

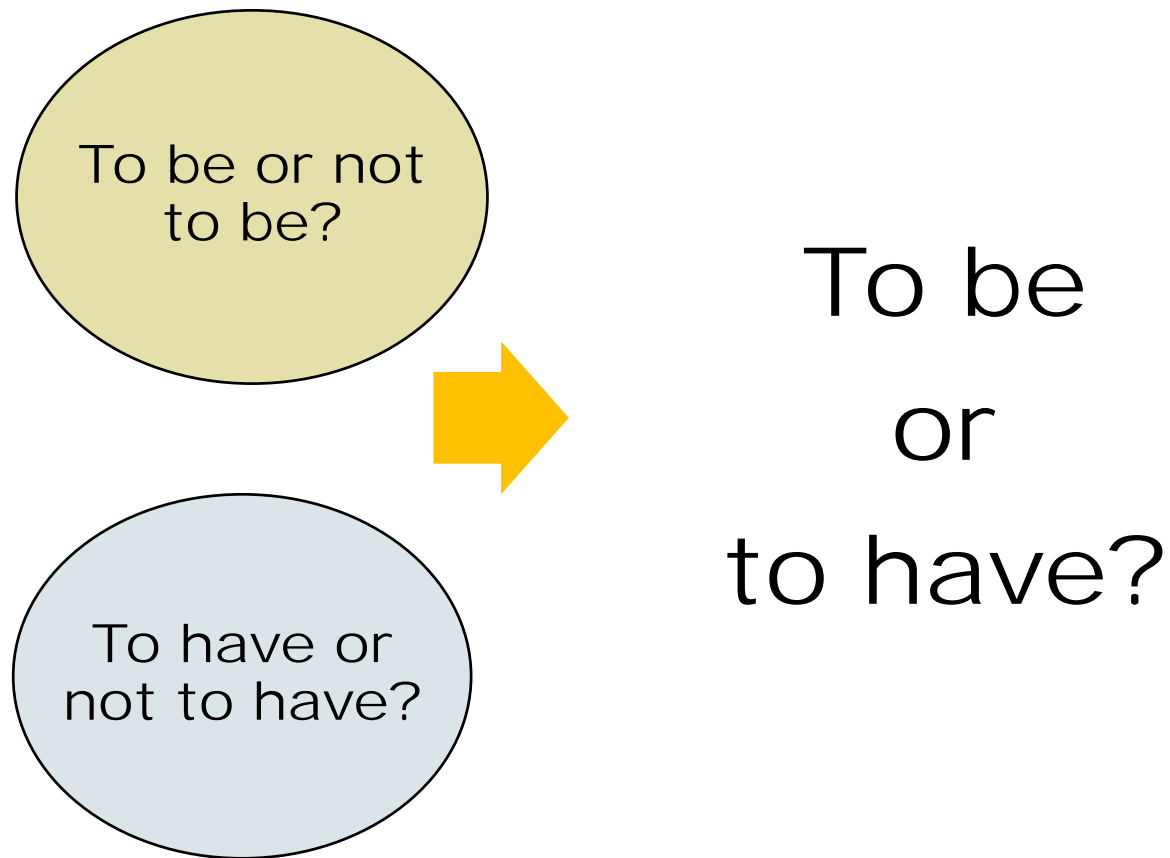
1.5-Degree lifestyles

- An absolute reductions trajectory towards 2050 climate goals -



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What is *the* question again?



Why do people consume?

- People do not intentionally harm the environment;
- environmental impact is an unintended consequence of pursuing well-being!

- to meet essential needs
- to meet social expectations
- to satisfy personal desires
- because they are railroaded and urged to

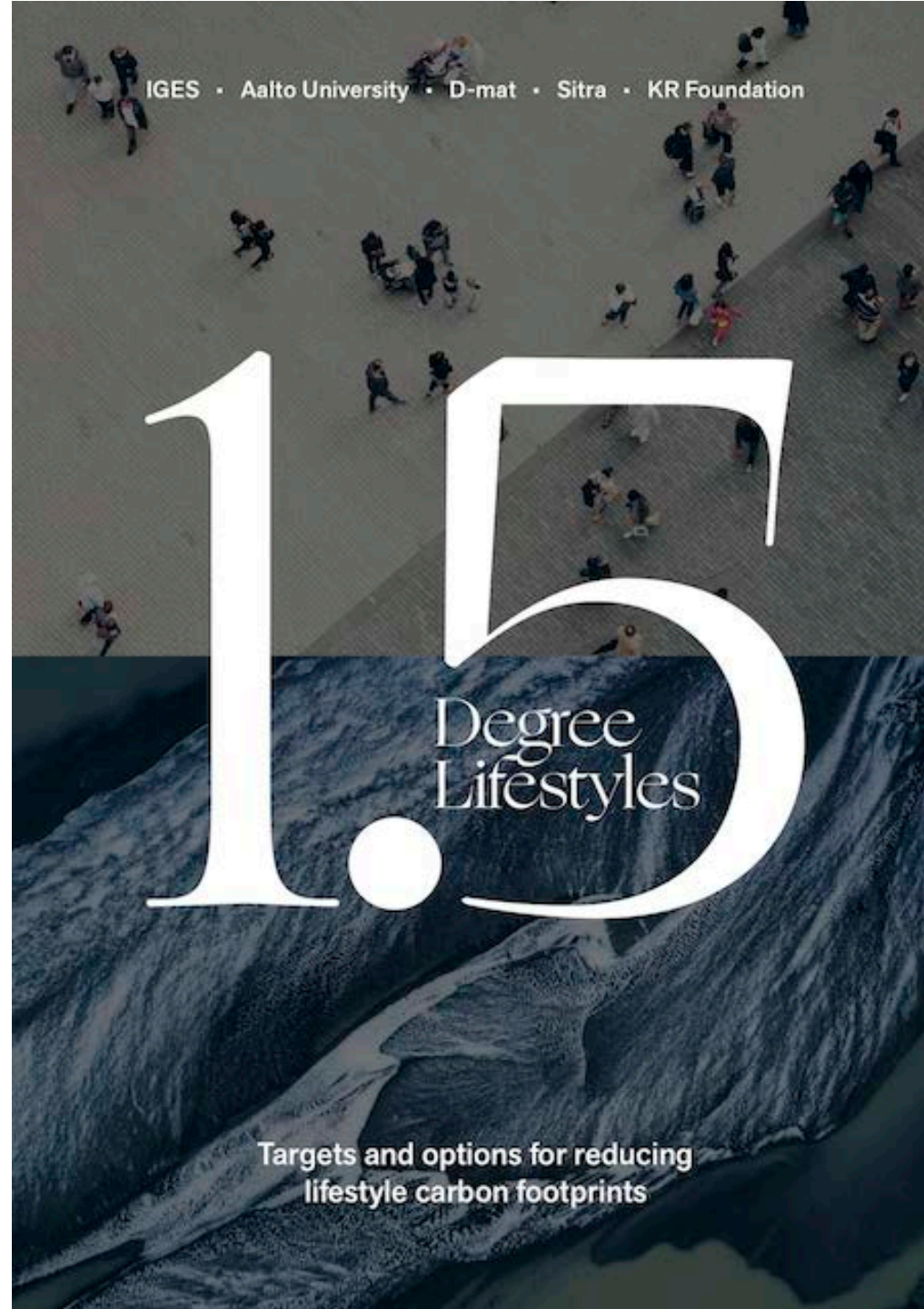


Flattening and merging trends

- Between consumption and production
- Between social trends and individualization
- Ownership structure
- Merging of online and offline living
- Merging of work and private life
- Information use and knowledge
- Traditional services and digital

New report!

#HotorCool



IGES
Institute for Global
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A!
Aalto University

D-mat

SITRA

KR foundation

Challenge: link lifestyles to climate action

- Many climate scenarios based on energy systems and effects of future tech
- Touching consumption is a hot-potato issue
- Debate focused so far rather on territorial emissions than value-chain-wide footprints
- Consumer scapegoatism done through green consumerism and awareness raising

Translating the Paris Agreement into lifestyles

Project approach:

- Current carbon budget
- Hot spots (carbon footprint) of current lifestyles
- Targets (lifestyle carbon footprints) for 2030, 2040, 2050
- Reduction potentials for various lifestyle changes

Review of emission scenarios

Criteria of scenario selection

- Emission pathway to 2 °C goal with at least 66% propability or 1.5 °C goal with at least 50% propability.
- Addresses demand-side measures, utilization of renewable energy, and covers emission reduction across all sectors.
- Provides a quantified estimate of a carbon budget on a time scale up to year 2100.
- Aims to limit atmospheric GHG concentration at 430–480 parts per million (ppm) CO₂eq for 2 °C target and 430–450 ppm CO₂eq for 1.5 °C target (in 2100)
- Estimates a cumulative carbon budget at 350–950 GtCO₂ for 2 °C target and less than 350 GtCO₂ for 1.5 °C target (2011–2100)
- Covers all Kyoto GHGs (CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆) in its estimation.
- Explains the assumptions of “human carbon sink” utilisation

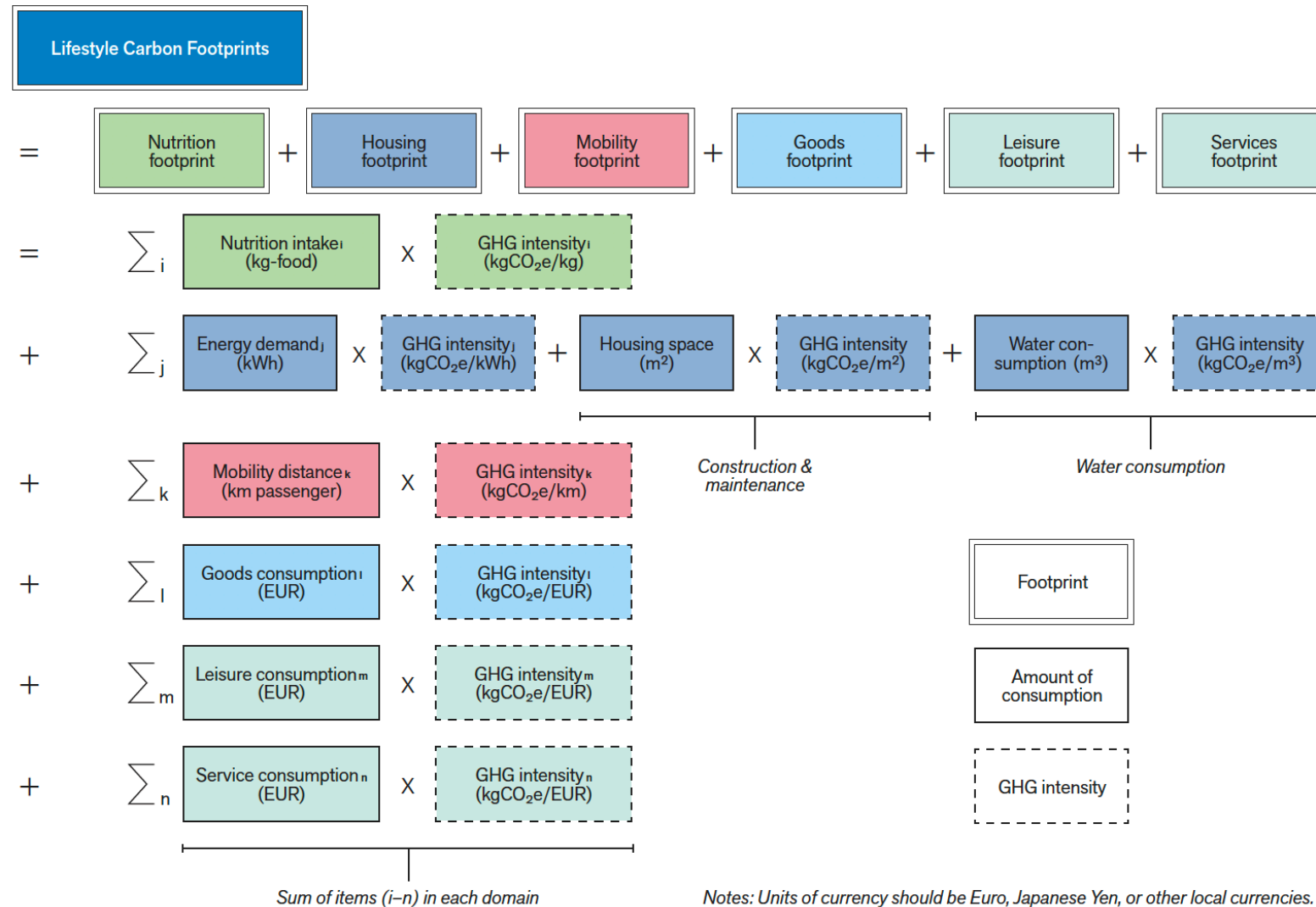
Scenario	Description	Reference
1.5S	Pathway to the 2 °C target with 75% probability and the 1.5 °C target with 50% probability, considering the use of all sinks starting before year 2050	Rockström et al., 2017
2S	Pathway to the 2 °C target with more than 66% probability, considering the use of CCS technologies	Rogelj et al., 2011

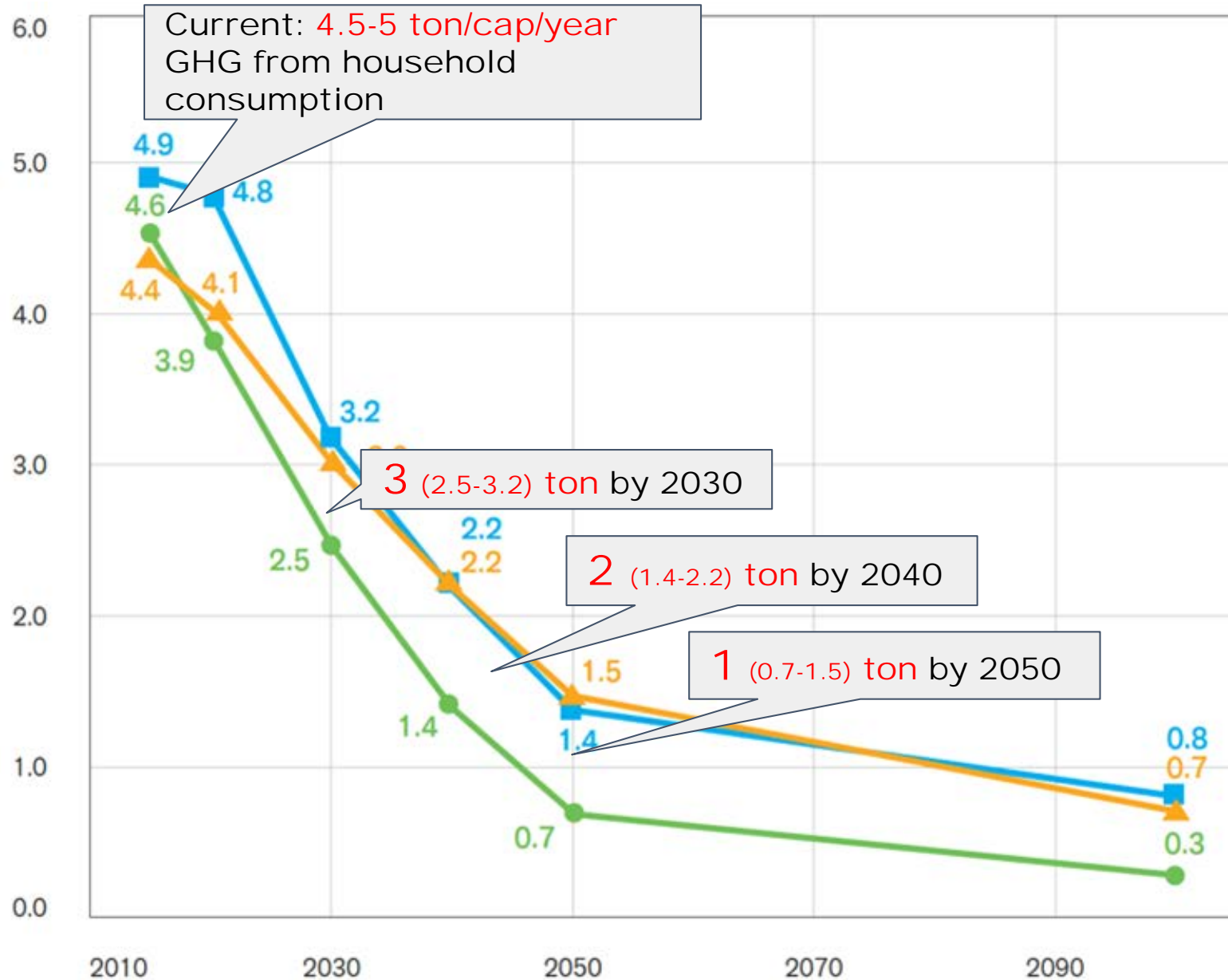
Scenario	Description	Reference
1.5D (a)	Pathway to the 1.5°C target with 60% propability, without the use of CCS	Ranger et al., 2012
1.5D (b)	Pathway to 1.5°C target with stringent measures to reduce end-of-pipe emissions and non CO2 GHG emissions	Van Vuuren et al. 2018
1.5D (c)	Pathway to 1.5°C target with land sector sequestration, increased efficiency, renewable electricity, agricultural intensification, low non-CO2 emissions, lifestyle changes, and low population growth	Van Vuuren et al. 2018

Lifestyle Carbon Footprints

- Footprints are **consumption-based accounting** of environmental impacts both including direct emissions and indirect emissions via purchases of products/services
- LCF defined as “*GHG emissions directly emitted and indirectly induced from household consumption excluding those induced by government consumption and capital formation*”

Estimation of lifestyle carbon footprints





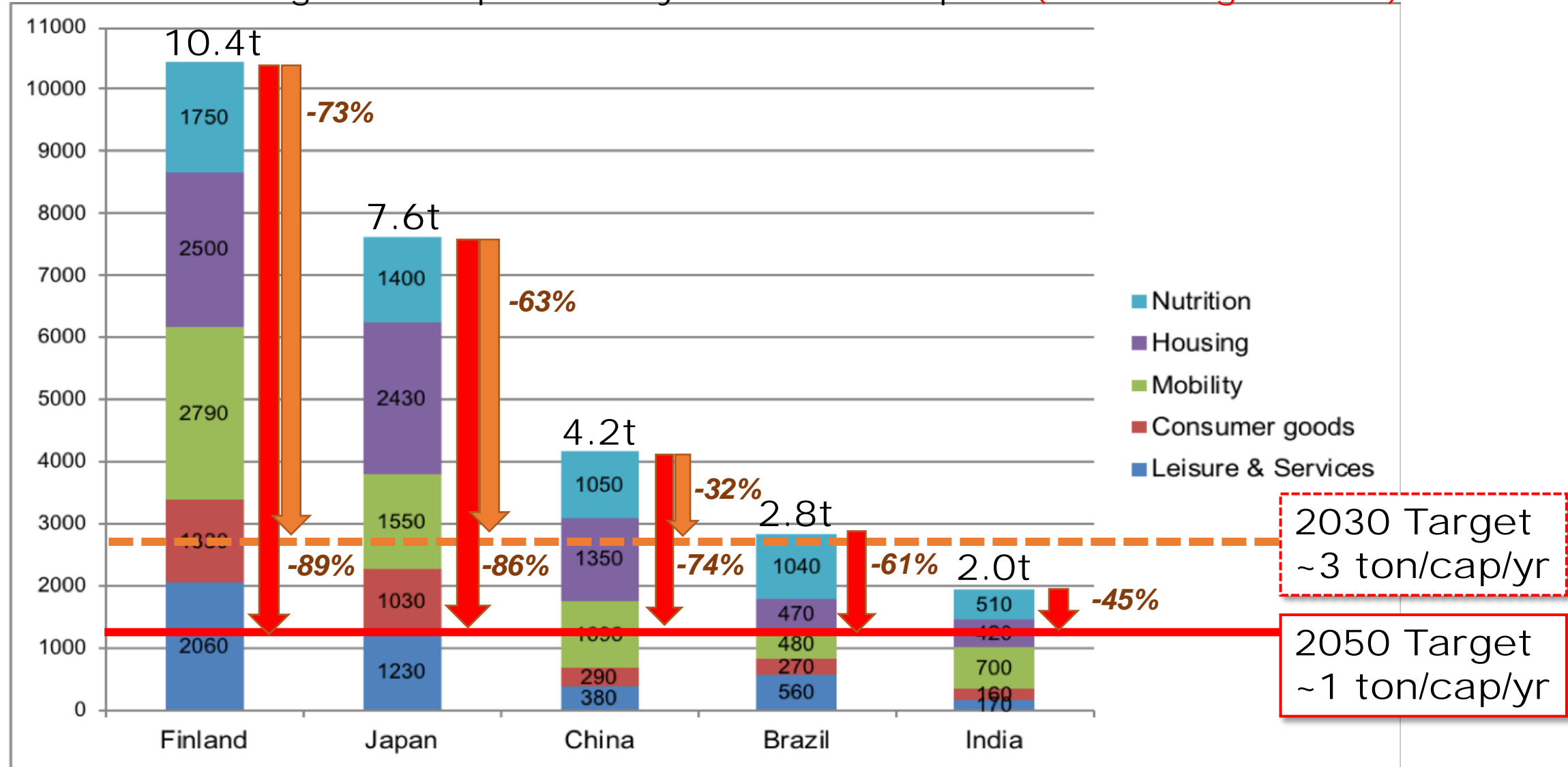
Carbon footprint targets per capita for 2° and 1.5° goals

- 1.5D Scenario (tCO₂e/cap/yr)
- 1.5S Scenario (tCO₂e/cap/yr)
- ▲ 2S Scenario (tCO₂e/cap/yr)

Household footprint share is assumed as 72%.

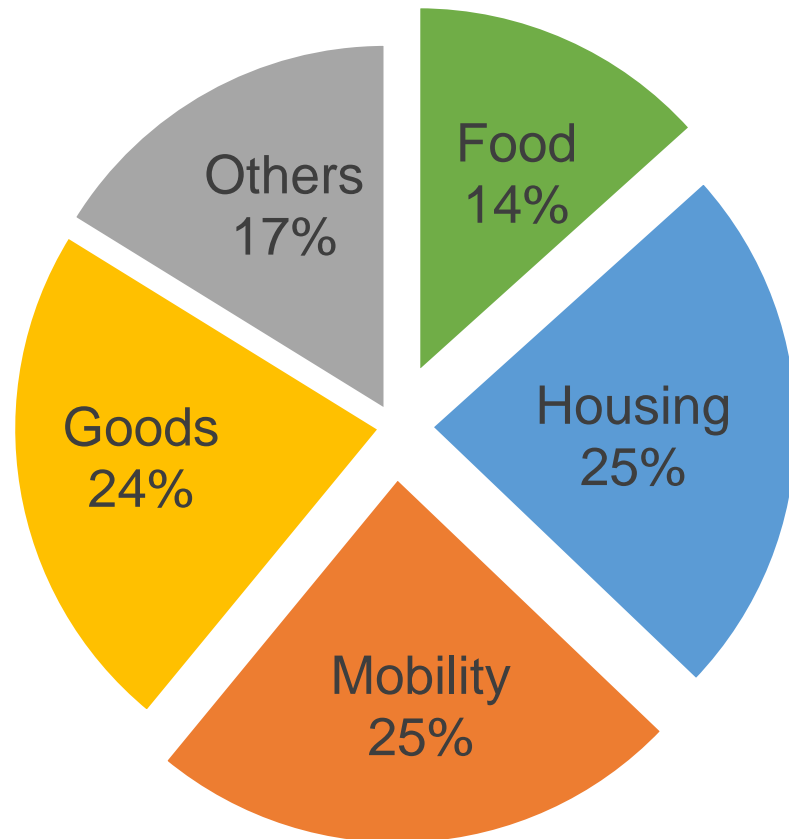
Footprint gap

Current and Target Per-Capita Lifestyle Carbon Footprint (for 1.5 degree limit)



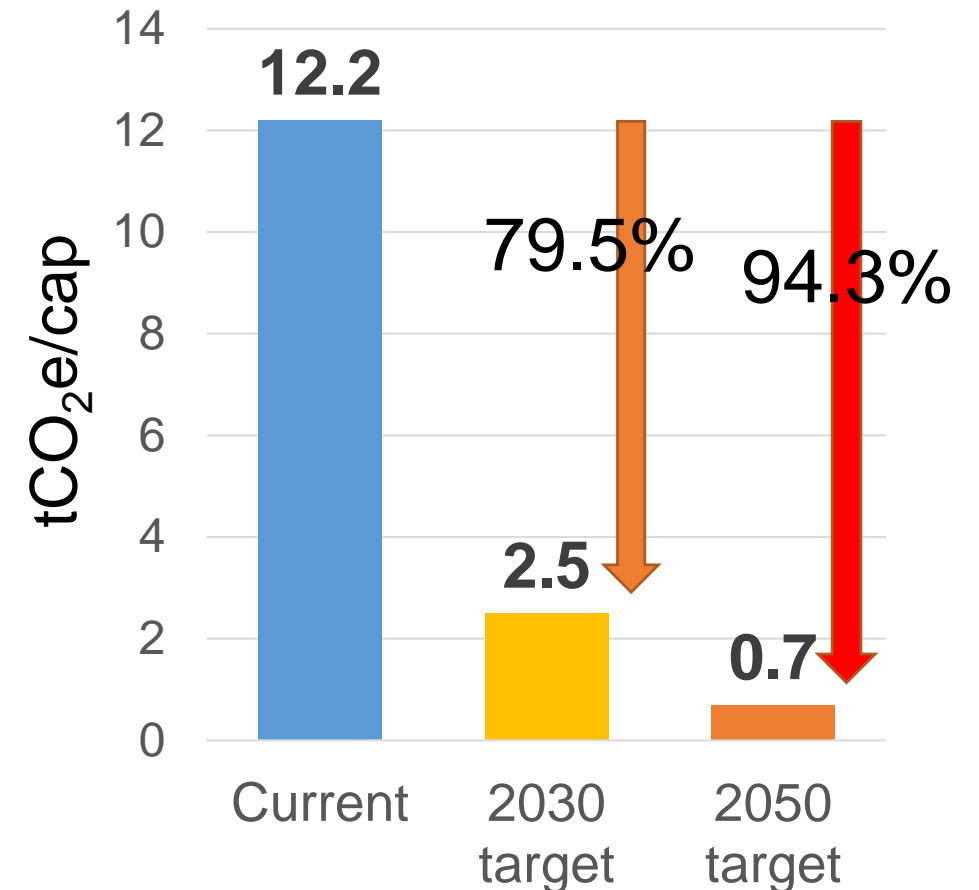
Belgium: Lifestyle Carbon Footprints

Carbon Footprints



Source: Hertwich and Peters (2009). Note: Inc. government consumption and capital formation. Others: services & trade, housing: construction & shelter, goods: manufactured goods & clothing.

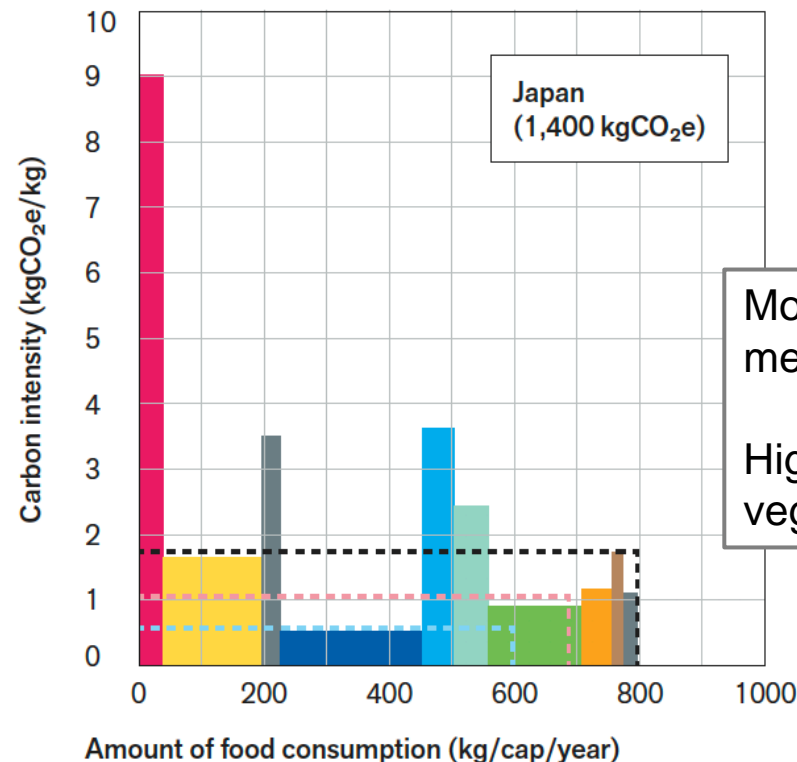
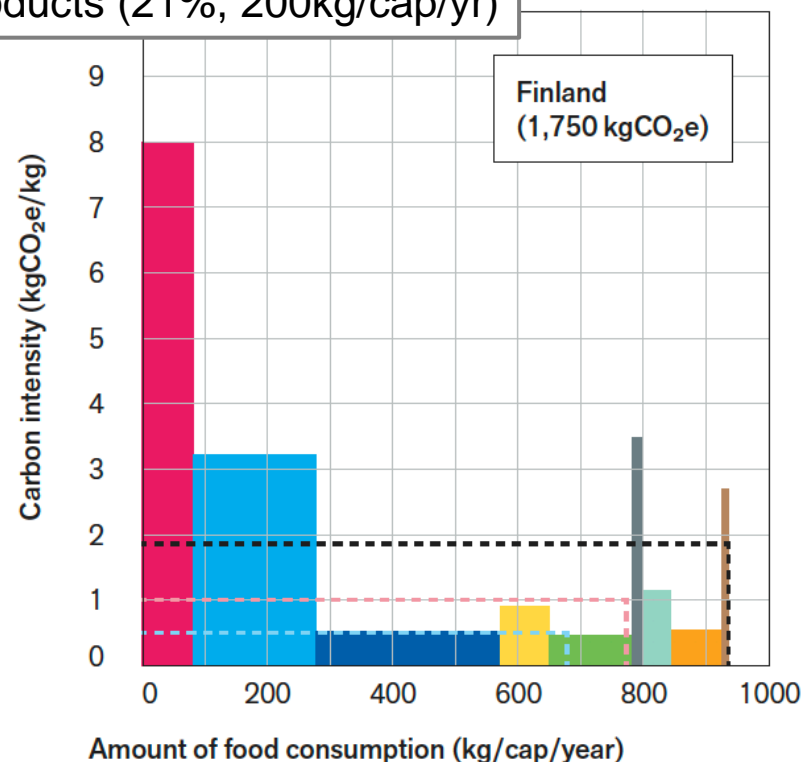
Lifestyle Carbon Footprints



Source: Current household footprint from Ivanova et al. (2016) Environmental Impact Assessment of household consumption. Targets from IGES, Aalto University, D-mat (2019).

Current Footprint: Nutrition

High consumption of dairy products (21%, 200kg/cap/yr)



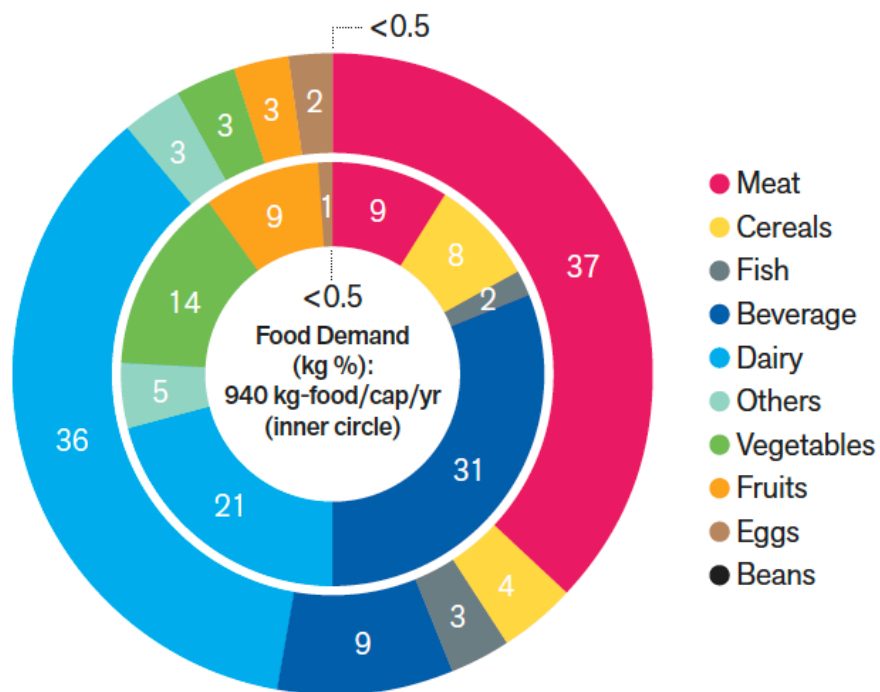
--- Average as of 2017
- - - 1.5 degree target by 2030
- - - 1.5 degree target by 2050

Moderate intake of high intensity meat products (40kg/cap/yr)
High intake of cereals and vegetables (approx 20%, each).

● Meat ● Dairy ● Beverage ● Cereals ● Vegetables ● Fish ● Others ● Fruits ● Eggs ● Beans

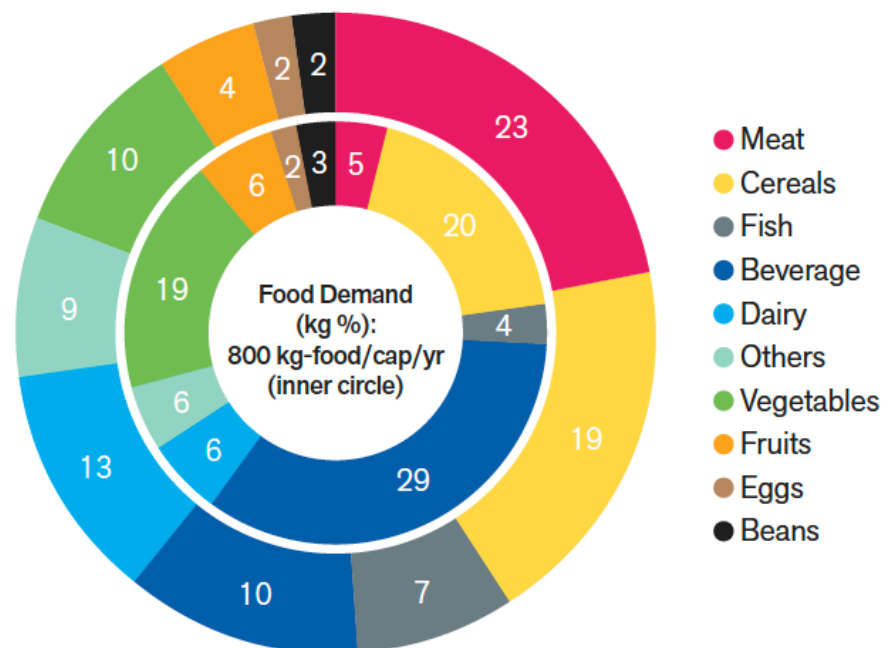
Current Footprint: Nutrition

Carbon Footprint (kgCO₂e%): 1,750 kgCO₂e/cap/year (outer circle)



Finland

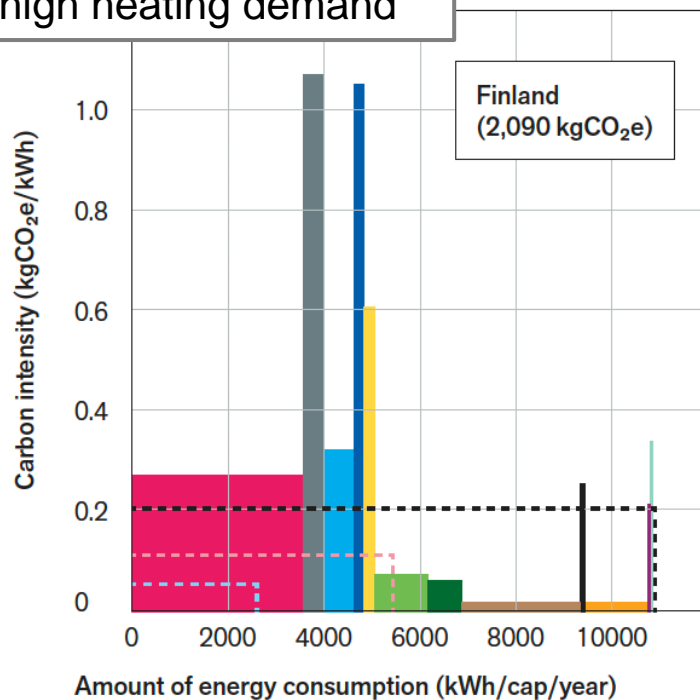
Carbon Footprint (kgCO₂e%): 1,400 kgCO₂e/cap/year (outer circle)



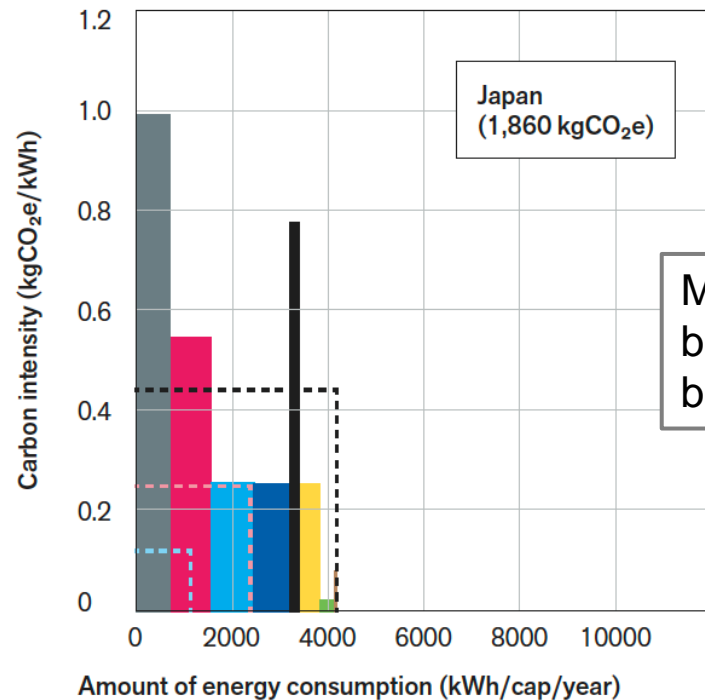
Japan

Current Footprint: Housing

Large living space (40m²)
and high heating demand



- District heat ● Coal grid electricity ● Light heating oil ● Peat grid electricity
- Natural gas grid electricity ● Renewable / Hydro grid electricity
- Biomass grid electricity ● Wood ● Oil grid electricity
- Nuclear grid electricity ● Natural gas ● Other heating sources



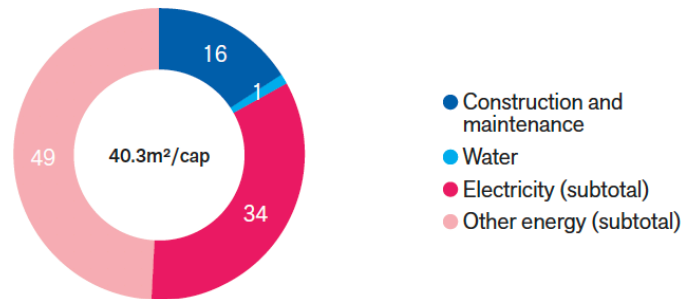
- Coal grid electricity ● LNG grid electricity ● Urban gas ● Kerosene
- Oil grid electricity ● LPG ● Renewable grid electricity
- Renewable off grid/steam ● Nuclear grid electricity

--- Average as of 2017
- - - 1.5 degree target by 2030
- - - 1.5 degree target by 2050

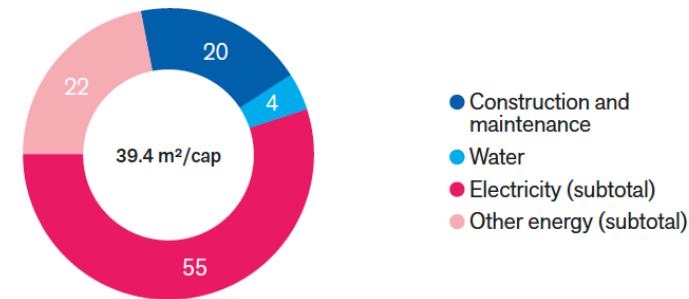
Moderate heating demand
but high share of fossil-fueled
energy sources

Current Footprint: Housing

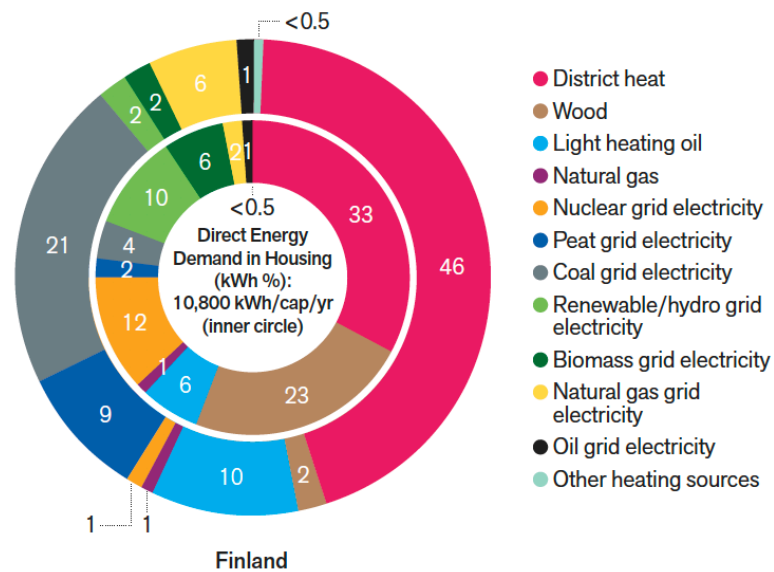
Carbon Footprint (kgCO₂e%): 2,500 kgCO₂e/cap/year



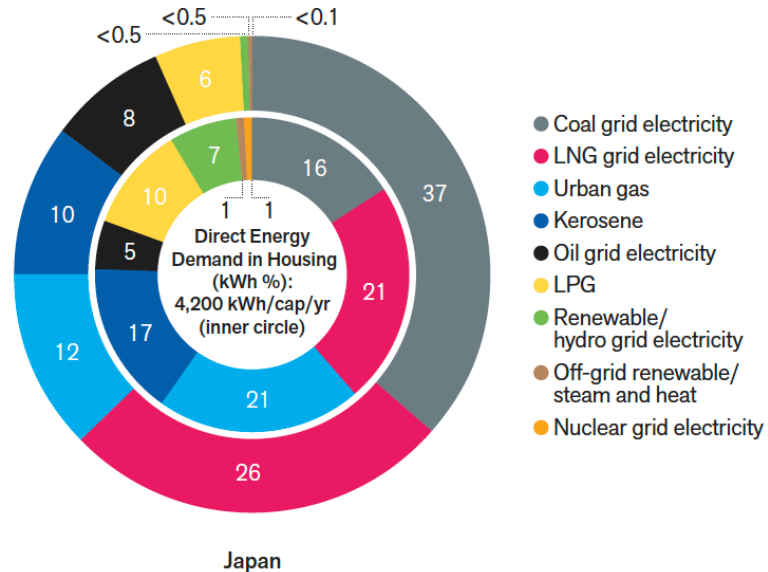
Carbon Footprint (kgCO₂e%): 2,400 kgCO₂e/cap/year



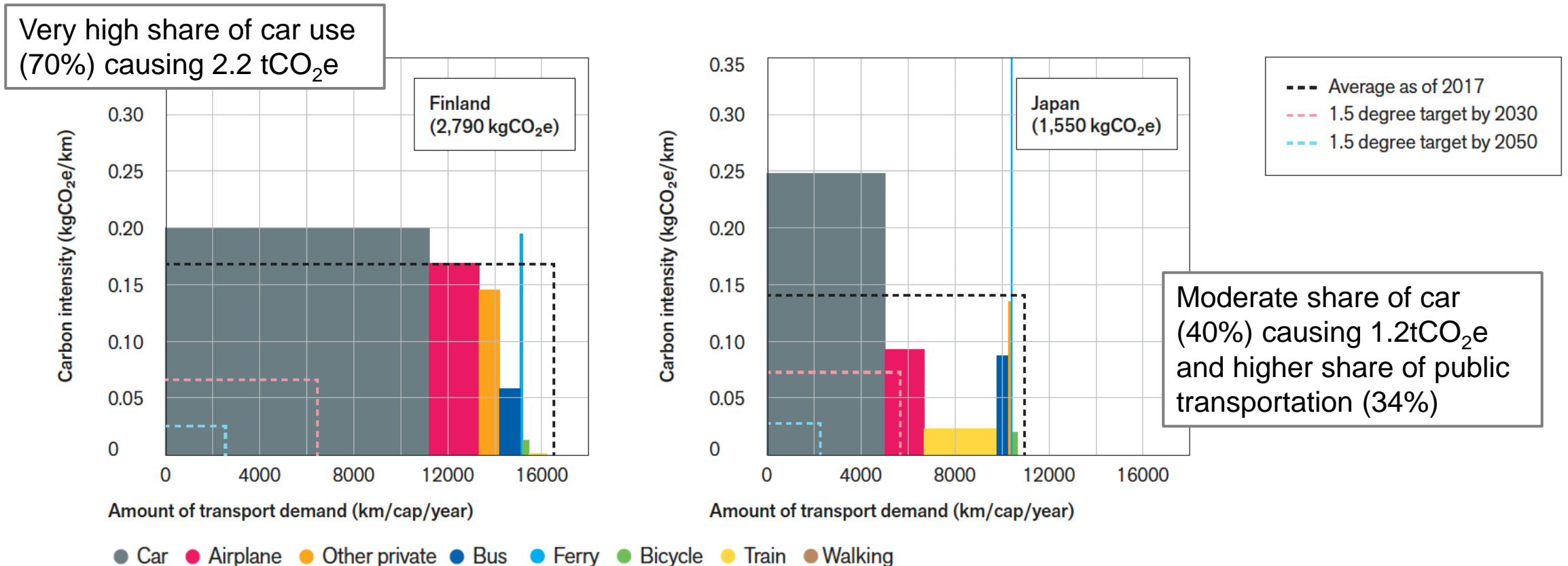
Energy-related Carbon Footprints (kgCO₂e%): 2,090 kgCO₂e/cap/year (outer circle)



Energy-related Carbon Footprints (kgCO₂e%): 1,860 kgCO₂e/cap/year (outer circle)

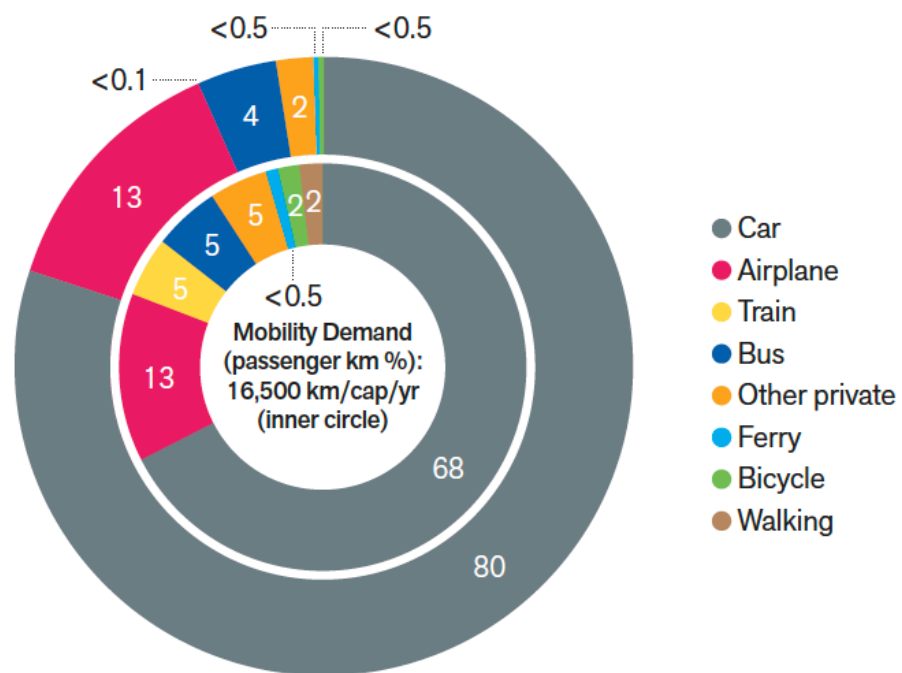


Current Footprint: Mobility



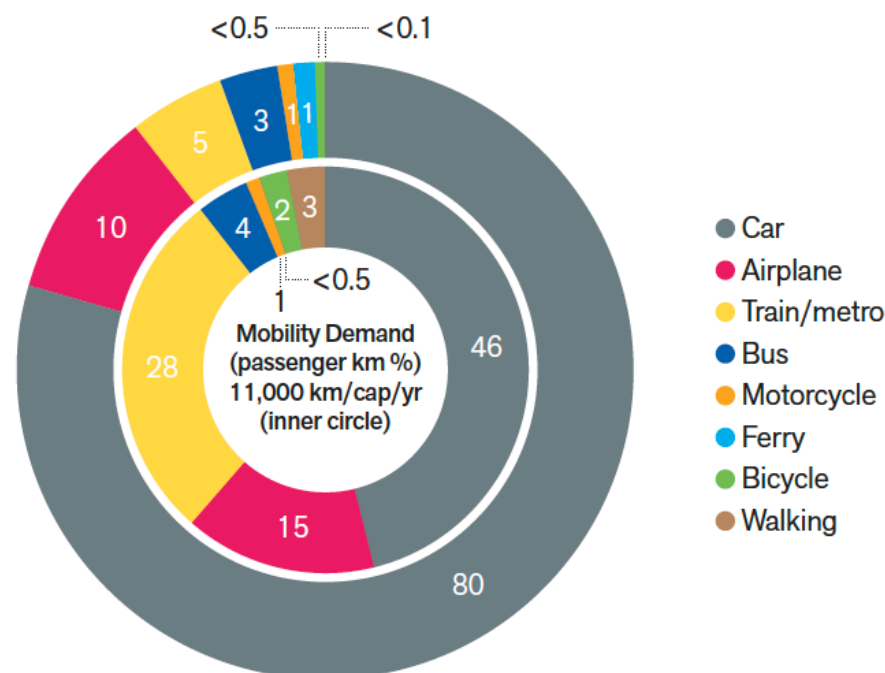
Current Footprint: Mobility

Carbon Footprint (kgCO₂e%): 2,790 kgCO₂e/cap/year (outer circle)



Finland

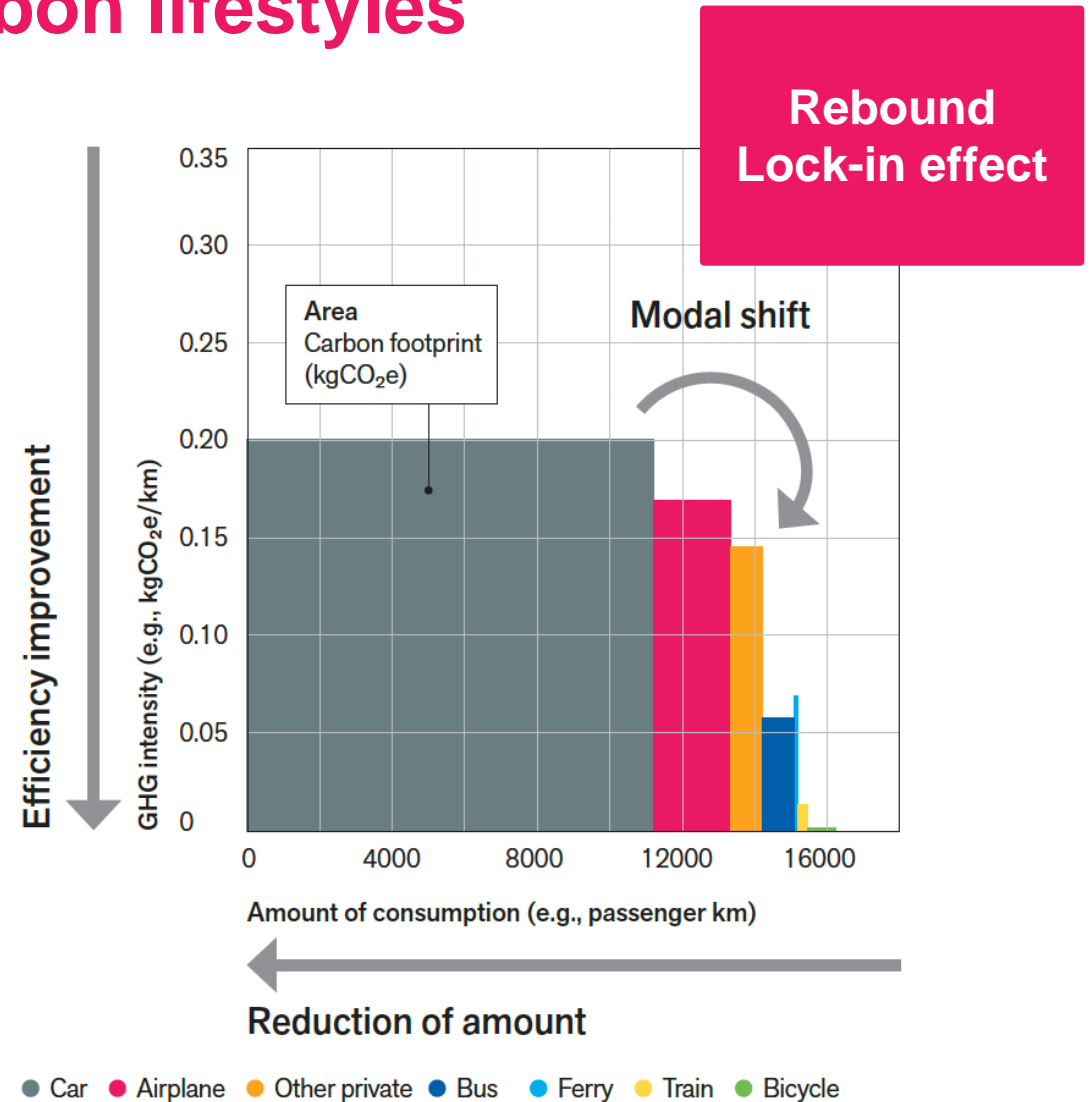
Carbon Footprint (kgCO₂e%): 2,430 kgCO₂e/cap/year (outer circle)



Japan

Three Key Approaches to low-carbon lifestyles

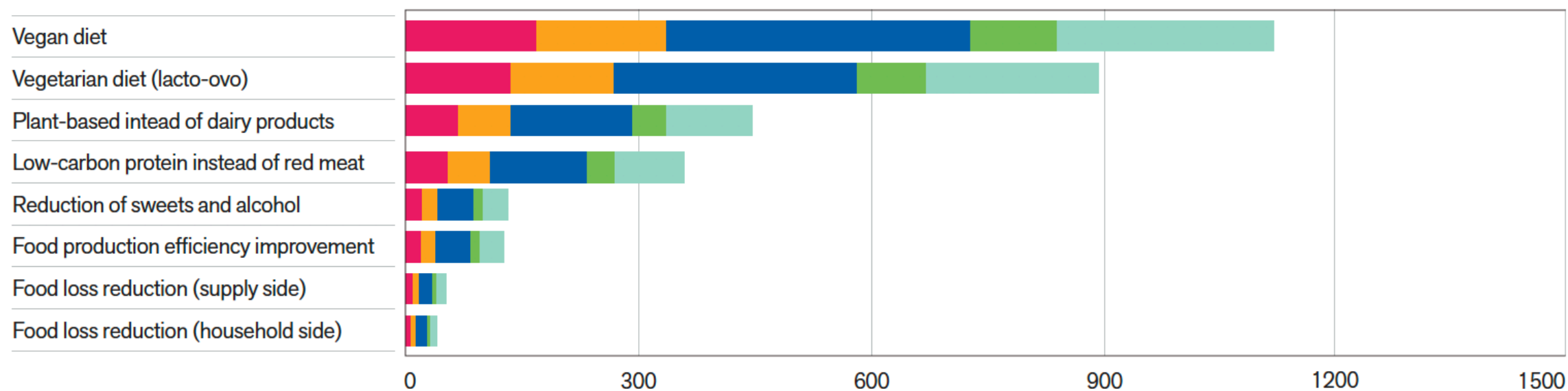
- **Absolute reductions:** reducing physical amounts of goods or services consumed, as well as avoiding unsustainable options.
- **Efficiency improvements:** decreasing emissions by replacing technologies with lower-carbon ones while not changing the amount consumed or used.
- **Modal shifts:** changing from one consumption mode to a less carbon intensive one.



Estimated Impacts of Low-Carbon Options: Nutrition (Finland)

Partial adoption impacts = full implementation impacts x adoption rate

a) Nutrition, Finland



Estimated per-capita carbon footprint reduction impacts (kgCO₂e/capita/year)

● 15% adoption rate ● 30% adoption rate ● 65% adoption rate (2S target) ● 75% adoption rate (1.5D target) ● 100% adoption rate

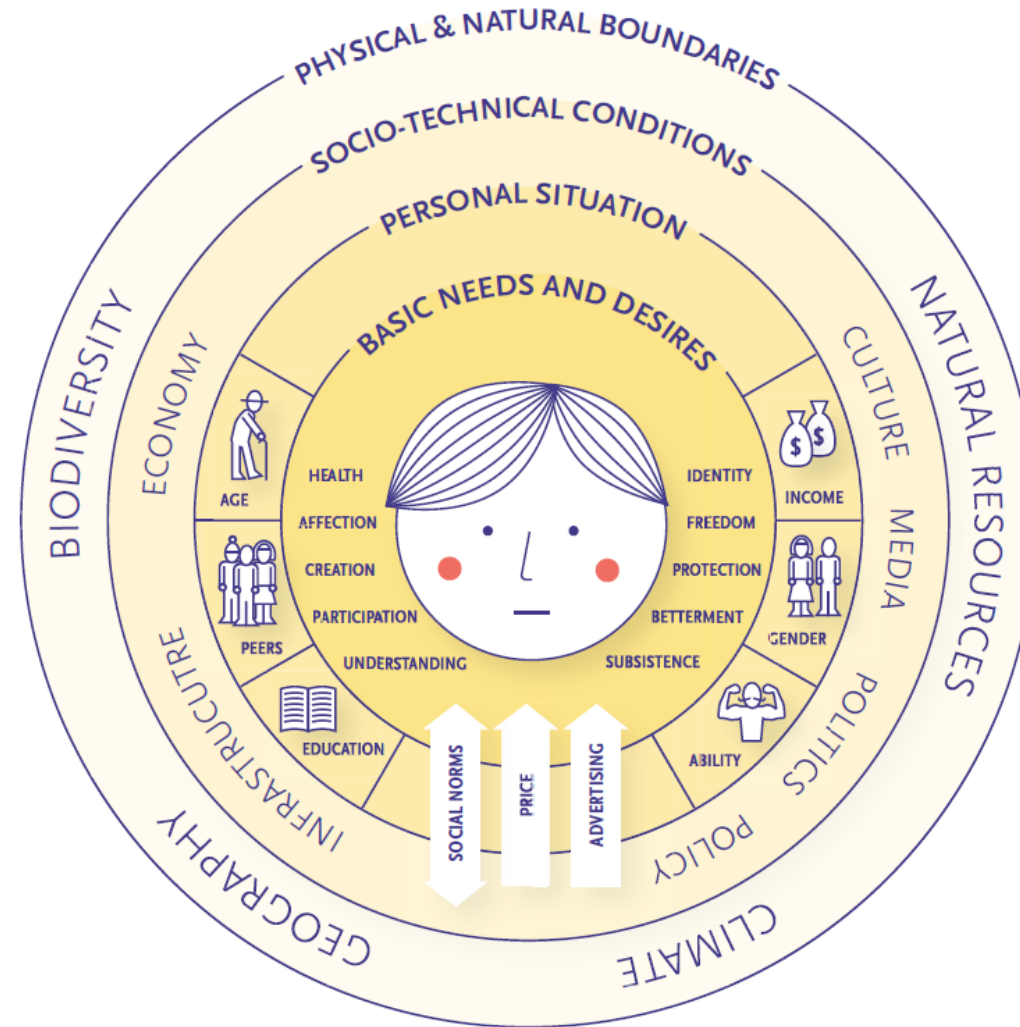
What the numbers say:

- Long-term targets for lifestyle carbon footprints compatible with the 1.5 °C aspirational target under Paris Agreement are: 2.5, 1.4, & 0.7 tCO₂e per capita for 2030, 2040, and 2050.
- Developed countries need to reduce lifestyle carbon footprints 60-80% by 2030, and 80-90% by 2050. Emerging economies need ambitious reduction of 25-80% by 2050.
- Nutrition, housing, and mobility tend to have the largest impact (approximately 75%) on total lifestyle carbon footprints; these areas therefore offer high potential for impactful intervention.
- The range of footprint reductions required for the developed countries for 2030 (2050) are at least 47% (75%) in nutrition, 68% (93%) in housing, and 72% (96%) in mobility.

- We need to give up some things!
 - sooner rather than later
 - Avoid the small-action trap!
- Large, unprecedented undertaking of capacity development
 - For individuals and change organizations
 - To imagine life differently and to accept radical solutions
 - Techno-optimism is not sufficient
- New institutions
 - including new business models
 - Find solutions beyond the markets
 - Completely new approaches to meeting needs and wants

The ring of lifestyles

The context of consumption and lifestyles



Some reflections on the study and its implications

1.5-Degree Lifestyles

Targets and options for reducing lifestyle carbon footprints

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Thank you

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- IGES, Japan

- Report is available at:
- IGES: <https://pub.iges.or.jp/pub/15-degrees-lifestyles-2019>
- Aalto University: <https://www.aalto.fi/departments-of-design/15-degrees-lifestyles>
- Hot or Cool network: <https://hotorcool.org/publications/15-degree-lifestyles-report-2019>