

***Visions for Renewables After
3.11
– a changing energy world***

Hans Jørgen Koch
Deputy State Secretary, Denmark
IEA Governing Board Member
September 2011

WHAT I will tell you:

- In the future, any economy dependent of import of oil, coal and gas will be a fragile economy.
- Renewable energy contributes not only to reducing greenhouse gases, but also enhances energy security.
- Subsidies are necessary for greater deployment of renewables, but key technologies will soon become cost-competitive with fossil technologies.

HOW will I tell you:

- Four key drivers of global energy development.
- Three main sources of energy and their main problems.
- Twelve statements about the global energy situation.

Four key drivers of global energy development

- **Energy security:** people & societies getting the *amount* of energy they need *when* they need it;
- **Economic development:** energy provided at a price and in a manner which allows economic growth and elimination of energy poverty.
- **Environmental priorities:** tackling climate change and local pollution.
- **Energy safety:** providing energy in a manner consistent with safety for people and societies.

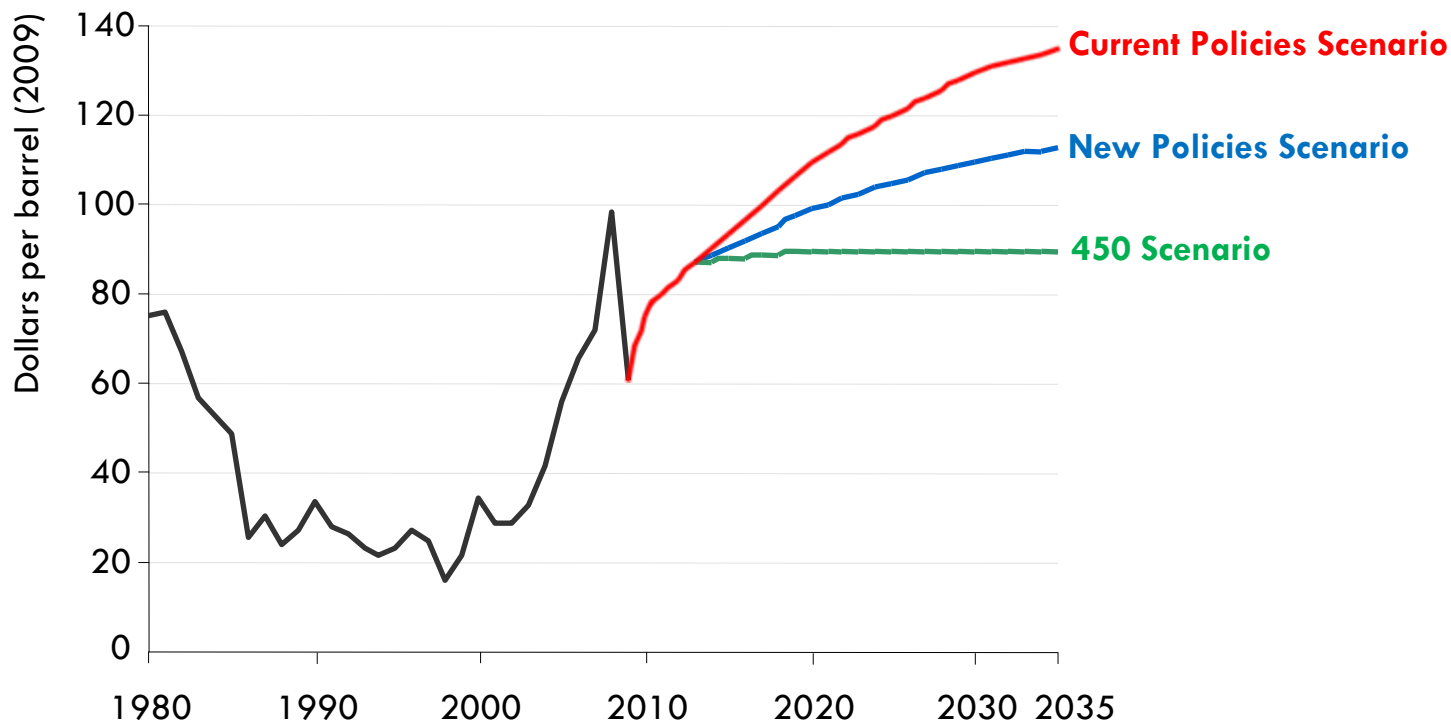
Facing the problem 1 – oil.

- The era of cheap oil is over – unrest in Northern Africa and Middle East demonstrates the vulnerability of the oil market: even if just 2% of global oil production were missing, the price surged, strategic stocks were released, etc.!
- Saudi Arabia only country with excess production capacity...
- “Geopolitical risk premium”: \$15-\$20 per barrel.”
- Oil imports by OECD countries in 2011: 2.3% of the region’s GDP (at 100 \$ average price).
- China spends US\$ 206 billion on oil imports in 2011 – over US\$ 50 billion more than in 2010.

Facing the problem 1 cont. - oil

- Even if all countries do what they have promised to do (at COP15 and COP16) oil prices will still increase and global energy consumption continue to increase.
- Oil production from existing fields have peaked and most of the oil needed in the future will have to come from fields either not found or developed yet.

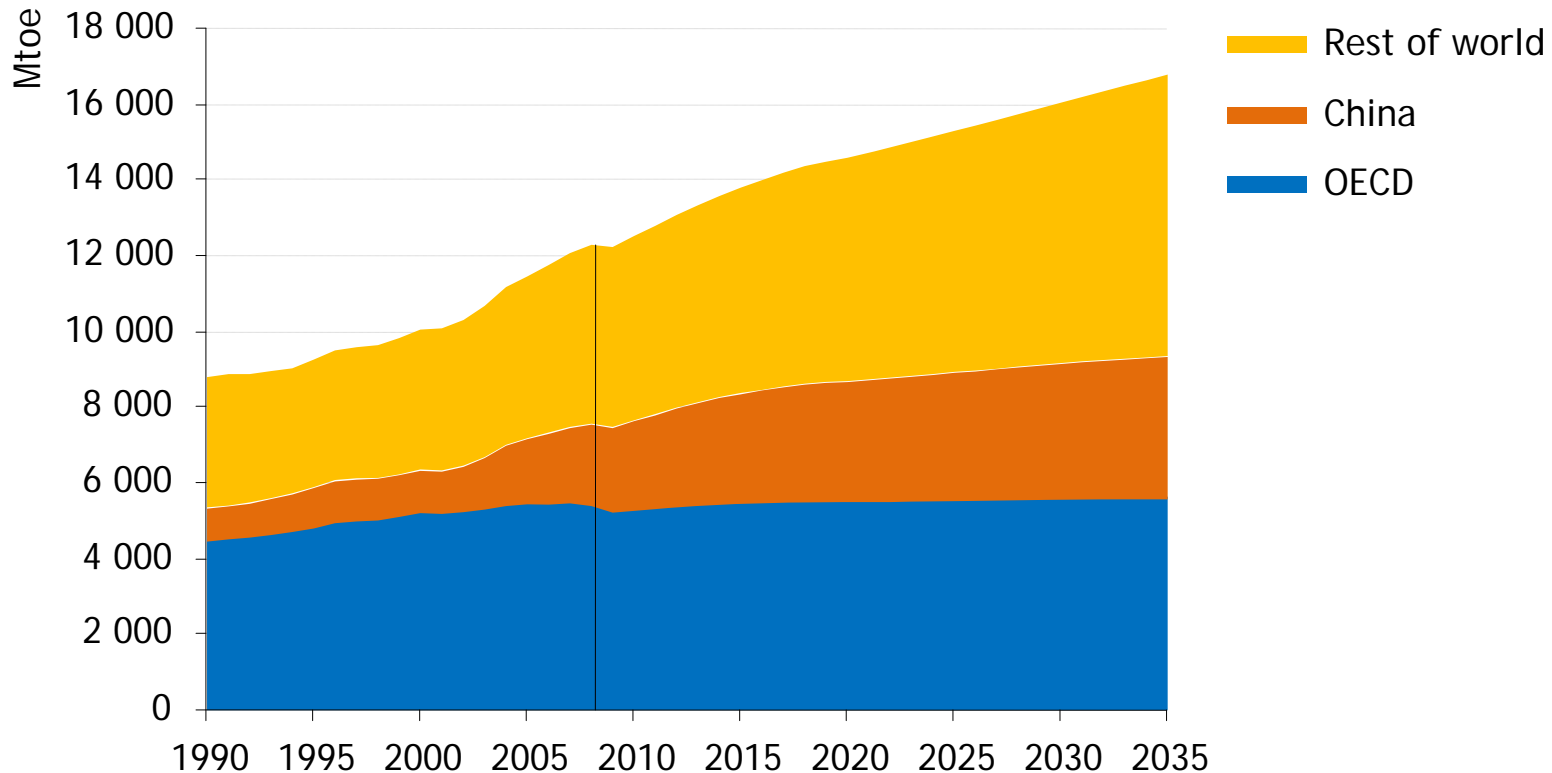
International oil price assumptions



The age of cheap oil is over, though policy action could bring lower international prices than would otherwise be the case

Recent policy commitments, if implemented, would make a difference

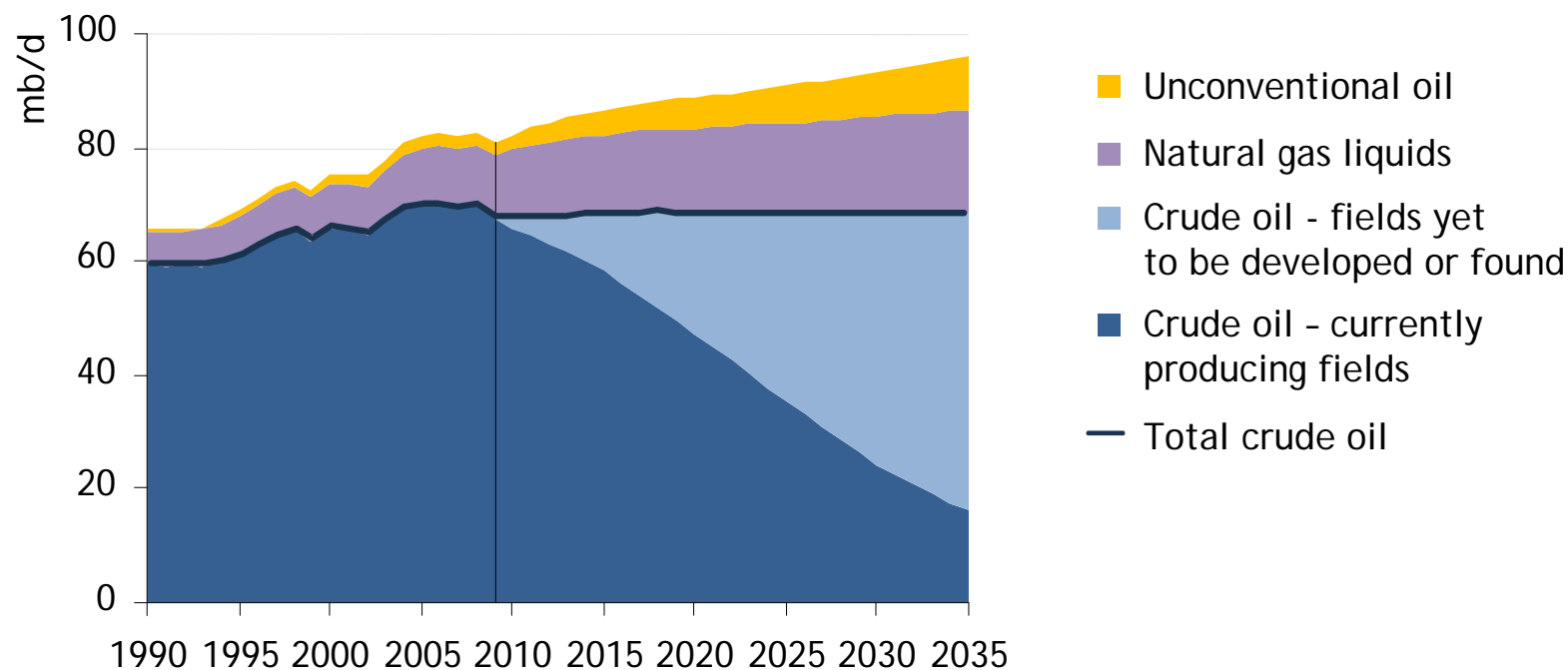
World primary energy demand by region in the New Policies Scenario



Global energy use grows by 36%, with non-OECD countries – led by China, where demand surges by 75% – accounting for almost all of the increase

Oil production becomes less crude

World oil production by type in the New Policies Scenario



Global oil production reaches 96 mb/d in 2035 on the back of rising output of natural gas liquids & unconventional oil, as crude oil production plateaus

Facing the problem 2 – natural gas and coal:

- The era of cheap natural gas and coal may also soon be over.
- China now net importer of coal: In just two years China's *incremental* demand has equaled the size of TOTAL EU coal use.
- Natural Gas is the joker: Majority of global reserves in just 3 countries, but much depends of development of unconventional gas and LNG.
- Natural gas is a useful companion to fluctuating renewable energy but prices are uncertain, politicized and often linked to the oil price.

Facing the problem, 3: nuclear

- The tragic events in Japan cast uncertainty to the future share of nuclear power in electricity generation – not only in Japan.
- But which technology – if it is ONE technology - has the capacity to replace nuclear?

Twelve statements about the state of the energy world.

Statement 1: The overall picture:

- "if governments do nothing or little more than at present, then demand will continue to increase, supply costs will rise, the economic burden of oil use will grow, vulnerability to supply disruptions will increase and the global environment will suffer serious damage."

WEO 2010, Executive Summary

Statement 2 + 3: Climate Change:

- The situation is urgent. Achieving the 2° target will soon be impossible, unless we see a phenomenal policy push by governments.
- Things are going the wrong way: CO₂ emissions reached a record high in 2010 – after slow-down caused by the financial crisis, emissions in 2010 climbed 5% over the previous record year 2008.

Statement 4, 5 & 6: The role of the energy system

- There is a need for an energy revolution, i.e. “a far-reaching transformation of the global energy system.”
- The revolution will not happen overnight: 80% of projected 2020 emissions from the power sector are already locked in.
- What we do over the next ten years will decide our emissions the next 40 years.

Statement 7, 8 & 9: The role of Renewable Energy

- Large-scale deployment of renewable energy is unavoidable to achieve deep greenhouse gas reductions – efficiency is important but cannot do the job alone.
- RE is not about Climate Change only: Renewable Energy also contributes to enhanced energy security.
- RE's share of electricity generation needs to more than double from 19% in 2000 to 45% in 2035, if the 2° C target should be pursued. (WEO 2010)

Statement 10, 11 & 12: Economic benefits

- Transforming the global energy system is likely to lead to economic benefits.
- Subsidies are necessary for greater deployment of renewables, but still plenty of room: Global fossil fuel subsidies in 2009 were US\$ 312 billion vs. US\$ 57 to renewables.
- Key technologies will soon become cost-competitive with fossil technologies.

Conclusions

- In the future, any economy dependent of import of oil, coal and gas will be a fragile economy.
- Renewable energy contributes not only to reducing greenhouse gases, but also enhances energy security.
- Subsidies are necessary for greater deployment of renewables, but key technologies will soon become cost-competitive with fossil technologies.

Thank you for your attention!