

# Environmental impacts of consumption patterns in Switzerland and reduction potentials

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49th LCA Discussion Symposium  
Zurich, 18. September 2012

# Key questions

- What are the total environmental impacts of consumption and how can they be allocated to consumption areas?
- What are the most important aspects within consumption areas?
- Which options exist for the reduction of environmental impacts due to consumption?
- Difficulties and rebound effects for implementation are not considered

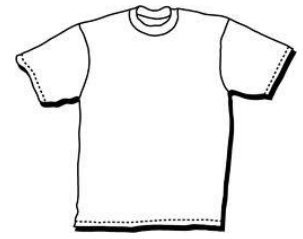
## Background

- Different projects finances by
  - WWF Switzerland
  - Energieforschung Zurich - ewz-electricity supply Zurich
  - Swiss Federal Office for the Environment, FOEN
- Here we present our personal summary

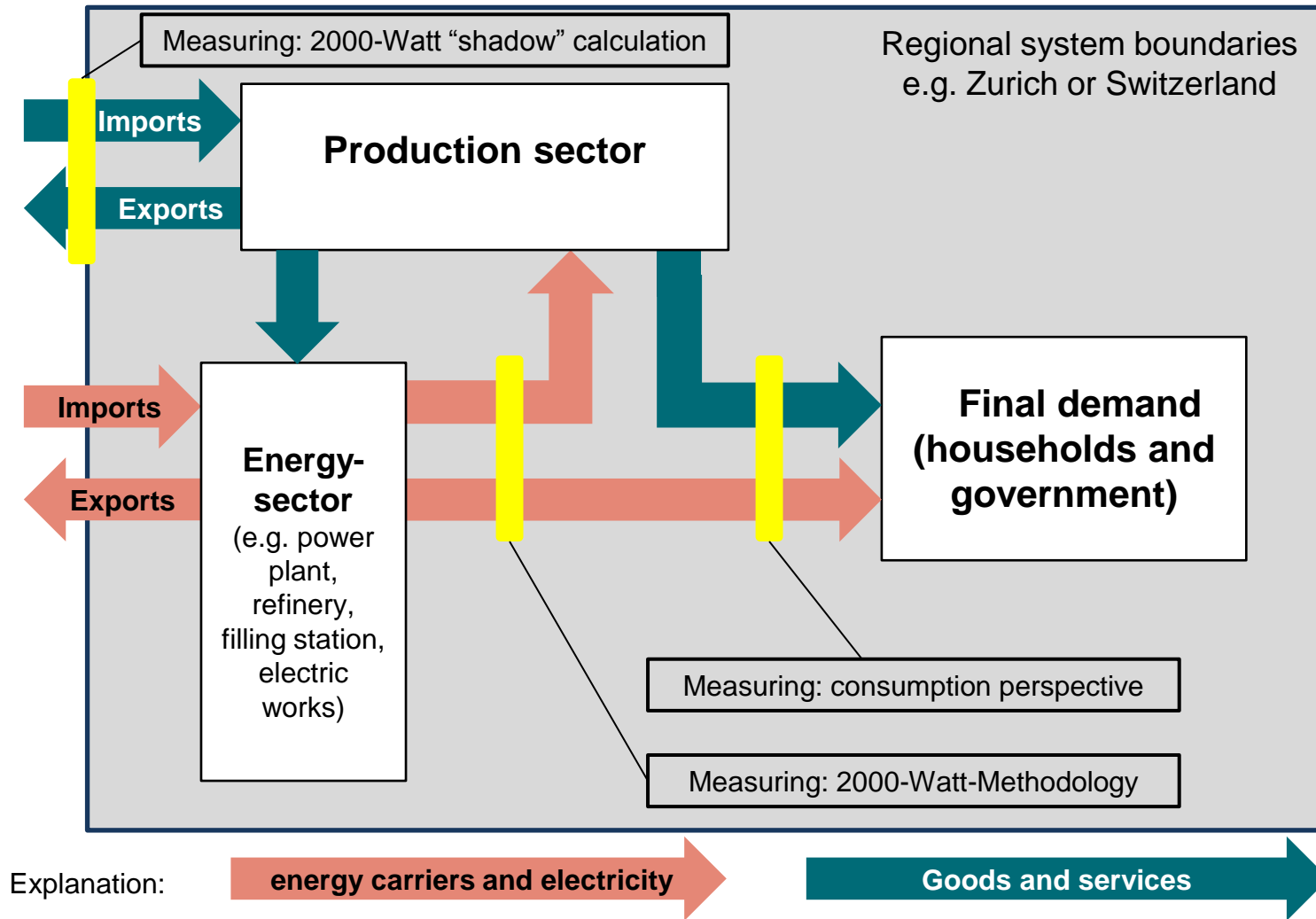
# Environmental impacts of lifestyles

Public

Private



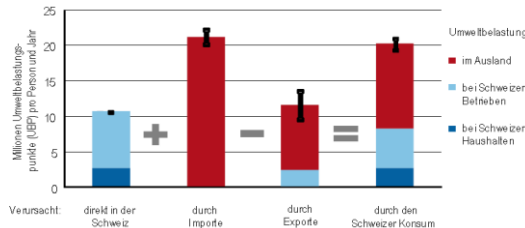
# Consumption perspective and 2000-Watt



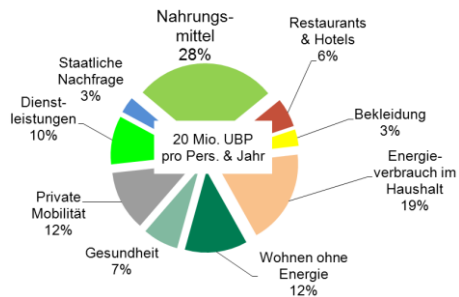
- Consumption perspective measures all impacts of final consumption
- 2000-Watt measures the impacts of energy uses in a regional perspective

# Main stages for the calculation

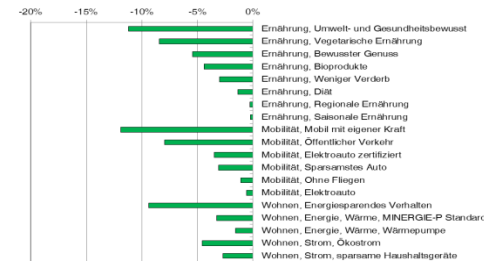
## 1. Total impacts CH



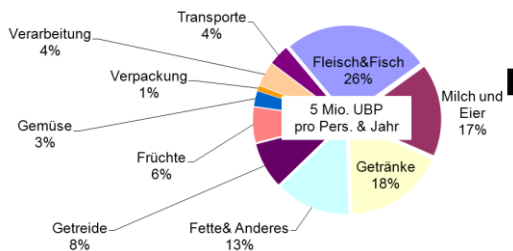
## 2. Share of consumption areas



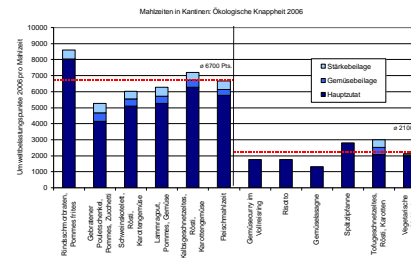
## 5. Total potentials



## 3. Further analysis

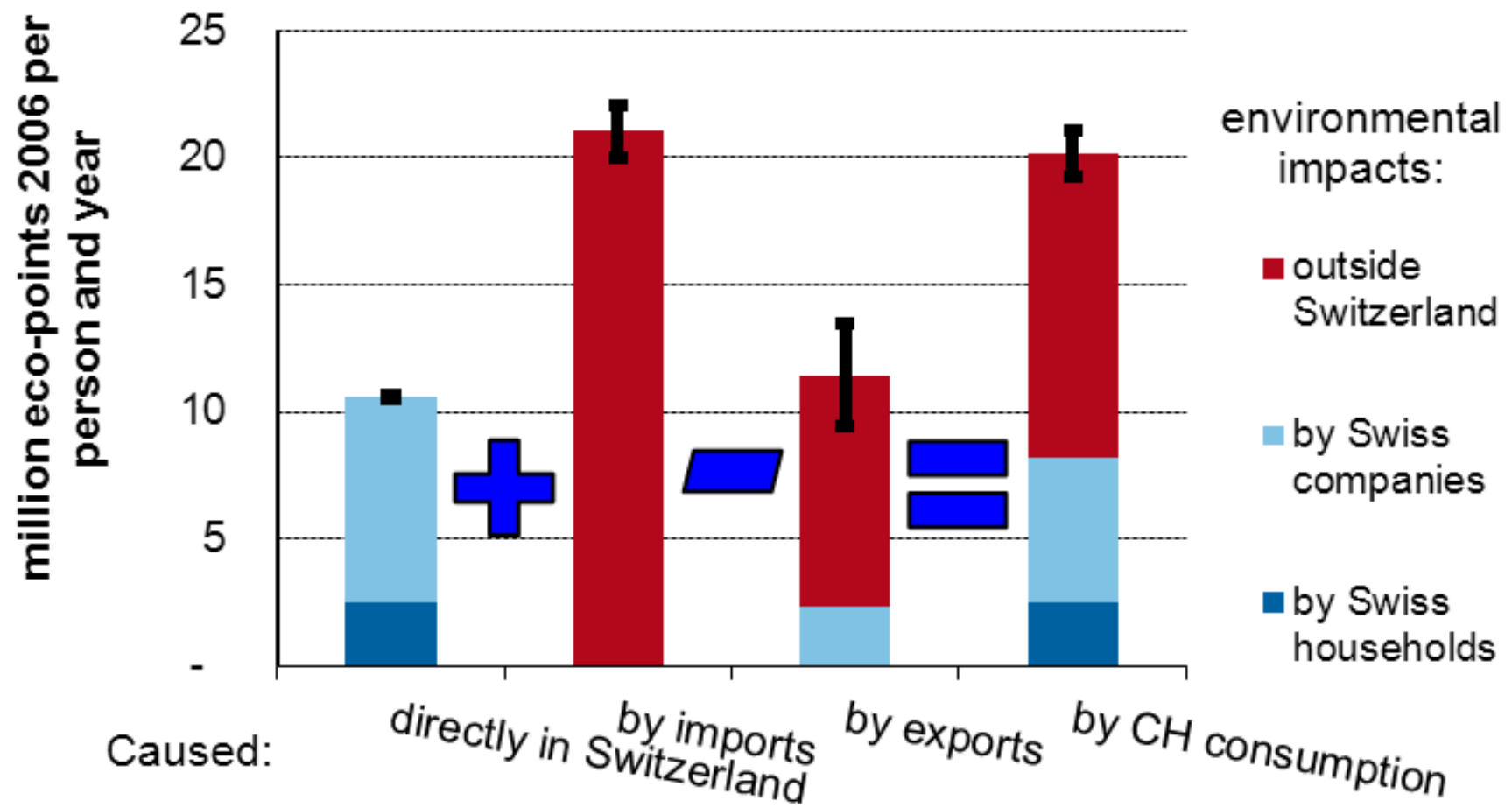


## 4. Reduction potentials



# **TOTAL IMPACTS IN SWITZERLAND MEAN FIGURES OF SWISS EE-IOA AND SIMPLIFIED “LCA&TRADE” APPROACH**

# Total balance of Swiss impacts



➤ Imports cause 60% of environmental impacts due to Swiss consumption



# Key figures per capita and year for Switzerland

	<b>Consumption perspective</b>	<b>2000-Watt current situation</b>
Tonnes CO <sub>2</sub> -eq	12.8	8.6
Watt	8'250	6'300
eco-points	20 Million	~ 8.5 Million

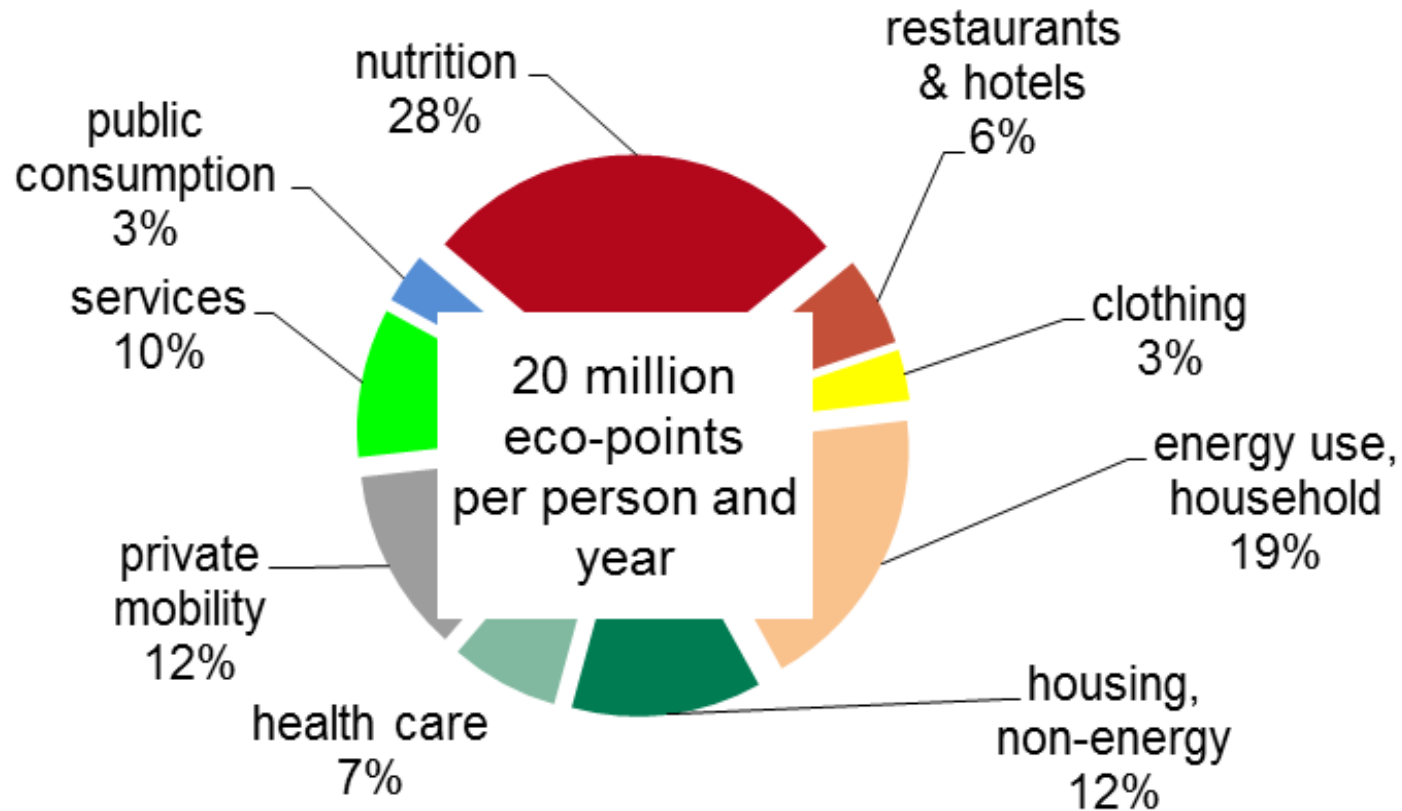
➤ Considerable differences because of different system boundaries

# SHARE OF CONSUMPTION AREAS CALCULATION WITH SWISS EE-IOA

# Share of consumption areas



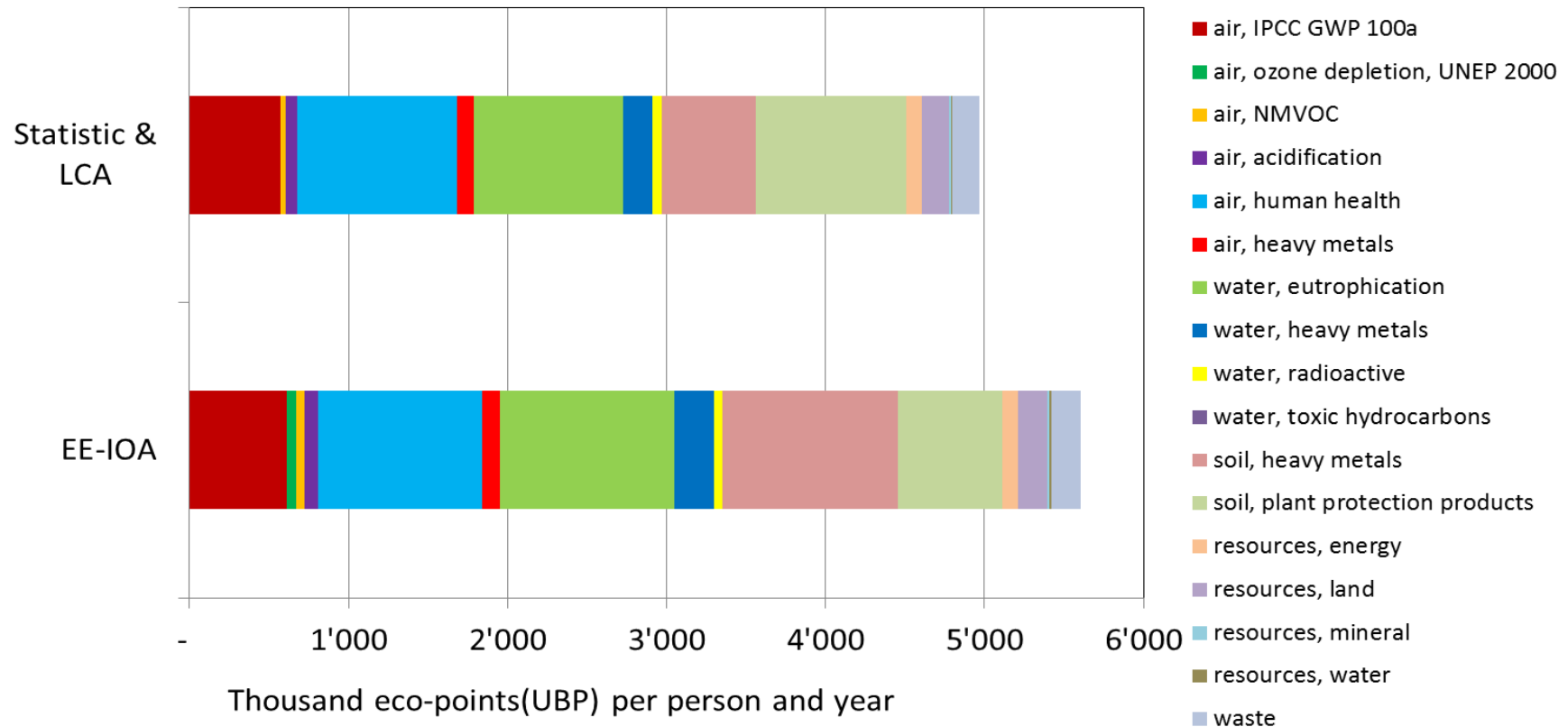
# Share of consumption areas



- Nutrition is the most important consumption area
- 60% of environmental impacts in nutrition, energy use and mobility

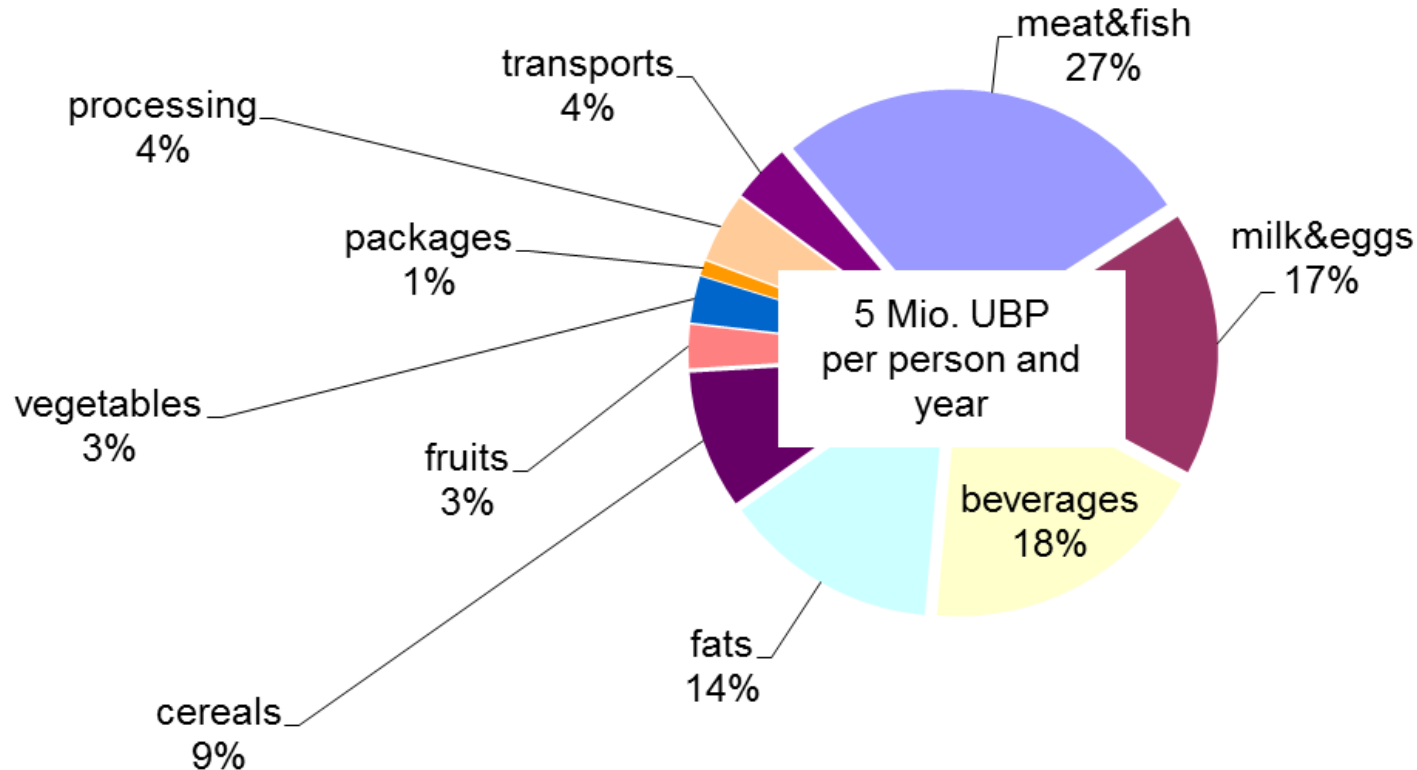
# **FURTHER ANALYSIS OF CONSUMPTION AREAS TOP-DOWN AND BOTTOM-UP ASSESSMENT WITH LCA AND COMPARISON WITH EE-IOA**

# Environmental impacts of food purchases



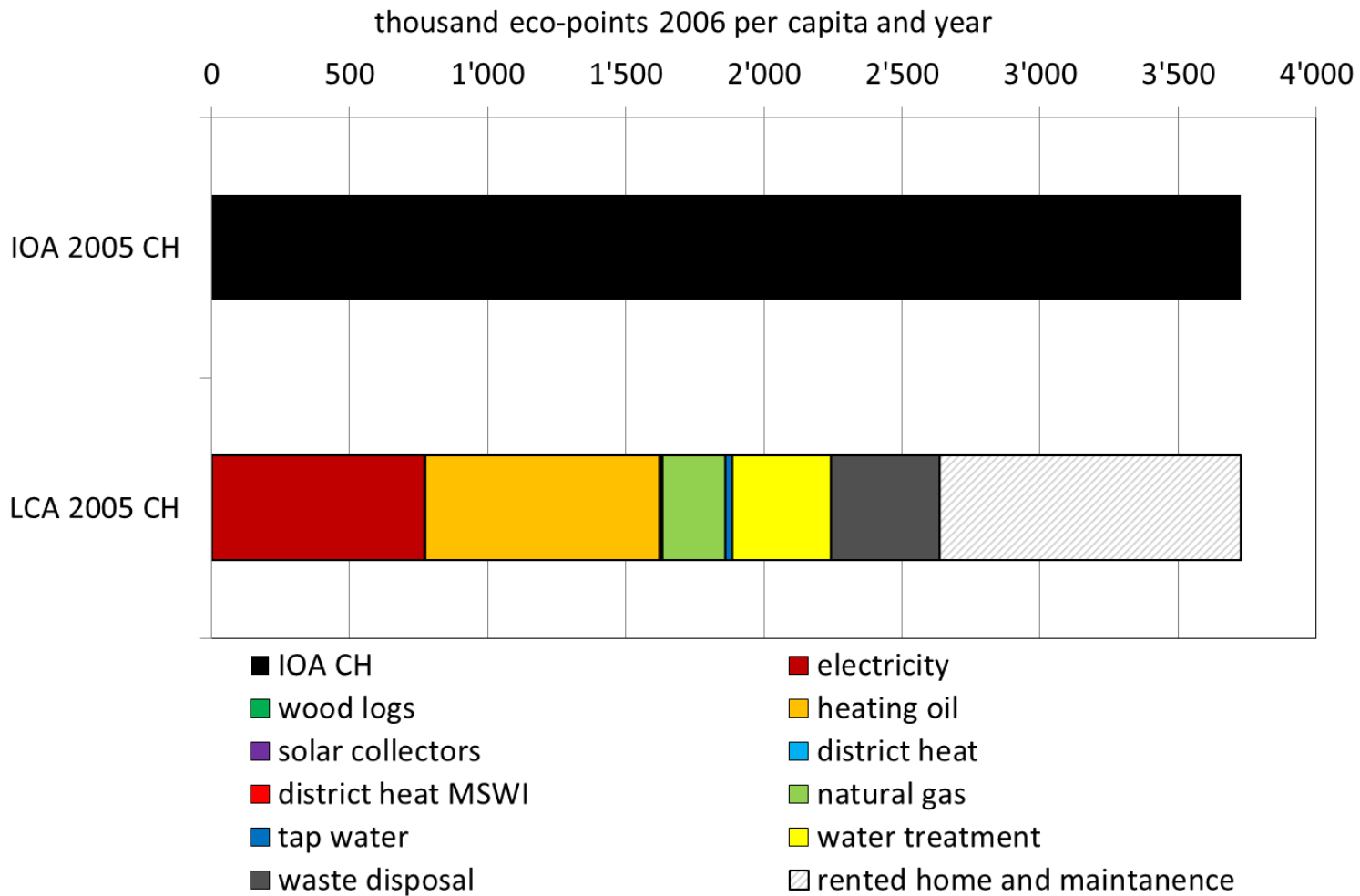
- Top-Down and bottom-up come to comparable results
- Further analysis of consumption areas based on LCA and statistics

# Product groups within nutrition



- Meat and animal products cause 44% of total impacts
- Wine, coffee and beer are important for beverages

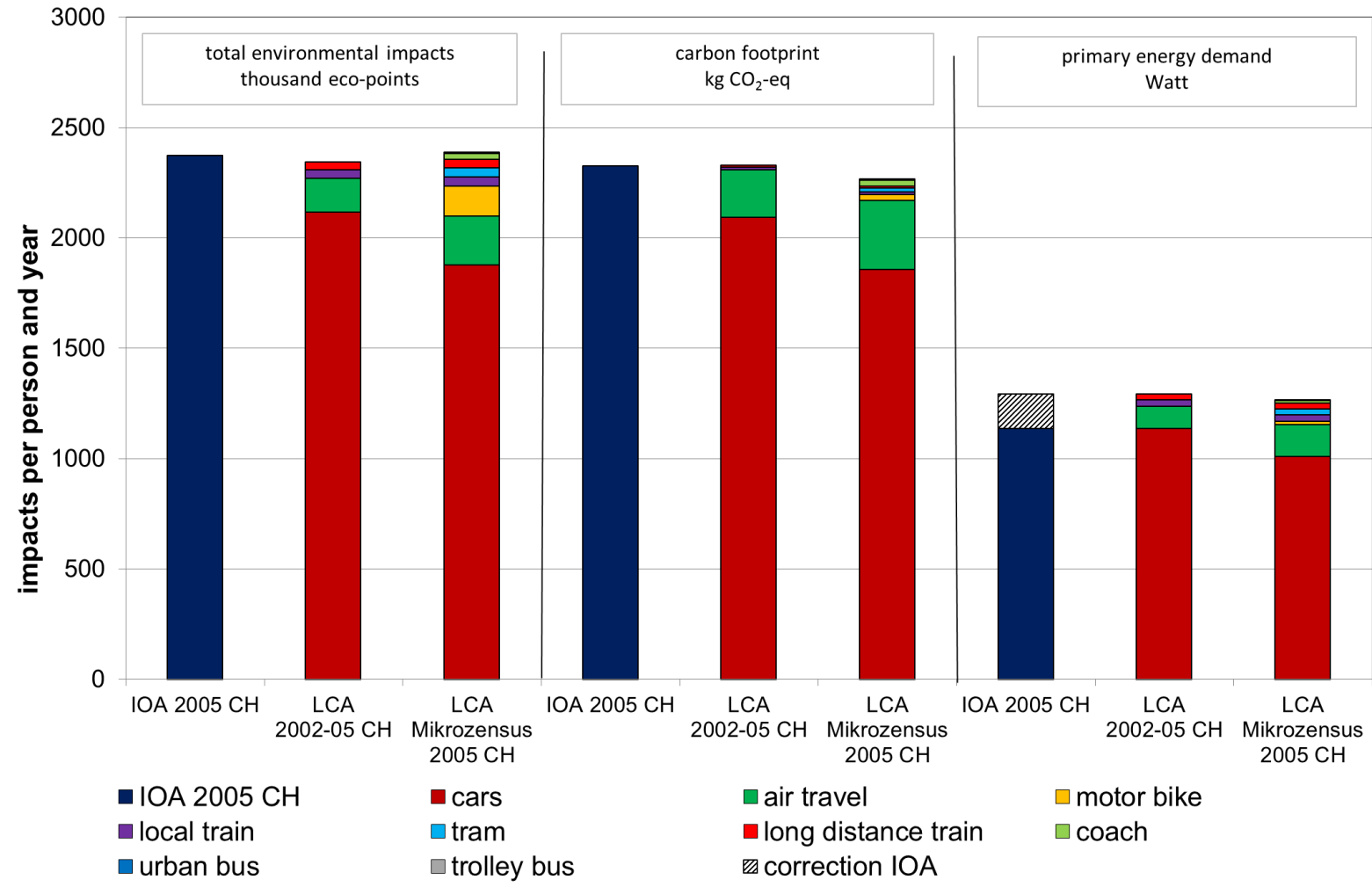
# Analysis of household energy use



➤ Electricity and heating oil are most important energy carriers



# Analysis of mobility



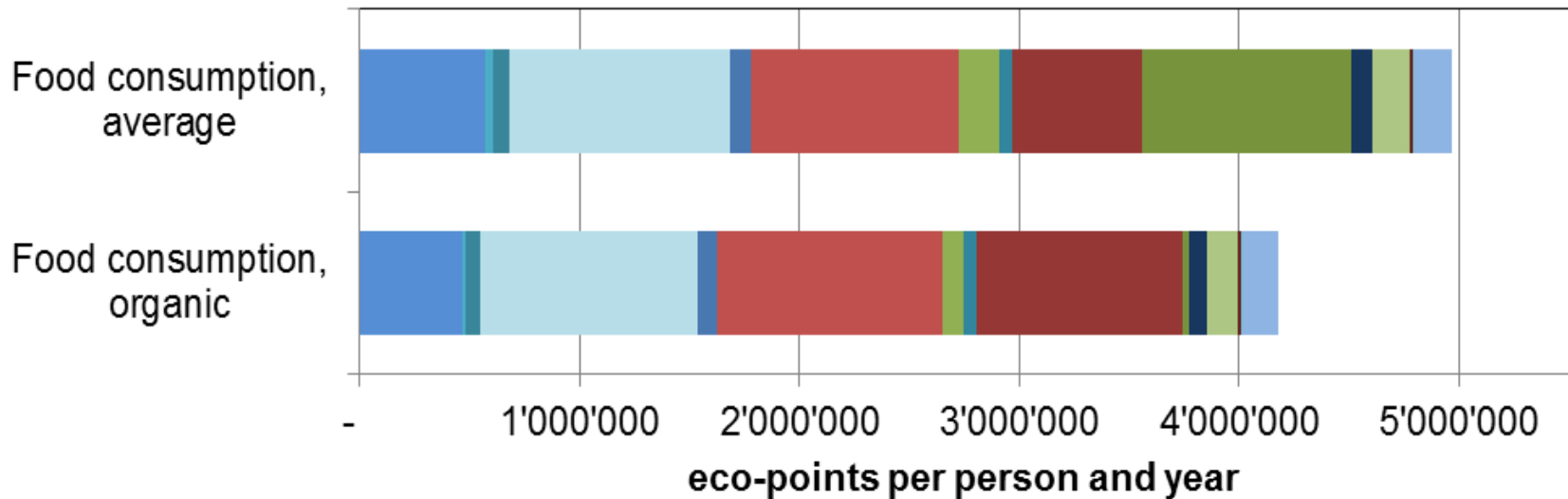
➤ Car driving is the most important issue

# **REDUCTION POTENTIALS**

## **ANALYSIS OF SINGLE CHANGES IN LIFESTYLES**

### **EXAMPLE FOR BUYING ORGANIC FOOD PRODUCTS**

# Organic products



- air, IPCC GWP 100a
- air, acidification
- water, eutrophication
- water, toxic hydrocarbons
- resources, energy
- resources, water use
- air, ozone depletion, UNEP 2000
- air, human health
- water, heavy metals
- soil, heavy metals
- resources, land
- air, NMVOC
- air, heavy metals
- water, radioactive
- soil, plant protection products
- resources, mineral
- waste

➤ Reduction potential about 16% if only organic food is bought

# Reduction potential - organic products

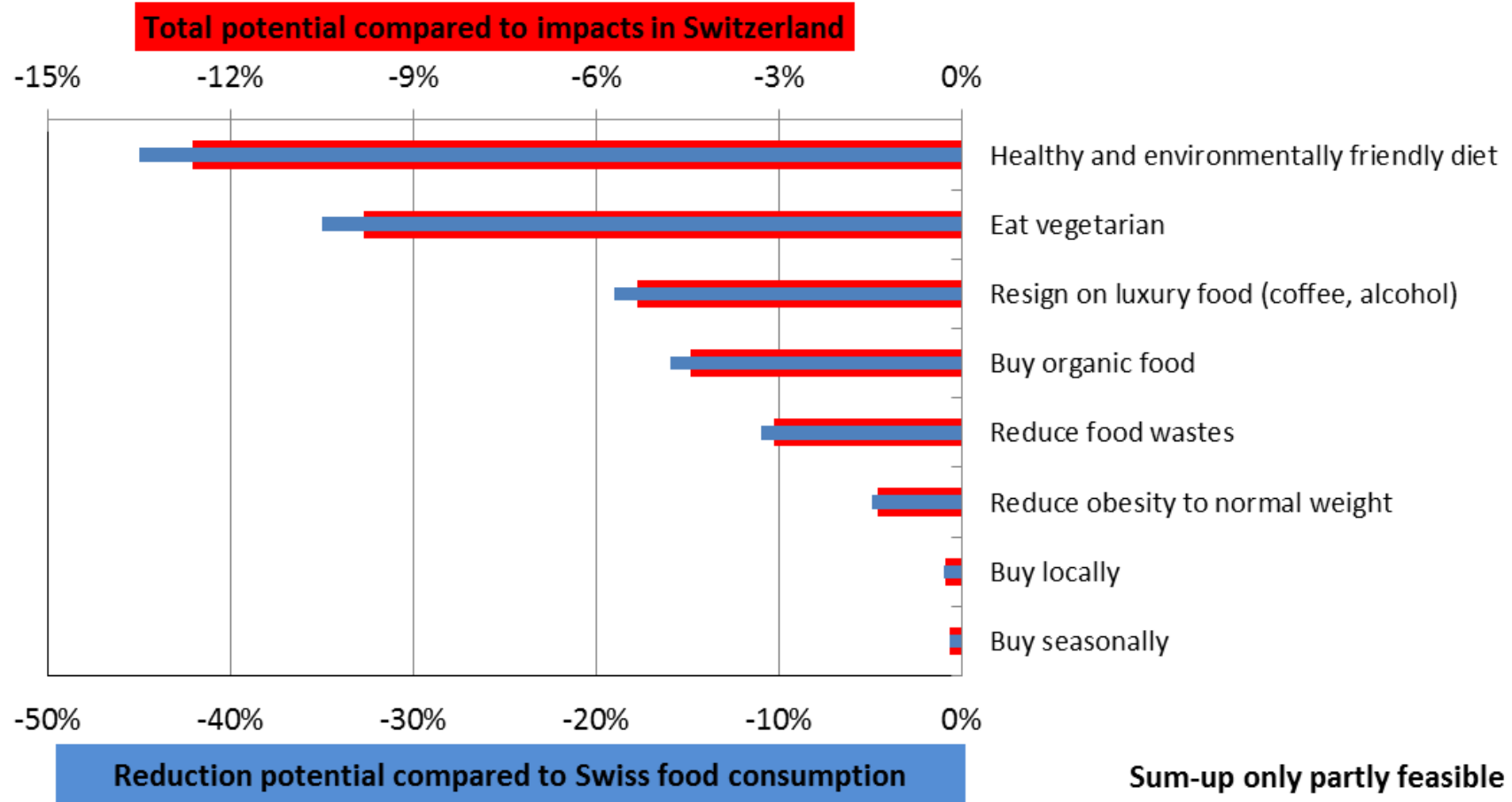
Organic products	reduction potential	total potential	Land	Source	Estimation
Consumption area	nutrition				
Total environmental impacts	-15.9%	-4.5%	CH	Own calculation	Organic production, no heated greenhouses and no air transported goods
Primary energy demand	-6.2%	-1.0%	CH	Own calculation	Organic production, no heated greenhouses and no air transported goods
	-33.0%		AT	Fazeni 2011	100% organic production in AT
	-4.0%		CH	Faist 2000	Additional impacts of transports are estimated with 1%, but not included
	-1.7%		CH	Jungbluth 2003	100% organic, extra transports
	-20% - 56%		CH	Mäder et al. 2002	
Carbon footprint	-18.2%	-2.9%	CH	Own calculation	Organic production, no heated greenhouses and no air transported goods
	-33.0%		AT	Fazeni 2011	100% organic production in AT
	-10% bis -30%		DE	Grießhammer 2010	Organic vegetables
	-6.0%		CH	Jungbluth 2003	100% organic, extra transports

- Own calculations and literature research for the estimation
- 15.9% less environmental impacts (reduction potential)
- Total potential = Reduction potential \* Share of consumption area
- 4.5% total potential for reductions

# TOTAL POTENTIALS

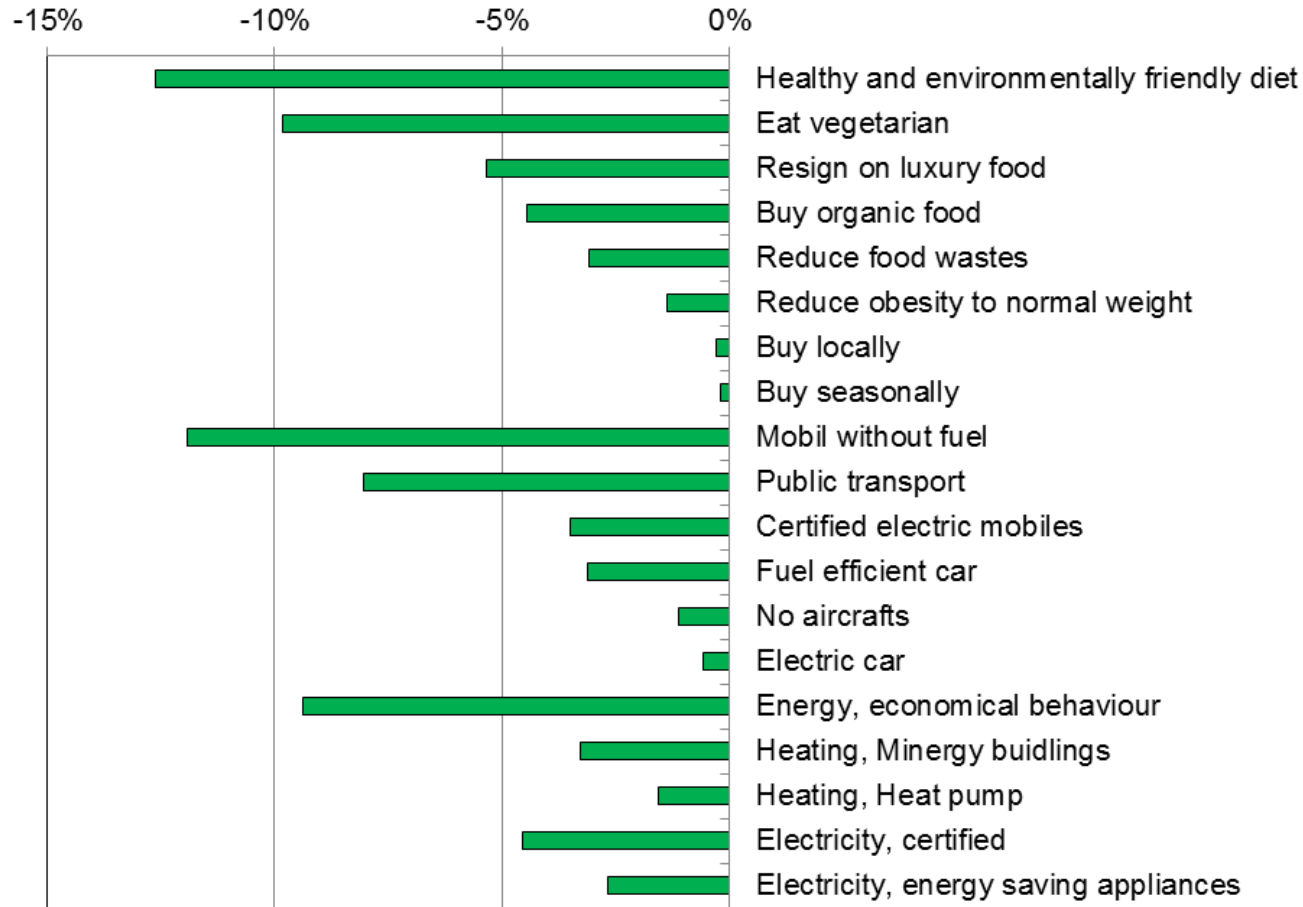
## ANALYSIS FOR THE PRESENT SITUATION IN SWITZERLAND

# Total potential for reduction of impacts



- Most relevant is a reduction of animal products
- Buying local/seasonal low potential because only vegetables and fruits affected

# Summary of total potentials



- Vegetarian diet and substantial reduction of mobility demands have highest potentials
- Sum-up only partly possible

# Reduction targets for environmental impacts

- Political targets according to ecological scarcity method  
2006: - 38% for domestic situation or - 63% without exporting environmental impacts
- Reaching world average with ecological scarcity: -47%
- Ecological footprint concept: - 64%
- 2000-Watt: -68% on energy and - 88% on CO<sub>2</sub>-eq

➤ At least -40% reduction of environmental impacts necessary



## Sum of total reduction

Indicator	Total environmental impacts	Carbon footprint	Primary energy demand
Total (per capita and year)	20'000'000	12.8	8'250
Nutrition	28%	16%	17%
Total potential nutrition	<b>-22%</b>	-12%	-11%
Private mobility	12%	19%	17%
Total potential mobility	<b>-12%</b>	<b>-19%</b>	<b>-17%</b>
Energy use households	19%	24%	25%
Total potentials energy use	<b>-15%</b>	<b>-23%</b>	<b>-23%</b>
Share of 3 areas of consumption	59%	59%	59%
Total potential, 3 areas of consumption	<b>-49%</b>	<b>-54%</b>	<b>-51%</b>
Total, reduced (per capita and year)	10'223'846	6	4'047

- In theory it seems possible to achieve ambitious reduction targets
- In practice this encounters substantial changes of personal life styles

## Summary

- Our methodology allows to investigate and compare the impacts of behavioural changes in all areas of consumption
- Most important are the areas of nutrition, mobility and energy use in households
- Combination of EE-IOA for broad overview and LCA for detailed analysis
- The highest potentials exist for a vegetarian diet, reduction of mobility and energy savings in households

Thanks for financial contributions:  
WWF Switzerland  
Energieforschung Zurich – ewz-  
electricity supply Zurich  
Swiss Federal Office for the  
Environment, FOEN

Further information about the projects  
[www.esu-services.ch/projects/lifestyle/](http://www.esu-services.ch/projects/lifestyle/)

WWF Footprint calculator to be updated with  
the data  
[www.footprint.ch](http://www.footprint.ch)

Download of the background study and  
electronic data  
[www.esu-services.ch/projects/iaa/](http://www.esu-services.ch/projects/iaa/)

ESU data-on-demand for imported goods  
[www.esu-services.ch/de/daten/datenverkauf/](http://www.esu-services.ch/de/daten/datenverkauf/)

Discussion forum LCA on life styles  
[www.esu-services.ch/news/df/#c833](http://www.esu-services.ch/news/df/#c833)



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