What does 1.5°C-compatible living look like? An update on the science

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http://www.sgr.org.uk/

- Webinar as part of Ethical Consumer Week, 19 October 2021
- These slides are a slightly revised/ extended version of those delivered, with notes.

Some basics

- Paris target to keep global heating below 1.5C moving quickly out of reach
- Govt and industry focus remains on tech change
- Reduction in climate pollution not happening nearly fast enough
- At least 59% of required carbon emissions reduction involves some behaviour change
- Behaviour change must be a key element of action, especially among wealthy

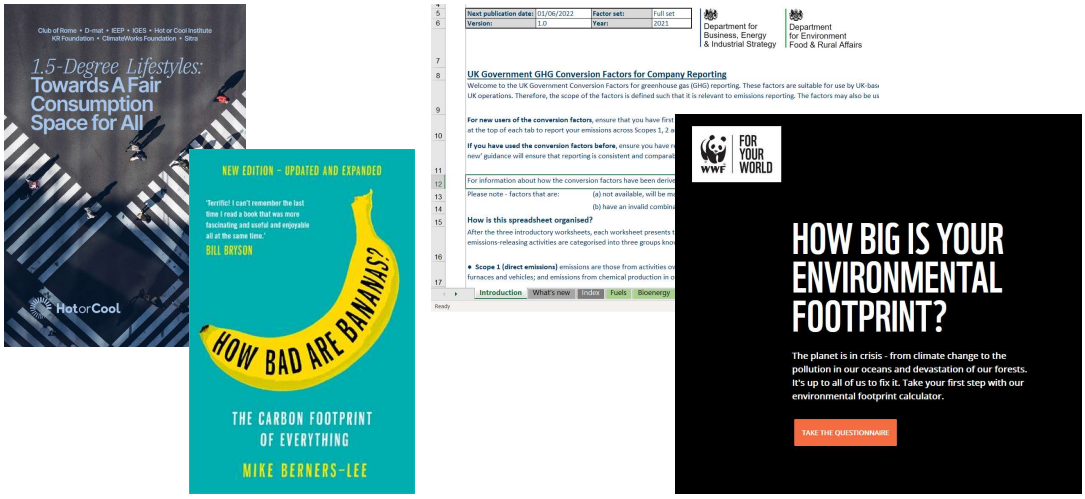
- 59% of required carbon emissions reduction involves some behaviour change – from: p70 of Climate Change Committee (2020). https://www.theccc.org.uk/publication/sixth-carbon-budget/
- Other analysis has concluded the figure is higher

Questions for this talk

- What are the most effective actions to reduce carbon emissions?
- What are credible targets for 'sustainable behaviours'?
- What are the main 'guilt-free' activities?
- What are the 'co-benefits' of action, e.g. health, social, env?
- How does individual action fit within the bigger climate picture?

- **UK focus**

Key information sources



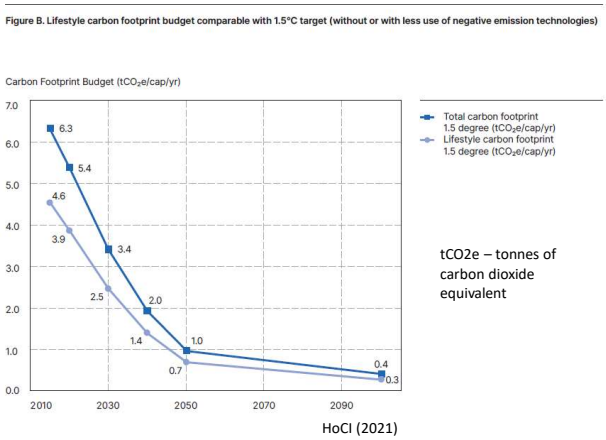
NB methodological differences between researchers mean all figures still have some uncertainty, and may not always be consistent with each other

Main sources:

- HoCI (2021). 1.5-Degree Lifestyles: Towards A Fair Consumption Space for All. Hot or Cool Institute, Berlin. https://hotorcool.org/1-5-degree-lifestyles-report/
- Berners-Lee M (2020). How bad are bananas? The carbon footprint of everything (2nd edition). Profile books. https://profilebooks.com/work/how-bad-are-bananas/
- BEIS (2021). Greenhouse gas reporting: conversion factors 2021. https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2021
- WWF (2018). How big is your environmental footprint? (online calculator) https://footprint.wwf.org.uk/#/

Key science and ethics

- To keep global heating below 1.5C, need to keep within 'global carbon budget' of 500 billion tCO2e
- Leads to descent curve (right)
- 'Lifestyle carbon footprint' is due to consumer activity
- 2030 target: **2.5 tCO2e**
- Ethical considerations:
  - Equity; sufficiency



tCO2e – tonnes of carbon dioxide equivalent

HoCl (2021)

Caveats/ further explanation:

- Figure for remaining global carbon budget drawn from latest report of Intergovernmental Panel on Climate Change (IPCC)
- Budget covers emissions from January 2020 onwards, so budget is already being used at a faster rate than this graph indicates
- Budget gives a 50% chance of staying below 1.5C – so risk of breach is high even if these targets are met
- Further individual/ govt/ industry action will obviously be required after 2030
- Equity – it is assumed everyone has a 'fair consumption space', i.e. an equal right to emit carbon to live their lives
- Sufficiency – it is assumed that everyone is permitted to carry out activities sufficient to fulfil their basic needs (some of which may emit carbon)
- For more details see: HoCl (2021) – chaps. 2 & 3.

UK situation

Current total carbon footprint per person
12
tCO2e

Current lifestyle carbon footprint per person
8.5
tCO2e

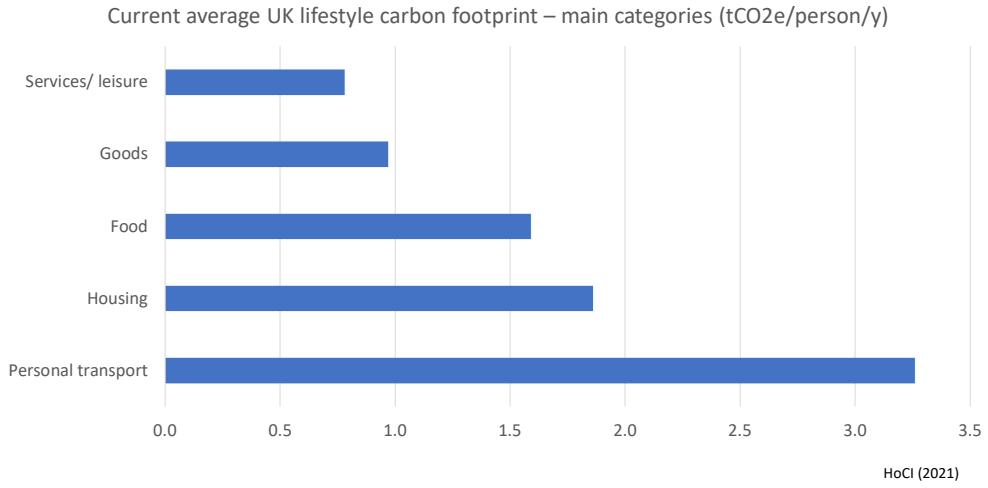
Target lifestyle carbon footprint per person
2.5
tCO2e

How close do you think you are to the 'target lifestyle'?

- Figures rounded to nearest half tonne.

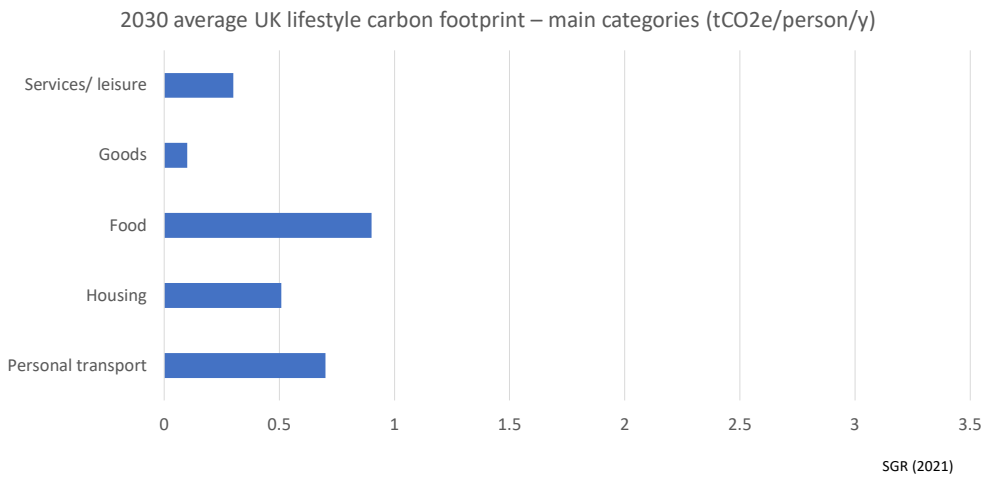
HoCI (2021), chaps. 2 & 3.

Current UK situation



Data from: HoCI (2021), p154 (Table B.4).

UK targets



SGR estimates based on HoCI (2021) and Berners-Lee (2020). Full details to be published in early 2022.

What individual actions reduce UK emissions the most on average?

Reduction category	Action	Average carbon saving (tCO2e/person/y)
Extremely high	Avoid flying	-1.4
Very high	Avoid using cars (incl. not owning a car)	-1.0
High	Switch to vegan diet	-0.75
Medium-high	Avoid red meat/ Switch to vegetarian diet Closer weekend leisure/ Live closer to workplace Switch to electric car/ Switch to (elec) bike for commuting	-0.5
Medium-low	Switch to renewable energy for heating/ Smaller living space Switch to renewable energy for electricity/ Install heat pump More efficient car/ Commute using public transport	-0.3 to -0.4
Low	Efficient home appliances/ Improve building efficiency Spare room rental/ Saving hot water Tele-work/ Lift-sharing/ Reduce food waste	-0.1 to -0.2

Individual circumstances may vary considerably!

HoCI (2021)

- Actions only in the personal transport, housing and food domains – from: HoCI (2021), p64.

Targets: Personal transport

Category	Individual targets	Carbon footprint (tCO2e/person/y)
Flying	• Zero flying for personal/ leisure purposes	0.0
Other travel	• No car ownership • Less than 5,000 km long-distance train travel • Less than 5,000 km bus and short-distance train travel • Less than 1,000 km car travel (e.g. lift-share), on average shared with one other person • Walking & cycling for most short journeys • Minimal ferry travel • Zero travel on cruise ships, speed boats, steam trains or other very high emissions vehicles/ vessels	0.7
Total		***0.7***

- SGR estimates based on HoCI (2021) and Berners-Lee (2020). Full details to be published in early 2022.
- 'Zero' or 'No' = never do this; 'minimal' = very low level
- Flying (and other travelling) as part of work is not included, but arguably should be a priority action as well because of its high impact
- Daily/ regular commuting is counted as personal travel not work travel
- Approx. examples:
    - 5,000km is 4 return journeys from London to Glasgow (long distance)
    - 5,000km equiv. to daily commute of 10km each way (short distance)
    - 1,000km equiv. to 2 local journeys every week (short distance)
- Higher levels in one area (e.g. long distance train travel) can be compensated for by lower levels in another area (e.g. bus travel) – according to personal circumstances

Targets: Housing

Category	Individual targets	Carbon footprint (tCO2e/person/y)
Home energy use	• Home energy consumption (heating, hot water and electricity) less than 3,500 kWh	1.0
Home energy supply	• All grid electricity from a high quality 100% renewable energy supplier • Equivalent consumption of electricity and/or heat supplied from local renewable sources	-0.8
Embodied energy of home	• Home floor space per person of less than 30m^2	0.3
Total		***0.5***

- SGR estimates based on HoCI (2021) and Berners-Lee (2020). Full details to be published in early 2022.
- Home energy use
    - Current UK average home energy consumption is approx. 7,200 kWh/person/y (p154 of HoCI, 2021)
    - Home energy consumption target is approx. equiv. to 10kWh/person/day – can be monitored via a smart meter or energy bills
- Home energy supply
    - Most common local renewable energy technologies are solar photovoltaic panels and solar hot water panels.
    - Use of wood fuel for heating can lead to other significant environmental problems (e.g. indoor/ outdoor air pollution), so is permissible only in limited cases.
- Embodied energy of home
    - Embodied energy of home includes estimates for maintenance (mostly older properties) and construction (mostly newer properties)
    - Current UK average floor space is 39m2/person (p154 of HoCI, 2021)
    - Home floor space measurement can be found on energy performance certificates - https://find-energy-certificate.digital.communities.gov.uk/

- Floor space arguably does not include home office space – if this leads to a reduction in employers' workspace

Targets: Food

Category	Individual targets	Carbon footprint (tCO2e/person/y)
Food	• Minimal animal foods, e.g. 100% plant food (vegan) diet • Minimal air-freighted foods • Minimal food waste • Minimal foods which contribute to deforestation	0.9
Total		***0.9***

- SGR estimates based on HoCI (2021) and Berners-Lee (2020). Full details to be published in early 2022.
- Reducing consumption of animals foods leads to largest reductions – and also easiest to do due to better labelling (air-freighted foods or foods contributing to deforestation are generally not labelled)
- 'Minimal' = small amounts of higher carbon foods can be included occasionally

Targets: Goods

Category	Individual targets	Carbon footprint (tCO2e/person/y)
Possessions	• Low overall consumption of bought goods • Majority of bought goods second-hand/ reconditioned, especially high carbon goods such as electronic equipment, furniture • A very limited number of new high carbon goods, if kept for an adequate lifetime • A limited number of new medium carbon goods, if kept for an adequate lifetime, e.g. clothes, shoes • Minimal consumption of new very high carbon goods, e.g. high-cost jewellery, commercial cut flowers	0.1
Pets	• Zero large or meat-eating pets (e.g. horses, dogs/ cats on meat diet)	0.0
Total		***0.1***

- SGR estimates based on HoCI (2021) and Berners-Lee (2020). Full details to be published in early 2022.
- Suggested minimum lifetimes for new high carbon goods: e.g. laptop/ mobile phone for at least 5y, TV/ washing machine for at least 10y, furniture for at least 15y

Targets: Services & leisure

Category	Individual targets	Carbon footprint (tCO2e/person/y)
Services	All savings/ loans with low carbon finance companies	0.2
Leisure	Less than 5 weeks' (holiday) accommodation in self-catering/ eco-friendly hotels	0.1
Total		***0.3***

- SGR estimates based on HoCI (2021) and Berners-Lee (2020). Full details to be published in early 2022.
- Camping is another low carbon option for holidays

Transition actions – on the way to 2030

Category	Individual targets	Carbon footprint (tCO2e/person/y)
Personal transport	• Ownership of battery electric vehicle, BEV (small/ medium), travelling less than 2,000 km	+1.0
Food	• Minimal meat & fish, e.g. 100% plant and dairy food (vegetarian) diet	+0.4

- SGR estimates based on HoCI (2021) and Berners-Lee (2020). Full details to be published in early 2022.
- These actions would be consistent with the 2020 target of 3.9tCO2e (see slide 5)

Rare, very high impact decisions

- Arguably, the decision on whether & how many children to have is the largest factor in determining an individual's impact on the climate
- Impact is higher if you're wealthy and/or don't manage to embed low carbon behaviour in the child from an early age
- Major ethical issues involved

Very low carbon behaviours

General area	*Specific activity*
Socialising	• Talking with family and friends • Musical activities – singing, dancing and playing musical instruments • Dinner parties and picnics, with low-carbon food
Home skills	• Cooking, especially using seasonal vegetables and fruit • Gardening, including growing your own food • Home maintenance ('DIY') • Sewing and knitting • Repairing electronic goods
Exercise	• Walking, running and cycling • Playing outdoor sport, including swimming • Yoga and other home fitness
Shopping	• For low-carbon food • For second-hand goods
Other activities	Wildlife watching/ Foraging for wild plant-foods/ Reading, creative writing & story-telling/ Drawing, painting and other visual arts/ Playing games, e.g. computer, board games, cards/ Other learning and teaching/ Volunteering in local environment or community/ Meditation, resting & sleeping/ Listening to the radio, watching TV, listening to recorded music

- More details will be published in 2022
- Any other suggestions?

Co-benefits

- Numerous other benefits of climate action, e.g.
  - Ecological benefits due to:
    - Reductions in consumption of energy/ materials
    - Reductions in consumption of meat/ dairy/ fish
  - Health/ well-being benefits due to:
    - Better insulated homes
    - Increased time with family & friends
    - Reductions in consumption of meat/ dairy
  - Financial benefits due to:
    - Reductions in consumption of energy/ goods
  - Animal welfare benefits due to:
    - Reductions in consumption of meat/ dairy/ fish

The bigger picture

- Individual action is not a replacement for govt/ corporate action – indeed it can help spur further action at higher levels
- Lifestyle actions by leading figures – e.g. scientists – are important
  - SGR's Science Oath for Climate
- Behaviour changes by the wealthy often have a large impact
- Protest/ political action is very important
  - especially for those on lower incomes without as much buying power
- Publicising behaviour changes – without bragging – is essential
- Don't feel guilty – feel empowered!

- Science Oath for Climate – see: https://www.sgr.org.uk/projects/science-oath-climate

Thank you!
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