NETL Life Cycle Inventory Data
Process Documentation File

Process Name: Cargo, Train Transport

Reference Flow: 1 kg of cargo, from train

Brief Description: Transport of unspecified cargo via train

Section I: Meta Data

Geographical Coverage: US **Region:** N/A

Year Data Best Represents: 2011

Process Type: Transport Process (TP)

Process Scope: Gate-to-Gate Process (GG)

Allocation Applied: No

Completeness: Individual Relevant Flows Captured

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:

Distance	*[km] Adjustable parameter; default value is 100 km roundtrip*
PowerDemand	*[MJ/kg-km] Adjustable parameter; Power Demand of Diesel Locamotive per*

Tracked Input Flows:

diesel combusted in locomotive engine	*[Technosphere] Diesel input*

cargo, to train	*[Technosphere] cargo being transported by train*
cargo train construction [Installation]	*[Technosphere] Construction of rail transportation*

Tracked Output Flows:

cargo, from train	*Reference flow*

Section II: Process Description

Associated Documentation

This unit process is composed of this document and the data sheet (DS) *DS_Stage24_O_Petro_Train_Transport_2013.01.xlsx*, which provides additional details regarding relevant calculations, data quality, and references.

Goal and Scope

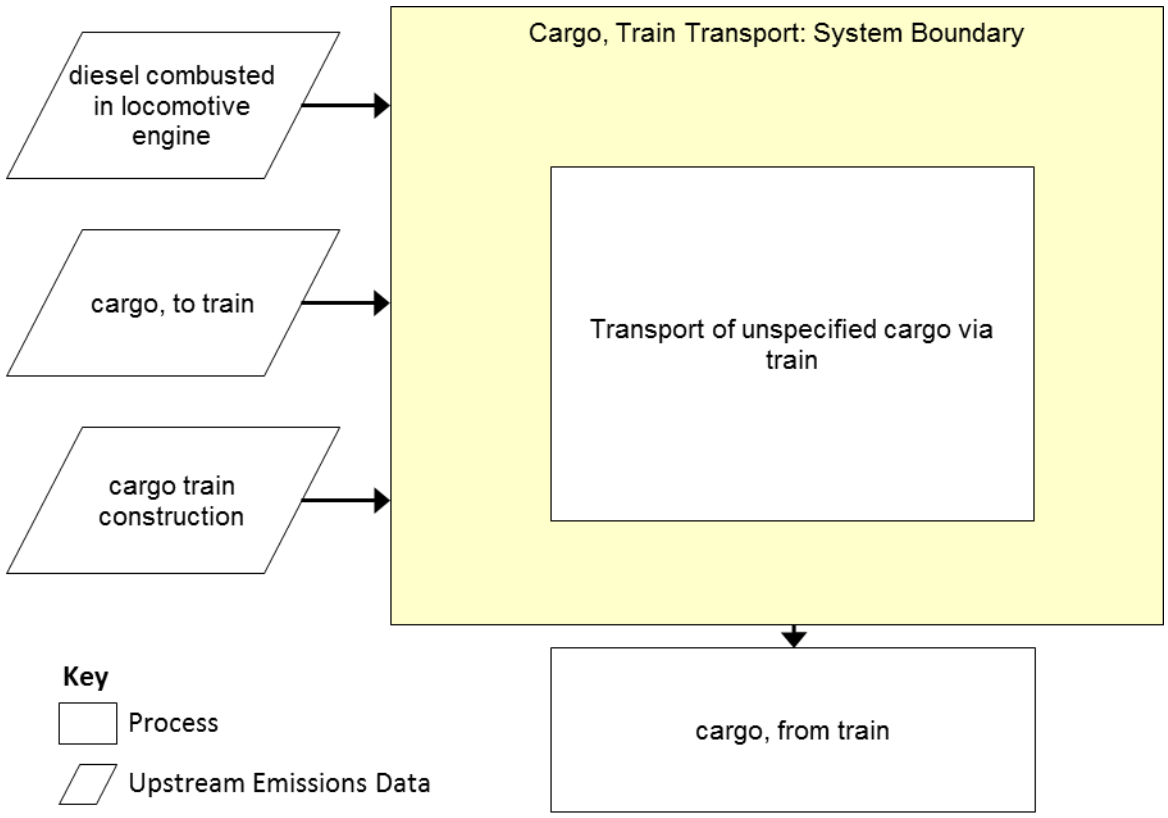
This unit process provides the fuel input to transport generic cargo a given distance by train. The actual combustion of fuel occurs in an upstream process, and because this process is for generic cargo, it does not account for product losses, which are also to be accounted for in upstream processes as necessary. The reference flow of this unit process is: 1 kg of cargo, from train.

Boundary and Description

The unit process is designed such that the type of cargo being transported and location of transport are irrelevant. This unit process assumes that the unspecified type of cargo is loaded into the tanker during a previous unit process. This unit process transports the unspecified cargo from one location to another.

Figure 1 provides an overview of the boundary of this unit process. As shown, upstream emissions associated with the production and combustion of fuel and processed cargo are accounted for outside of the boundary of this unit process. So, if the freighter is transporting cargo that will have emissions (e.g., crude transport with tank losses), then a process that accounts for those emissions will need to be connected upstream of this transport process.

Figure 1: Unit Process Scope and Boundary



The lower heating values are used for fuel energy content and are taken from the Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation (GREET) Model and converted to mass basis using density data from the same source (ANL, 2013). The expected energy intensity of cargo train transport is averaged for 2007-2011 data in the Transportation Energy Data Book (ORNL, 2013).

Table 1: Unit Process Input and Output Flows

Flow Name	Value	Units (Per Reference Flow)
Inputs		
diesel combusted in locomotive engine	**5.08E-04**	**kg**
cargo, to train	**1.00E+00**	**kg**
cargo train construction [Installation]	**1.00E+00**	**Number of pieces**
Outputs		
cargo, from train	1.00E+00	kg

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

Embedded Unit Processes

None.

References

ANL 2013 — Argonne National Laboratory. 2013. GREET.net 2013 v.1.10.9210. Argonne, IL: Argonne National Laboratory. Retrieved December 2, 2013 from http://greet.es.anl.gov/main

ORNL 2013 — Oak Ridge National Laboratory. 2013. Transportation Energy Data Book: Edition 32. Oak Ridge, TN: Oak Ridge National Laboratory. Retrived December 2, 2013 from http://cta.ornl.gov/data/download32.shtml

Section III: Document Control Information

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