



Rulemaking Advisory Committee #3: Adjustments to the Carbon Intensity of Electricity

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Background and Overview

The Clean Fuels Program (CFP) is requesting feedback on our proposals to adjust how the carbon intensity (CI) of electricity is computed and used in the program. Specifically, this paper proposes five provisions to move forward with during this rulemaking: 1) changing the methodology for the statewide grid mix and utility-specific CI calculations; 2) specifying what qualifies as renewable or zero-carbon electricity for the CFP when used to claim incremental credits; 3) specifying who can claim incremental credits; 4) changing the frequency of residential base credit generation; and 5) providing direction on how revenue is used from the sale of electricity credits. This paper builds on the discussion paper from the Rulemaking Advisory Meeting (RAC) meeting #1. It incorporates comments we have received since that meeting and additional research and consideration by the agency.

It is important that stakeholders understand the impact of these provisions in aggregate, although the discussion paper will later discuss them individually in the sections below. Sections 3, 4, and 5 do not necessarily have an impact on the number of credits that may be generated so this table focuses on Sections 1 and 2. Section 2 allows for potentially significant additional credit generation by using RECs to reduce the CI of electricity used for residential EV charging, while Section 1 includes three distinct adjustments to how utility CIs will be calculated:

- A. Switching from a 5-year rolling average to a single-year average to calculate the CI of electricity
- B. Whether the statewide mix should remove the load and emissions from utilities that have opted into utility-specific CIs
- C. Factoring in the closure of the Boardman facility

The following two tables show how Sections 1 and 2 could affect credit generation:

Using 2019 EV #s:	Base Credit Generation	Potential Impact of Section 1 on base credit generation	Potential Impact of Section 2 allowing incremental credits generation	Net Impact on potential credit generation
2020 Electricity CI under current rules	71,000		+35,000	+33,000 to +44,000
Section 1.A & 1.B: Single year (2018) Statewide mix w/ specified utility adjustment		62,000 (-9,000)	+44,000	
Section 1.A & 1.C: Single year (2018) statewide mix, Boardman at 0.428 MT/MWh		73,000 (+2,000)	+33,000	
Section 1.A, 1.B, & 1.C: Single year statewide mix with Boardman at 0.428 MT/MWh and specified utility adjustment		64,000 (-7,000)	+42,000	

As we add more electric vehicles (EVs) to Oregon’s roads in the future, the impact is greater:

Using estimated 2025 EV #s:	Base Credit Generation	Potential Impact of Section 1 on base credit generation	Potential Impact of Section 2 allowing incremental credits generation	Net Impact on potential credit generation
2020 Electricity CI under current rules	272,000		+153,000	+147,000 to +192,000
Section 1.A & 1.B: Single year (2018) Statewide mix w/ specified utility adjustment		233,000 (-39,000)	+192,000	
Section 1.A & 1.C: Single year (2018) statewide mix, Boardman at 0.428 MT/MWh		278,000 (+6,000)	+147,000	
Section 1.A, 1.B, & 1.C: Single year statewide mix with Boardman at 0.428 MT/MWh and specified utility adjustment		240,000 (-32,000)	+185,000	

The proposed changes to how the statewide grid mix is calculated in order to ensure its ongoing accuracy will cause some changes in how many credits are generated, the overall effect of this rulemaking will be a significant increase in credit generation from EVs. The addition of incremental crediting for lowering the carbon intensity of electricity to zero would ensure that more credits are generated if those provisions are put into effect, along with our provisions that will allow the program to more rapidly incorporate new electric vehicles into the program. The additional revenues available from incremental credits may also drive investments that further increase adoption of EVs in Oregon, which would have the compounding effect of even more credits being generated in the future.

1. Changes to the statewide mix and utility-specific CI calculations

DEQ introduced this concept in RAC meeting #1 and asked stakeholders to provide feedback on:

- A. Switching from a 5-year rolling average to a single-year average to calculate the CI of electricity
- B. Whether the statewide mix should remove the load and emissions from utilities that have opted into utility-specific CIs
- C. Factoring in the closure of the Boardman facility

The comments we received were mixed. We believe that stakeholders need more information about how the electricity mix changes would impact CI and credit generation to fully consider their positions concerning these two issues. In order to demonstrate this, DEQ developed a CFP Scenario Tool (tool) that will allow users to pick from a variety of CIs and see how those CIs impact the number of credits generated. The base case for the tool is the current regulation: a 5-year rolling average for the statewide mix. Alternative CIs were calculated for 1) single year values, 2) adjustments for the shutdown of the Boardman facility, and 3) the removal of the utility-specific loads from the statewide mix or specified utility adjustment.

Here are the options available in the tool:

- The currently in effect 2020 statewide mix under current rules
- Statewide mix with the specified utility adjustment using a single data year (2018 data was used for this option and the other single-year CIs)
- Single year statewide mix with the Boardman at 0.428 MT/MWh
- Single year statewide mix with the Boardman at 0.428 MT/MWh and specified utility adjustment
- Single year BPA CI

- Single year PacifiCorp CI
- Single year PGE CI
- Single year PGE CI with Boardman at 0.428 MT/MWh
- Natural gas mix at 0.428 MT/MWh
- Renewable energy credits (RECs) retired against residential charging

Description	Electricity CI (gCO ₂ e/MJ)
2020 Electricity CI under current rules	107.92
Single year (2018) Statewide mix with specified utility adjustment	135.77
Single year (2018) statewide mix, Boardman at 0.428 MT/MWh	104.02
Single year statewide mix with Boardman at 0.428 MT/MWh and specified utility adjustment	130.59
Single year (2018) BPA CI	3.54
Single year (2018) PacifiCorp CI	207.63
Single year (2018) PGE CI	122.65
Single year (2018) PGE CI with Boardman adjustment	112.74
Natural gas mix at 0.428 MT/MWh	169.49
Renewable Electricity	0.00

Some of the differences in the electricity CI's from the 2020 value are due to DEQ updating the upstream emissions associated with Oregon's grid mix, and especially the updates from OR-GREET 3.0 to upstream methane emissions associated with natural gas generation. The effect of those changes increases the carbon intensity of electricity other than BPA's mix by about 5gCO₂e/MJ.

The tool allows the user to input the number of EVs in their service area and choose a growth rate to forecast the number of EVs through 2025. The user can also choose an improved electricity CI for future years. Stakeholders are encouraged to use this tool as we move forward with this rulemaking advisory committee work in order to determine how different decisions would impact credit generation.

As we developed the tool, several findings emerged:

- Moving to a single year CI value will add more volatility than what is currently seen in a five-year rolling average. As discussed previously, while the five-year average approach may control for the variability of the hydropower system in the Northwest, it also mutes the effects of the retirement of fossil-fired power plants and the addition of new zero-carbon generation to the grid, and it delays the potential for a higher generation rate for base credits.
- The effect of hydropower system variability is relatively small in terms of the year-to-year shift in the CI of electricity and smaller still for the actual number of credits generated per car. As discussed previously, the application of energy economy ratios (EERs) for EVs significantly decreases the impact to actual credit generation.
- Because there is a lag in reported data to DEQ's Greenhouse Gas Reporting Program (GHG RP), we need to consider an adjustment to the 2021 and 2022 annual CIs to account for Boardman's retirement. In consultation with the GHG RP, we replaced the emissions intensity associated with Boardman's generation with an emissions factor of 0.428 metric tons per megawatt-hour (MT/MWh). This is a reasonably conservative emissions factor for the replacement power and would lower the statewide mix modestly until we get actual data.

Considering all of the factors above, DEQ proposes to move to a single-year CI for the statewide mix and utility-specific mixes. We also propose to adjust the statewide mix to remove emissions and energy associated with utilities that have opted in for a utility-specific mix. While this will affect credit generation, we believe the overall effect will be minor when combined with the following renewable

energy provisions discussed in section 2 of this paper. The table below summarizes the changes to base credit generation under this proposal using a modified forecast from the Department of Administrative Services (DAS) for the growth in the EV fleet, given a population of 29,000 EVs in 2019 and no improvement to the grid CI. The number of credits has been rounded and, for this example, no adjustment was made to account for credits generated in utilities that have already opted into their own specific grid mix.

Base Credits				
Year	2020 Electricity CI under current rules	Section 1.A & 1.B	Section 1.A & 1.C	Section 1.A, 1.B & 1.C
2020	93,000	81,000	94,000	83,000
2025	272,000	233,000	278,000	240,000

2. What qualifies as renewable energy for CFP?

DEQ introduced this concept in RAC meeting #1 and asked stakeholders to consider the following table:

Parameters to Consider				
	Which electricity qualifies?	What timespan counts?	Geographic eligibility?	Generator start date?
Broader ↓ Narrower	Follow Oregon RPS	All valid RECs qualify	All RECs count	All RECs count
	Follow Green-e or another standard	Renewable electricity must be generated within 2 years of EV charging	RECs in the western electric grid count	Within 15 years of the claim
	Create own requirements	Renewable electricity must be generated within 3 quarters of charging	RECs must be generated in Oregon or a balancing area that includes Oregon	Generator placed in service after the CFP's start date of 2016

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And to provide feedback on:

- How can we ensure that actual additional reductions are achieved?
- Who should be able to claim they are delivering renewable power to vehicles?
- Does it make sense to require that RECs retired under this provision meet a voluntary standard such as Green-e?
- Should there be geographic restrictions on what renewable electricity qualifies? Should eligible generators be located in the Western Electricity Coordinating Council (WECC)? In an electricity balancing authority that includes Oregon? In Oregon? The same utility service territory?
- Could utility green tariffs meet a vintage/temporal restriction on renewable electricity generated to meet the zero carbon claim?

The comments we received were mixed. Some focused on the accuracy of the carbon accounting to ensure that renewable electricity represents actual emissions reductions. At the same time, others focused on how these provisions could increase credit generation and send a stronger signal to the market that electricity used in the CFP should be renewable.

As discussed in Section 1 above, one of the CIs in the tool is an option for RECs retired against residential charging, resulting in a zero CI. This option was put into the tool for stakeholders to be able to estimate the number of incremental credits that might be available in the program if we move forward with the provisions discussed in Section 1 above. The following table estimates the number of incremental credits that may be generated under various CI scenarios using the same assumptions as the table in section 1:

Incremental Credits				
Year	2020 Electricity CI under current rules	Section 1.A & 1.B	Section 1.A & 1.C	Section 1.A, 1.B & 1.C
2020	46,000	58,000	45,000	56,000
2025	153,000	192,000	147,000	185,000

Note again that these incremental credits could be generated in addition to the base credits and should be considered in aggregate. With this new information, DEQ is interested in further input from stakeholders regarding how changes to the electricity CI can impact incremental credit generation.

In addition, DEQ is proposing the following qualifications for RECs. RECs retired on behalf of residential or non-residential EV charging must meet the following conditions:

- **Qualifying Sources:** RECs must be certified under Green-e’s current standard¹, which includes electricity generated from:
 1. Solar electric
 2. Wind
 3. Geothermal
 4. Hydropower from new capacity on a non-impoundment or new capacity at an existing impoundment, subject to certain conditions.
 5. Solid, liquid, and gaseous forms of biomass, subject to certain conditions.
 6. Biodiesel, subject to certain conditions.
 7. Fuel cells, if powered by hydrogen from a qualifying source.
 8. Tidal and wave generation.

In the case of biogas, biodiesel, or biomass-generated RECs, the facility operator must apply for an electricity CI through a Tier 2 fuel pathway application.

- **Placed in-service date:** RECs must be generated from a generator that was placed in service after 2015. We use this year in other areas of our program to allow a displacement credit for Light Rail and Streetcar systems.
- **Deliverability to Oregon:** RECs must demonstrate that generation occurred within a balancing authority area that includes Oregon or that the electricity from the facility is delivered to one of those balancing authorities on a real-time basis without shaping, storage, or integration services².
- **Vintage:** RECs must be from the same or prior year as the electricity was used to charge vehicles. For 2022 charging, RECs generated in 2021 or 2022 would be eligible for this provision.

In the case of RECs associated with a green tariff program offered by an electric utility, DEQ proposes establishing an application process where the utility would submit information on renewable generation sources for the Green Tariff through a Tier 2 fuel pathway application process. The utility would report to

¹ <https://www.green-e.org/docs/energy/Green-e%20Standard%20v3.4%20US.pdf>

² PGE, BPAT, PACW, IPCO, AVR, GRID

<https://www.nerc.com/AboutNERC/keyplayers/PublishingImages/BA%20Bubble%20Map%2020191106.tif>

DEQ annually on renewable energy sources used for the tariff through the annual fuel pathway report. Customers on that tariff would need to use utility bills to demonstrate that EV charging equipment was covered by utility meters enrolled in an approved green tariff program.

3. Who is eligible to claim the incremental credits?

DEQ introduced this concept in RAC meeting #1 and asked stakeholders to provide feedback on the following questions:

- For residential charging, should the utility have priority to generate the incremental credits? What about the automakers or charger owners? What should the hierarchy be?
- For non-residential charging, should the current credit generator also generate the incremental credits?
- Is there some other proxy like enrollment in a time of use program that could substitute for actual charging activity data? What parameters would have to be considered?

DEQ did not get many comments concerning this provision but has continued to develop the concept because it has the potential to incent even more investment in transportation electrification in Oregon. Below, we will describe four models of different entities that would be eligible to generate incremental credits within CFP.

1. For non-residential charging, including in public, for fleets and workplace, and fixed rail systems, the current reporting entity would be eligible to claim qualifying renewable power.
2. For residential charging:
 - a. The Utility Model – This model would allow the electric utility to retire RECs on behalf of their residential EV customers. For residential EV credits given to the Backstop Aggregator, they could also retire RECs equivalent to the amount of electricity that is not claimed by an individual utility. Under this option, DEQ would calculate the amount of incremental credits consistent with the frequency of the residential base credit generation unless otherwise specified by the utility.
 - b. The Backstop Aggregator Model – This is modeled after the Backstop Aggregator framework used to capture the residential base credits not claimed by utilities but in this it is applied to residential incremental credits not claimed by utilities as described above. In the incremental credit version, DEQ would seek an entity to aggregate the incremental credits, retire RECs, sell the CFP credits, and manage the revenue to fund a portfolio of projects. The portfolio in this case would focus on projects are prioritized to address equity issues and assist income-limited individuals and communities that are vulnerable to the impacts of climate change. Projects undertaken could include expanding and decarbonizing public transit and micromobility; placing charging infrastructure in high pollution areas and rural communities to support expanding local EV adoption; and increasing accessibility to and affordability of used EVs. DEQ would convene an advisory committee to ensure that portfolio goals are met.
 - c. The Automaker Model – This model would allow automakers or a designated aggregator to use precise telematics data to demonstrate how much residential charging occurs for EVs charging in Oregon. We assume that: 1) the telematics can tell us how much each EV charges at home on a quarterly basis; and 2) that RECs are retired for that amount of electricity.

These models are presented as options for stakeholders to consider. As discussed during our first meeting, we are considering whether to propose a single model or a waterfall approach where multiple entities would be able to claim incremental credits in case an entity higher up on the hierarchy chooses not to participate.

4. Changes to the frequency of residential base credit generation

DEQ introduced this concept in RAC meeting #1. The comments received were positive. At this time, DEQ proposes to issue residential base credits to utilities every 6 months, beginning in 2021. DEQ would use the Oregon Driver and Motor Vehicle (DMV) Services registration data from the end of June 2021 and issue credits in approximately late August or early September. Then at the end of December 2021, credits would be issued in late February or early March. For the backstop aggregator, DEQ proposes to also convert to issuing the residential base credits on a semi-annual basis.

5. Spending requirements on revenue generated from residential charging credits

DEQ introduced this concept in RAC meeting #1 and asked stakeholders to provide feedback on the following questions:

- How should it be structured?
- How broad or narrow should the direction be? Should there be broad categories of projects or narrower types of projects?
- Should who generates the credits make a difference in what the permissible uses would be?
- What kind of documentation should be required to demonstrate compliance with spending requirements?

The comments we received were mixed. Some observed that the current regulation does not currently require this, and there is no evidence that revenue is being used for things not related to transportation electrification. Others were concerned that as the revenue from these credits grows and an increasing number of out-of-state entities participate, there is a higher risk that revenue will not be used to benefit Oregonians.

At this time, DEQ is proposing to require all recipients of base and incremental credits for residential EV charging to annually file a report with the agency on how they have used the revenue from their credit sales, starting with credits issued in 2021. DEQ would then review and post these reports on its website. Reports must be submitted by April 30th and include the following elements:

1. Total revenue from the sale of their base and incremental residential credits
2. The percentage of that revenue that went to CFP-related administration costs (including but not limited to submitting reports, selling credits, etc.)
3. The percentage of that revenue that went to administering any programs (including but not limited to project management, developing and managing contracts, etc.)
4. A description of the programs that were funded by CFP revenue and the amount spent in each category. Categories could include:
 - a. Ongoing operations and maintenance of existing transportation electrification equipment (including but not limited to the cost of electricity, staff costs related to maintenance and upkeep, etc.)
 - b. Grants, rebates, or other incentives to purchase vehicles or charging equipment to residential or non-residential customers
 - c. Direct deployment of public charging equipment

- d. EV specific electricity tariffs
- e. A description of their plan for credit revenue in the current year.