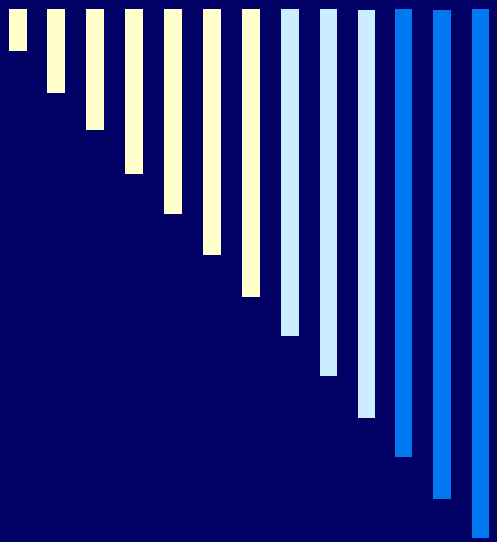

The oil and gas industry

Risks posed by measures to mitigate greenhouse gases

Expert meeting on response measures

Montreal 23-24 November 2005

Gabriel Sanchez-Sierra

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- Past versus present environment constraints
- Why is GHG mitigation a challenge?
- Investment risks
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Context

- The history of the oil industry shows that its operating environment has always been complex
- All segments of the industry (production, refining, distribution and transport) have been transformed into global and highly competitive areas
- Competitive landscape changed by mergers, global and regional joint ventures and partnerships

Context (cont'd)

- The varying regulations on GHG emissions across borders (USA, Europe, developing countries) also changing the framework for the industry
- GHG regulations impact on the oil and gas industry via price of carbon emissions on two fronts – oil prices and price of carbon as a pollutant

Past vs. present environment constraints

Past

- 1960-1970: Environmental issues within the compound of industry operations
- 1980s: Regional issues such as acid rain, biodiversity and ecology
- 1990s: Ozone depletion and CFCs and oil spills

Past vs. present environment constraints (cont'd)

Present

- Governments have shifted concerns from energy availability to energy acceptability and environment
- All environmental issues of the past and now greenhouse gas mitigation

Why is GHG mitigation a challenge?

- The need to mitigate GHG adds a layer of complexity for development of projects to meet future demand
- The challenge for the oil industry in the 21st century is to
  - reduce GHG emissions in oil operations
  - reduce GHG emissions at the consumers' level
  - ensure security of supply and market stability

Investment risks

- Existing
  - Economics
  - Politics
  - Technology
  - High capital investment
  - Lack of flexibility in the supply chain
  - Long term horizons (planning and development)
  - Taxes
  - Fiscal and legal regimes

Investment risks (cont'd)

- Prices that will allow acceptable profits affected by
  - Political stability
  - OPEC rulings and stock levels
  - Attacks on oil and gas infrastructure
  - Hot summers and cold winters
  - Proven reserves
  - Regulatory environment worldwide
- Demand! …. like any other business, demand is the most important element of profitability and survival

Investment risks (cont'd)

- The new ones for the 21st century
  - Uncertainty of how GHG regulations on carbon emission constraints will affect oil demand and oil prices over the next 20 years
  - Exposure to compliance costs from unexpected expenses in regulations, fines, taxes and caps on products that emit GHG emissions
  - Prices of products may be set to reflect the cost of carbon emissions reductions, pollution controls
  - New tax and fiscal regimes in exploration and production

Investment risks (cont'd)

- Future markets for oil and gas may be threatened depending on national energy policies
- Willingness of investors to provide funds to oil companies may be reduced
- Potential litigation by the public against GHG emitting sources
- Asset management where GHG regulations could result in premature retirement of technologies before time, resulting in heavy financial losses for companies
- Investing in future technology without having ability to forecast future GHG regulations could have significant economic implications

Investment risks (cont'd)

- Climate related events
  - Risk due to possible effects of weather-related catastrophes (hurricanes, tornadoes, flooding, extreme heat conditions)
  - These have a direct impact on infrastructure such as off-shore platforms, refineries, retail outlets, port and storage facilities (e.g Katrina resulted in closure of 25% of refining capacity in Southern USA)

Managing financial risk

- Improving modelling oriented to:
  - Design an agreed model with the participation of all countries involved (G8, OPEC and others)
  - Analyse the effects of GHG regulations on energy demand
  - Analyse different GHG scenarios for upcoming fiscal and regulatory regimes and determine how companies should direct investments to ensure futur returns
  - Facilitate decisions, like investments in retrofitting versus buying carbon credits

Managing financial risk (cont'd)

- Improving producers' ability to deal with GHG issues via:
  - Transfer of technical know-how to national oil companies to improve operations
  - Encourage the low-cost commercialization of carbon sequestration technologies to extend the lifetime of reserves
  - Develop financial hedging instruments to insure against undue revenue losses

Managing financial risk (cont'd)

- Improving oil industry's response:
  - Reducing flaring and venting of gas, optimizing available energy resources in field operations
  - Using dynamic evaluations instead of static analyses to reach optimal life cycle costs

Approach	**Electricity costs (US$/bl) ***	
	Year 1	Year 15
Technical	1.20	4.50
Technical and economical	1.00	1.00

* Specific case; not always

Managing financial risk (cont'd)

- Improving oil industry's response:
  - Participating in carbon offset (Clean Development Mechanism, emissions trading)
  - Developing CO_2 separation technologies and safe geological underground gas storage
  - Strengthening positions in natural gas and renewable energy (energy diversification)
  - Developing GHG friendly energy technologies
  - Analysing the post 2030 non-energy use of oil and coal participation to ensure economic revenues

Possible steps forward

- Develop a common model with the participation of all countries involved
- Develop financial hedging mechanisms against revenue losses arising from the implementation of response measures
- Transfer GHG reducing technologies especially to countries that have large reserves of oil and gas in order to give them an opportunity to monetize these resources at reduced cost and reduced pollution levels
- Assist countries to manage the transition towards less dependency on oil revenues via economic diversification

Possible steps forward (cont'd)

- Support countries in developing cleaner fuels
- Establish partnerships to transfer technical know-how and technology to assist national oil companies in making their operations more efficient (cogeneration, reduced flaring)
- Encourage the low cost commercialization and transfer of carbon capture and storage technologies to extend the lifetime of reserves

Final thoughts