



Agenda Item F – Modifications to the Electricity Provisions

Meeting #3 – January 26-27, 2017

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Last year, Oregon’s legislature declared that the widespread electrification of the state’s transportation sector is “necessary to reduce petroleum use, achieve optimum levels of energy efficiency and carbon reduction, meet federal and state air quality standards, meet this state’s greenhouse gas emissions reduction goals described in ORS 468A.205 and improve the public health and safety.” Given this broad direction from the legislature, DEQ is taking a fresh look at the provisions around the use of electricity as a transportation fuel in the Clean Fuels Program (CFP).

The intent of the CFP is to be technology-neutral and fuel-neutral with respect to its carbon-intensity reduction mandate. DEQ believes that the CFP should recognize as many applications and alternative fuels as it can. As electricity expands to new vehicle types and becomes increasingly commercialized and available, many companies, public transit agencies, and private citizens are exploring the many benefits of owning an electric vehicle. DEQ believes it is an opportune time to make clear that the CFP plays an important role in creating incentives to electrify the transportation sector, by providing the proper level of support to electricity as a transportation fuel and not creating unnecessary barriers as it competes with other alternative, low-carbon fuels in our program’s marketplace.

There are three major categories of changes that DEQ is proposing changes to: 1) changes to the electricity carbon intensity values, 2) changes to the electricity credit generation provisions, and 3) the addition of new electricity energy economy ratios.

Changes to the Electricity Carbon Intensity Values

Current statewide mix CI

The current rules (Tables 3 and 4 in OAR 340-253-3300 and -3400) adopt the fuel pathway code ORELC001 that represents the Oregon average electricity mix. There are two errors in the value currently listed:

- 1) It was inadvertently pre-adjusted using the energy economy ratio (EER) for a light-duty vehicle; and
- 2) It mistakenly used a carbon intensity score of 108.29 gCO₂e/MJ for the statewide average electricity mix when it should have been 120.29 gCO₂e/MJ, based on 2012 information.

Both of these errors will be corrected in the upcoming rulemaking and apply to credit calculations beginning in 2018.

Potential changes in calculating the statewide electricity mix CI

DEQ is considering changes to how it calculates the carbon intensity of the statewide electricity mix. One proposal is to use a 3-year average in lieu of a 1-year value to calculate the statewide electricity mix. This will smooth out some of the annual variability resulting from a significant share of power coming from the region's hydroelectric system. For the current rulemaking, DEQ proposes to use data from 2013 – 2015 to establish the statewide electricity mix. This value will be recalculated every 3 years along with the carbon intensities of other fuels. The data for 2015 has not yet been finalized, but based on this methodology using the data from 2012-2014 the value would be 125.42 gCO₂e/MJ. Preliminary, incomplete, data for 2015 indicates that the carbon-intensity value for that single year would be around 122 gCO₂e/MJ.

Considerations for non-IOU utility-specific CIs

Under OAR 340-253-0400(3)(b), utilities that are not regulated by the Public Utility Commission can obtain a CI that is different from the statewide mix. However, the regulations do not specify the requirements to obtain a utility-specific CI. DEQ is proposing to base that score on the last three full years of their generation mix as reported to DEQ's greenhouse gas reporting program.

Should there be a Bonneville Power Administration electricity CI?

Many of Oregon's small utilities are full requirements customers of the Bonneville Power Administration. BPA calculates the mix of electricity provided to their customers and submits this information to DEQ on behalf of their full requirements customers to comply with their Greenhouse Gas Reporting requirements. It follows that DEQ could then calculate a BPA-specific electricity CI which would then be used to calculate the number of credits that could be generated by:

- 1) Utilities under the residential electricity provisions (OAR 340-253-0330(2))
- 2) EV charger owners and operators under the non-residential electricity provisions (OAR 340-253-0330(3))

Based on this methodology using the data from 2013-2015 the value for BPA electricity would be 4.53 gCO₂e/MJ. This value is preliminary and will be subject to internal vetting and verification before it is finalized, should DEQ move forward with this proposal.

Utilities that are not full requirements customers of BPA would still need to apply for a utility-specific CI from DEQ if they want a CI other than the statewide mix.

In addition, DEQ is seeking input on whether the statewide electricity mix CI would have to be adjusted to remove the portion of the mix which is attributable to full requirement customer utilities of BPA.

On-site renewable electricity CIs

DEQ is proposing to clarify the methodology to calculate a CI for on-site generation of renewable electricity to charge electric vehicles. EV4 Oregon is a company that owns EV chargers and has registered for a solar electricity fuel pathway code for their on-site solar charging of electric vehicles. Their charging stations consist of a canopy with photovoltaic panels over the parking spots for the chargers, and include a battery that stores the solar power until a vehicle plugs in to charge. DEQ has issued that pathway with the following conditions:

1. Solar electricity can only be claimed for KWh dispensed from the charger's battery or which is generated contemporaneously from the solar panels while a vehicle is charging. Any grid electricity used for charging must be reported separately under the Oregon grid average electricity fuel pathway code ORELC001.
2. No RECs can be generated from the facility, or if they are generated from the facility an equal number of RECs generated from that facility to the dispensed solar power into vehicles must be voluntarily retired by the entity claiming credits under the Clean Fuels Program.

The purpose of these conditions is to prevent double-counting of the greenhouse gas reductions from those specific volumes of power.

DEQ is considering adding a similar default pathway for on-site generation of electricity from wind power.

Nearby renewable electricity CIs

DEQ is also considering provisions that would allow renewable electricity generation that is nearby but not directly on the same site as an electric vehicle charger, as long as there is a clear physical or contractual path for the electricity to the electric vehicle charger. DEQ notes that California proposed some provisions along this line in November¹ of last year. DEQ believes that the nearby renewable electricity generation would:

- Be additional and explicitly for the charging stations
- Be located within the same utility service territory
- Qualifies as renewable power under our state's RPS
- Would not generate RECs, or any RECs generated would be voluntarily retired by the generator or the charger owner or operator and not be sold onto another party

Changes to credit generation provisions

The current rule contains two sets of hierarchies for eligible credit generators for electric vehicle charging: for non-residential charging such as public or workplace charging and residential charging. DEQ is considering modifications or additions to these sets of hierarchies.

¹ See page 4 of the white paper:
https://www.arb.ca.gov/fuels/lcfs/lcfs_meetings/12022016discussionpaper_electricity.pdf

Non-residential

For non-residential charging, the hierarchy is currently set up in the preference order of:

1. The owner or operator of the charging equipment
2. The electric utility
3. A broker designated by the owner or operator of the charging equipment.

This hierarchy was set up to first reward the entity that had made the largest economic investment, in this case the electric vehicle charger. The purpose of having electric utilities as a backstop to those entities is to ensure that credits get generated. While an electric utility may not have made a direct investment in that charger, they are providing the electric service to those chargers. Electricity from these chargers carries the carbon intensity value of the statewide mix, unless the utility has applied for a utility-specific CI score.

DEQ is considering a change to the language above based on a comment from ChargePoint to reword subpart (1) to replace “operator” to “service provider” or “network operator”.

DEQ is considering the addition of electric buses, fixed light rail, street cars and aerial trams to the CFP. For these applications, DEQ recommends the following hierarchy:

1. The transit agency
2. The electric utility
3. A broker designated by the owner or operator of the charging equipment.

DEQ believes this is consistent with the intent to designate the default credit generator be the entity with the largest investment, in this case the vehicle.

Residential

For residential charging, the hierarchy is currently set up in the preference order of:

1. The electric utility
2. A broker designated by the utility
3. The owner of the electric charging equipment

In an individual homeowner setting, subpart (3) should be the home owner. For a multi-family dwelling, subpart (3) should be the charger owner.

The residential hierarchy was constructed in this manner to: 1) provide administrative efficiency for the CFP and 2) allow the electric utilities to act as natural aggregators for their customers. Allowing utilities to aggregate the CFP credits on behalf of their customers will also create an incentive for the utilities to use the revenue from the sale of CFP credits to support the addition of more EVs in their service territories, under the oversight of the Oregon Public Utility Commission.

June 2016 data indicates that there are over 10,000 electric vehicles in Oregon, shown here by service territory:

Utility Name	# of full EVs	# of Plug-in Hybrids
PGE	4,513	2,554
PacifiCorp	942	804
EWEB	143	106
Consumers Power Inc	139	128
Lane Electric	135	86
Central Electric Coop	96	70
Emerald PUD	62	50
West Oregon Electric Coop	57	40
Springfield Utility Board	31	26
Columbia River PUD	25	35
Midstate Electric Coop	19	24
Wasco Electric Coop	16	21
Coos-Curry Electric Coop	16	38
Salem Electric	16	15
Central Lincoln PUD	14	21
Douglas Electric Coop	13	22
Tillamook People's Utility District	13	15
Blachly-Lane	10	6
Hood River Electric Coop	8	3
Forest Grove	8	7
Umatilla Electric Coop	8	18
Oregon Trail Electric Coop	7	14
Idaho Power	5	6
Canby Utility Board	3	2
N Wasco Co PUD	3	4
City of Cascade Locks	2	1
City of Bandon	2	2
Clatskanie PUD	2	1
Columbia Power Coop Association	1	1
Ashland Electric Services	1	1
Columbia Basin Electric Coop	0	2
Harney Electric Coop	0	2
Hermiston Energy Services	0	1
Surprise Valley Electric Coop	0	1
Monmouth Power and Light	0	0
Milton-Freewater Light & Power	0	0
Columbia Rural	0	0
Clearwater Power Company	0	0
City of Drain	0	0
Total	6,311	4,126

To date, no electric utility has registered in the CFP to generate credits from residential electric vehicle charging, nor has any utility designated a broker to act on their behalf. Comments received in past stakeholder engagements have pointed to two key questions:

1. Is the utility best suited to aggregate the credits on behalf of its residential customers?
2. What are the anticipated costs to participate in the CFP and how does it relate to the potential revenue from the sale of CFP credits?

These answers to these questions can be partially answered from the CFP context while the PUC must weigh in as well. DEQ will continue to work with stakeholders and regulators to clarify the issues.

If a hierarchy continues to exist for the designation of credit generators, the issue of the opt-in timeline must also be addressed. Under the current rules, electric utilities are required to register by October 1st of a given year to generate residential credits in the following year. DEQ is seeking input on whether this is an appropriate deadline.

Similarly, DEQ is seeking input on what the appropriate deadline is for a utility to designate a broker to act on its behalf.

With respect to a broker designation, DEQ is seeking input on whether there should be any limitations on the type of entity that can be a designated broker? Should there be limitations to what the proceeds from the sale of the credits be used for?

While the current rules allow individual homeowners who charge at their residences to sign up with the CFP, DEQ believes that it does not have the staff resources to administer such a program. DEQ is seeking input on whether there are any other ideas how individual homeowners can benefit from the CFP credits without having to register individually.

Additional Energy Economy Ratios (EER)

Electric transit buses

With the forthcoming appearance of electric buses in Oregon transit fleets, DEQ plans to propose the addition of an EER for electric transit buses. DEQ has discussed the factors that go into calculating the EERs with both Lane Transit District and TriMet, focusing on the bus models they are purchasing. DEQ also reviewed the fuel-economy data for those vehicles as tested by the Altoona Bus Research and Testing Center² and found that the energy-economy of their bus models were roughly equivalent to the value adopted by the California Air Resources Board, 4.2.

² <http://altoonabustest.psu.edu/buses/>

Fixed light rail

The proposed EERs for fixed light rail is based on comparing those vehicles versus diesel buses on a passenger mile-weighted basis. In the Additional Electrification Report, ICF has calculated Oregon-specific numbers based on TriMet's reporting to the National Transit Database. The EER value they calculated is 3.33 for fixed light rail. DEQ will confirm the accuracy of that value in further consultation with TriMet.

Street car

The proposed EERs for the street car system is based on comparing those vehicles versus diesel buses on a passenger mile-weighted basis. In the Additional Electrification Report, ICF has calculated Oregon-specific numbers based on the City of Portland's reporting to the National Transit Database. The EER value they calculated is 1.81 for street cars. DEQ will confirm the accuracy of that value in further consultation with the City of Portland.

Aerial tram

The proposed EERs for the aerial tram is based on comparing those vehicles versus diesel buses on a passenger mile-weighted basis. In the Additional Electrification Report, ICF has calculated Oregon-specific numbers based on the City of Portland's reporting to the National Transit Database. The EER value they calculated is 2.46 for the tram. DEQ will confirm the accuracy of that value in further consultation with the City of Portland.

DEQ is also working with stakeholders to identify any other vehicle types which could be added to the current set of EERs in tables 7 and 8 of the regulation.

Diesel displacement credit for fixed light rail and street cars

The displacement credit for electricity is the program's way of adjusting and accurately accounting for the fact that the engines which use electricity are different from traditional internal combustion engines for gasoline and diesel. The differences are accounted for in the Energy Economy Ratios; the higher an EER is, the more efficient it is versus traditional engines.

Using the example of an electric transit bus, the EER for those is 4.2 in the California LCFS. That means those buses are 4.2 times more energy efficient than diesel transit buses. So if a diesel bus was getting one mile per gallon, the equivalent electric bus would move 4.2 miles on the same diesel gallon-equivalent amount of electric energy.

So the environmental benefit from having an electric bus is twofold – the adjusted carbon-intensity of electricity is lower per megajoule than diesel, and it reduces the total amount of energy needed. The displacement credit captures that benefit and is one of the core components of our existing credit calculations for the CFP.

In California, the Air Resources Board opted against including electricity in its baselines for the Low-Carbon Fuel Standard. That meant that the existing uses of electricity for transportation, for example in the subway system in Los Angeles, were not accounted for in the baseline calculations of the program. Rather than recalculate and re-issue the baseline, ARB opted to differentiate between the portions of the electric transit systems in operation prior to the baseline and those that were placed in service after the baseline. They did this by awarding older infrastructure credits based on their direct energy use without an adjustment for the EER of those vehicles. Portions of those systems placed in service after the LCFS's baseline are awarded credits under the normal credit calculations, which do adjust the energy supplied by the EER.

The displacement credit is applied to the energy dispensed portion of the credit calculation as follows:

$$Credits_i^{XD}(MT) = \left(CI_{standard}^{XD} - \frac{CI_i}{EER^{XD}} \right) \times E_i \times EER^{XD} \times C$$

Where: CI_i represents the fuel's carbon intensity value

$CI_{standard}^{XD}$ would represent the diesel standard

E_i represents the amount of energy dispensed for the vehicle's propulsion

C is a factor translating the per-gram calculations into per-tonne credits

Fixed light rail and street car systems operating on track placed in-service prior to a specified baseline date would only claim credits without the displacement credit, as in the following equation:

$$Credits_i^{XD}(MT) = \left(CI_{standard}^{XD} - \frac{CI_i}{EER^{XD}} \right) \times E_i \times C$$

DEQ is seeking input on whether to allow fixed light rail and street car systems operating on track placed in-service after a specified baseline date to claim a displacement credit based on their vehicles' EER. DEQ strongly believes that credits should be generated from all contemporaneous transportation fuel use. Previous comments have been received that credits should not be generated from systems with infrastructure existing prior to the start of the CFP. However, this distinction is not made for petroleum or biofuel infrastructure such as refineries, CNG or LPG dispensers or electric vehicle chargers.

DEQ is also seeking input on what year to use as the baseline.

Comments

The agency invites comments addressing all aspects of this paper. This discussion will be captured in the meeting summary and posted on the committee webpage. DEQ will accept written comments one week after the posting in order to develop materials for the next meeting. Comments received after one week will still be considered, but may not be reflected in the next meeting's materials. Please e-mail any written comments to: OregonCleanFuels@deq.state.or.us.