



## ENSURING EUROPE'S ECONOMIC FUTURE: An Energy Industry Perspective

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- Challenges of and Responses to Globalisation
- European Models and their Post-Crisis Viability
- Shell Priorities in a Greener, Smarter Europe

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# CHALLENGES OF AND RESPONSES TO GLOBALISATION

OIL AND GAS INDUSTRY GLOBAL ALMOST SINCE ITS START SO GLOBALISATION IS NOT NEW, BUT TODAY'S CHALLENGES ARE – ENERGY AND COMPETIVENESS

## LONG-RUN GLOBAL ENERGY CHALLENGES – SHELL ENERGY SCENARIOS TO 2050 (2008)

- Energy demand set to roughly double by 2050 largely due to growth in emerging markets
- Anticipate supply tightness and energy price volatility because oil and gas supplies would struggle to keep pace with income and energy demand growth
- Environmental stresses associated with energy would continue to get worse and trigger a patchwork of responses by governments, consumers and businesses

## UPDATED ENERGY OUTLOOK

- Economies of China and other emerging markets have shown resilience though the recession
- Continue to see eventual supply tightness particularly for oil, despite newly expected Iraq supplies
- Scientific evidence on climate change continues to harden, patchwork of policies in Copenhagen
- But the fast ramp up North American (NA) unconventional gas dramatically changes the NA supply outlook and frees up supplies of liquefied natural gas for other countries, including Europe

# CHALLENGES OF AND RESPONSES TO GLOBALISATION

## SHELL RESPONSES TO GLOBAL ENERGY CHALLENGES

- Cleaner energy and increasing supply of energy (more later)

## GLOBAL COMPETITION AND SHELL STRATEGY AND PERFORMANCE

- Intense competition for access to resources and growing competition in refining and chemicals
- Health, safety, security and environment remains a top priority
- Increase scale and technological complexity in manufacturing (refining and chemicals)
- Innovative exploration technologies and strong project execution (exploration and production)
- Innovative partnerships with emerging market companies
  - Proposed joint venture with Cosan of Brazil (ethanol from tropical sugar cane and fuel distribution)
- Among industry leaders on research and development and brand value

## GENERAL BUSINESS IMPLICATIONS

- People, skills and technology, as well as product differentiation are key to competitiveness
- Develop innovative business partnerships

# EUROPEAN MODELS AND THEIR POST-CRISIS VIABILITY

## TWO EUROPEAN MODELS: ECONOMIC AND SOCIAL; ENERGY AND CLIMATE

### EUROPEAN ECONOMIC AND SOCIAL MODEL

- Comprehensive welfare systems to reduce individual risks and to promote health and education
- Institutionalised industrial relations and state mediation between employees and employers
- High levels of taxation to support public social expenditure
- But relatively low productivity growth compared to the United States since the mid-1990s ...
- ... and persistently high unemployment in some countries

### POST-CRISIS VIABILITY

- Dramatic structural deterioration in public finances puts the model under heavy pressure
  - Driven by large permanent EU output loss from recession – about 10% according to the EC
- Burden of the adjustment appears set to fall more heavily on spending than taxes
- Supply-side reforms aimed at greater labour market flexibility could reduce the permanent output loss and protect more social expenditure

# EUROPEAN MODELS AND THEIR POST-CRISIS VIABILITY

## EUROPEAN ENERGY AND CLIMATE MODEL (SUMMARISED BY 20-20-20 targets for 2020)

- 20% reduction in emissions from 1990 levels and 30% stretch target if strong international action
- 20% share of renewables in total energy mix and 10% share of biofuels in the transport fuel mix
- 20% gain in energy efficiency over business-as-usual
- EU-ETS with safeguards for energy-intensive, trade exposed sectors as a central policy pillar
- Financial support for carbon dioxide capture and storage (CCS) demonstration projects

## POST-CRISIS VIABILITY

- Concern of a structural shift in supply and demand for emission allowances in the EU-ETS driven by expectation of large permanent EU output loss from recession
- Important that the EU-ETS remain robust to the cycle and drive needed innovation and investment
- But it is the long-run supply-demand balance that matters for large, long-lived investments
- Shell has used a \$40 per tonne carbon cost in all its investment decisions for several years, well above the carbon price in EU and elsewhere, and this has not changed due to the recession
- Too soon to form a reliable judgment about permanent output loss, but prospect of EU-ETS review and potential recalibration of system should be sufficient to support expected long-run carbon price

# SHELL PRIORITIES IN A GREENER, SMARTER EUROPE

## CLEANER FUELS FOR POWER

- Modern combined cycle gas plants emit about half the CO<sub>2</sub> of a modern super critical coal plant and about 60 – 70% less than older steam turbine plants
- Shell has for some time been increasing its supply of natural gas, which will make up half of our total energy production by 2012 and grow beyond that
  - Has a leading position in liquefied natural gas (LNG) and is developing technologies to recover natural gas from tight formations
- We are advancing carbon dioxide capture and storage technologies and their application
  - Development of technologies for gas separation and transportation and participation in CCS demonstration projects such as CO<sub>2</sub> SINK in Germany
- Natural gas plants offer immediate environmental benefits and in the longer run when emissions from power generation must come down even further they can be retrofitted with CCS
  - Similar cost to retrofitting CCS to coal plants when evaluated on the long-run cost of generation
- Increasing number of natural gas suppliers, continued development of pipeline networks and globalisation of LNG are also bringing greater diversity and security of supply

# SHELL PRIORITIES IN A GREENER, SMARTER EUROPE

## MORE SUSTAINABLE TRANSPORT FUELS

- Working to improve the sustainability of today's biofuels by introducing sustainability clauses in new and renewed contracts with suppliers
- Investing in developing more advanced biofuels for the future – our most promising advanced biofuel is cellulosic ethanol, developed in collaboration with Iogen Energy

## LOWER EMISSIONS FROM OUR OPERATIONS

- Continue to implement long-term energy management programmes to improve our efficiency and to reduce flaring and venting of natural gas

## INVESTMENT IN RESEARCH AND DEVELOPMENT

- Spent over \$1 billion in 2009 on research and development – more than our competitors – to develop new energy technologies and to meet the rising demand for energy
- Over the past five years, spent over \$2 billion on research and development in CCS and alternative energies, including biofuels

