



# Oil outlook and investment challenges

**Mohamed Hamel**  
Head, Energy Studies Department

**Ministerial Symposium on  
“Providing Petroleum, Promoting Prosperity, Protecting the Planet”  
15<sup>th</sup> – 16<sup>th</sup> November, 2007**



## Outline

Oil outlook to 2030: reference case

Alternative scenarios

Investment requirements

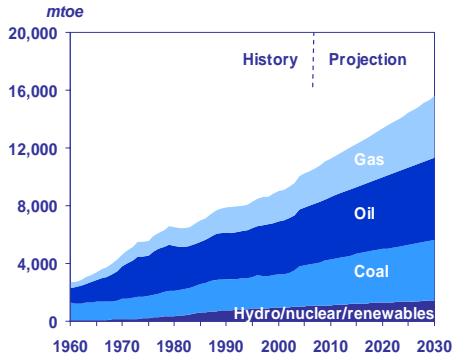
Associated challenges and implications

Concluding remarks



## Energy demand is set to grow

Energy demand by fuel type  
Reference case

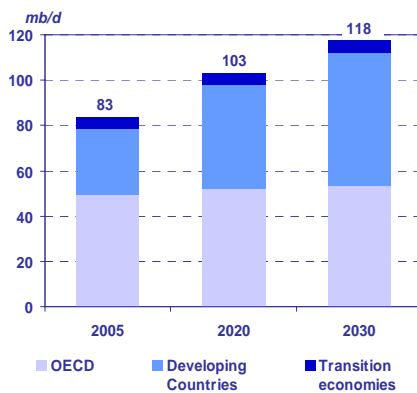


- Economic growth, rising population and social progress have led to increased use of energy
- However, many still lack access to modern energy services
- Fossil fuels will continue to play the key role in energy mix
- Resources are plentiful
- Deliverability and sustainability are the key issues

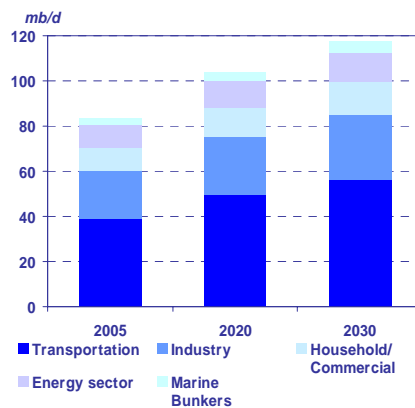


## Oil demand outlook, reference case

By region



By sector



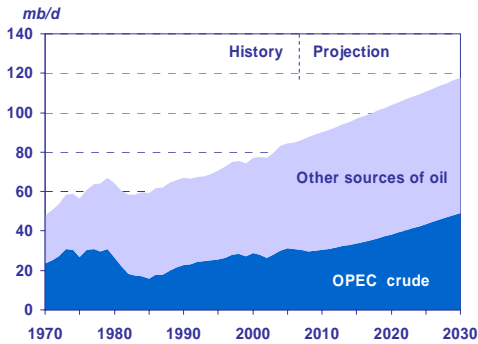
Developing countries' demand will rise fast, but per capita consumption will remain much lower than in OECD

Key sector: transportation



## Both OPEC crude and other sources of oil supply will rise

### Global oil supply Reference case



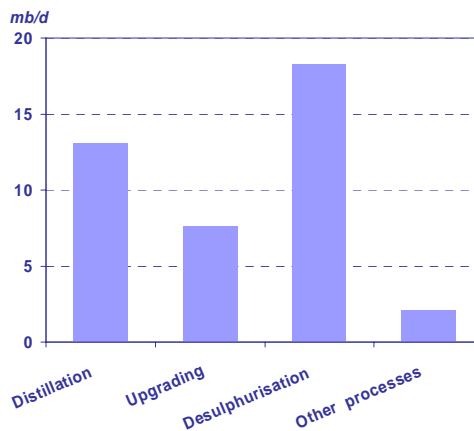
- Resource base is sufficient
- Supply from sources of oil other than OPEC crude will increase
- OPEC crude share not markedly different from today
- Sustainability of large biofuels supply and use is questionable



## Capacity additions are needed in the downstream

- Growth in product demand and shift towards lighter products
- More stringent quality specifications
- Large capacity additions needed by 2020, particularly in distillation, desulphurisation and upgrading units
- Crude and product regional trade expanding, with progressive shift towards Asia

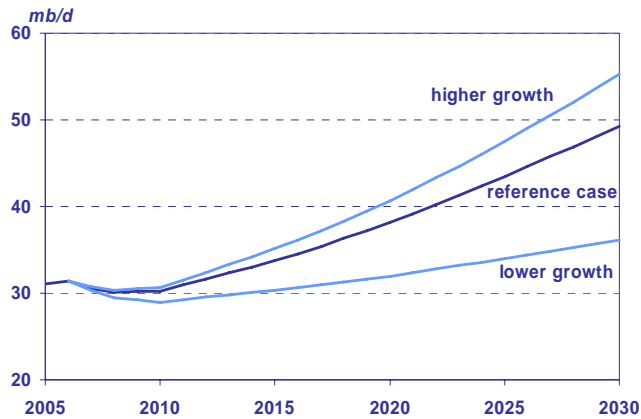
### Required refining capacity additions 2006-2020





## Demand uncertainties translate into large uncertainties for required OPEC oil

The demand for OPEC crude oil in three scenarios



Risks to demand are skewed towards the downside



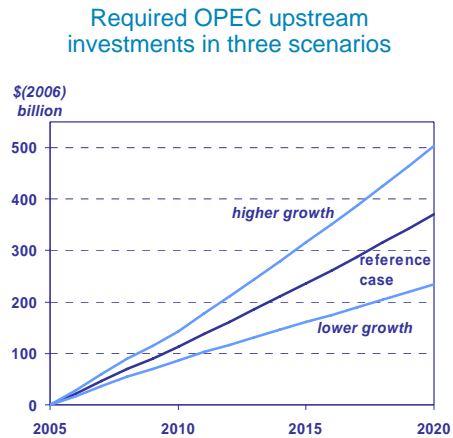
## Investment challenges

- How much capacity?
- Upstream and downstream economics
- Developing and deploying technology
- Protecting the environment



## How much capacity?

- Uncertainties over required OPEC crude translate into a wide range of possible upstream investment needs
- Consuming country policies add uncertainty
- Over-investment: waste of precious resources and poor return to investors
- Under-investment: the needs of consumers are not met
- The key role of OPEC spare capacity
- Security of *demand* and security of *supply* go hand-in-hand



## Upstream and downstream economics

- Globally, availability of capital is not an issue
- Oil is an exhaustible natural resource
- Oil projects are capital intensive, with long lead times
- Are market signals reliable and conducive to appropriate levels of investment?
- Petroleum projects are facing a huge increase in costs
- Shortages in skilled labour: need to restore and redevelop the industry's image to appeal to young people



## Developing and deploying technology

- Technology has always had substantial impacts
- Technological progress and innovation contributed to additions in petroleum resources/reserves, increased recovery, cleaner fuels, etc.
- R&D spending was reduced significantly in the 1990s; this trend needs to be reversed
- Of increasing importance: the development of technologies that enable an increased use of fossil fuels in a carbon-constrained world



## Protecting the environment

- Growing concern over local pollution and potential climate change
- Huge progress made in reducing tailpipe emissions
- The petroleum industry will adapt to a carbon-constrained world by developing cleaner fossil fuel technologies
- This includes carbon dioxide capture and storage
- Developed countries should take the lead in the development and deployment of this technology



## Concluding remarks

- Energy is crucial for sustainable development
- OPEC Fund for International Development (Algiers, 1975)
- Poverty alleviation, economic growth and social progress can be made compatible with the protection of the environment
- Energy interdependence is a key ingredient for long-term market stability
- The OPEC Long-Term Strategy calls for improved dialogue and co-operation among all parties: prime example is the International Energy Forum



[www.opec.org](http://www.opec.org)