

CSI Summit 2007

Clean technology and Sustainable Industries Summit

Shell's alternative energy portfolio...
in a carbon constrained world
October 30, 2007



Agenda

1. The Energy Challenge
2. The **CO₂** Challenge
3. Shell's Alternative Energy Portfolio
 - Biofuels
 - Wind
 - Hydrogen
 - Solar
3. Leadership in **CO₂** Management

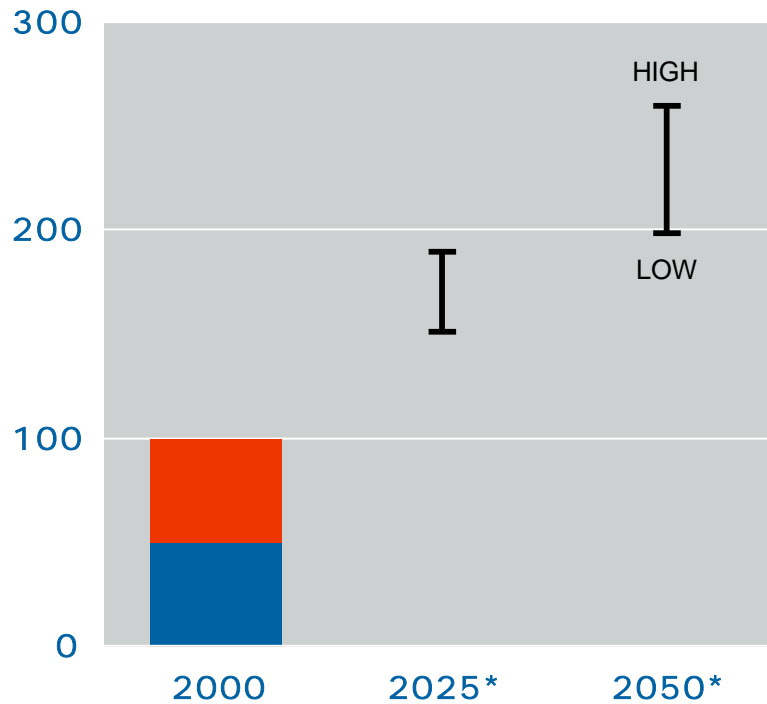


The Energy Challenge

Growth in Energy Demand

RISING GLOBAL ENERGY DEMAND

100= Global primary energy demand 2000

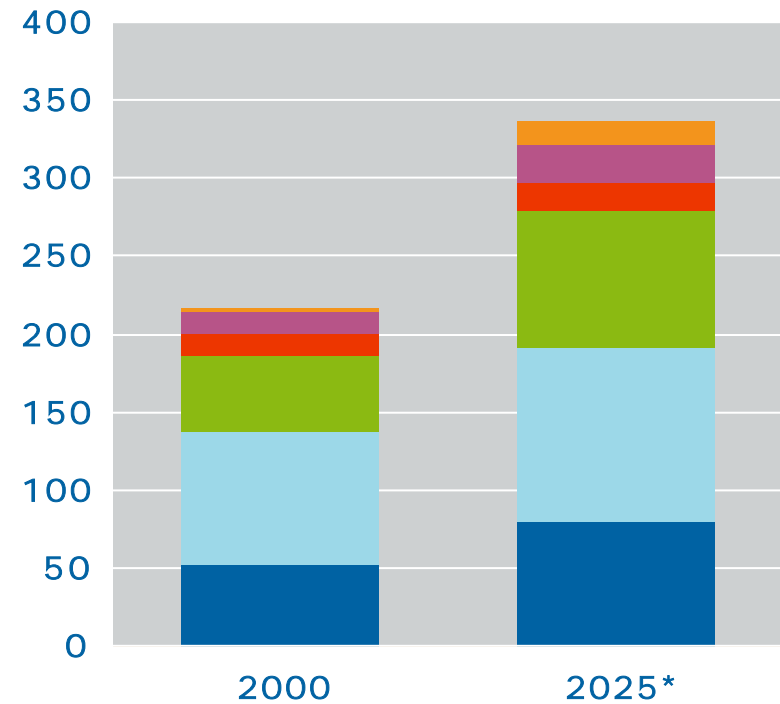


■ REST OF THE WORLD
■ OECD

* Shell estimates

CHANGING ENERGY MIX

Million barrels oil equivalent per day



■ COAL
■ OIL
■ GAS
■ NUCLEAR
■ LARGE SCALE HYDRO
■ ALTERNATIVE ENERGIES

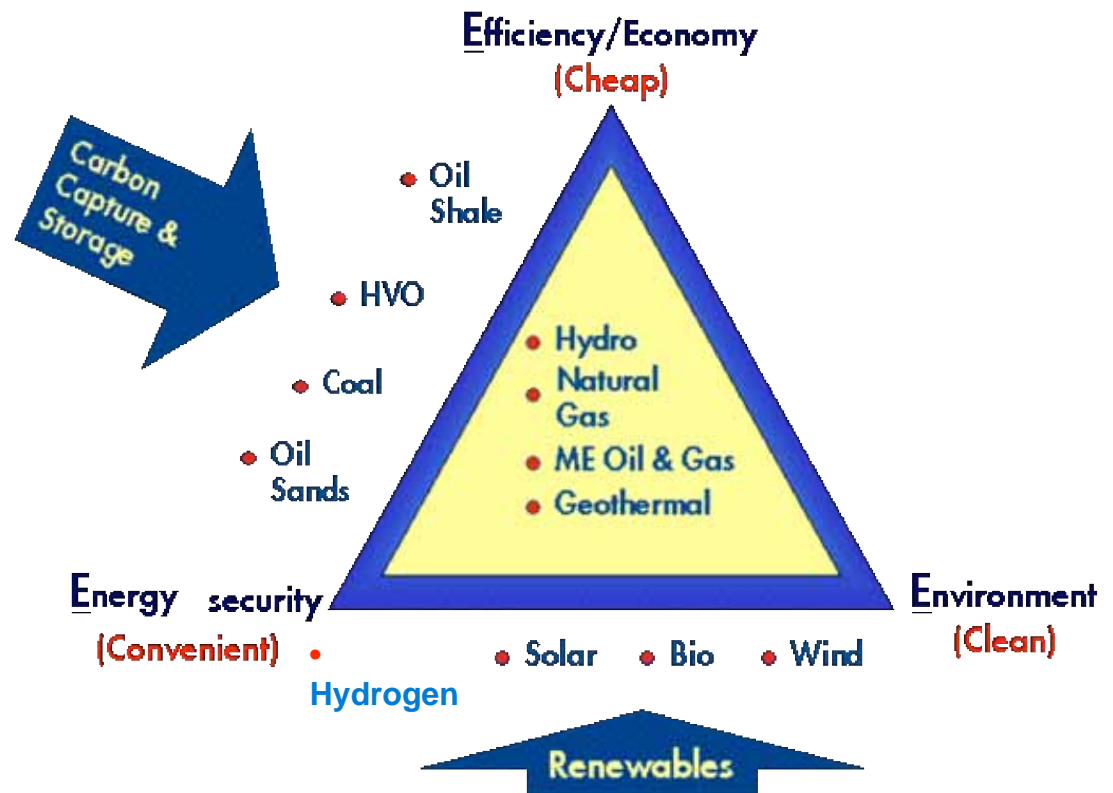


The Energy Challenge

“Trilemma” – The 3 C’s and the 3 F’s

ENERGY DEMAND

- Could more than double by 2050, as population rises and developing countries expand economies.
- Hydrocarbons will continue to provide the foundation of world energy supply for at least the rest of this century.
- As a result, management of the CO₂ footprint is a priority.



The CO₂ Challenge

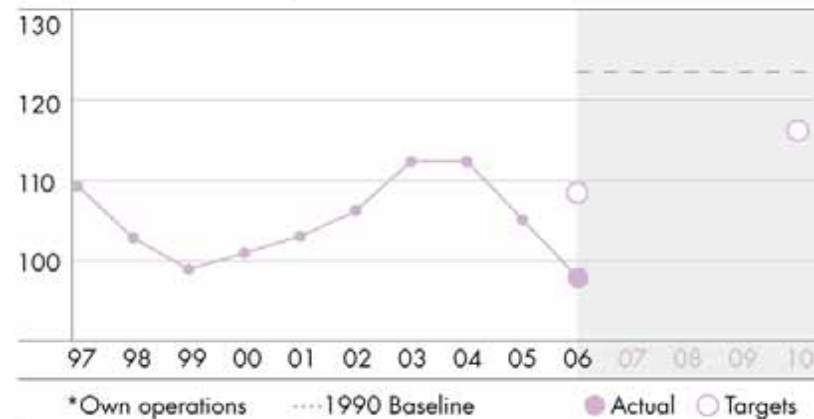
Shell's Commitment To CO₂ Management

A VOLUNTARY COMMITMENT

- We set an aggressive, voluntary CO₂ emissions target, aiming to reduce emissions from Shell operations in 2010 to a level at least 5% lower than in 1990, even while we grow our business.
- In 2005, our emissions fell to 107 million tonnes CO₂ equivalent, 15% below the 1990 level of 123 million tonnes.
- This has been accomplished by reduced flaring and increased efficiency in our operations.

GREENHOUSE GAS EMISSIONS*

Million tonnes CO₂ equivalent



*Petroleum Industry Guidelines for Greenhouse Gas Estimation, December 2003 (API, IPIECA, OGP) indicate that uncertainty in greenhouse gas measurements can be significant. Accordingly, we have assumed that the uncertainty associated with our 1990 CO₂ measurements was the same as that associated with our measurement in 2002.



Shell's Alternative Energy Portfolio

Renewables: Pursuing a Competitive Business

BIOFUELS



- Leading in first generation transport biofuels
- Investment in second-generation biofuels

SHELL WIND ENERGY



- A leading wind operator
- 412 MW installed capacity (Shell share)

SHELL HYDROGEN



- World's largest public transport JV (NL)
- Demonstration projects in US, Europe and China

SHELL SOLAR



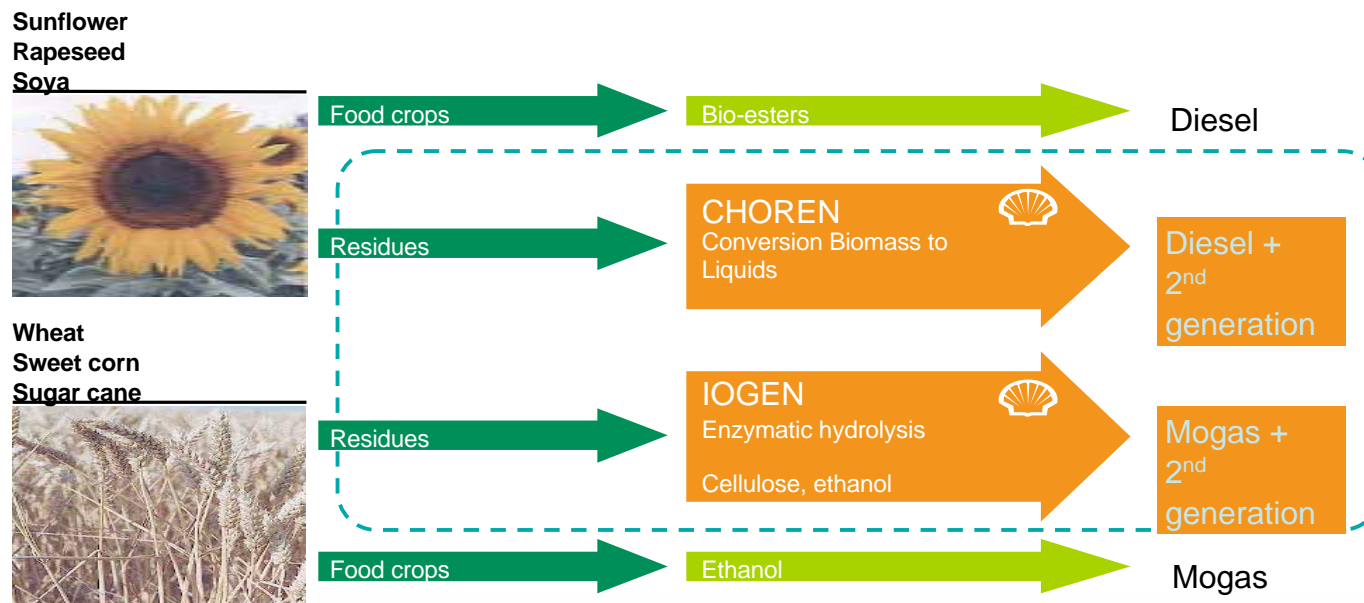
- New generation thin film technology (CIS)
- Improved efficiency
 - 20 MW facility under construction



Shell's Alternative Energy Portfolio

Renewables: Biofuels

- Shell has been involved in distributing biofuels for more than 30 years. Our experience and investment in biofuel technology have helped to move the development of biofuels forward.
- We believe that we are now the world's largest distributor of first generation transport biofuels, selling over 3.5 billion litres in 2006, mainly in the USA and Brazil. This is enough to avoid around 3.5 million tons of CO2 production, compared with using conventional gasoline or diesel.
- Shell was one of the first energy companies to invest in second generation biofuels, that use non-food feedstocks, offer lower well to wheels' CO2 production and can offer enhanced performance. Shell's technical partnerships with two of the world's leading biotechnology companies are at the forefront of these developments: Iogen in Canada and CHOREN in Germany.



Shell's Alternative Energy Portfolio

Renewables: Shell Wind Energy

NoordzeeWind, Netherlands



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- Shell is a leading wind operator.
 - Shell's wind farm interests have a total capacity of 412MW (Shell share)
 - Shell has interests in:
 - 7 operating wind farms in 5 states in the US, is constructing a 164MW (Shell share 50%) farm in West Virginia and earlier this year announced our intention to develop a 3 gigawatt wind project in the Texas Panhandle.
 - NoordzeeWind, a 108MW off-shore wind project in the North Sea off the coast of The Netherlands.
 - Wind farms in both Spain and Germany.
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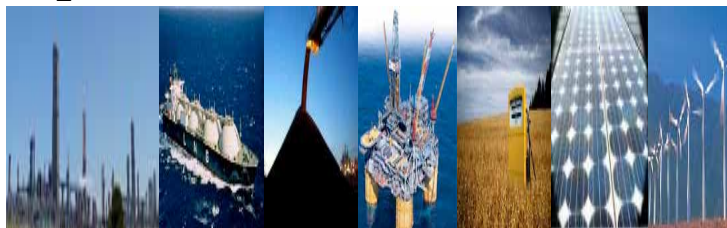
Shell's Alternative Energy Portfolio

Renewables: Shell Hydrogen



- World's largest public transport JV (NL)
- Demonstration projects in US, Europe and China

H₂ Manufacturing



Refining	LNG	Coal	E&P	Biomass	Solar	Wind
SM	Excess H ₂ Streams	Reforming/Gasification			Electrolysis	

CO₂ capture and sequestration

- Shell recognises the potential environmental and energy security benefits of hydrogen as a fuel.
- Shell has demonstrated that it is serious about hydrogen and has built up an impressive track record of leadership in just seven years. Shell is the only energy company building hydrogen infrastructure in the three key markets of the USA, Europe and Asia.
- We believe that hydrogen mini-networks* could play a crucial role in bridging the gap between hydrogen demonstration projects and commercialisation. That is why we are working with other energy companies and auto manufacturers to set up hydrogen mini-networks in the USA (California and New York), Europe, China and Japan.
- We recognise that if the environmental benefits of hydrogen are to be realised, a critical challenge is to produce - and make widely available - hydrogen with a low or even zero CO₂ footprint. Shell is a leader in carbon sequestration and will also investigate potentially cost-effective ways to make hydrogen from renewable sources.
- Shell is continuing to invest in hydrogen research and development, and is working with technical partners, to help make hydrogen a viable energy solution in the longer-term.

Mini-network = at least four combined hydrogen and gasoline refuelling stations in urban centres



Shell's Alternative Energy Portfolio

Renewables: Shell Solar



- JV with Saint-Gobain in November '06
- New generation thin film technology (CIS)
 - Improved efficiency

AVANCIS

Why CIS?

- Highest efficiency of all thin-films:
 - Shell module has world record efficiency of 13.5 %
- Superior energy yield
- Better reliability
- Low direct materials cost
- Uniform appearance / aesthetics

Why thin-film?

- Lower consumption of materials
- _ the number of process steps
- Simplified materials handling
- Significantly streamlined assembly



Leadership in CO₂ Management

MANAGING OUR OWN CO₂ EMISSIONS

BASELINE EMISSIONS



- Improving efficiency
- Reducing flaring
- Leading designs
- CO₂ for enhanced oil recovery
- CO₂ storage
- Renewables offsets
- CO₂ allowance trading

REDUCED NET EMISSIONS

ADDRESSING CO₂ INTENSITY

- Increasing gas and LNG supply
 - CO₂ storage / EOR
 - Clean coal technologies
 - Renewables: Biofuels, Wind, Hydrogen & Solar
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Thank you

Questions

www.shell.com/renewables