

ASSOCIATION STANDARD

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**Life cycle assessment methods for greenhouse gases and air
pollutants emissions of the automobile
(English Translation)**

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Foreword

This standard is drafted in accordance with the rules given in GB/T 1.1-2009 "Standardization Work Guide Part 1. Standard Structure and Preparation".

Some elements of this standard may involve patents, the publication of standards the organization does not assume responsibility for identifying these patents.

This standard was proposed by the China Automotive Engineering Society.

This standard was drafted. China Automotive Engineering Society, Ministry of Ecology and Environment, Motor Vehicle Sewage Monitoring Center, Tsinghua University, China Automotive Technology Research Center Co., Ltd.

1 Scope

This standard specifies the terminology and evaluation method framework for the evaluation method of greenhouse gas and atmospheric pollutant emissions in the life cycle of automobiles.

This standard applies to the evaluation of greenhouse gas and atmospheric pollutant emissions during the life cycle of automobiles.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article.

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 24040-2008 Environmental Management Life Cycle Assessment Principles and Framework (ISO 14040:2006) GB/T 24044-2008 Environmental Management Life Cycle Assessment Requirements and Guidelines (ISO 14044:2006) Argonne National Laboratory.GREET.2017.

GB/T 32150-2015 General rules for accounting and reporting of greenhouse gas emissions from industrial enterprises GB/T 3095-2012 Ambient Air Quality Standard Technical Guidelines for the Preparation of Air Pollutant Emission Inventory for Road Vehicles (Trial) GB 18352.6 -2016 Light vehicle pollutant emission limits and measurement methods (China Stage 6) GB 17691-2018 Heavy Duty Diesel Vehicle Pollutant Emission Limits and Measurement Methods (China Stage 6) GB 27999-2014 Passenger car fuel consumption evaluation method and index

3.1 Life cycle life cycle

A series of stages in the product system that are connected from the natural world or from natural resources to the final disposal.

[GB/T 24040-2008, definition 3.1]

3.1.1 Automotive Fuel Cycle Upstream Stage Well to Pump, WTP

The upstream phase of the automotive fuel cycle, including primary energy extraction, transportation and storage, and fuel production, transportation, distribution, and storage Storage.

3.1.2 Automobile fuel cycle operation stage Pump to Wheels, PTW

The stage of fuel consumption in the operation of a car.

3.1.3 Automotive Material Cycle Materialmanufacturing Cycle

The automotive material cycle covers the mining and transportation of raw materials, the production and processing of automotive materials, the manufacture of automobiles, and the use of the components.

Replacement and vehicle scrapping and other processes.

3.2.1 Automotive Life Cycle Assessment

Compilation and evaluation of data collection of inputs, outputs and their potential environmental impacts in the life cycle of automotive systems. Car life cycle the evaluation includes two aspects of vehicle fuel cycle evaluation and automotive material cycle evaluation.

[GB/T 24040-2008, definition 3.2]

3.2.2 Automotive fuel cycle evaluation

The vehicle fuel cycle includes two stages, WTT and TTW. The evaluation of the fuel cycle of a car refers to the extraction and production of automotive fuel from raw materials.

Production, storage, transportation and replenishment, and finally environmental impact assessment of processes such as energy depletion (vehicle operation).

3.2.3 Automotive material cycle evaluation

Automotive materials from raw material extraction, raw material processing, parts manufacturing, automobile assembly, and finally to automobile scrap, recycling and utilization Environmental impact assessment of the process.

3.3 Greenhouse gases greenhouse gases

Naturally occurring in the atmosphere and capable of absorbing and dissipating due to human activities produced by the Earth's surface, atmosphere and clouds A gaseous component of radiation having a wavelength in the infrared spectrum.

Note: The greenhouse gases involved in this standard mainly include carbon dioxide (CO₂), methane (CH₄) and nitrous oxide specified in the Kyoto Protocol.

(N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF₆), the last five gases are based on 100-year time scales of different substances the global warming potential (GWP) is calculated as CO₂ equivalent.

[GB/T 32150-2015, definition 3.1]

3.3 Atmospheric pollutants airpollutants

This standard considers fine particulate matter (PM_{2.5}), nitrogen oxides (NO_x), volatile organic compounds (VOC), carbon monoxide (CO), Five pollutants of sulfur dioxide (SO₂).

[GB 18352.6 -2016, definition 3.12] [GB 17691-2018, definition 3.24] [GB/T 3095-2012, definition 3.4]

3.4.1 Emission factors

Emissions per unit of activity level.

3.4.2 Automotive Life Cycle Emission Factors

The emissions from the average unit mileage during the life cycle of the vehicle, including fuel cycle and material cycle emissions.

3.4.3 Automotive Life Cycle Greenhouse Gas Emission Factors

The amount of greenhouse gas emissions caused by the average unit mileage of a car during its life cycle.

3.4.4 Automotive life cycle air pollutant emission factors

The amount of air pollutants emitted by the average unit mileage of the car during its life cycle.

4.1 Purpose of evaluation

Scientifically evaluate the environmental impact of various fuels and power systems, promote energy saving and emission reduction in the life cycle of automobiles, and promote automobiles.

Sustainable and healthy development of the industry.

4.2 Data acquisition

(1) Key data in the upstream phase of the automotive fuel cycle Including energy efficiency, power composition, mode of transport/distance/ratio, power plant emission factors.

(2) Key data of the automotive fuel cycle operation phase Air pollutant emission factor based on the technical guidelines for motor vehicle emissions inventories in China;

Fuel consumption during the car operation phase of the road.

[Technical Guide for the Preparation of Air Pollutant Emission Inventory for Road Vehicles (Trial)] [GB 27999-2014] (3) Key data of the automotive material cycle Including vehicle component weight and composition map, body material manufacturing, power battery, vehicle manufacturing, parts replacement and scrap recycling Energy consumption and consumption list, etc.

4.3 System Boundary and Data Calculation

(1) System boundary