

25 SEPTEMBER 2019
ALTIA PLC

ALTIA

Life Cycle Assessment of Koskenkorva Vodka

BACKGROUND DOCUMENT AND RESULTS SUMMARY



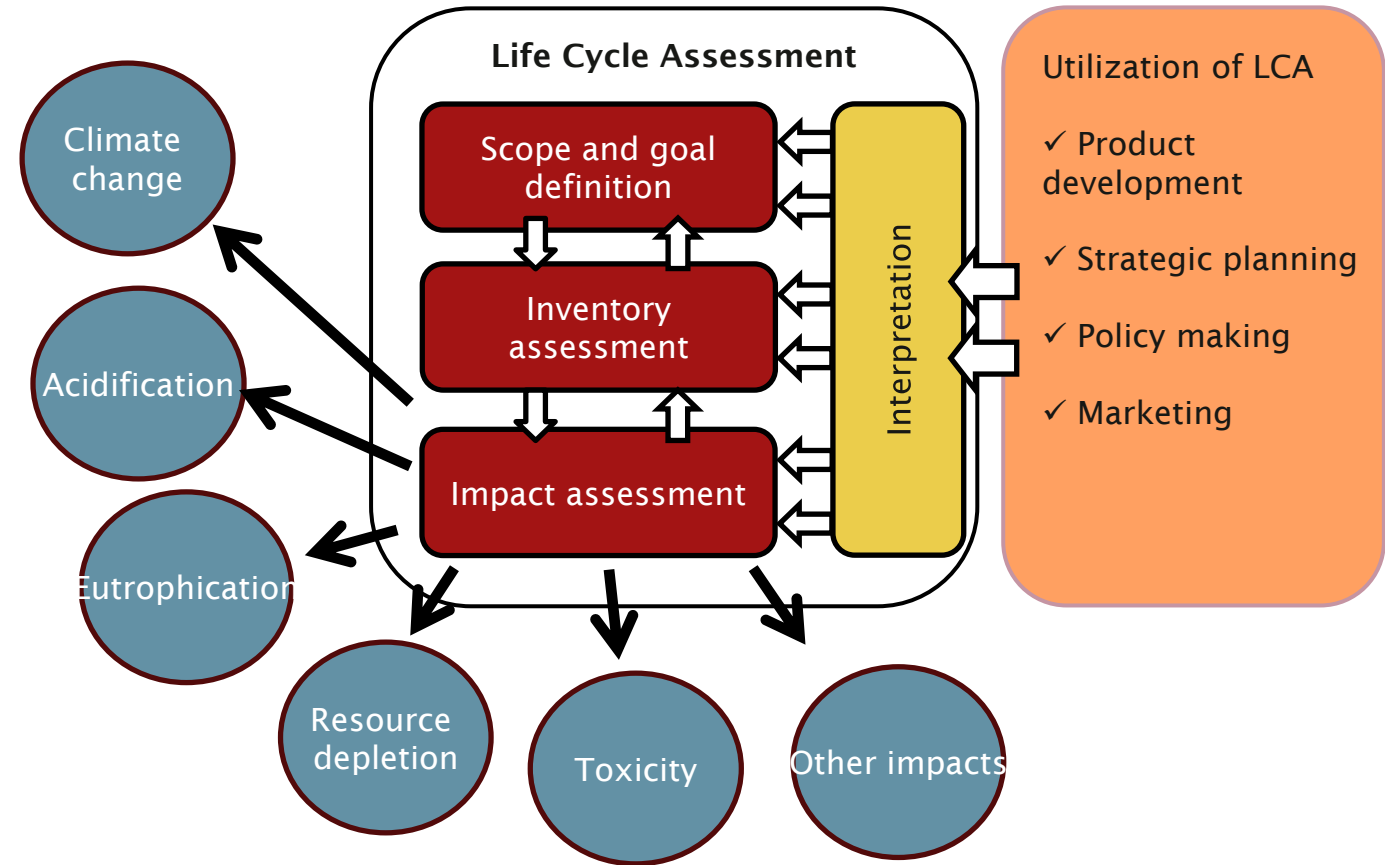
Background

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LIFE CYCLE ASSESSMENT (LCA) OF A PRODUCT

- The purpose of an LCA is to study the environmental impacts caused by a product during its entire lifecycle, including production of raw materials, processing stages, use phase as well as end-of-life stage of a product.
- During a product's life cycle, different inputs, for example, material, energy and water, are used for production and the use of a certain product. All life cycle stages have different environmental impacts.

Life cycle assessment provides a comprehensive picture of the environmental impacts of a product from cradle-to-grave



Scope of the project

Scope of the study

KOSKENKORVA VODKA LCA

- The LCA has been conducted according to ISO 14040 and ISO 14044 (Environmental management. Life Cycle Assessment. Principles and Frameworks & Requirements and guidelines).
- The product studied in LCA assessment is Koskenkorva Vodka (40 % alcohol) with two different packaging options:
 - Glass bottle (0,7 l) with wooden closure and secondary packaging of cardboard box
 - PET bottle (0,5 l) with plastic closure and secondary packaging of cardboard tray
- The scope is defined as cradle-to-grave, excluding the use phase
- Product distribution to the retailer and the end-of-life of the main packaging are included.
- Functional unit/declared unit is 1 litre of Koskenkorva vodka packed in glass bottle or in PET bottle. Additionally the results are also calculated per bottle (0,7 litres of vodka in glass bottle and 0,5 litres of vodka in PET bottle).
- Data for the assessment is based on the production period of 1-12/2018.

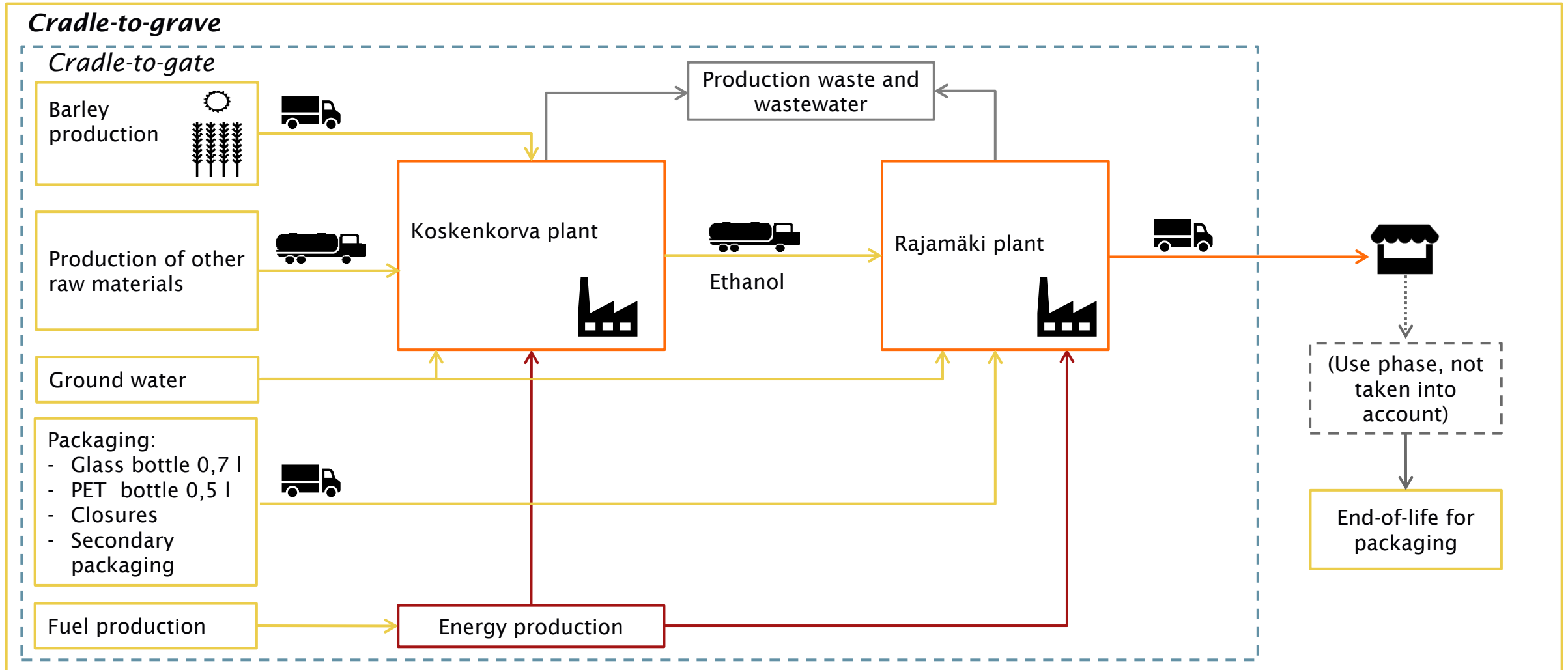
Scope and data of the project

SYSTEM BOUNDARY

- The considered inputs include: Raw material extraction and production (barley, chemicals, water, packaging materials), transportation of raw materials, energy and fuel production for production processes, transportation of ethanol, distribution to retailer and end-of-life of packaging.
- Production processes in Koskenkorva and in Rajamäki are included
- Outputs include: Vodka, emissions from transportation and distribution, upstream emissions related to raw materials and energy production, production waste and wastewater and packaging waste.
- For the calculation, primary data was collected from Altia (Koskenkorva plant and Rajamäki plant) and its suppliers: Transportation companies and packaging manufacturers, using excel-based data collection forms.
- Data was collected for the production period of 1-12/2018.

Scope of the project

SYSTEM BOUNDARY



Data sources and assumptions

- Data validation was conducted throughout the assessment together with Altia's experts and according to Gaia's internal quality assurance processes.
- Treatment of missing data:
 - Suppliers were asked for clarifications and for missing data.
 - Only minor assumptions had to be made regarding missing supplier data.
- Simapro LCA-software (SimaPro Analyst ver. 9.0.0.41) was used for the calculation.
- For secondary data Ecoinvent (v3.4) and Agrifootprint (v4.0) databases were used.
- For fossil GHG emissions (carbon footprint, global warming potential, GWP) two different data sources for barley (the main ingredient) were used:
 - Altia's supplier-specific carbon footprint for barley calculated by Luke (Natural Resources Institute Finland) in 2019. Supplier-specific carbon footprint for barley is calculated as an average for 2013-2017 with Altia's barley acquisition areas in Finland.
 - Other impact categories were calculated only with Agrifootprint data for barley

Impact categories

- The following environmental impact categories were assessed:
 - Global warming potential (GWP100a) [kg CO₂ eq.] (Method: IPCC 2013 GWP 100a, V1.03)
 - Acidification (AP) [kg SO₂ eq.] (Method: CML-IA non-baseline, version June 2017, V3.04 / EU25)
 - Eutrophication (EP) [kg PO₄³⁻ eq.] (Method: CML-IA baseline, version November 2017, V3.05 / EU25)
 - Also primary energy use (Method: Cumulative energy demand, V1.10) and water use were calculated.
 - No value-choices were used as no normalization, grouping or weighting was done.

Results

KOSKENKORVA VODKA CARBON FOOTPRINT
GLASS BOTTLE & PET BOTTLE

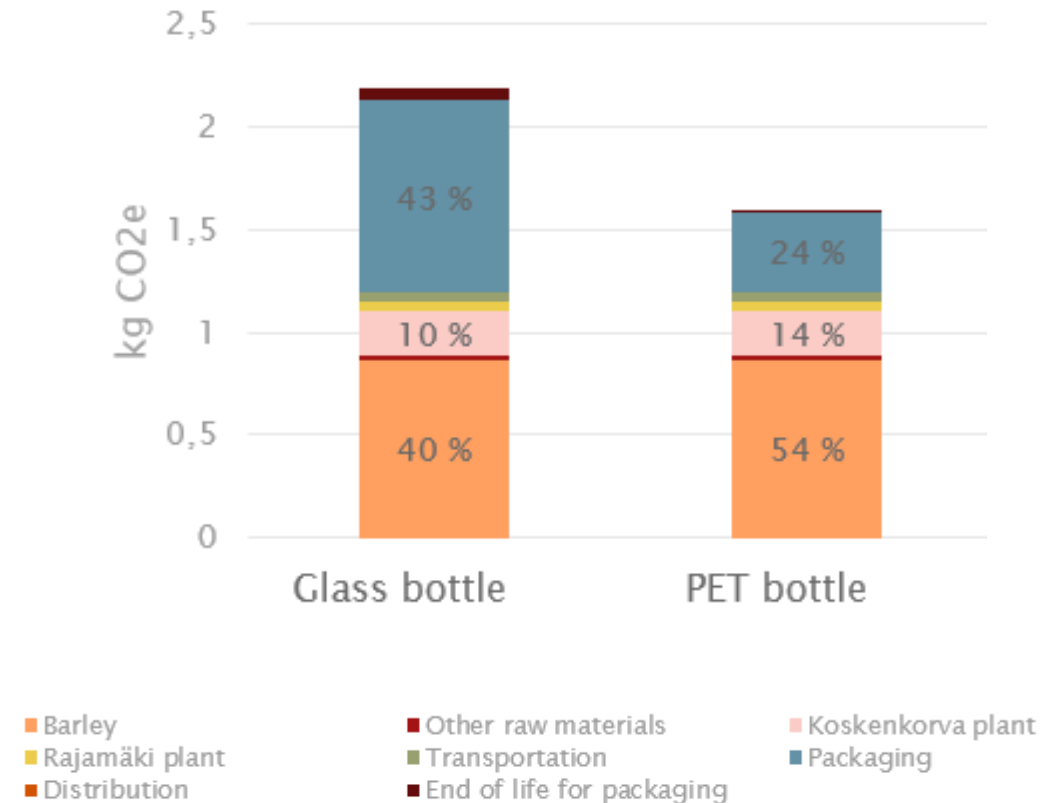


Koskenkorva Vodka carbon footprint

RESULTS PER LITRE OF VODKA

- Carbon footprint of 1 litre of Koskenkorva Vodka in a glass bottle is 2,19 kgCO₂e and in a PET bottle 1,60 kgCO₂e.
- Koskenkorva Vodka in a PET bottle has 27% smaller impact than in a glass bottle. In both cases the main impacts are caused by the packaging and by barley used as raw material in the production of ethanol in Koskenkorva plant.
 - For Koskenkorva vodka in glass bottle packaging causes 43% and barley 40% of carbon footprint
 - For Koskenkorva vodka in PET bottle packaging causes 24% and barley 54% of carbon footprint.
- Without packaging, barley constitutes 71 % of the total impact.
- Koskenkorva plant has increased the share of biofuels in energy production from 24% (2014) to 61 % (2018). The effect of this to Koskenkorva Vodka's carbon footprint was assessed by calculating the results also with the old fuel mix.
 - The increase in biofuels decreased the carbon footprint of vodka in glass bottle by 5 % and by 7 % for vodka in PET bottle.
 - For 1 litre of vodka (without packaging, distribution and packaging end-of-life) carbon footprint decreased by 9 %.

Fossil GHG emissions per litre of Koskenkorva Vodka (40%)



Koskenkorva Vodka carbon footprint

RESULTS PER LITRE OF VODKA

	Koskenkorva Vodka 40% glass bottle		Koskenkorva Vodka 40% PET-bottle	
	kg CO2e/litre	%-share of carbon footprint	kg CO2e/litre	%-share of carbon footprint
Packaging	0.931	43%	0.386	24%
Barley	0.866	40%	0.866	54%
Koskenkorva plant	0.219	10%	0.219	14%
Rajamäki plant	0.039	2%	0.039	2%
Transportation	0.049	2%	0.049	3%
Other raw materials	0.026	1%	0.026	2%
Distribution to Alko	0.001	0%	0.000	0%
End-of-life of packaging	0.056	3%	0.004	0%

The LCA assessment has been carried out during March-August 2019 by Gaia Consulting Oy.

Further information:

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