

# No More Easy Oil – A Perspective on The Production Decline Curve:

**David Purvis**

**Technical Director  
Brunei Shell Petroleum**

**Brunei Energy Week Forum – 26<sup>th</sup> May 2009**



There are three hard truths we must live with:

1. **Global energy demand is increasing, until recently accelerating**
2. **'Easy Oil' will not keep pace**
3. **Using more energy, more CO<sub>2</sub>, the effect on climate is real and must be addressed**

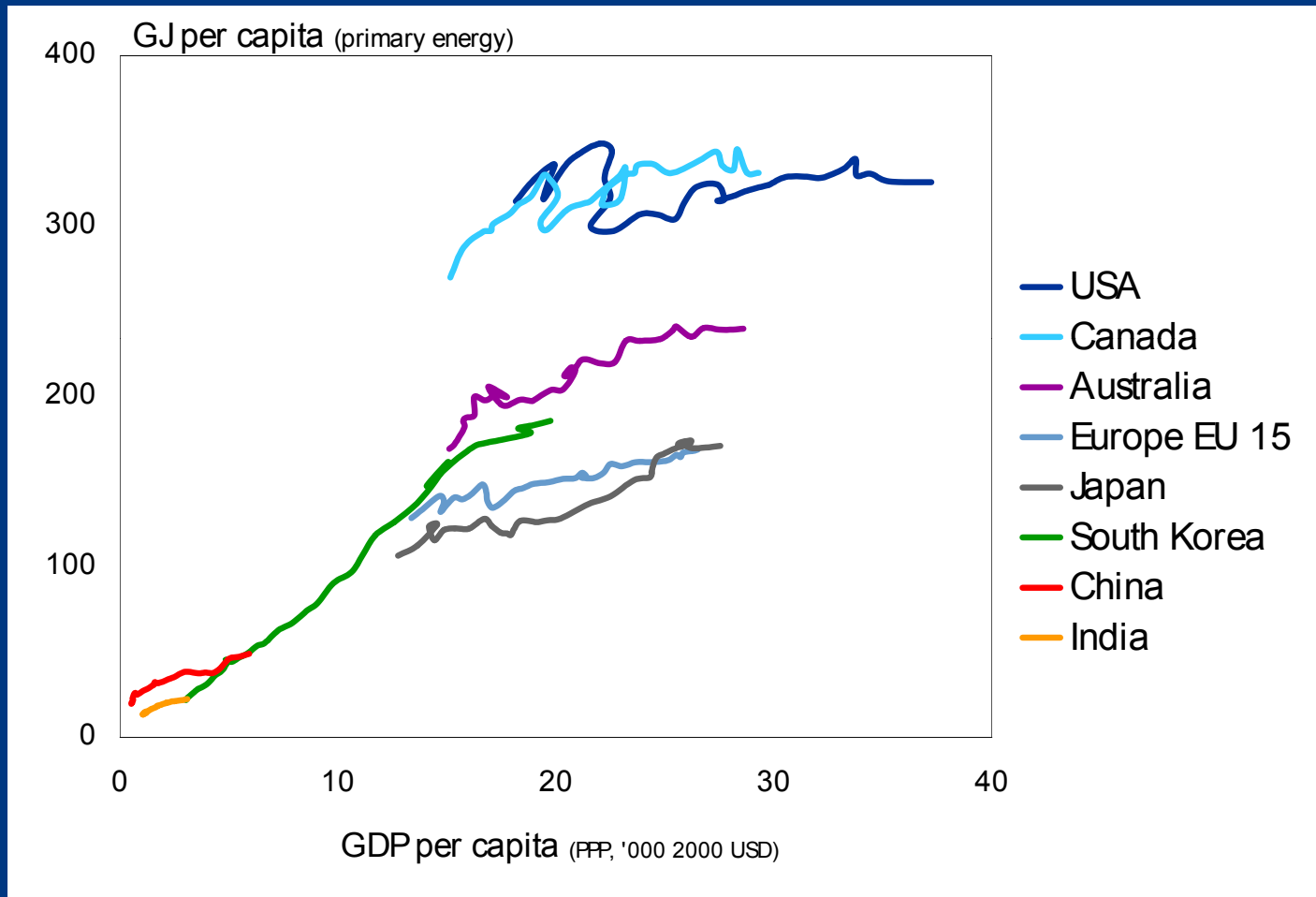
***Quantify the Challenge***

- *Global demand forecast*
- *Earth's original endowment*
- *The yet to find (YTF) conventional hydrocarbons*
- *The technically feasible yet to produce hydrocarbons*
- *The importance of unconventional hydrocarbons*

# China and India are major new markets



# Economic Development = rising energy use



# The global energy challenge

Improved access to modern energy for the world



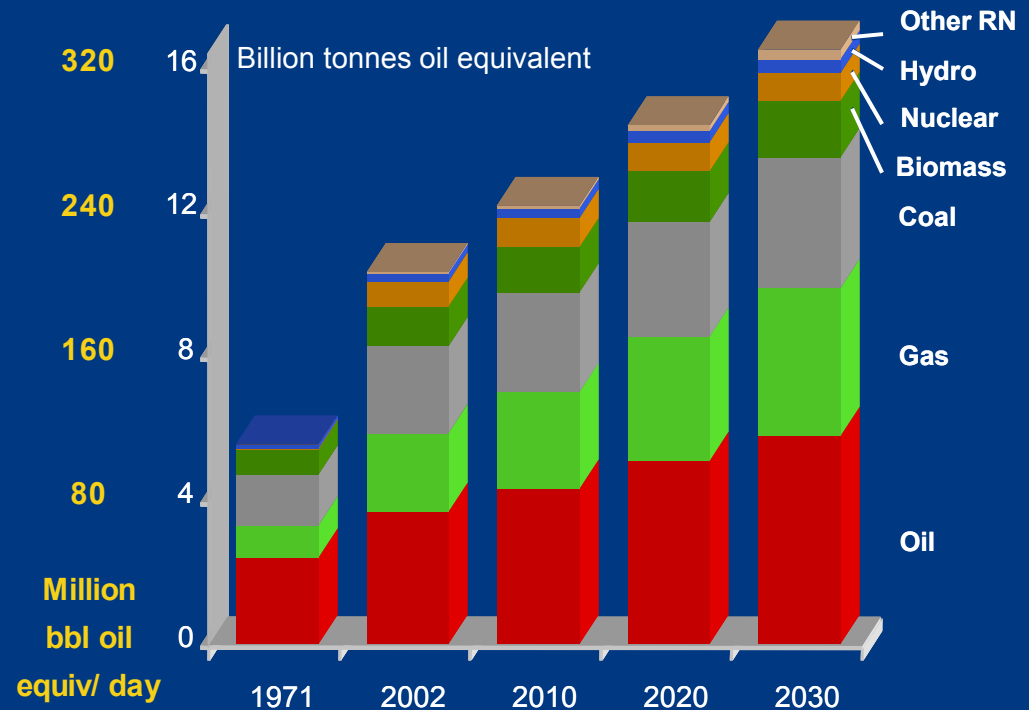
Growing demand for energy to be met by fossil fuels in the short term



Low-carbon energies, sustainable carbon sequestration



World Energy Demand Growth



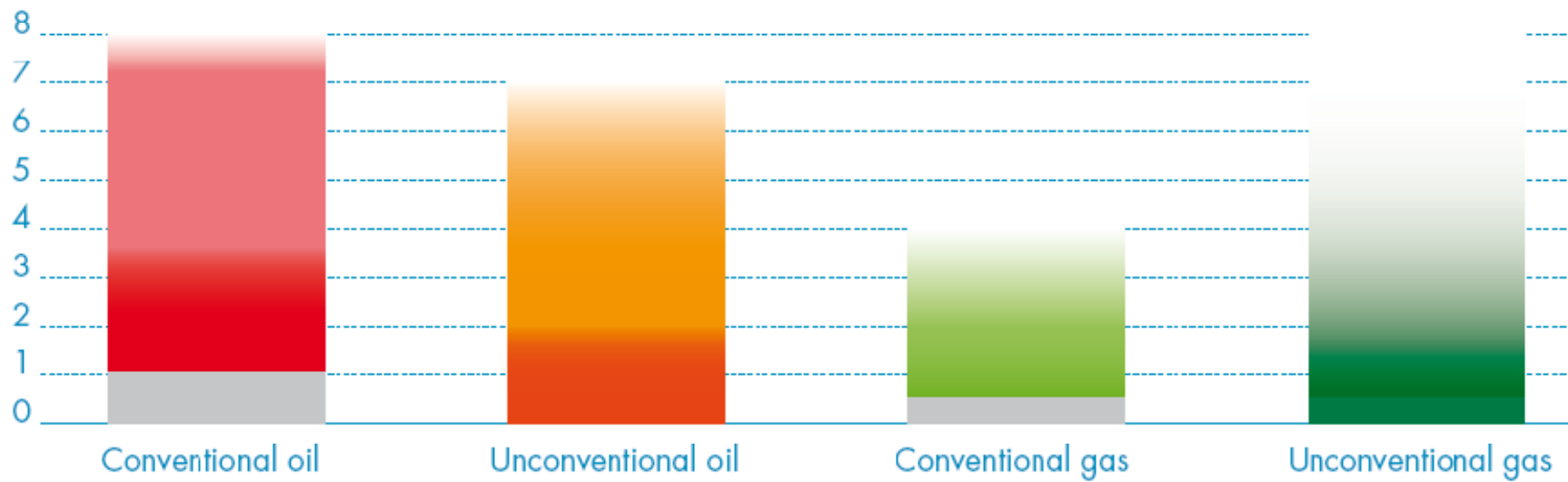
IEA 2004 (reference case)



# Hydrocarbon resource base

## Hydrocarbon Resource Base\*

Trillion barrels of oil equivalent

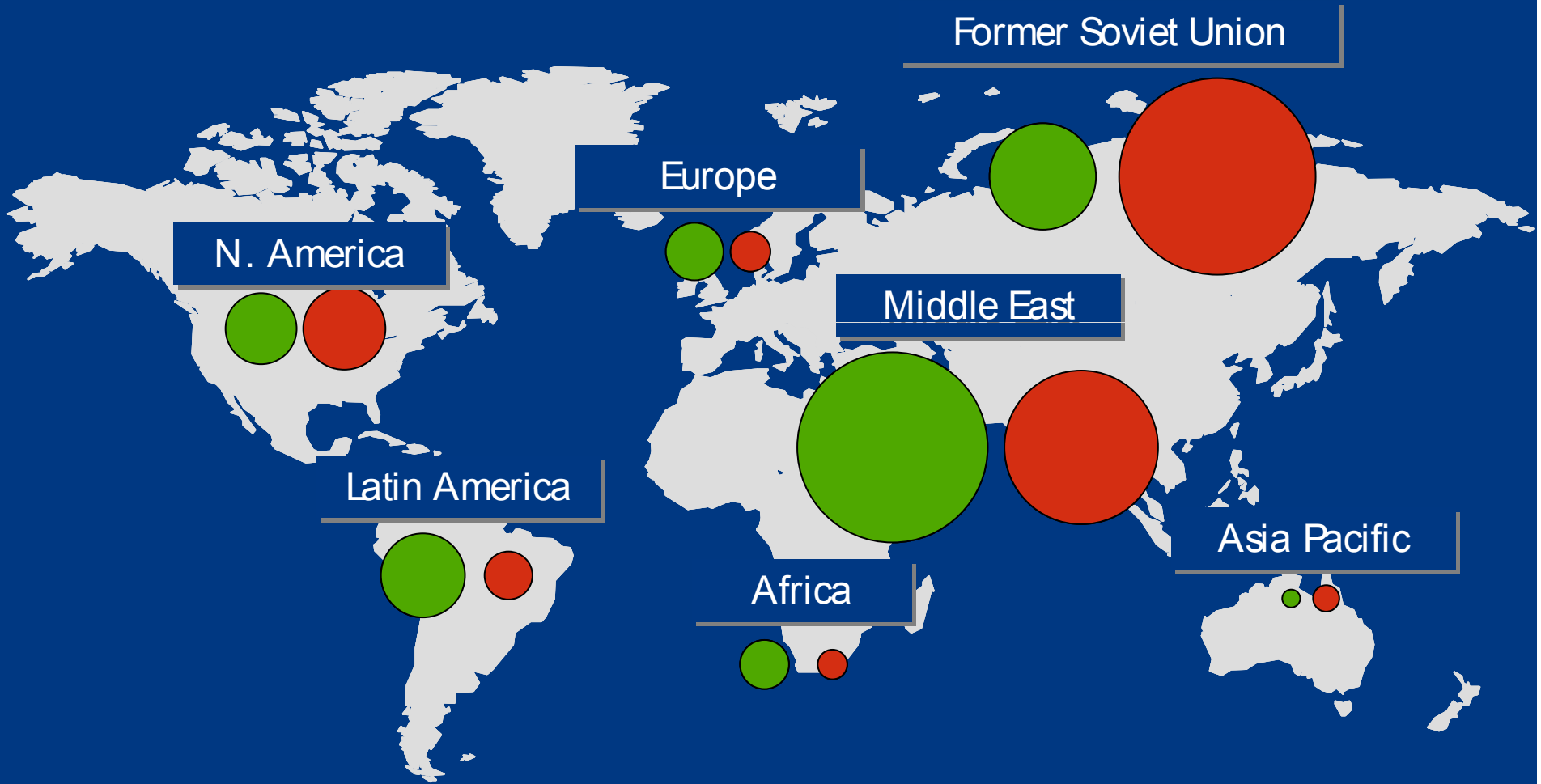


■ Already produced      ■ ■ ■ ■ ■ Technically recoverable

\* Excluding gas hydrates

Source: based on USGS and IEA data

# Yet to find hydrocarbons



100 Bln bbl  
Conv liquids



500 TCF  
Conv. gas

High end estimates end 2004

**Total ~1.6 Trillion Boe**

Sources – USGS/ IHS Energy

# The increasing technical challenge

## INCREASING TECHNICAL CHALLENGES IN OIL & GAS PRODUCTION

Conventional Hydrocarbons



Enhanced Oil Recovery

Contaminated Oil & Gas

Tight Oil & Gas

Oil Sands

Coal Bed Methane

Technical challenge

Difficult Hydrocarbons



Difficult Reservoirs  
e.g. fractured carbonates

Ultra Deep Water

The Arctic

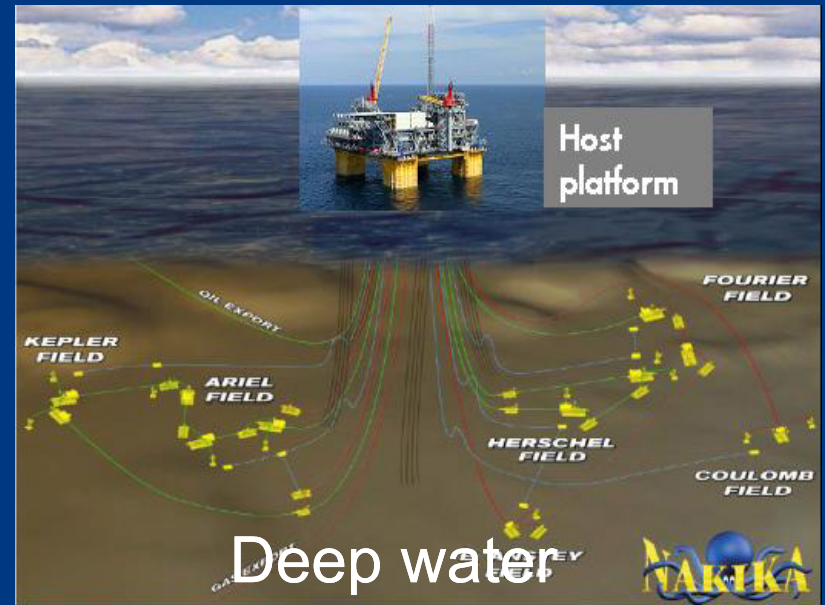
Oil & Gas Shale

Gas Hydrates

# New activity in difficult environments



Desert



Deep water



Arctic

- Extreme conditions
- Deep water
- Drilling deeper
- Higher pressures and temperatures