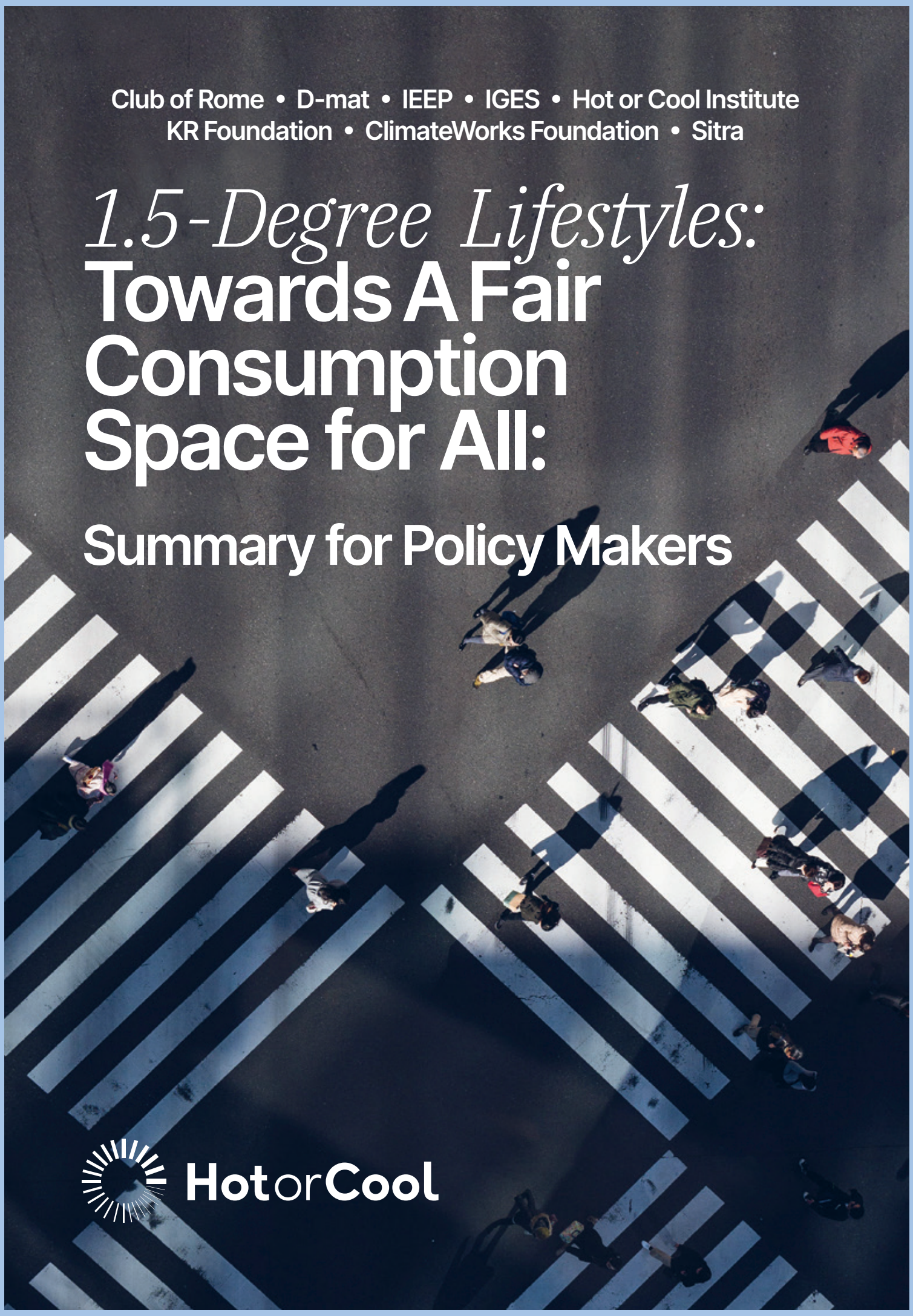
Club of Rome • D-mat • IEEP • IGES • Hot or Cool Institute
KR Foundation • ClimateWorks Foundation • Sitra

# *1.5-Degree Lifestyles:* Towards A Fair Consumption Space for All:

## Summary for Policy Makers



HotorCool

*1.5-Degree Lifestyles:* Towards A Fair Consumption Space for All: Summary for Policy Makers

This report was produced thanks to generous financial support from

**Suggested citation**
Lewis Akenji, Magnus Bengtsson, Viivi Toivio, Michael Lettenmeier. 2021. **1.5-Degree Lifestyles: Towards A Fair Consumption Space for All: Summary for Policy Makers**
Hot or Cool Institute, Berlin.

**With revisions**

**Copyright** Hot or Cool Institute, Berlin. October 2021.

**ISBN** 978-3-98664-013-2

**Editing and proofreading** Erik Assadourian

**Graphic design** Jalo Toivio Design
**Graphics** Koponen+Hildén
**Cover Photo** Ryoji Iwata / Unsplash

Full report and other details available online at *hotorcool.org*

## Authors

Lewis Akenji (Hot or Cool Institute, Germany)
Magnus Bengtsson (Hot or Cool Institute, Germany)
Viivi Toivio (D-mat ltd., Finland;
Hot or Cool Institute, Germany)
Michael Lettenmeier (Aalto University, Finland;
D-mat ltd., Finland)

# Summary for Policy Makers

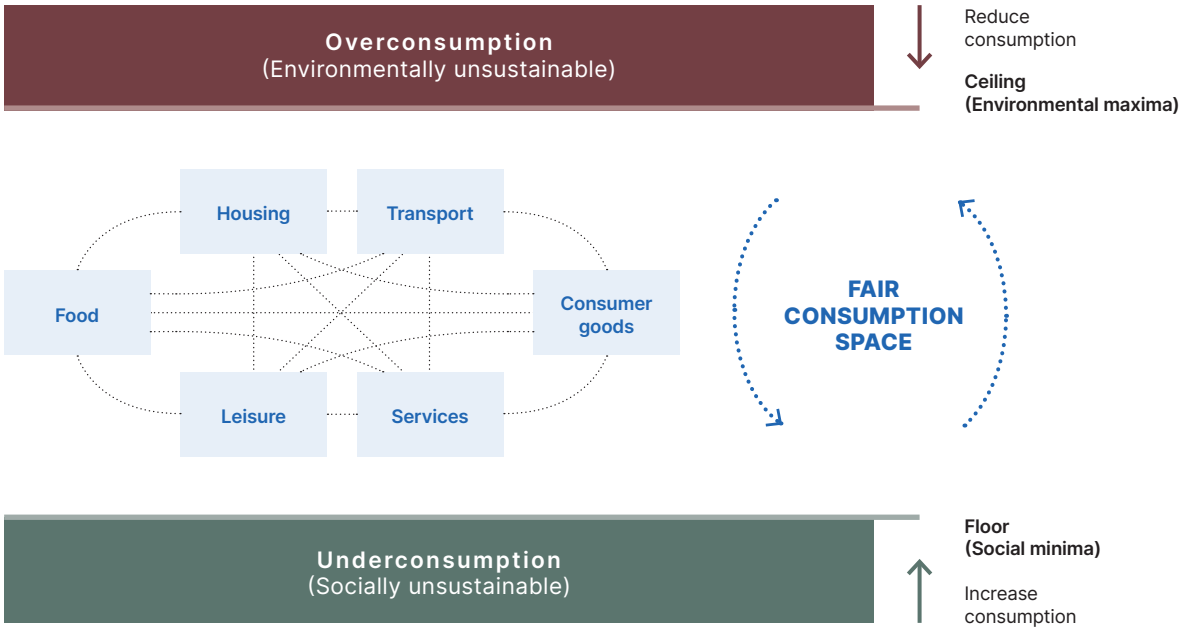
History of government commitments and failures on climate change shows that technological interventions and offsetting emissions, which is central to the net-zero strategy, has been teased for over three decades leading to the worsening state of affairs in which we now find ourselves—what the IPCC describes in its most recent report as "irreversible" damage to the environment, with worse to come unless we change course (IPCC 2021b). As this report demonstrates, changes in predominant lifestyles, especially in high-consuming societies, will determine whether we meet commitments in the Paris Agreement and avoid dire consequences of climate change. Overall reductions in levels of consumption must be achieved, while attending to growing social tensions.

An indictment of the current unsustainable economic development paradigm is the widening gap between the rich and the poor. The emissions share of the 10% richest, highest-emitting individuals ranges from 36-49% of the global total, while that of the poorest, lowest-emitting 50% of the world's population ranges from 7-15% of the total (UNEP 2020). There is observed inequality among countries, inequality within countries, inequality across races and between genders, and inequality across generations. And there are multiple expressions of inequality: of income, of health, of access to natural resources and public services, of participation in decision-making processes, for example, and notably in terms of inequality of carbon emissions. Calls for climate justice are already growing loud; these tensions will only get worse as competition heightens over diminishing resources and the remaining carbon budget to stay within sustainable limits.

The COVID-19 pandemic and the consequent unprecedented lockdown revealed what could happen if the world is caught in an unplanned transition. The deaths, restrictions on visiting friends and family, runs on necessities in shops, food shortages, and increased depression and anxiety, were just as shocking as the partial collapses in economic, health, security, and transportation systems that society had come to rely upon. By even the most conservative IPCC assessments, runaway temperature rise would produce a climate crisis several times the magnitude of the COVID pandemic. A planned transition (rather than a chaotic one as seen with the pandemic) to a society with sustainable lifestyles remains central to building a peaceful future in harmony with the ecological rhythm and balance of our planet.

Lifestyles embrace much more than just consumption patterns and behaviours. It includes non-economic aspects of our lives, such as caring for children or elderly parents, spending time with our friends, play, volunteering, or activism. All of these potentially affect, directly or indirectly, our wellbeing and our carbon footprint. Lifestyles are how we consume, and also how we relate to one another, what kind of neighbours, friends, citizens and parents we are, what kinds of values we nurture, and how we let those values drive our choices.

**Figure A. A Fair Consumption Space for Sustainable Lifestyles**




While generally overlooked in our pursuit of technological solutions to climate change, failing to shift the lifestyles of nearly eight billion human beings means we can never effectively reduce GHG emissions or successfully address our global climate crisis. This becomes especially complex, considering that the most impoverished populations will need to consume more, in order to achieve basic levels of wellbeing. Oxfam estimates that to reach the global average per capita emissions level by 2030 consistent with limiting global heating to 1.5°C, the per capita consumption emissions of the richest 10% of the global population should be reduced to about a tenth of their current level, while those of the poorest 50% could still increase by two to three times their current level (Oxfam 2020). Humanity will need to converge into "a fair consumption space" (See Figure A).

This report introduces the concept of a fair consumption space—an ecologically healthy perimeter that supports within it an equitable distribution of resources and opportunities for individuals and societies to fulfil their needs and achieve wellbeing. Within this space, there are a range of regenerative options (which this report details), but there are also clear demarcating limits to over- and underconsumption: with a cap in emissions, overconsumption by one person affects the prospects of another, and encroaches into another's consumption space, requiring collectively working toward a more equitable distribution of limited carbon budgets.

## About this report

This report continues the science-based approach of linking concrete changes in lifestyles to measurable impacts on climate change in order to keep with the 1.5-degree aspirational target of the Paris Agreement on climate change. The 1.5-degree lifestyles approach examines GHG emissions and reduction potentials using consumption-based accounting, which covers both direct emissions in a country and embodied emissions of imported goods while excluding emissions embodied in exported goods. It analyses lifestyle carbon footprints of ten sample countries, representing high-, middle-, and low-income countries, and identifies hotspots, or consumption domains with the highest impact on the environment.

The report also fills the knowledge gap arising from most prevailing climate scenarios that underplay the potential contributions of lifestyle changes to climate change mitigation and focus entirely or mainly on developing new technologies and on changes in production. For each country in the report, the footprint gap between current and sustainable target levels are determined for the years 2030, 2040, and 2050. To bridge these gaps, options for reducing footprints in each country are introduced, estimating potential impacts from various adoption rates in each country. Finally, two scenarios are developed for each country, one focused on systems change and another on behaviour change, showing indicative pathways for achieving the 2030 target.

## Targets and gaps

The results show massive gaps between current per capita footprints and targets; the lifestyle carbon footprint target for 2050 is exceeded in all countries analysed, requiring rapid and radical reductions. Estimates of current annual average lifestyle carbon footprints per person of countries analysed, as of 2019, are: Canada: 13.6 $tCO_2e$, Finland: 9.7, United Kingdom: 8.5, Japan: 8.1, China: 5.0, Turkey: 4.9, South Africa: 4.9, Brazil: 3.2, India: 3.0 and Indonesia: 2.2 $tCO_2e$ (Figure C). In comparison, we need to aim for a lifestyle carbon footprint target of 0.7 $tCO_2e$ by 2050, with intermediary targets of 2.5 and 1.4 $tCO_2e$ by 2030 and 2040, respectively (Figure B). These targets are in line with the 1.5°C aspirational target of the Paris Agreement and for global peaking of GHG emissions as soon as possible without relying on the extensive use of negative emission technologies.

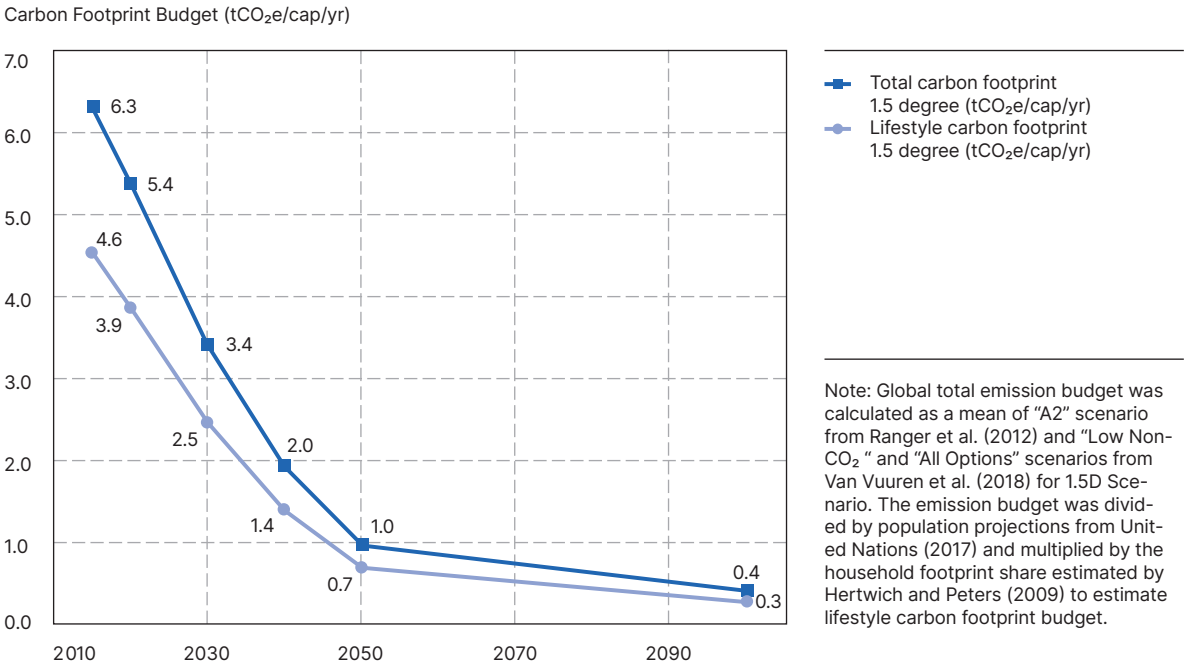
The footprint gaps between actual lifestyle and the targets show that footprints in high-income countries need to be reduced by 91–95% by 2050. Upper-middle income countries already need to reduce their footprints by 68–86% by 2050. Even lower-middle income countries need to reduce footprints by 76% in order to meet the 2050 target.

## Hotspots

The report explores impacts of consumption in six domains: food; housing, personal transport; goods; leisure; and services, and uses these to aggregate total lifestyle carbon footprints and reveal hotspots in the ten surveyed countries. Focusing efforts to change lifestyles in relation to these domains would yield the most benefits; the three domains of food, housing, and personal transport tend to have the largest impact (approximately 79%) on total lifestyle carbon footprints.

Food consumption impacts show relatively similar footprints between the case countries (Figure D), with the exception of India and Indonesia where the overall meat consumption is notably lower than in the other countries. The reduction required in the footprint for food by 2030 ranges from 39% to 60% for all countries besides India and Indonesia where it is only 8%. In addition to meat, dairy products are a major contributor to footprints, especially in high-income countries, such as Canada and Finland. Different food cultures are reflected in the footprints as different consumption patterns between case countries: a primarily vegetarian diet in India shows the value of protecting this low-impact, healthy diet. Meat consumption by a Canadian (90 kg per year) is four times that eaten by a Japanese (40 kg

**Figure B. Lifestyle carbon footprint budget comparable with 1.5°C target (without or with less use of negative emission technologies)**




Note: Global total emission budget was calculated as a mean of "A2" scenario from Ranger et al. (2012) and "Low Non-$CO_2$ " and "All Options" scenarios from Van Vuuren et al. (2018) for 1.5D Scenario. The emission budget was divided by population projections from United Nations (2017) and multiplied by the household footprint share estimated by Hertwich and Peters (2009) to estimate lifestyle carbon footprint budget.

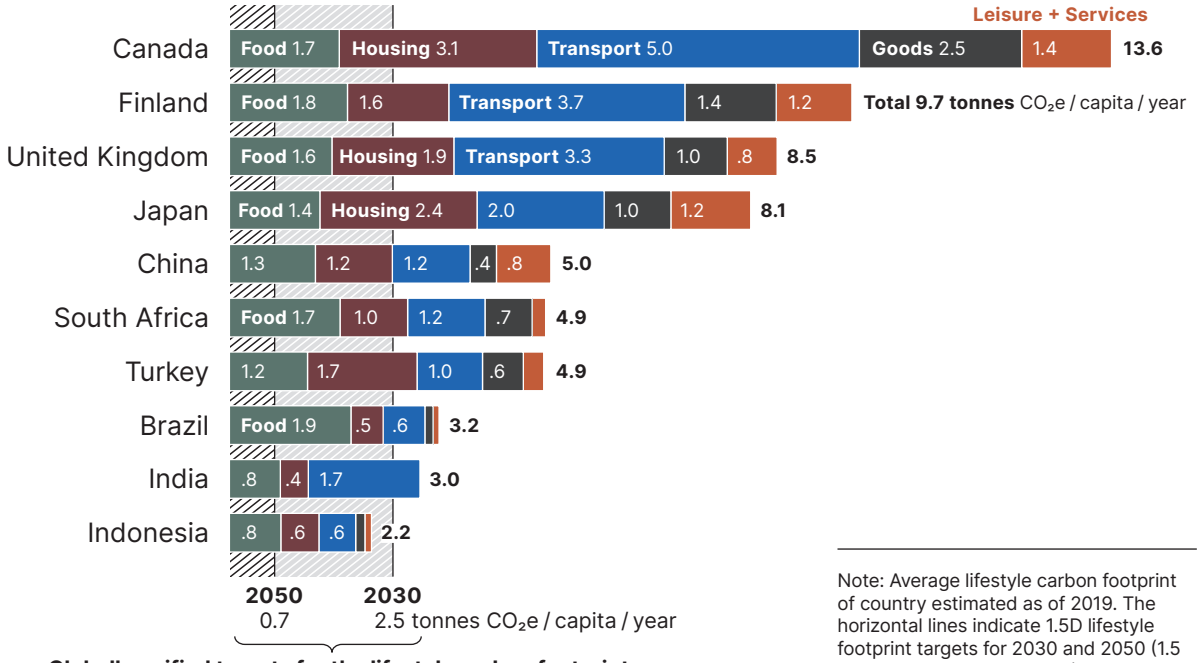
per year) with no discernible additional nutritional benefits for the Canadian.

In the housing domain, non-renewable grid electricity is an important source of lifestyle carbon footprints in all countries, as shown in Figure E. In addition, gas used for heating and cooking is another major contributor to the footprint of some countries, such as the United Kingdom, Japan, and Turkey. Large average living spaces and higher living standards are reflected as higher footprints in high-income countries. This is especially the case in Canada and Finland, where large living spaces together with long and cold winters are increasing the overall energy demand. Nevertheless, the housing footprint is notably higher in Canada due to relatively high consumption of carbon-intensive energy sources, such as natural gas. In Finland, a high share of the heating energy (the largest share of overall energy consumption) is based on district heating which has lower intensity due to the relatively high share of renewable energy sources. In Japan, overall energy demand is the lowest of the high-income countries studied but is mostly based on non-renewable energy sources, which is similar in the upper and lower middle-income countries studied.

Footprints for personal transport are highest in the high-income countries due to a high overall transport demand and a high share of car use and carbon-intensive air travel (Figure F). However, Japan has a high mobility demand but a notably higher share of public transport use than other high-income countries while India has a similar transport demand as Finland but motorcycles are responsible for the largest share of transport demand and footprint. In countries with a lower share of car use, transport demand is mainly focused on public transportation (bus and train), except in India and Indonesia, where motorcycles are the biggest contributor to both mobility demand and footprints. While Indonesia and Brazil would need to decrease the carbon footprints of personal transport for 2030 by 25% and 34%, respectively, all other countries require reductions in the range of 51% to 91%.

Footprints from other domains are strongly related with income levels, as shown in Figure G. In particular, leisure related footprints are the lowest in countries with the lowest average per capita spending, such as India and Indonesia. Consumer goods account for the greatest share of the footprint in most countries. Canada has a higher footprint compared to other countries, due to notably higher intensity for consumer goods and leisure related services. In middle-income countries the spending is focused on necessities, such as clothing and furniture/room coverings. The share of service-related footprints vary across countries and income groups.

**Figure C. Carbon footprint and its breakdown between consumption domain and globally unified targets for the lifestyle carbon footprints.**




Note: Average lifestyle carbon footprint of country estimated as of 2019. The horizontal lines indicate 1.5D lifestyle footprint targets for 2030 and 2050 (1.5 °C without/less use of CCS).

**Figure D. Food-related carbon footprint ($tCO_2e$/cap/yr) and its breakdown between consumption components**

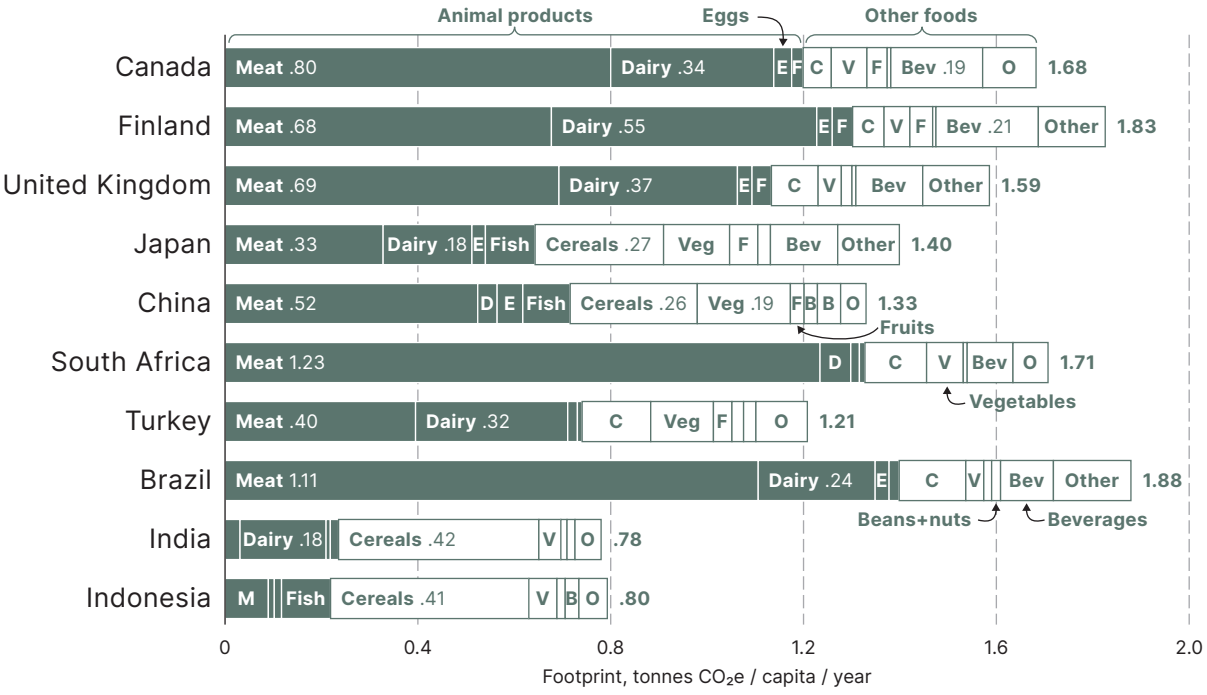
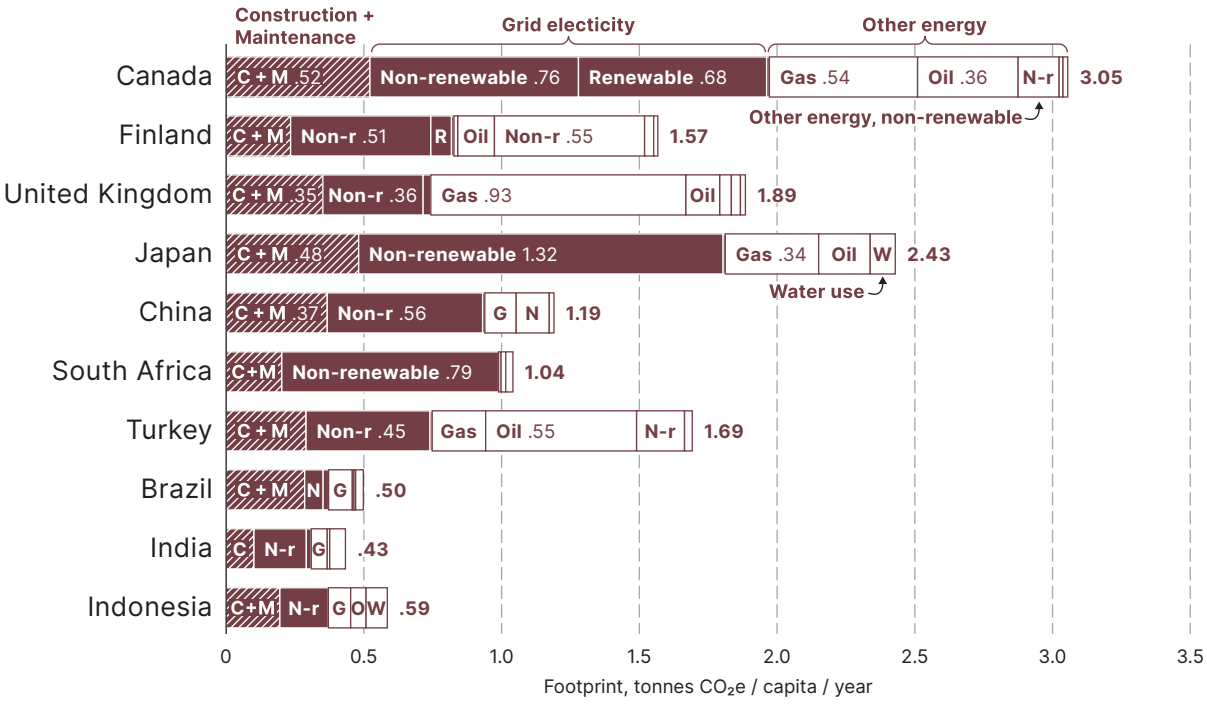
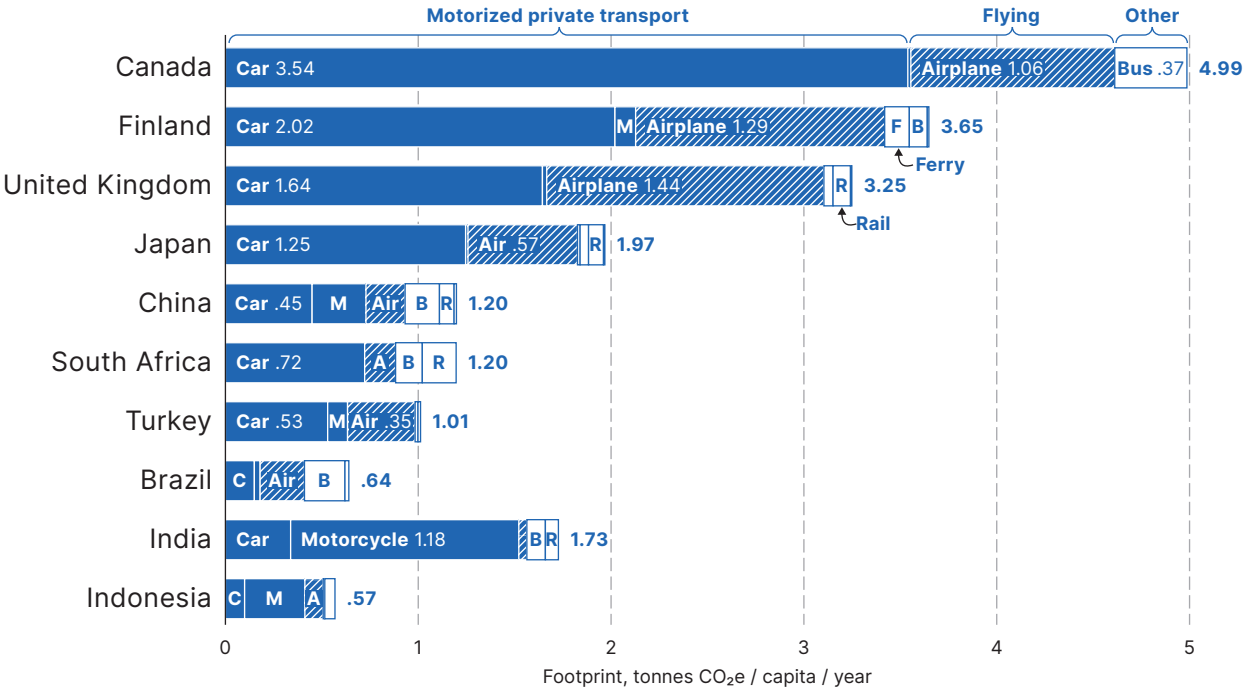



**Figure E. Housing-related carbon footprint ($tCO_2e$/cap/yr) and its breakdown between consumption components**



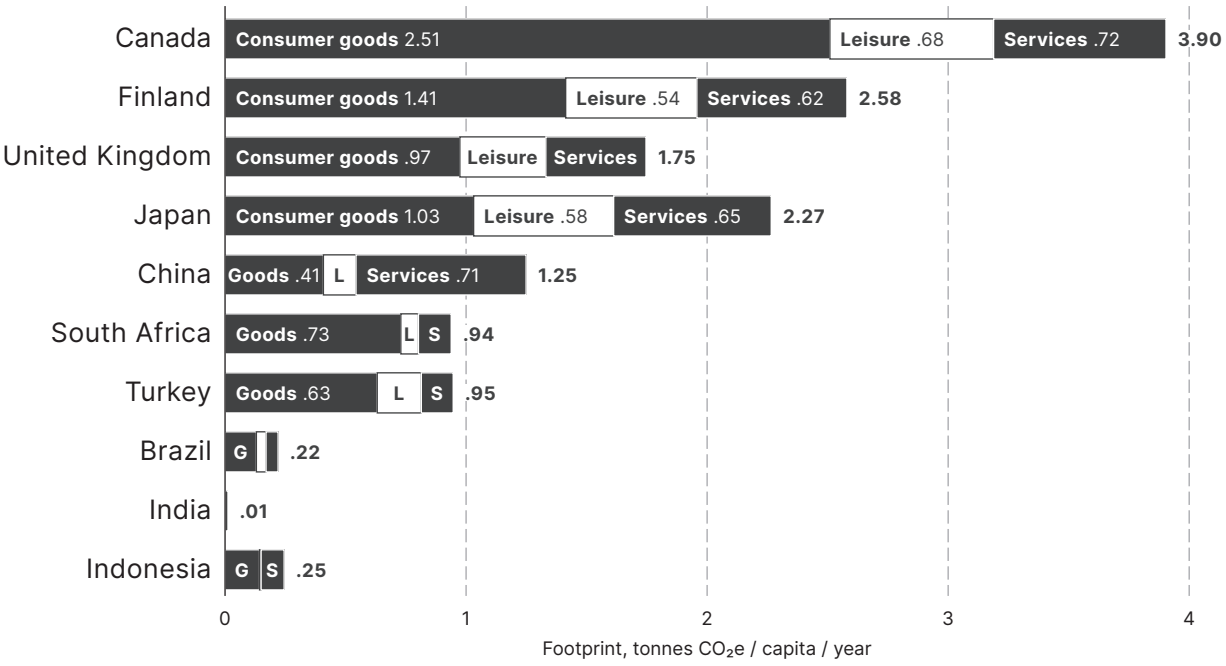

Note: Construction/maintenance covers emissions related to the living space (m2/person).

**Figure F. Personal transport related carbon footprint ($tCO_2e$/cap/yr) and its breakdown between consumption components**




Note: Rail covers bullet, long-distance and local trains, as well as trams and metros; other public transportation covers local modes of transportation, such as auto-rickshaw in India and bajaj (three-wheelers) in Indonesia.

**Figure G. Consumer goods, leisure, and services related carbon footprint ($tCO_2e$/cap/yr) and its breakdown between consumption components**



## Options and scenarios

Practical solutions will require three parallel types of efforts: absolute reductions in high-impact consumption (such as flying and driving less); modal shifts towards more sustainable options (such as shifting from driving to public transport or biking); and efficiency improvements (such as shifting to electric cars), to use three examples from the transportation realm.

The options with large emission reduction potentials as revealed in this report are reducing car travel, air travel, meat consumption, and fossil-based energy usage. If these options are fully implemented they could reduce the footprint of each domain by a few hundred kg to over a ton annually. The magnitude of impacts would depend on adoption rates of actions by the public.

To present indicative pathways, this report analyses scenarios for which countries can meet the 2.5-ton target for 2030. For each country it presents two scenarios: one prioritizing systems change (adjusting carbon intensity of lifestyles options) and one prioritizing behaviour change (adjusting volume of consumption). Both intensity- and amount-adjusted carbon budget scenarios highlight the urgency of drastic lifestyle carbon footprint reductions in high-income countries, as the needed footprint reductions of 69–82% require almost full (at least 95%) adoption of low-carbon lifestyle options in all countries. Canada was an exception, as it is not able to meet the 2.5-ton target even with full adoption of the options applied in this report. Upper and lower-middle income countries also need lifestyle carbon footprint reductions of 23–50% by 2030, but pathways allow more freedom in terms of chosen actions and adoption rates, as well as the possibility of focusing on country-specific hotspots.

The results highlight the large potential lifestyle changes required across consumption domains in order to implement the Paris Agreement, and also imply it is not an either-or question of technology or lifestyles but rather both—improvements to the energy system and technology as well as shifts in consumption patterns are required to achieve the ambitious climate targets.

## Policies

With a diminishing carbon budget amid impacts of climate change already being felt, growing social tension exacerbated by vast inequities in society, and a short timeline for action, we need every tool in the box, including options that may seem politically challenging. The report highlights a number of policy frameworks that may help society transition towards fair consumption within planetary boundaries. These recognise that significant lifestyle changes are, however, only possible if they occur within broader system change in the underlying economic and social conditions, and that the burden of change also includes communities, businesses and institutions, and government agencies.

Recommendations here deliberately focus on a few radical approaches that are not yet part of the mainstream climate discourse. This would hopefully broaden the discussions on how to deal with the escalating climate emergency in an equitable manner and within a short timeframe. The first approach is taking out the harmful consumption options, through choice editing. Choice editing is a traditional government approach that has been primarily applied through the filter of public safety, health, and security. However, in a climate emergency, governments need to incorporate and prioritise sustainability in their choice editing criteria. High impact options such as fossil-fuelled private jets and mega yachts, excessive meat consumption, and customer loyalty programs that encourage unnecessary

frequent flying and stays in wasteful hotels need to be edited out, for example, while innovation for more sustainable alternatives would need to be edited in.

The second approach requires setting limits for environmentally harmful consumption and staying within those limits. The report asks the question of whether the time has come for carbon rationing. Rationing has been used in the past as a tool to regulate water shortages in times of droughts, and to ensure equitable availability of fuel and food when limited. Carbon rationing is relevant, since existing policies and programs are insufficient for meeting carbon reduction targets, and because it is a policy idea that meets calls for socially just action on climate change. However, rationing can be complex and controversial and it is so far not clear what mechanism could be used to implement carbon rationing. At the very least, thoughtful conversations among politicians and the public are needed, and so is some bold experimentation to implement such an approach.

The third set of policy approaches is intended to ensure a more equitable wellbeing society. One recommendation is to adopt a sufficiency approach to the design of policy and practical solutions. In contrast, and sometimes complementarily, to the dominant technology-driven efficiency approach with its open-ended incrementalism, sufficiency prioritises needs-provisioning with limits determined by the biophysical processes. A sufficiency approach will support a fair consumption space through a range of options for housing, personal transport, thermal comfort, and nutritional needs, for example, that are optimised for wellbeing within planetary boundaries. Another recommendation to ensure equity and guarantee access to basic needs for all, is to go beyond universal basic income and implement universal basic services (UBS). Meeting human needs through public services and other collective measures is more equitable, affordable, and sustainable than simply providing cash benefits to support individual market transactions. UBS are underscored by a social guarantee, which recognises that everyone has basic human needs that enable them to participate with dignity in society; equitable access is based on needs, not ability to pay. UBS, to be provided through a combination of individual effort, organisations, and government mandates, would be determined for each society. In the UK, for example, these include: health and social care, education, housing, childcare, digital access, and transport.

## Thinking forward

The final section puts forward some ideas on research policy and practice to accelerate the transformation towards a low-carbon society and a stable climate. Akin to annual GDP projections, national governments should announce annual emissions reductions targets, and establish national carbon budgets. Sustainable Development Goal 12 on sustainable consumption and production is not sufficient on its own to carry the required global shifts in lifestyles. A midterm review of the SDGs needs to recognise its limits and boost the Goal through complementary programmes. One such programme is the 10-Year Framework of Programmes on sustainable consumption and production, which expires in 2022. The programme could be renewed and refocused on sustainable lifestyles and using a 1.5-degree lifestyles approach to boost SDG12 and link it to the Paris Agreement. More efforts also need to be put into creating visions that can inspire people and guide society towards a just and sustainable future. These visions should show opportunity, centre on wellbeing, and engage the youth population that is heavily affected by climate anxiety and that is destined to live with our success or failure to create a sustainable future.

Club of Rome • D-mat • IEEP • IGES • Hot or Cool Institute
KR Foundation • ClimateWorks Foundation • Sitra

This report uses a science-based approach to link concrete changes in lifestyles to measurable impacts on climate change in order to achieve the 1.5-degree aspirational target of the Paris Agreement on climate change. The report also fills the knowledge gap arising from most prevailing climate scenarios that underplay the potential contributions of lifestyle changes to climate change mitigation and focus on developing new technologies as well as on changes in production.

For each country in the report, the footprint gap between current and sustainable target levels are determined for the years 2030, 2040, and 2050. To bridge these emissions gaps, options for reducing footprints in each country are introduced, estimating potential impacts from various adoption rates in each country. The report introduces policies that could transform lifestyles and socio-technical systems in sustainable directions. Finally, two scenarios are developed for each country, one focused on systems change and another on behaviour change, showing indicative pathways for achieving footprint targets for 2030.

HotorCool