generation.

Oregon	2012 baseline	Target assumption
Coal, MWa	301	0
CCCT, MWa	1,304	1,606
Total, coal + CCCT, MWa	1,606	1,606
Coal + CCCT CO_2 (million metric tons)	6.9	5.4

Table 4 – Offset coal with gas, OR

Washington	2012 baseline	Target assumption
Coal, MWa	426	0
CCCT, MWa	647	1,073
Total, coal + CCCT, MWa	1,073	1,073
Coal + CCCT CO_2 (million metric tons)	6.2	3.5

Table 5 – Offset coal with gas, WA

Issues with building block 2 methodology

When evaluating statewide CCCT capacity factors the EPA focuses on annual energy, not peak hour capacity. While there are time periods in which coal could be offset by latent CCCT capacity, during hours of high demand the Northwest will likely have to run coal units in Oregon and Washington to maintain electric power system reliability.[10]

[10] Recent studies by PNUCC and the Northwest Power and Conservation Council indicate that the region is slightly inadequate regarding winter peak capacity. If coal units in Oregon and Washington were not used this inadequacy would become more acute.

Building block 3: build more renewables and preserve nuclear generation

Building block 3 focuses on acquiring more renewable energy and preserving existing nuclear power generation.

The table below shows the amount of new renewables the EPA assumes can be developed in each state by 2030. It also shows, on the right, the total amount of renewables the EPA assumes can be online in each state in 2030.

Annual energy, MWa	New renewables by 2030	Total renewables in 2030
Idaho	78	365
Montana	167	311
Oregon	612	1,435
Washington	1,085	2,023

Table 6 – EPA renewable assumptions

To arrive at the 2030 value, the EPA assumes in-state 2012 non-hydro renewable generation stays static through 2016 and then grows at a rate of around 6% per year.[11] This growth is continued until the year 2030 is reached, or until the amount of renewable generation in the state is equal to 21% of 2012 total statewide electric generation (including all hydroelectric and nuclear generation). Both Oregon and Idaho hit the 21% cap whereas Montana and Washington do not.

An example of how this assumption works for Oregon is below – note that Oregon hits its 21% cap in 2026.

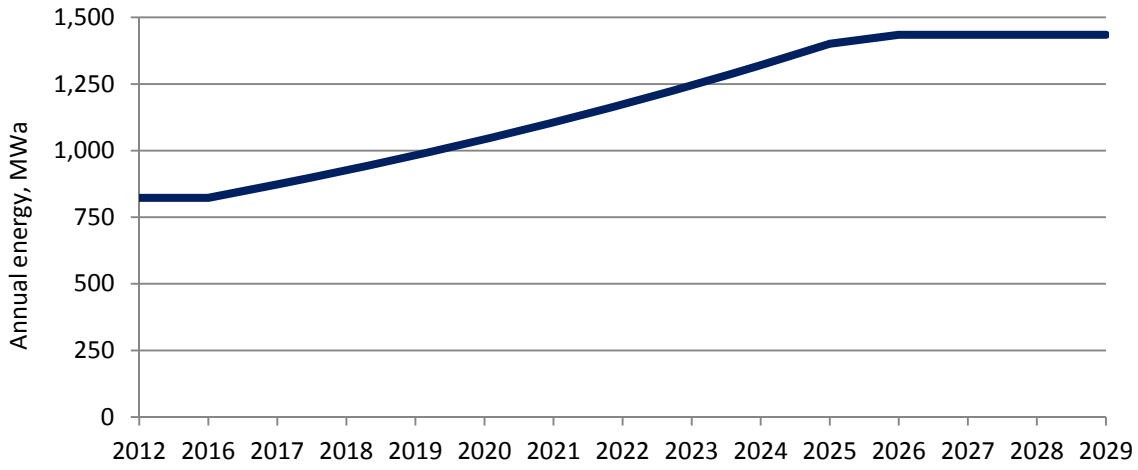

Figure 1– EPA renewable assumption for Oregon

[11] This value is specific to states in the EPA designated "West" region.

Issues with building block 3 renewable assumption methodology

The EPA notes that their renewable assumptions are in part based "on the RPS requirements already established by a majority of states."[12] However, when creating both the 2012 renewable baseline and the 21% renewable cap for Northwest states, they use assumptions that differ from typical renewable portfolio standards. Depending on the state, these differences can result in more difficult CO_2 targets than were likely intended.

First, in creating the 2012 renewable baseline the EPA counts all non-hydro renewable generation within state borders. This includes renewables that sell their power out-of-state, and excludes renewables whose power is imported in. This gives states that are non-hydro renewable net exporters a higher baseline than states that are net importers. Since the EPA assumes renewables will grow as a percentage of the 2012 baseline, this can impact the amount of renewables assigned in the target formation process and thus impact the carbon targets.

Second, the 21% cap used for the Northwest is created by the EPA by averaging the renewable portfolio standards in the "West" region.[13] However, this average does not consider the exceptions that renewable portfolio standards provide. For example, the EPA uses 15%, 25% and 15% as the renewable portfolio standard of Montana, Oregon and Washington when creating the cap. However the Committee estimates that the effective renewable portfolio standards of those states should be 8%, 20% and 12%, respectively.[14] By not taking exceptions into consideration, the EPA arrives at a higher cap than may be intended. For some states this higher cap leads to more renewables assigned in the target formation process and thus more difficult CO_2 targets.

Last, the EPA uses the 21% cap to limit the amount of renewables they assume each state in the West region will build. For example, the cap for Oregon is 1,435 MWa. However, this value is calculated by multiplying 21% by total 2012 in-state generation (including all hydro and nuclear power). This is different than renewable portfolio standards, which typically apply to sales, not generation. As a result net electric power exporting states have a higher cap than net importing states, all other factors equal. A higher cap may result in more difficult CO_2 targets, depending on the state.

[12] Federal Register, Vol. 79, No, 117, p. 34866.
[13] The West region includes AZ, CA, CO, ID, MT, NV, NM, OR, UT, WA and WY.
[14] This is due to the standards not applying to all in-state power sales.

What counts as a new renewable resource under 111(d)?

All new renewable resources are eligible for 111(d) compliance. Although hydropower is excluded from the 2012 baseline new hydropower is included as a resource that can be used for target compliance.[15]

During a Committee conference call with EPA Region 10 it was noted that new renewables that are built out-of-state and have their power imported in-state could count as new renewables provided multistate agreements are reached under which they are not double counted. For example, an Idaho utility could build wind power in Wyoming, import the power into Idaho, and use the resource for 111(d) compliance provided that Wyoming agrees to not count the resource as well.

Preserving nuclear generation

Part of building block 3 is preserving existing nuclear generation. To incent preservation, 6% of 2012 nuclear generation is included in the 2012 baseline and target calculations as a CO_2 free resource. Including 6% of nuclear generation in the targets makes the targets more difficult to meet if nuclear generation is retired. In the Northwest this only applies to Washington since the other Northwest states do not have any nuclear generation.

[15] This includes new hydroelectric projects and new incremental hydroelectric generation. Federal Register, Vol. 79, No. 117, p 34867.

Building block 4: acquire more energy efficiency

In building block 4 the EPA assumes states can acquire more energy efficiency starting in 2017. The table below shows the amount of new (post 2012) energy efficiency the EPA assigns each state in the target formation process. Note that the EPA assumes states can acquire more energy from energy efficiency than new renewable resources.

Annual energy, MWa	EPA target assumption
Idaho	151
Montana	185
Oregon	654
Washington	1,276

Table 7 – New energy efficiency by 2030

The EPA creates the above values by assuming each state can achieve energy efficiency in 2030 equal to around 11% of 2012 generation or sales, whichever is lower.[16] For example, Montana sales in 2012 were 1,701 MWa. The EPA multiplies this value by 10.90% to arrive at the 185 MWa value in the table above.[17]

Issues with building block 4 methodology

The EPA assumes that the average energy efficiency measure lasts ten years. They take measure life into consideration by assuming "an even distribution from one year in length to two times the average measure life (twenty years) in length."[18] This translates roughly into a 5% steady yearly decay for energy efficiency measures in their calculations. The Committee is unsure if this decay assumption has to factor into state plans.

What counts as energy efficiency?

From discussions with the EPA, it appears that all energy efficiency programs are eligible for use in building block four, including federal codes and standards, provided they are named in the state level plans and are quantifiable measures.

The EPA notes that although they assume states will start acquiring more energy efficiency in 2017, "Any improvement in EE savings performance between 2012 and 2017 will benefit a state in meeting its state EE goals for the 2020-2029 interim compliance period."[19] The Committee is unsure if energy efficiency acquired between 2012 and 2017 counts towards the final 2030 goal in addition to the interim goals.

[16] In all Northwest states except Idaho sales was the lower value. The sales value used includes a 7.5% increase to account for line loss.
[17] The multiplier is different for each state and is 11.10, 10.90, 11.41, and 11.26 percent for ID, MT, OR and WA, respectively.
[18] See chapter 5 of the EPA technical support document "GHG Abatement Measures" for more detail on this assumed rate of decay.
[19] EPA, "GHG Abatement Measures." P. 5-34.

Putting it all together – 2030 target formation

The table below shows how the EPA utilizes all four building blocks to create the 2030 target using Washington as an example. It starts with 2012 baseline emissions and generation. The table then adds in the four building blocks to arrive at the 2030 target of 215 lbs/MWh.

Washington	Emissions (lb)	Generation (MWh)	Intensity (lb/MWh)
2012 baseline	**14,588,714,739**	**19,303,639**[20]	**756**
Building blocks			
1. Improved coal plant efficiency	-	-	
2. Offset coal with gas	(6,010,013,227)	-	
3. New renewables	-	9,511,208	
4. New energy efficiency	-	11,178,874	
2030 target	**8,578,701,513**	**39,993,721**	**215**

Table 8 – Applying the building blocks to Washington

Note that building block 1, improved coal plant efficiency, does not apply to Washington since all coal generation is offset by natural gas in building block 2.

Appendix A shows how the building block math works for each Northwest state's 2030 target.

[20] Excludes all existing hydropower and most existing nuclear power (the value does include a 6% nuclear bonus of 506,700 MWh).

Interim targets

The proposed interim CO_2 targets begin in 2020 and run to 2029. States must meet the average target over the 2020 – 2029 time period.

The charts below show the interim targets for the Northwest states – Montana is shown in a separate chart due to scale. The charts start with the baseline year, 2012, and then jump forward to the first interim target year, 2020.

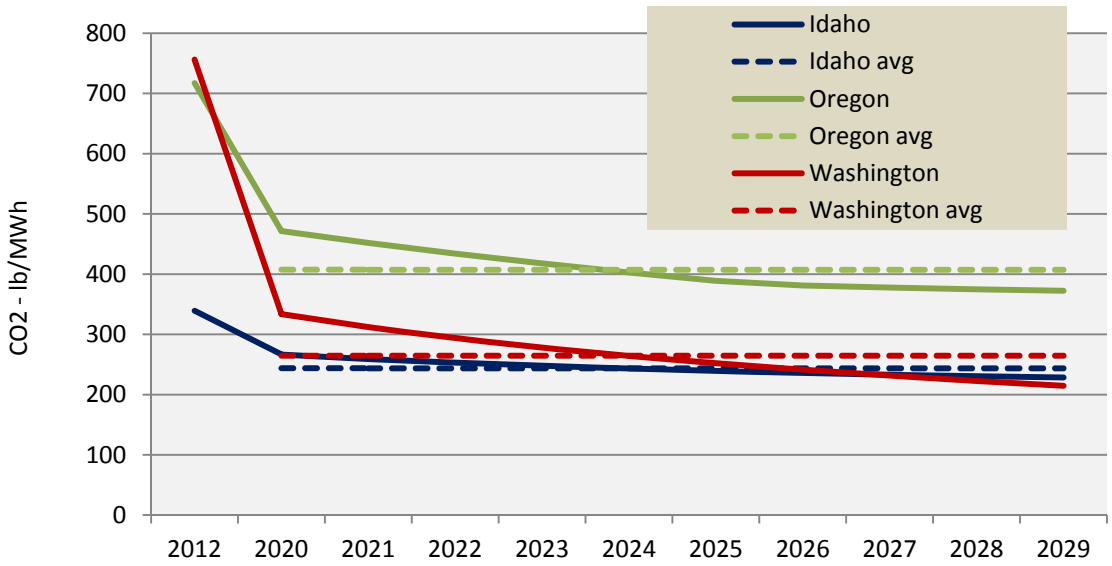

Figure 2 – Interim intensity targets, ID, OR & WA

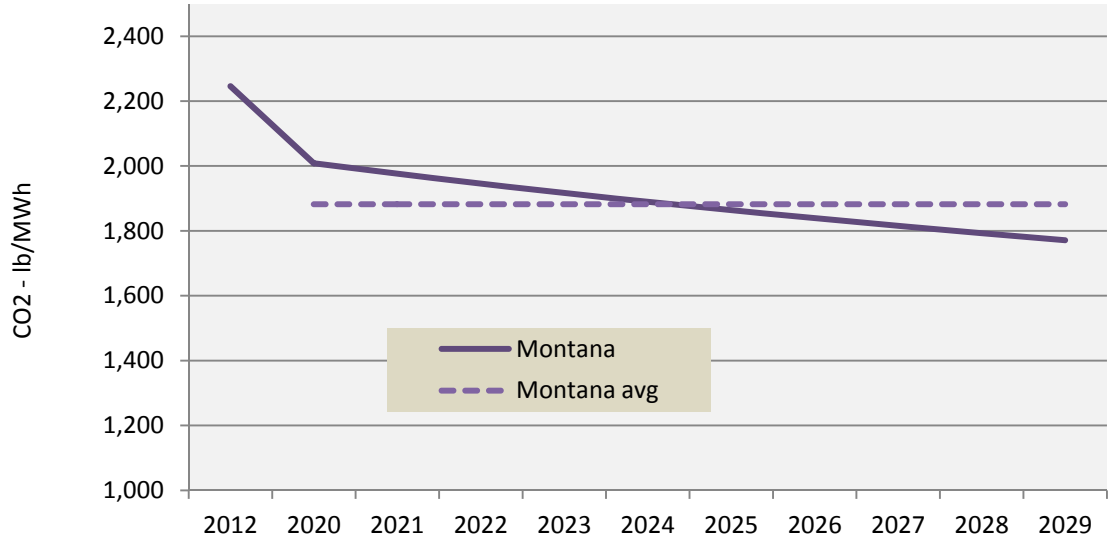

Figure 3 – Interim intensity targets, MT

The downward slope of the interim targets is due to building blocks 3 and 4, increased renewable generation and energy efficiency, being phased in year-by-year starting in 2017 (before the interim targets begin). The sharp downward jump from 2012 to 2020 is mostly due to building blocks 1 and 2, increased coal unit efficiency and offsetting coal with natural gas, being fully implemented at the start of 2020.

Both Oregon and Washington have an especially steep drop from the 2012 baseline to the 2020 interim target. This is largely due to building block 3, offsetting all coal generation with natural gas starting, in 2020. Although both states are planning to retire all their coal plants by the end of 2025, Oregon will have power plant Boardman operational until the end of 2020 and Washington will have both Centralia units operational until the end of 2020, with unit 2 staying operational until the end of 2025. As such, both Oregon and Washington will have to deviate substantially from current planning to meet the interim targets which assume zero coal generation starting in 2020.

Challenges with picking a specific baseline year

Hydroelectric generation offsets thermal generation

In the Northwest, electric power emissions fluctuate significantly each year, and are inversely correlated to water supply. High water supply leads to increased hydroelectric generation which reduces the need to operate coal and natural gas units and thus reduces emissions.

The chart below shows hydroelectric and coal + gas (combined) generation in the Northwest since 2000.[21] In the chart hydro generation corresponds to the right axis and coal + gas generation corresponds to the left axis. Note how the yearly change in hydroelectric generation inversely affects the amount of coal + gas generation.

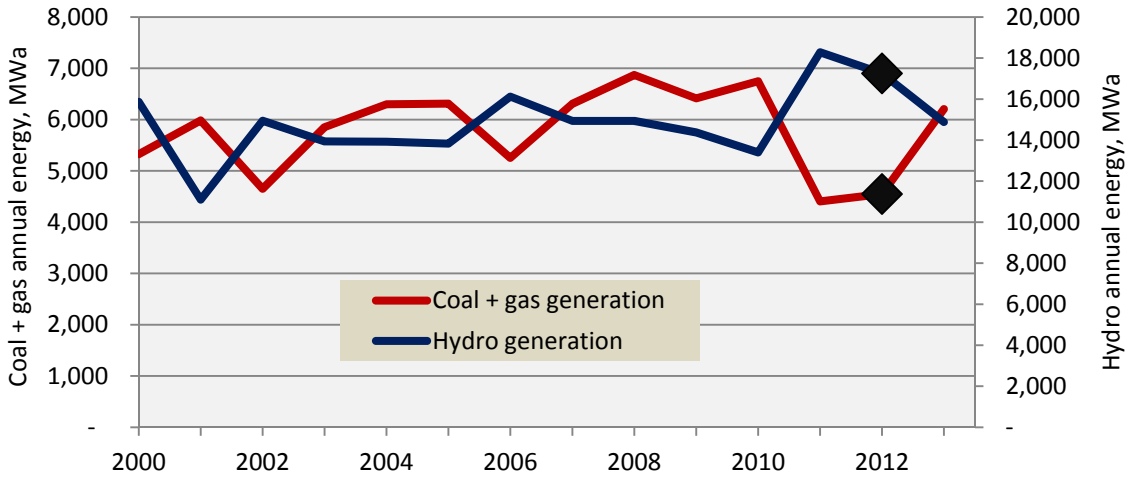

Figure 4 – Historic hydropower production; ID, MT, OR, WA

In the Northwest, the proposed 2012 baseline year had higher than average hydroelectric generation and correspondingly lower than average thermal generation. It is unclear if the EPA took the hydro-thermal relationship into consideration in the proposal.

Historic thermal generation in the Northwest

Due largely to hydroelectric variations, each state's thermal generation changes yearly. Total thermal generation in 2012 matters since the EPA assumes in the target creation process that each state will produce as much thermal power in 2030 as in 2012. As such, having below average thermal generation in the baseline year leads to more stringent targets, whereas higher thermal generation in the baseline year leads to less stringent targets, all other factors equal.

This report section shows charts of historic coal and gas (combined) generation in each of the four Northwest states from 2000 – 2013. New CCCT and coal power plants added since 2000

[21] The time period 2000 to 2013 is slightly below average regarding water runoff (97%) when compared to 1981-2010 Jan-Jul runoff levels at the Dallas (NOAA). The data used in this report section are from the EIA and include all generation by fuel source from the subcategory "total electric power industry."

are shown on the charts as well. Due to a lack of space and their smaller impact on annual generation new natural gas peaking power plants added since 2000 are not shown.

Idaho historic thermal generation

Prior to 2012, Idaho only had one large thermal power plant. In July 2012, Langley Gulch, a CCCT, went online. Note how much higher 2013 gas generation was in Idaho as compared to 2012. Part of this was due to water conditions and part was due to Langley Gulch being online all year. In setting the 2012 baseline the EPA did not annualize Langley Gulch's generation.

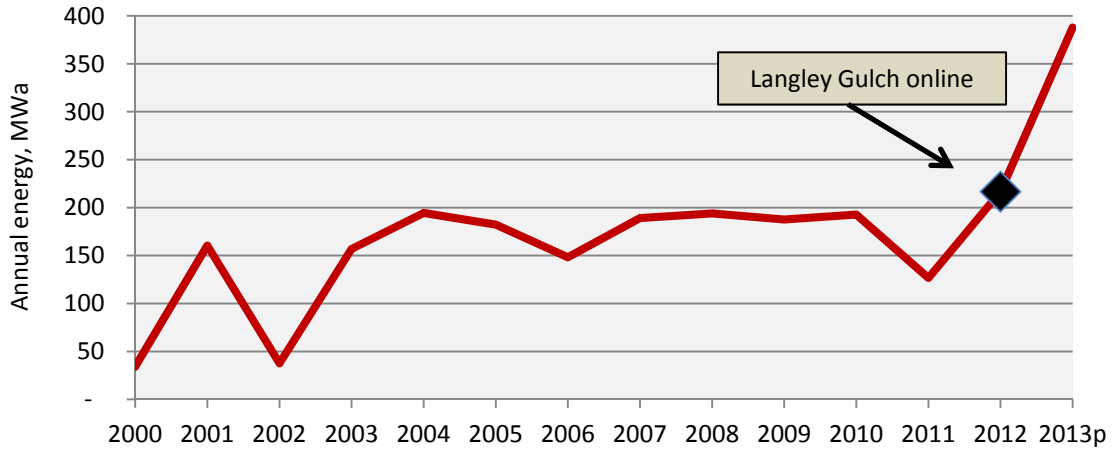

Figure 5- Idaho gas generation

Montana historic thermal generation

Most of Montana's thermal generation is from baseload coal power plants. Montana's thermal generation varies each year, but the variations are smaller than in other Northwest states. This is likely due to Montana's baseload coal units being on the margin less often than other Northwest thermal units. Still, 2012 was the lowest thermal year Montana has had since 2000 and over 250 MWa under the 2000-2013 average.

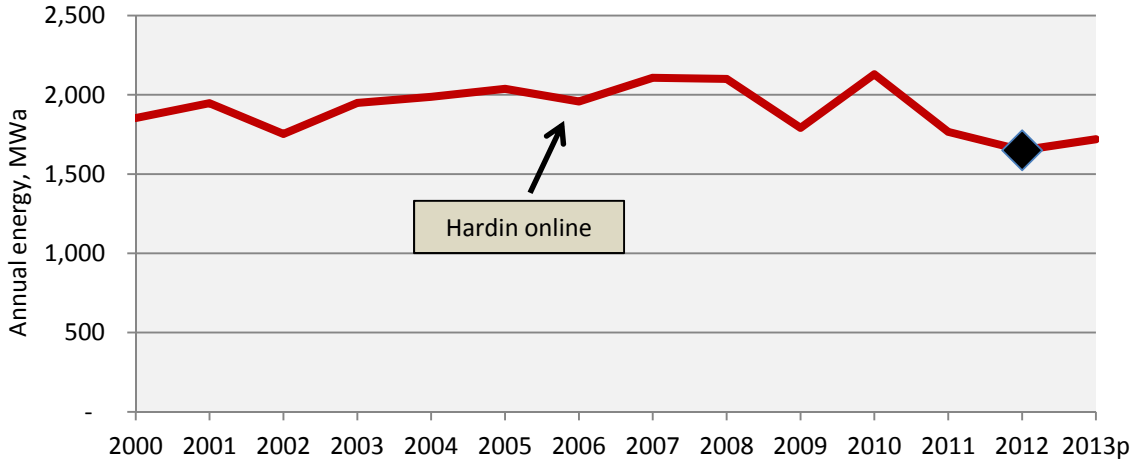

Figure 6 – Montana coal + gas generation

Oregon historic thermal generation

In 2011, a high water year, Oregon saw a sharp fall in coal + gas generation. Generation rebounded slightly in 2012, but 2012 coal + gas generation was still nearly 400 MWa below the 2000-13 average.

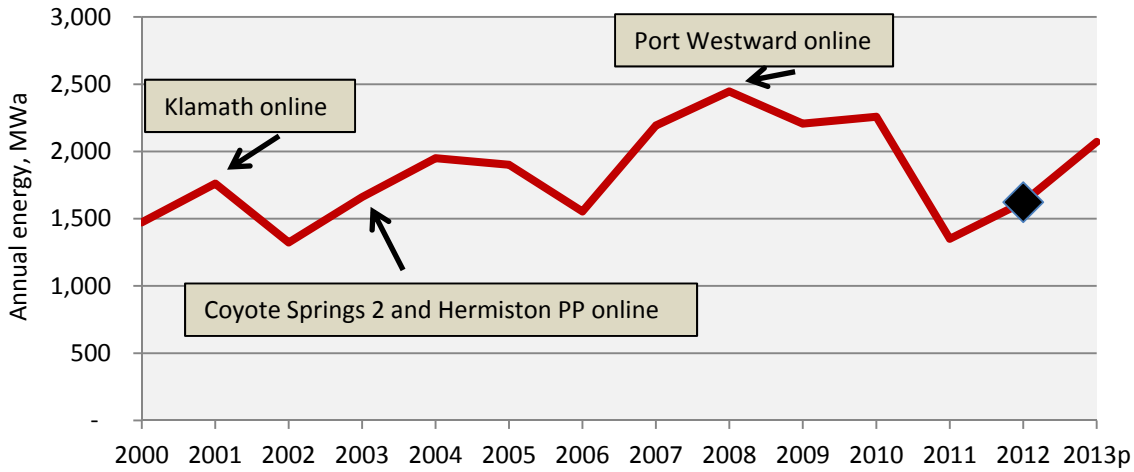

Figure 7 – Oregon coal + gas generation

Washington historic thermal generation [22]

During 2012 generation at power plant Centralia, Washington's sole coal power plant, was low. This was partially due to high water conditions and inexpensive natural gas. Due to this low coal generation, and below average gas generation, 2012 was the lowest coal + gas generation year for Washington since 2000 and over 800 MWa below the 2000-2013 average.

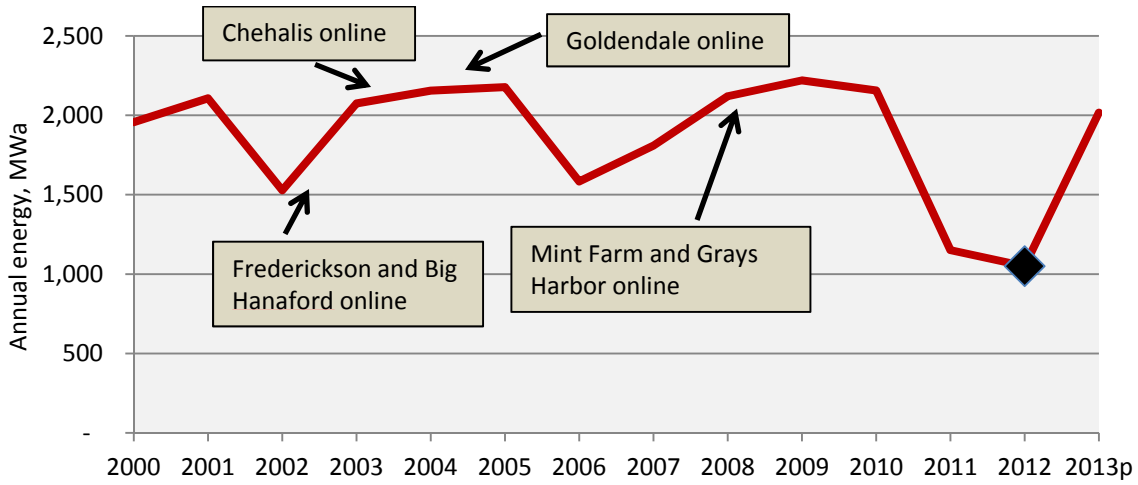

Figure 8 – Washington coal + gas generation

[22] Not including the Columbia Generating Station, a thermal nuclear plant.

What if 2013 had been used as the baseline year?

As noted above 2012 was a high water year for the Northwest. Due to this, and other factors, the Northwest electric power sector had low thermal generation use and CO_2 emissions in 2012 in comparison to the past decade.

The table below shows how the 2030 targets change when 2013 is used as the baseline instead of 2012. 2013 is used for comparison since it is recent and reflects the current system. 2013 was also a nearly average water year (96%).[23] Using 2013 as the baseline year changes the 2030 targets significantly for all states except Montana.[24]

Intensity (Lb/MWh)	Proposed 2012 baseline	Using 2013 baseline[25]
Idaho	228	335
Montana	1,771	1,779
Oregon	372	423
Washington	215	321

Table 9 – 2030 intensity targets with 2012 baseline and 2013 baseline (est.)

The Committee does not suggest that 2013 should be used as the baseline year. Rather, the above table is included to highlight the variability in targets when a single, non-adjusted, year is used as the baseline. It would behoove the Northwest if the final rule included a mechanism to account for the yearly variation of hydroelectric generation.

Interaction between 111(d) and 111(b)

This report is about the EPA's proposal to reduce carbon emissions from the existing electric power sector under section 111(d) of the Clean Air Act. The EPA has also proposed a rule to limit emissions from new power plants, which fits under section 111(b) of the Clean Air Act. As proposed, resources that were operational or had commenced construction on or before January 8, 2014, are under 111(d) compliance, and resources that commenced construction after January 8, 2014, are under 111(b) compliance.

As proposed, 111(b) sets emission rate limits on new power plants. It makes it economically challenging, if not prohibitive, to construct new coal units. Although it sets standards for gas units, the standards are relatively easy to meet. A final version of 111(b) is expected in January 2015.

During a Committee conference call with EPA Region 10 it was noted that 111(b) and 111(d), in their currently proposed forms, are separate rules that do not overlap with one another. The EPA also noted that they are taking comment on this issue.

[23] 96% average runoff at the Dallas Jan-Jul as compared to the 1981-2010 30 year average.
[24] In 2013 Montana's thermal units produced a similar amount of annual energy as in 2012. However, in 2010 they produced notably more energy than in 2012 (see page 17 of this report for a chart showing this). If 2010 were used as the baseline year Montana's target would be significantly different.
[25] This estimate was performed by PNUCC.

Existing carbon reduction efforts and 111(d)

The Northwest has been utilizing steps similar to the EPA's "building blocks" for a number of years. These steps have led to:

- Around 8,000 MW of wind power, mostly developed since 2005, due to state renewable portfolio requirements, PURPA policies, production tax credits and utility needs.[26]
- 5,300 MWa of energy efficiency savings since 1978.
- The planned retirement of coal plants Boardman (end of 2020, OR) and Centralia (half at the end of 2020, the other half at the end of 2025, WA).

In the proposed rule the EPA has not provided a mechanism for states to receive credit for existing carbon reduction efforts. In some cases, existing carbon reduction efforts could lead to more difficult CO_2 targets.

As noted earlier in this report, the EPA assigns renewable resources to states in the target formation process based on a growth factor and the state's 2012 non-hydro renewable generation. This leads to future renewable resource growth assumptions that are directly related to the amount of non-hydro renewables online in 2012. For example, Kentucky, a state with a larger population than Oregon, has a 2012 non-hydro renewable baseline of 38 MWa, as opposed to Oregon's baseline of 823 MWa. Going forward, Kentucky is expected to develop another 158 MWa of new renewable resources by 2030 whereas Oregon is expected to develop 612 MWa.

The Northwest is a national leader in energy efficiency, having achieved over 5,300 MWa since 1978. However, in achieving this high level of energy efficiency Northwest states have exhausted many low cost measures. In the target creation process it does not appear that the EPA took into consideration that states will face different costs for energy efficiency depending on how much has been achieved in the past.

If they choose to use a mass target, states may have to submit a reference case including all current policies as part of the mass target creation process. States would also submit a CO_2 reduction plan outlining new policies to reduce CO_2 emissions. Since retiring Boardman and Centralia is current policy in Oregon and Washington, and not a new policy, retiring these coal plants may not count towards achieving a mass target. This may make it more difficult for Oregon and Washington to use a mass target for 111(d) compliance.

The Committee hopes that the EPA will refine the final rule to give credit for existing carbon reduction efforts and ensure that existing efforts do not result in more difficult CO_2 targets.

[26] Including around 3,000 MW of wind not built for Northwest utility needs (PNUCC 2014 NRF).

Other 111(d) issues

Demonstrating a link between new renewables and/or energy efficiency on emissions

At multiple meetings Northwest utilities and state agencies have expressed concerns that 111(d) requires proof that new renewables and/or energy efficiency measures reduce emissions from power plants within state boundaries. These concerns may be due to an EPA technical support document, "State Plan Considerations." This document discusses state plan creation and notes different methods for calculating the impact of new renewable energy and energy efficiency measures on power plants.

During a Committee conference call with EPA Region 10 it was noted that states/utilities do not have to prove that new renewables and/or energy efficiency measures reduce carbon emissions from in-state power plants. The EPA also stated that new renewable energy and energy efficiency measures must include an evaluation, measurement and verification plan.

The Northwest may already have the tools in place to meet this requirement. In the EPA State Plan Considerations document the "Pacific Northwest's Regional Technical Forum" is highlighted as an organization that provides evaluation, measurement and verification of energy efficiency measures. The same document also discusses how some state renewable portfolio standards have evaluation, measurement and verification mechanism built into them.

The Committee urges interested parties to contact the EPA directly for guidance on this issue.

Potential future interactions between 111(b) and 111(d)

A few Northwest parties have raised concerns that future regulations may require new power plants to achieve an emissions output rate that is not mechanically possible. This hypothetical rule would require utilities to build renewables and/or energy efficiency alongside new thermal power plants to dilute the emissions rate. If this were to happen, there would be concerns over how new renewables/energy efficiency built for this hypothetical rule interact with 111(d).

Appendix A – EPA building blocks and creation of 2030 targets

Idaho	Emissions (lb)	Generation (MWh)	Intensity (lb/MWh)
2012 baseline	**1,407,034,770**	**4,155,424**	**339**
Building blocks			
1. Improved coal plant efficiency	-	-	
2. Offset coal with gas	-	-	
3. New renewables	-	681,185	
4. New energy efficiency	-	1,324,481	
2030 target	**1,407,034,770**	**6,161,090**	**228**

Table 10- EPA building blocks and Idaho

Montana	Emissions (lb)	Generation (MWh)	Intensity (lb/MWh)
2012 baseline	**35,859,473,817**	**15,966,675**	**2,246**
Building blocks			
1. Improved coal plant efficiency	(2,113,299,791)	-	
2. Offset coal with gas	-	-	
3. New renewables	-	1,460,954	
4. New energy efficiency	-	1,624,321	
2030 target	**33,746,174,026**	**19,051,950**	**1,771**

Table 11 – EPA building blocks and Montana

Oregon	Emissions (lb)	Generation (MWh)	Intensity (lb/MWh)
2012 baseline	**15,334,712,993**	**21,395,595**	**717**
Building blocks			
1. Improved coal plant efficiency	-	-	
2. Offset coal with gas	(3,239,323,641)	-	
3. New renewables	-	5,360,143	
4. New energy efficiency	-	5,727,910	
2030 target	**12,095,389,352**	**32,483,649**	**372**

Table 12- EPA building blocks and Oregon

Washington	Emissions (lb)	Generation (MWh)	Intensity (lb/MWh)
2012 baseline	**14,588,714,739**	**19,303,639**[27]	**756**
Building blocks			
1. Improved coal plant efficiency	-	-	
2. Offset coal with gas	(6,010,013,227)	-	
3. New renewables	-	9,511,208	
4. New energy efficiency	-	11,178,874	
2030 target	**8,578,701,513**	**39,993,721**	**215**

Table 13 – EPA building blocks and Washington

[27] Includes a 6% bonus for CGS, 506,700 MWh.

Appendix B – report sources

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