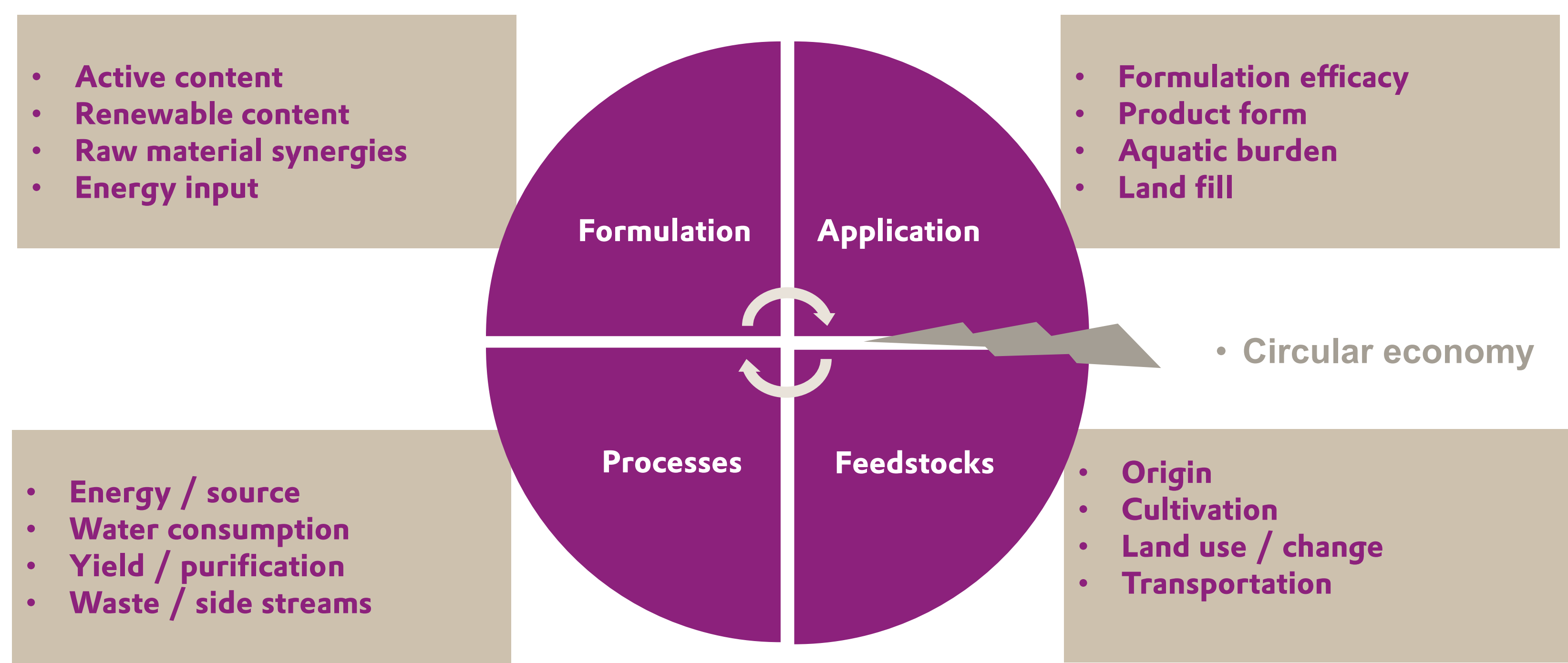


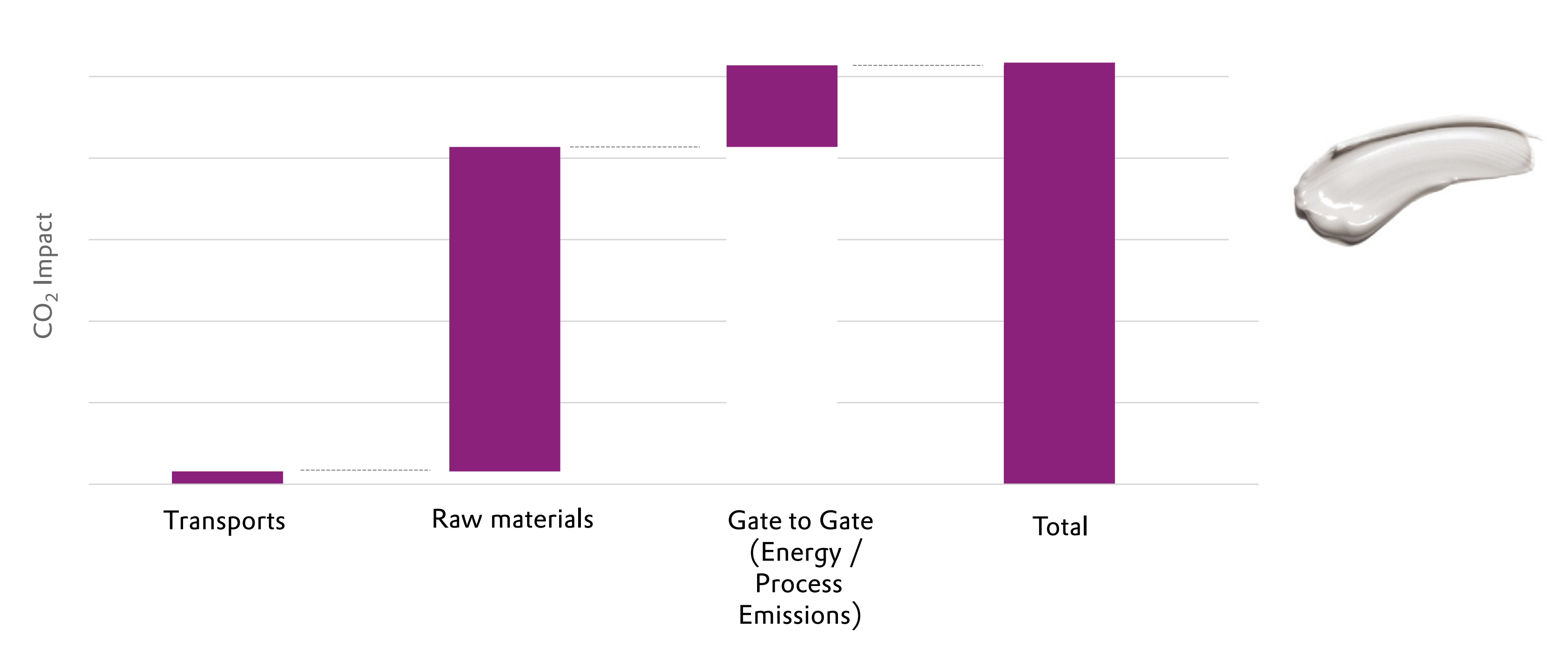
Bottle Your Sustainability Goals – Minimize Your Environmental & VOC Footprint in Sun Care Products

Anna Howe, Evonik – Richmond VA; James Grundy, Sun Bum – Encinitas CA;
Arnoldo Fonseca, Evonik – Allentown PA; Stephanie Facuri, Evonik – Dana Point CA

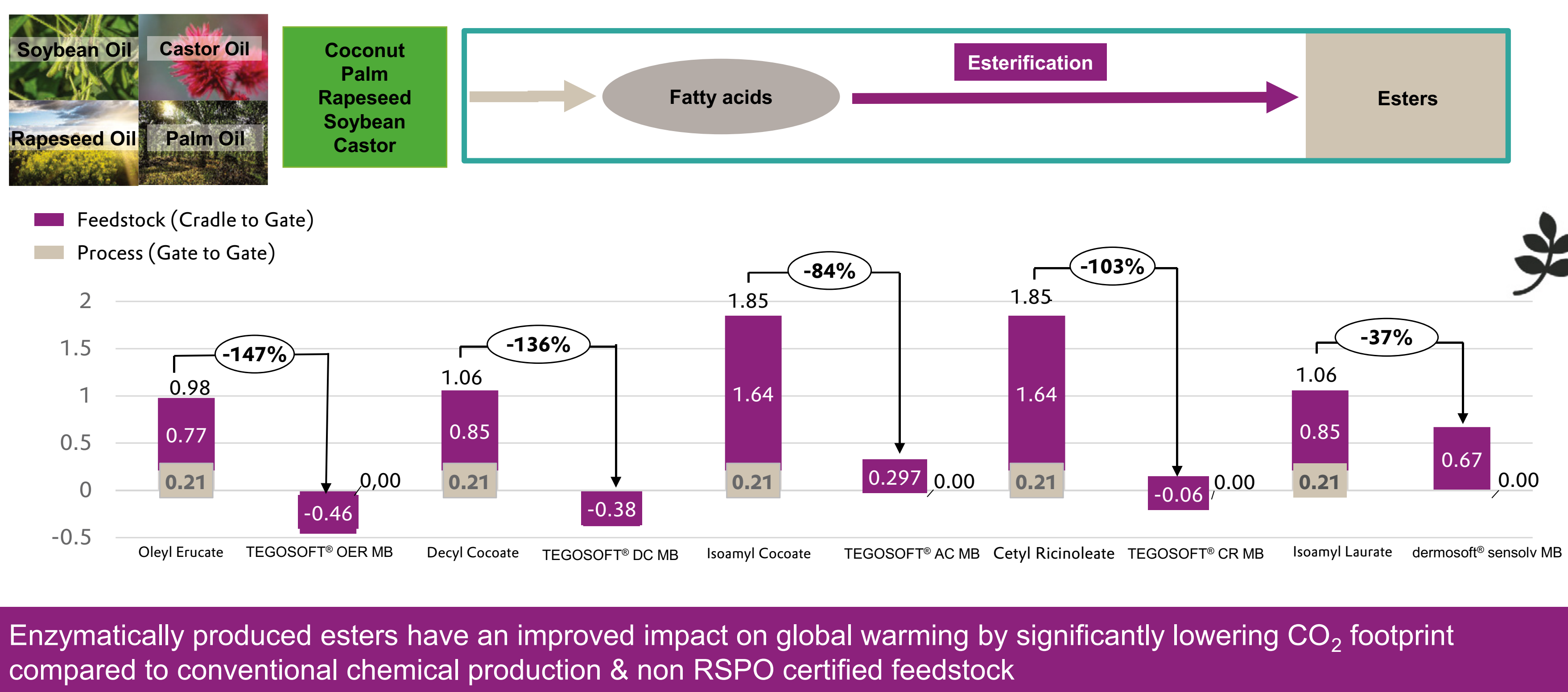
Global Warming Potential (GWP) Impact Categories Cosmetics



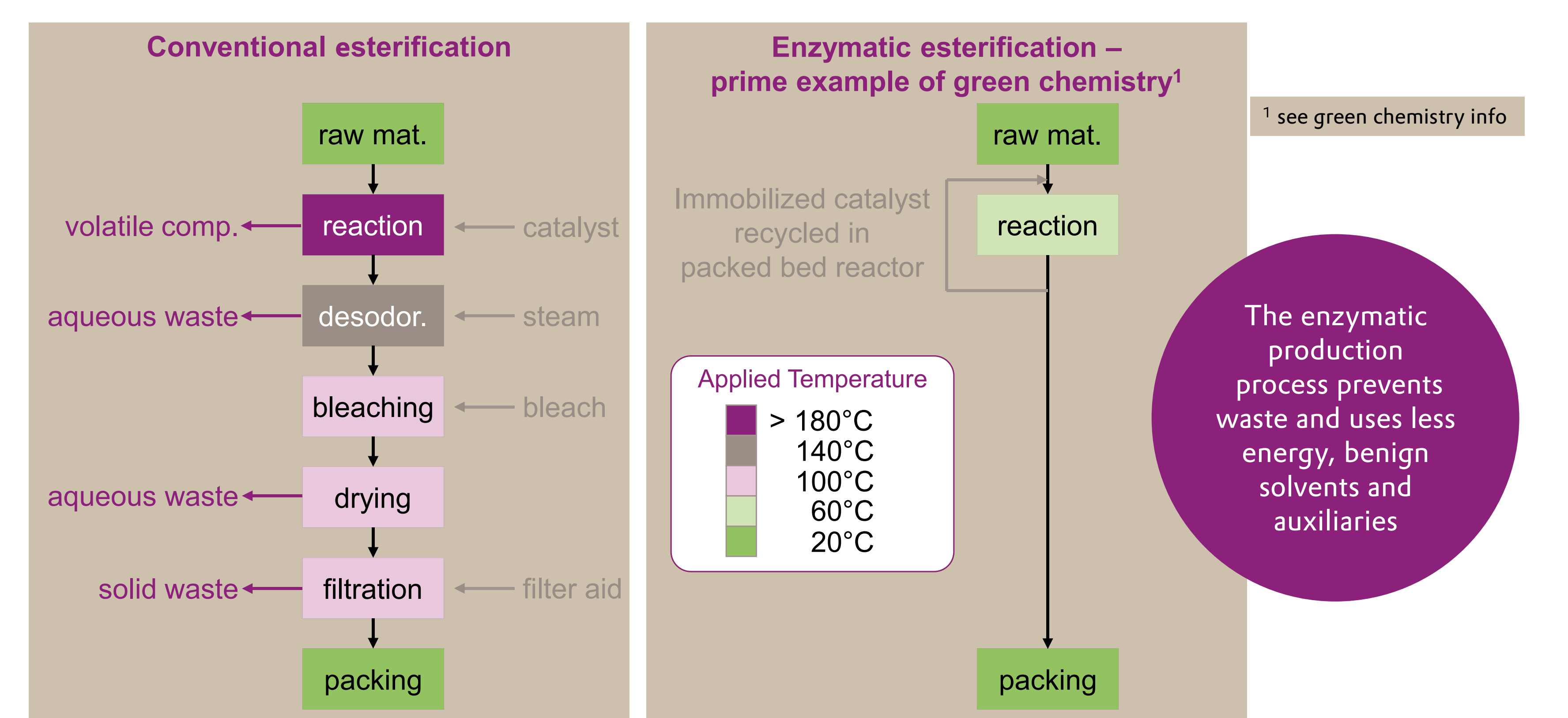
Quantitative CO₂ Impact Categories incl. biogenic carbon + land use change (LUC)



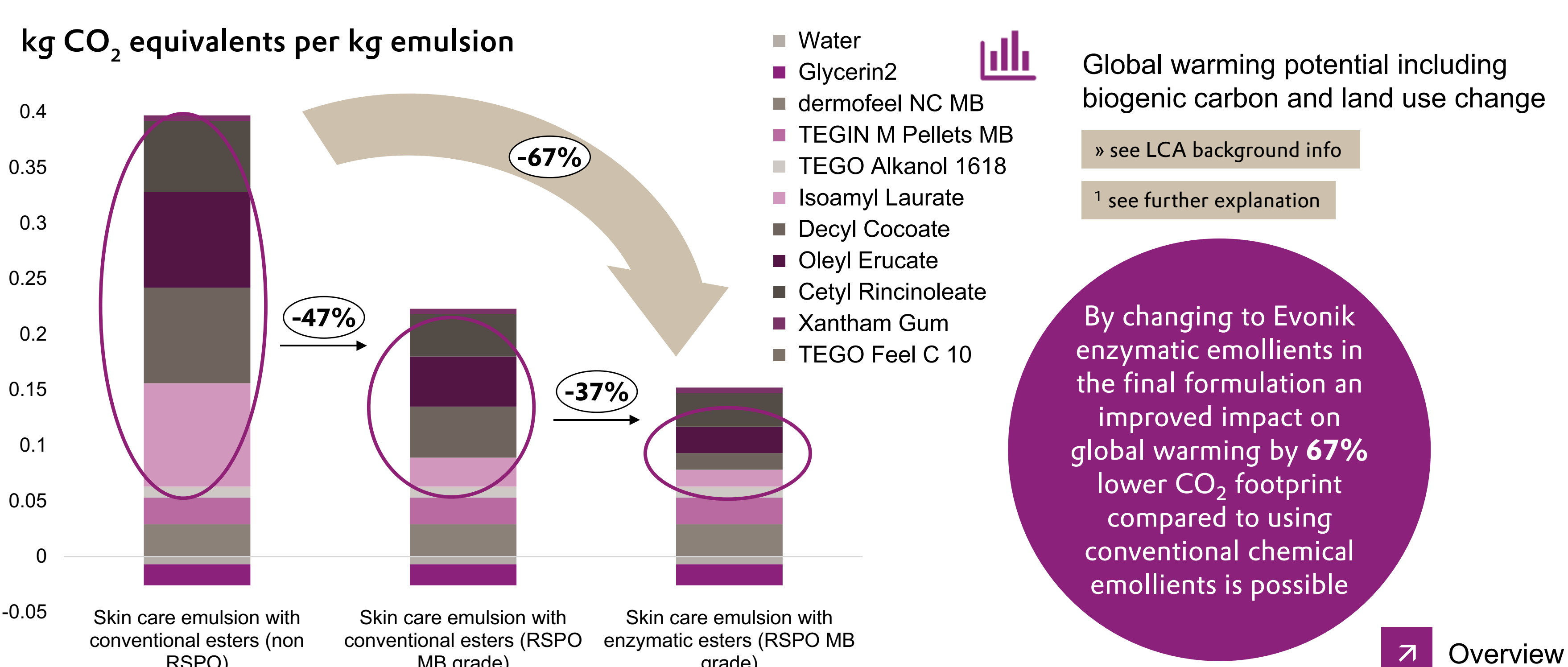
Esterification Production: Global Warming Potential



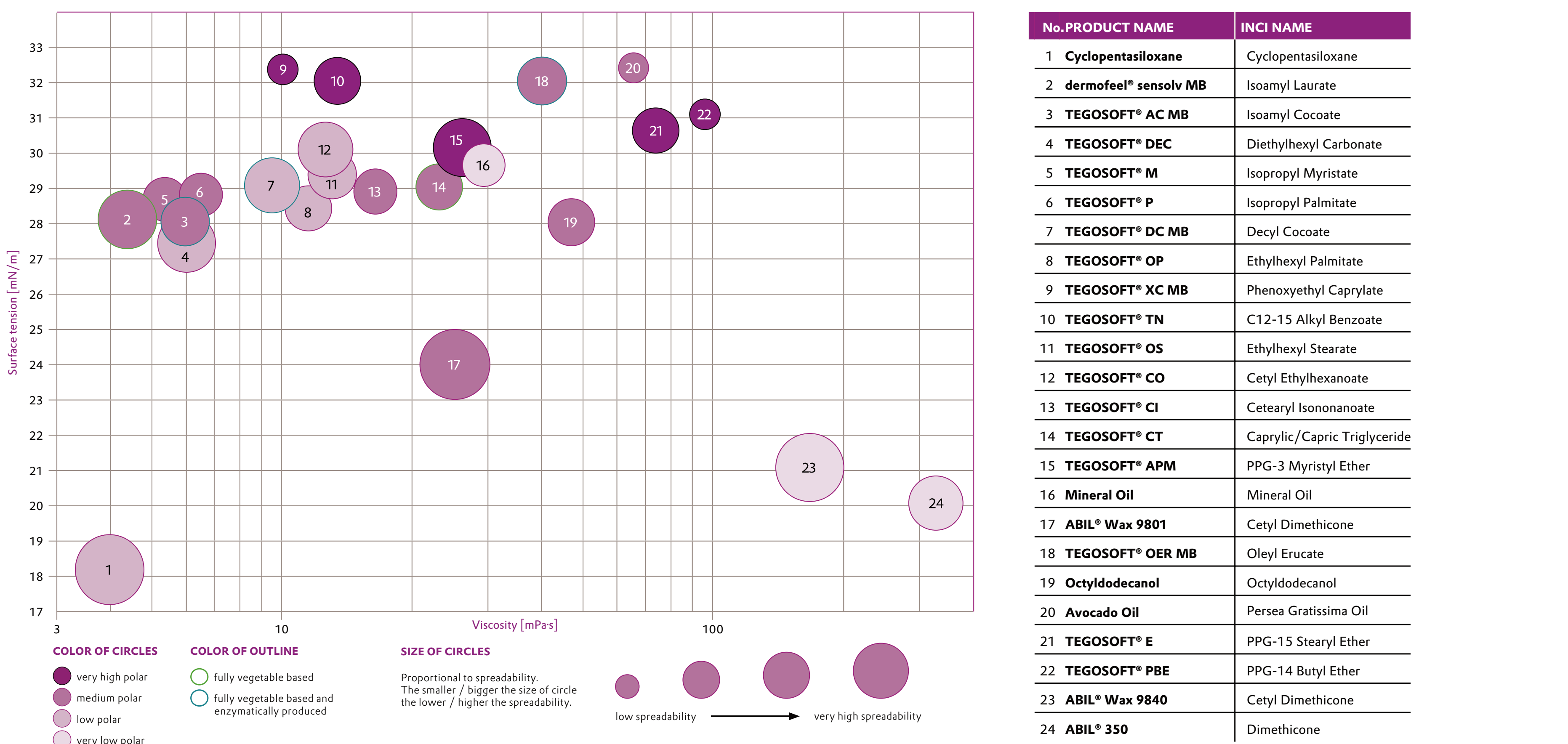
Process Comparison of Conventional Esterification vs. Enzymatic Production of Emollient Esters



Environmental Impact of Your Market Product Life Cycle Assessment of a typical O/W cream – cradle to gate



The Emollient Chart dermofeel® solnov MB and TEGOSOFT® AC MB on the emollient chart



Low VOC High Performance Sustainable Sunscreen Spreading behavior, Gloss and Sensory evaluation



Incorporate emollients produced by an eco-efficient process and formulate to minimize the consequences for the environment:

- Reduce your CO₂ emissions
- Climate relief with superior quality
- Create your desired skin feel