



Rulemaking Advisory Committee #2: Adopting New Energy Economy Ratio (EER) Values

Contact: CFPE2021@deq.state.or.us

Background and Overview

The Department of Environmental Quality’s Clean Fuels Program (CFP) is requesting feedback on our proposal to adopt new Energy Economy Ratios (EERs) in this rulemaking, and create a related administrative processes to do so between rulemakings. Specifically, this paper proposes three provisions to move forward with during this rulemaking: 1) adding new EERs for two vehicle categories; 2) specifying what the agency’s data needs are to consider adoption of a new EER and a standardized methodology for the evaluation of new EERs; and 3) defining the administrative process and reporting requirements to adopt new EERs. This paper builds on the discussion paper for RAC #1 and incorporates comments we have received since then, along with additional research that the agency has conducted.

Part 1: Adding EERs for Two Vehicle Categories

DEQ proposes to adopt new EERs for two additional vehicle categories, given the following considerations:

- 1) The California Air Resource Board (CARB) Low Carbon Fuel Standard (LCFS) regulation currently includes these categories.
- 2) Current, peer-reviewed literature validates the commercial readiness of these vehicle categories.

Based on the factors described above, DEQ believes the EERs for the following vehicle categories could be added in this rulemaking:

- 1) Electric Ocean Going Vessel (eOGV) meaning shore power provided to an ocean going vessel at-berth.
- 2) Electric Cargo Handling Equipment (eCHE) meaning any off-road, self-propelled vehicle or equipment, other than yard trucks, used at a port or intermodal rail yard to lift or move container, bulk, or liquid cargo carried by ship, train, or another vehicle, or used to perform maintenance and repair activities that are routinely scheduled or that are due to predictable process upsets.

The following equipment is currently eligible for the CARB LCFS crediting under the eCHE and eOGV categories in LCFS:

Eligible Application ¹	Equipment	Energy Economy Ratio (EER)
Electric Cargo Handling Equipment (eCHE)	Loader	2.7
	Rubber-Tired Gantry Crane (RTG Crane)	
	Rail Mounted Gantry Crane	
	Automated Stacking Crane	
	Side Handler	
	Top Handler	
	Reach Stacker	
	Aerial Lift	
	Excavator	
Electric Ocean Going Vessel (eOGV)	Various shore power provided to an ocean going vessel at-berth	2.6

¹Ref.: https://ww2.arb.ca.gov/sites/default/files/2020-07/2020_lcfs_fro_oal-approved_unofficial_06302020.pdf

In RAC #1, we were asked whether electric ground service equipment at an airport (e.g., luggage tugs, container loaders, belt loaders, pushbacks) fits into the eCHE category. The definition of eCHE includes any off-road, self-propelled vehicle or equipment, other than yard trucks, used at a port or intermodal rail yard to lift or move a container, bulk, or liquid cargo carried by ship, train, or another vehicle, or used to perform maintenance and repair activities that are routinely scheduled or that are due to predictable process upsets. DEQ interprets this to mean that some airport ground service equipment can be included in this category.

Key Questions:

- 1) Should we add the eCHE vehicle category?
- 2) Should we include add the eOGV vehicle category?
- 3) Should we include electric ground service equipment in the eCHE vehicle category? If not, then is there sufficient data to warrant a new EER?
- 4) Are there other vehicle categories that we should consider?

Part 2: Specifying DEQ’s Conditions, Data, and Methodology Requirements for Evaluation of New EERs

Table 7 of the CFP’s rules at Oregon Administrative Rule (OAR) 340-253-8010 (see Appendix A) provides EER values for several fuel-vehicle combinations used to calculate credits and deficits.

This part of the discussion paper describes the conditions, data, and methodology requirements for requesting an EER-adjusted CI or a new EER. DEQ is requesting feedback on this proposal to require the following conditions and requirements as it considers adding new EERs.

Part 2.a. Conditions

DEQ proposes that these conditions would have to be met before a new EER-adjusted CI is considered:

- 1) The EER value requested does not represent a current fuel-vehicle combination (see Appendix A), or the existing EER is inappropriate for the new fuel-vehicle combination, and
- 2) Both the fuel and vehicle type are eligible under OAR 340-253-0100.

If both the above conditions are met, an EER-adjusted carbon intensity (CI) can be requested using a Tier 2 pathway application. An EER-adjusted CI is specific to the pathway holder. No other entity can use it for credit generation purposes.

Part 2.b. Data

The CFP is requesting public comment on a proposal to consider adopting the following recommended data, as part of the methodology (see Part 2.c) to help facilitate an informed review of the application:

- 1) ***Description of Fuel-Vehicle Technology.*** The applicant will describe the fuel-vehicle technology, and provide a preliminary estimate of the EER and the EER-adjusted CI for their specific use case, and how this novel transportation application could help support the CFP’s goal of reducing the carbon intensity of transportation fuel in Oregon, including the potential magnitude of credit generation.
- 2) ***Displacement Baseline.*** Displacement baseline refers to the conventional fuel-vehicle application that the proposed alternative fuel-vehicle combination will be displacing. In some cases, the displacement baseline may be a combination of multiple transport applications rather than a one-to-one replacement of a particular application. For example, a new high-speed train project may be shown to displace passenger vehicles, air transport, and bus transport.

The applicant will identify their proposed displacement baseline. They will provide a justification and all the data sources relied upon to make that determination. The applicant may rely on academic and market research, study, reports, surveys, and other data sources to make that determination.

Incorrectly identifying the displacement baseline may result in overestimation or underestimating the useful output that the alternative fuel-vehicle combination is displacing and lead to an inaccurate EER. Therefore, to accurately assess the EER value, it is critical to identify the displacement baseline correctly. DEQ will review the proposed baseline for completeness, suitability, and accuracy. The agency may request the applicant revise their proposal or propose its own.

Note: Proper identification of the units used to measure and compare useful output is necessary for accurately quantifying the EER value. The *units used to measure useful output* may differ on a case-by-case basis. For example, while comparing a battery-electric light-duty vehicle to an internal combustion light-duty vehicle, the useful output can be measured in miles traveled by the vehicle per unit of energy of a fuel (miles/MJ). Comparing a light-rail transit system displacing light-duty passenger cars, the useful output can be measured in passenger miles traveled per unit of energy of a fuel (passenger-miles-traveled/MJ).

- 3) ***Determining System Boundary and CI Impacts.*** Proper identification of the system boundary is necessary to determine all energy inputs and useful outputs. The system boundary defines which unit processes (e.g., energy resource extraction, energy carrier distribution) are part of the system to accurately account for any impact on the life cycle emissions and energy consumption associated with the fuel-vehicle combination. It includes the geographic region and time-frame of the data. For example, e-bicycles or e-scooters may be refueled at a designated central location but may be deployed elsewhere throughout a city. In this case, any resulting energy consumption and emissions associated with the transportation of these e-bicycles or e-scooters would need to be accounted for in the system boundary to assess the useful output and effective CI of the fuel.
- 4) ***Refueling practices and data.*** The applicant must describe expected refueling practices and data collection methods employed in their use case to meet CFP reporting requirements (see Part 3 for related reporting requirements).

Part 2.c. Methodology

The methodology must compare the useful output from the alternative fuel-vehicle technology under consideration to comparable conventional fuel-vehicle technology. The applicant must provide a detailed description of the methodology used, all assumptions made, and the data used.

Key Questions:

- 1) If an EER-adjusted CI is certified, then should that CI apply only to the applicant?
- 2) Should DEQ allow a vehicle manufacturer to apply for an EER-adjusted CI jointly with a fuel reporting entity? In the latter case, should any purchaser of the same vehicles be allowed to use the EER-adjusted CI?
- 3) Should an applicant requesting a Tier 2 pathway application for an EER-adjusted CI be required to provide a detailed description of the methodology used, all assumptions made, and provide all data and references to calculate the proposed EER-adjusted CI value, including details indicated in the *description of fuel-vehicle technology*, the *displacement baseline*, and the *determining system boundary and CI impacts* sections?

- 4) If an EER-adjusted CI is certified through the CARB, should be any additional data submitted to DEQ when they apply for a pathway in Oregon?
- 5) Because refueling practices and data collection methods may vary widely across different fuel-vehicle use cases, should an applicant be required to describe expected refueling practices and data collection methods employed in their use case to meet CFP reporting requirements?

Part 3: Defining an administrative process and reporting requirements to adopt EERs

Currently, since EERs are contained in the rules, new EERs must be adopted through a formal rulemaking process. This can be a very lengthy process and delay an entity's ability to generate credits in the CFP. The CFP is contemplating a new process to adopt some EERs without having to go through a formal rulemaking and is requesting public comment on a proposal to consider adopting the following application process and requirements that must be met before a Tier 2 pathway application for an EER-adjusted CI is accepted.

- 1) **Application Process.** An applicant must submit a Tier 2 pathway application for requesting an EER-adjusted CI using the Alternative Fuel Portal (AFP) and include the following:
 - a. **Letter of Intent.** The applicant must provide a letter of intent to request an EER-adjusted CI for their specific use case along with a justification that the EER values provided in Table 7 of the CFP regulation do not apply to the fuel-vehicle combination under consideration.
 - b. **Methodology.** The applicant must provide a detailed description of the methodology used, all assumptions made, and provide all data and references to calculate the proposed EER-adjusted CI value as laid out in Part 2 of this paper.
- 2) **Review and Approval Process.** The approval of an EER adjusted CI would be a discretionary act by the agency. DEQ would review the application, consider its suitability for addition to the program, and if it believes it could be approved the agency would summarize its review for a 30-day public comment period. Based on that feedback, the agency may approve the application, deny it, or request further revisions to the application prior to acting on it. If the agency deems the revisions to be significant, it may put the revised proposal out for additional rounds of public comment. Applications that include site-specific CI inputs are subject to third-party validation requirements under OAR 340-272-0100, beginning in 2022 for reports with data for calendar year 2021, and in each year thereafter.
- 3) **Public comment packet.** The information released for public comment on an application would include at least the following elements:
 - a. The agency's draft review and proposed EER and adjusted electricity CI.
 - b. The applicant's description of their fuel-vehicle technology, proposed displacement baseline, and system boundary. Data provided to the agency will be placed out for public comment in an aggregated fashion and with only as many redactions as may be needed to protect the trade secrets of the applicant, participating fleets, or the vehicle manufacture. Data released should be sufficiently detailed to allow external parties to understand the assumptions and analysis, and replicate the calculations that led to the proposed EER.

DEQ is also considering adopting the following ongoing reporting requirement if the EER-adjusted CI is approved: any reporting entity using the EER-adjusted CI may be required to provide, on an annual basis, a supplemental report that would allow the agency to monitor the accuracy of the approved EER. The reporting requirements would be established at the time of approval of the EER-adjusted CI as refueling practices and data collection methods may vary widely across different fuel-vehicle use cases. Based on

the annual reporting, DEQ may adjust the EER if it determines if it is inaccurate, or may use that information to establish a categorical EER in a future rulemaking.

Key Questions:

- 1) Should an applicant requesting a Tier 2 pathway application for an EER-adjusted CI be required to include a letter of intent to request an EER-adjusted CI for their specific use case along with a justification that the EER values provided in Table 7 of the CFP regulation do not apply to the fuel-vehicle combination under consideration?
- 2) Is the public comment process proposed above appropriate? How difficult might it be for applicants to provide sufficiently detailed data for public review and comment?
- 3) Should the applicant or DEQ prepare the applicant's materials for public comment?
- 4) Are the ongoing reporting requirements appropriate?

Appendix A
OAR 340-253-8010

Table 7. Oregon Energy Economy Ratio Values for Fuels

Light/Medium Duty Applications (Fuels used as gasoline replacements)		Heavy-Duty/Off-Road Applications (Fuels used as diesel replacements)		Aviation Applications (Fuels used as jet fuel replacements)	
Fuel/Vehicle Combination	EER Value Relative to Gasoline	Fuel/Vehicle Combination	EER Value Relative to Diesel	Fuel/Vehicle Combination	EER Value Relative to Jet Fuel
Gasoline (including E10) or any other gasoline-ethanol blend	1.0	Diesel fuel (including B5) or any other blend of diesel and biodiesel or renewable hydrocarbon diesel	1.0	Alternative Jet Fuel	1.0
CNG Internal Combustion Engine Vehicle (ICEV)	1.0	CNG, LNG, or LPG (Spark-Ignition Engines)	0.9		
Electricity/Battery Electric Vehicle or Plug-In Hybrid Electric Vehicle	3.4	CNG, LNG, or LPG (Compression-Ignition Engines)	1.0		
Electricity/On-Road Electric Motorcycle	4.4	Electricity/Battery Electric Vehicle or Plug-In Hybrid Electric Vehicle	5.0		
Propane/Propane Forklift	0.9	Electricity/Battery Electric Vehicle or Plug-In Hybrid Transit Bus	5.0		
Hydrogen/Fuel Cell Vehicle	2.5	Electricity/Fixed Guideway Light Rail	3.3		
		Electricity/Fixed Guideway Streetcar	2.1		
		Electricity/Fixed Guideway Aerial Tram	2.6		
		Electricity/Electric Forklift	3.8		
		Electricity/Electric TRU (eTRU)	3.4		
		Hydrogen/Fuel Cell Vehicle	1.9		
		Hydrogen/Fuel Cell Forklift	2.1		

Reference: https://artifacts.casertext.com/artifacts/2020340-253-8070_34