

Avoiding Greenhouse Gas Emissions The Essential Role of Chemicals



Rigid containers for chocolate drink powder in Brazil

A Braskem case study



Replacing tinplate rigid containers with polypropylene containers for chocolate drink powder in Brazil can lead to a 56% reduction in GHG emissions.

Considering the Brazilian market size in 2010, a full replacement of tinplate containers by polypropylene containers could lead to total GHG reductions by 10 ktonCO₂e.

241 million tinplate containers for Chocolate Drink Powder were sold in 2010 on the Brazilian market. In the same year, 87 million polypropylene containers were used to package the same product.

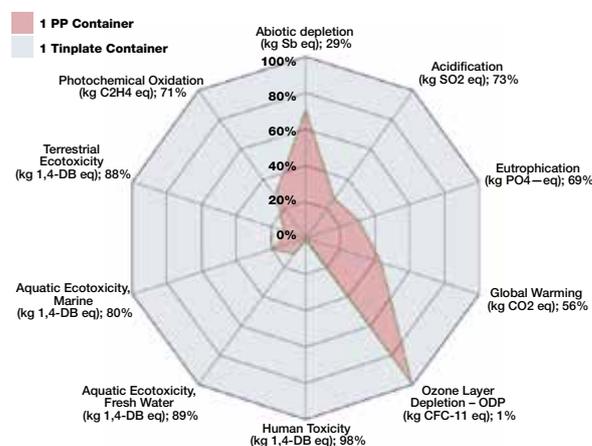
Life cycle GHG emissions for tinplate containers amount to 0.21 kgCO₂e/container whereas polypropylene containers are responsible for a total emission of 0.09 kgCO₂e/container. The majority of GHG emissions in the life cycle of these containers are concentrated in the raw material (polypropylene or tinplate) production and processing.

No trade-offs in other environmental impact categories were found in the full Life Cycle Assessment study that supports this case-study as can be seen.

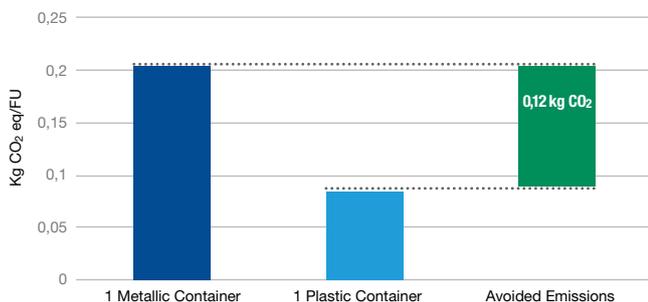
Full study available at: www.icca-chem.org/energy-climate

Full Life Cycle Impact Assessment Profile

Comparative full environmental profile of polypropylene containers as compared to tin containers (100% = tin containers) showing the absence of trade-offs.



Scenario Analysis



Life Cycle Stage	1 Plastic Container kCO ₂ /400g of chocolate powder	1 Metallic Container kCO ₂ /400g of chocolate powder
Raw Material	0.06	0.12
Manufacturing/Processing	0.02	0.10
Transport	2.54E-03	5.11E-03
End of Life/Disposal	3.82E-03	-0.02
Total	0.09	0.21
Avoided Emissions	0.12	



This case study illustrates how the reduction of greenhouse gas (GHG) emissions can be enabled by chemical products, as part of a series of case studies brought to you by ICCA. Chemical industry members offered Life Cycle Assessment [LCA] case studies for the purpose of showing illustrative examples on how to calculate avoided greenhouse gas emissions. The avoided emission calculations were based on the guidelines developed by ICCA and WBSCD (World Business Council for Sustainable Development) - Chemical Sector, with the support of Arthur D. Little and Ecofys. Other life cycle environmental impacts such as water and land use change were outside the scope and usually not considered.

