Assessment Title: A comparison of current vs. new packaging for Arla Pro. 10L for the Danish market

Assessed by:	Julian Bopp
Reviewed by:	Samineh Moghaddas
Date of assessment:	13-01-2022
Arla reference	1121-036
Market:	Denmark
Net product content:	10 L

Purpose

The purpose is to quantify the change in carbon footprint of the current and new Arla Pro. 10L for the Danish market, consisting of:

1. a HDPE bottle and a HDPE Closure
2. a cardboard box (42,2% recycled content), a LLDPE bag, a LLDPE cap + spout, and a PP screw cap

The end of life scenario for this study is based on Eurostat data for Denmark, as defined by Arla.
For the current packaging, the Danish recycling rate for rigid plastic was raised (by Arla) from 31,5% to 50%, considering, that professional kitchens are sorting more.

Method

The assessment has been carried out using Sphera's Packaging Calculator tool built in GaBi and based on the 2020 GaBi databases (Sphera, 2020). This is modelled based on principles and approaches outlined in ISO 14040 and ISO 14044 (ISO, 2006; ISO, 2006). The cut-off ("recycled content") methodology for accounting for recycling has been applied, which treats scrap inputs as being free of burdens but gives no credits for recycling or energy recovery at end of life.

The carbon footprint results have been calculated based on global warming potential values reported in IPCC's 5th Assessment Report (IPCC, 2013). Both fossil and biogenic carbon emissions are accounted for, and emissions as associated with land use change have been included as a worst case assumption (such impacts only need to be accounted for if the land use change occurred within the last 20 years (GHG Protocol, 2011))

Data on removals and emissions associated with biogenic carbon and from direct land use change were taken from background GaBi database (Sphera, 2020).

Conclusion

The carbon footprint of the new packaging solution is at least 53,7% less than that of the current solution, with an absolute reduction in carbon footprint of 523,9 g CO_2 eq.

References

Eurostat. (2018). *Packaging waste by waste management operations and waste flow.* Eurostat.

GHG Protocol. (2011). *GHG Protocol Product Life Cycle Accounting and Reporting Standard.* Greenhouse Gas Protocol.

IPCC. (2013). *Climate Change 2013: The Physical Science Basis.* Genf, Schweiz: IPCC.

ISO. (2006). *ISO 14040: Environmental management - Life cycle assessment - Principles and framework.* Geneva: International Organization for Standardization.

ISO. (2006). *ISO 14044: Environmental management – Life cycle assessment – Requirements and guidelines.* Geneva: International Organization for Standardization.

Sphera. (2020). *GaBi LCA Database Documentation*. Retrieved from Sphera Solutions Inc.: http://www.gabi-software.com/support/gabi/gabi-database-2020-lci-documentation/

APPENDIX A: Input data

	Unit	Current packaging	New packaging
Primary Packaging			
HDPE (Bottle 10L)	g	260,00	-
HDPE (Closure)	g	8,80	-
LLDPE (Bag)	g	-	43,72
Cardboard (Box)	g	-	266,00
LLDPE (Cap + spout)	g	-	15,10
PP (Screw cap)	g	-	3,72
Transport			
HDPE (Bottle 10L)	km	Road: 25	-
HDPE (Closure)	km	Road: 25	-
LLDPE (Bag)	km	-	Road: 711
Cardboard (Box)	km	-	Road: 18
LLDPE (Cap + spout)	km	-	Road: 711
PP (Screw cap)	km	-	Road: 711

The table below summarises the end of life data for the Denmark market.

End of life	Landfill (%)	incineration (%)	Recycling (%)
HDPE (Bottle 10L)	1,1	48,9	50
HDPE (Closure)	1,1	48,9	50
LLDPE (Bag)	1,1	98,9	-
Cardboard (Box)	1,1	7,1	91,8
LLDPE (Cap + spout)	1,1	98,9	-
PP (Screw cap)	1,1	67,4	31,5

APPENDIX B: Results

The table below shows the results for the current packaging solution.

Material	Current packaging (kg CO2 eq.)			
	Fossil	Biogenic	Land use	Total
HDPE (Bottle 10L)	0,5410	4,49E-03	3,79E-04	0,5459
HDPE (Closure)	0,0180	1,50E-04	1,24E-05	0,0182
End of life	0,4120	8,60E-06	2,39E-06	0,4120
Total	0,9710	0,0046	0,0004	0,9760

The table below shows the results for the new packaging (50% recycled content).

Material	New packaging (kg CO2 eq.)			
	Fossil	Biogenic	Land use	Total
LLDPE (Bag)	0,0913	4,13E-04	5,27E-05	0,0918
Cardboard (Box)	0,1170	-0,4190	2,68E-04	-0,3017
LLDPE (Cap + spout)	0,0346	1,65E-04	2,24E-05	0,0348
PP (Screw cap)	0,0088	5,54E-05	7,56E-06	0,0088
End of life	0,1905	0,4280	1,69E-06	0,6185
Total	0,4421	0,0096	0,0004	0,4521