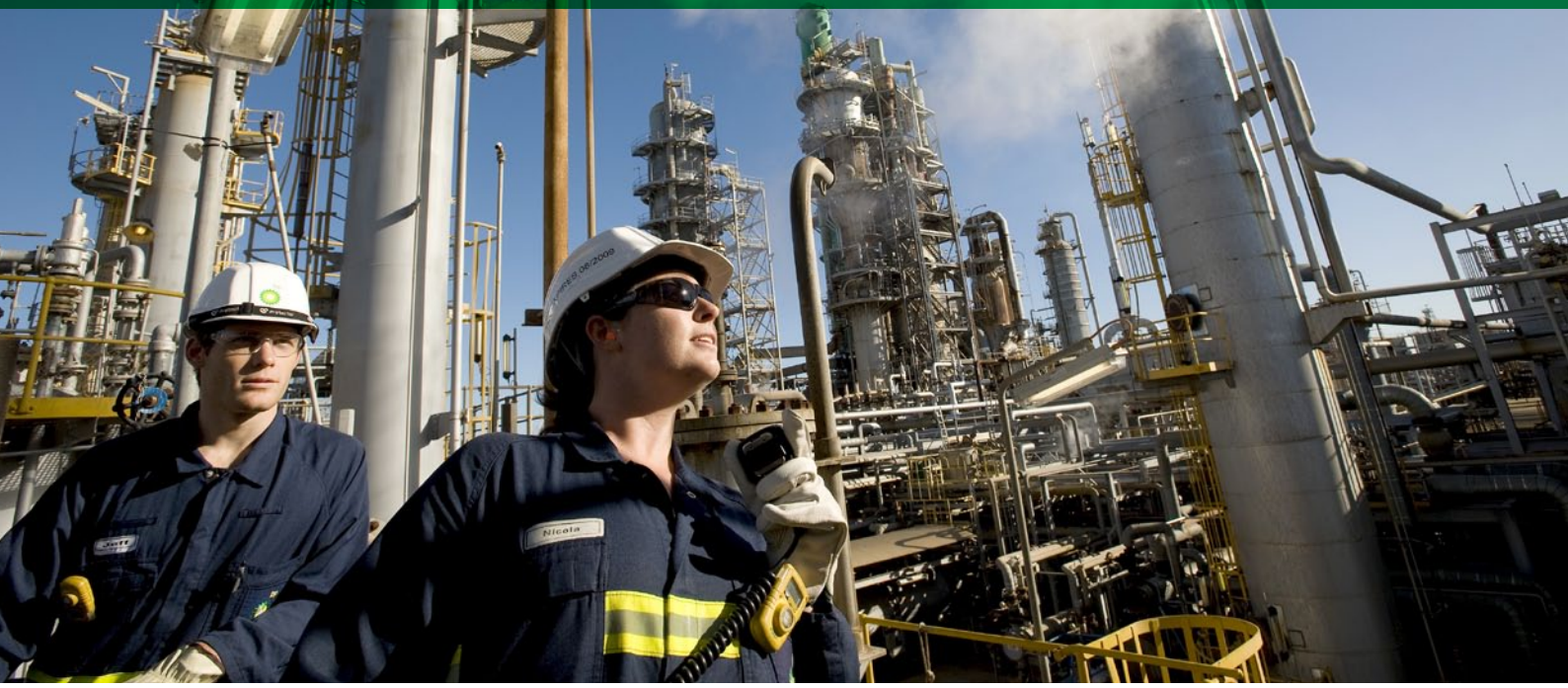
Climate Change

BP Refinery
Kwinana, Western Australia

The effect of carbon on the earth's climate has become the most debated environmental issue of our time. When, in the late 1990s, BP recognised reducing carbon emissions was the way forward for responsible companies, it was the first major oil company to do so. Since that time BP has strived to reduce its carbon emissions while continuing to meet the world's increasing demand for energy.



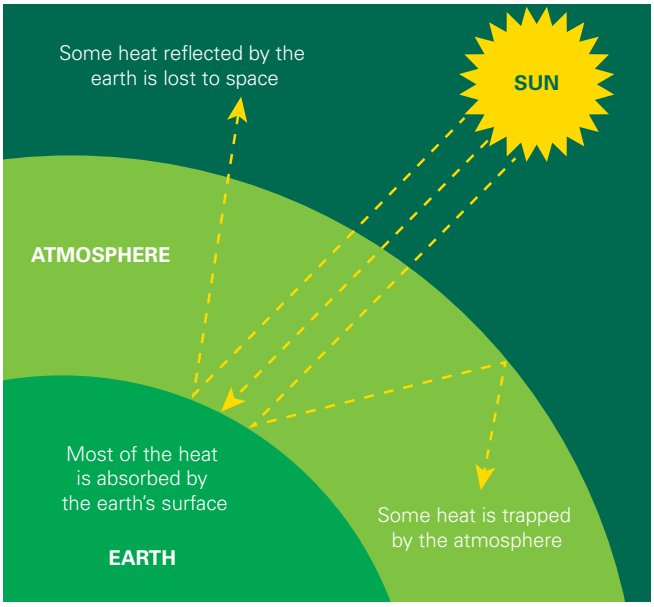
Why is carbon a problem?

When energy from the sun passes through the atmosphere, it warms the Earth's surface which releases heat energy. Some of this heat escapes into space, however many greenhouse gases that are trapped in the Earth's atmosphere, in particular water vapour, ozone and carbon dioxide, act as insulators. They absorb most of the heat from the Earth and retain it. These gases are becoming warmer because of their ongoing heat absorption. This process is known as the Greenhouse Effect because the Earth's atmosphere acts like the glass of a greenhouse, trapping the warmth of the sun within.

Carbon dioxide (CO_2) is a major Greenhouse Gas. Others are methane (CH_4), oxides of nitrogen (N_2O), hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride.

Human activity is believed to increase the amount of atmospheric greenhouse gases. The concentration of CO_2 in the atmosphere is considerably higher than at the start of the industrial revolution and levels are expected to continue to increase. Burning fossil fuels is the primary contributor to CO_2 concentrations in the atmosphere.

The Greenhouse Effect



Why Does It Matter?

If action is not taken to substantially reduce greenhouse gas emissions, scientists have predicted the average global temperature of the Earth will rise by 2°C to 4°C by the year 2100. This change in temperature may lead to extreme weather conditions, changes in sea level, seasonal adjustment and rainfall patterns.

The reality is that climate change and the timescales involved are not certain but rather possibilities that can not be discounted. The need is to balance the uncertain possibilities that are taken seriously by society and economic reality. Actions need to be timely and appropriate to not only reduce the greenhouse emissions, but also to increase the mechanisms for removal of greenhouse emissions from the atmosphere.

BP's Global Response to Climate Change

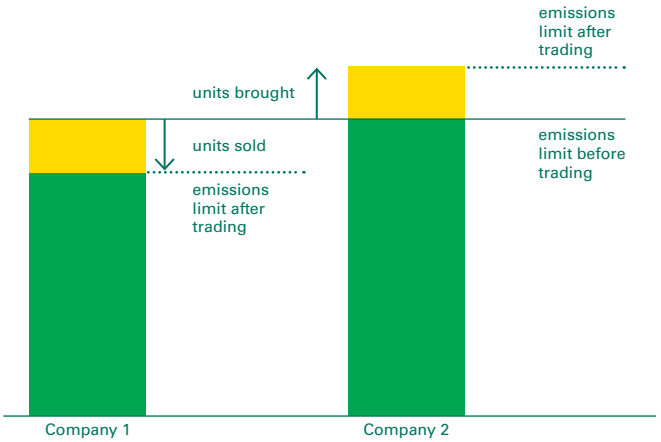
BP set itself a considerable challenge in 1997, to reduce global greenhouse emissions by 10% from a 1990 baseline, in the years to 2010. The target was more ambitious than that suggested under the international Kyoto agreement. BP delivered on its challenge in 2001, nine years early. Following this achievement BP set itself the new target to hold net emissions at 2001 levels until 2010 while continuing business growth.

BP achieved these emission reductions through actions to control greenhouse emissions and by developing and implementing a pilot internal trading scheme. The trading scheme had a number of purposes. The trial was to provide BP with experience emission trading, and to integrate emissions trading into normal business activities. The scheme was to also demonstrate BP's commitment to reducing emissions and to encourage other businesses to follow with their own emission reduction plans.

As the first company to introduce an internal emissions trading scheme BP attracted a lot of external interest and attention. The pilot scheme was conducted between 1998 and 2001, and provided BP with insight and experience on how national or international trading schemes might affect BP's businesses.

Concept of Emissions Trading

Carbon Dioxide Emissions



How is BP's Kwinana Refinery helping reduce the impact of climate change?

Deforestation is another of the main contributors to climate change. Trees absorb carbon as part of their growing process. But as more forests are harvested to make room for other land uses, the number of trees assisting the carbon removal process is decreased. Additionally, if a tree is harvested and burned, the carbon locked inside it is released back to the atmosphere.

In 1998 BP's Kwinana Refinery, in conjunction with the Forest Products Commission and private landowners, commenced a major initiative involving the reforestation of farmland in the south-west of Western Australia.

Within five years nearly 2000ha maritime pines (Pinus pinaster) and Sandalwood trees had been planted in plantations in WA. The plantations are located in the 400-600mm rainfall belt, with the focal point being the Katanning region. The benefits of the tree plantation project are environmental, social and economic.

The environmental benefits include the offsetting of greenhouse gas emissions as trees are a known sink for carbon. Additionally, the plantation project is addressing the issues of salinity and land degradation.

What is salinity and how do the trees help?

Salinisation of land and water in south-western Australia is the most critical environmental problem facing Western Australia. Salinity poses a major threat to natural diversity, rural towns, capital infrastructure, tourism, agriculture and recreation areas.

Other environmental issues such as waterlogging, flooding, water and wind erosion, soil structure decline and eutrophication are all worsened by salinity.

The cause of salinity is the replacement of perennial, deep-rooted native vegetation with agricultural crops and pastures. Annual crops and pastures do not need as much rainfall as native vegetation so the unused water either runs off or infiltrates beyond the root zone and accumulates as groundwater. As the groundwater rises, salts that have accumulated in the subsoil are mobilised. When groundwater comes close to the surface, salt enters the plant root zone and the plant suffers, eventually leading to the death of species that are not salt tolerant. Saline groundwaters also discharge at the soil surface and are concentrated by evaporation, damaging soils on-site and down slope and eventually draining into streams, rivers and lakes, degrading wetland habitat and water resources.

While salinity threatens our native biota across the landscape, wetlands and other low lands have borne the brunt of degradation, and this will continue.

Salinity can be reversed. Planting perennial (deep root) species such as woody shrubs and trees on salt affected land can lower the water table as these species have the ability to use water stored deep in the soil profile. Perennial species also have the ability to use water resulting from rainfall. By selectively planting perennial species on recharge areas it is possible to directly control the groundwater fluctuations and lower the water table. Planting salt tolerant species and ensuring adequate surface drainage will also help to reverse salinity on affected farm lands.

** For more information about how BP Refinery Kwinana is working to minimise CO_2 emissions, see the Air Quality brochure.