

Life Cycle Assessment of Swiss Chocolate

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www.esu-services.ch



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Key questions

- What are the differences between different types of chocolate?
- What are the environmental impacts of chocolate consumption?
- What are the most important aspects within the production of chocolate?
- Which potentials exist for the reduction of environmental impacts due to chocolate consumption?

Background

- Projects commissioned by German Aluminium Association (GDA) in cooperation with European Aluminium Foil Association (EAFA), Düsseldorf, Germany
- Büsser S. and Jungbluth N. (2009) LCA of Chocolate Packed in Aluminium Foil Based Packaging. ESU-services Ltd., Switzerland
- www.esu-services.ch/projects/packaging/
- Here we present our personal point of view

ESU-services Ltd.

- Founded in 1998 as an ETHZ spin-off
- 3 co-workers
- Long time experience since 1994 with life cycle assessment (LCA)
- Clients from industry, NGO, administration, universities
- Global LCA food database with more than 6'000 datasets

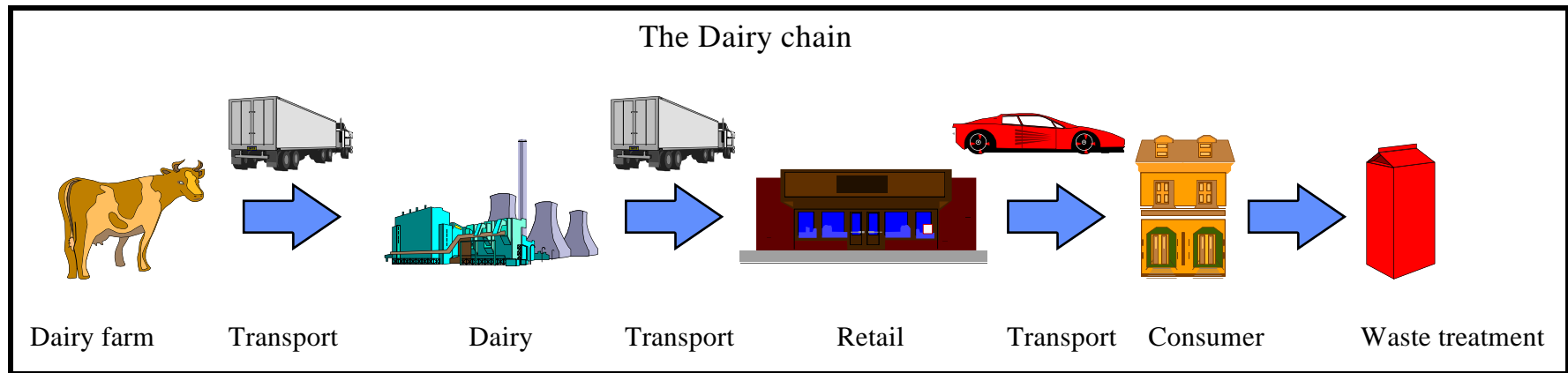
Our services

- Full-scale Life Cycle Assessments (LCA)
- Tiered LCAs
- LCI data acquisition and management (data-on-demand)
- LCA project management
- Ecolabelling concepts
- Literature surveys
- Critical peer reviews
- LCA training & coaching
- Regional SimaPro Centre (LCA software)

Life Cycle Assessment

- Balance of all in- and outputs
- Life cycle from cradle to grave
- Assessment of different environmental impacts (e.g. climate change, eutrophication, summer smog)
- Improvement and comparison of production processes

Life Cycle Assessment of Products



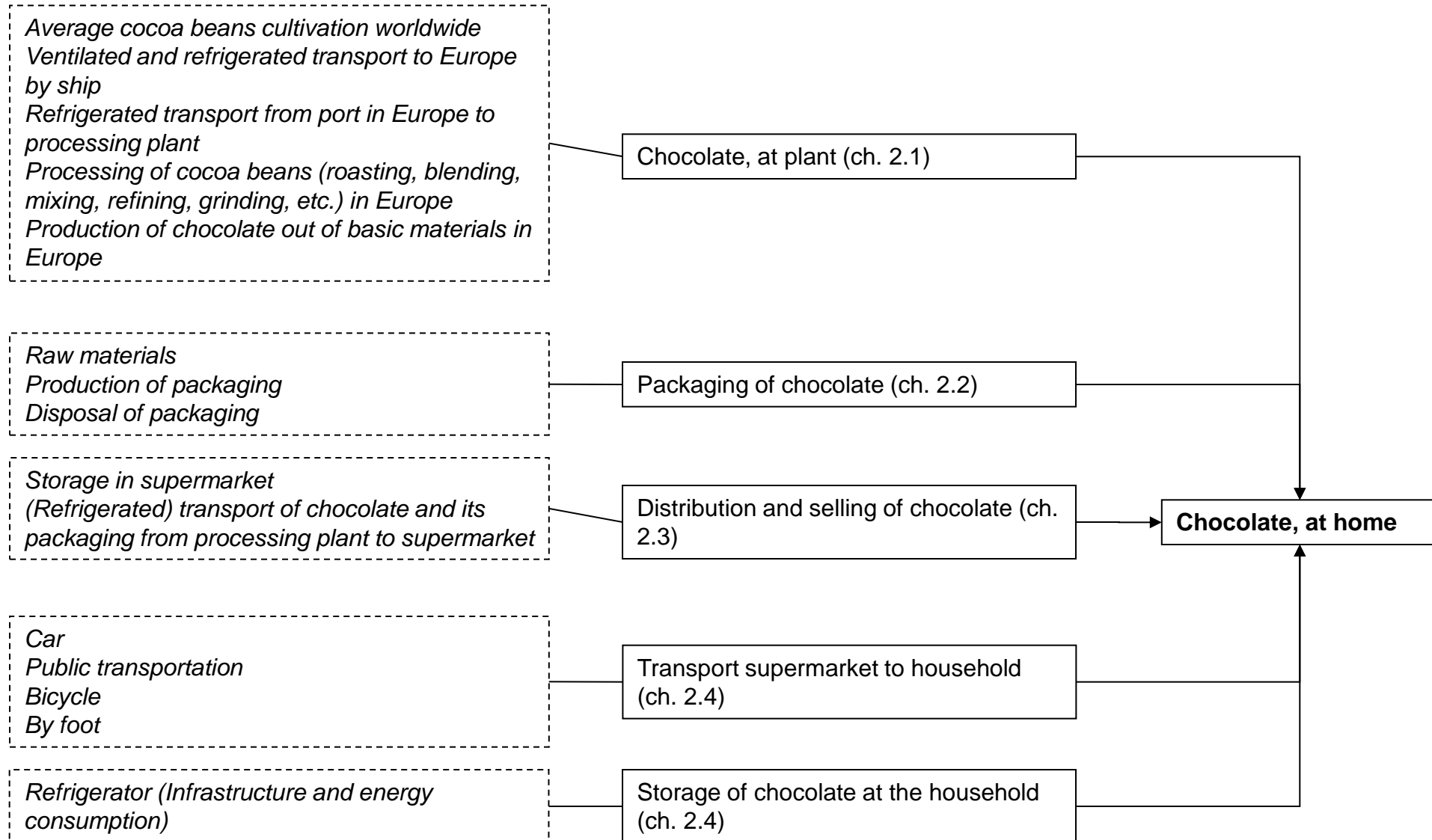
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- Cradle to grave
- Assessment of emission to air, water and soil as well as resources (water, energy, land)
- International standardisation ISO 14040 ff
- No absolute judgment nor accounting for social and economic aspects

Goal and Scope for this study

- Functional unit: 1 kg of chocolate for consumption in the household
- Packed in aluminium foil and wrapped with paper
- Cocoa data from Ghana
- Consumption in Europe

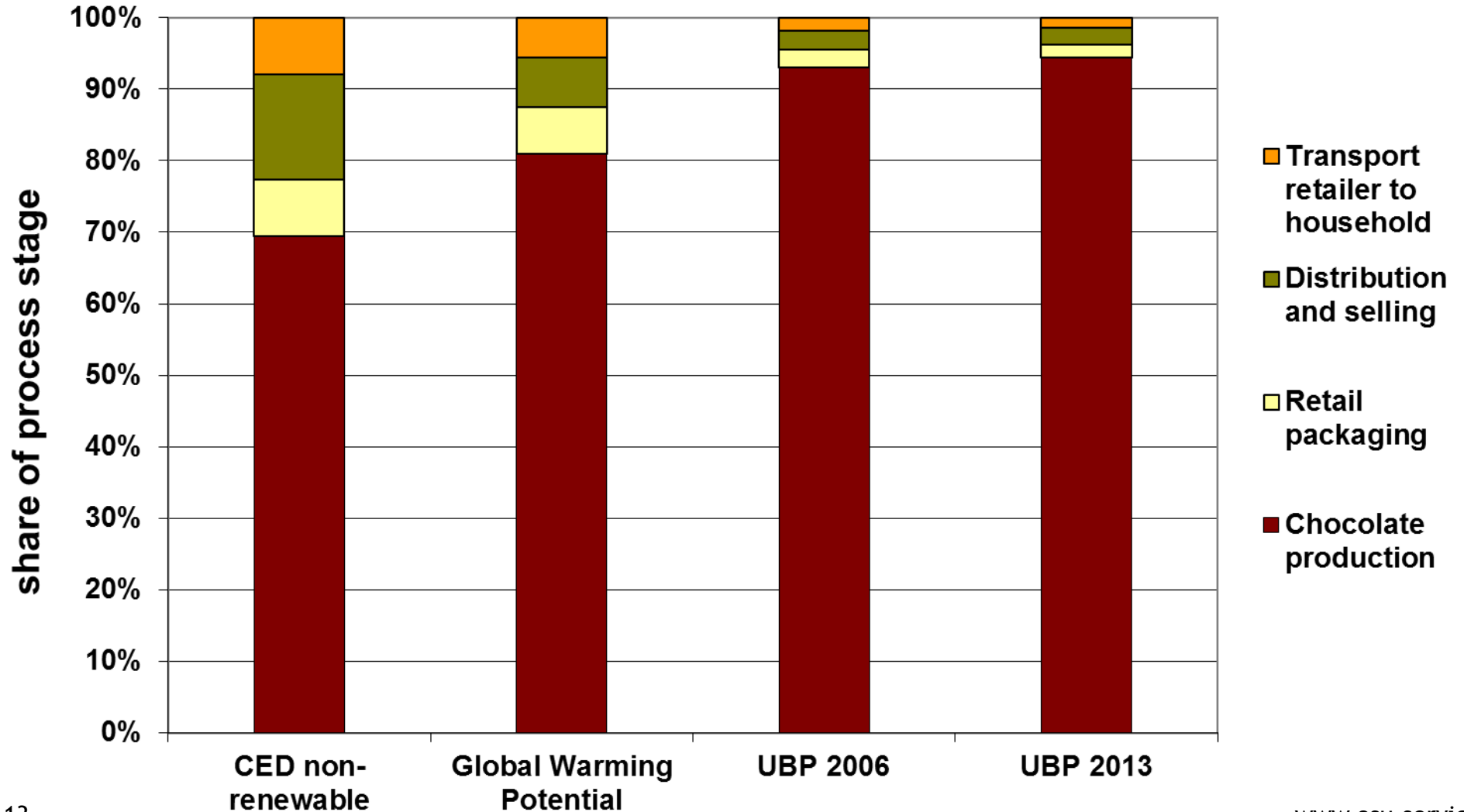
Included processes



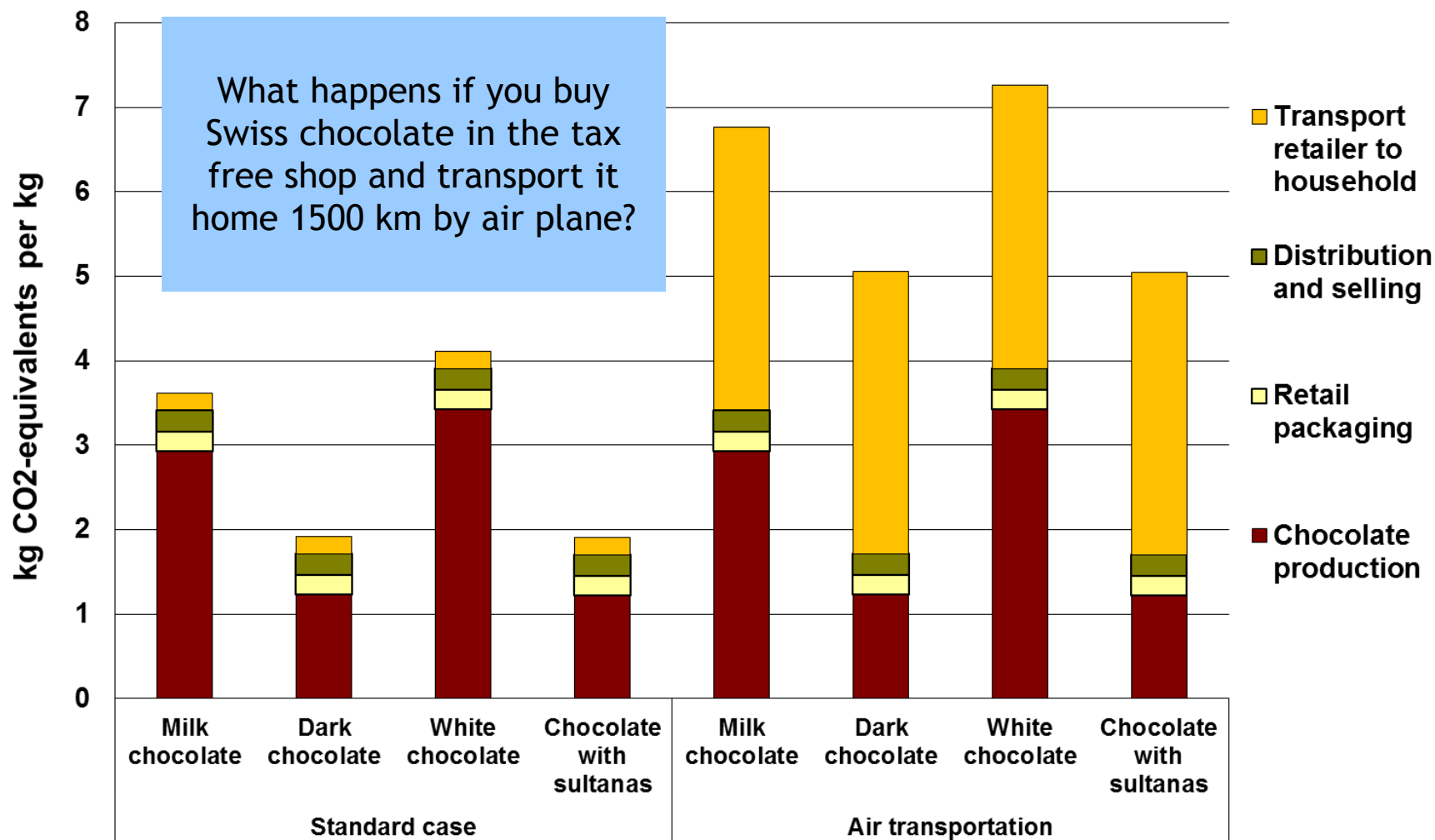
Life cycle impact assessment

- Evaluation of CML impact categories in original study
- Here use of the LCIA method ecological scarcity 2013 (Switzerland) to simplify the presentation
- Evaluation of greenhouse gas emissions and cumulative energy demand as most common category indicators

Impacts per process stage

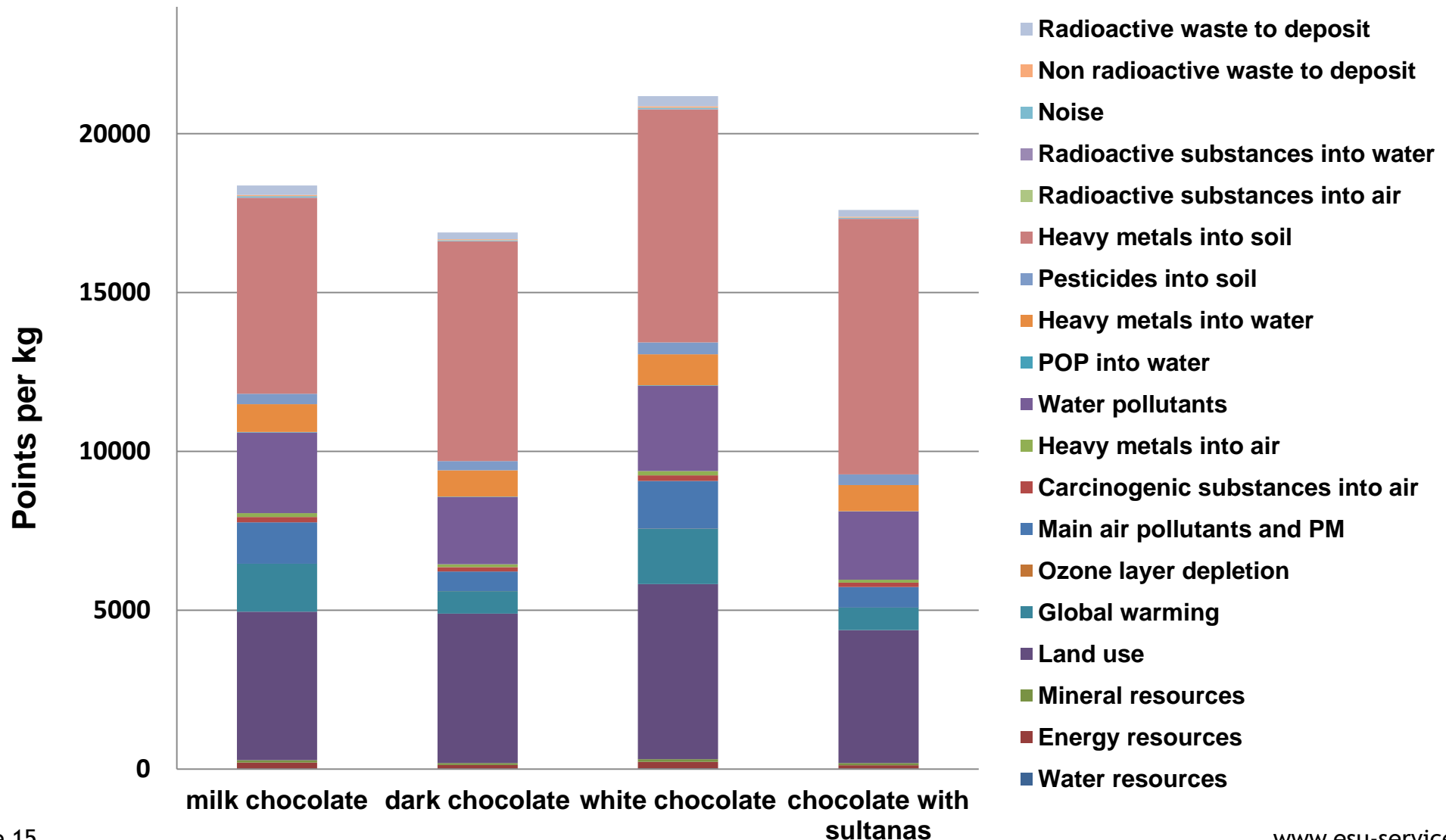


GWP: Comparison of different chocolates



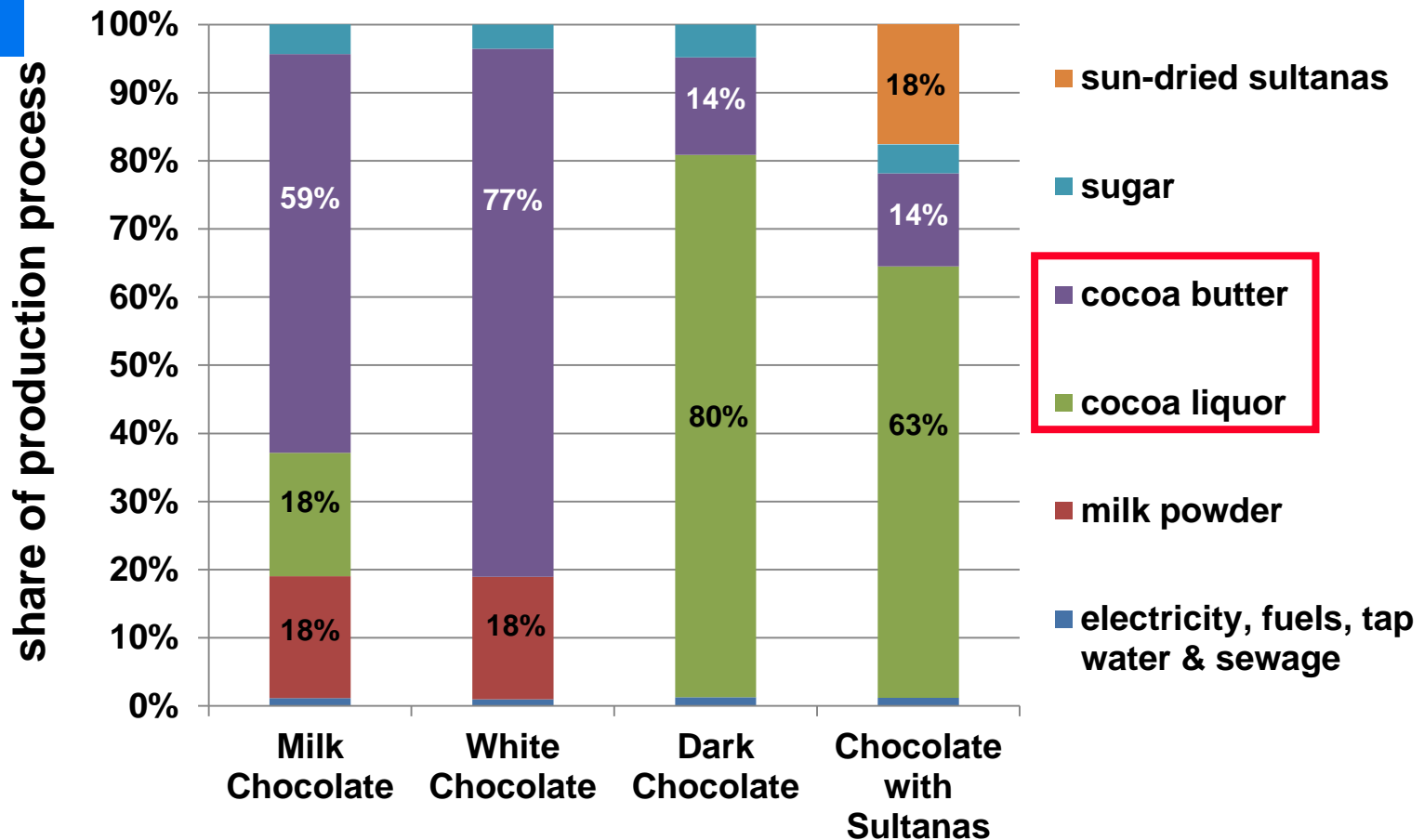
➤ Buy in tax free and 1500 km flying home can add considerable impacts

UBP2013: Comparison of different chocolates



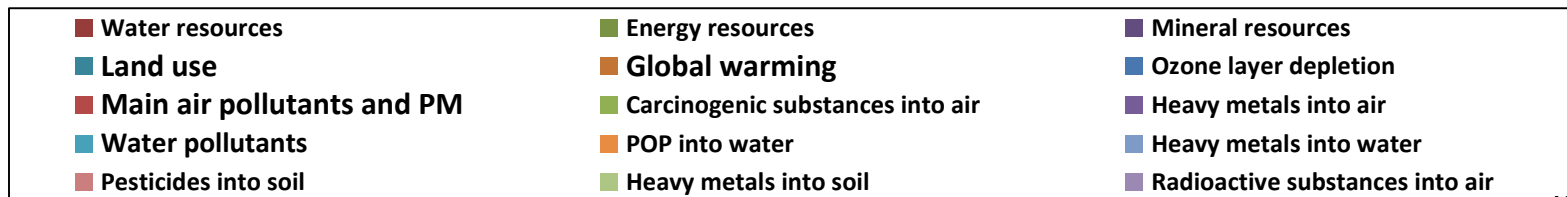
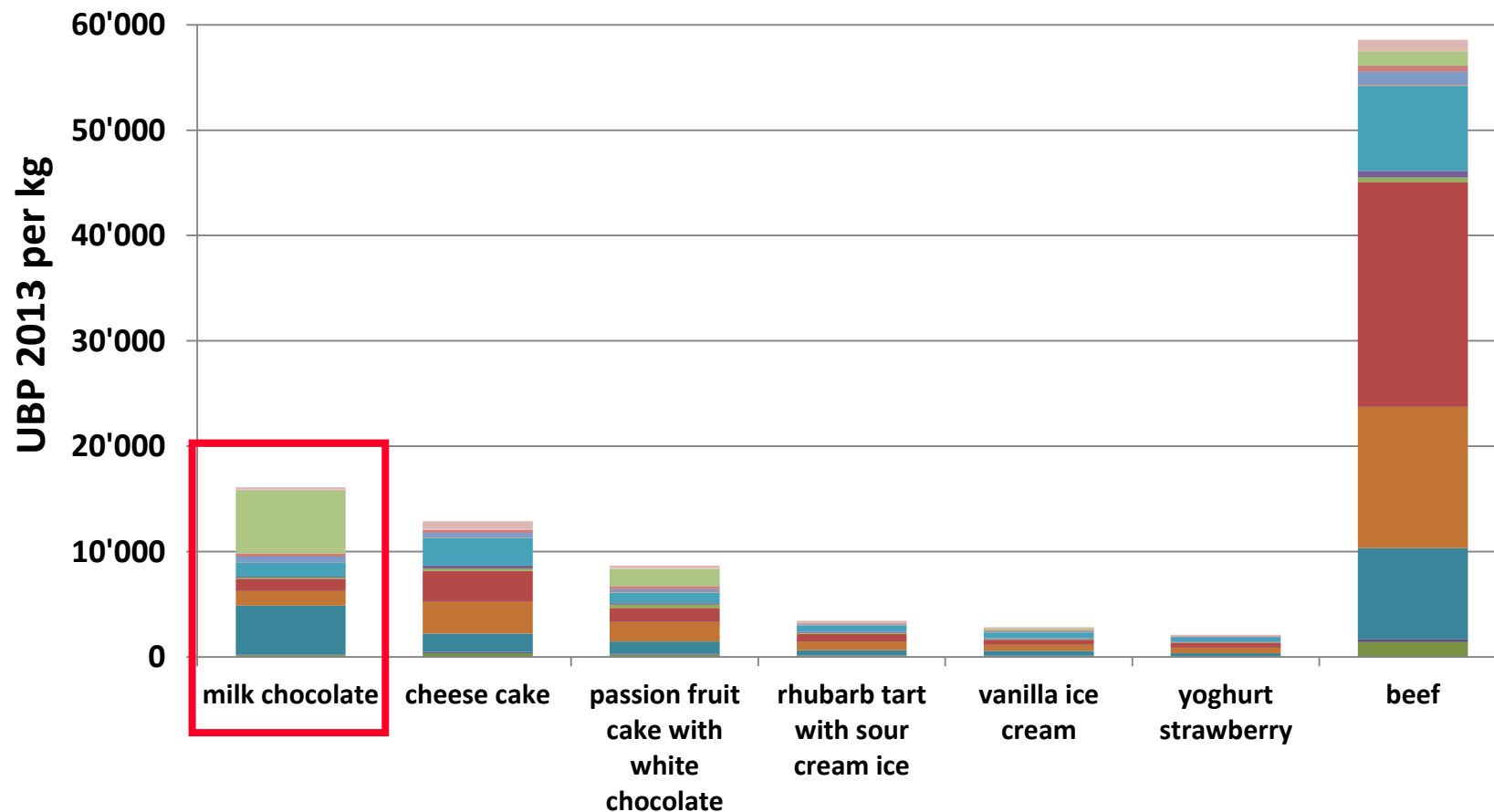
Shares in chocolate production

UBP 2013

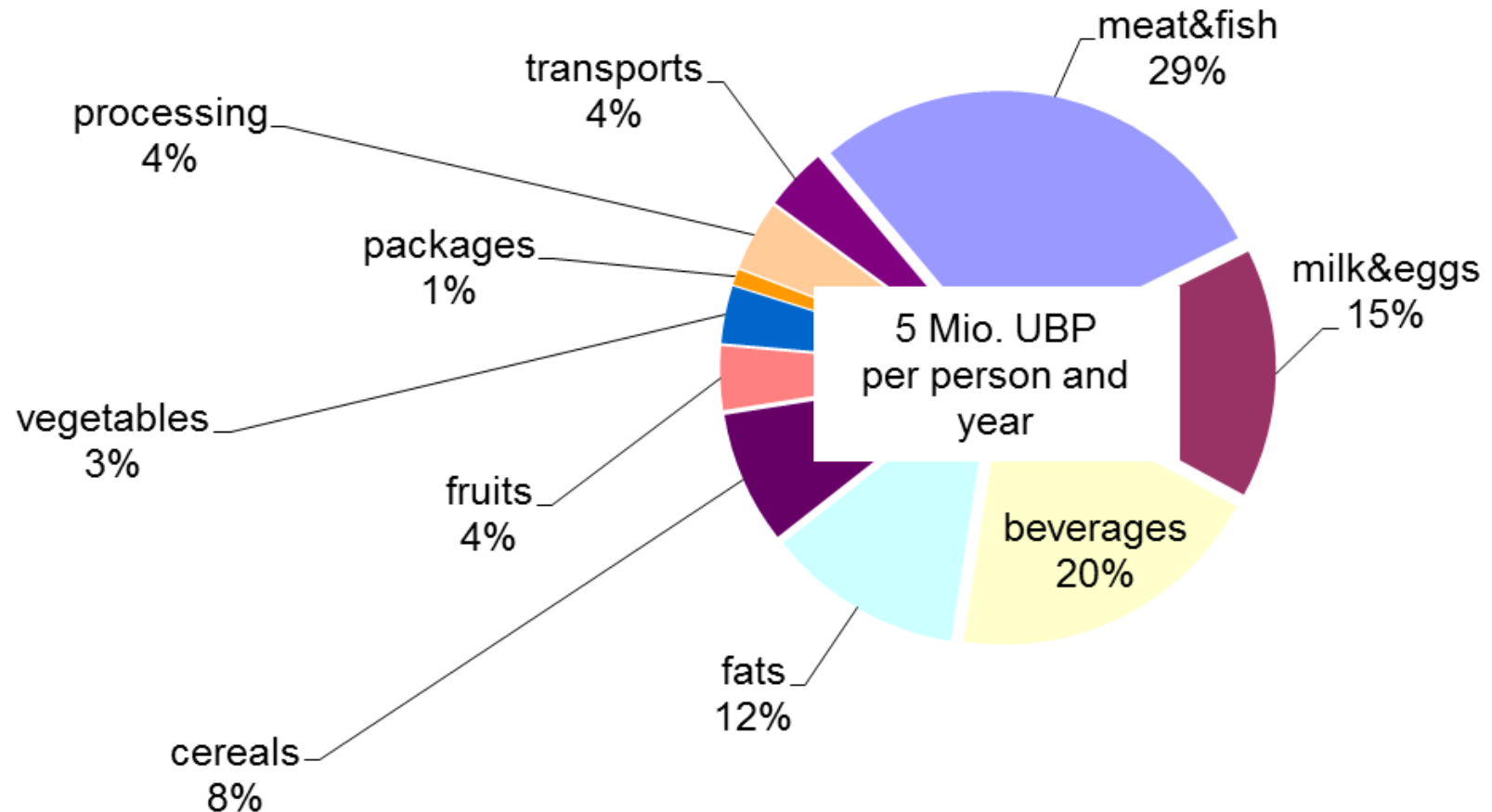


- Land use and heavy metals into soil due to agricultural production of coca beans as main environmental impact factors

Chocolate and other food products



Chocolate related to total Swiss food consumption impacts



- Milk chocolate consumption of 12.3 kg per year and Swiss causes about 3.5% of total impacts due to food consumption

Summary

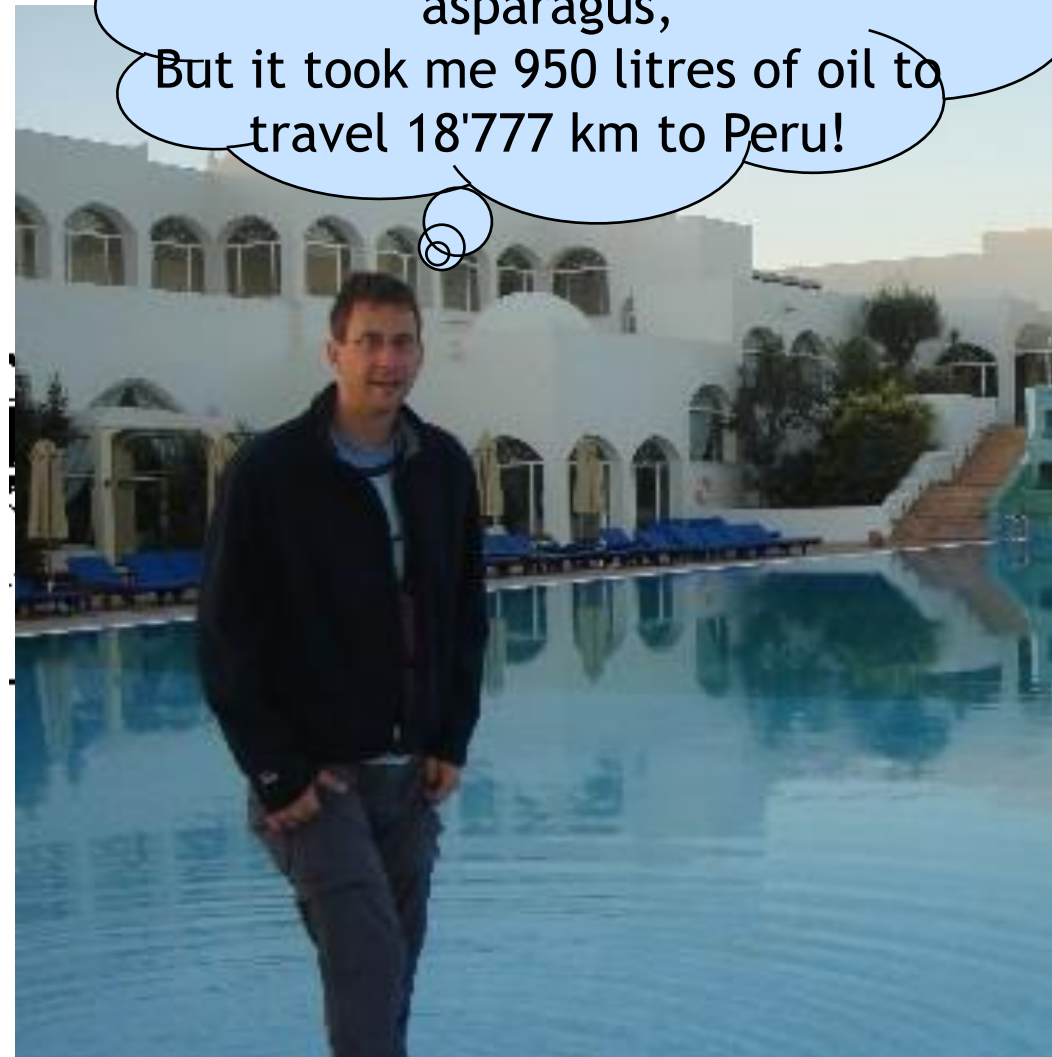
- Environmental impacts of chocolate are dominated by the agricultural production of cocoa beans and milk
- Packaging and distribution is of minor importance
- Dark chocolate has the lowest impacts
- Tax free chocolate transported by airplane can cause considerably higher impacts
- Chocolate is a product with comparable high impact

Thanks for financial contributions:
German Aluminium Association (GDA) in
cooperation with European
Aluminium Foil Association (EAFA),
Düsseldorf, Germany

Further information about the project
www.esu-services.ch/projects/packaging/

ESU data-on-demand for
food production and consumption
www.esu-services.ch/data/data-on-demand/

Here I can enjoy the local
asparagus,
But it took me 950 litres of oil to
travel 18'777 km to Peru!



- The relevance of single decisions
has to be taken into account