

REN  ZERO

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Developing a Low Carbon Future for Business

Steps to Net Zero for Business

Developing a low carbon future for business

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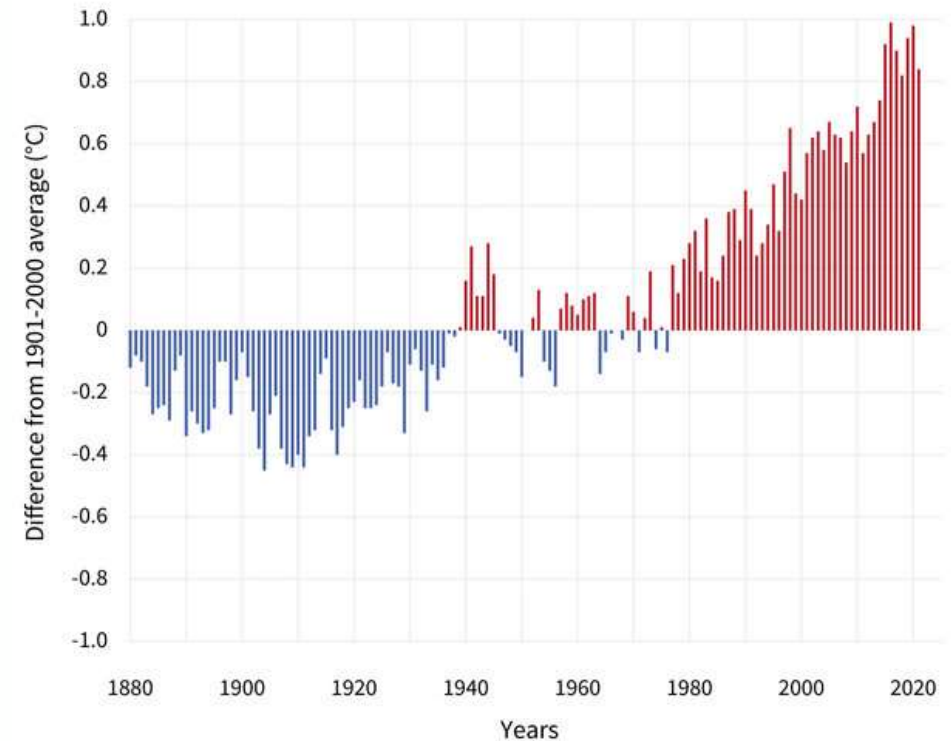


The Climate Emergency

- Natural heat exchange and dynamic climate cycles
- Heat exchange intervention by adding greenhouse gases
 - Small increase in global concentrations, disrupting climate cycles
 - Water, climate turbulence, environmental conditions, natural disasters
 - Human existence threatened, supplies of natural resources compromised
 - Increased demands on resources
 - Uneven supply/demand

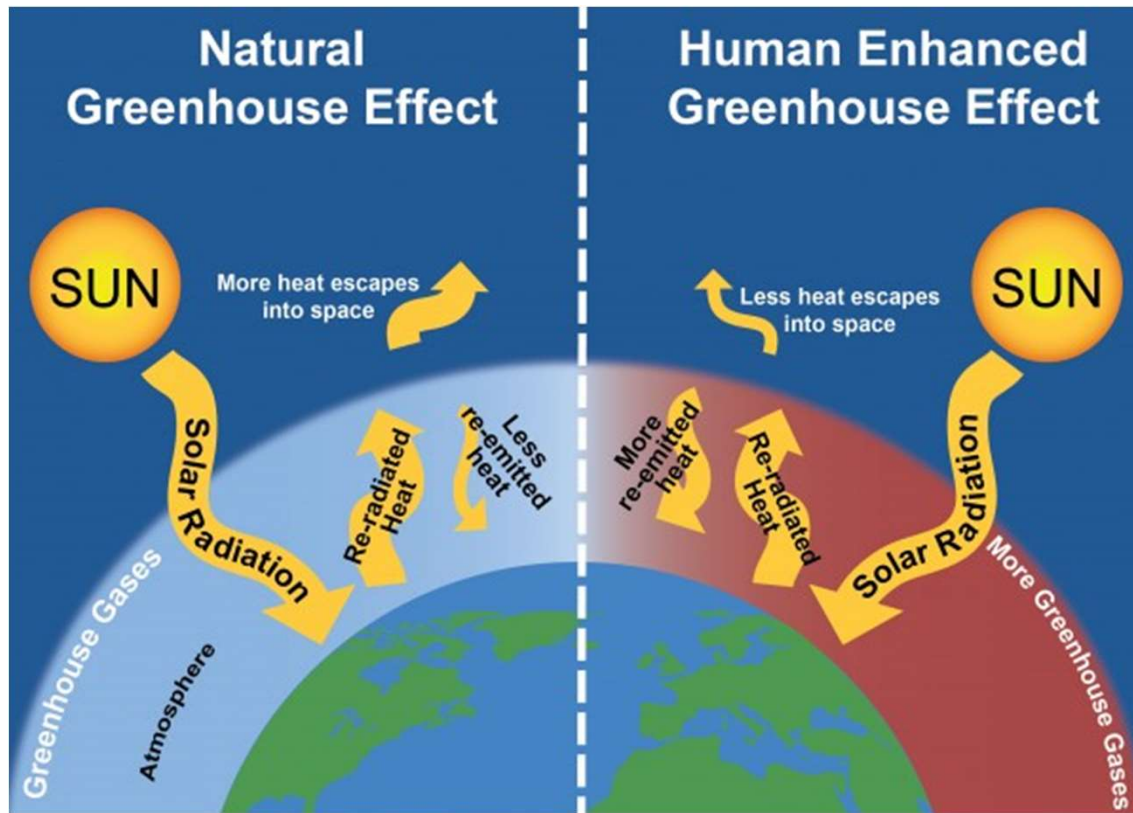
<https://www.climate.gov/news-features/understanding-climate/climate-change-global-temperature>

GLOBAL AVERAGE SURFACE TEMPERATURE



- Earth's temperature has risen by 0.08° Celsius per decade since 1880, but the rate of warming since 1981 is more than twice that: 0.18° C)per decade.
- 2021 was the sixth-warmest year on record based on NOAA's temperature data.
- Averaged across land and ocean, the 2021 surface temperature was 0.84 °Celsius warmer than the twentieth-century average of 13.9 °C and 1.04 °C warmer than the pre-industrial period (1880-1900).
- The nine years from 2013 through 2021 rank among the 10 warmest years on record.

The Greenhouse Effect



- Greenhouse gases (GHGs) naturally occur in Earth's atmosphere
- Without GHGs the average global temperature would be around 30°C lower than it is today.
- Human activity is increasing concentration of GHGs
- The carbon cycle
 - understanding links exchanging "C" between components of the earth system and cause-effect.

Climate change - can we fix it?

- Major human disruption is to **carbon exchange**
- Additional, strongly infrared active gases, smaller amounts add to thermal “shock”
- “Fix” to rapidly remove greenhouse gases, change processes releasing and improve other components:
 - land surface, marine conditions, human behaviour
- Patchy distribution, different political priorities
- Improved technology, reduced resource demand,
- Apply **systems thinking** in what we do



The St Fergus Gas Terminal is at the centre of the Acorn Project

<https://www.bbc.co.uk/news/uk-scotland-scotland-business-58960740>

<https://www.theacornproject.uk/>

What is Net Zero?

- Improving the balance between carbon emitted into the atmosphere and carbon removed from it.
 - Country balance needed by 2050 (2045!!!)
 - Not realistic to reach zero emission
 - Reduce/capture and *establish low C working – individual action plan*
 - *Step 1: your footprint, Step 2: reduce, verify*



<https://www.scottish-enterprise.com/learning-zone/business-guides/components-folder/business-guides-listing/low-carbon-strategy-for-business>

<https://www.nationalgrid.com/stories/energy-explained/what-is-net-zero>

Low Carbon Economic Opportunities

- More sustainable business models for all sizes of operation
- Early adopters win?
- Efficiencies and opportunities
 - Est.* 26 trillion USD gain by 2030, 65 million low carbon jobs by 2030, -700k premature deaths
- Carbon pricing, infrastructure, innovation, people-centred



* <https://www.wri.org/insights/low-carbon-growth-26-trillion-opportunity-here-are-4-ways-seize-it>

What is Low Carbon?

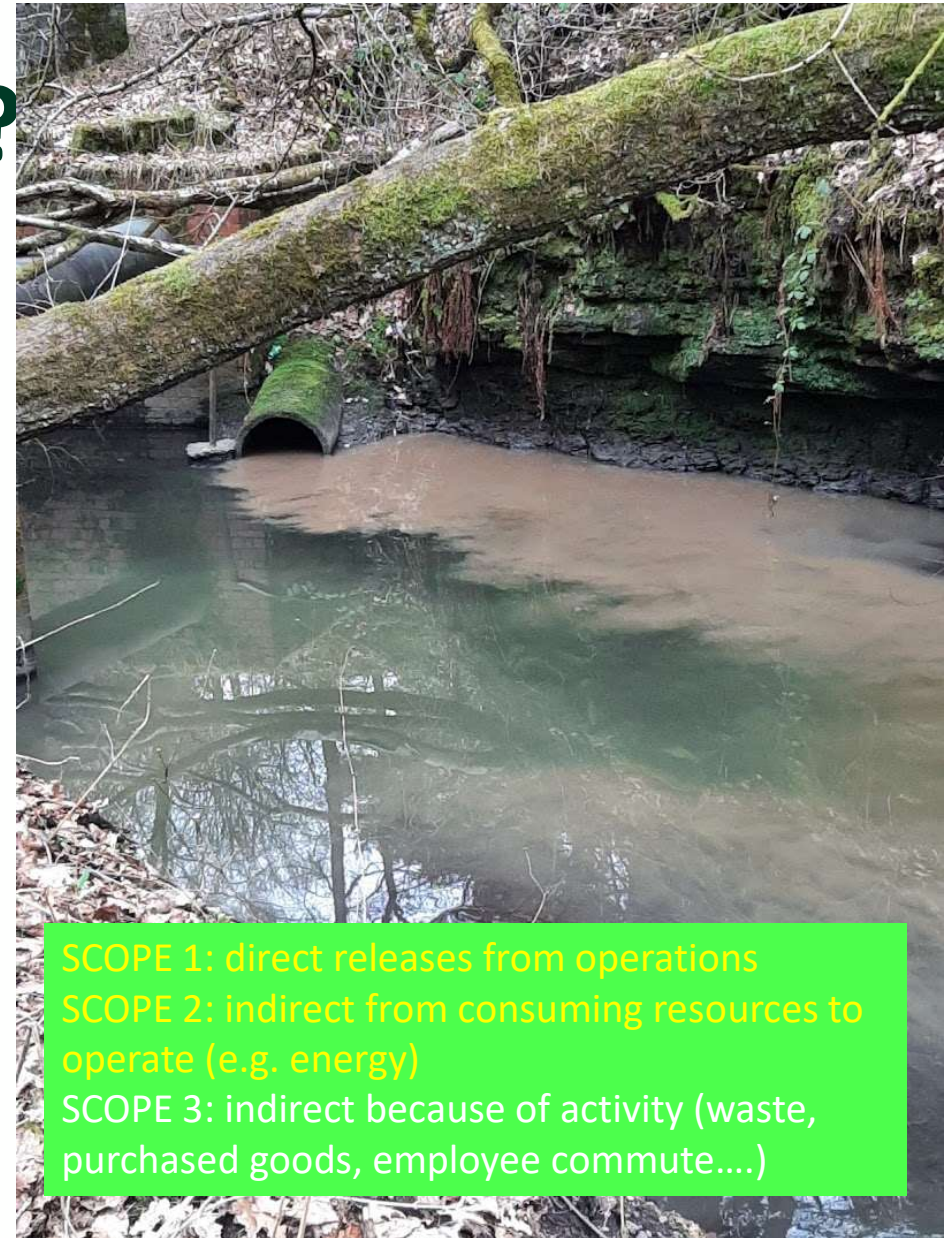
- Strategy to reduce **CO₂e*** from business activity
 - Using conversion factors and data on resource use, business footprint can be determined.
 - Process needs to be verified
 - Opportunity to improve (+40%?) with case-specific initiatives



* **CO₂e** is the number of metric tonnes of CO₂ equivalent to the global warming potential of emissions

What is a Carbon Footprint?

- Total greenhouse gas (GHG) emission caused directly or indirectly by an individual, organisation, event or product
 - Carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF₆)
- Expressed as carbon dioxide equivalent (CO₂e)
 - Calculate by multiplying each gas emission by 100-year global warming potential
- Many “calculators” available:



SCOPE 1: direct releases from operations
SCOPE 2: indirect from consuming resources to operate (e.g. energy)
SCOPE 3: indirect because of activity (waste, purchased goods, employee commute....)

CARBON CALCULATOR

Carbon Footprint Calculator For Individuals And Households

This carbon calculator is provided free to use

Show your care for the environment and communities across the World by Carbon Offsetting.

You can support [Carbon Offsetting](#) Projects that both tackle climate change and support impoverished communities across the world. Just click the 'Offset' button after you have finished your calculation. It takes only a few easy clicks and costs only a few Pounds/Dollars/Euros per tonne CO₂. **You also get a personalised**

Certificate recognising your offsetting - makes an ideal gift too!



Language:

[Why create an account?](#)

Welcome House Flights Car Motorbike Bus & Rail **Secondary** Results

Welcome to the web's leading carbon footprint calculator

First, please tell us where you live: [\[why?\]](#)

Country:

Carbon footprint calculations are typically based on annual emissions from the previous 12 months.
If you would like to calculate your carbon footprint for a different period use the calendar boxes below (optional):

from to

Next, select the appropriate tab above to calculate the part of your lifestyle you are most interested in, e.g. your flights.
Or, visit each of the tabs above to calculate your full carbon footprint.

Following your calculation, you can offset / neutralise your emissions through one of our climate-friendly projects.

[add our CO₂ calculation tools to your website](#)

Welcome House Flights Car Motorbike Bus & Rail **Secondary** Results

Secondary carbon footprint calculator

Please enter your amount of spend for each category below, and then press the Estimate button to estimate your secondary carbon footprint

Choose your currency:

Food and drink products	<input type="text" value="for a medium meat eater"/>	£ <input type="text"/>	<input type="text" value="per year"/>
Pharmaceuticals		£ <input type="text"/>	<input type="text" value="per year"/>
Clothes, textiles and shoes		£ <input type="text"/>	<input type="text" value="per year"/>
Paper based products (e.g. books, magazines, newspapers)		£ <input type="text"/>	<input type="text" value="per year"/>
Computers and IT equipment		£ <input type="text"/>	<input type="text" value="per year"/>
Television, radio and phone (equipment)		£ <input type="text"/>	<input type="text" value="per year"/>
Motor vehicles (not including fuel costs)		£ <input type="text"/>	<input type="text" value="per year"/>
Furniture and other manufactured goods		£ <input type="text"/>	<input type="text" value="per year"/>
Hotels, restaurants, and pubs etc.		£ <input type="text"/>	<input type="text" value="per year"/>
Telephone, mobile/cell phone call costs		£ <input type="text"/>	<input type="text" value="per year"/>
Banking and finance (mortgage and loan interest payments)		£ <input type="text"/>	<input type="text" value="per year"/>
Insurance		£ <input type="text"/>	<input type="text" value="per year"/>
Education		£ <input type="text"/>	<input type="text" value="per year"/>
Recreational, cultural and sporting activities		£ <input type="text"/>	<input type="text" value="per year"/>

Total Secondary Footprint = 0.00 tonnes of CO₂e

For more information on this Secondary footprint tab, please see our [Calculator FAQ page](#)

e.g. <https://www.carbonfootprint.com/calculator.aspx>

- **Organisational** footprints

- Across organisational activities including business function and supply chain

- **Product** footprints

- Over whole life of the product – raw materials to re-use/disposal
- Consumer choice

- **Overlap between approaches; use standard protocols**

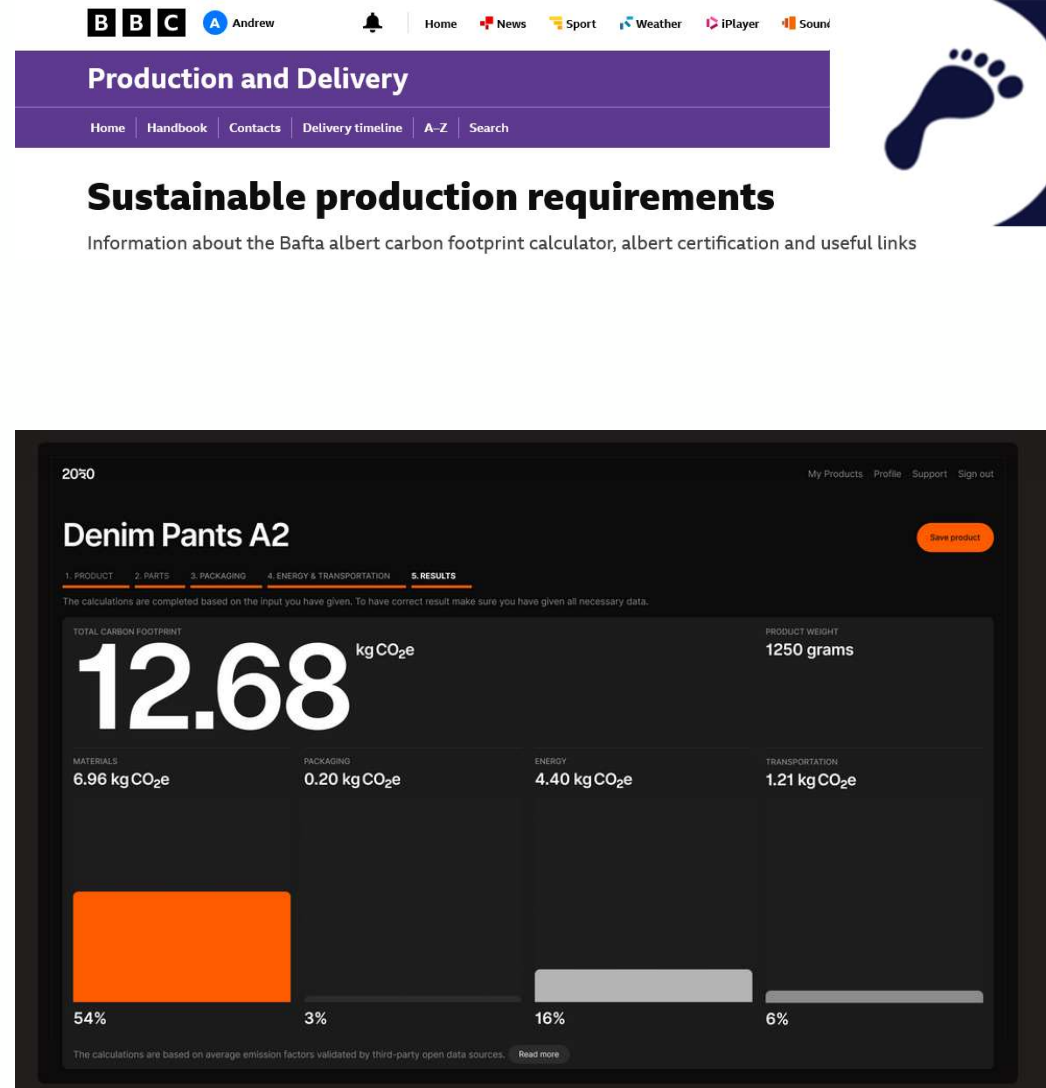
- e.g. Greenhouse Gas Protocol <http://www.ghgprotocol.org/>

or

- PAS 2050: Specification for the assessment of the life cycle greenhouse gas emissions of goods and services; ISO 14067 standards

- **Choosing a standard or methodology?**

<https://pre-sustainability.com/articles/product-carbon-footprint-standards-which-standard-to-choose/>

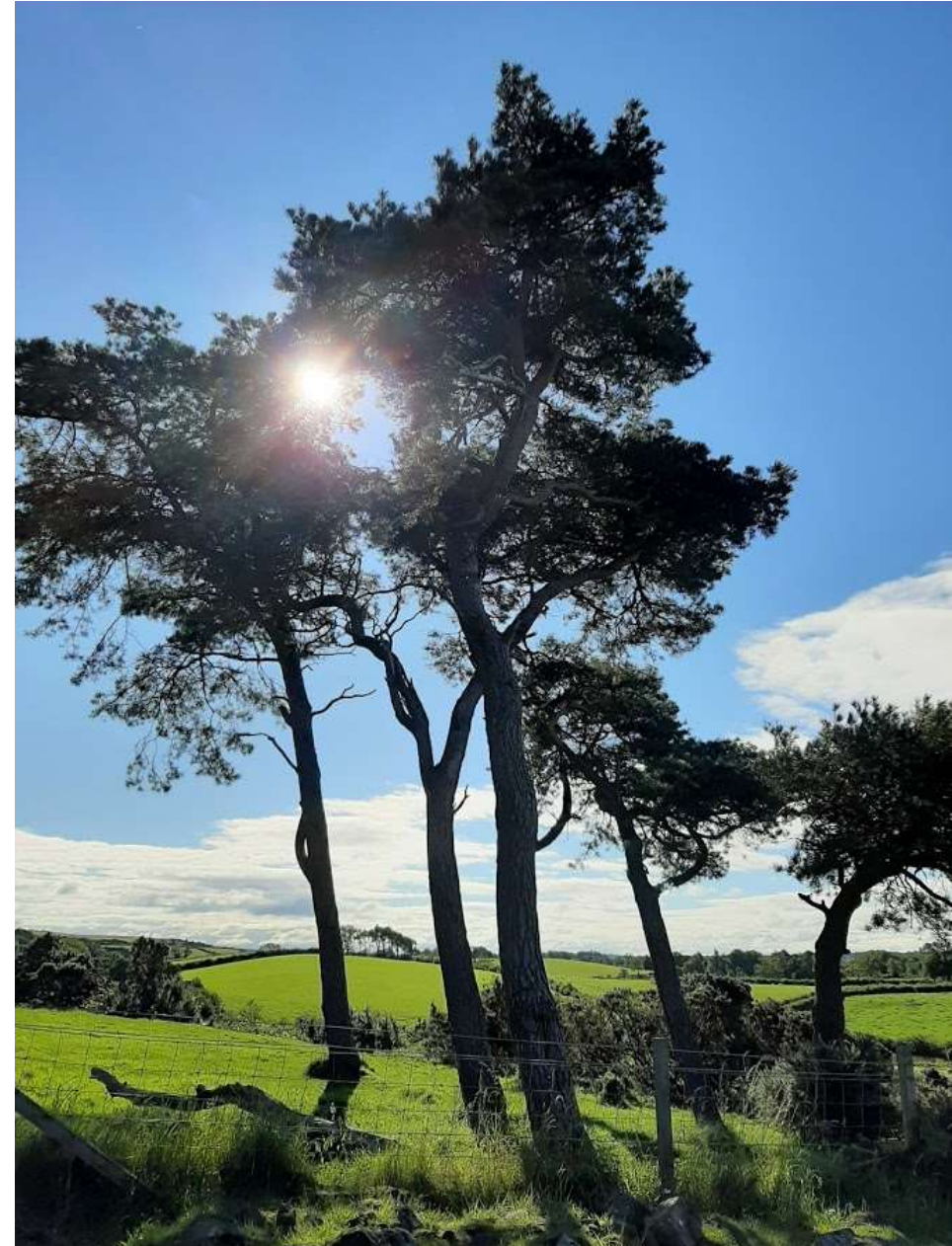


What is carbon offsetting?

- Funding organisations that lower/reduce carbon emissions
 - E.g. Re-forestation projects; renewable energy; energy efficiency projects; better efficiency vehicles; “gentle farming”
- Limitation is they do not address the initial cause
 - E.g. a tree takes ~60 years to capture all the “CO₂” its used to off set, forest fires immediately release it

<https://www.ukcarbon.org/uk-offset-projects>

<https://www.carbonfootprint.com/carbonoffsetprojects.html>



When the message goes astray

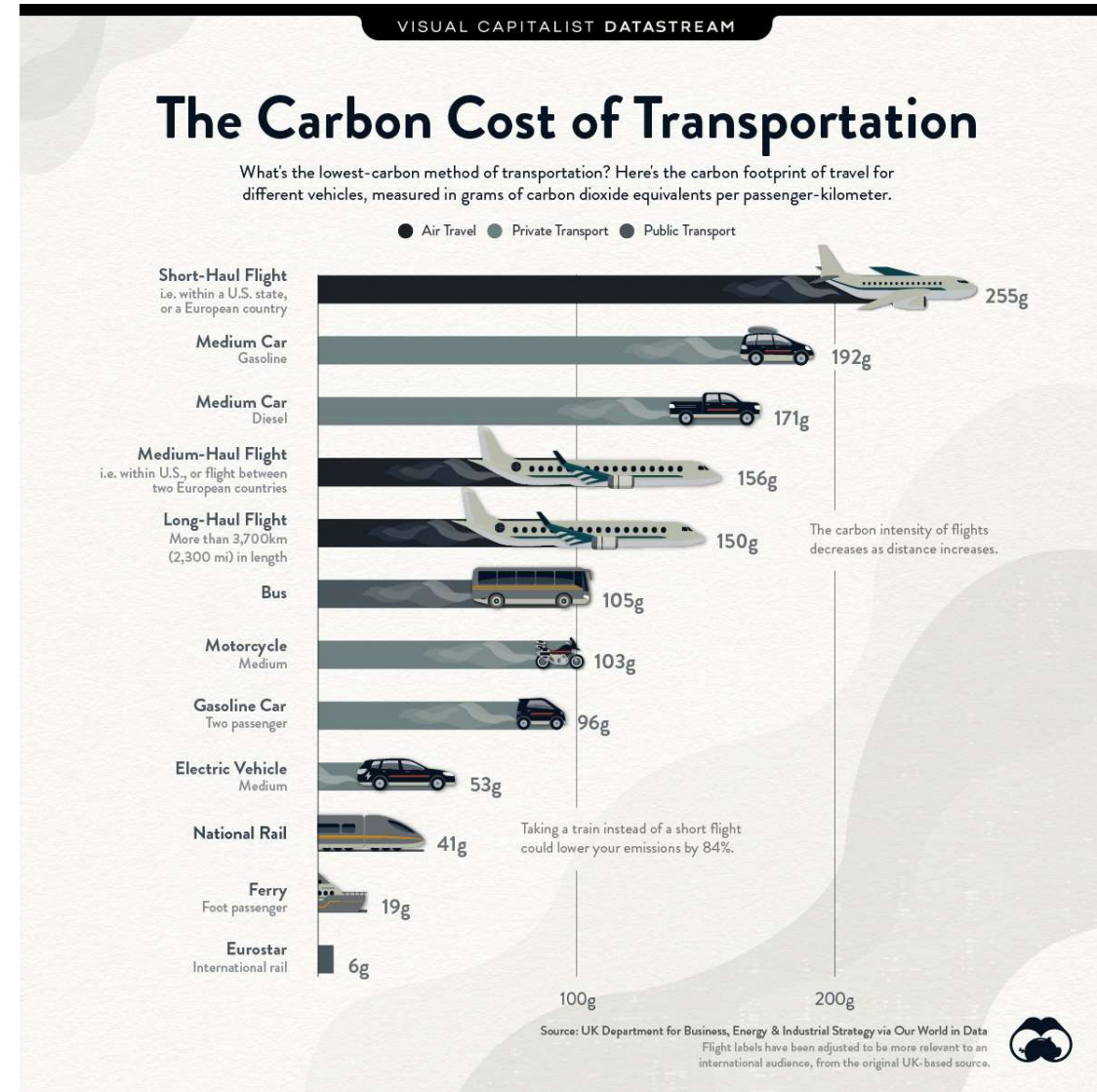
- **Greenwashing** – making claims of environmental benefit which are not backed up or wrong
- E.g.
 - **fast fashion brands** – claiming green cotton, polyester textiles re-used when textile waste increased
 - **Banks** lending to badly polluting industries but advertising green investment opportunities

<https://easyecotips.com/learn-how-to-avoid-greenwashing/>
<https://thesustainableagency.com/blog/greenwashing-examples/>



Creating a low carbon strategy

- Leadership, policy, systems
 - Prepare to invest resources, and maintain
 - Information, Audit, validation
- Assessing carbon footprint
 - Define your operational activity
 - Impact on SCOPE 1, 2 (and 3?) contributions
 - Collect and check data
- Setting reduction goals
- Verify carbon credentials – independent, transparent
- Its just the start!



<https://www.visualcapitalist.com/comparing-the-carbon-footprint-of-transportation-options/>

We need to change what we do

- Adopting new ways of working
 - Resource efficiency
 - Raw materials – regenerative agriculture
 - Consumption
 - Eco-innovation
 - Production
 - Waste prevention and management
 - Behaviours – societal, governance
 - reporting
- Effective mechanisms
 - Training, awareness, communication
 - Plan, execute, review, verify, report

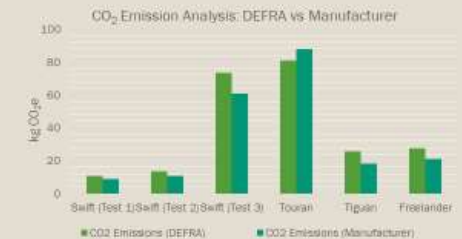
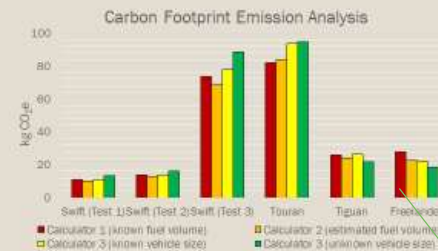


Implementing a carbon reduction plan

- Be aware of the **complex (uncertain) science** behind the problem and the solutions!
- **Evidence driven decision making**, remember the data (and uncertainty) - needed to help make the right or “best” decision
- Look for **more** sustainable options (supplier credentials)
- Stick with it!
- Take action across all activities
 - Transport
 - Energy
 - Food
 - Water
 - Consumer goods
 - Equality and equity

Testing calculation methods

- Volume of fuel used, distance travelled, & average fuel consumption were recorded
- Allowed a comparison of the different carbon Footprinting methods
- Additionally, a comparison between DEFRA and manufacturer CO₂ emissions was made



- Required data
 - Type of fuel
 - Distance travelled
 - Average fuel consumption
- Conversion factors
 - Petrol - 2.16802 kg CO₂e L⁻¹
 - Diesel - 2.54603 kg CO₂e L⁻¹

Credit: Andrew Barlee, BSc (Hons) Chemistry Project, UWS 2021