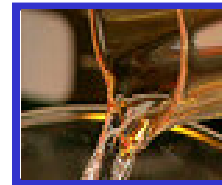


World Automotive Congress 2008  
Future Energy & Environment Panel

# The future for road transport fuels



**Jack Jacometti**  
**VP Future Fuels & CO2**  
**Shell International Petroleum Co.**

**September 17 2008**  
**Munich**



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# Agenda

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- **Paradigm Shift in Oil & Gas Industry**
- **Three Hard Truths**
- **Energy Scenarios**
- **Future Fuels**
- **Shaping a Sustainable Future**



# Critical paradigm shifts in the oil & gas industry

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- **Shift in economic and political power, from the West to the East**
- **Climate change issues fundamentally changing the energy industry structure**
- **There is no “silver bullet” to replace oil and gas**
- **Energy security is, from a national issue, rapidly becoming a global issue**

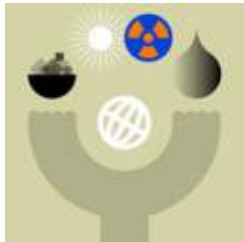


# In other words...Three Hard Truths

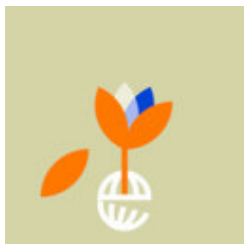
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- The global demand for energy is growing, both in the developed and developing world.



- Supplies of “easy oil” cannot keep up with the growth in energy demand.



- More energy means more CO<sub>2</sub> emitted at a time when climate change looms as a critical global issue.

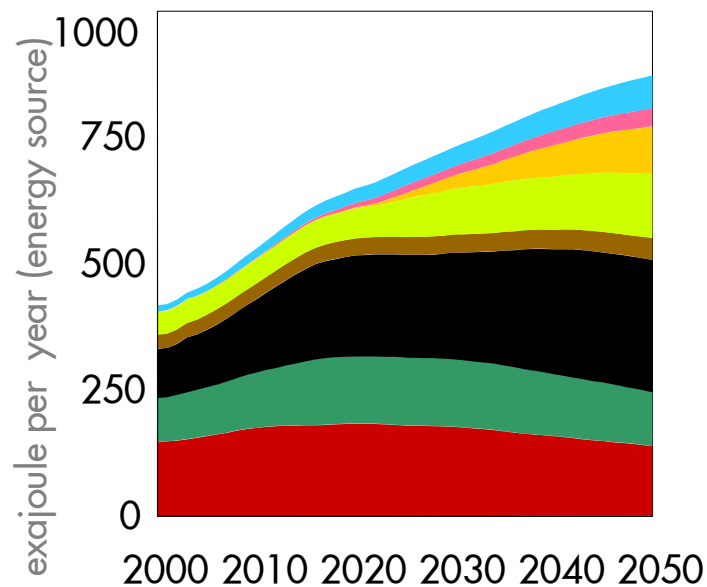


# Scenarios - Scramble



**Scramble** - reflects the dynamics behind energy nationalism, with fears over energy security leading to a scramble for resources and insufficient attention to the environment.

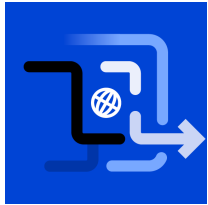
**Total primary energy supply/demand**



- Traditional energy pathways
  - Focus on existing infrastructure
- Sequential responses to energy strains
- Energy prices rise and volatility
- Knee-jerk reactions to climate events
  - No effective carbon pricing
- Patchwork of national standards

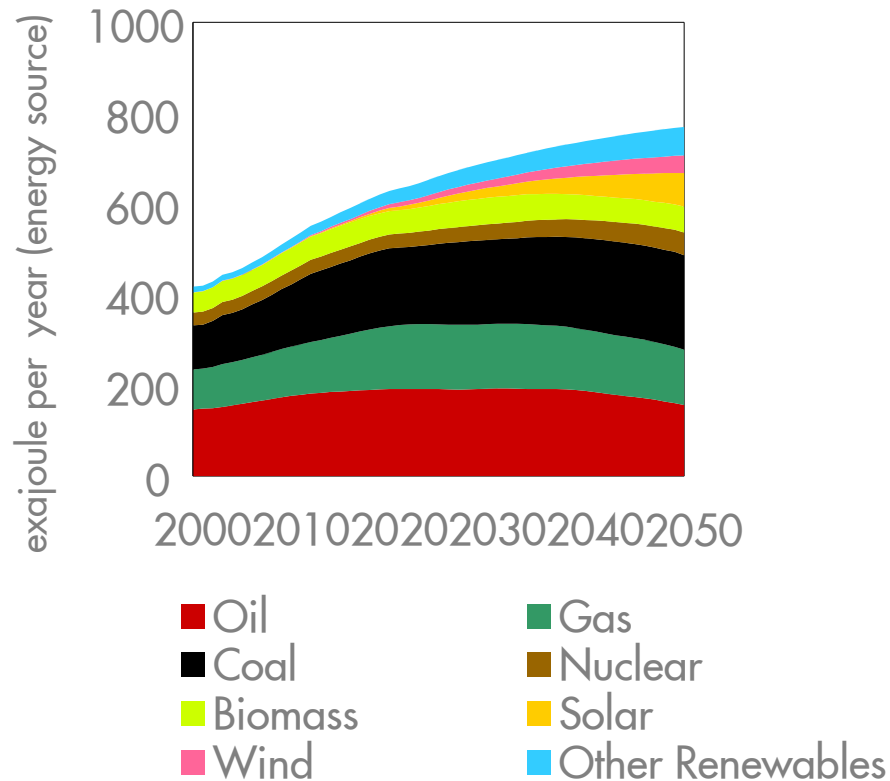


# Scenarios - Blueprint



**Blueprint** - reflects better anticipation of energy supply security and environmental issues, with coalitions emerging to lead in addressing these. This results in a more stable energy system with better environmental outcomes.

Total primary energy supply/demand



- Broader anticipation of challenges
- Critical mass of parallel responses to hard truths
- Effective carbon pricing established early
- Aggressive efficiency standards
- New infrastructure develops
- CCS emerges after 2020



# Developing a policy framework

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*Governments need to develop internationally aligned policies to meet the energy challenge and address climate change, which should include:*

- **Cap and trade systems** for large stationary sources
- Clear incentives for **CO<sub>2</sub> Capture and Storage (CCS)**
- A simple, credible target for the share for **renewable sources** in our energy supply.
- Separate measures in the **transport sector** such as
  - vehicle efficiency standards;
  - modal switch and reduction of vehicle kilometres travelled;
  - incentivising the fuels to deliver reductions in CO<sub>2</sub> based on WtW
- A series of robust **energy standards** for buildings and appliances with incentives to retrofit existing infrastructure.

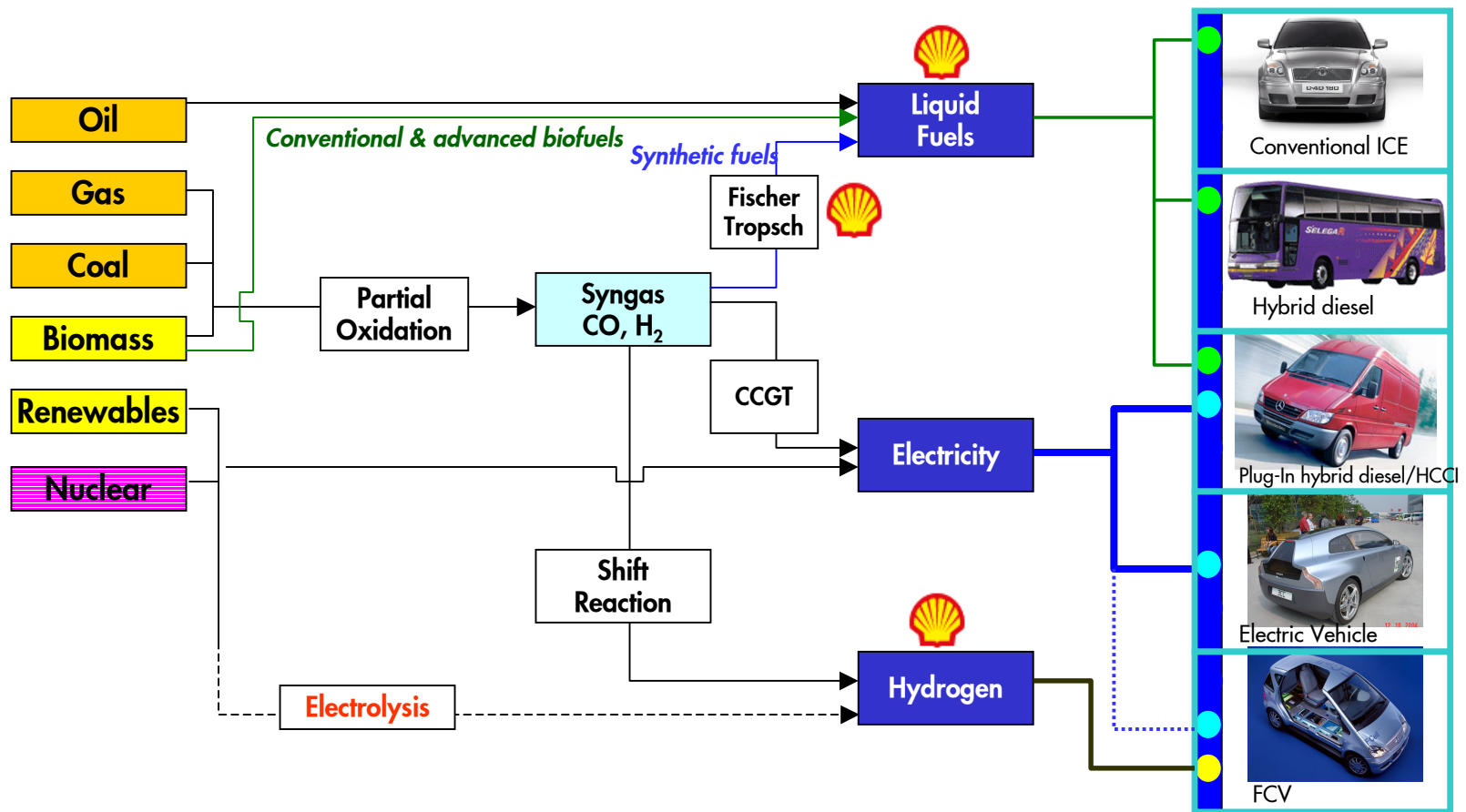


# Energy Sources and Carrier Options

Energy sources

energy carrier

drive-train options



# Future Fuels & CO<sub>2</sub>

## BIOFUELS



Leading in future biofuels

### Second-generation

- Iogen
- Choren

## SYNTHETIC FUELS



Bintulu Malaysia  
14 700 b/d

Integrated workscale  
Qatar project  
140 000 b/d

## SHELL HYDROGEN



World's largest  
public transport JV  
(NL)

Demonstration  
projects in US,  
Europe and China

## CO<sub>2</sub> MANAGEMENT



Manage our own  
emissions

Address CO<sub>2</sub>  
intensity

The purpose of FFCO<sub>2</sub> is to minimize Shell's environmental impact by leading the management of its own CO<sub>2</sub> emissions and the development of low-emission transportation fuels



# Shaping a sustainable future - Blueprints

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- **Cooperation between government, industry, Foundations, NGOs and academia focused on:**
  - **Prioritization of energy options, including R&D based on rigorous cost effectiveness analysis**
  - **Energy efficiency/conservation and the environment**
  - **Transport specific measures - vehicles, fuels and behaviour**
- **Raise public and industry awareness around the world on “intelligent use of energy” – a shift in mindset.**
- **Cities as a driving force for quicker and practical actions towards Energy Efficiency**

