

Helping energy users manage their CO₂ emissions

More than 80% of the CO₂ from fossil fuels is emitted when energy products are used. Our customers emit six to seven times more CO₂ using our products than we do making them – more than 750 million tonnes of CO₂ in a typical year. We encourage the efficient use of energy and provide technologies and fuels to help.

Lower CO₂ electricity

We delivered more than 1.44 million barrels of oil equivalent of natural gas per day in 2006. That was more than 40% of our total upstream production. If all that gas were used to generate electricity, it would be enough to power approximately 180 million homes. Because natural gas contains less carbon than coal and can be turned more efficiently into power, a gas-fired power plant produces about half the CO₂ emissions of a conventional coal-fired station. This is true even if extra energy is needed to liquefy the gas and transport it.

Coal is the world's most abundant fossil fuel. Today it meets nearly 40% of total electricity demand and its use is expected to continue to grow. Shell companies do not produce coal, but we do have a patented technology for gasifying it. When used together with a combined-cycle power plant, our technology increases conversion efficiency. More electricity is produced from every tonne of coal, reducing

CO₂ emissions by up to 15% compared to the latest conventional coal-fired power plants. The process produces relatively pure, high-pressure CO₂ that is easier to capture and store. This technology has been chosen by the ZeroGen project (page 12). It is also an important part of our Clean Coal Energy Alliance, formed in 2006 with Anglo American plc, one of the largest coal producers.

We are actively supporting a European Union (EU)-China dialogue that is trying to make it possible for European companies to use the EU Emissions Trading Scheme to equip new coal-fired Chinese power plants to capture and store CO₂.

Lower CO₂ transport

The large-scale rollout of hydrogen-powered vehicles is uncertain and at least 10–20 years away. That means transport will continue to rely mainly on oil for many years to come. In the meantime, reductions in GHG emissions in the transport sector will need to come mainly from blending biofuels into petrol and diesel, from technologies to improve the fuel efficiency of conventional fuels and vehicles, and from efforts to manage people's demand for transportation.

We are one of the world's leading distributors of today's transport biofuels and are developing a new generation of lower CO₂ biofuels with partners (page 15). We continue to upgrade

our refineries to produce lower sulphur petrol and diesel. These fuels not only help reduce local air pollution (page 16), they also allow car makers to roll out more fuel-efficient (hence less CO₂ emitting) engines.

For example, our new Fuel Economy formula, available in 19 countries, reduces fuel consumption at no extra cost for drivers. In 2006, the Shell Fuel Economy World Record Challenge winners set the world record for fuel efficiency, using a version of this fuel and fuel-efficient driving techniques.

Every year we host the Shell Eco-marathon contest in Europe (and in 2007 in the USA) challenging students to design and build the most energy-efficient vehicle possible. In 2006, the contest was won by a car with average fuel efficiency of 2,885 km for the equivalent of one litre of fuel. In 2005–2006 we ran Fuel Stretch Campaigns in 19 countries to help drivers use less fuel and reduce CO₂ by teaching more efficient driving techniques.

Additional web content:

- The carbon footprint of our products.
- Our work on CO₂ sequestration and capture.
- How we are participating in the climate change policy debate.
- How we use carbon costs in investment decision-making.
- Help we are giving customers to reduce their emissions.

 www.shell.com/climate

CO₂ AND UNCONVENTIONAL OIL

As the era of “easy” oil ends, producing oil will continue to get more energy and CO₂ intensive. Increasing production from local unconventional sources, like oil sands and, in the future, possibly oil shales, is part of this industry trend. These sources provide a secure long-term supply that is close to major markets. However, the extra energy needed to produce them means higher CO₂ emissions. On a lifecycle basis, petrol from oil sands currently emits approximately 10% more CO₂ than petrol from conventional oil. Producing petrol from oil shales could require more energy still. So finding ways to reduce or offset CO₂ emissions from these sources is a clear priority.

Shell is a leader in unconventional oil. This is part of our strategy for developing a broad range of energy options. We are committed to developing these resources responsibly. For example, Shell Canada's first oil sands mining operation, the Athabasca Oil Sands Project (60% Shell Canada), has a voluntary GHG

reduction target: to make the combined CO₂ emissions from producing and using its petrol lower than those for petrol from the imported oil it replaces by 2010. The reductions are being sought in energy efficiency improvements and CO₂ capture and storage at our oil sands facilities, and in mitigation measures outside the project that offset its emissions. Shell Canada's external Climate Change Panel has provided independent advice on the reduction programme for this project. We are continuing to improve oil sands technology. The first expansion at Athabasca, announced in 2006, will use the new *Shell Enhance* technology. It reduces energy and CO₂ emissions from the step in the production process when the oil is separated from the sand, by 10% compared to previous technology.

A voluntary GHG management plan will be developed for the expansion. We are, for example, working with government and other stakeholders to develop new technologies such as CO₂ capture and storage.

