INSTITUT FÜR ENERGIE- UND UMWELTFORSCHUNG HEIDELBERG

Key findings of Tetra Pak® LCA study for Nordic countries focussing on the Swedish market

Study title: Comparative Life Cycle Assessment of Tetra Pak® carton packages and alternative packaging systems for liquid food on the Nordic market

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Who is ifeu?

ifeu – Institute for Energy and Environmental Reserach …

…founded in 1978 by a group of scientists from the University of Heidelberg.

Today…

…ifeu is an independent non-profit ecological research institute without any party political and economical influence. Financing solely project-bounded means orders 2/3 from public sector 1/3 from private enterprises.

An important part of the institute…

… is the commitment of its employees to a sustain-able society.

Clients…

… ... include international institutions, federal and state ministries and agencies, governments, well-known companies, business associations, NGOs, public utilities, transport and logistics service providers.

Research and consulting for a sustainable society

70 Scientists working on

Resource protection and waste
Development of policies for a circular economy and assessment of practical recycling solutions and its ecological benefits.

Energy
Evaluation of technologies, development of strategies and policies for a sustainable and efficient energy system , development of climate action plans

Food and Biomass
Environmental assessment and sustainability analyses of foodstuffs, animal feed, bioenergy and all aspects of renewable raw materials from different biomass sources

Industry and Products
Environmental impact assessment, resource and risk analysis of products, processes, technologies, sustainable urban development

Mobility
Analysis of energy consumption and emissions from all motorised transport systems, evaluation of strategies designed to reduce the environmental impact of transport.

Industry and Products

Longstanding experience in

- Life Cycle Assessment (LCA) and GHG emission calculation
- development of methodologies and standards, e.g. German Federal Environment Agency (UBA) and ISO Standards for LCA

In recent years

- LCA of packaging systems and cooperation with packaging producers worldwide
- special focus on beverage packaging systems including many LCA studies
- general environmental consultancy for Tetra Pak and ACE

Neutral and independent

- Commissioned also by competitors like bottle or can producers
- Consultancy also for European Commission, ministries and agencies

LCA for Nordic countries

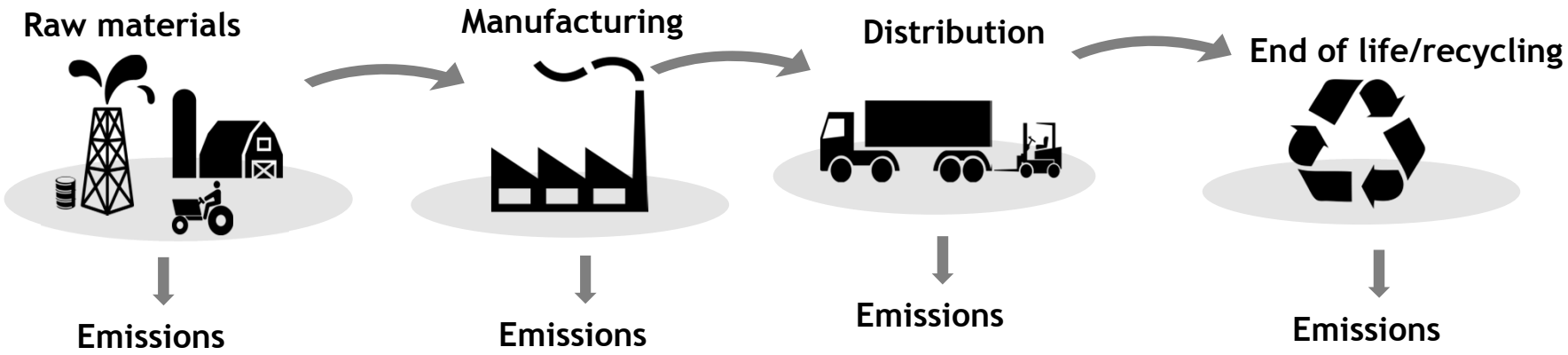
Main objectives

- Assessment of environmental performance of Tetra Pak carton packaging portfolio on the Nordic market
- Comparison with plant based plastics & alternative packaging systems
- Special focus on higher share of renewable material in beverage cartons and their impact on environmental profile

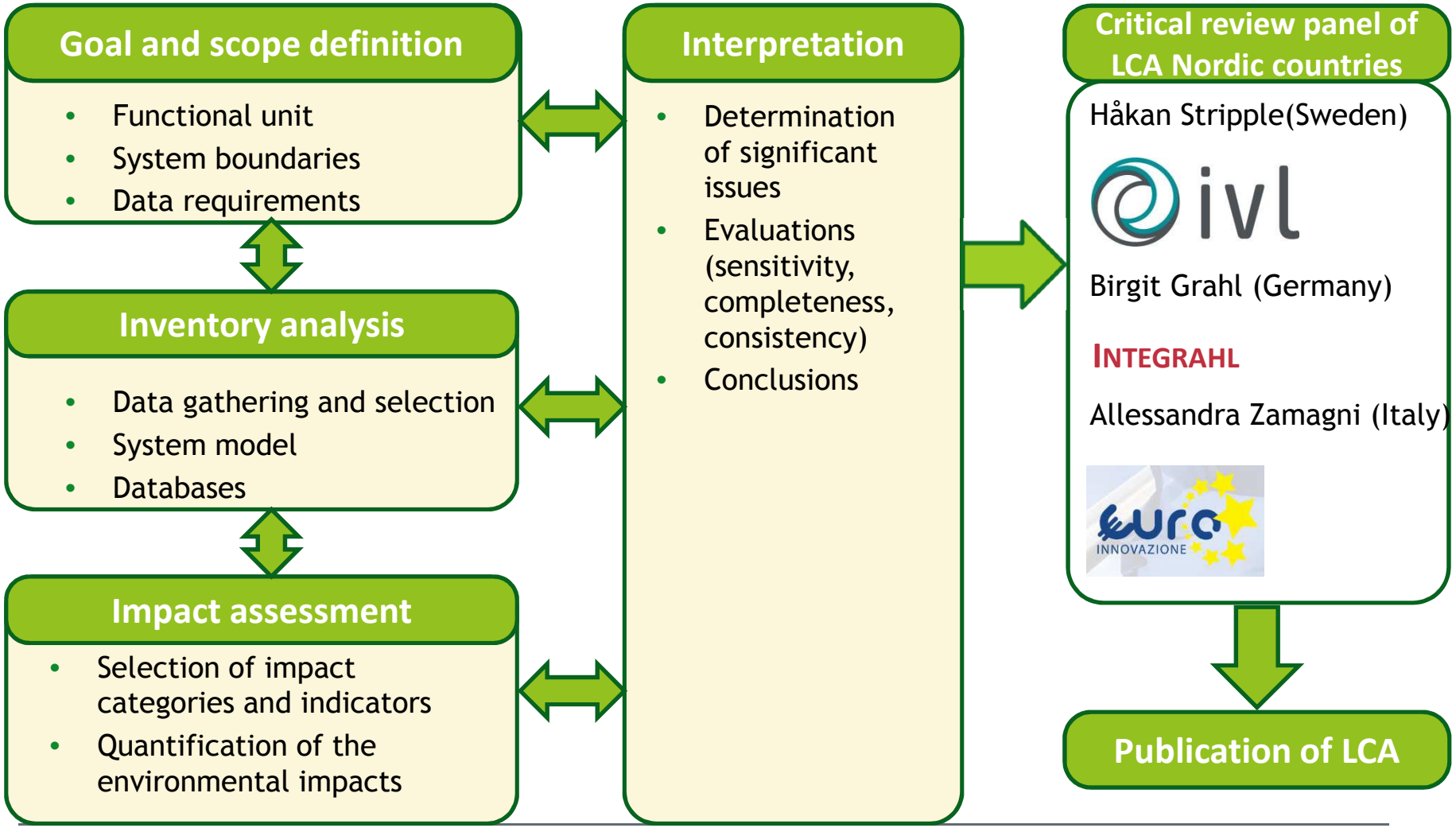
What is LCA

Life **C**ycle **A**ssessment is a compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle

–ISO 14040

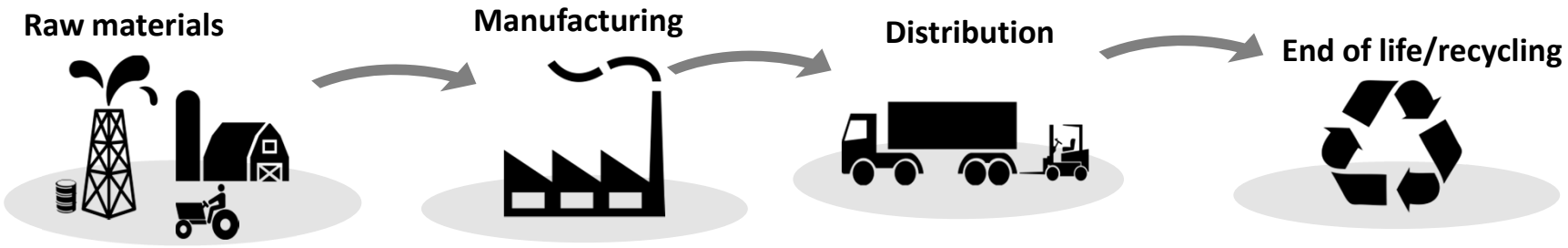


LCA framework according to ISO 14040/44



System boundaries

‘Cradle-to-grave’ LCA



System allocation approach

How are the impacts and benefits of recycling and recovery processes considered in the system model?

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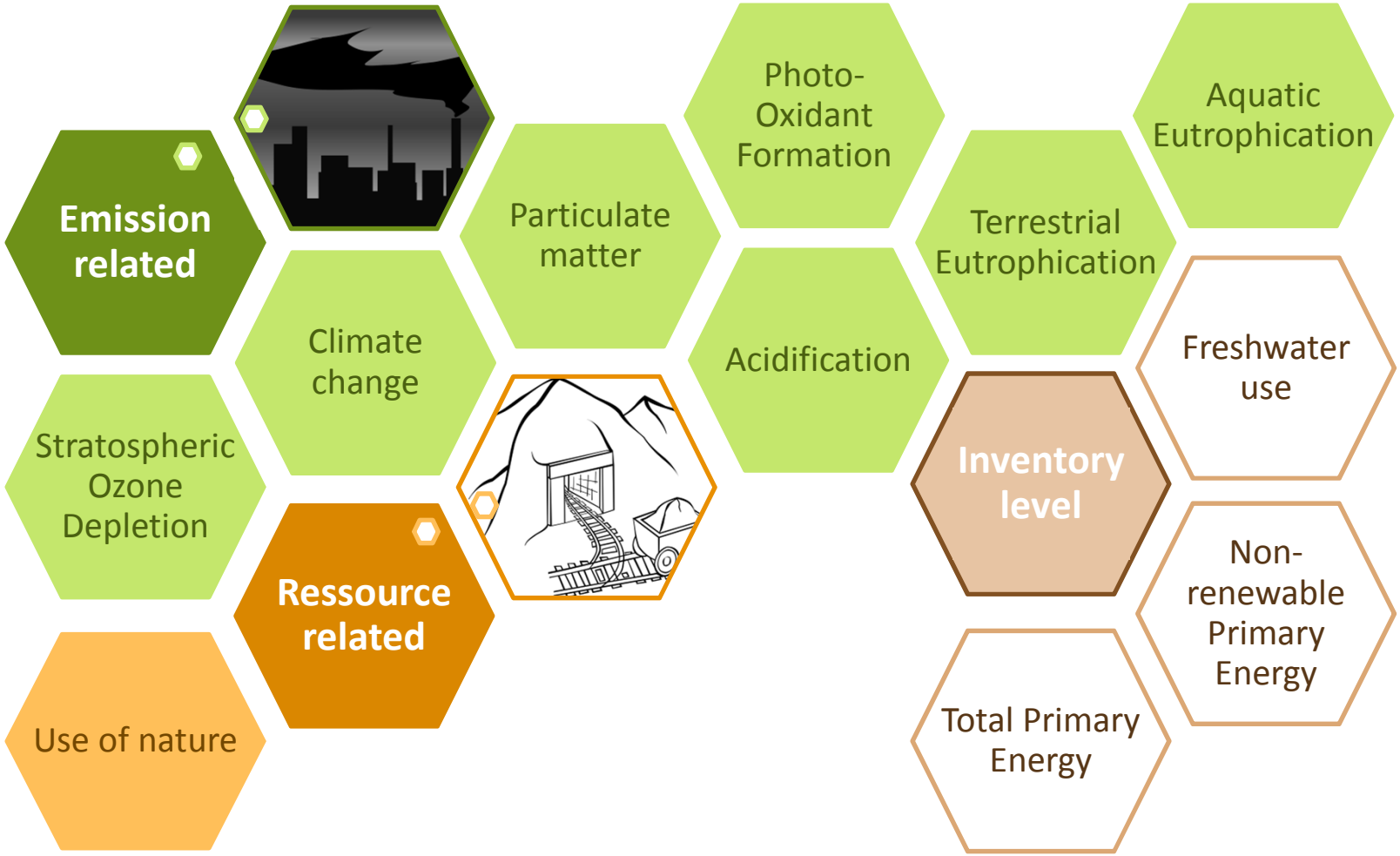
Base scenarios: Allocation factor 50%

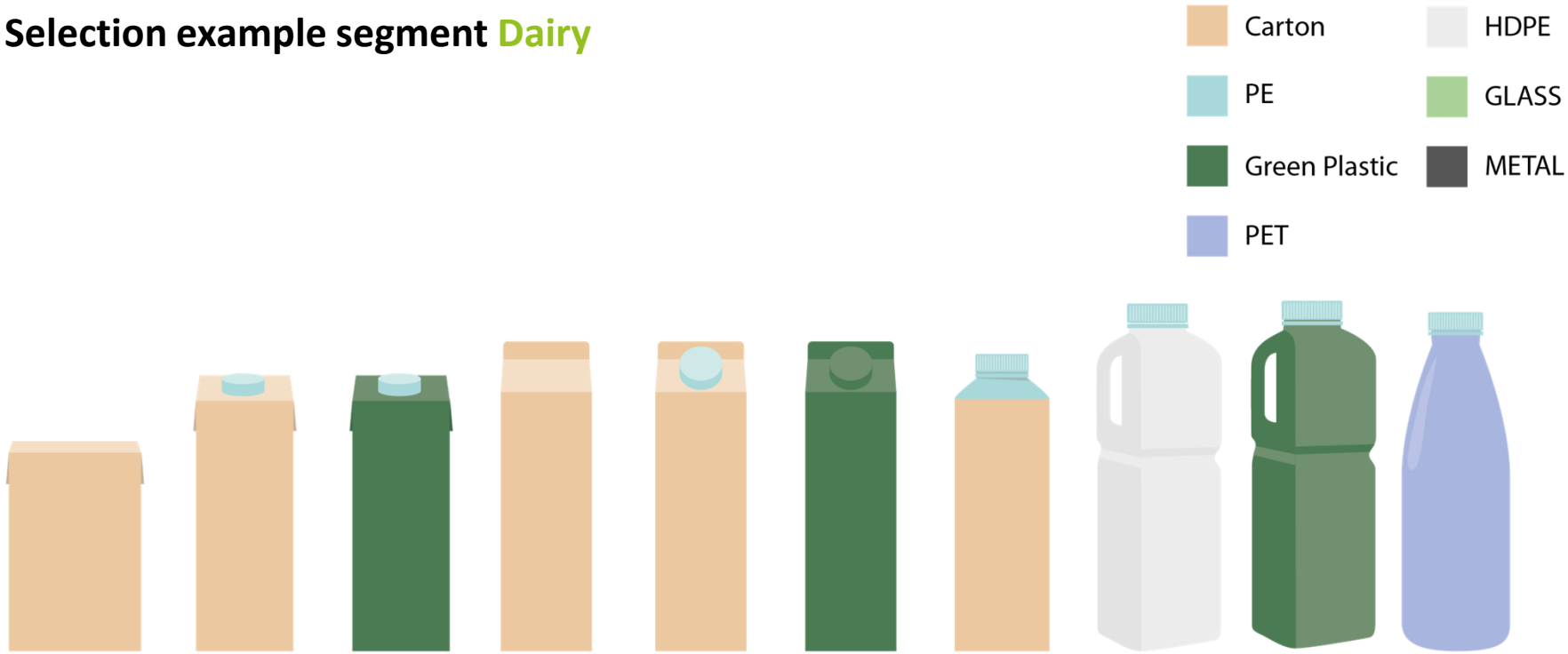
Sensitivity analysis: Allocation factor 100%

Environmental categories

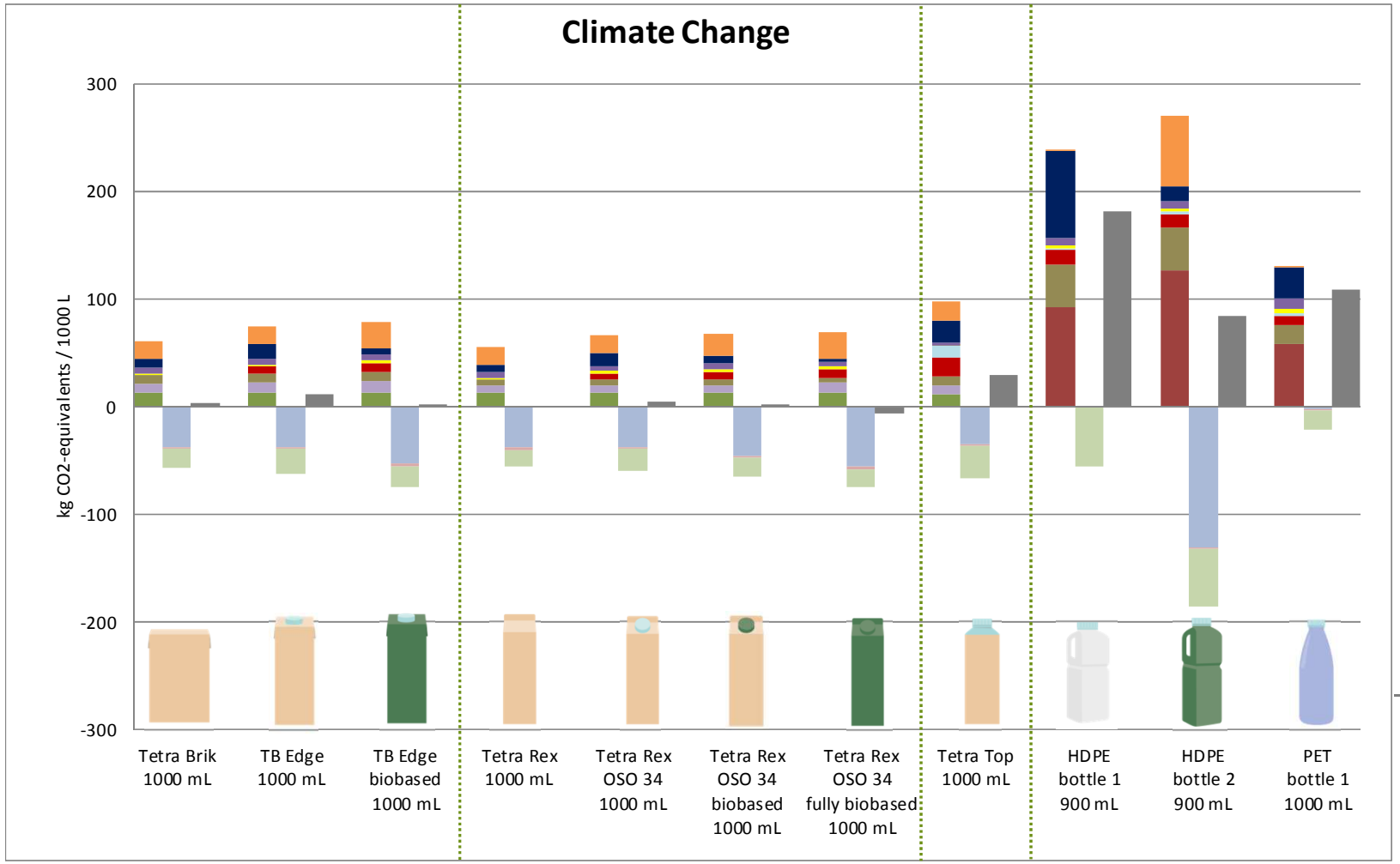


Selection of segments & systems Sweden

Selection example segment Dairy



Results Segment Dairy Sweden – Base scenario



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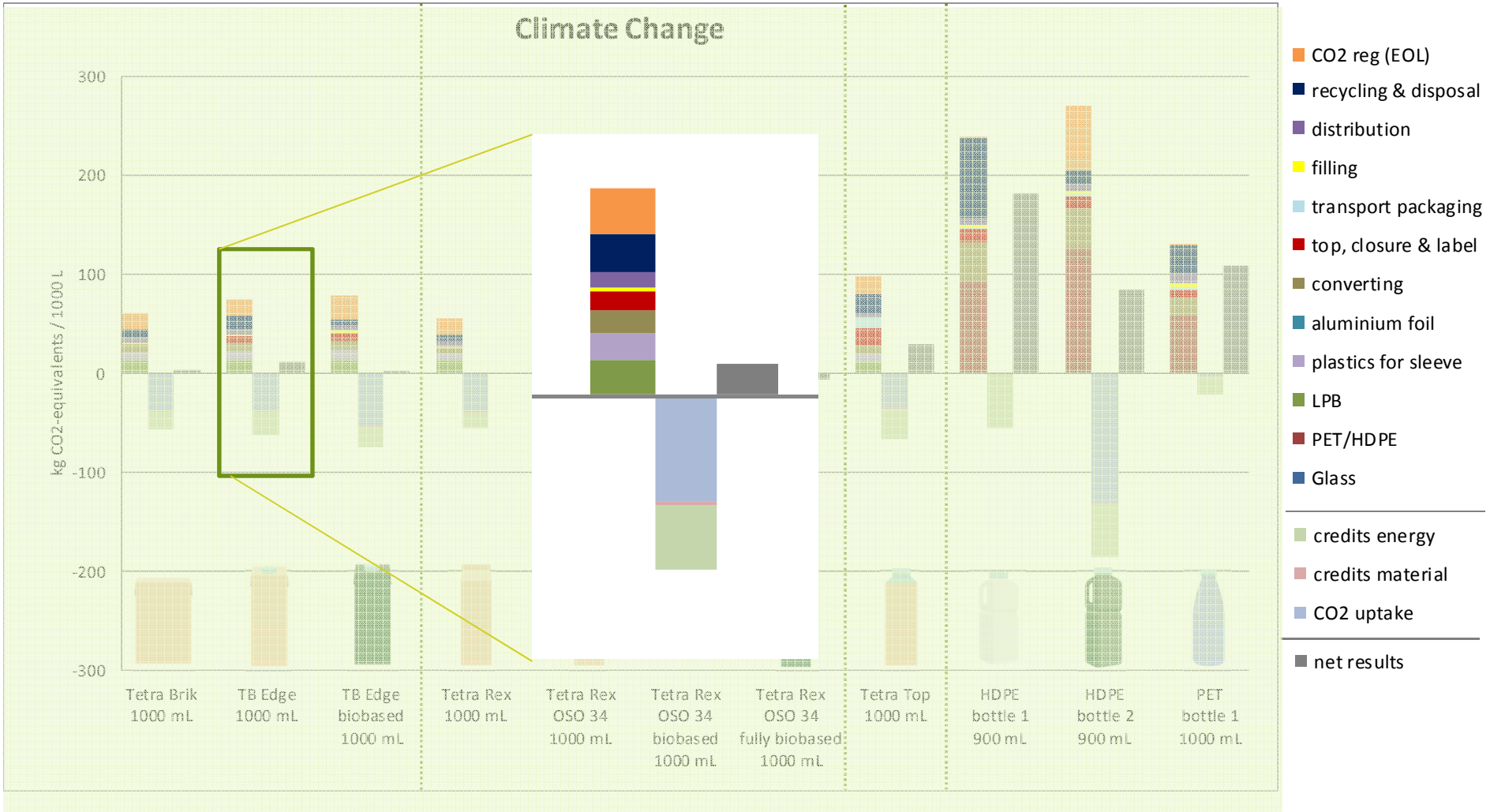

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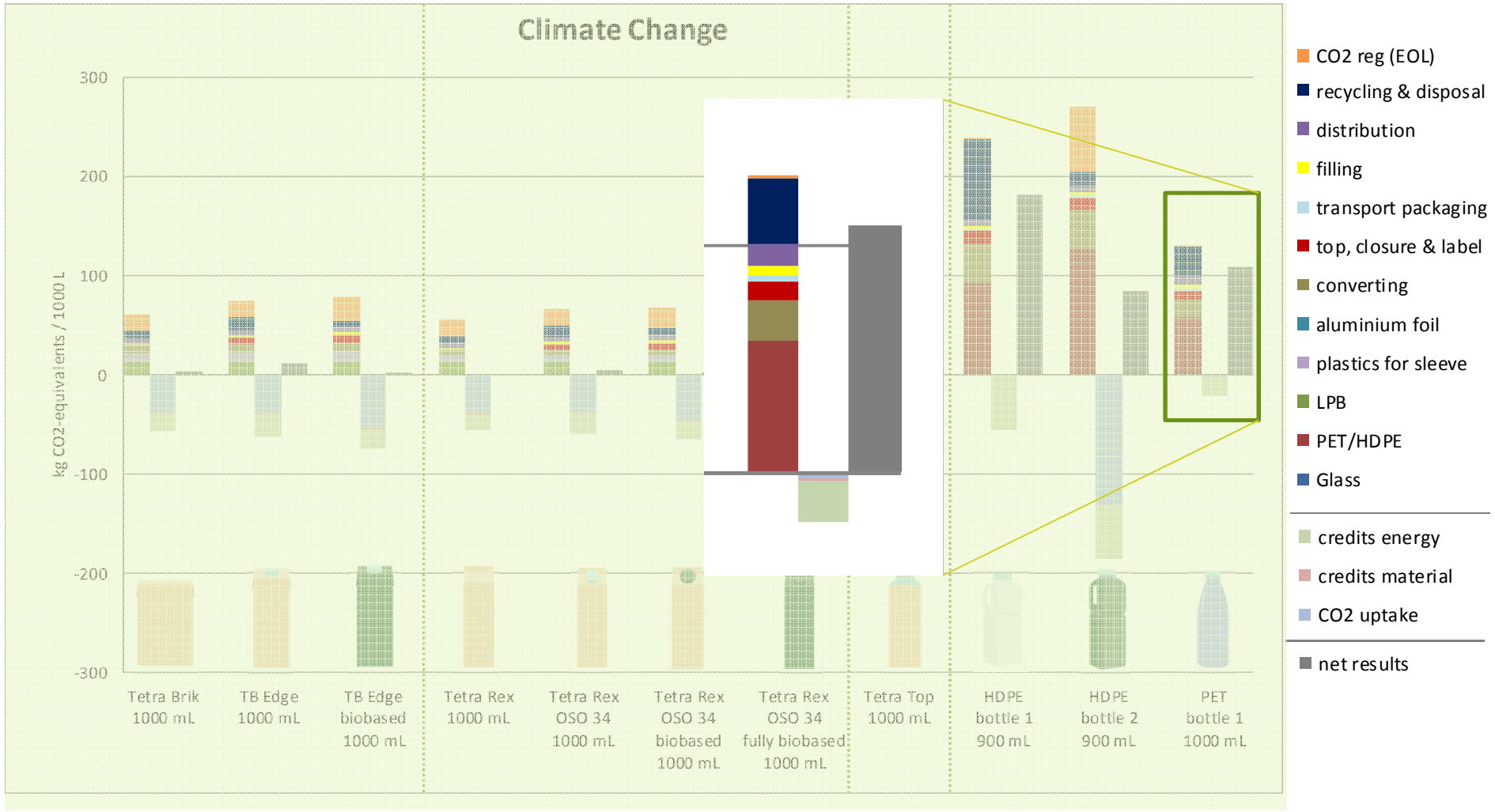

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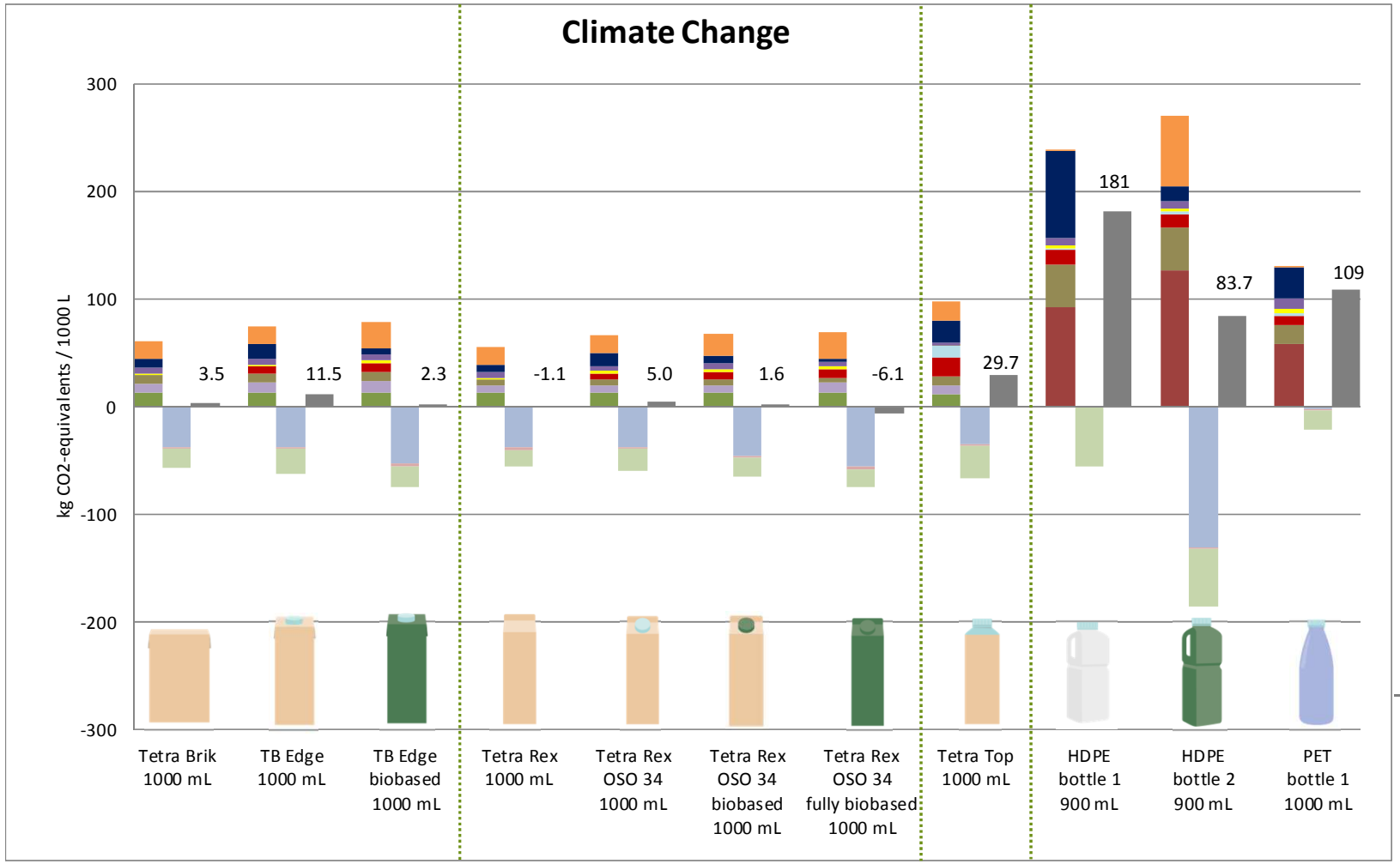
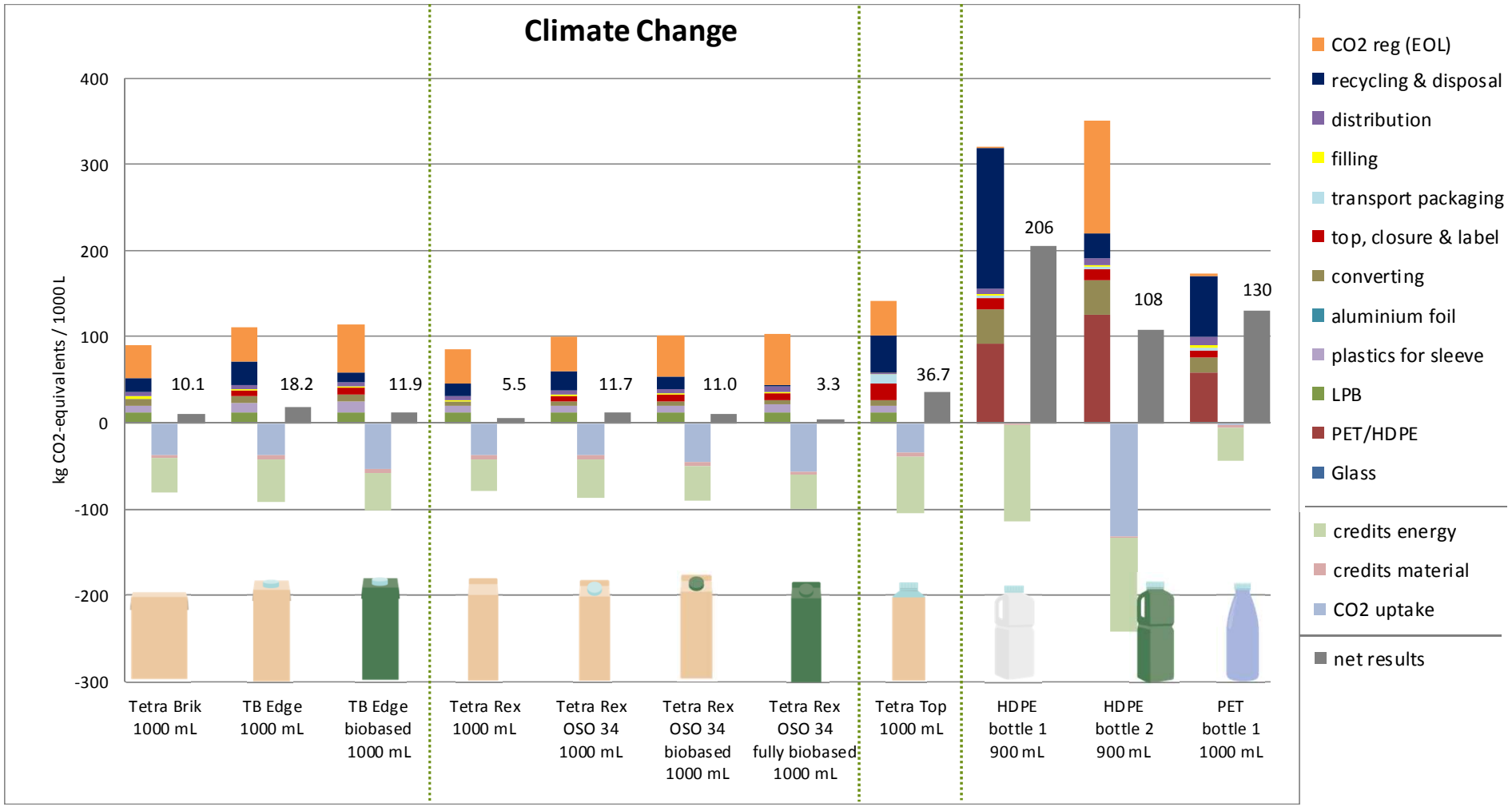


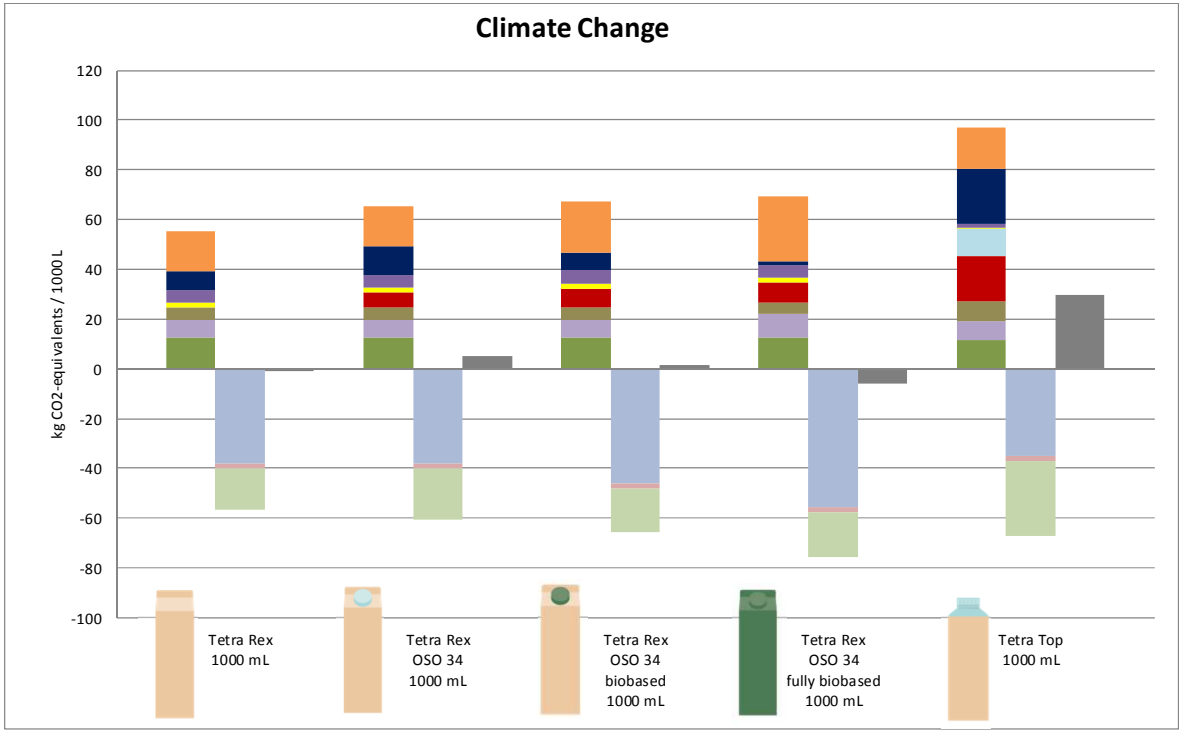
Results Segment Dairy Sweden - Allocation factor 100%



Results Segment Dairy Sweden – Key findings

Lower results for beverage cartons in Climate Change

- No closure
- Biobased closure
- Fully biobased carton
- No transport packaging



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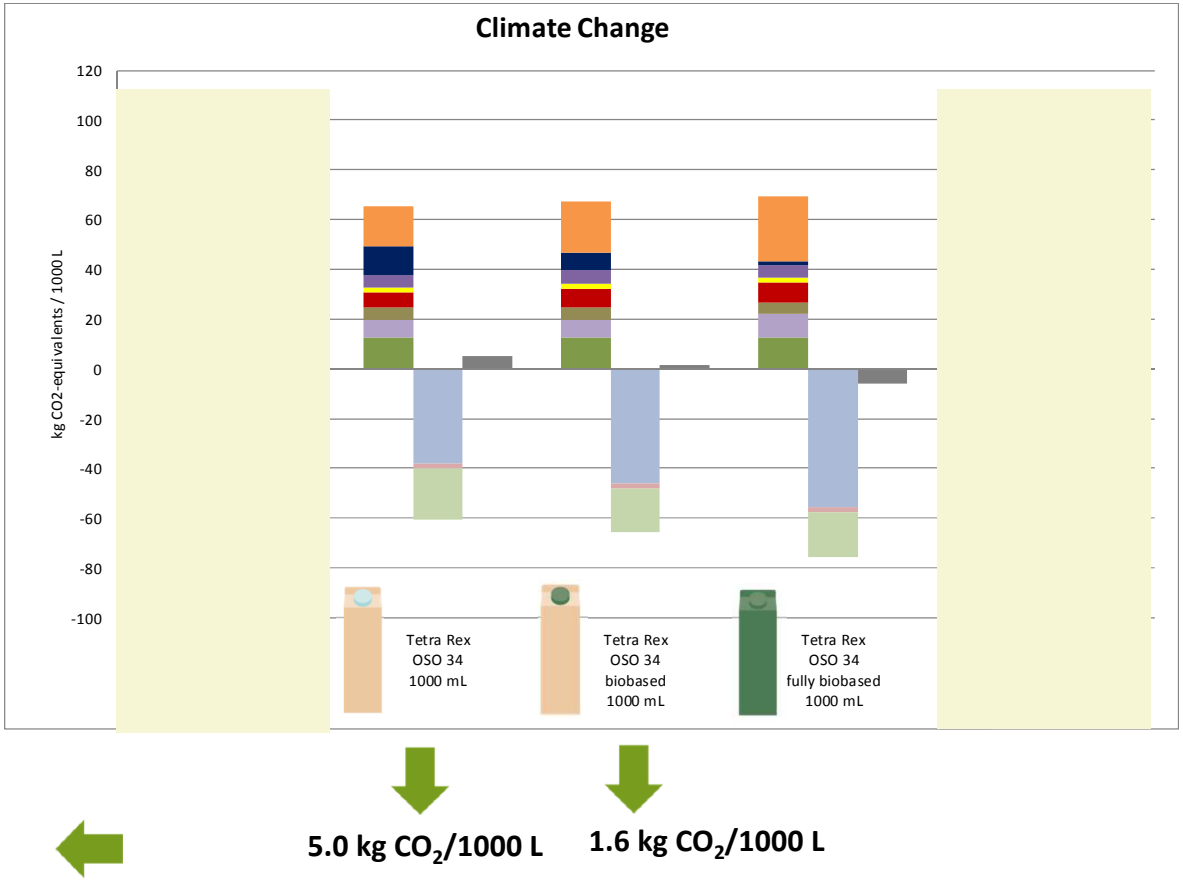
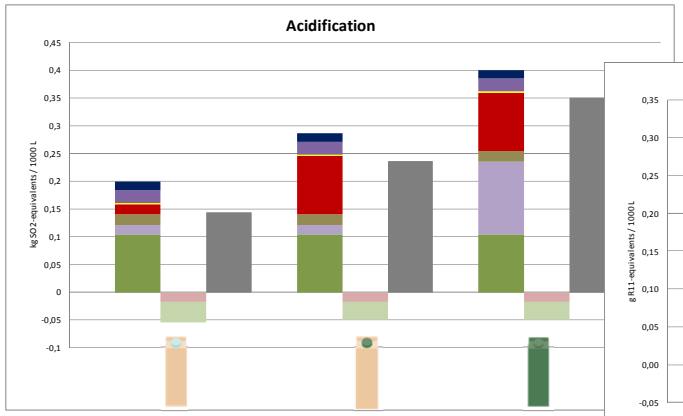
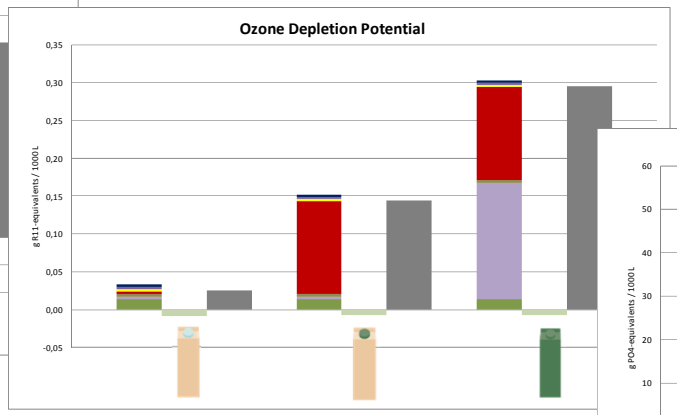


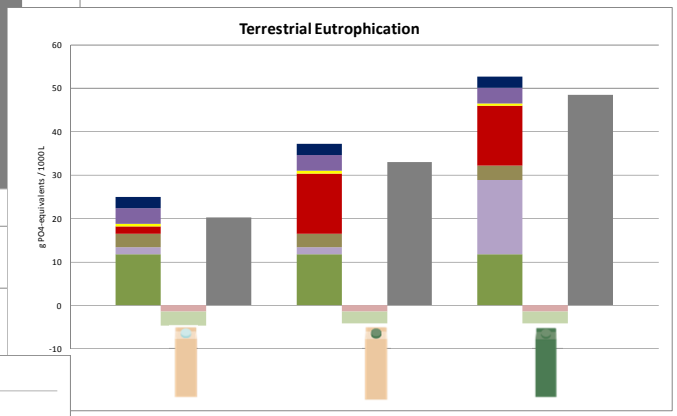
Example biobased closure:

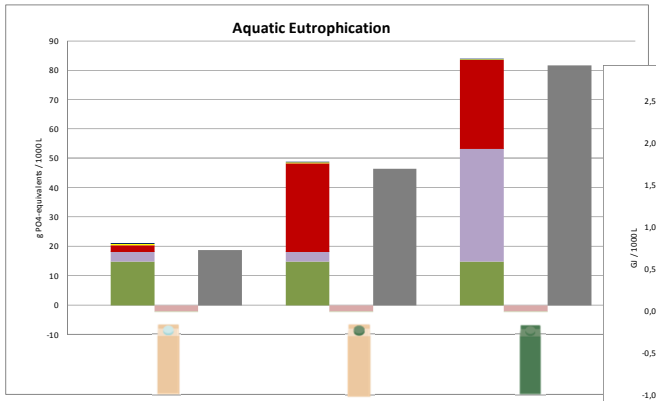
Substitution of 2.6 kg of fossil PE per 1000 packaging units by the same amount bio-based PE leads to a saving of 3.4 kg CO_2-eq.

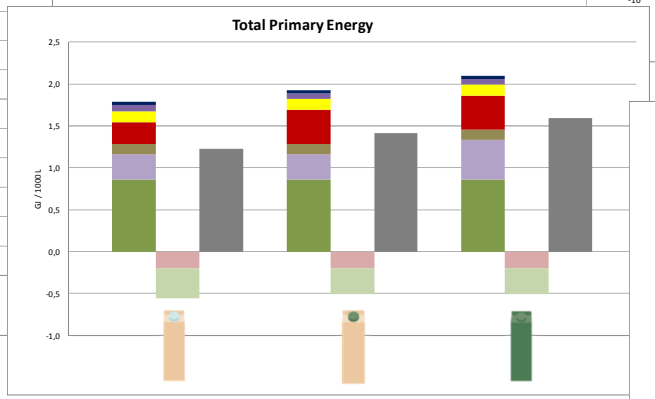
Results Segment Dairy Sweden - Key findings

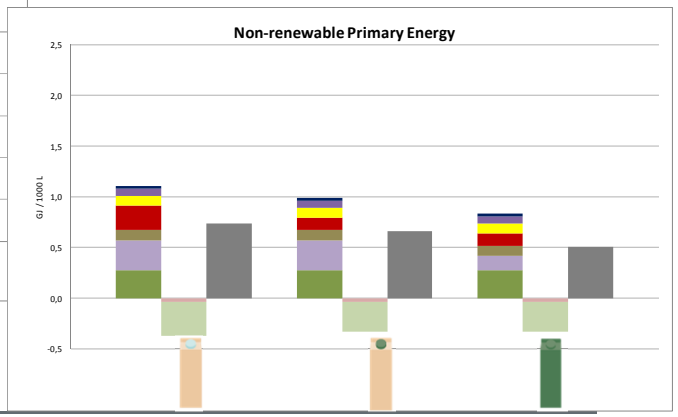












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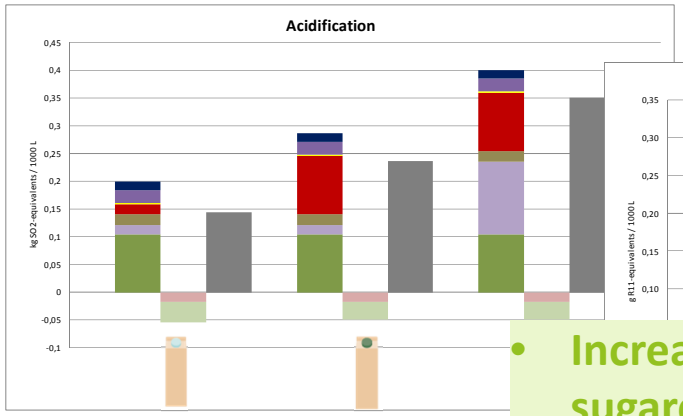
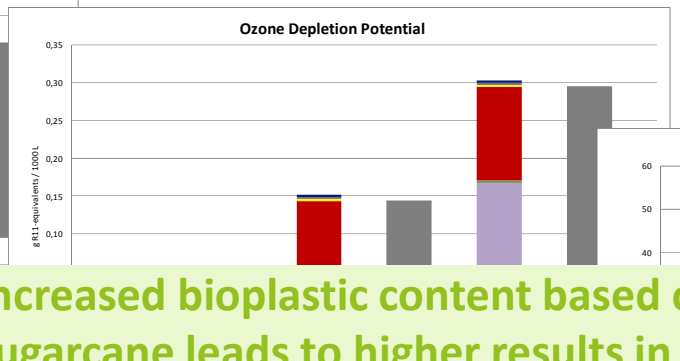
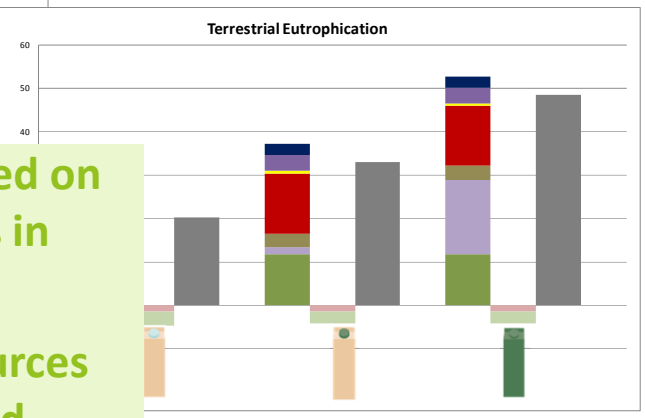
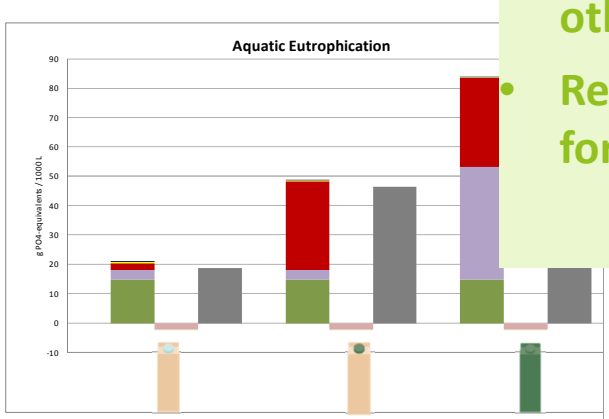
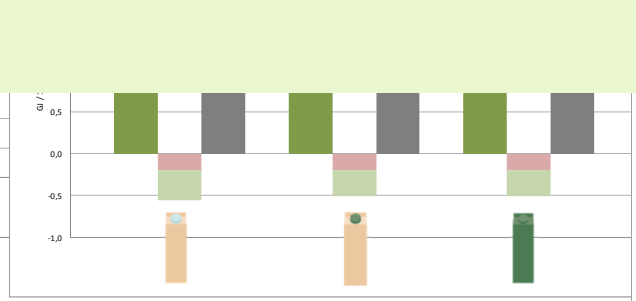
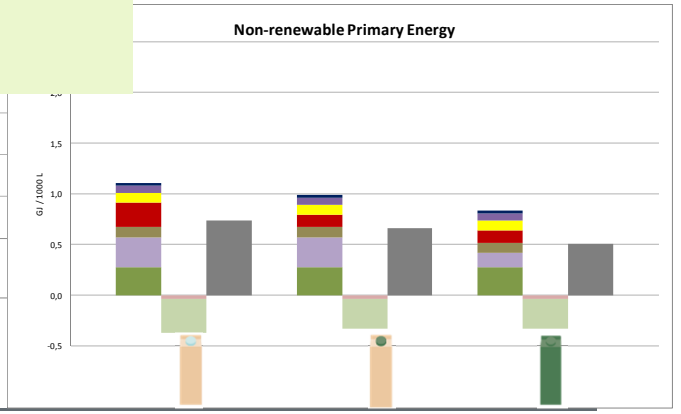






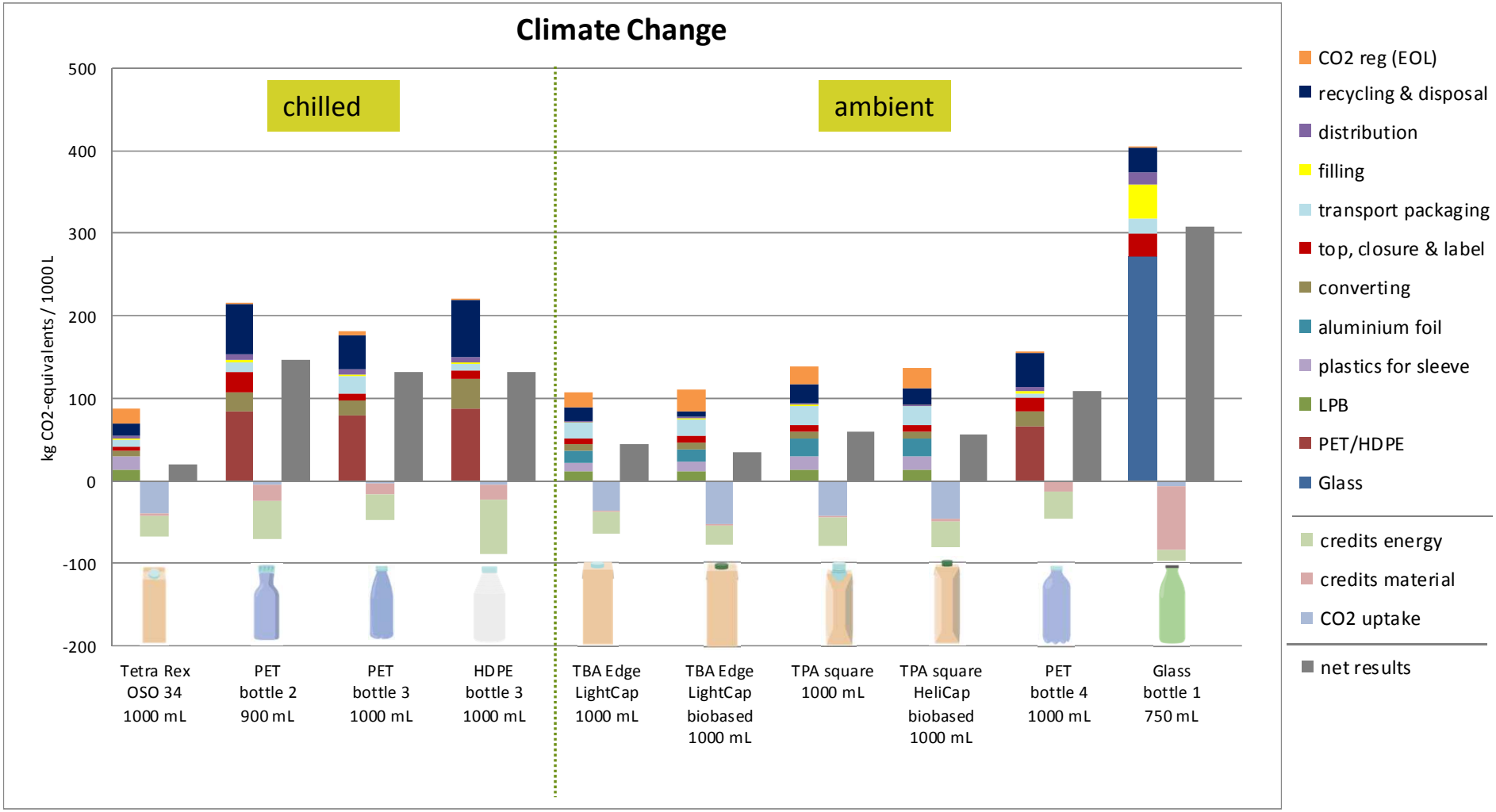




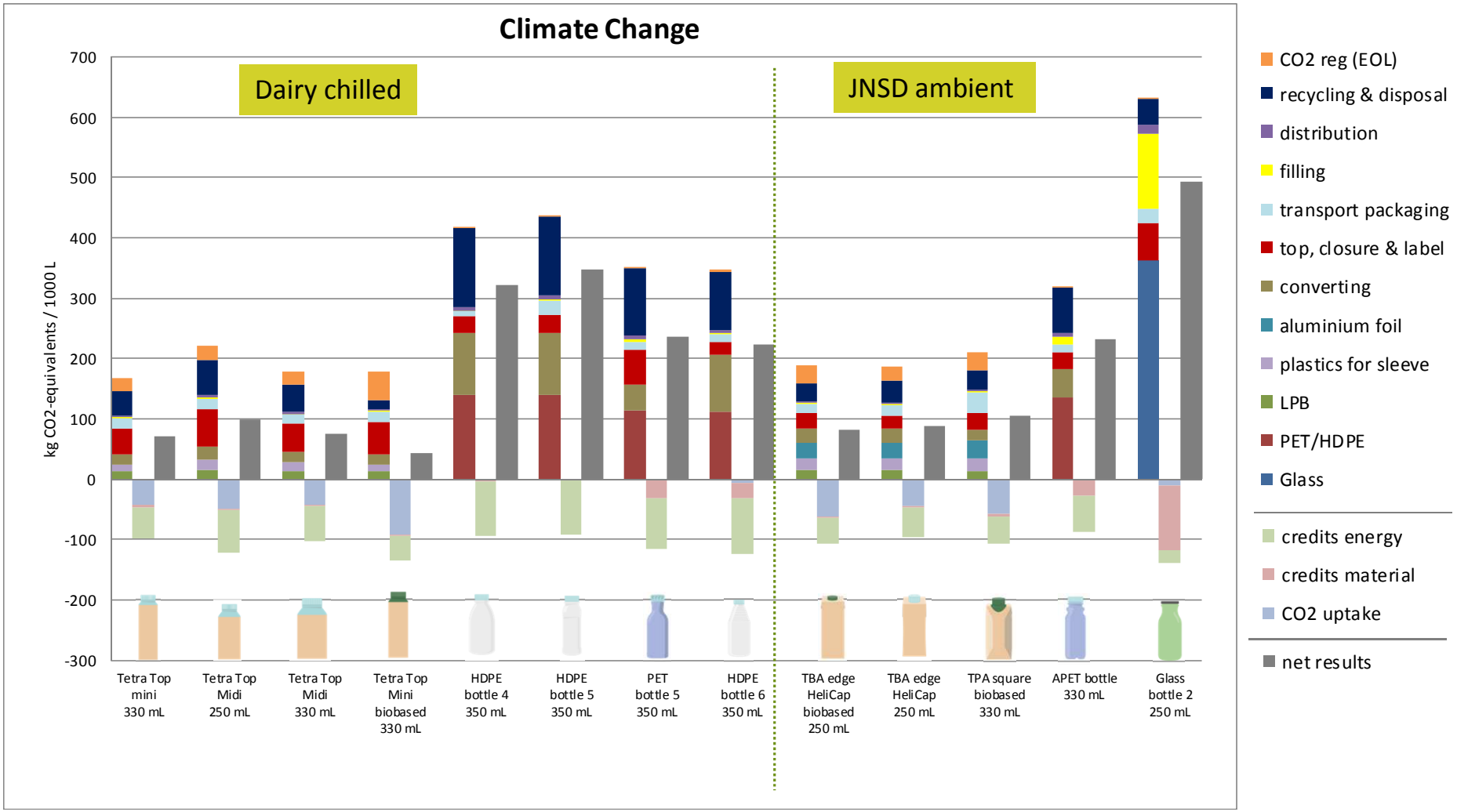


- Increased bioplastic content based on sugarcane leads to higher results in other impact categories
- Review availabilities of other sources for bio-polymers is recommended

Results Segment JNSD Sweden



Results Segment Grab & Go Sweden



Overarching conclusions & recommendations

- Low LCA results for beverage cartons in most environmental impact categories compared to alternative systems in the segments Dairy, JNSD and Grab & Go in Sweden
- Benefit from use of renewable materials in production processes
- Use of biobased polyethylene instead of fossil-based material leads to lower results in ´Climate Change´
- Cultivation phase of biobased PE increases environmental impacts in other impact categories
- With strong focus on climate change mitigation in Tetra Pak‘s policy, utilisation of biobased PE can be an applicable path
- Review of availability of others sources for bio-polymers is recommended to examine if lower environmental impacts can be achieved

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Thank you for your attention

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