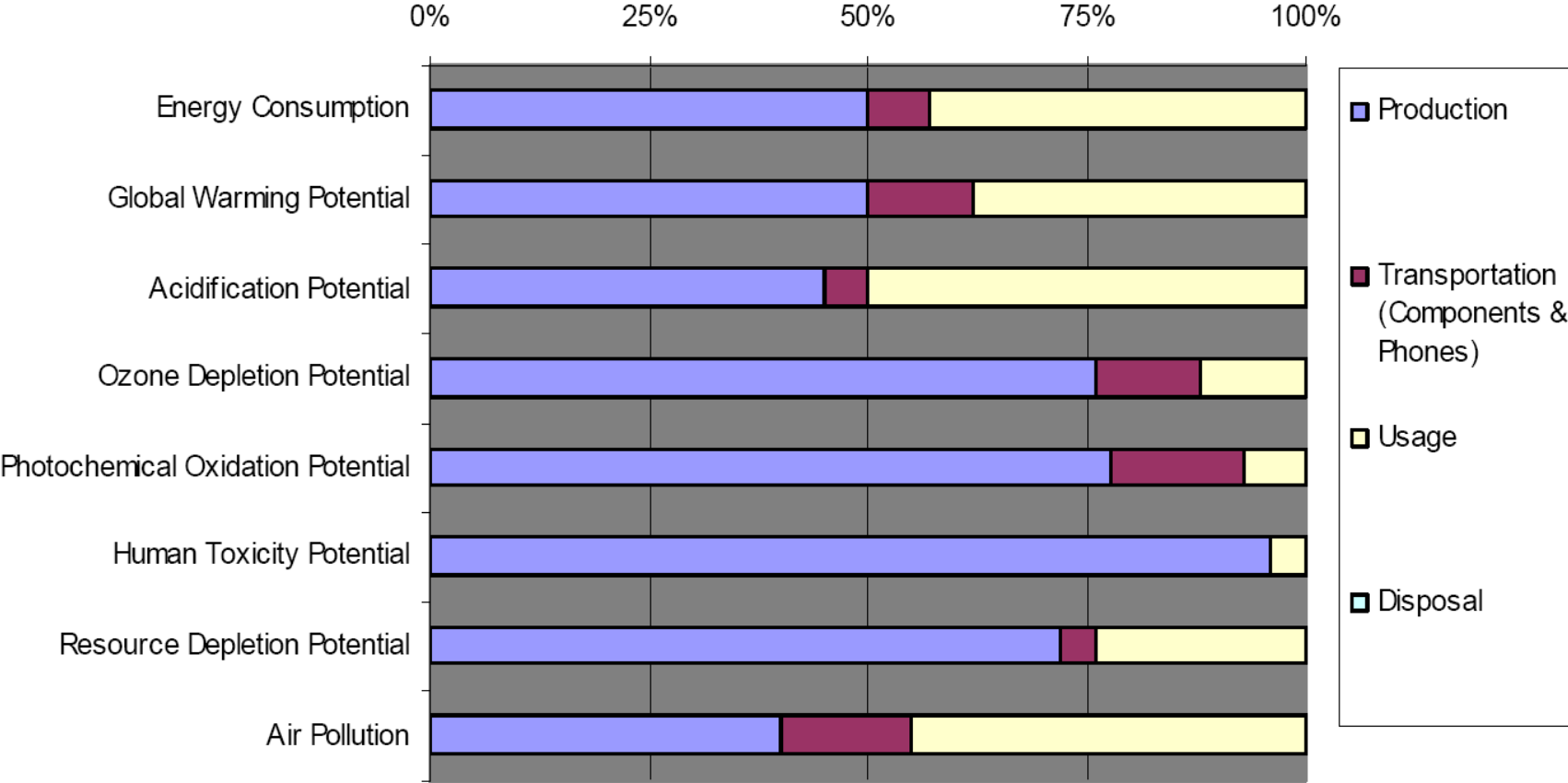


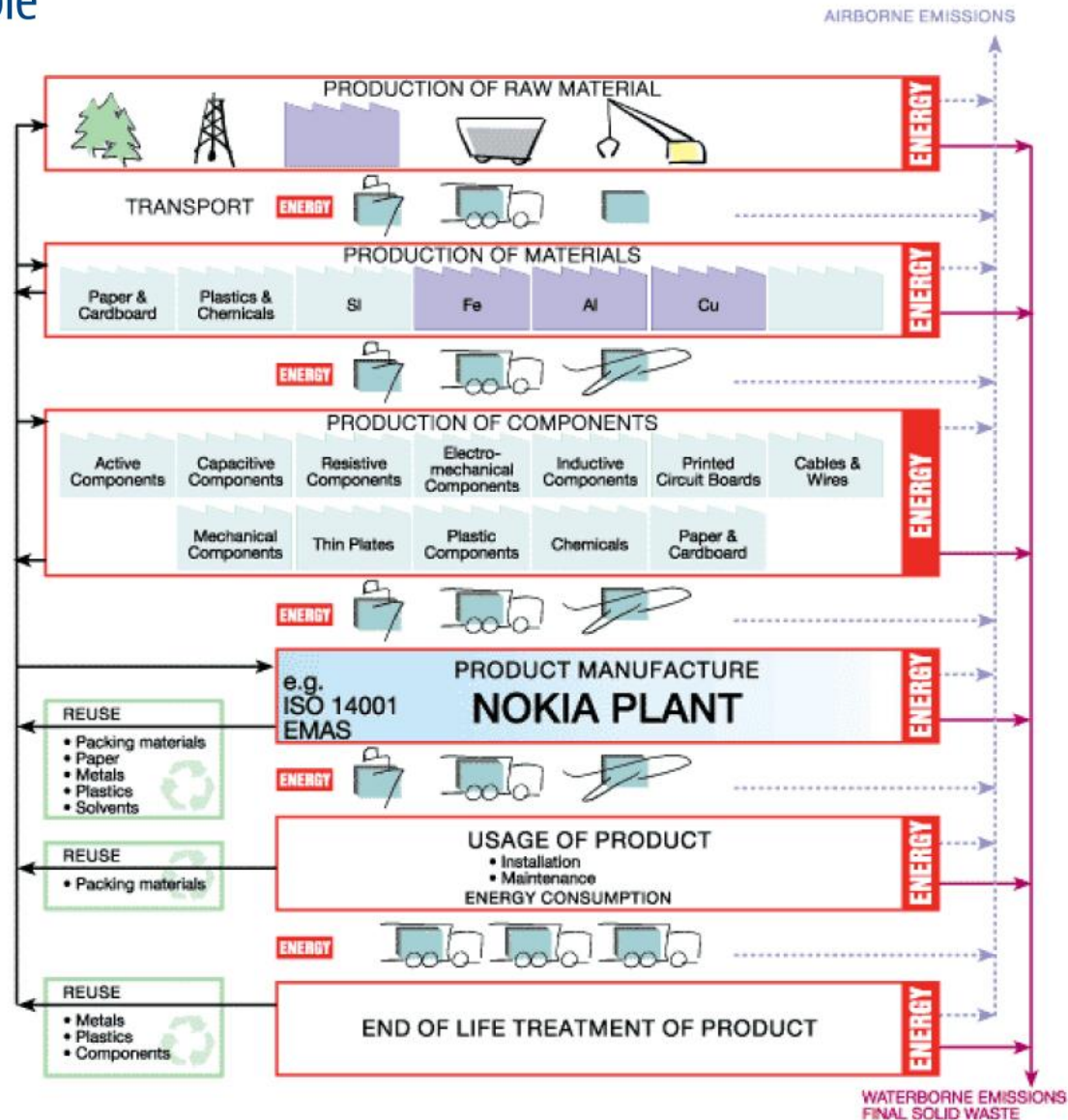
D4M

LCA case study - Nokia

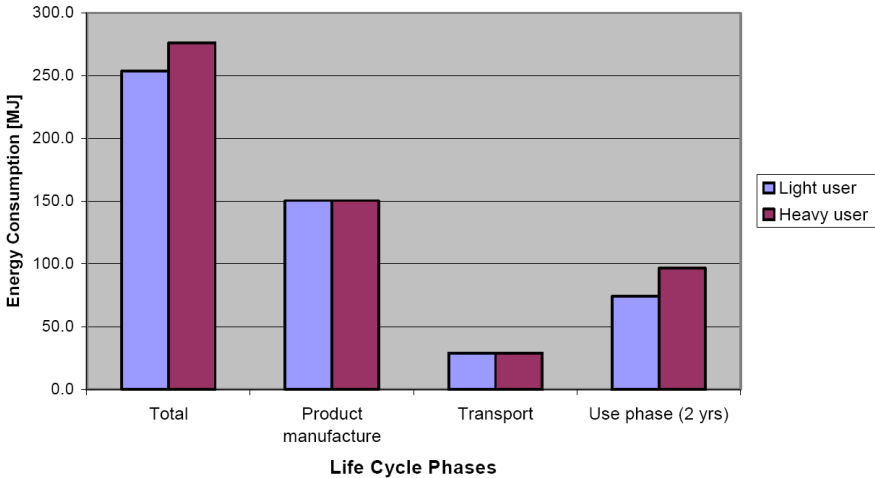


environmental impact distribution for mobile phones - 2 year lifetime

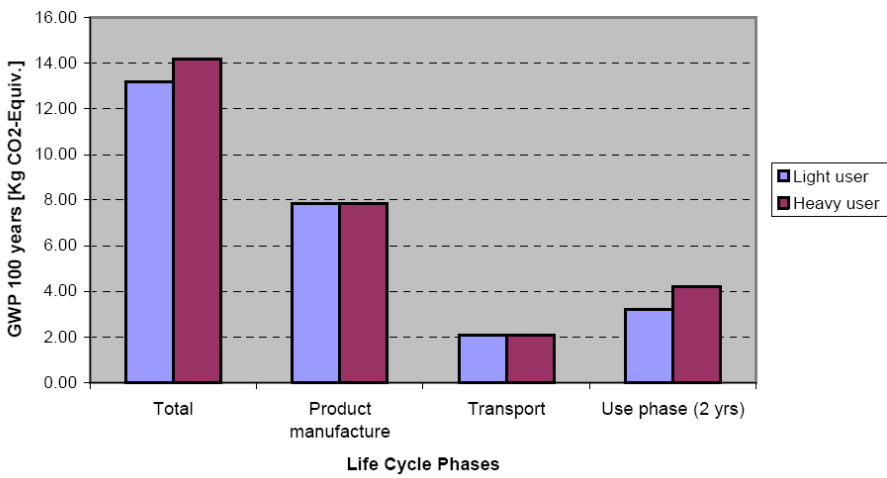




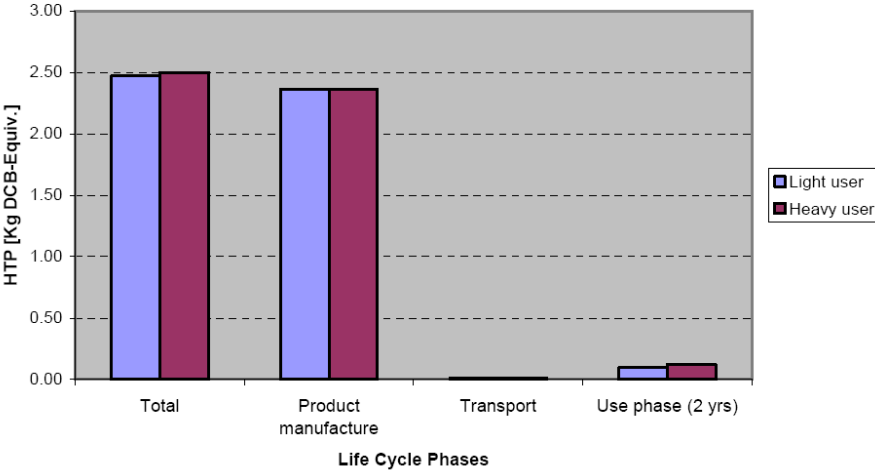
Primary Energy Consumption



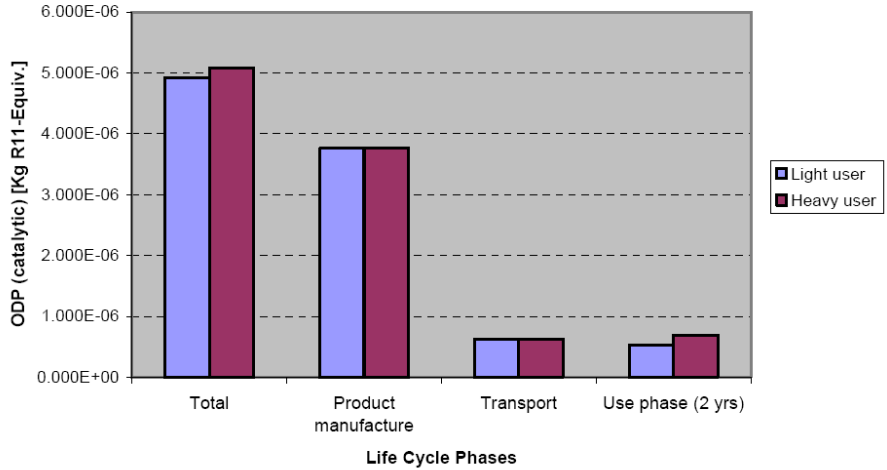
Global Warming Potential



Human Toxicity Potential

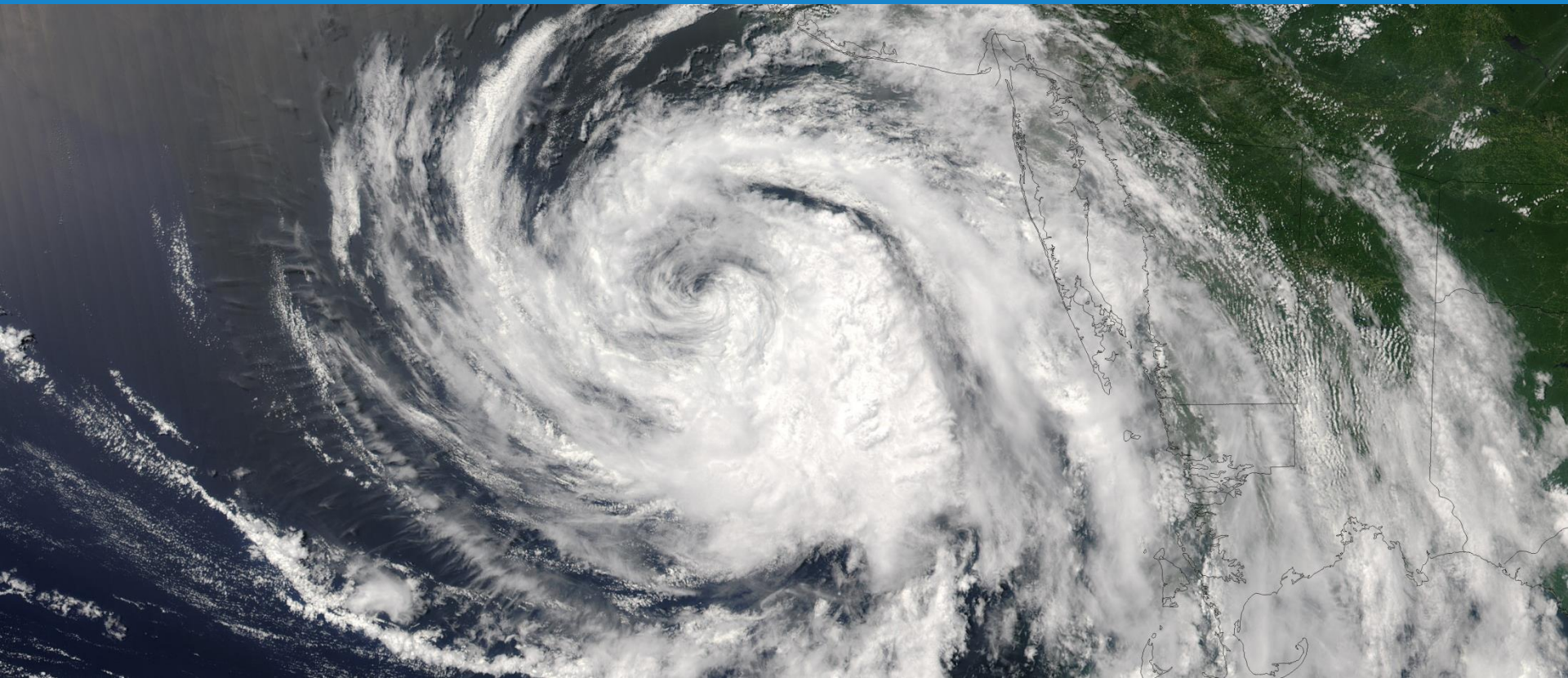


Ozone Depletion Potential



impact: global warming potential

- Global warming (or climate change) results from the addition of gases to the atmosphere from the burning fossil fuels, agriculture and industrial practices that affect the temperature of the Earth's atmosphere.
- The Intergovernmental Panel on Climate Change (IPCC) estimates that deforestation produces 5.9 billion tonnes of CO₂ per year or 18 per cent of global CO₂.
- Burning fossil fuels like coal, oil and gas releases greenhouse gases.



impact: acidification

- Acid rain is caused by the release of acidic gases, primarily from burning fossil fuels.
- Acidic rain can dissolve cement and minerals in buildings.
- It also dissolves aluminium and other metals from soils which is toxic to plants and to aquatic organisms.



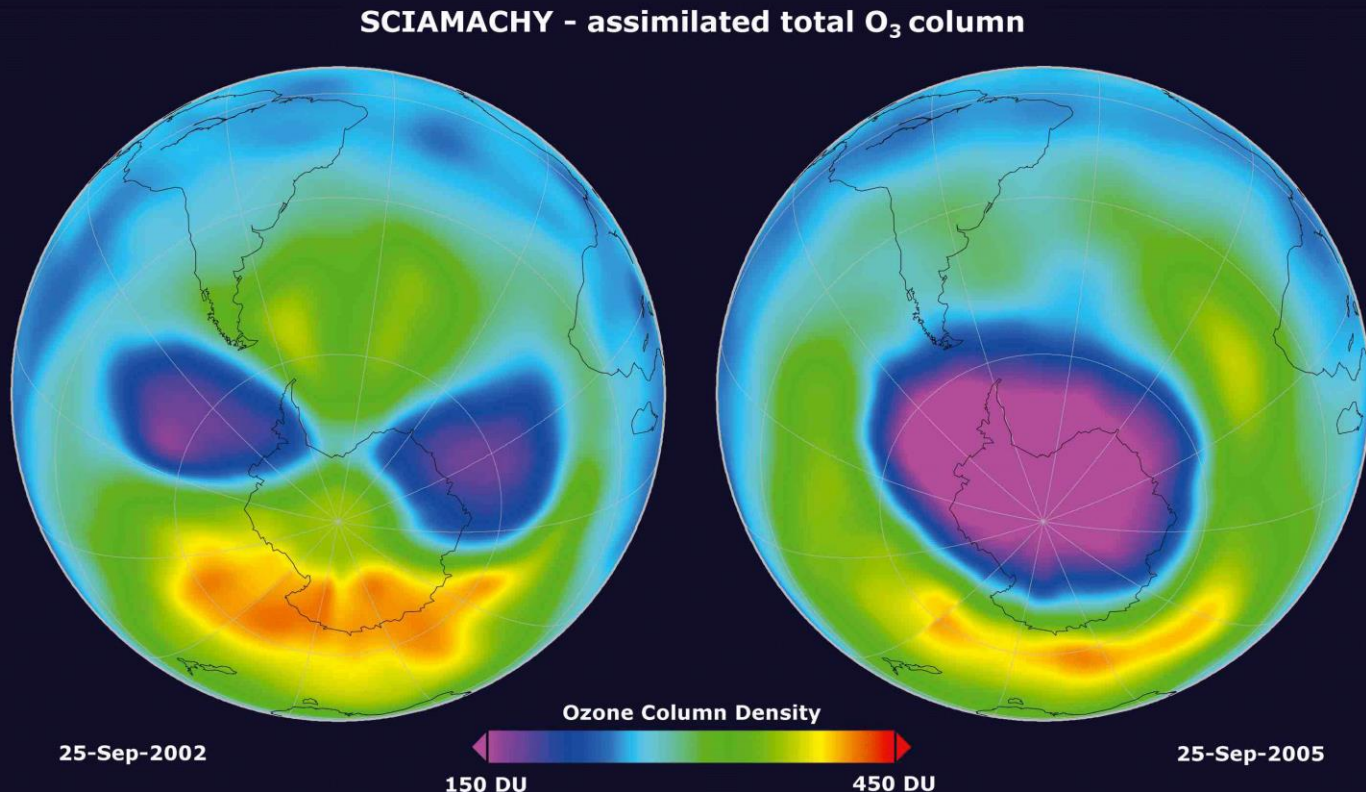
impact: Water eutrophication

- Caused by the presence of excess nutrients to water. This leads to a reduction of available oxygen.
- Nitrogen and phosphorous compounds from municipal wastewater and agriculture pollute surface waters.
- Eutrophication removes the oxygen from the water, killing fish and other aquatic organisms.



impact: ozone depletion

- Caused by emissions of chlorinated fluorocarbons (CFCs) such as Freon. These destroy ozone in the upper atmosphere, leading to "ozone holes".
- This increases the amount of ultraviolet (UV) light falling on the Earth, leading to increases in cancers, reduction of productivity of plants and affects marine algae. The 1992 Montreal Protocol banned use of 42 ozone depleting chemicals internationally.



impact: photochemical oxidation

- Photochemical smog is caused by the emissions of nitrogen oxides and volatile organic substances that generate ground level ozone (O_3) in the presence of sunlight.
- Smog and air pollutants increase the incidence of asthma in humans and reduce the photosynthetic capacity of plants.



impact: human toxicity

- Human toxicity is the effect of toxic substances on humans
- This can include skin irritants, growth inhibitors, and hormone disrupting chemicals (endocrine disruptors).
- Potential toxic effects can include transient irritation, physical or mental disability, inhibition of physical or mental development, temporary or permanent disability and/or death.



impact: resource depletion

- Human demands on world resources have doubled over the last 40 years
- It takes around 4,000 litres of water to make a cotton T-shirt - some lakes in cotton-producing areas are drying up, causing the collapse of fish stocks
- The use of coal has risen by more than half over the last 20 years and will continue to go up
- World populations of freshwater fish have nearly halved since 1970 due to increased demand for water in producing food, fibre and energy



impact: air pollution

- Air pollution happens when harmful substances are allowed into the air.
- The main pollutants affecting the air in England and Wales are carbon monoxide, nitrogen dioxide, sulphur dioxide, lead, ground level ozone, small particles and cancer causing chemicals like benzene.

