

Real Variable

(Microsoft Global ISV Recruit Partner)

Sustainability Capability Deck (Scope 3 Emissions Tracking)

Presentation to



Microsoft

30-June-2023



What is Scope 1, Scope 2, Scope 3 Emission?

Scope 1 emissions refer to greenhouse gas (GHG) emissions that are directly produced by a company or organization from sources that it owns or controls. Examples of Scope 1 emissions include:

- Combustion of Fossil Fuels
- Industrial Processes
- On-Site Fuel Consumption

Scope 2 emissions refer to indirect greenhouse gas (GHG) emissions associated with the consumption of purchased or acquired electricity, heat, or steam by a company or organization. These emissions occur as a result of the generation of the purchased energy, rather than from sources directly owned or controlled by the reporting entity.

Scope 3 emissions refer to indirect greenhouse gas (GHG) emissions that occur in the value chain of a company or organization, including both upstream and downstream activities. These emissions are not directly owned or controlled by the reporting entity but are a consequence of its operations.

Here are some examples of Scope 3 emissions:

Upstream Activities:

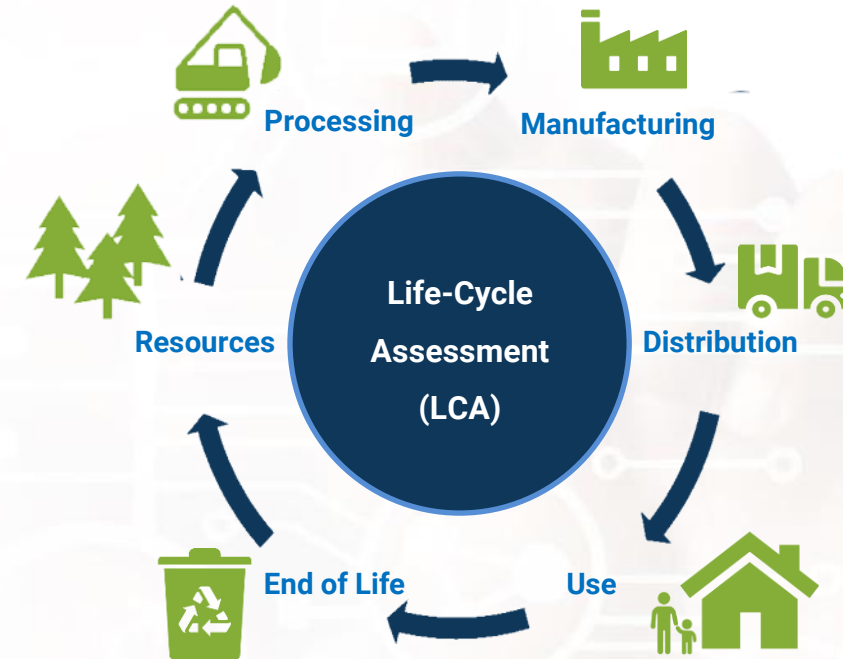
- Purchased goods and services
- Capital goods
- Fuel- and energy-related activities (not included in scope 1 or scope 2)
- Upstream transportation and distribution
- Waste generated in operations
- Upstream leased assets
- Processing of sold products
- End-of-life treatment of sold products

Downstream Activities:

- Business travel
- Employee commuting
- Downstream transportation and distribution
- Use of sold products
- Downstream leased assets
- Franchises
- Investments

- **Cradle to Gate:** Evaluates the environmental impact of a product or process from its raw material extraction (cradle) to the point of leaving the factory gate, excluding its use and end-of-life stages.
- **Cradle to Grave:** Considers the environmental impact of a product or process throughout its entire life cycle, from raw material extraction (cradle) to disposal or end-of-life stage (grave).
- **Cradle to Cradle:** Emphasizes the concept of designing products and systems that can be continuously recycled or reused in a closed-loop system, eliminating the concept of waste and aiming for sustainable resource management.

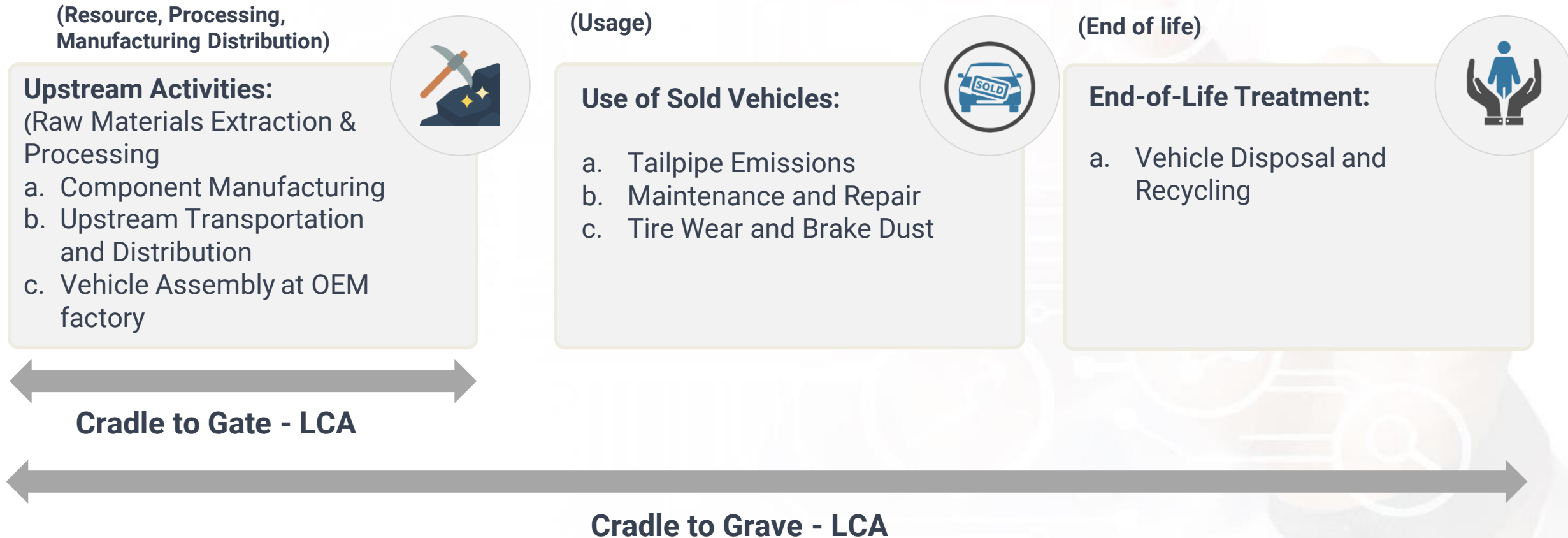
Typical LCA for a product



Scope 3 Emissions – Automotive Industry

Scope 3 emissions in the automotive industry encompass a wide range of indirect greenhouse gas (GHG) emissions that occur along the value chain, including both upstream and downstream activities.

Examples of Scope 3 emissions in the automotive industry:



- **Data Availability and Accuracy:** Gathering accurate and comprehensive data for all life cycle stages of a vehicle, including raw material extraction, manufacturing processes, transportation, use phase, and end-of-life treatment, can be challenging. Data on energy consumption, emissions, material inputs, and waste generation may vary depending on the specific vehicle model, production facility, and supply chain. Ensuring data accuracy and representing the diversity within the industry can be complex.
- **Supply Chain Complexity:** supply chains can be intricate, involving numerous tiers of suppliers and global sourcing. Tracing the environmental impacts and data collection throughout the supply chain can be demanding, as it requires cooperation and data sharing from various stakeholders. The complexity increases when dealing with multiple suppliers, diverse materials, and different geographic locations.

We leverage US EPA approved opensource plugins such as Open LCA for Scope 3 emission tracking

Key Features

- Tracks Supplier Part traceability to nth tier supplier
- Provides powerful functionality for conducting life cycle assessments, allowing users to analyse environmental impacts throughout a product's life cycle.
- Integrates seamlessly with LCI databases, offering access to extensive environmental data, enabling users to incorporate accurate information into their assessments.
- Supports complex modelling, capturing interconnections between life cycle stages, and facilitating accurate representation of real-world systems
- Includes a variety of impact assessment methods, enabling users to evaluate environmental impacts based on their specific needs and goals.
- Promotes transparency and collaboration through user friendly interfaces and sharing capabilities, fostering knowledge exchange within the LCA community

Environment Parameters Tracked

Impact Category	Unit of the Results
Global warming (GWP)	kg CO _{2eq}
Stratospheric ozone depletion (ODP)	kg CFC-11 _{eq}
Ionizing radiation (IRP)	kBq Co-60 _{eq}
Ozone formation, human health (HOFP)	kg NO _x _{eq}
Fine particulate matter formation (FPMF)	kg PM2.5 _{eq}
Ozone formation, terrestrial ecosystems (EOFP)	kg NO _x _{eq}
Terrestrial acidification (TAP)	kg SO ₂
Freshwater eutrophication (FEP)	kg P _{eq}
Marine eutrophication (MEP)	kg N _{eq}
Terrestrial ecotoxicity (TETP)	kg 1.4-DCB
Freshwater ecotoxicity (FETP)	kg 1.4-DCB
Marine ecotoxicity (METP)	kg 1.4-DCB
Human carcinogenic toxicity (HTPc)	kg 1.4-DCB
Human non-carcinogenic toxicity (HTPnc)	kg 1.4-DCB
Land use (LOP)	m ² year
Mineral resource scarcity (SOP)	kg Cu _{eq}
Fossil resource scarcity (FFP)	kg oil _{eq}
Water consumption (WCP)	m ³

Multi-tier Supply Chain part traceability with CO₂e tracking

VIN

Scope 3 Emissions

Simulated CO₂e calculation



Hatchback Car (VIN)
CO₂e – 77,000 kg for

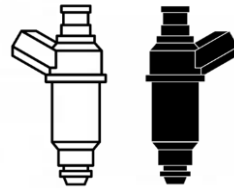
- Engine
- Fuel Injection Pump
- Drive Shaft assembly

Tool: OpenLCA - Ver: 2.0.0
Database (LCIA): Eco-invent
Method: ReCipe 2016 Midpoint (H)

Tier 1 Parts



1.8 L Engine
CO₂e – 50,700 kg



Fuel Injection Pump
CO₂e – 10,600 kg



Drive Shaft Assembly
CO₂e – 15,700 kg

Tier 2 Parts



Engine Harness
CO₂e – 500 kg



Engine Cover
CO₂e – 200 kg



Injection Nozzle
CO₂e – 100 kg

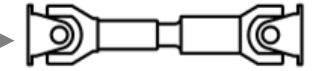
Pump Shield
CO₂e – 50 kg



Fuel Filter
CO₂e – 150 kg



Camshaft
CO₂e – 300 kg



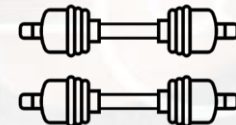
Universal Joint
CO₂e – 100 kg



Slip splines
CO₂e – 50 kg



Roller Bearing
CO₂e – 150 kg



Propeller Shaft
CO₂e – 400 kg

Real Variable | Document Distribution Controlled

Real Variable - Document Distribution Controlled


Multi-tier Supply Chain part traceability with CO₂e tracking

REALWARRANTY DASHBOARD INBOUND ▾ OUTBOUND ▾ PRODUCTION INFO WARRANTY ▾ DEBIT NOTE MANAGE REGISTRATIONS ▾ Light Mode abcauto ▾

PRODUCTION PART USAGE Organization Type: **OEM** Logged User: **abcauto**


Material / Part # Batch / Lot # Serial # **SUBMIT** **RESET**

Assembly

Production Order# : 1001104
Material # : HBKMFCD2CCD574275
Material Name : **ABC S5 HATCHBACK(CAR)**
Production Plant : ABCA
Batch # : 0000000059
Serial # : 1
Production Unit : EA
Quantity : 1
Planned Start Date : 19-Nov-2021
Planned Start Time : PT00H00M00S
Planned End Date : 19-Nov-2021
Planned End Time : PT00H00M00S
Schedule Start Date : 19-Nov-2021
Schedule Start Time : PT00H00M00S
Schedule End Date : 19-Nov-2021
Schedule End Time : PT00H00M00S
Production Supervisor : NA
CO₂e  : **77,000 kg**

Level 1 Assembly


Vendor Code : 1000166
Serial # : 1, **Material #** : 500541220 **CO₂e** : 50,700 kg

Vendor Code : 1000166 **Storage Location** : R001
Material Document # : 4900004760 **Batch** : 0000000056
Material Document Year : 2021 **Serial #** : 1
Material Number : 500541220 **Quantity** : 1
Material Name : **1.8L Engine** **Unit Of Measure** : EA
Received Plant : ABCA **Document #** : 180000024
CO₂e  : **50,700 kg**

L2 Assembly

Level 2 Assembly

Vendor Code : 1000181
Serial # : 1, **Material #** : 53454513 **CO₂e** : 10,600 kg

Vendor Code : 1000181 **Storage Location** : R001
Material Document # : 4900004760 **Batch** : 0000000058
Material Document Year : 2021 **Serial #** : 1
Material Number : 53454513 **Quantity** : 1
Material Name : **Fuel injection pump** **Unit Of Measure** : EA
Received Plant : ABCA **Document #** : 180000025
CO₂e  : **10,600 kg**

L2 Assembly

Main product (VIN) and Tier 1 parts

Multi-tier Supply Chain part traceability with CO₂e tracking

Tier 2
assembly
for Engine

REALWARRANTY SUPPLIER WARRANTY RECOVERY DASHBOARD INBOUND ▾ OUTBOUND ▾ PRODUCTION INFO WARRANTY ▾ DEBIT NOTE MANAGE REGISTRATIONS ▾
Light Mode abcauto ▾

PRODUCTION PART USAGE

Material / Part #

Batch / Lot #

Assembly	
Production Order#	: 1001104
Material #	: HBKMFCD2CCD574275
Material Name	: ABC S5 HATCHBACK(CAR)
Production Plant	: ABCA
Batch #	: 0000000059
Serial #	: 1
Production Unit	: EA
Quantity	: 1
Planned Start Date	: 19-Nov-2021
Planned Start Time	: PT00H00M00S
Planned End Date	: 19-Nov-2021
Planned End Time	: PT00H00M00S
Schedule Start Date	: 19-Nov-2021
Schedule Start Time	: PT00H00M00S
Schedule End Date	: 19-Nov-2021
Schedule End Time	: PT00H00M00S
Production Supervisor	: NA
CO ₂ e	: 77,000 kg

[View Chart](#)

L2 ASSEMBLY

Material: **1.8L Engine**

Material / Supplier #:

Vendor Code: 1000159

Serial #: 1, Material #: 552549140 CO₂e : 500 kg

Vendor Code	: 1000159	Storage Location	: R001
Material Document #	: 4900004750	Batch	: 0000000048
Material Document Year	: 2021	Serial #	: 1
Material Number	: 552549140	Quantity	: 1
Material Name	: BRACKET CPL. ENGINE HARNESS	Unit Of Measure	: EA
Received Plant	: ABCC	Document #	: 180000016
CO ₂ e	: 500 kg		

Vendor Code: 1000161

Serial #: 1, Material #: 552713160 CO₂e : 200 kg

CLOSE

Multi-tier Supply Chain part traceability with CO₂e tracking

REALWARRANTY DASHBOARD INBOUND ▾ OUTBOUND ▾ PRODUCTION INFO WARRANTY ▾ DEBIT NOTE MANAGE REGISTRATIONS ▾ Light Mode abcauto ▾

PRODUCTION PART USAGE

Material / Part # Batch / Lot #

Assembly

Production Order# : 1001104
Material # : HBKMFCD2CCD574275
Material Name : **ABC S5 HATCHBACK(CAR)**
Production Plant : ABCA
Batch # : 0000000059
Serial # : 1
Production Unit : EA
Quantity : 1
Planned Start Date : 19-Nov-2021
Planned Start Time : PT00H00M00S
Planned End Date : 19-Nov-2021
Planned End Time : PT00H00M00S
Schedule Start Date : 19-Nov-2021
Schedule Start Time : PT00H00M00S
Schedule End Date : 19-Nov-2021
Schedule End Time : PT00H00M00S
Production Supervisor : NA
CO₂e : 77,000 kg

[View Chart](#)

L2 ASSEMBLY

Material: **Fuel injection pump** Material / Supplier #:

Vendor Code: 1000159	Serial #: 1, Material #: 512717243	CO₂e: 100 kg
Vendor Code : 1000159	Material Document # : 4900004751	Storage Location : R001
Material Document Year : 2021	Material Number : 512717243	Batch : 0000000052
Material Name : Injector Nozzle	Received Plant : ABCY	Serial # : 1
CO₂e : 100 kg		Quantity : 1
		Unit Of Measure : EA
		Document # : 180000020

Vendor Code: 1000159	Serial #: 1, Material #: 517999150	CO₂e: 50 kg
Vendor Code: 1000161	Serial #: 1, Material #: 552963120	CO₂e: 150 kg
Vendor Code: 1000179	Serial #: 1, Material #: 552792829	CO₂e: 300 kg

CLOSE

Tier 2 assembly for Fuel Injection Pump

Multi-tier Supply Chain part traceability with CO₂e tracking

REALWARRANTY SUPPLIER WARRANTY RECOVERY
DASHBOARD
INBOUND ▾
OUTBOUND ▾
PRODUCTION INFO
WARRANTY ▾
DEBIT NOTE
MANAGE REGISTRATIONS ▾
Light Mode
abcauto ▾

PRODUCTION PART USAGE

Material / Part #

HBKMFCD2CCD574275-ABC S5 HATCHBACK(CAR) x
▾

Batch / Lot #

0000000059

Assembly	Level
Production Order# : 1001104	i
Material # : HBKMFCD2CCD574275	i
Material Name : ABC S5 HATCHBACK(CAR)	i
Production Plant : ABCA	i
Batch # : 0000000059	i
Serial # : 1	i
Production Unit : EA	i
Quantity : 1	i
Planned Start Date : 19-Nov-2021	i
Planned Start Time : PT00H00M00S	i
Planned End Date : 19-Nov-2021	i
Planned End Time : PT00H00M00S	i
Schedule Start Date : 19-Nov-2021	i
Schedule Start Time : PT00H00M00S	i
Schedule End Date : 19-Nov-2021	i
Schedule End Time : PT00H00M00S	i
Production Supervisor : NA	i
CO ₂ e ✔ : 77,000 kg	i

L2 As

L2 ASSEMBLY

Material: DRIVE SHAFT ASSY - AXLE RR

Material / Supplier #:

i Vendor Code: 1000163
 Serial #: 1, Material #: 51392672 CO₂e : 100 kg

Vendor Code : 1000163	Storage Location : R001
Material Document # : 4900004748	Batch : 0000000042
Material Document Year : 2021	Serial # : 1
Material Number : 51392672	Quantity : 1
Material Name : Universal Joint	Unit Of Measure : EA
Received Plant : ABCG	Document # : 180000013
CO ₂ e ✔ : 100 kg	

i Vendor Code: 1000163
 Serial #: 1, Material #: 51398572 CO₂e : 50 kg

i Vendor Code: 1000163
 Serial #: 1, Material #: 51391672 CO₂e : 150 kg

i Vendor Code: 1000179
 Serial #: 1, Material #: 53395678 CO₂e : 400 kg

[View Chart](#)

CLOSE

Tier 2
assembly for
Drive shaft
assembly

THANK YOU!



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