

# Carbon footprint indicator for household consumption in Finland

*Changes in household consumption patterns are needed to tackle increase of greenhouse-gas emissions (GHGE). Policy programs and policy instruments are being developed for this purpose in Finland and many other countries. Therefore, an indicator for GHGE is needed to measure and follow the carbon footprint development of private consumption.*

*We develop an indicator and repeatable procedure to calculate the carbon footprint of private consumption annually, soon after the publication of each year's statistics based on an environmentally extended input-output model. The data sources include:*

- 1) *emission intensities of product and service categories, produced by an input-output model for Finland*
- 2) *Statistics Finland's Household Budget Survey and consumption statistics in annual national accounts, and additional statistics and data sources about*
- 3) *energy use and GHGE of housing and passenger transport*
- 4) *amounts of different food items consumed.*

## Average carbon footprint per year (kg/capita)

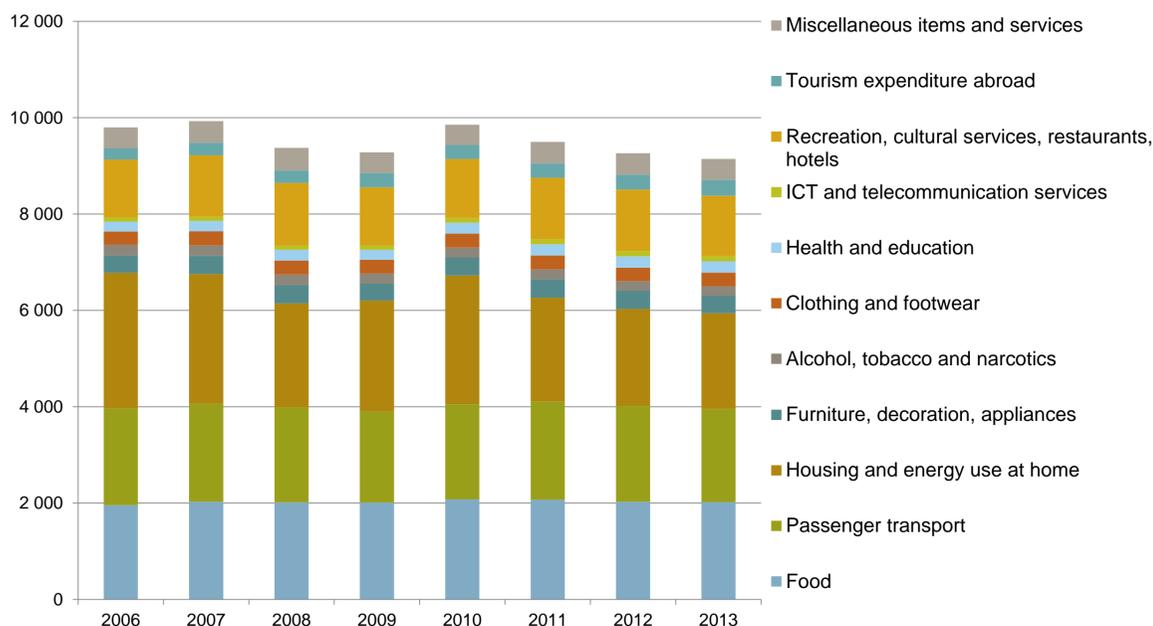


Fig.1. Carbon footprint kg of CO<sub>2</sub> eq. of private consumption per person in Finland during 2006–2013.

## Housing energy consumption

Household energy use was responsible for 21 % of the final energy use of Finland in 2013. Typically one third of household carbon footprint comes from energy use at home.

## Passenger transport

The fuel consumption of passenger cars dominate the carbon footprint of passenger transport. According to the National Travel Survey, share of passenger car on number of kilometres travelled in Finland is 72 %.

## Food items

Animal-based food contribute to more than half of the carbon footprint of food. Finns consumed 77 kg of meat; 180 kg liquid dairy products and 23 kg of cheese per capita in 2013.

## General conclusions

The preliminary analysis and results show that it is possible to annually follow up the changes in carbon footprint of private consumption, even if the procedure is not as straightforward as national greenhouse gas inventories. The changes in carbon footprints result from technological improvements, reduced greenhouse gas intensities of production and changes in consumption patterns.

The calculation procedure takes into account the yearly changes in greenhouse gas intensities of energy production. In addition, weather conditions have an impact on the volume of heating energy consumption. The volume of energy consumed in residential buildings and the greenhouse gas intensity together have a significant impact on the total level carbon footprint on a certain year. Results show that the total level of carbon footprint is stable compared to national GHGE. The economic downturn is one potential reason for bending the overall trend of increasing carbon footprint of consumption.

## References

Seppälä, J., Mäenpää, I., Koskela, S., Mattila, T., Nissinen, A., Katajajuuri, J.-M., Härmä, T., Korhonen, M.-R., Saarinen, M., Virtanen, Y., 2011. An assessment of greenhouse gas emissions and material flows caused by the Finnish economy using the ENVIMAT model. *Journal of Cleaner Production* 19, 1833–1841.

Statistics Finland /Environment and energy

Statistics Finland/National Accounts

National Travel Survey Finland 2010–2011

Natural Resources institute Finland/Consumption of food commodities per capita in 2013



The three key areas of consumption: energy use at home, passenger transport, food items



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