



Post-combustion CO₂ capture (PCC)

Graeme Puxty, CSIRO Energy Technology
Marcel Maeder, University of Newcastle

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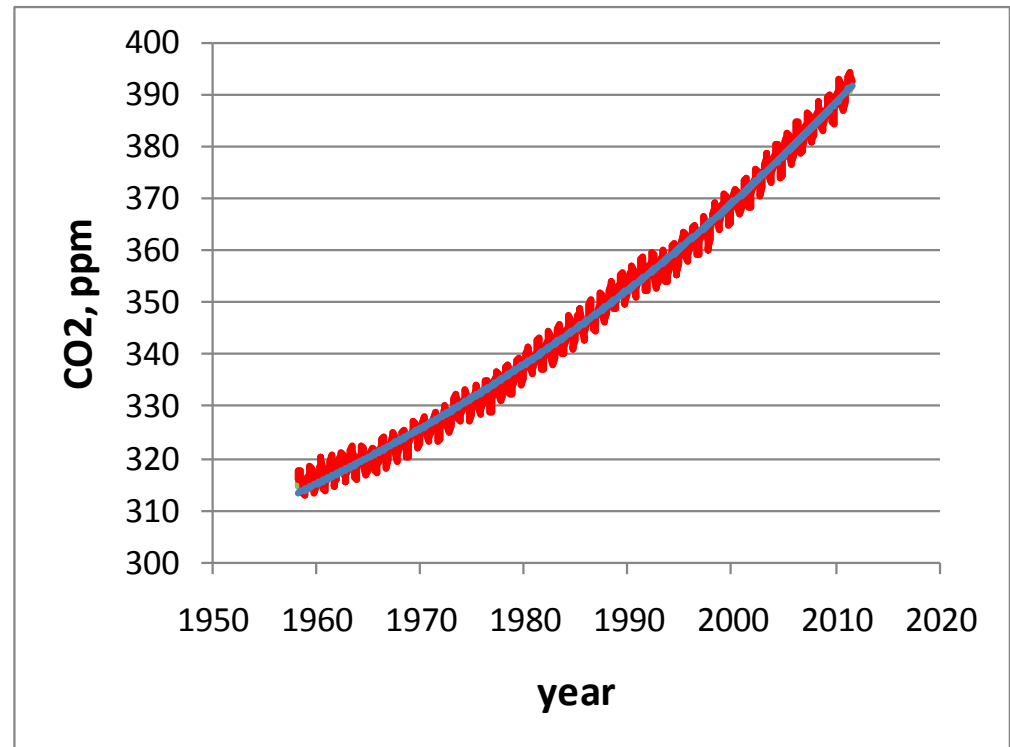


Introduction

- The greenhouse effect
- Sources of CO₂

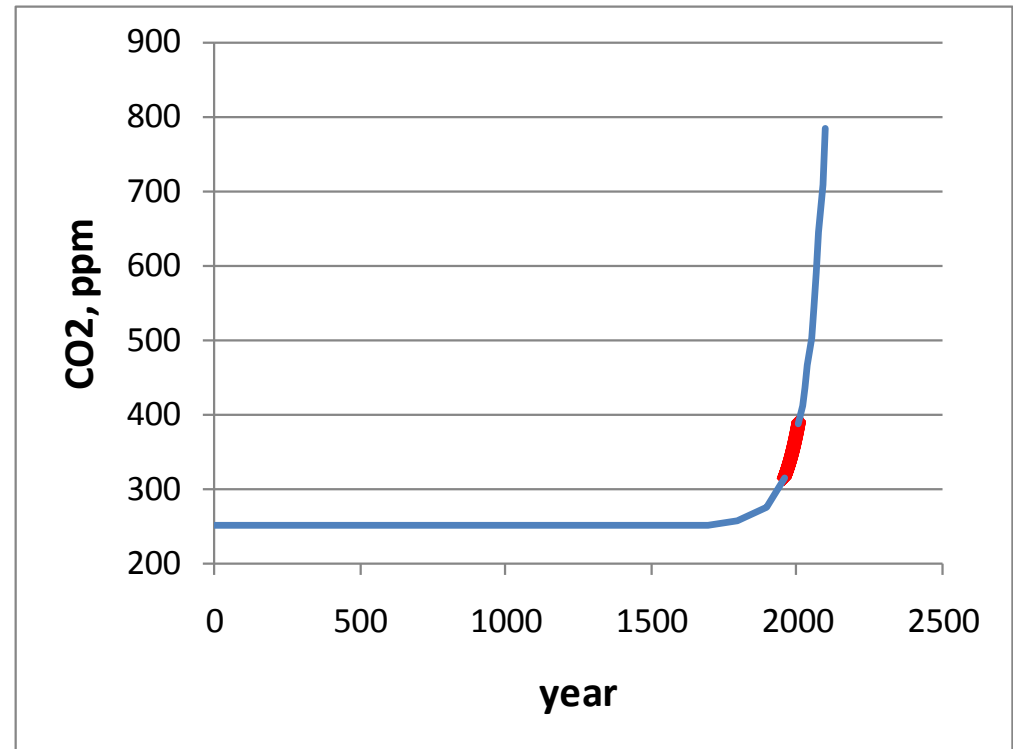
The greenhouse effect

- Over the last 50 years the concentration of CO₂ in the atmosphere has increased substantially.
- The red line shows the original data taken at Mauna Loa.
- The blue line is an exponential fit. Fitting allows extrapolation into the future and the past.



The greenhouse effect

- Continuation the CO₂ output along the present trend is completely out of question; CO₂ concentration of 800 ppm at the end of the century would result in dramatic climate change.
- The validity of the approach is partially confirmed by the correct extrapolation into the past where the CO₂ concentration was about 250 ppm.



The greenhouse effect

- Why should we worry?
- What are the consequences of increased CO₂ concentration in the atmosphere ?
- Why is it called 'Greenhouse effect' ?

The greenhouse effect

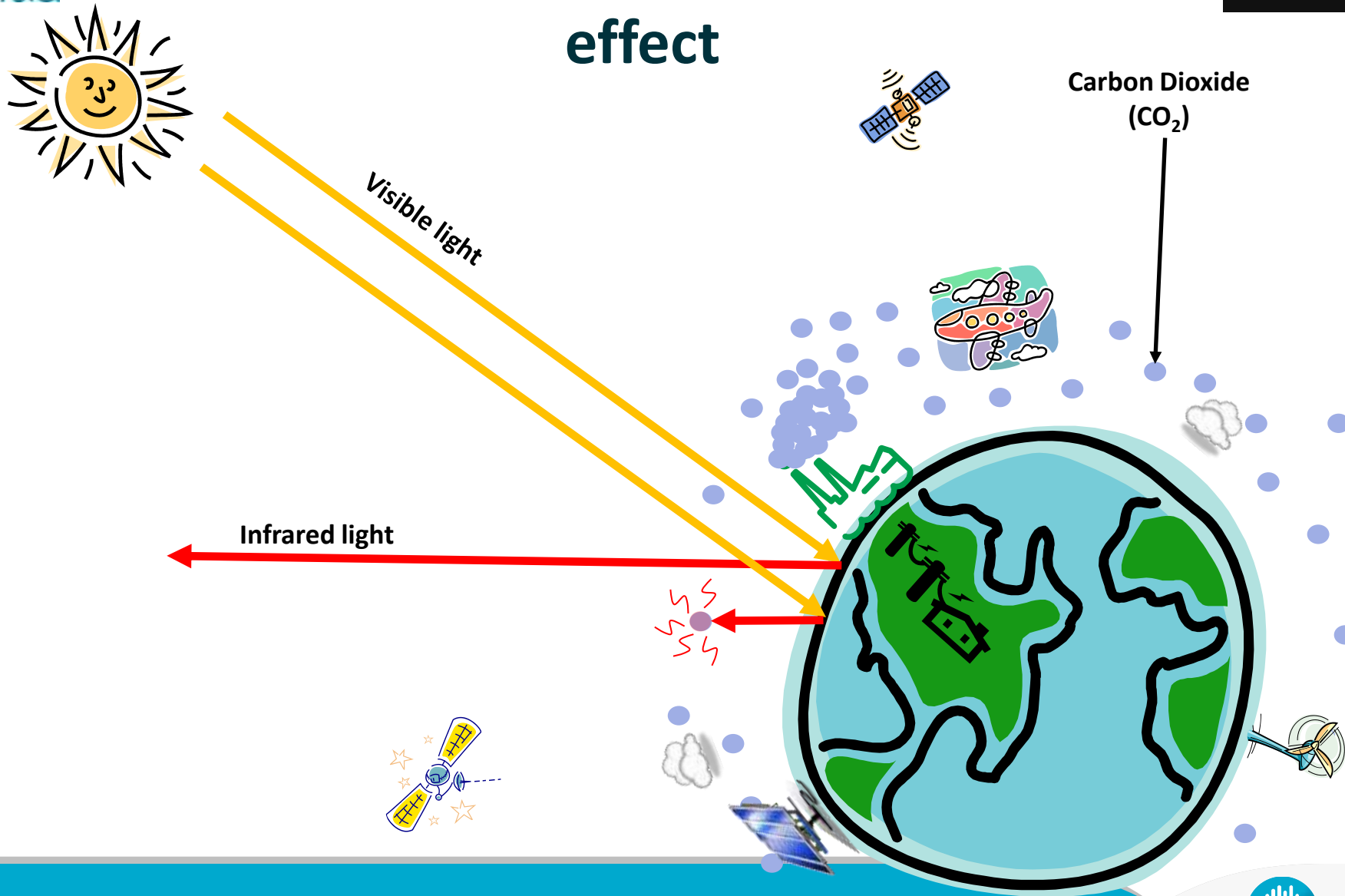
- The glass or plastic that forms the greenhouse is transparent to visible light. The light is absorbed in the inside by plants and soil and transformed into heat. The glass/foil is less transparent to the heat radiation, energy is trapped.
- If we add another layer of foil or replace with thicker foil the effect will be stronger and the temperature in the inside will rise.



The greenhouse effect

- CO₂ is a greenhouse gas, it is more transparent for visible light than for the heat radiation from the planet back into space.
- If we increase its concentration, the effect will be stronger and the temperature will increase. As a consequence the climate patterns on the planet will change.
- It is very difficult to ***quantify*** the expected increase in temperature as well as the climate changes. ***Discussions are on-going.***

Greenhouse gases and the greenhouse effect



Sources of CO₂

- Australian sources of CO₂ are predominantly from stationary energy production, followed by transport and others.
- Combustion of coal is the main fossil fuel used for the power generation.
- If CO₂ should be captured the best option is at power stations where the concentration is relatively high.
- It would be much more difficult to capture CO₂ from cars

Figure 5: Trends in CO₂-e emissions by sector – change since 1990

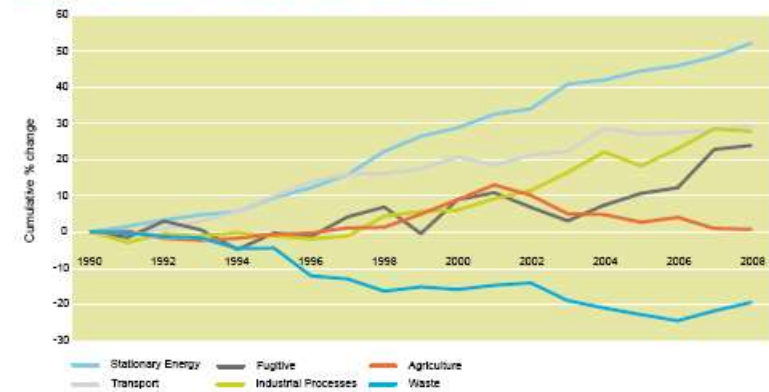
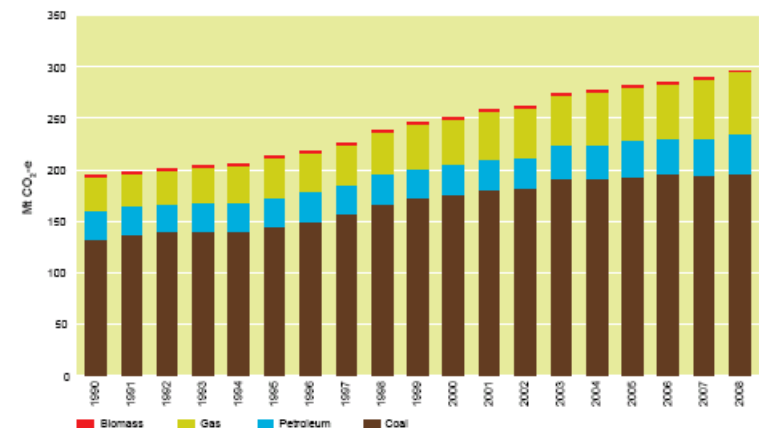


Figure 6: Total CO₂-e emissions from stationary energy combustion by fuel, 1990–2008



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