

Life Cycle Assessment and Product Carbon Footprint of Refrigeration Systems

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What is LCA?

- Life Cycle Assessment (LCA) is a systematic and holistic tool for the evaluation of the environmental impact of a given product, substance or service (Andrews, 2006)

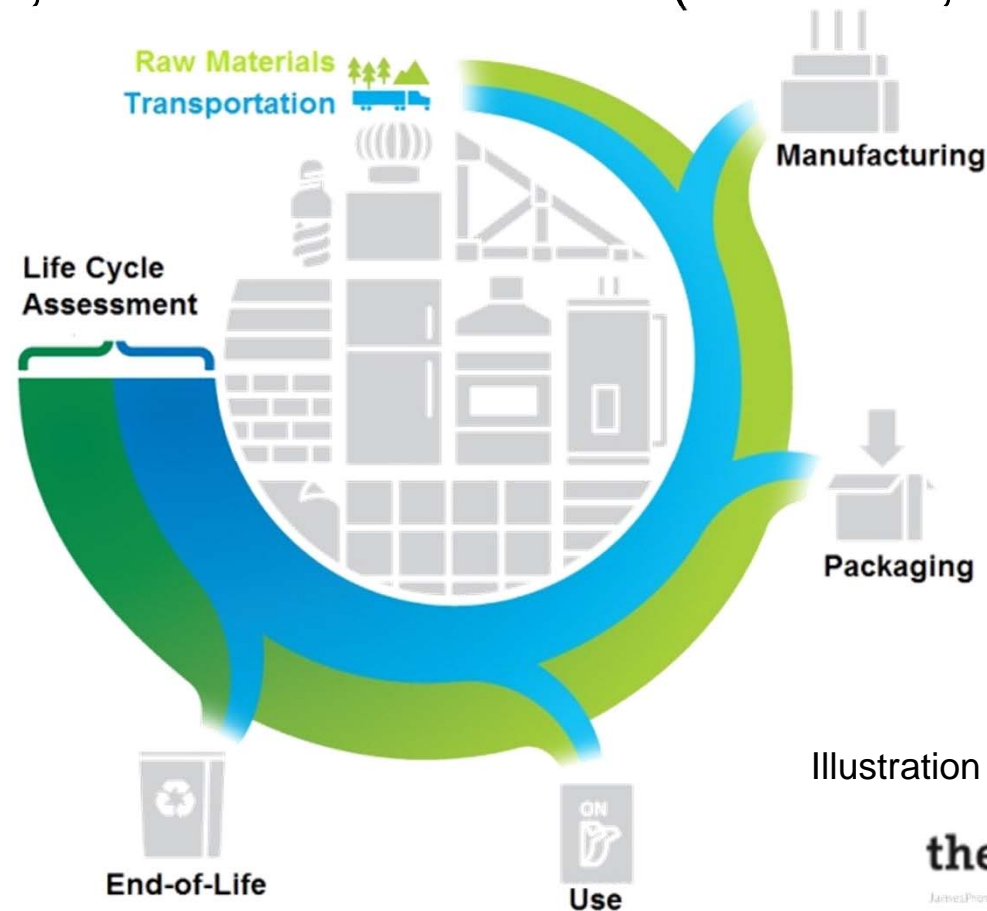
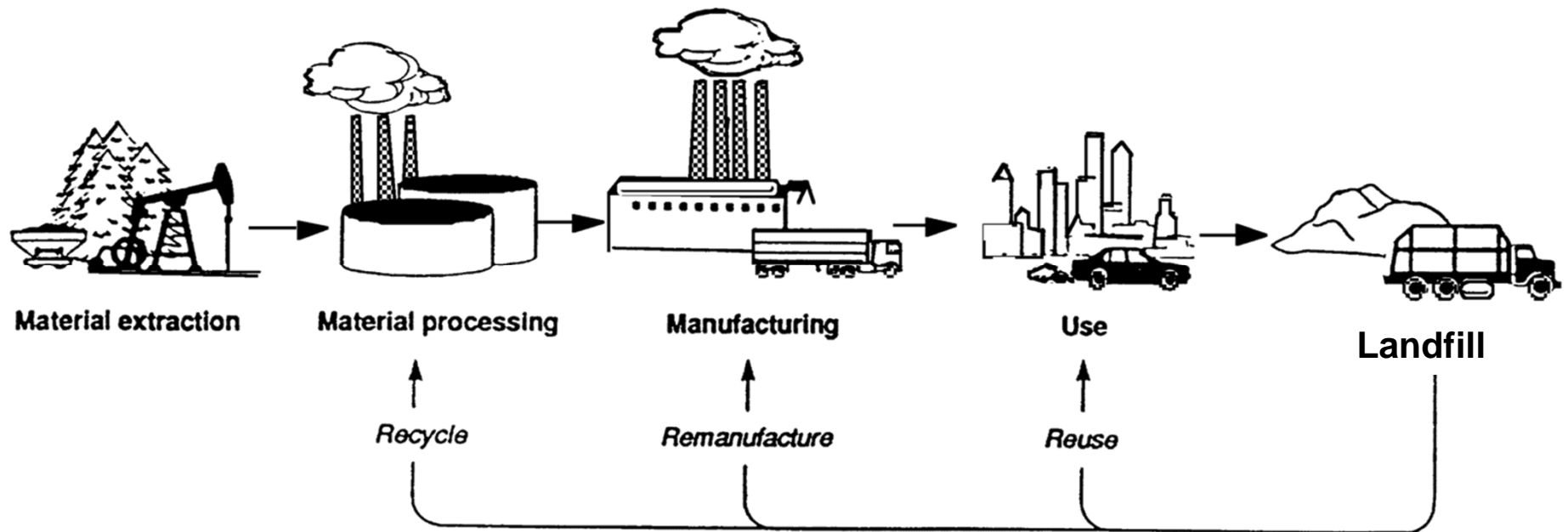


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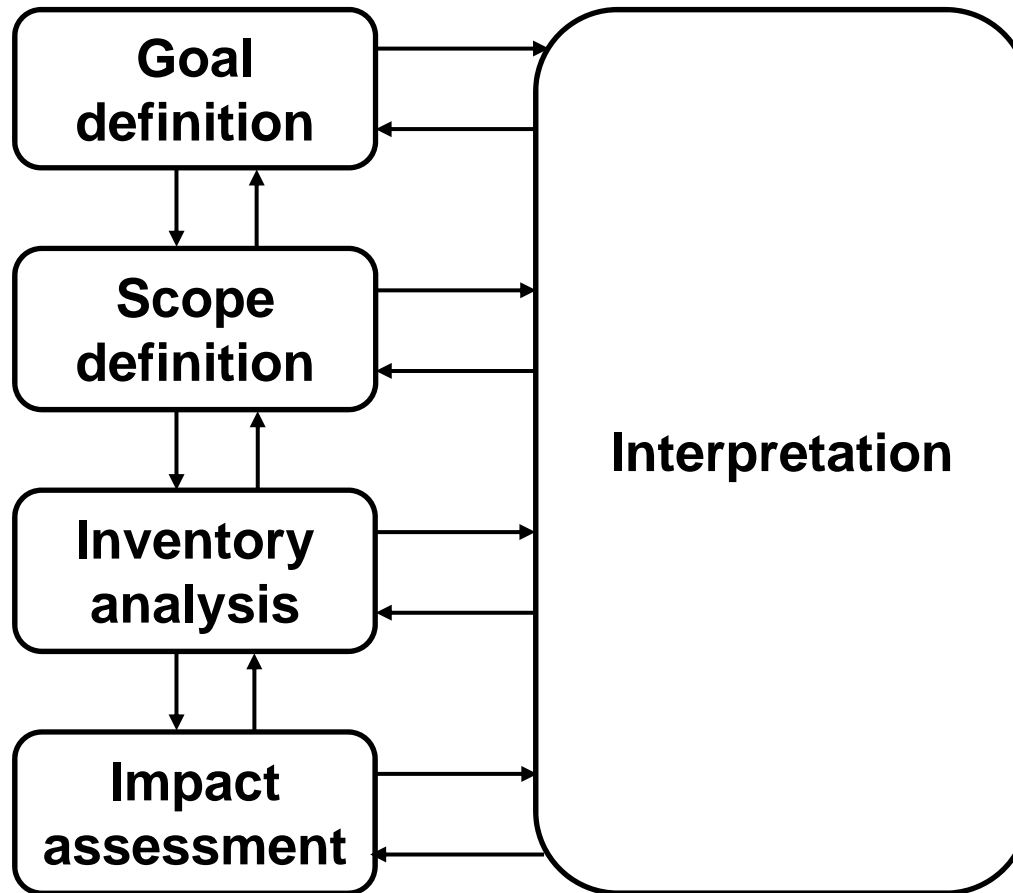
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Product Life Cycle and EoL



Source: (Matthews, 2006)

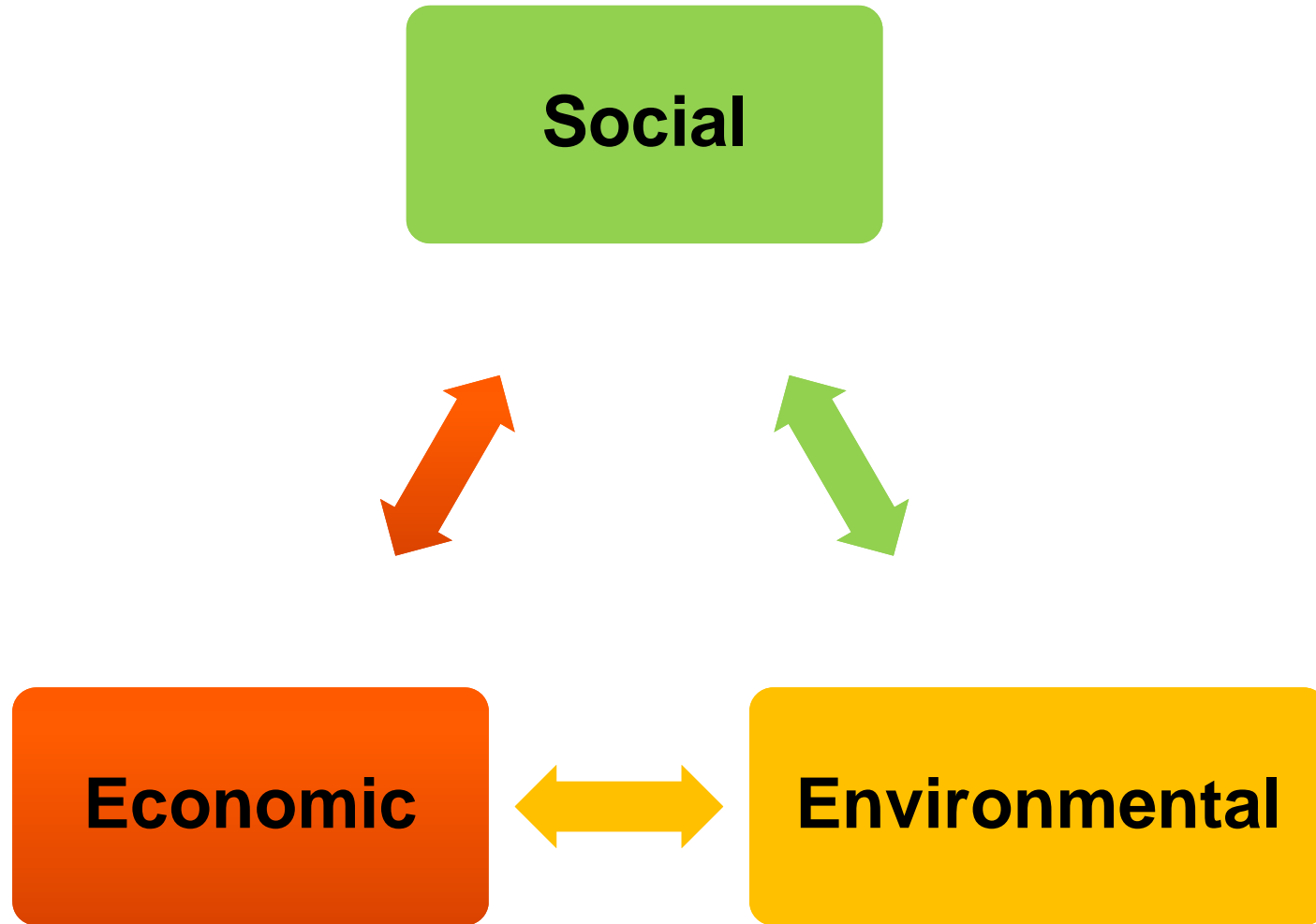
Stages of an LCA ISO 14040



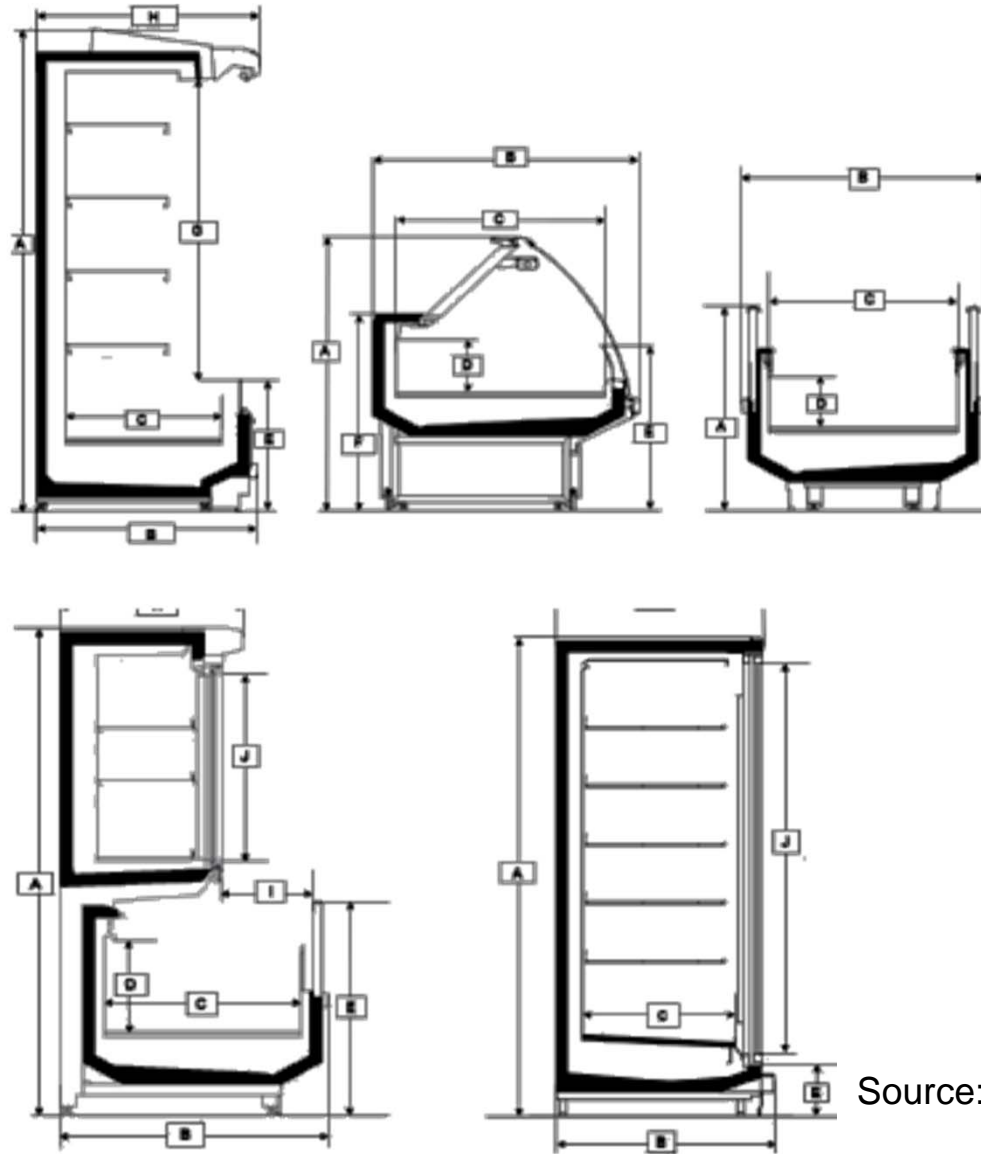
Drivers in the Retail Sector

- More stringent regulations and legislations
- Rising customer awareness
- Prominent NGO campaigns
- Rising operating costs

Our Approach to Sustainability



Refrigeration Case Studies



Source: (Marinhas, 2012)

Results

		Condensing Unit	Mass (kg)	Size (m)	Embodied carbon (kg CO_{2e})	Embodied energy (MJ)
Geometry	Multi Deck	Integral	450	2.5	699	10,594
	Deli serve-over	Integral	310	2.5	903	13,111
	Half Glass Door	Remote	408	2.5	1,095	17,722
	Full Glass Door	Remote	765	3.9	1,552	24,187

Challenges, Gaps and Future Work

- Data collection and modelling
- Little literature of cradle to grave LCA of refrigerants (*GWP is only one impact!*)
- Full LCA, LCC and SLCA of refrigerated display cabinets

THANK YOU FOR YOUR ATTENTION

QUESTIONS?



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