

**PART 474—ELECTRIC AND HYBRID VEHICLE RESEARCH, DEVELOPMENT, AND DEMONSTRATION PROGRAM; PETROLEUM-EQUIVALENT FUEL ECONOMY CALCULATION**

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AUTHORITY: 49 U.S.C. 32901 *et seq.*

SOURCE: 65 FR 36991, June 12, 2000, unless otherwise noted.

**§ 474.1 Purpose and Scope.**

This part contains procedures for calculating a value for the petroleum-equivalent fuel economy of electric vehicles, as required by 49 U.S.C. 32904(a)(2). The petroleum-equivalent fuel economy value is intended to be used by the Environmental Protection Agency in calculating corporate average fuel economy values pursuant to regulations at 40 CFR Part 600—Fuel Economy of Motor Vehicles.

**§ 474.2 Definitions.**

For the purposes of this part, the term:

*Combined energy consumption value* means the weighted average of the Urban Dynamometer Driving Schedule and the Highway Fuel Economy Driving Schedule energy consumption values (weighted 55/45 percent, respectively), as determined by the Environmental Protection Agency in accordance with 40 CFR parts 86 and 600.

*Electric vehicle* means a vehicle that is powered by an electric motor drawing current from rechargeable storage batteries or other portable electrical energy storage devices, provided that:

(1) Recharge energy must be drawn from a source off the vehicle, such as residential electric service; and

(2) The vehicle must comply with all provisions of the Zero Emission Vehicle definition found in 40 CFR 88.104–94(g).

*Highway Fuel Economy Driving Schedule energy consumption value* means the average number of watt-hours of electrical energy required for an electric vehicle to travel one mile of the Highway Fuel Economy Driving Schedule, as determined by the Environmental Protection Agency.

*Petroleum equivalency factor* means the value specified in § 474.3(b) of this part, which incorporates the parameters listed in 49 U.S.C. 32904(a)(2)(B) and is used to calculate petroleum-equivalent fuel economy.

*Petroleum-equivalent fuel economy* means the value, expressed in miles per gallon, that is calculated for an electric vehicle in accordance with § 474.3(a) of this part, and reported to the Administrator of the Environmental Protection Agency for use in determining the vehicle manufacturer's corporate average fuel economy.

*Petroleum-powered accessory* means a vehicle accessory (e.g., a cabin heater, defroster, and/or air conditioner) that:

(1) Uses gasoline or diesel fuel as its primary energy source; and

(2) Meets the requirements for fuel, operation, and emissions in 40 CFR part 88.104–94(g).

*Urban Dynamometer Driving Schedule energy consumption value* means the average number of Watt-hours of electrical energy required for an electric vehicle to travel one mile of the Urban Dynamometer Driving Schedule, as determined by the Environmental Protection Agency.

**§ 474.3 Petroleum-equivalent fuel economy calculation.**

(a) The petroleum-equivalent fuel economy for an electric vehicle is calculated as follows:

(1) Determine the electric vehicle's Urban Dynamometer Driving Schedule energy consumption value and the Highway Fuel Economy Driving Schedule energy consumption value in units of Watt-hours per mile;

(2) Determine the combined energy consumption value by averaging the Urban Dynamometer Driving Schedule energy consumption value and the Highway Fuel Economy Driving Schedule energy consumption value using a weighting of 55 percent urban/45 percent highway; and

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(3) Calculate the petroleum-equivalent fuel economy by dividing the appropriate petroleum-equivalency factor (depending on whether any petroleum-powered accessories are installed; see paragraph (b) of this section) by the combined energy consumption value, and round to the nearest 0.01 miles per gallon.

(b) The petroleum-equivalency factors for electric vehicles are as follows:

(1) If the electric vehicle does not have any petroleum-powered accessories installed, the value of the petroleum equivalency factor is 82,049 Watt-hours per gallon.

(2) If the electric vehicle has any petroleum-powered accessories installed, the value of the petroleum-equivalency factor is 73,844 Watt-hours per gallon.

### § 474.4 Test procedures.

(a) The electric vehicle energy consumption values used in the calculation of petroleum-equivalent fuel economy under § 474.3 of this part will be determined by the Environmental Protection Agency using the Highway Fuel Economy Driving Schedule and Urban Dynamometer Driving Schedule test cycles at 40 CFR parts 86 and 600.

(b) The "Special Test Procedures" provisions of 40 CFR 86.090-27 may be used to accommodate any special test procedures required for testing the energy consumption of electric vehicles.

### § 474.5 Review and Update

The Department will review Part 474 five years after the date of publication as a final rule to determine whether any updates and/or revisions are necessary. DOE will publish a notice in the FEDERAL REGISTER soliciting stakeholder input in this review. The Department will publish the findings of the review and any resulting adjustments to Part 474 in the FEDERAL REGISTER.

#### APPENDIX TO PART 474—SAMPLE PETROLEUM-EQUIVALENT FUEL ECONOMY CALCULATIONS

*Example 1:* An electric vehicle is tested in accordance with Environmental Protection Agency procedures and is found to have an Urban Dynamometer Driving Schedule energy consumption value of 265 Watt-hours per mile and a Highway Fuel Economy Driv-

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ing Schedule energy consumption value of 220 Watt-hours per mile. The vehicle is not equipped with any petroleum-powered accessories. The combined electrical energy consumption value is determined by averaging the Urban Dynamometer Driving Schedule energy consumption value and the Highway Fuel Economy Driving Schedule energy consumption value using weighting factors of 55 percent urban, and 45 percent highway:

combined electrical energy consumption value = (0.55 \* urban) + (0.45 \* highway) = (0.55 \* 265) + (0.45 \* 220) = 244.75 Wh/mile

Since the vehicle does not have any petroleum-powered accessories installed, the value of the petroleum equivalency factor is 82,049 Watt-hours per gallon, and the petroleum-equivalent fuel economy is:

(82,049 Wh/gal) (244.75 Wh/mile) = 335.24 mpg

*Example 2:* The vehicle from Example 1 is equipped with an optional diesel-fired cabin heater/defroster. For the purposes of this example, it is assumed that the electrical efficiency of the vehicle is unaffected.

Since the vehicle has a petroleum-powered accessory installed, the value of the petroleum equivalency factor is 73,844 Watt-hours per gallon, and the petroleum-equivalent fuel economy is:

(73,844 Wh/gal) (244.75 Wh/mile) = 301.71 mpg

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