NETL Life Cycle Inventory Data
Process Documentation File

Process Name: Fuel Efficiency for a Gasoline-Powered Passenger Vehicle

Reference Flow: 1 km of Vehicle Travel

Brief Description: Fuel consumption of gasoline-powered, internal combustion engine passenger vehicles per one kilometer of travel

Section I: Meta Data

Geographical Coverage: U.S. **Region:**

Year Data Best Represents: 2015

Process Type: Energy Conversion (EC)

Process Scope: Gate-to-Grave (End-of-Life) Process (GE)

Allocation Applied: No

Completeness: All Relevant Flows Recorded

Flows Aggregated in Data Set:

☑ Process ☐ Energy Use ☐ Energy P&D ☐ Material P&D

Relevant Output Flows Included in Data Set:

Releases to Air:	☐ Greenhouse Gases	☐ Criteria Air	☐ Other
Releases to Water:	☐ Inorganic	☐ Organic Emissions	☐ Other
Water Usage:	☐ Water Consumption	☐ Water Demand (throughput)	
Releases to Soil:	☐ Inorganic Releases	☐ Organic Releases	☐ Other

Adjustable Process Parameters:

Vehicle_Effic	*[kg/km] Kilograms of fuel per kilometer driven in a passenger vehicle*

Tracked Input Flows:

Gasoline [Refinery Products]	*Technosphere*

Tracked Output Flows:

Vehicle Travel [Valuable substances]	*Reference flow*

Section II: Process Description

Associated Documentation

This unit process is composed of this document and the data sheet (DS) *Stage5_O_Fuel_Efficiency_Gasoline_Passenger_Vehicle_2016.01.xlsx*, which provides additional details regarding relevant calculations, data quality, and references.

Goal and Scope

This unit process provides a summary of relevant input and output flows associated with the fuel economy of gasoline-powered, internal combustion engine passenger vehicles. The input is the reference flow from fuel production. The output is the amount of fuel required to travel one kilometer. The reference flow of this unit process is: 1 km of Vehicle Travel.

Boundary and Description

This unit process (UP) converts fuel efficiency values for passenger vehicles from miles driven per gallon of gasoline equivalent (MPG_{ge}) to kilograms of gasoline per kilometer driven (kg/km). This UP is meant to compliment a similar unit process for hydrogen-powered vehicles that uses similar vehicles to calculate fuel efficiency (NETL 2016). This allows for comparison between gasoline-powered vehicles and hydrogen-powered vehicles. The vehicles used in this UP and their fuel efficiencies are included in Table 1. Data for Table 1 was compiled from study that originally obtained their data from fueleconomy.gov (Tong, Jaramillo, & Azevedo, 2015). The originating data was no longer available on fueleconomy.gov.

Figure 1: Unit Process Scope and Boundary

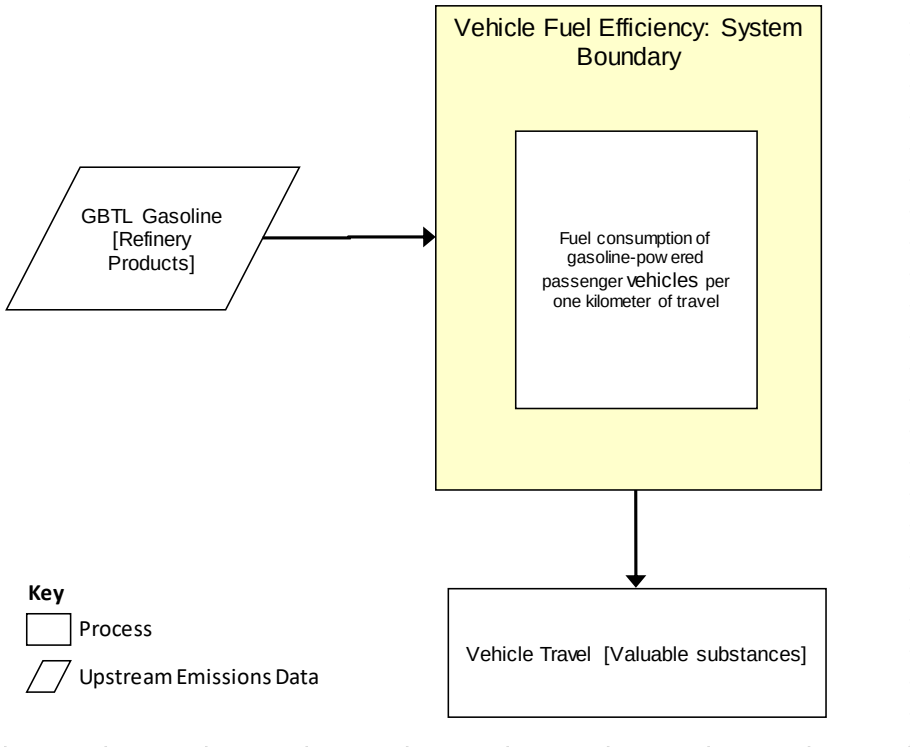

Table 1: Vehicle Data

Vehicle	Vehicle Type	Efficiency	Units
2015 Honda Civic	Car	33	MPG_{ge}
2015 Hyundai Tucson 2WD	Sports Utility Vehicle	25	MPG_{ge}

Table 2: Unit Process Input and Output Flows

Flow Name	Value	Units (Per km)
Inputs		
Gasoline [Refinery Products]	**5.34E-02**	**kg**
Outputs		
Vehicle Travel [Valuable substances]	**1.00**	**km**

* **Bold face** clarifies that the value shown *does not* include upstream environmental flows.

Embedded Unit Processes

None.

References

NETL 2016 — NETL (2016). NETL Life Cycle Inventory Data – Unit Process: Vehicle Fuel Efficiency -- Hydrogen Fuel Cell Vehicles. U.S. Department of Energy, National Energy Technology Laboratory. Last Updated: January 2016 (version 01). www.netl.doe.gov/LCA (http://www.netl.doe.gov/LCA)

Tong, Jaramillo, & Azevedo 2015 — Tong, F., Jaramillo, P., & Azevedo, I. (2015). Supporting Information for Comparison of Life Cycle Greenhouse Gases from Natural Gas Pathways for Light-Duty Vehicles. *Energy Fuels, 29*. doi: 10.1021/acs.energyfuels.5b01063

Section III: Document Control Information

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Point of Contact: Timothy Skone (NETL), Timothy.Skone@NETL.DOE.GOV

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