

الهيئة السعودية للمواصفات و المقاييس و الجودة
Saudi Standards, Metrology and Quality Org(SASO)

DRAFT: FINAL

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**SAUDI ARABIA CORPORATE AVERAGE FUEL ECONOMY
STANDARD (SAUDI CAFE) FOR INCOMING LIGHT DUTY
VEHICLES (2016 – 2020)**

ICS : 43.060.40

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SAUDI ARABIA CORPORATE AVERAGE FUEL ECONOMY
STANDARD (SAUDI CAFE) FOR INCOMING LIGHT DUTY
VEHICLES (2016 – 2020)

AMENDMENT (1)

Page 3, 2- DEFINITIONS

Insert a new items 2.9, 2.10, 2.11 and 2.12 to read:

2.9 Electric Vehicle (EV)

An electric vehicle, also called an electric drive vehicle, uses one or more electric motors or traction motors for propulsion. EVs can be Battery Electric Vehicles (BEV) or Plug-in Hybrid Electric Vehicles (PHEV).

2.10 Battery Electric Vehicle (BEV)

A battery electric vehicle (BEV), battery-only electric vehicle, full electric vehicle, or all-electric vehicle is a type of electric vehicle (EV) that uses chemical energy stored in rechargeable battery packs. BEVs use electric motors and motor controllers instead of internal combustion engines (ICEs) for propulsion.

2.11 Plug-in Battery Electric Vehicle (PHEV)

A plug-in hybrid electric vehicle (PHEV) is a hybrid electric vehicle that is equipped with an internal combustion engine along with an electric motor that can be recharged by plugging it in to an external source of electric power as well by its on-board engine and generator.

2.12 Fuel Economy Equivalency (FEe)

Fuel Economy Equivalency (FEe) is a measure of the average distance traveled per liter of gasoline equivalent. FEe is used to compare energy consumption EVs with the energy consumption of conventional ICE rated in kilometer per liter.

Page 10, Insert a new paragraph after statement " A manufacturer should test the fuel economy of electric vehicles (EV)... " to read :

- For Plug-in hybrid electric vehicle (PHEV) and battery electric vehicle (BEV), the following methodology shall be utilized to convert energy consumption into kilometer per liter equivalent:

1- Battery Electric Vehicle (BEV)

$$(FEe)_{EV} = \frac{2348}{GHG_{Elec.} - GHG_{Upstr.}}$$

GHG_{Elec.} : is the carbon-related exhaust emission equivalent from EVs as a result of electricity generation and transmission.

GHG_{Upstr.} : is the carbon-related exhaust emission value from upstream gasoline refining intended for consumption by a target internal combustion engine.

$$\text{GHG}_{\text{Elec.}} = \frac{\text{EC}}{\text{GRIDLOSS}} * \text{AVGSUP}$$

$$\text{GHG}_{\text{Upstr.}} = \frac{279}{\text{Target FE}}$$

EC: is the vehicle energy consumption in kilowatt-hours per kilometer.

GRIDLOSS: accounts for grid transmission losses and is equal to 0.93.

AVGSUP: is the nationwide average electricity greenhouse gas emission rate at the power plant, in grams per kilowatt-hour and is equal to 588.

279: is the estimated grams of upstream greenhouse gas emissions per liter of gasoline.

2348: is the estimated content of greenhouse gas emissions per liters of gasoline in grams of CO₂.

Target FE: is the fuel economy target value, of an internal combustion engine vehicle with a similar footprint to the required EV, as per Section 4 in the standard SASO 2864.

2- Plug-in Battery Electric Vehicle (PHEV)

$$(\text{FEe})_{\text{PHEV}} = 0.5 * \text{FE} + 0.5 * (\text{FEe})_{\text{EV}}$$

FE: is the fuel economy of the internal combustion engine part of the PHEV and is calculated as per SASO 2864 Section 4.

0.5: is the coefficient determining the daily distance covered by each type of fuel source (i.e. gasoline fuel source vs battery fuel source).

Page 16, 6- IMPLEMENTATION MECHANISMS

Insert a new items 6.1.1.2.29 to read:

6.1.1.2.29 For BEV and PHEV, the manufacturer shall provide the following additional data:

6.1.1.2.29.1 The battery capacity in kWh

6.1.1.2.29.2 The power consumption of the vehicle in kWh/100 km using the electric motor

6.1.1.2.29.2 The fuel economy using the internal combustion engine in km/l; specifically for PHEV

Page 19, Insert a new items No. (8) to read:

8.1 SASO shall issue and publicize an annual report post the conclusion of the enforcement cycle illustrating for each Motor Vehicle Class (i.e. PC and LT) per manufacturer

1. The actual fuel economy performance
2. The target fuel economy performance
3. The credits obtained during the same enforcement cycle
4. The accrued credit balance

8.2 The annual report shall not include the sales volumes for any of the automotive manufacturers.

Page 28, Insert a new paragraph after statement " SASO, or whomever it delegates, will review... " to read :

- AIR CONDITIONING TECHNOLOGIES CREDITS SUBMISSION

1- Starting on the third enforcement cycle of the standard (Jan 1, 2018 – Dec 31, 2018) until the fourth enforcement cycle of the standard (Jan 1, 2019 – Dec 31, 2019), automotive manufacturers, eligible to receive the additional flexibilities, will be granted the maximum credit limit for each air-conditioning efficiency technology according to menu of technologies illustrated in the “Air-conditioning efficiency credits” section.

To obtain the credits, the automotive manufacturer must prove the existence and functionality of the technology or technologies. The manufacturer shall provide the details of the testing methodology and obtain agreement from SASO prior to the acceptance of the test results.

Should the automotive manufacturer fail to prove the existence and functionality for any of the Air-conditioning efficiency technologies, the automotive manufacturer will not be granted any credits.

2- On the fifth enforcement cycle of the standard (Jan 1, 2020 – Dec 31, 2020) onwards, the process for generation of Air-conditioning efficiency credits shall be in accordance with the process illustrated in Appendix I, section “Air-conditioning efficiency credits”.

- AIR CONDITIONING AND OFF-CYCLE TECHNOLOGIES SUBMISSION DEADLINE

Automotive manufacturers must update the supply plans to include the Air-conditioning and Off-cycle credit requests prior to the conclusion of the second month post the enforcement cycle (i.e before March 1st of the subsequent enforcement cycle).