



PSB Singapore

**Choose certainty.
Add value.**

Introduction to Carbon Footprint – Working Towards a Greener Future

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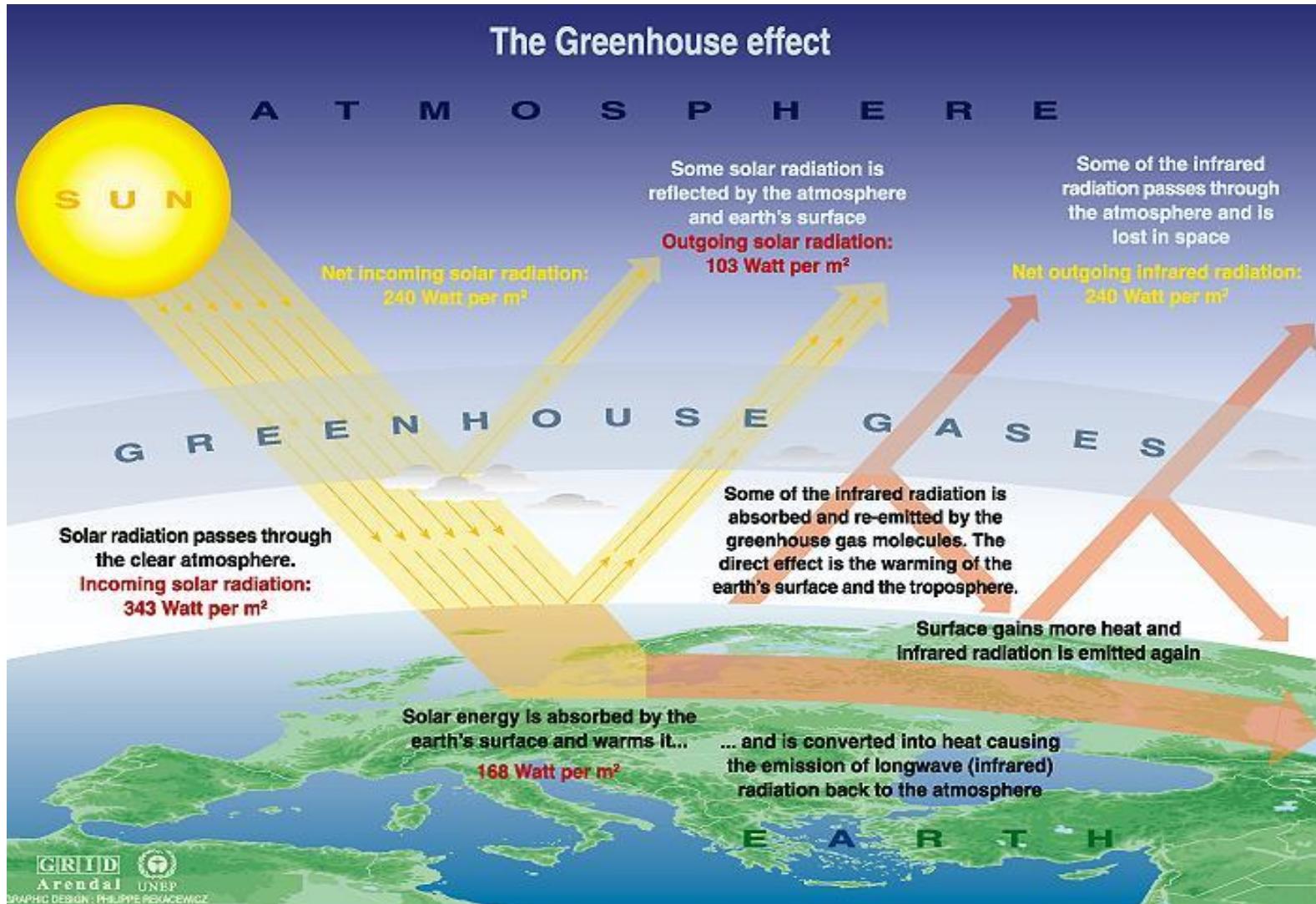


1 Introduction to Carbon Footprint

2 How to manage Carbon Footprint

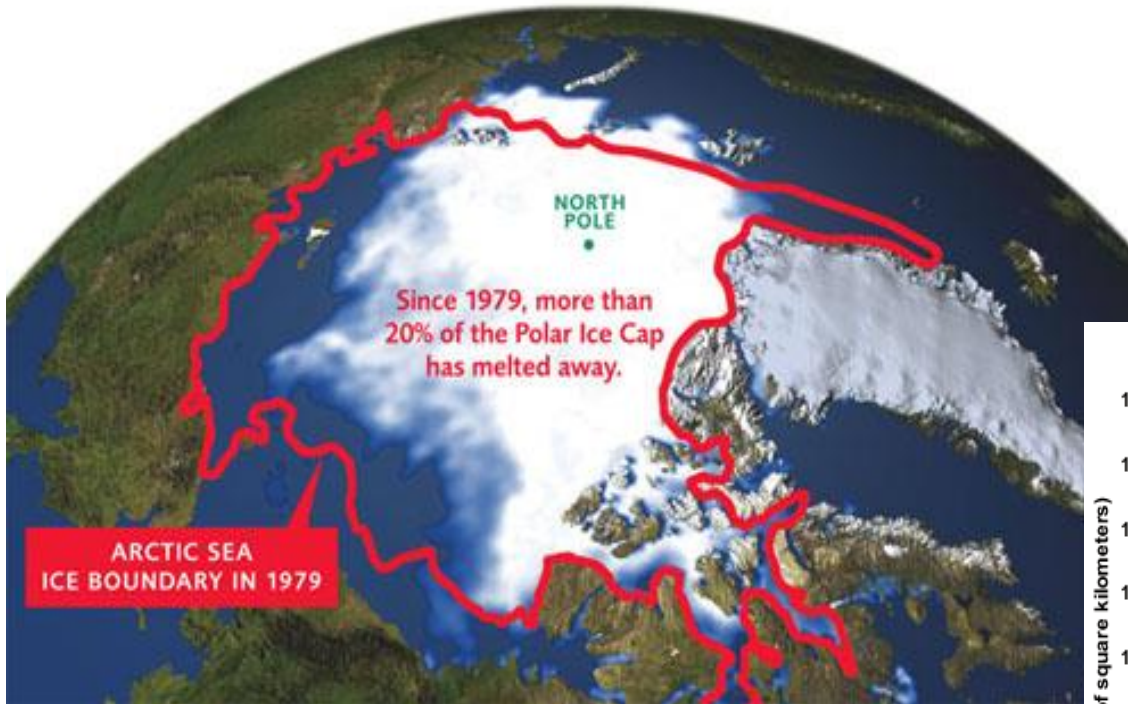
3 Case Study

Why Carbon Footprint: Greenhouse Effect

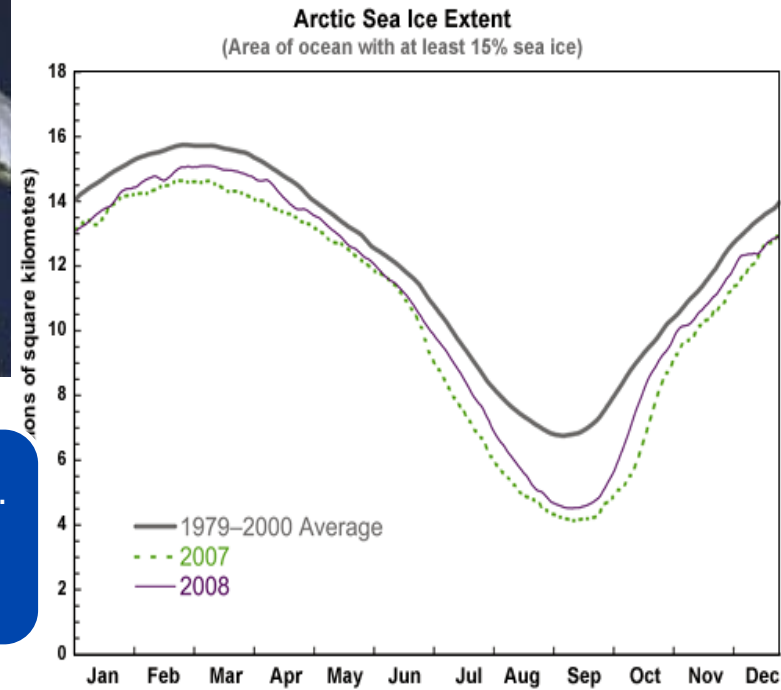


Sources: Okanagan university college in Canada, Department of geography, University of Oxford, school of geography; United States Environmental Protection Agency (EPA), Washington; Climate change 1995, The science of climate change, contribution of working group 1 to the second assessment report of the intergovernmental panel on climate change, UNEP and WMO, Cambridge university press, 1996.

Impacts: Melting Polar ice



Sea ice is dwindling too, especially in the Northern Hemisphere. Satellites have seen average Arctic sea ice shrink by 2.7% per decade from 1978 to 2006, with faster melting in summer



National Snow and Ice Data Center

Did you know?



Q1. Montana Glacier National Park had 150 glaciers in 1850; How many glaciers are left now?

- ✓ 25 glaciers
- ✓ 73 glaciers
- ✓ 105 glaciers



"HOW ON EARTH DO WE TURN IT OFF?"



What is Carbon Footprint?



“...the amount of Green House Gases released into the atmosphere as a result of the activities of a particular individual, organization, or community.....”



WIKIPEDIA
The Free Encyclopedia

What is Carbon Footprint ?



- It is a measure of the impact anthropogenic activities have on the environment in terms of amount of green house gases produced, **measured in kg or tonnes of CO₂e.**
- Process which emits any of the following GHGs are considered for Carbon Footprint evaluation:

Green house gas (GHG)

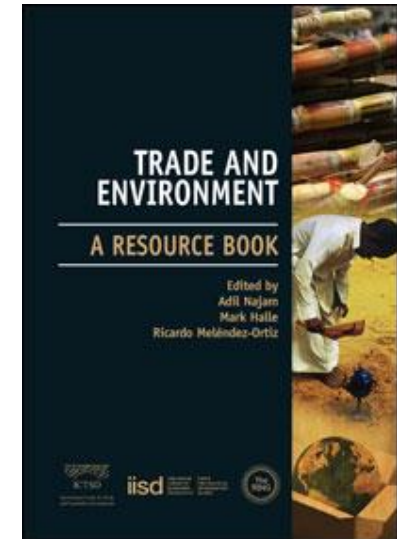
Global Warming Potential (GWP)

- | | |
|--|-----------------|
| ➤ Carbon-di-oxide (CO ₂) | ➤ 1 |
| ➤ Methane (CH ₄) | ➤ 25 |
| ➤ Nitrous oxide (N ₂ O) | ➤ 298 |
| ➤ Per fluoro carbons (PFCs) | ➤ 2,000 ~ |
| ➤ Hydro fluoro carbons (HFCs) | ➤ 5,000 ~ 8,000 |
| ➤ Sulphur hexa fluoride (SF ₆) | ➤ Above 10,000 |

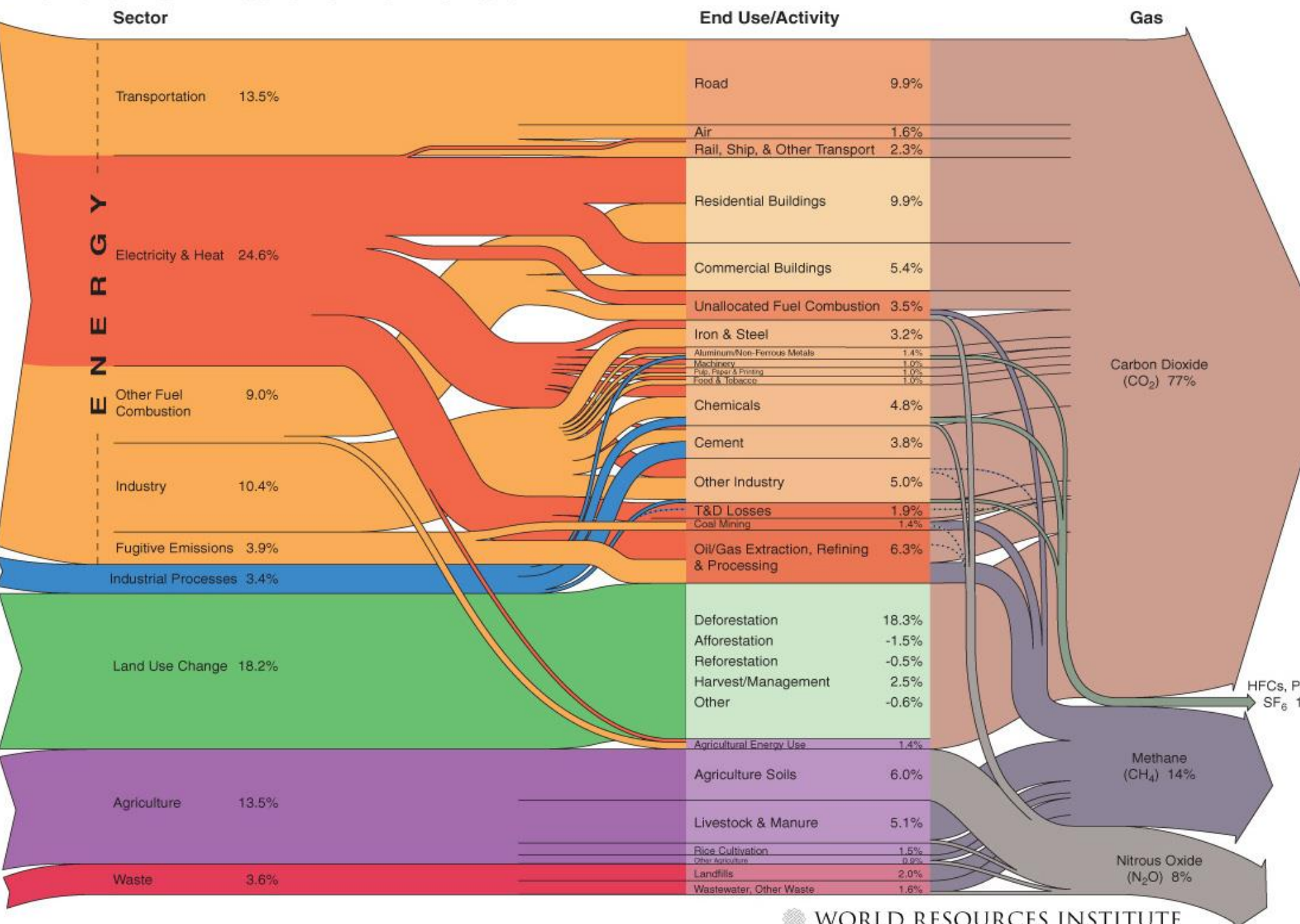


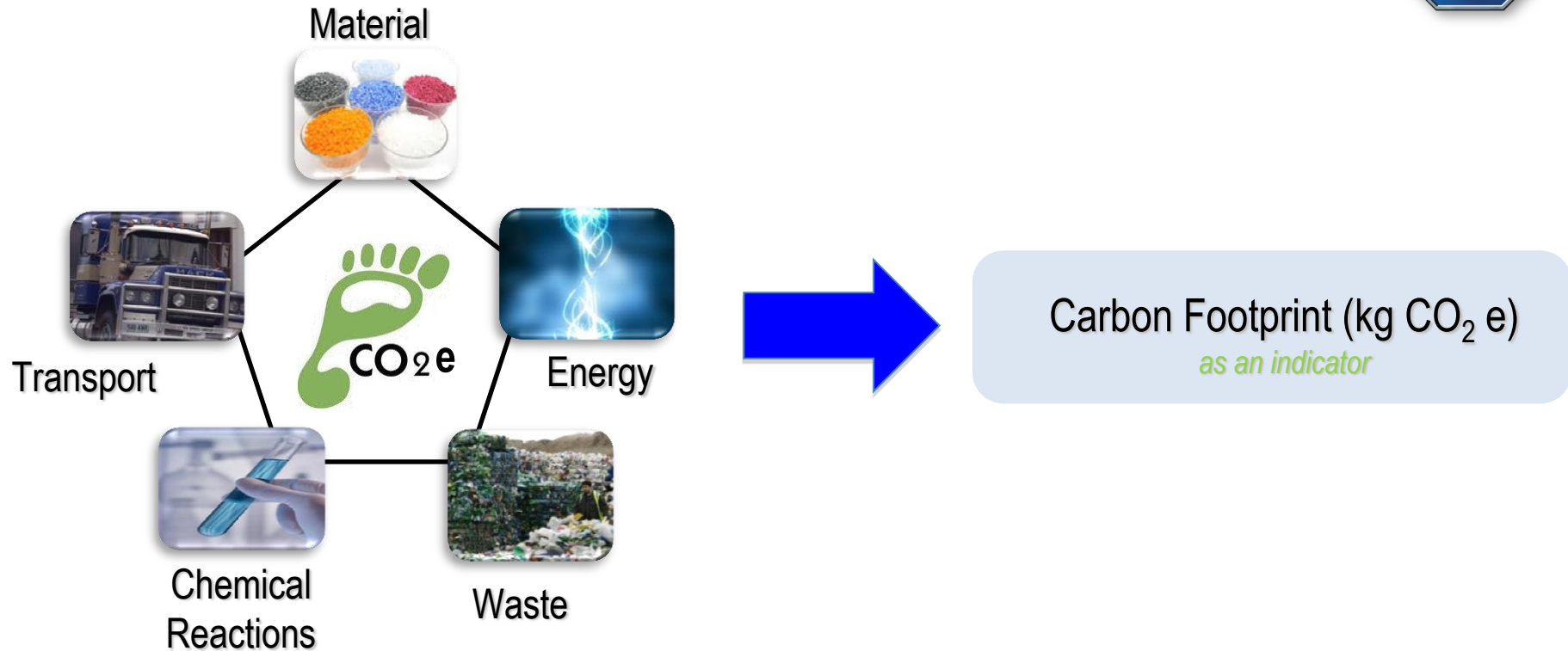


International trade has enormous potential to foster or frustrate sustainable development.



World GHG Emissions Flow Chart





Carbon Footprint is a comprehensive indicator

- Indicating resource efficiency: materials, energy, waste & waste management
- Details cross the life cycle processes and elements
- Enabling improvement strategizing & decision making



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Standards

ISO 50001 – Energy Management System

ISO 14064-1: Organizational Carbon Footprint or GHG inventory

ISO 14064-2: Project Carbon Footprint

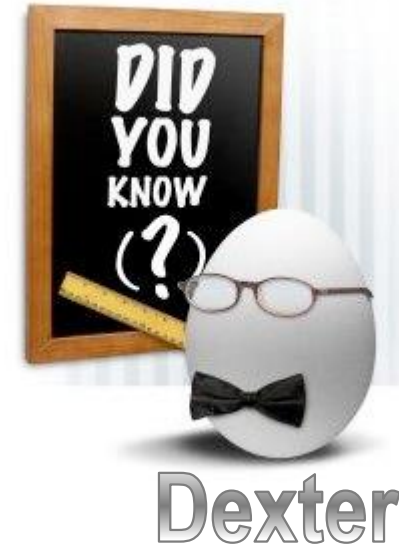
ISO/TS 14067: Product Carbon Footprint

GFA Labeling scheme

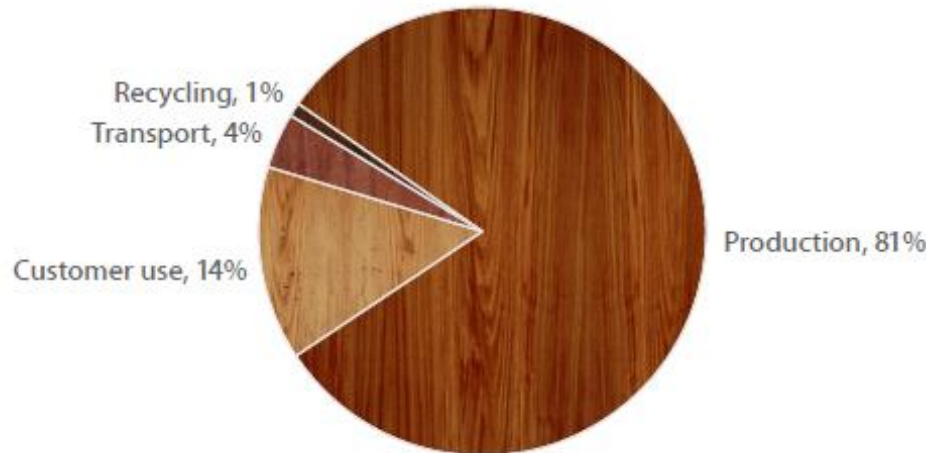


Q2. How much is the carbon emission from manufacturing one iPhone?

- ✓ 50kg CO2 per iPhone
- ✓ 65 kg CO2 per iPhone
- ✓ 95 kg CO2 per iPhone
- ✓ 110 kg CO2 per iPhone

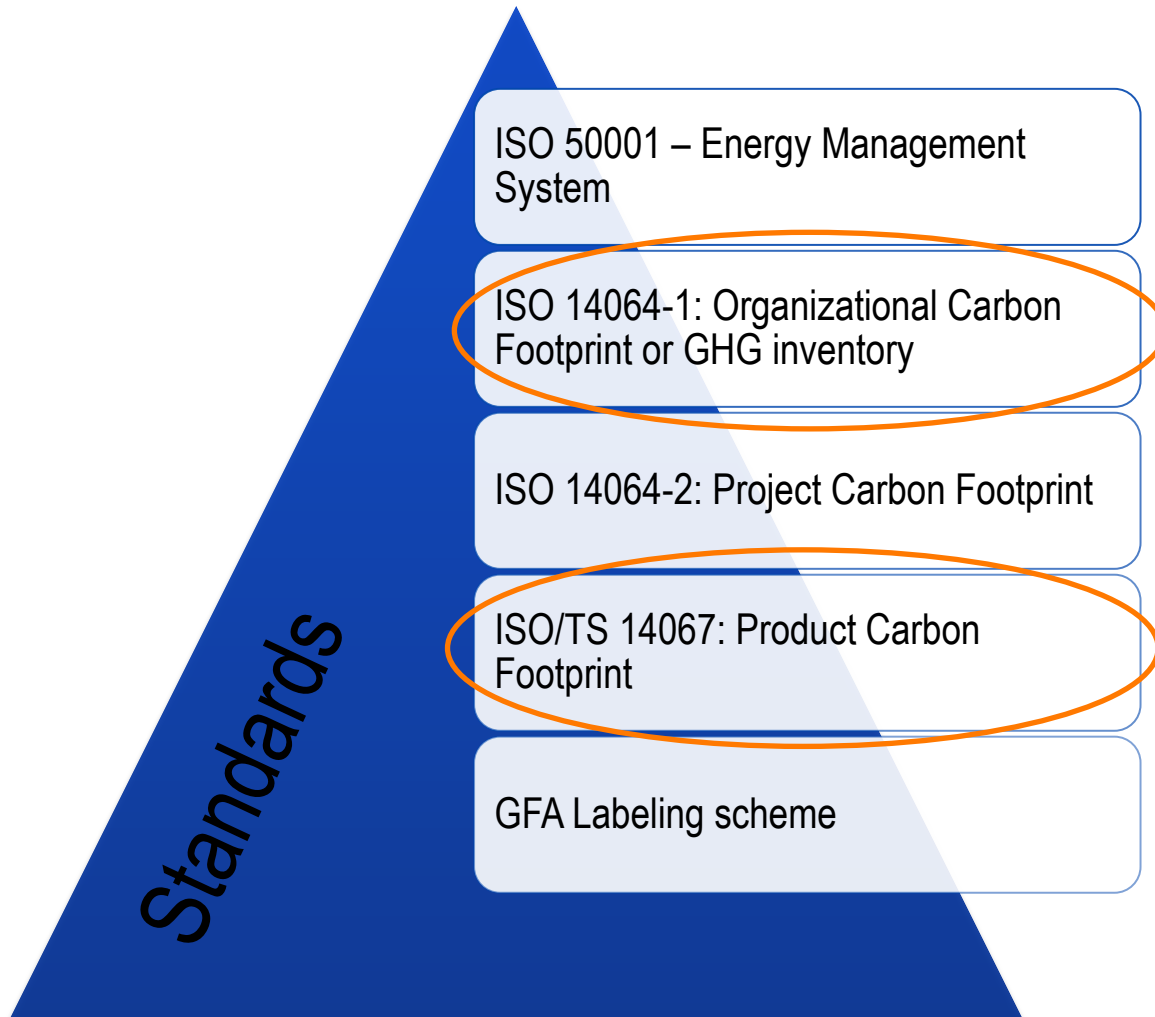


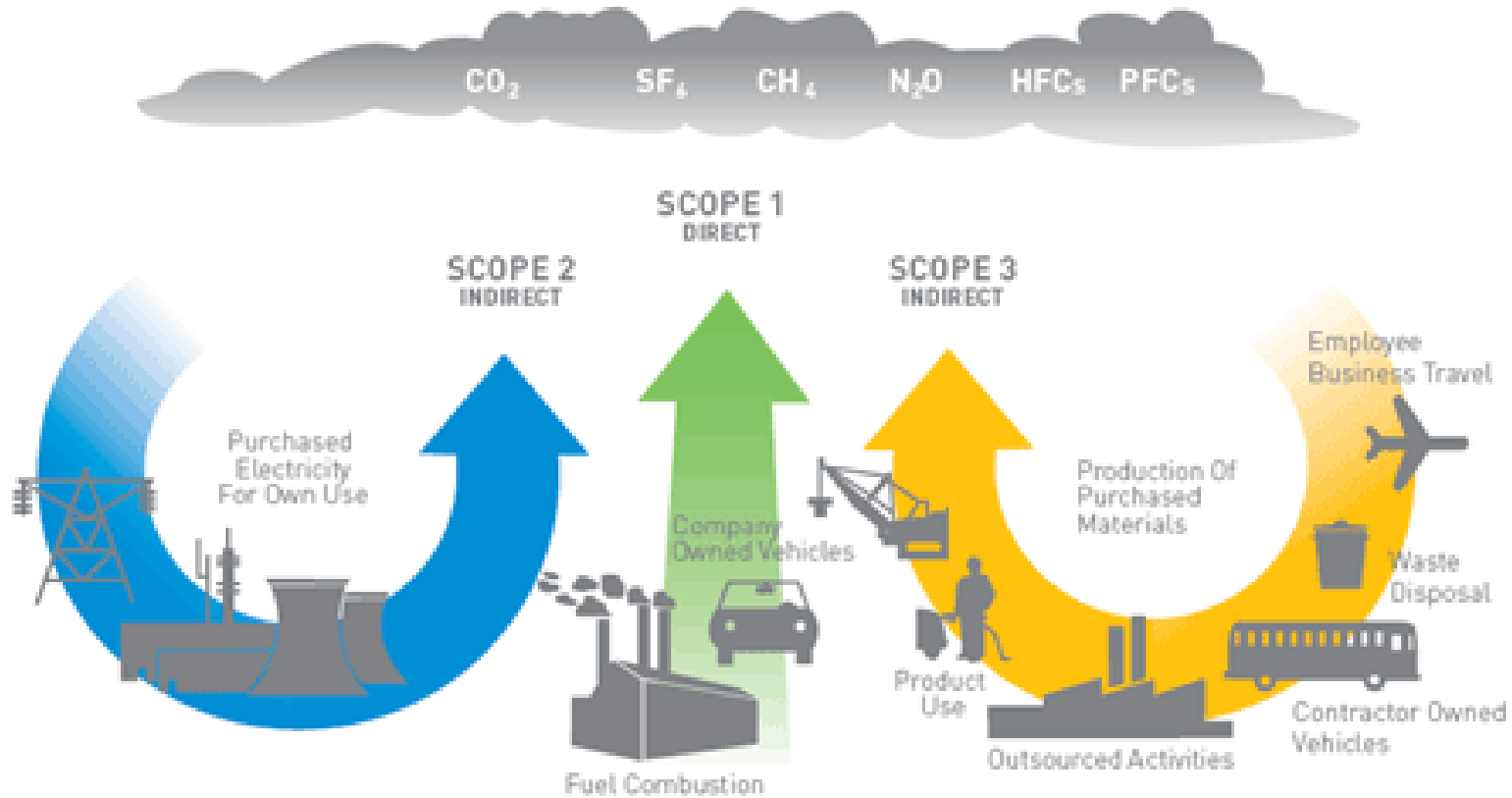
Greenhouse Gas Emissions for iPhone 6 Plus



Total greenhouse gas emissions: 110 kg CO₂e

Quoted from Apple's report





- Scope 1 & 2 must be reported
- Scope 3 is optional

GHG inventory Design & Development

- Determine organizational boundaries
- Identify the GHG sources
- Identify methodologies

Data Monitoring & quantify

- Monitor raw data required for calculation.
- Calculation of GHG emissions

Reporting & Verification

- GHG reporting as per ISO 14064-1.
- Conduct third party verifications.
- Publish the Verification Statement for stakeholders



Product Carbon footprint



ISO/TS 14067 – Life Cycle concept

Input Materials

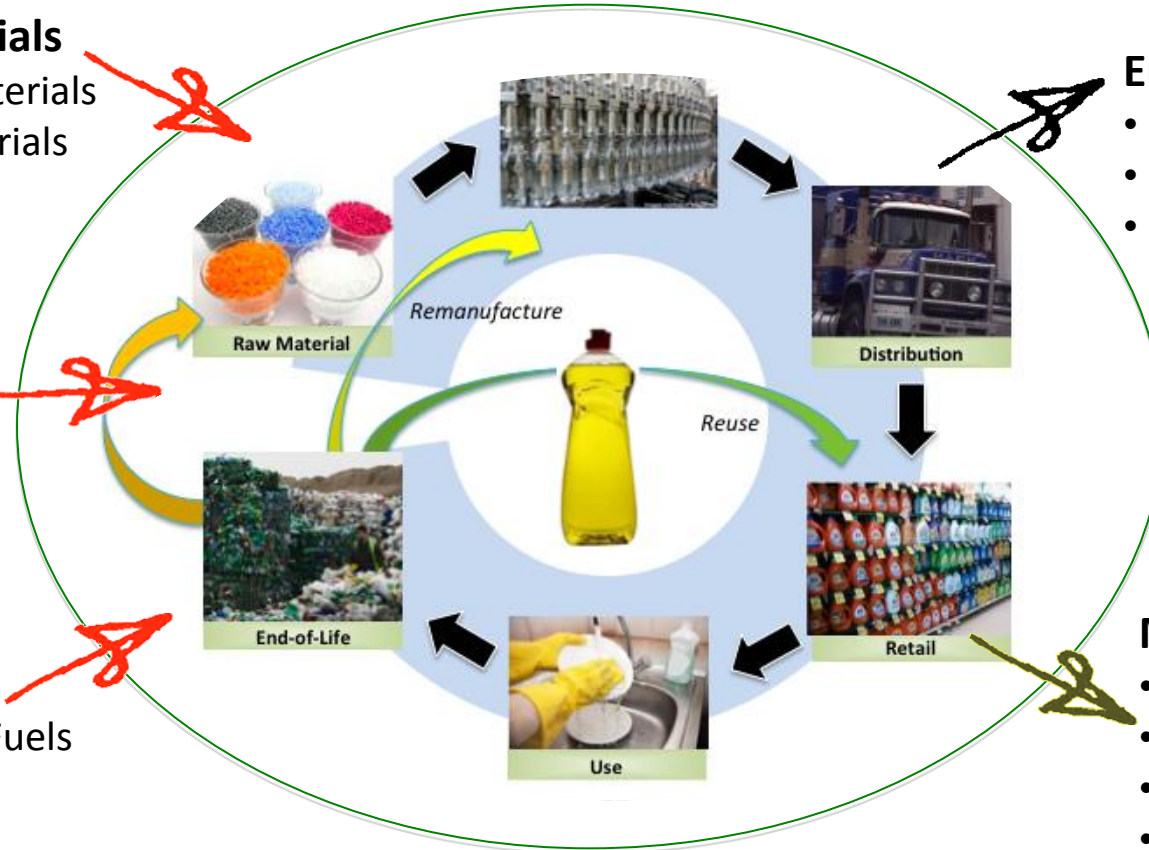
- Indirect materials
- Direct materials

Input Water

- Production

Input Energy

- Fossil fuels
- Alternative Fuels



Emissions

- Air
- Water
- Land

Materials

- Product
- By-product
- Co-product
- Waste



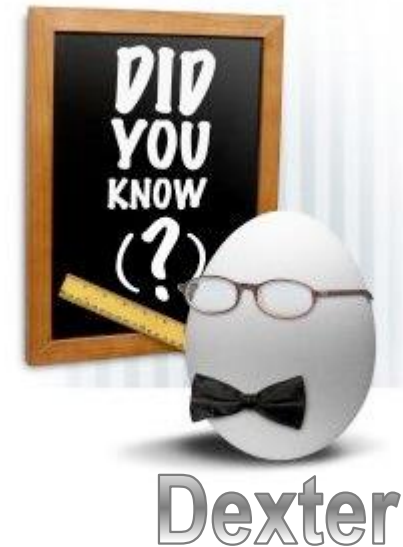
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Q3. What is a carbon footprint of a can of Coke?

- ✓ 90 gm of CO₂ per 330 ml can.
- ✓ 170 gm of CO₂ per 330 ml can.
- ✓ 360 gm of CO₂ per 330 ml can.

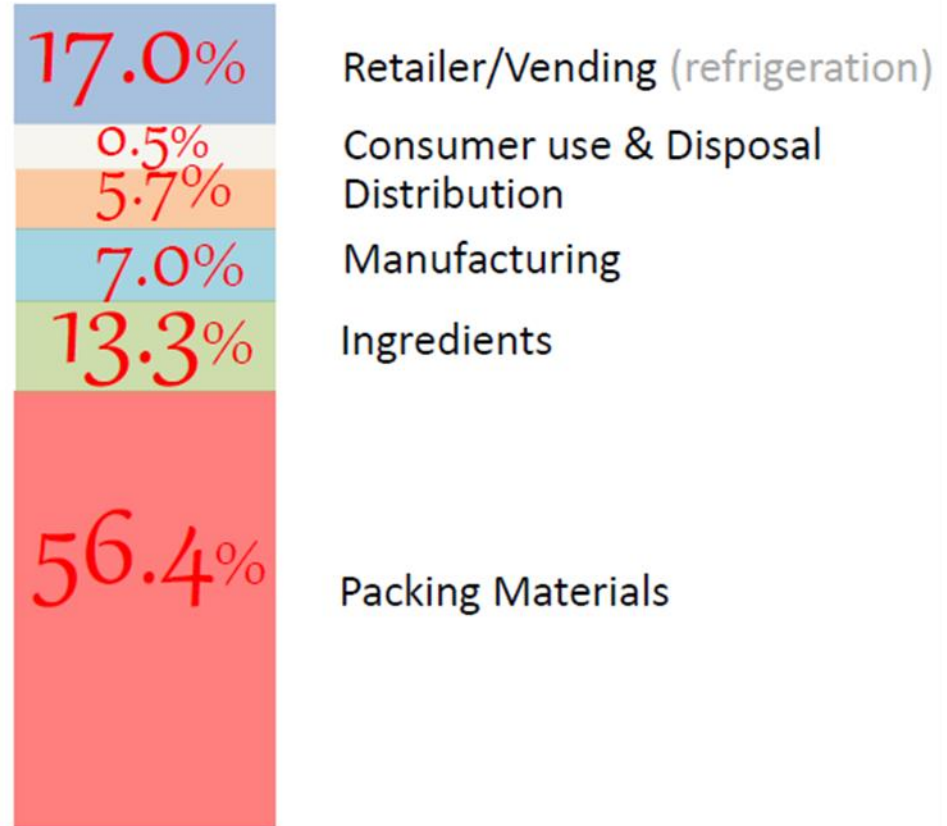


Dexter

Carbon Footprint: Can of Coke



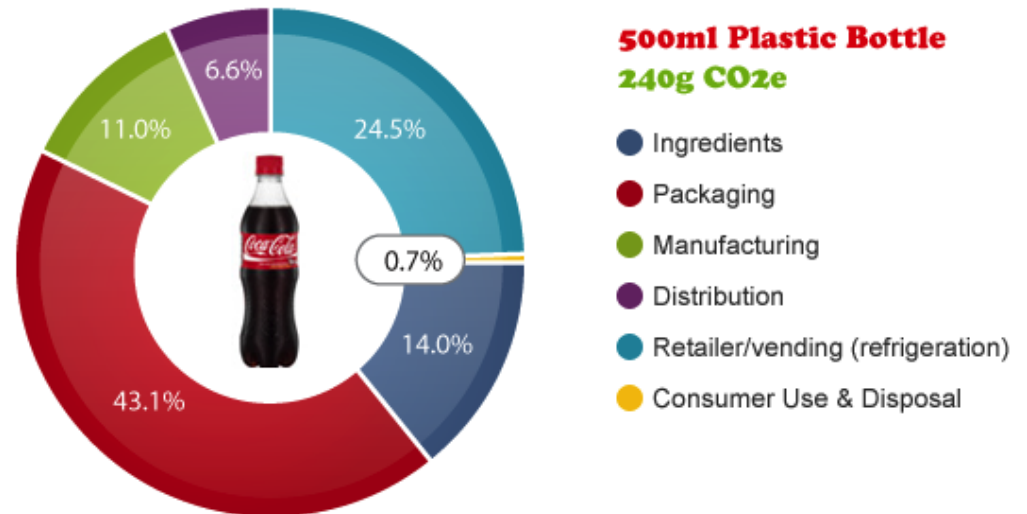
170g CO₂
Per 330ml bottle



Carbon Footprint: Can of Coke



Packaging contributes 30-70%



Note: Quoted from Coca cola report & SIMTECH

Q4. . What is an approximate carbon footprint for a return flight travel from SG to Munich (Germany)?

- ✓ 1,610 kg CO₂ per return trip
- ✓ 3,040 kg CO₂ per return trip
- ✓ 6,420 kg CO₂ per return trip



Dexter



Thank you for your attention

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