

EPA Decision Document:

Off-Cycle Credits for Mazda Motor Corporation

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Compliance Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency

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## I. Introduction

EPA's light-duty vehicle greenhouse gas (GHG) rules include opportunities for manufacturers to generate CO<sub>2</sub> credits for technologies that provide CO<sub>2</sub> reductions not captured by the 2-cycle emissions test. There are three pathways by which manufacturers can generate off-cycle credits: (1) a pre-determined "menu" of technologies and credits that is available for 2014 and later model years, (2) a testing based option, and (3) an alternative methodology that includes opportunity for public comment. These are described in more detail in Section II.

Mazda Motor Corporation (Mazda) has applied for off-cycle credits for the use of the High Efficiency Exterior Lighting technology. This application (with confidential business information redacted) will be published on EPA's web site at <https://www.epa.gov/ve-certification/mazda-compliance-materials-light-duty-greenhouse-gas-ghg-standards>. Mazda's request follows the allowance to request alternative values<sup>1</sup> rather than claim the pre-determined values<sup>2</sup> for this technology. Mazda has used the alternative methodology<sup>3</sup> for determining the alternative credit values and has requested a waiver<sup>4</sup> of the public notice and comment requirement because this application is substantially identical to applications that have previously been approved. EPA has waived the notice and comment requirement and is hereby approving the alternative credit levels as described in Mazda's application updated on April 26, 2022. Mazda did not create an updated FOI application, Mazda's original application was submitted to EPA on December 21, 2020, as the correction was made to the table which is redacted in the FOI application.

Section II of this document provides background on EPA's off-cycle credits program. Section III provides EPA's decision. This decision document applies only to the applications referenced herein.

## II. EPA's Off-cycle Credits Program

EPA's light-duty vehicle greenhouse gas (GHG) program provides three pathways by which a manufacturer may accrue off-cycle carbon dioxide (CO<sub>2</sub>) credits for those off-cycle technologies that achieve CO<sub>2</sub> reductions in the real world but where those reductions are not adequately captured on the test procedure used to determine compliance with the CO<sub>2</sub> standards. The first is a predetermined list of

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<sup>1</sup> See 40 CFR 86.1869-12(b)(3).

<sup>2</sup> See 40 CFR 86.1869-12(b)(1)(ii).

<sup>3</sup> See 40 CFR 86.1869-12(d).

<sup>4</sup> See 40 CFR 86.1869-12(d)(2)(ii).

credit values for specific off-cycle technologies that may be used beginning in model year 2014.<sup>5</sup> This pathway allows manufacturers to use conservative credit values established by EPA for a wide range of technologies, with minimal data submittal or testing requirements. In cases where additional laboratory testing can demonstrate emission benefits of an off-cycle technology, a second pathway allows manufacturers to use a broader array of emission tests (known as “5-cycle” testing because the methodology uses five different testing procedures) to demonstrate and justify off-cycle CO<sub>2</sub> credits.<sup>6</sup> The additional emission tests allow emission benefits to be demonstrated over some elements of real-world driving not captured by the GHG compliance tests, including high speeds, hard accelerations, and cold temperatures. Credits determined according to this methodology do not undergo additional public review. The third and last pathway allows manufacturers to seek EPA approval to use an alternative methodology for determining the off-cycle CO<sub>2</sub> credits.<sup>7</sup> This option is only available if the benefit of the off-cycle technology cannot be adequately demonstrated using the 5-cycle methodology. Manufacturers may also use this option for model years prior to 2014 to demonstrate off-cycle CO<sub>2</sub> reductions for technologies that are on the predetermined list, or to demonstrate reductions that exceed those available via use of the predetermined list.

Under the regulations, a manufacturer seeking to demonstrate off-cycle credits with an alternative methodology (i.e., under the third pathway described above) must describe a methodology that meets the following criteria:

- Use modeling, on-road testing, on-road data collection, or other approved analytical or engineering methods;
- Be robust, verifiable, and capable of demonstrating the real-world emissions benefit with strong statistical significance;
- Result in a demonstration of baseline and controlled emissions over a wide range of driving conditions and number of vehicles such that issues of data uncertainty are minimized;
- Result in data on a model type basis unless the manufacturer demonstrates that another basis is appropriate and adequate.

Further, the regulations specify the following requirements regarding an application for off-cycle CO<sub>2</sub> credits:

- A manufacturer requesting off-cycle credits must develop a methodology for demonstrating and determining the benefit of the off-cycle technology and carry out any necessary testing and analysis required to support that methodology.
- A manufacturer requesting off-cycle credits must conduct testing and/or prepare engineering analyses that demonstrate the in-use durability of the technology for the full useful life of the vehicle.

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<sup>5</sup> See 40 CFR 86.1869-12(b).

<sup>6</sup> See 40 CFR 86.1869-12(c).

<sup>7</sup> See 40 CFR 86.1869-12(d).

- The application must contain a detailed description of the off-cycle technology and how it functions to reduce CO<sub>2</sub> emissions under conditions not represented on the compliance tests.
- The application must contain a list of the vehicle model(s) which will be equipped with the technology.
- The application must contain a detailed description of the test vehicles selected and an engineering analysis that supports the selection of those vehicles for testing.
- The application must contain all testing and/or simulation data required under the regulations, plus any other data the manufacturer has considered in the analysis.

Finally, the alternative methodology must be approved by EPA prior to the manufacturer using it to generate credits. As part of the review process defined by regulation, the alternative methodology submitted to EPA for consideration must be made available for public comment.<sup>8</sup> EPA will consider public comments as part of its final decision to approve or deny the request for off-cycle credits.

Although these credits are requested under regulatory provisions that don't explicitly require limitations, or caps, on credit values, EPA is stipulating here that credits for technologies for which there is a regulatory cap must be held to the applicable regulatory cap, if such credits are approved by EPA. For example, for reasons described in the implementing rulemaking documents and analyses, EPA established caps on thermal technology credits of 3.0 grams/mile for cars and 4.3 grams/mile for trucks. The rationale for these caps is applicable regardless of the off-cycle pathway being used to achieve such credits. EPA also established caps on technologies that improve the efficiency of air conditioning systems (5 grams/mile for cars and 7.2 grams per mile for trucks). Thus, credits approved in this Decision Document are being approved only to the extent that the regulatory caps on credits for certain technologies or categories of technologies are not exceeded.

### **III. EPA Decisions on Off-cycle Credit Applications**

#### **A. High Efficiency Exterior Lights**

Mazda has applied for alternative values to the predefined credits for high efficiency exterior lights. Mazda's methodology for determining the credit values follows the same methodology used to determine the pre-defined credit values as described in the 2017-2025 LDV Greenhouse Gas Emission Standards and CAFE Standards Joint Technical Support Document<sup>9</sup> while utilizing high efficiency lighting wattages that are specific to Mazda vehicles.

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<sup>8</sup> See 40 CFR 86.1869-12(d)(2).

<sup>9</sup> EPA-420-R-12-901, August 2012, Section 5.2.3.

Ford Motor Company<sup>10</sup> and Mercedes-Benz<sup>11</sup> have previously been granted high efficiency exterior light credit values using this methodology after a public notice and comment periods were conducted<sup>12,13</sup>. Therefore, EPA has decided to waive the public notice and comment period for this application.

EPA has evaluated the application and finds that the methodologies described therein are sound and appropriate. Therefore, EPA is approving the High Efficiency Exterior Light credits requested by Mazda for 2020 and later model years. Caps or limits on credits that are specified in the regulations also apply to the credits being approved in this document, as discussed above. Specifically, alternative values to predefined credits are required to be used “in lieu”<sup>14</sup> of the predefined values. This means that these credit values are subject to the 10 or 15 g/mi credit caps<sup>15</sup> that apply to the predefined credit values. All information necessary to determine the total Megagrams of credits must be included in the reporting to EPA, and the total Megagrams for each fleet and model year should be included in a summary of credit averaging, banking, and trading.

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<sup>10</sup> EPA-420-R-15-014, September 2015

<sup>11</sup> EPA-420-R-14-025, September 2014

<sup>12</sup> 80 FR 31598, June 3rd, 2015

<sup>13</sup> 78 FR 60275, October 1<sup>st</sup>, 2013

<sup>14</sup> 40 CFR 86.1869-12(b)(3)

<sup>15</sup> 40 CFR 86.1869-12(b)(2)