recover and store energy during engine motoring operation but not from the vehicle’s wheels.

(1) Pre-transmission hybrid powertrains are those engine systems that include features that recover and store energy during engine motoring operation but not from the vehicle wheels. These powertrains are tested using the hybrid engine test procedures of 40 CFR part 1065 or using the post-transmission test procedures in 40 CFR 1037.550.

(2) Post-transmission hybrid powertrains are those powertrains that include features that recover and store energy from braking but that cannot function as hybrids without the transmission. These powertrains must have a single output shaft to the final drive and are tested by simulating the chassis test procedure applicable for hybrid vehicles under 40 CFR 1037.550. You need our approval before you begin testing.

(b) Rankine engines. Test engines that include Rankine-cycle exhaust energy recovery systems according to the test procedures specified in subpart F of this part unless we approve alternate procedures.

(c) Calculating credits. Calculate credits as specified in subpart H of this part. Credits generated from engines and powertrains certified under this section may be used in other averaging sets as described in §1036.740(c).

(d) Innovative technologies. You may certify using both provisions of this section and the innovative technology provisions of §1036.610, provided you do not double count emission benefits.

§1036.620 Alternate CO₂ standards based on model year 2011 compression-ignition engines.

For model years 2014 through 2016, you may certify your compression-ignition engines to the CO₂ standards of this section instead of the CO₂ standards in §1036.108. However, you may not certify engines to these alternate standards if they are part of an averaging set in which you carry a balance of banked credits. You may submit applications for certifications before using up banked credits in the averaging set, but such certificates will not become effective until you have used up (or retired) your banked credits in the averaging set. For purposes of this section, you are deemed to carry credits in an averaging set if you carry credits from advanced technology that are allowed to be used in that averaging set.

(a) The standards of this section are determined from the measured emission rate of the test engine of the applicable baseline 2011 engine family(ies) as described in paragraphs (b) and (c) of this section. Calculate the CO₂ emission rate of the baseline test engine using the same equations used for showing compliance with the otherwise applicable standard. The alternate CO₂ standard for light and medium heavy-duty vocational-certified engines (certified for CO₂ using the transient cycle) is equal to the baseline emission rate multiplied by 0.975. The alternate CO₂ standard for tractor-certified engines (certified for CO₂ using the SET cycle) and all other heavy heavy-duty engines is equal to the baseline emission rate multiplied by 0.970. The in-use FEL for these engines is equal to the alternate standard multiplied by 1.03.

(b) This paragraph (b) applies if you do not certify all your engine families in the averaging set to the alternate standards of this section. Identify separate baseline engine families for each engine family that you are certifying to the alternate standards of this section. For an engine family to be considered the baseline engine family, it must meet the following criteria:

(1) It must have been certified to all applicable emission standards in model year 2011. If the baseline engine was certified to a NOₓ FEL above the standard and incorporated the same emission control technologies as the new engine family, you may adjust the baseline CO₂ emission rate to be equivalent to an engine meeting the 0.20 g/ hp-hr NOₓ standard (or your higher FEL as specified in this paragraph (b)(1)), using certification results from model years 2009 through 2011, consistent with good engineering judgment.
emission rates (g/hp-hr): \( \text{CO}_2 = a \times \log(\text{NO}_X) + b \).

(ii) For model year 2014–2016 engines certified to NO\(_X\) FELs above 0.20 g/hp-hr, correct the baseline CO\(_2\) emissions to the actual NO\(_X\) FELs of the 2014–2016 engines.

(iii) Calculate separate adjustments for transient and SET emissions.

(2) The baseline configuration tested for certification must have the same engine displacement as the engines in the engine family being certified to the alternate standards, and its rated power must be within five percent of the highest rated power in the engine family being certified to the alternate standards.

(3) The model year 2011 U.S.-directed production volume of the configuration tested must be at least one percent of the total 2011 U.S.-directed production volume for the engine family.

(4) The tested configuration must have cycle-weighted BSFC equivalent to or better than all other configurations in the engine family.

(c) This paragraph (c) applies if you certify all your engine families in the primary intended service class to the alternate standards of this section. For purposes of this section, you may combine light heavy-duty and medium heavy-duty engines into a single averaging set. Determine your baseline CO\(_2\) emission rate as the production-weighted emission rate of the certified engine families you produced in the 2011 model year. If you produce engines for both tractors and vocational vehicles, treat them as separate averaging sets. Adjust the CO\(_2\) emission rates to be equivalent to an engine meeting the average NO\(_X\) FEL of new engines (assuming engines certified to the 0.20 g/hp-hr NO\(_X\) standard have a NO\(_X\) FEL equal to 0.20 g/hp-hr), as described in paragraph (b)(1) of this section.

(d) Include the following statement on the emission control information label: "THIS ENGINE WAS CERTIFIED TO AN ALTERNATE CO\(_2\) STANDARD UNDER §1036.620.""

(e) You may not bank CO\(_2\) emission credits for any engine family in the same averaging set and model year in which you certify engines to the standards of this section. You may not bank any advanced technology credits in any averaging set for the model year you certify under this section (since such credits would be available for use in this averaging set). Note that the provisions of §1036.745 apply for deficits generated with respect to the standards of this section.

(f) You need our approval before you may certify engines under this section, especially with respect to the numerical value of the alternate standards. We will not approve your request if we determine that you manipulated your engine families or test engine configurations to certify to less stringent standards, or that you otherwise have not acted in good faith. You must keep and provide to us any information we need to determine that your engine families meet the requirements of this section. Keep these records for at least five years after you stop producing engines certified under this section.

§ 1036.625 In-use compliance with family emission limits (FELs).

You may ask us to apply a higher in-use FEL for certain in-use engines, subject to the provisions of this section. Note that §1036.225 contains provisions related to changing FELs during a model year.

(a) Purpose. This section is intended to address circumstances in which it is in the public interest to apply a higher in-use FEL based on forfeiting an appropriate number of emission credits.

(b) FELs. When applying higher in-use FELs to your engines, we would intend to accurately reflect the actual in-use performance of your engines, consistent with the specified testing provisions of this part.

(c) Equivalent families. We may apply the higher FELs to other families in other model years if they used equivalent emission controls.

(d) Credit forfeiture. Where we specify higher in-use FELs under this section, you must forfeit CO\(_2\) emission credits based on the difference between the in-use FEL and the otherwise applicable FEL. Calculate the amount of credits to be forfeited using the applicable equation in §1036.705, by substituting the otherwise applicable FEL for the standard and the in-use FEL for the otherwise applicable FEL.