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Presentation outline

- The shifting energy landscape: the current energy transition from hydrocarbon molecules to electrons
- The key uncertainty = the speed of the transition
- Impact on the 'New Great Game of the Middle East'
  - The old geopolitics of energy
  - The new geopolitics of energy
    - Stage 1 during the transition
    - Stage 2 after the transition

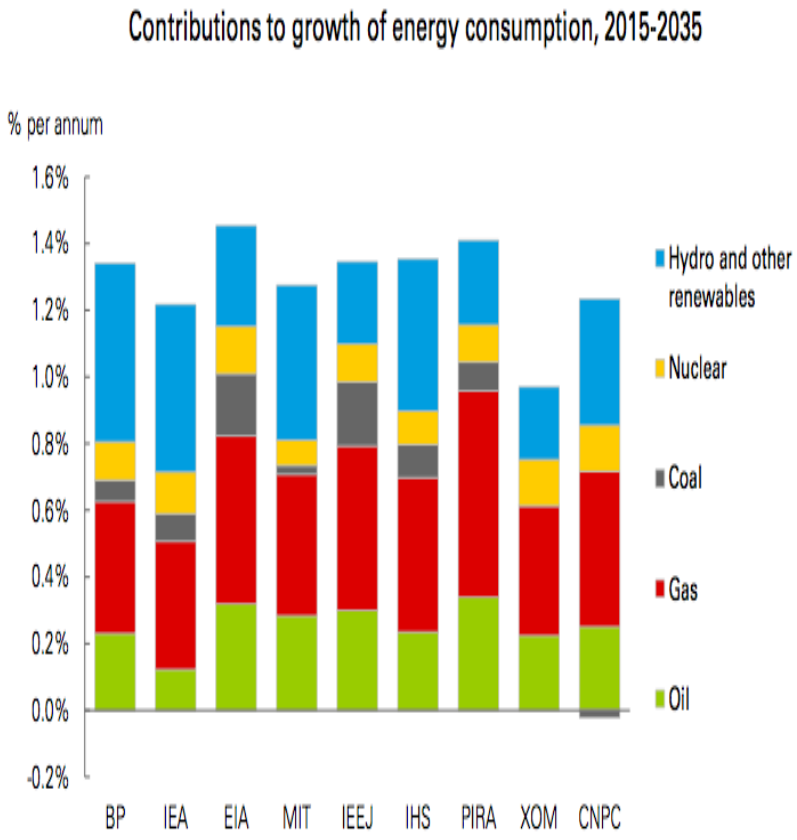
THE CURRENT ENERGY TRANSITION

- Many lessons from history give patterns
  - **Triggers**
  - **Reinforcing factors** from technical change affecting relative energy prices

- Current transition: hydrocarbons to electrons
  - The **triggers** are environmental
    - Climate change BUT more recently - urban air quality
  - The **reinforcing factors** include:-
    - Falling cost of renewables
    - Penetration of electric vehicles
    - Other demand side factors: 'Fourth Industrial Revolution'
    - A geo-political oil price shock affecting consumer government policies?

The Key Uncertainty = Speed of the Transition Contrasting views

- ‘Energy establishment’
  - Consensus seriously understating the speed
    - Forecasts continually underestimating the rise of renewables
    - Vested interests blinding judgment?
    - Underestimating political groundswell?
- ‘Financial community’
  - Being more realistic – see the ‘divest campaign’

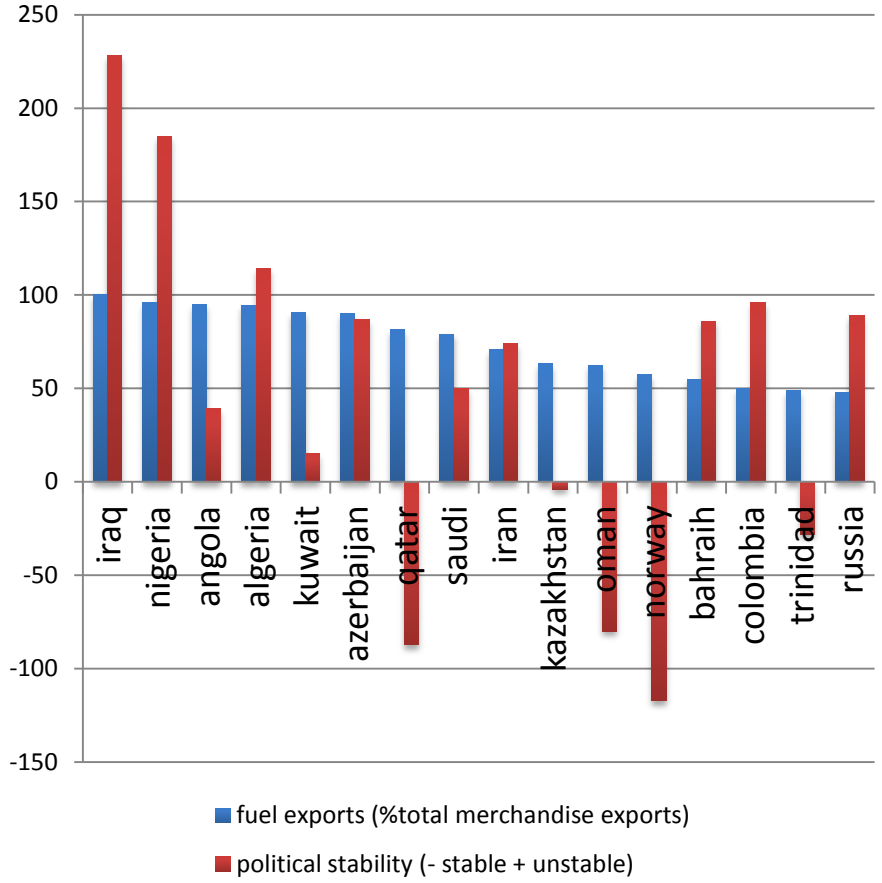


Source: Estimated from BP, World Energy Outlook 2017.
Forecast abbreviation: BP British Petroleum;
IEA International Energy Agency;
EIA Energy Information Administration – United States;
MIT Massachusetts Institute of Technology;
IEEJ Institute of Energy Economics – Japan;
IHS IHS Markit;
PIRA PIRA Energy Group
XOM Exxon Mobil;
CNPC Chinese National Petroleum Corporation

Why does the speed of transition matter?

- Faster the transition = greater disruption as hydrocarbon demand falls and exporters fail to adjust
- The 16 major hydrocarbon dependent countries listed (8 from the MENA region) account for 56% of global oil exports. Only four (minor) exporters are "politically stable".

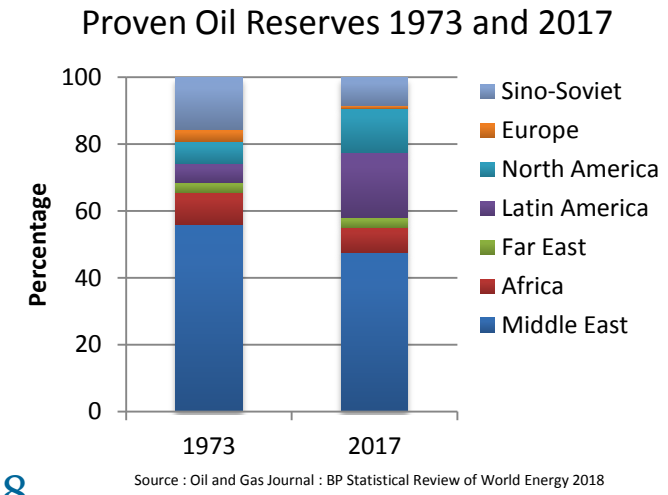
Vulnerability and political stability of major hydrocarbon exporters 2017

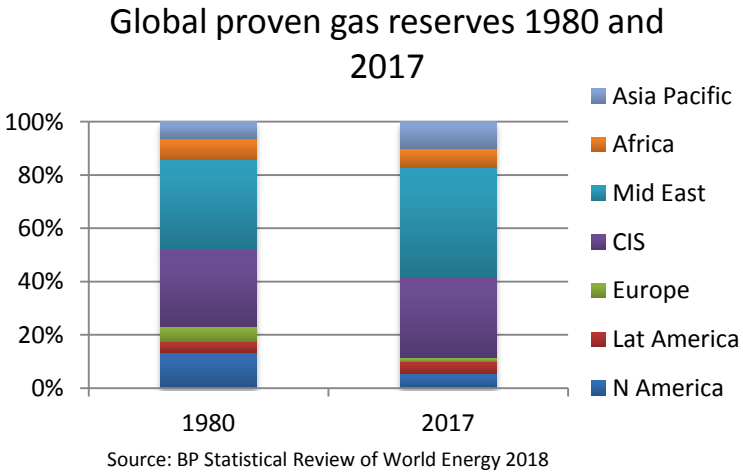


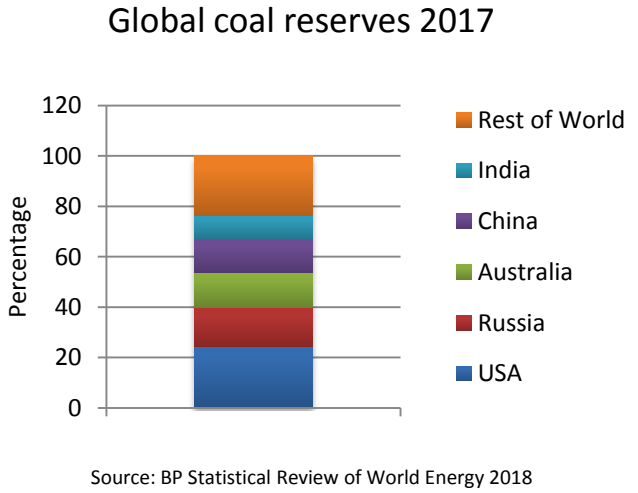
Sources: *Fuel exports:* World Bank, 2018 *Political stability:* Global Economy.Com, 2018

Geopolitical impact: The old geopolitics of energy

- Arose because of the uneven distribution of hydrocarbon resources
- Result = competition/conflict for access
  - E.G. UK foreign policy circa 1914- 24th January 1968

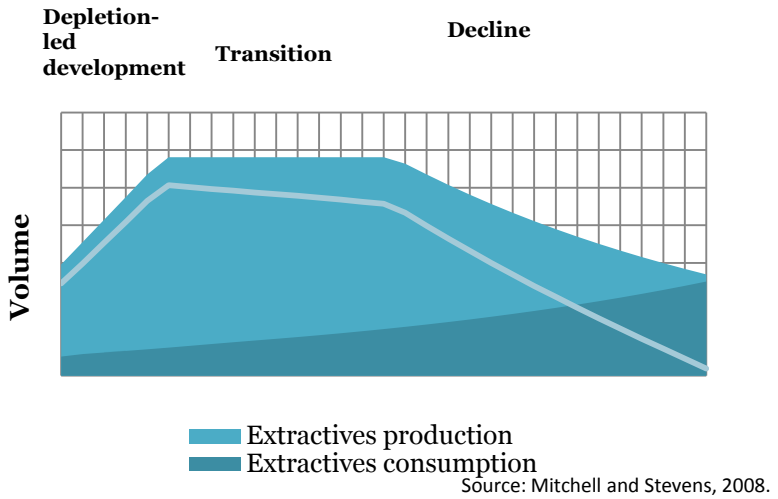






New geopolitics: Stage 1 During the transition

- The imperative to diversify the hydrocarbon producing economies
- Generally a failure to diversify the economies away from hydrocarbons
- The faster the transition the greater the disruption = destabilization of the MENA region



Source: Mitchell and Stevens, 2008.

Non-hydrocarbon fiscal deficit %

Source: IMF, 2007

New Geopolitics: Stage 2 After the transition

- The new geopolitics of energy
  - Renewables – small scale, decentralized and everywhere
  - Limited geopolitical issues: there may be some issues?
    - Access to key minerals?
    - Conflict over interconnectors?
    - IP disputes and access to technology?
- BUT the old geopolitics of energy surrounding conflict over access will be gone (if you can get through Stage 1!)
- Hardly the 'Great Game'!

Thank you

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