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How can the UK deliver net-zero emissions?

Monday 14 October | 12:00 – 13:00

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Introduction

Stuart Taberner

Dean for Interdisciplinary Research

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Piers Forster

Director, Priestley International Centre for Climate

Committee on Climate Change

28 October 2019

Net Zero

~~Chris Stark~~ Piers

Committee on Climate Change

Committee on Climate Change

2050 Net zero greenhouse gas emissions: **target**

Meeting Paris obligations: doing as much as possible to "limit warming to two degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius"

2050 Net zero greenhouse gas emissions: **actions**

1. Decarbonise: energy & agriculture and construction
2. Demand: efficiency, behaviour change
3. Negative emission solutions

2050 Net zero greenhouse gas emissions: **considerations**

1. International leadership
2. Urgent joined up cross-government action/decisions at scale and across scales
3. Public and industry engagement
4. Just transitions, co-benefits
5. Investment (money and skills)

Research Gaps

1. Resilient net-zero infrastructure
2. Linking targets, actions &outcomes
3. Land-use change: monitoring, modelling and farmers
4. System thinking solutions

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Chris Smith

Research Fellow

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Why we need a net-zero greenhouse gas target

Chris Smith

Priestley Centre / School of Earth and Environment

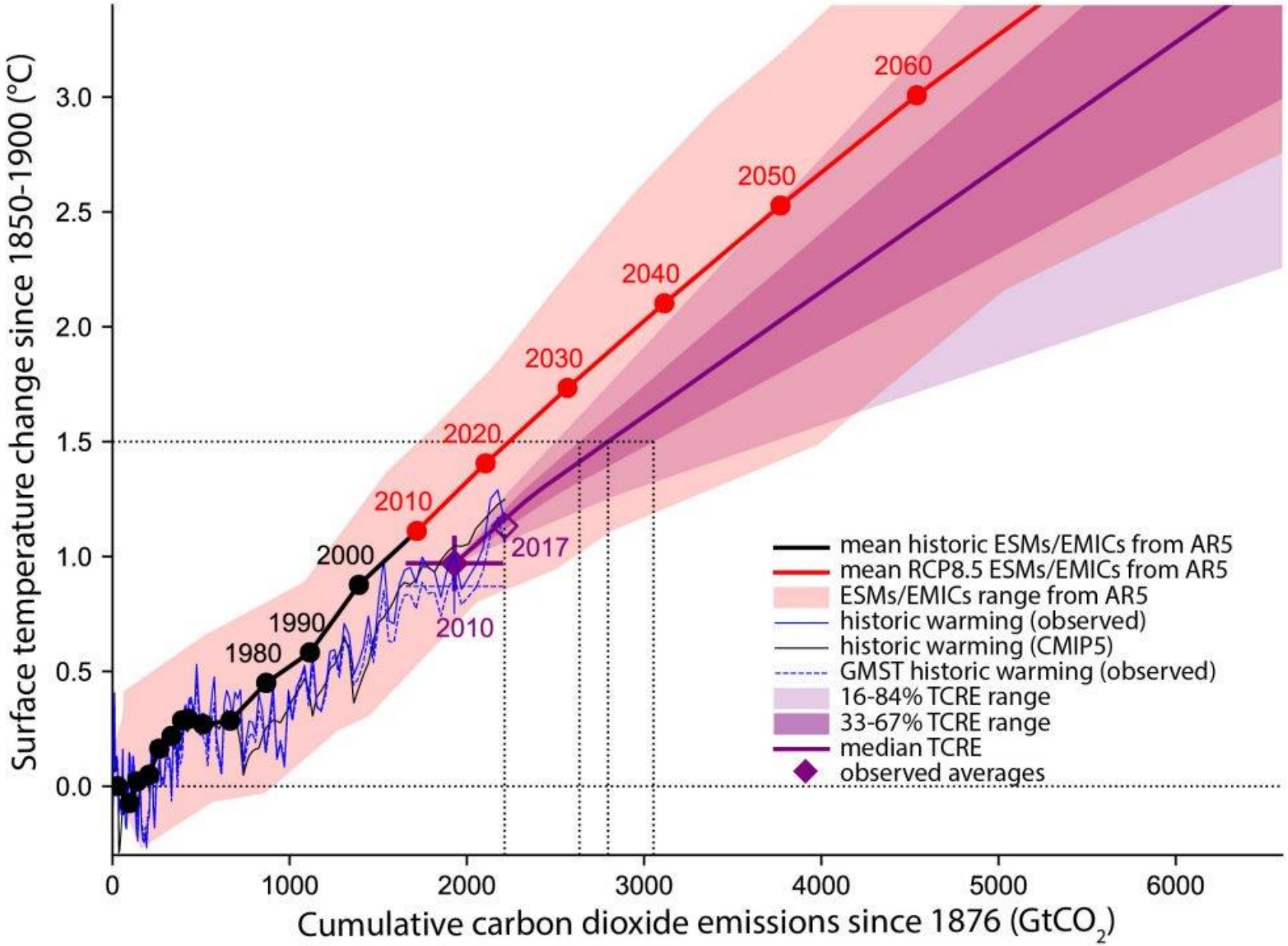
Surface temperature change since 1850-1900 (°C)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0
1000
2000
3000
4000
5000
6000
Cumulative carbon dioxide emissions since 1876 (GtCO2)
1980
1990
2000
2010
2020
2030
2040
2050
2060
2017
2010
mean historic ESMs/EMICs from AR5
mean RCP8.5 ESMs/EMICs from AR5
ESMs/EMICs range from AR5
historic warming (observed)
historic warming (CMIP5)
GMST historic warming (observed)
16-84% TCRE range
33-67% TCRE range
median TCRE
observed averages

Fig. 2.3, SR1.5

Differences in non-CO_2 warming

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Range of non-CO_2 contribution to 1.5°C carbon budget

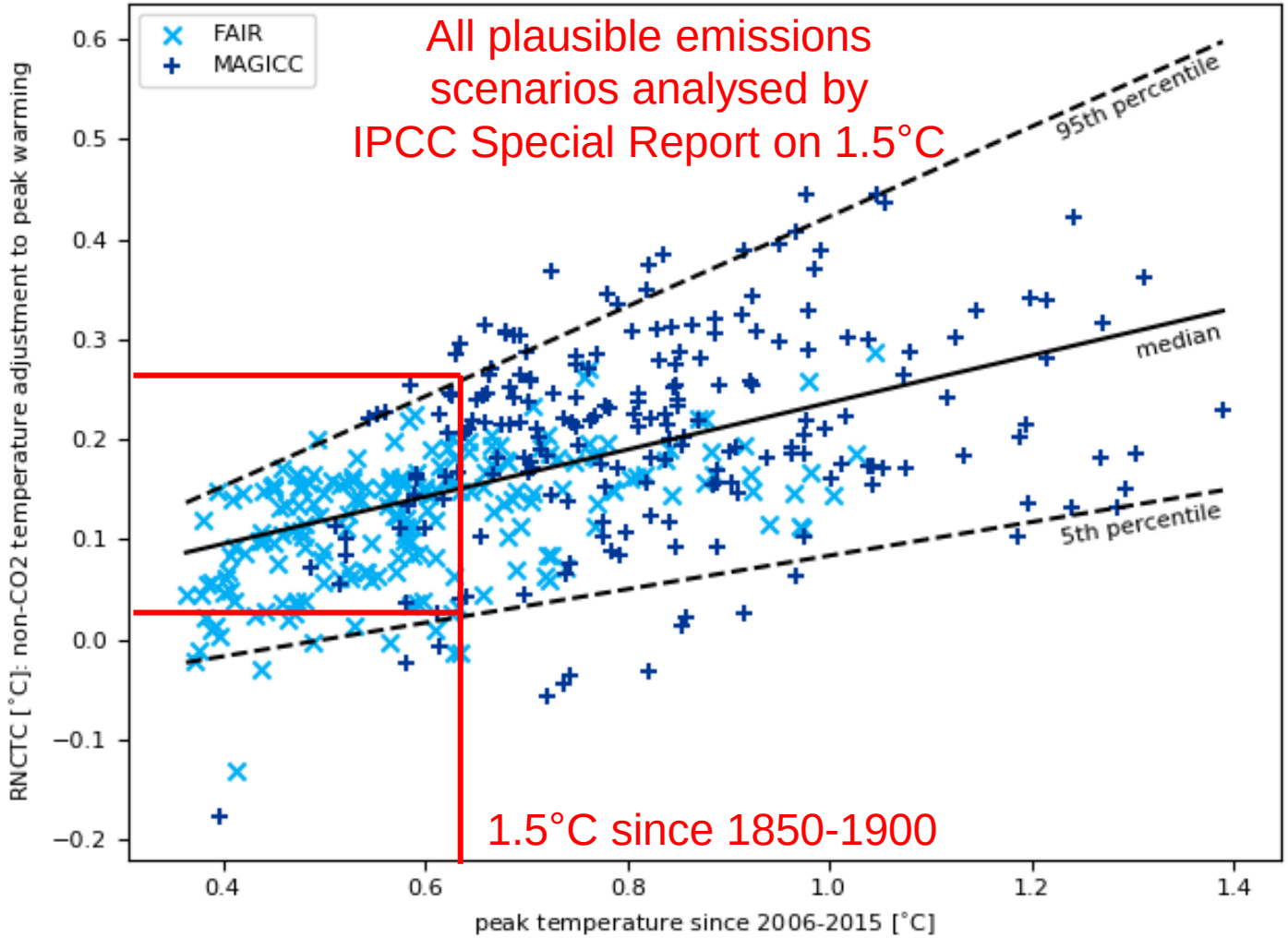

Fig. 2.A.4, SR1.5

2050 global net-zero greenhouse gas emissions

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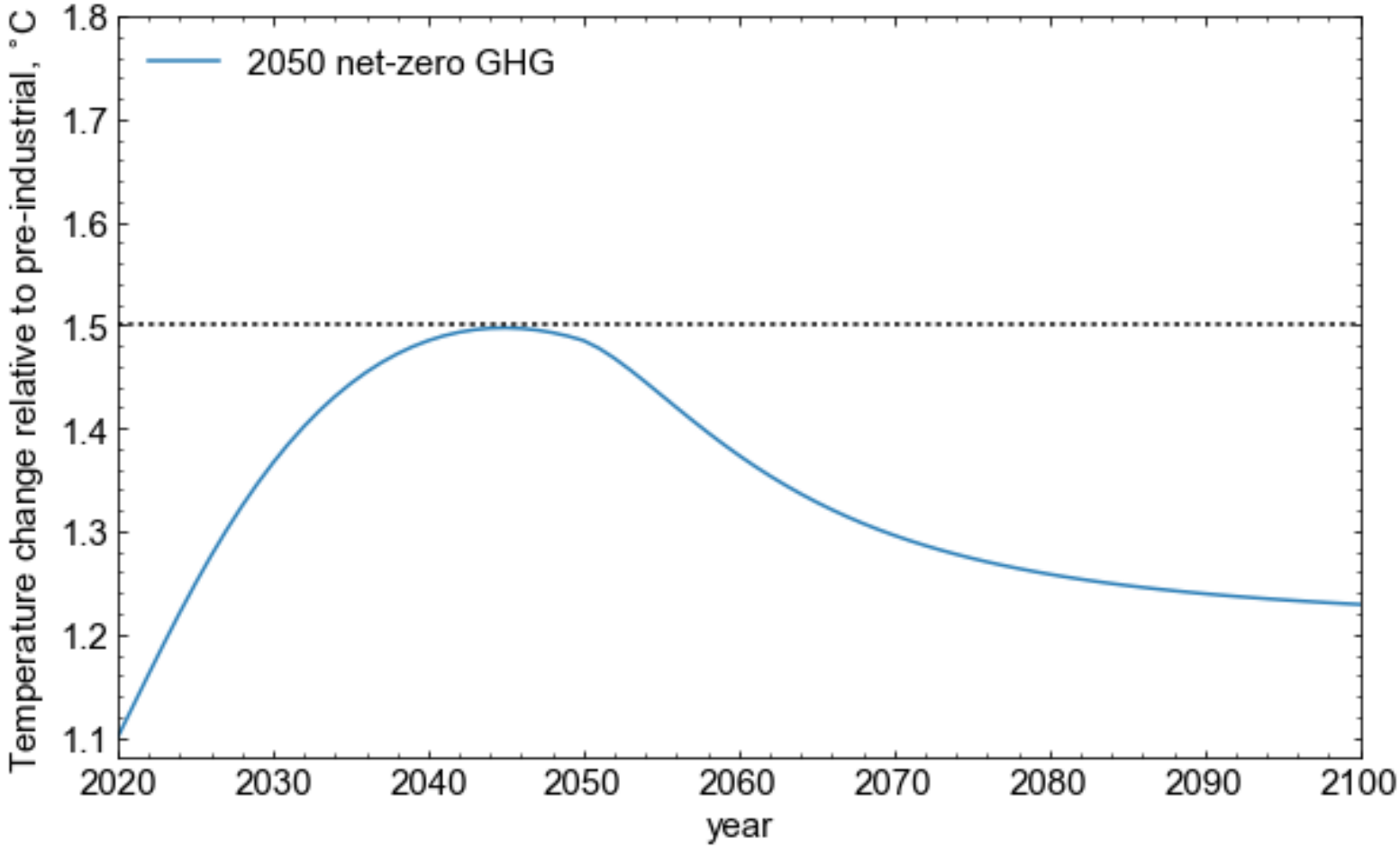

2050 global net-zero CO_2 emissions

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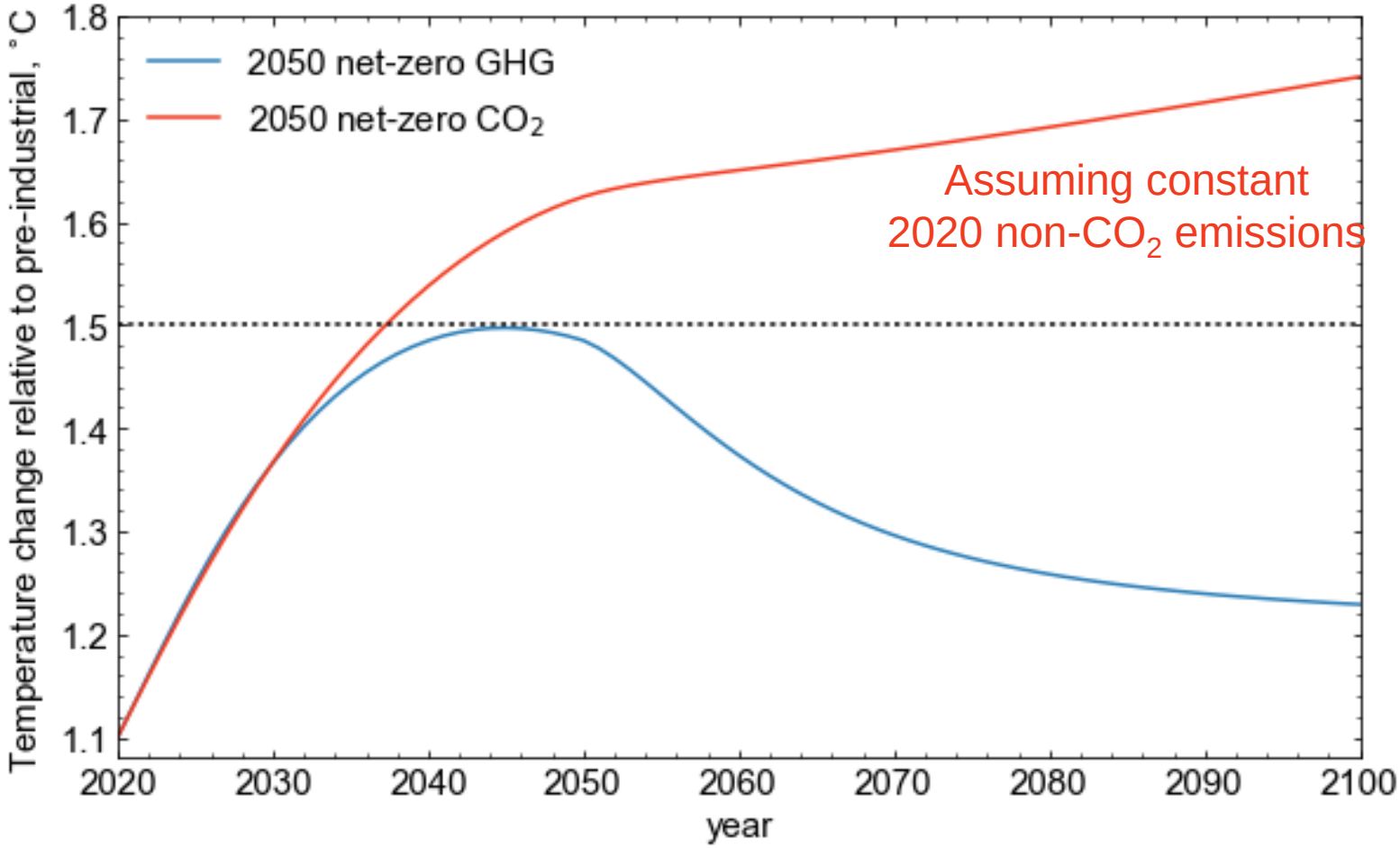

How do we equitably account for the climate effects of different timescales, sources and lifetimes of all greenhouse gas and air pollution emissions globally?

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Peter Taylor

Chair in Sustainable Energy Systems

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The Expert Advisory Group on Reaching Net-zero Emissions in the UK

Peter Taylor

School of Chemical and Process Engineering
School of Earth and Environment

Some highlights from the recommendations

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1. A transition to a net-zero UK economy is technically achievable.

2. There is a need for a fundamental change in the UK policy approach to the low-carbon transition – *from the current piecemeal approach ……to an explicitly economy-wide approach. The promotion of GHG emissions monitoring to the same status as economic monitoring. A flexible and responsive approach to policy that allows quick action and adaptation to take place if there is insufficient progress towards net-zero.*

3. The 2050 target should be implemented as a 100% reduction in GHGs from the UK on a production basis. *When monitoring progress towards net-zero, production and consumption emissions should be reported at the same time.*

Some highlights from the recommendations

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4. All options that can help to meet a net-zero target domestically should be explored fully. *The CCC analysis includes conservative assumptions about demand reduction. Therefore an important source of flexibility could be greater ambition on the demand side.*

5. Net-zero should not simply mean a shift in long-term aspirations, *with implementation left to future governments and generations. It also requires government and other actors to do things differently in the next five years.*

6. The costs and benefits of a transition to net-zero, including distributional impacts, require much more attention. *[It is] essential to ensure the UK implements a 'just transition' to net-zero so that costs and benefits are fairly shared between income groups, industries and regions – as well as between current and future generations.*

Key research gap

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- There are many……

- What does a “just transition” look like and how can it be achieved?

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Anne Owen

University Academic Fellow

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Accounting for consumption AND delivering net zero

Dr Anne Owen

SRI

What happens to the UK's reduction trajectory when we include imports?

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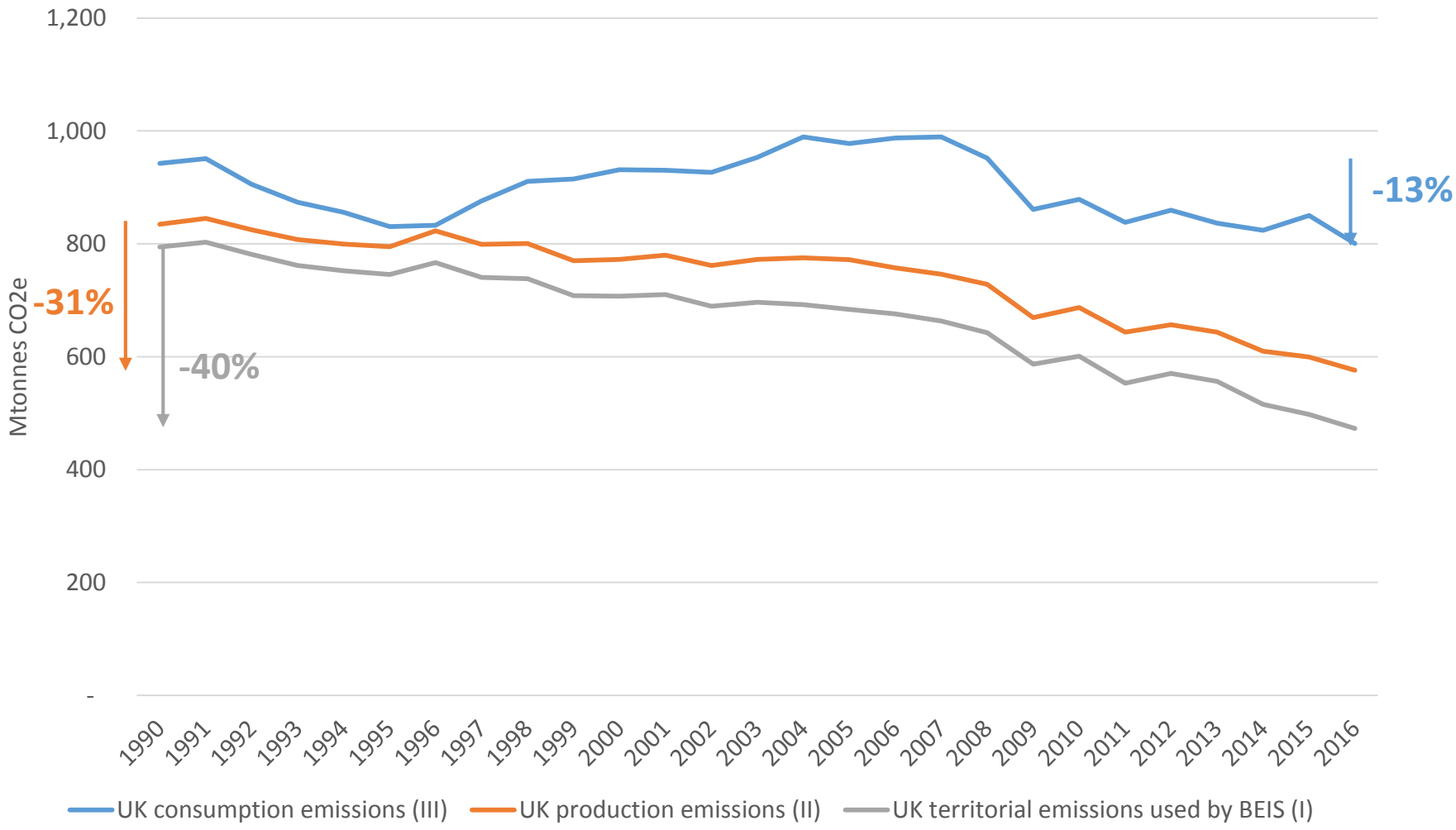

Breaking down the consumption emissions by source, product and end user

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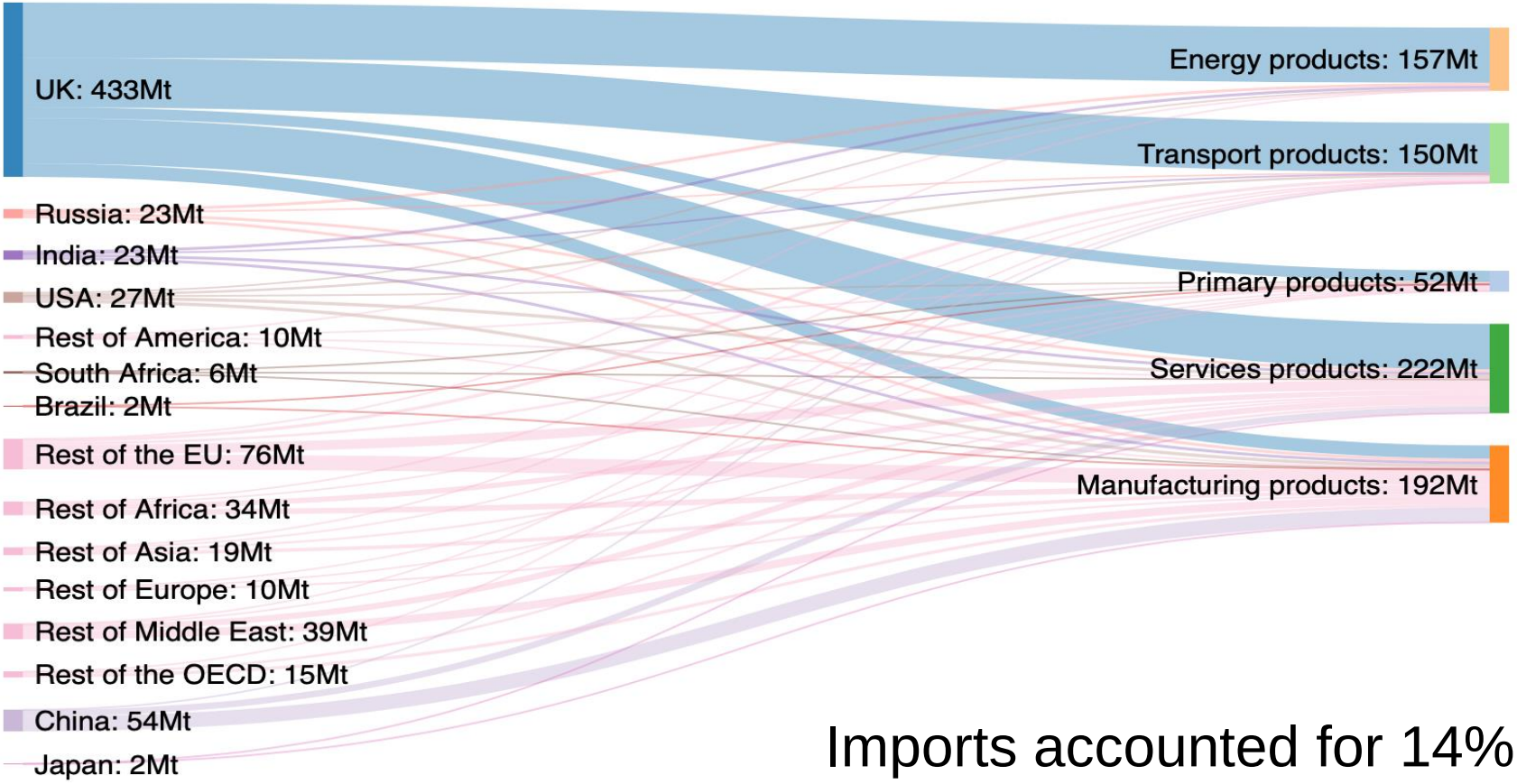

Imports accounted for 14% of the UK's footprint in 1990, now it's 46%

Breaking down the consumption emissions by source, product and end user

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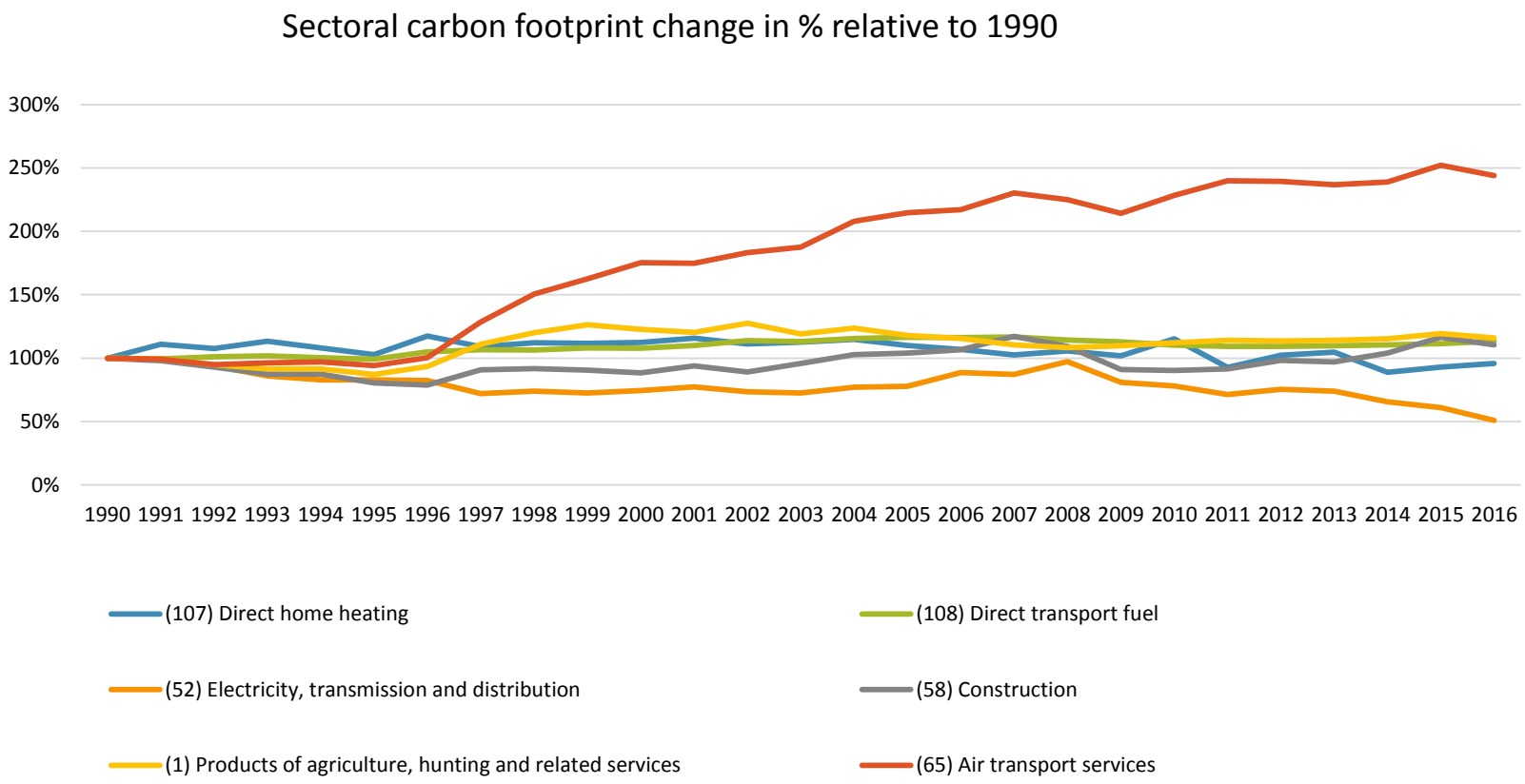

Emissions from air travel have increased by 246%

Breaking down the consumption emissions by source, product and end user

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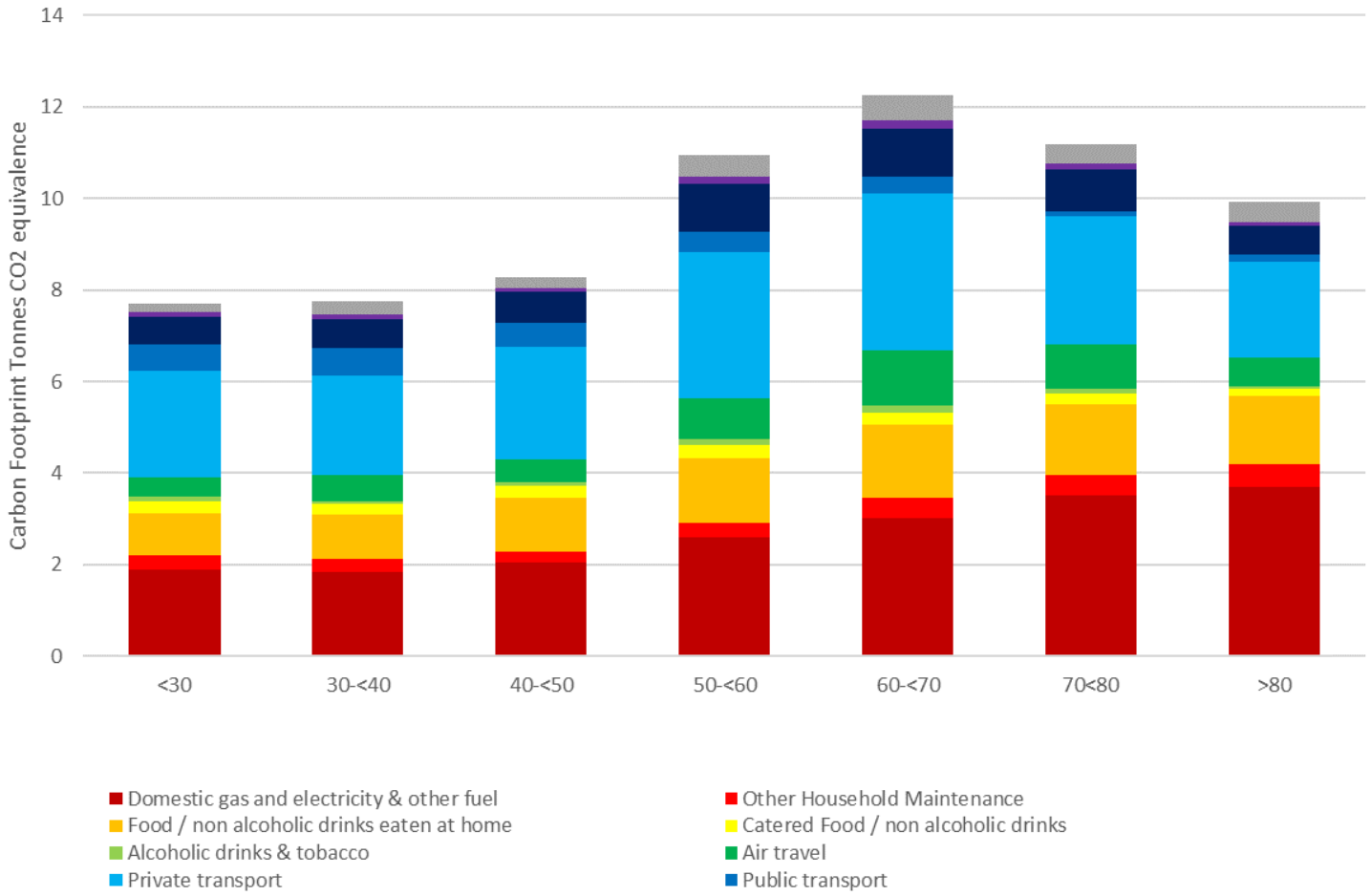

Older individuals have higher carbon footprints

1. We may potentially trade with nations whose economies rely more heavily on fossil fuels

2. Emissions from air travel are increasing

3. An aging population may mean increases in emissions

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Andy Gouldson

Professor of Environmental Policy

Chair of the Leeds Climate Commission

Research gaps

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- Resilient net-zero infrastructure
- Linking targets, actions &outcomes
- Land-use change: monitoring, modelling and farmers
- System thinking solutions
- How do we equitably account for the climate effects of different timescales, sources and lifetimes of all greenhouse gas and air pollution emissions globally?
- Accounting for Consumption Accounts in the net-zero calculations
- What does a “just transition” look like and how can it be achieved?
- Building a social license for transformative change

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Q&A

Chair: Stuart Taberner

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Net-zero research at Leeds:

climate.leeds.ac.uk/net-zero