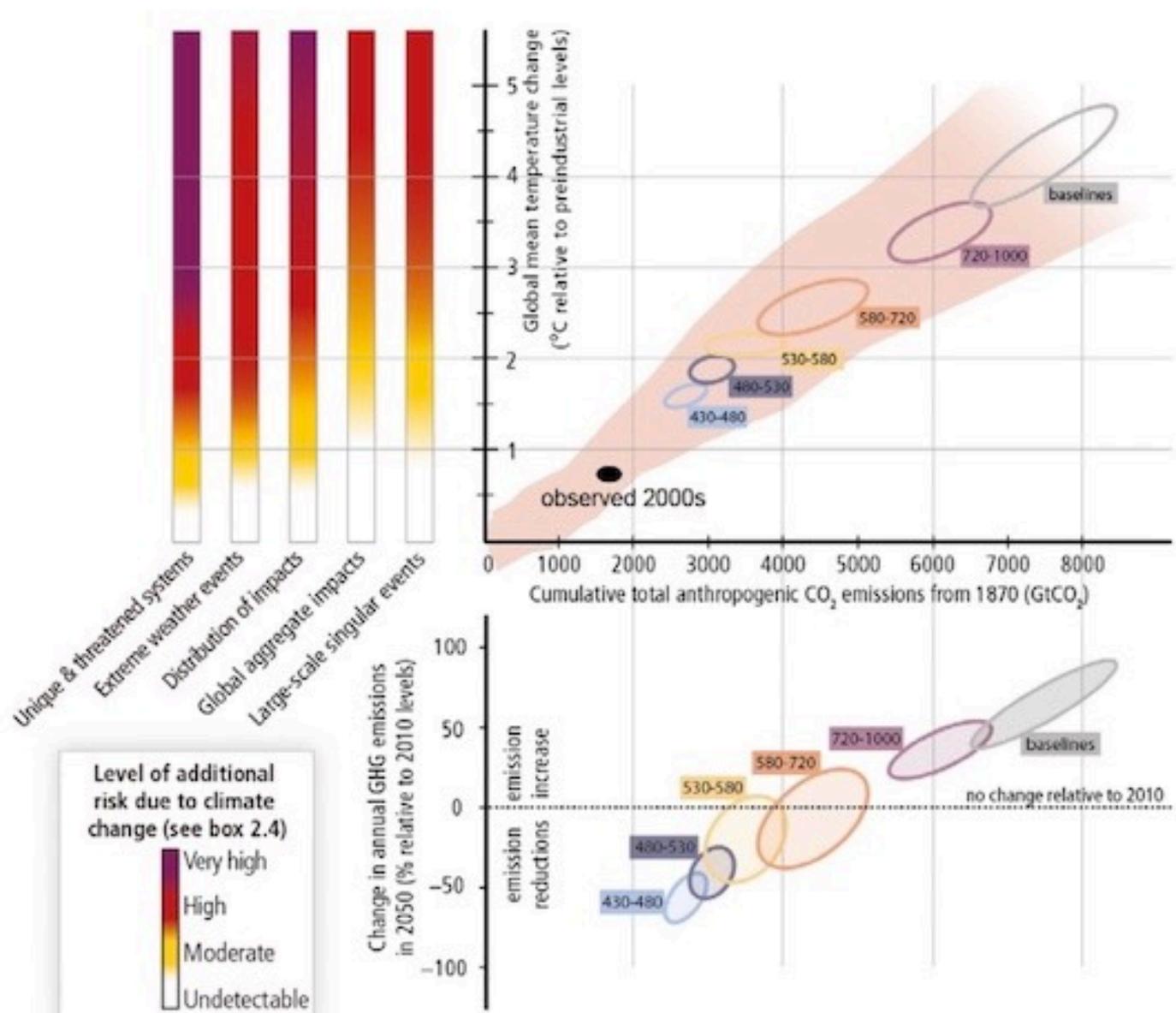# Climate Action Training - Additional Content

Identify education activities to make best use of i4A cards and website;
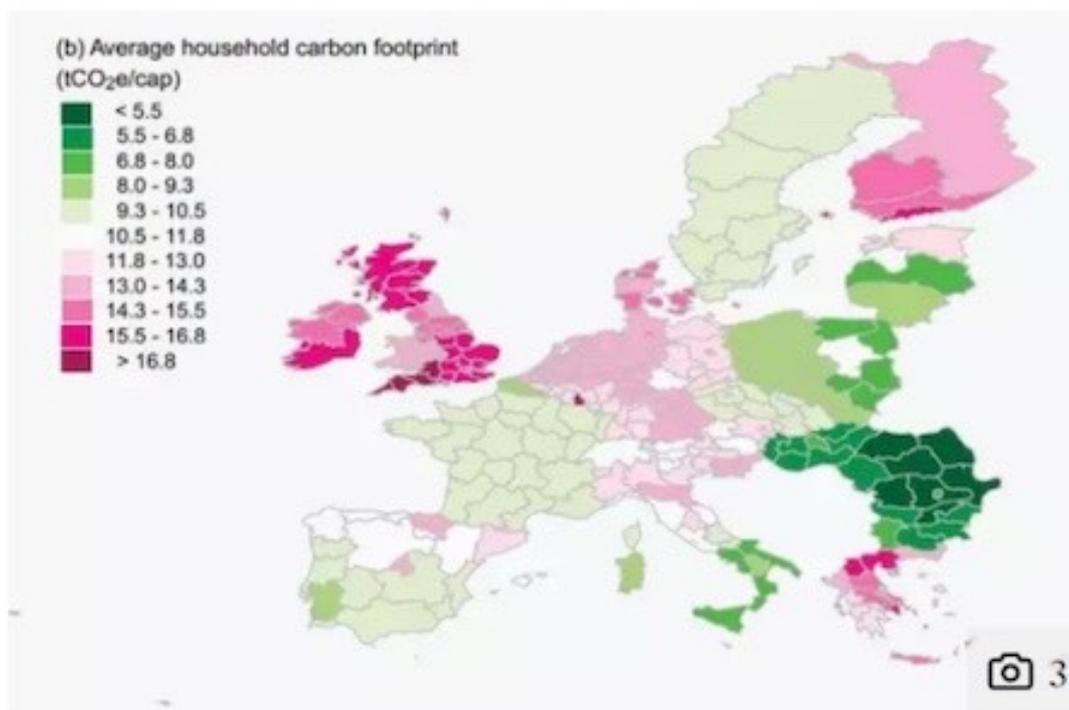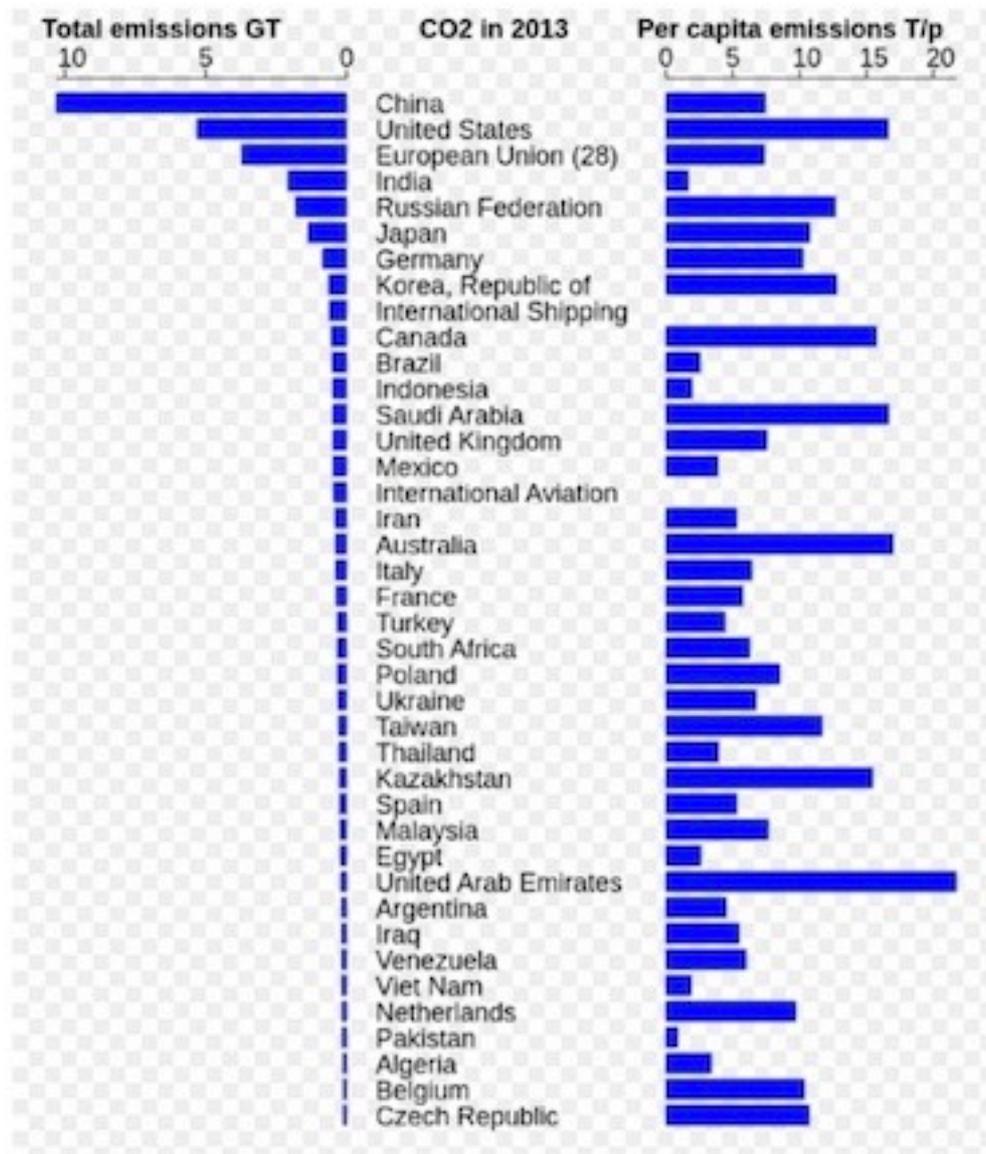
- See Appendix for 52 Actions list

Learning Objective 1: Understand climate impacts relevant to the geographic, cultural and economic situation

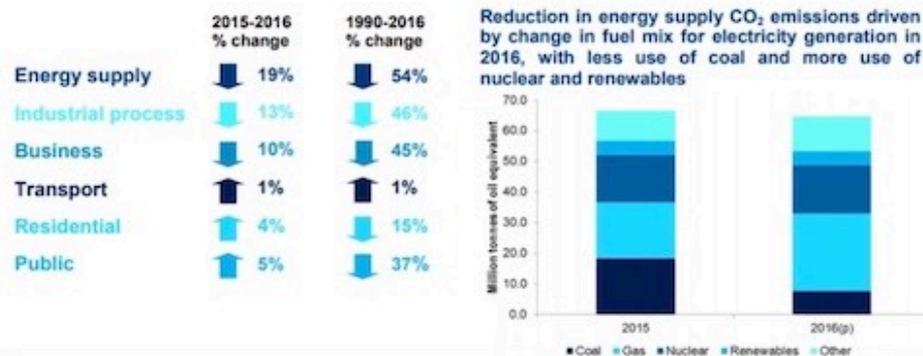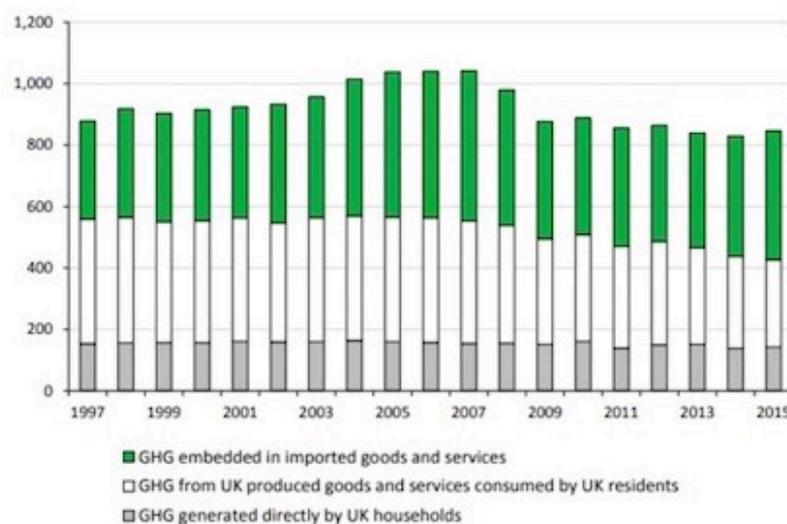(A) Risks from climate change... (B) ...depend on cumulative CO₂ emissions...

(C) ...which in turn depend on annual GHG emissions over the next decades

Total emissions GT | **CO2 in 2013** | **Per capita emissions T/p**

10   5   0 | | 0   5   10   15   20

China
United States
European Union (28)
India
Russian Federation
Japan
Germany
Korea, Republic of
International Shipping
Canada
Brazil
Indonesia
Saudi Arabia
United Kingdom
Mexico
International Aviation
Iran
Australia
Italy
France
Turkey
South Africa
Poland
Ukraine
Taiwan
Thailand
Kazakhstan
Spain
Malaysia
Egypt
United Arab Emirates
Argentina
Iraq
Venezuela
Viet Nam
Netherlands
Pakistan
Algeria
Belgium
Czech Republic

(b) Average household carbon footprint
(tCO_2e/cap)

< 5.5
5.5 - 6.8
6.8 - 8.0
8.0 - 9.3
9.3 - 10.5
10.5 - 11.8
11.8 - 13.0
13.0 - 14.3
14.3 - 15.5
15.5 - 16.8
> 16.8

Average household carbon footprint in tonnes of carbon dioxide (Ivanova et al,
Environmental Research Letters)

Figure 1 Greenhouse gas emissions associated with UK consumption 1997 to 2015

Million tonnes CO_2 equivalents

- GHG embedded in imported goods and services
- GHG from UK produced goods and services consumed by UK residents
- GHG generated directly by UK households

	2015-2016 % change	1990-2016 % change
Energy supply	19%	54%
Industrial process	13%	46%
Business	10%	45%
Transport	1%	1%
Residential	4%	15%
Public	5%	37%

Reduction in energy supply CO_2 emissions driven by change in fuel mix for electricity generation in 2016, with less use of coal and more use of nuclear and renewables

■ Coal ■ Gas ■ Nuclear ■ Renewables ■ Other

Influences of key factors: Climate + Population pattern + Lifestyle

Climate:
1. Hot climate e.g. Texas – vast energy use for cooling buildings in hot climate developed countries
2. Temperate climate e.g. UK, NW USA – high energy use for heating and cooling buildings in temperate climate developed countries
3. Cold climate e.g. Canada, Norway – vast energy use for heating buildings in cold climate developed countries
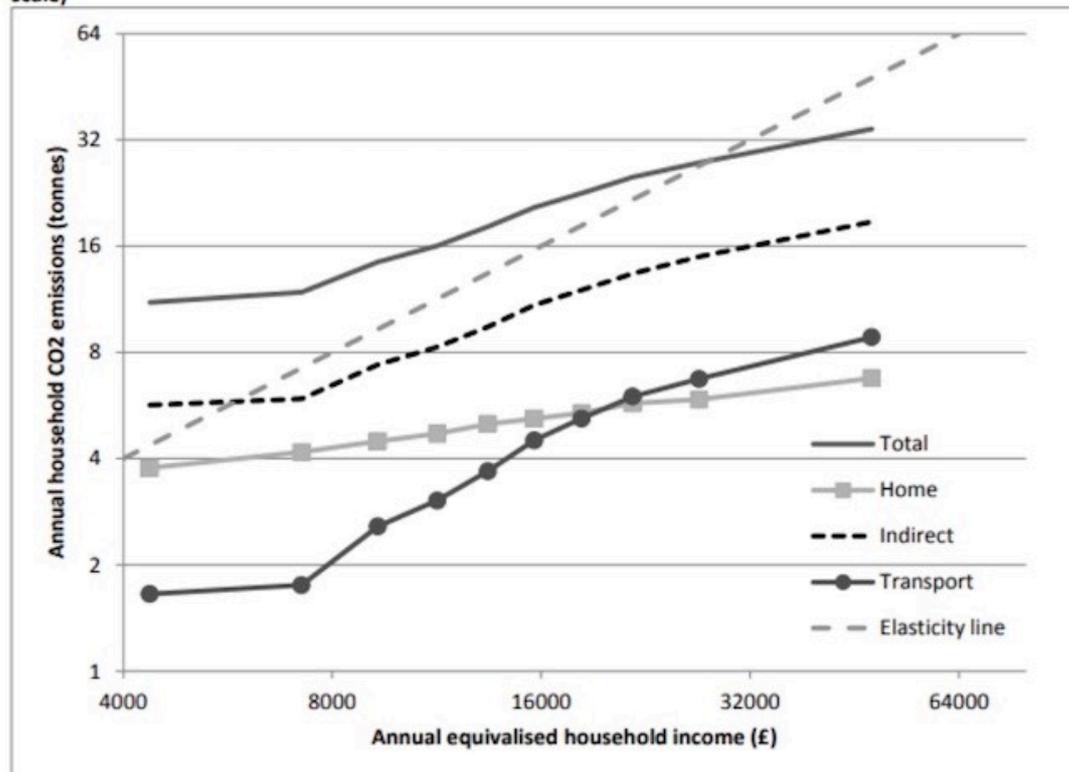
Population patterns:
1. Concentrated population / urban – London, Mexico City, Hong Kong, New York
2. Suburban
3. Dispersed population / rural – Scotland vs Australia vs Canada – much higher energy use for travel and transport of good to meet needs; higher infrastructure impacts / person for energy, communications, utility services etc.

Lifestyle:
1. Low income / low consumption – typically lower impact lifestyles, more likely to be impacted by climate change
2. Middle income / middle consumption – typically high impact lifestyles
3. High income / high consumption – typically very much higher impact lifestyles, much less likely to be impacted by climate change

Figure 1: Annual equivalised household income and household CO2 emissions by emission area (log – log scale)

Note: The graph plots mean household CO2 emissions by mean income at each income decile on log scales. The dashed "elasticity" line shows a 1% increase in household CO2 emissions if income increases by 1%.

Breakdown of major contributions for 'average' / typical lifestyles, for the kind of participants, climate / country, etc you are catering for:

1. Food choices
2. Home & buildings choices
3. Energy supply choices
4. Travel & transport choices
5. Leisure & holiday choices
6. Consumption and communication choices
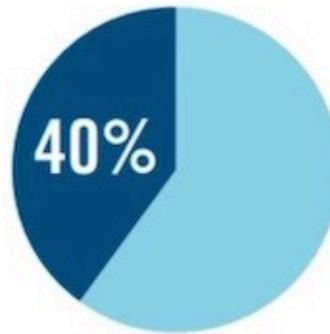7. Money choices
8. Work-life choices

The government-funded Carbon Trust estimates of the annual carbon footprint of the average Briton = 10.92 tons of CO2 - roughly half of the 19 tons of CO2 produced each year by the average American. It's own way of breaking down household emissions, includes emissions associated with the NHS and education – and has 'recreation' at three times that of Aviation, which seems difficult to explain without much more detailed information about how they have arrived at these calculations.
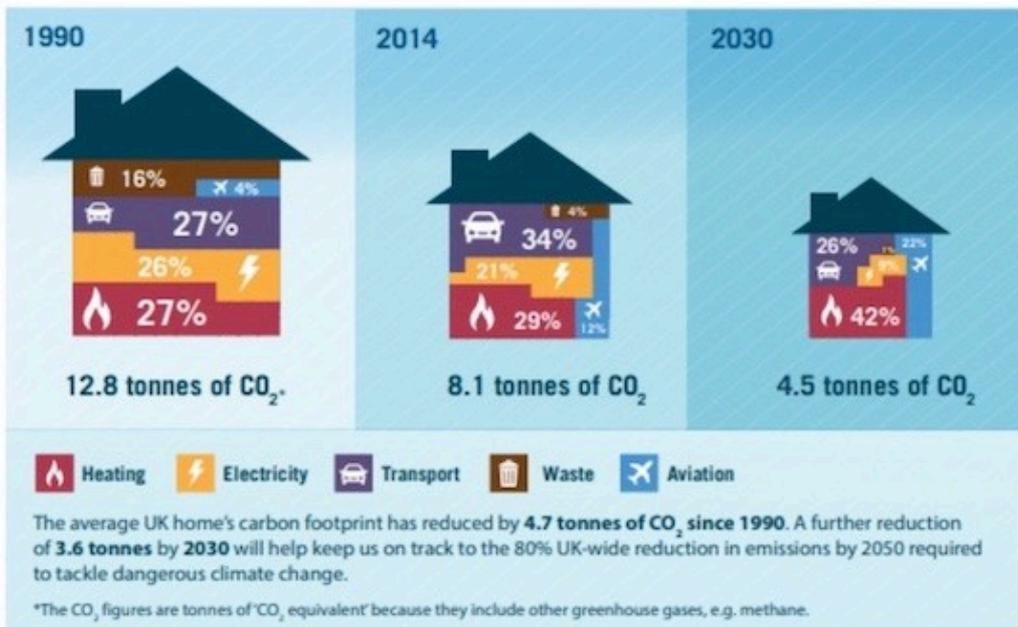
Committee on Climate Change

The Fifth Carbon Budget
How every household can help reduce the UK's carbon footprint

40% of UK emissions come from households.
This means our homes have an important part to play in meeting the 2030 emissions reductions in the Fifth Carbon Budget.

40%

The path from 1990 to 2030

1990
- 16%
- ✈ 4%
- 🚗 27%
- 26%
- 🔥 27%

12.8 tonnes of CO₂.

2014
- 🚗 34%
- 4%
- 21%
- 🔥 29%
- ✈ 12%

8.1 tonnes of CO₂

2030
- 26%
- 22%
- 🚗 7% ✈
- 🔥 42%

4.5 tonnes of CO₂

🔥 Heating ⚡ Electricity 🚗 Transport 🗑 Waste ✈ Aviation

The average UK home's carbon footprint has reduced by **4.7 tonnes of CO₂ since 1990**. A further reduction of **3.6 tonnes** by **2030** will help keep us on track to the 80% UK-wide reduction in emissions by 2050 required to tackle dangerous climate change.

*The CO₂ figures are tonnes of 'CO₂ equivalent' because they include other greenhouse gases, e.g. methane.

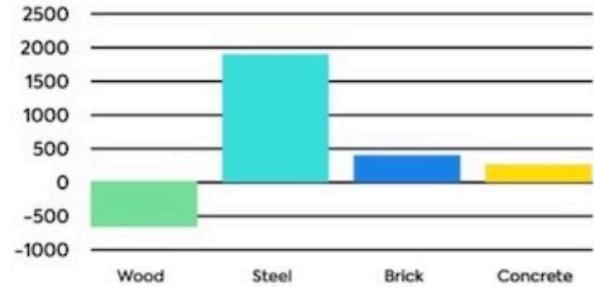|	Tonnes of CO2	% of total emissions
Recreation	1.95	19%
Heating	1.49	14%
Food	1.39	13%
Household	1.37	13%
Hygiene	1.34	13%
Clothing	1	9%
Commuting	0.81	8%
Aviation	0.68	6%
Education	0.49	5%
Phones	0.01	0%
Total	**10.53**	**100%**

Average Household CO2 Emissions - Carbon Trust

Legend: ■ Recreation ■ Heating ■ Food ■ Household ■ Hygiene ■ Clothing ■ Commuting ■ Aviation ■ Education ■ Phones

What your house is built from also has a huge effect on its carbon footprint. Most houses in the UK are built out of brick, with a concrete foundation. It takes a quarter of a tonne of CO_2 to create a tonne of brick, and even more for steel and other house elements.
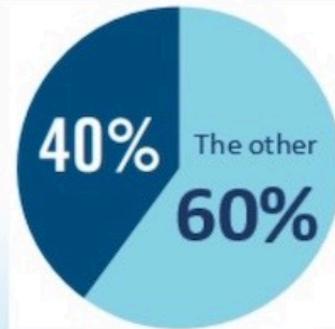
Kg of CO_2 created (or stored) to create each tonne of building materials

As a result, a typical masonry house in the UK takes between 50 and 80 tonnes of CO2 to build.

Completing the picture

The rest of the economy can reduce its emissions too, through increased efficiency, decarbonising the power supply and reducing emissions from manufacturing and workplaces.

40% The other 60%
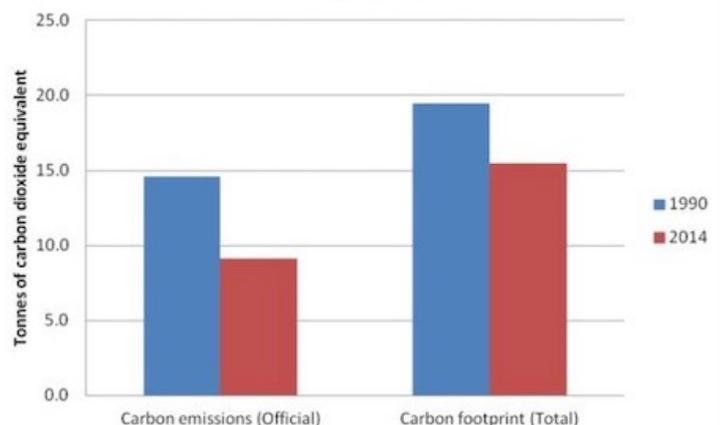
Which is why work-life is SO important to include too …!

But …. Dr Stuart Parkinson, of Scientists for Global Responsibility, analysed the 2016 data on our UK contribution to climate change:
Source: http://www.sgr.org.uk/resources/how-big-average-briton-s-carbon-footprint-really

This indicates that our actual carbon emissions and carbon footprint per head in the UK are probably about 30%-50% higher than official estimates.

The twist in the tale comes when we consider the average carbon footprint per head needed to keep global temperature change below 2°C. This level is about 3t per head. [13] Hence the UK still needs to cut its levels by 80%. [14]

UK contribution to climate change per head of population

Learning Objective 2: Identify appropriate options for meaningful climate action relevant to that situation, including understanding the resource implications of those choices;

Role of design and strategy:

1. Use a complete personal and community tool for minimising footprint
2. Put in place reversing mechanisms that build over time

	Home	Work	Community	Other
Reducing Emissions / Mitigation – Behaviour Change	Use the 52 Climate Actions cards and website Use the Climate Action training tools		Climate Action parties Climate Action supper club Climate Action purchasing groups	
Reducing Emissions / Mitigation – Technical Action	Use the 52 Climate Actions cards and website Use the Climate Action training tools			
Adaptation & Design for climate change • Buildings • Managed land • Ecosystems	Use the 52 Climate Actions cards and website Use the Climate Action training tools			
Sequestration / Binding Carbon 1. In soil 2. In grown timber 3. In buildings 4. Elsewhere	Use the 52 Climate Actions pack and website Use the Climate Action training tools			

How households can help reach the 2030 target

Heating

1 in 20 homes with a gas boiler could join a heat network, saving 2 tonnes of CO_2 per year.

1 in 4 homes currently using oil heating, and 1 in 3 homes using electric heating could switch to a heat pump, saving 3.2 tonnes of CO_2 per year and 0.8 tonnes of CO_2 per year respectively.

Electricity

Low-carbon generation could reduce emissions by 79%, saving 1.25 tonnes of CO_2 per year for the average home.

Transport

By using a more efficient petrol or diesel car, the average home could save 0.9 tonnes of CO_2 per year. A fully electric vehicle could save 2 tonnes per year.

The CCC estimates that 1 in 6 cars will need to be fully electric by 2030

Efficiency

By saving energy, for example through...

better insulation....

smarter lighting and appliances....

and smart heating systems....

...the average household could reduce its emissions by 0.6 tonnes of CO_2 per year. These measures could also save the average gas heated home £184 per year.

Aviation

CO_2 emissions per household from flying could stay the same because, although there are more journeys, aircraft are more efficient.
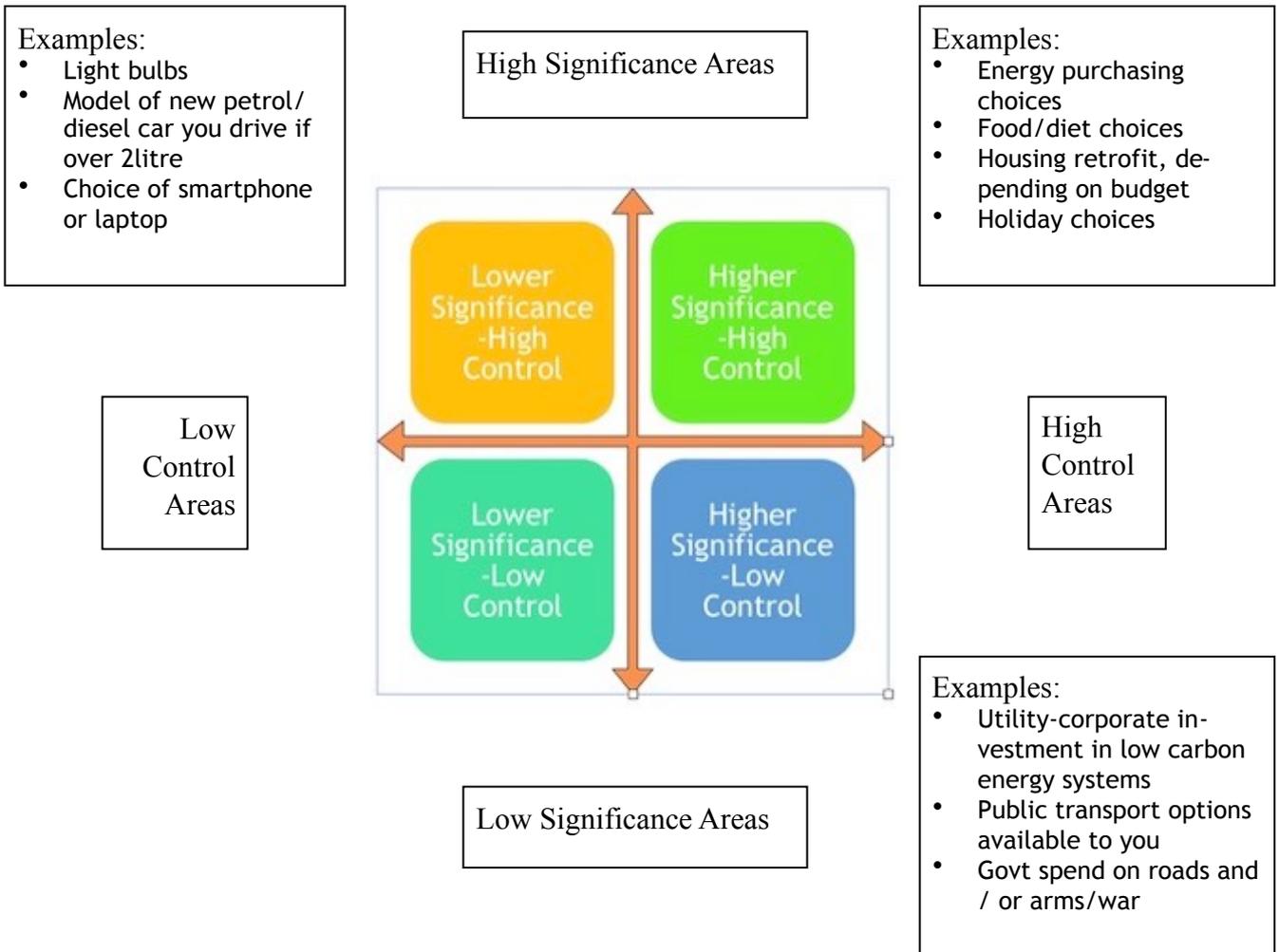
2014

2030

Waste

By reducing and sorting waste, emissions from the average home could fall by 0.25 tonnes of CO_2 per year.

Learning Objective 3: Understand relevant options that are applicable at: a) Personal / household, b) community or c) organisational levels;

Tool for choice of actions: Matrix of 'degree of significance' + 'degree of control'

Use it for each of the 52 Actions.

Examples:
- Light bulbs
- Model of new petrol/diesel car you drive if over 2litre
- Choice of smartphone or laptop

High Significance Areas

Examples:
- Energy purchasing choices
- Food/diet choices
- Housing retrofit, depending on budget
- Holiday choices

Lower Significance -High Control	Higher Significance -High Control
Lower Significance -Low Control	Higher Significance -Low Control

Low Control Areas

High Control Areas

Low Significance Areas

Examples:
- Utility-corporate investment in low carbon energy systems
- Public transport options available to you
- Govt spend on roads and / or arms/war

What you can control (direct effects):

The General Rule for Choices: both reduce the quantity of impacts <u>and</u> shift the quality of impacts from negative to positive (it's not an "either or")

- **Firstly: reduce consumption**

1. i.e. significantly reduce the energy demand & use in your home, particularly for heating (by much improved insulation) / cooling and hotwater

- **Secondly: green your supply**

2. i.e. change your supply to a 100% renewable energy supplier, and / or install your own renewable energy systems

3. even better, set up a community renewable energy company to give you greater control over your renewable energy supply and to supply more people locally, who might otherwise not switch to a 'green' supply, including businesses

- **Thirdly: reduce i) in-use (or operational) energy & carbon, and ii) embodied energy & carbon** and – and we need to reduce both, where it is important to do so (again, it's not an "either or" choice)

4. **In-use energy & carbon emissions (or operational In-use energy & carbon emissions): the amount of energy and carbon emissions produced from using the thing in question to the point when you use or consume it** - for example:

    i. A house or building – normally one of the largest proportions of our annual contributions to energy use / carbon emissions (around 25+%), particularly from heating/cooling and hotwater, significantly added to if you have a lot of large electrical consumer goods etc.

    ii. A car – a combination of your MPG and mileage, so much larger for an inefficient larger car, whether new or old/second hand

    iii. Food – relatively small, essentially how much energy you use to store, prepare / cook your food

    iv. Consumer goods – very much larger for inefficient larger appliances than smaller efficient appliances e.g. AAA* appliances

5. **Embodied energy & carbon: the amount of energy and carbon emissions required to produce and transport the thing in question to the point when you use or consume it, for example:**

    i. A house or building – a very large amount, much larger for a much larger building built of the same materials, very much larger for a building built of steel and cement with a lot of glass, compared to a timber structure with natural insulation materials and timber cladding

    ii. A car – large for a larger new car, less for a second-hand car if you are keeping its life going

    iii. Very much larger for fruit and veg (or meat) imported from the other side of the world compared to one grown locally or in your garden

    iv. Consumer goods – very much larger for a full height double door fridge than a half-height single door fridge

Specific choices:

1. Food choices:

   a) Shift to more of a plant-based diet or a wholly plant-based diet

   b) Shift any remaining meat eating to local/regional, and more chicken, less beef

   c) Grow and eat more of your own produce, and local/regional produce

   d) Shift to organic and natural produce, shift away from non-organic (chemical/agro-industrial) and processed produce and products

2. Transport and travel choices

   a) Reduce how far your travel – reduce journey lengths in general, and your overall distance travelled in each year (assuming your travel in the same ways)

   b) Reduce the impacts of your mode(s) of transport – how you travel, efficiency of your mode of transport etc

3. Energy choices

   a) 'what's the MPG of your home' – calculate an estimate of the kWh/m2/year (kilowatt hours per metre squared per year) for your home – this is a rough equivalent of the MPG of a car

   b) Significantly reduce the energy use of your home – heating & hotwater is typically 70% of our energy use in the UK.

4. Purchasing choices

   a) Shift to: local

   b) Shift to: less things

   c) Shift to: smaller / more efficient things

   d) Shift to: things made from natural / organic materials

   e) Shift to: things that will have a long life and are sturdy and repairable

   f) Shift to: second hand (if its efficient)

5. Money choices

   a) Shift to spending your money with green energy suppliers

   b) Shift to ethical banks that support greener building, greener energy, green food options etc

   c) Shift to a green mortgage option

   d) Shift to a) ethical investment, with positive climate action as a key criteria for your investment choices, and / or b) proactive investment, which positively seeks out climate positive investment options

   e) Shift to a green pension scheme

   f) Shift to ethical: phone and internet suppliers;

What you can influence (ripple effects)

i. General choices – support ethical / regenerative activity & business / minimize support non-ethical / destructive activity & business

ii. Community and pressure groups lobbying and influencing govt policy/working with local councils to enact practical actions
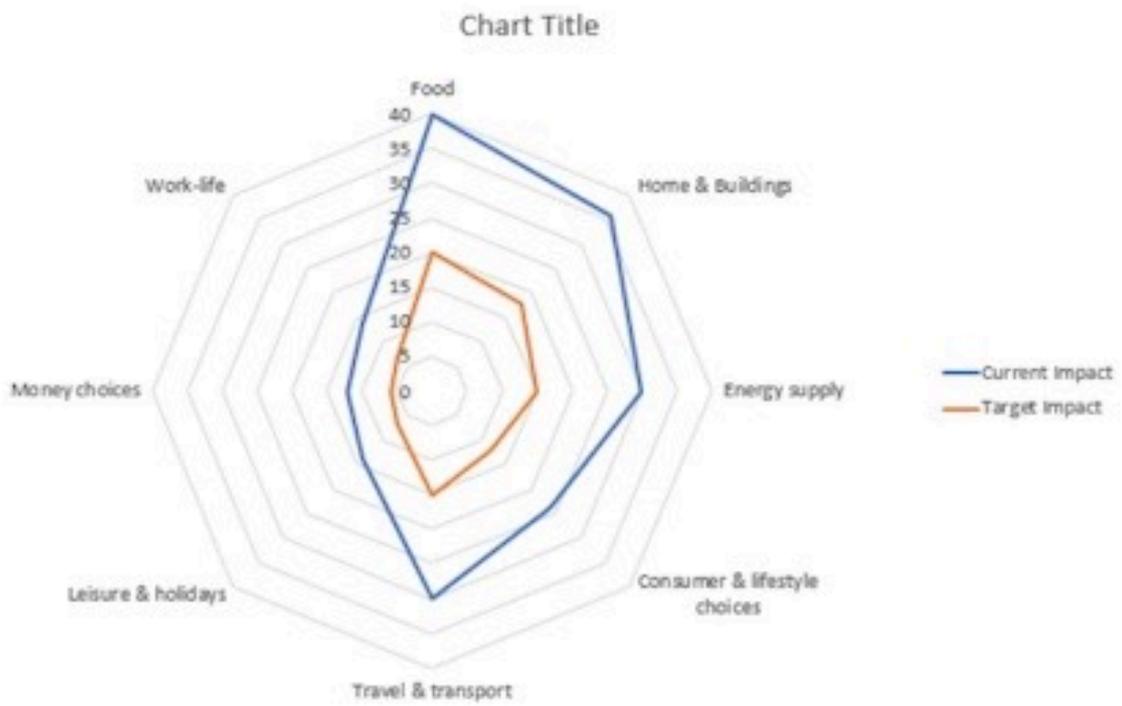
iii. Specific choices:

	Personal and Household Choices	Community Choices
Food choices – growing and eating		• **Local food growing projects: e.g. business or social enterprise** • Community garden • Local organic / wholefood purchasing groups / coop • Community shop • Climate friendly eating workshops / supper clubs / etc
Energy choices		• **Community renewable energy company (ESCo) – for supply and efficiency services**
Transport and travel choices		• **Reduce the need to travel by localising supply of products and services** • **Lobby for good public transport & sustainable travel options e.g. cycle paths** Car share scheme • Community bus scheme
Home & building choices		• **Good quality local green building / retrofit company/social enterprise** • Localised green building product supplies – e.g. structural timber, cladding, flooring etc • Community-led eco-housing schemes, to meet local housing need with eco-housing
'Consumer' product choices		• Local purchasing groups / coop • Community shop • Positive consumer clubs / deconsumption clubs
Leisure and holiday		• Great things to do locally / regionally • Great places to stay locally / regionally • 'Holiday at home' club / options
Money choices		• Local Credit Union – for greener purchases • Local purchasing coop(s)

• Work Choices

What you can control (direct effects):

What you can influence (ripple effects)

Climate Action Tool

Chart Title

Radar chart with axes: Food (40), Home & Buildings, Energy supply, Consumer & lifestyle choices, Travel & transport, Leisure & holidays, Money choices, Work-life. Scale: 0, 5, 10, 15, 20, 25, 30, 35, 40.

Legend: Current Impact, Target Impact

Climate Action Tool 2

Chart Title

Sunburst chart with segments: Home-Life (Stem 1, Stem 2), Leaf 1, Leaf 2, Leaf 3, Leaf 4, Leaf 5, Leaf 6; Work-Life (Stem 3, Stem 4), Leaf 8, Leaf 9, Leaf 10, Leaf 11; Commu-Life (Stem 5, Stem 6), Leaf 12, Leaf 13, Leaf 14, Leaf 15, Leaf 16.

Learning Objective 4: Know how to plan a realistic Climate Action Pathway for achievable implementation of meaningful climate actions;

1. Mitigation: SMART Climate Target: 50%+ carbon reduction – how can I / we realistically halve my / our carbon emissions? And over what period of time?

2. Adaptation: buildings; landscape and ecology; 'design for climate change';

3. Sequestration: in soil, trees, buildings.

4. 'Marginal Gains' for climate action.

5. DEVELOP SIMPLE ACTION PLAN HANDBOOK BASED ON ADJUSTING PERFORMANCE GAP HANDBOOK – 'CLOSING THE CARBON GAP: THE GAP BETWEEN WHERE WE ARE AND WHERE WE NEED TO BE'

Learning Objective 5: Know options for measuring, monitoring and reporting the benefits arising from implementation of climate actions.

b. Simple measures and estimates:

   v. Energy bills

      a. Heating and hotwater

      b. Electricity use

   vi. Annual mileage: keep a log of your annual travel by different modes that have a climate impact - specifically:

      a. Car (or van / lorry)

      b. Public transport:

         i. Train

         ii. Bus / coach

      c. Plane:

	52 Actions
1	Assess your climate risks
2	Avoid seasonal excess
3	Build soil health
4	Build with green materials
5	Buy less, make more
6	Campaign for a fossil fuel free future
7	Campaign for local adaptation
8	Catch the train not the plane
9	Change your heating
10	Choose green building standards
11	Choose renewable energy
12	Commit to climate action
13	Design for floods
14	Design for high winds
15	Design for wildfires
16	Eat less meat and dairy
17	Eat local, seasonal food
18	Enjoy the simple things
19	Farm regeneratively
20	Follow your passion
21	Generate your own electricity
22	Get water wise
23	Hold a party
24	Hold meetings online
25	Join a climate action group
26	Keep your cool
27	Learn to survive an emergency
28	Listen, share and learn
29	Live where you work
30	Look after your mental health
31	Make compost
32	Manage water in the landscape
33	Parent consciously
34	Pay producers properly
35	Plant an edible forest garden

36	Plant and nurture trees
37	Protect and restore forests
38	Protect and restore wetlands
39	Reduce food waste
40	Reduce your carbon footprint
41	Refuse, reduce, reuse, repair & recycle
42	Ride your bike
43	Share your home
44	Share your ride
45	Start a conversation
46	Study permaculture
47	Think differently
48	Use an electric vehicle
49	Use climate tolerant plants
50	Use efficient appliances
51	Use innovative technology
52	Warm your home efficiently

The 16 Solution families
1. Love **trees**
2. **Travel** wisely
3. Respect **food**
4. Value **waste**
5. Begin at **home**
6. Generate **power**
7. **Shop** conciously
8. **Build** green
9. Prepare for **floods**
10. Prepare for **drought**
11. **Campaign** for change
12. Build **community**
13. Get **growing**
14. Protect and restore **nature**
15. **Share** what you have
16. **Farm** for the future