
Oil is not dead, it just smells funny



TAIC

31 March 2015

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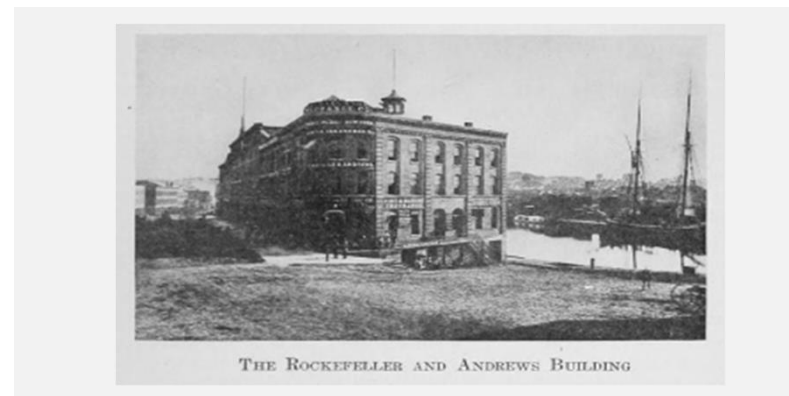
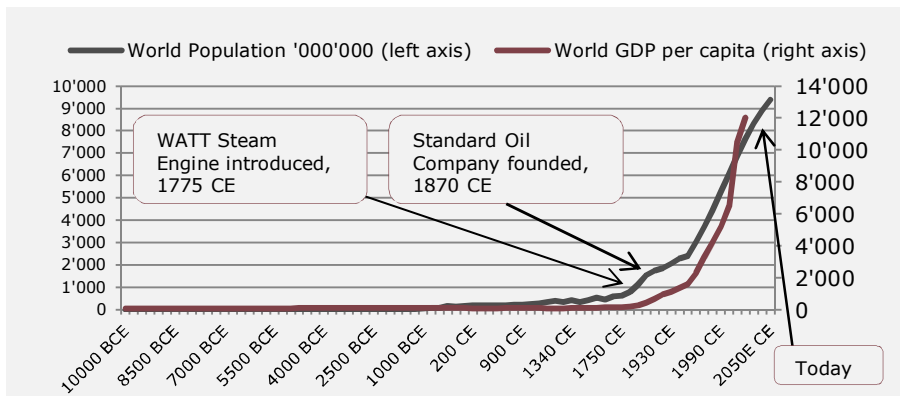
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Economic Activity Relies on Energy

- “ The industrial revolution has driven wealth with relying on energy supply
 - . Energy demand grew 100x



- “ Now, we are within the transformation into the second machine age » the digital revolution, which is even more energy consuming

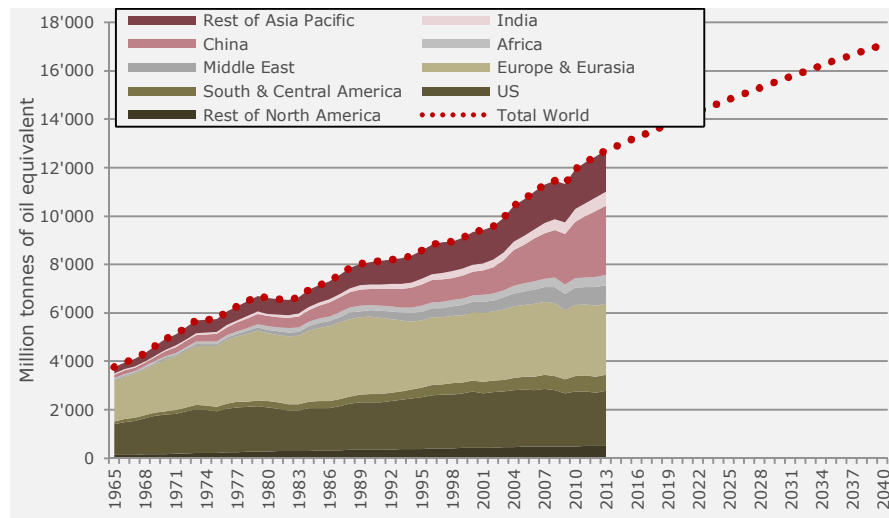


Competition for Energy

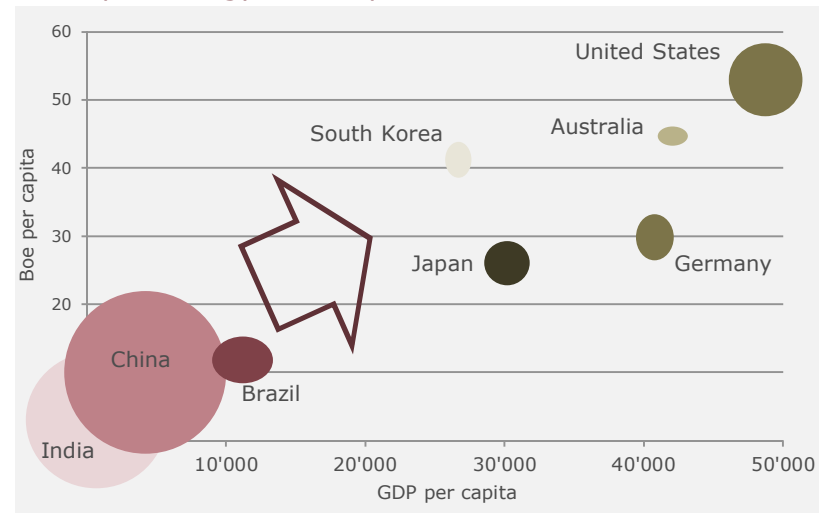
Challenge of a generation

- “ Half of global primary energy supply is consumed by only 15% of the global population
- “ IEA expects global primary energy demand to increase by 37% by 2040
 - China accounts for the largest share of the projected growth in global energy use, its demand rises by 60%, followed by India where demand more than doubles
 - China is expected to consume more power by 2035 than US and Japan together
- “ The competition for existing energy sources will intensify
- “ Many countries have shown that as incomes rise, demand for resources increases
- “ During the next 20 yrs, the world population is expected to grow larger and, on average, younger
 - up to 3 billion more middle-class consumers expected by 2030 compared with 1.8bn today
 - almost 90% of the new middle-class consumers will live in the Asia-Pacific region

Global primary energy demand by region



Per capita energy consumption

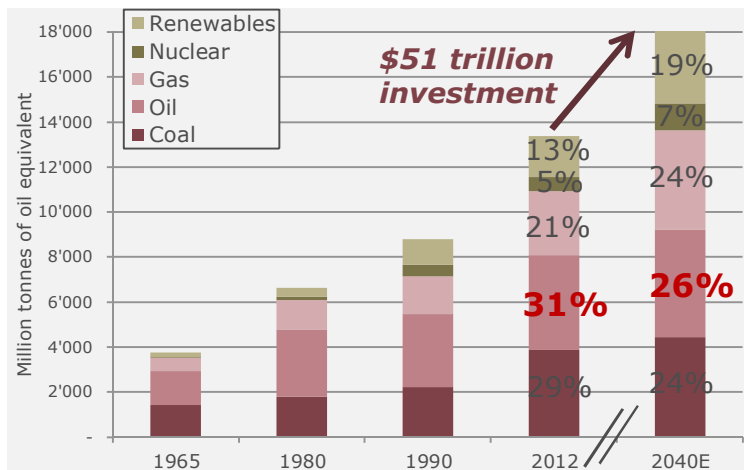


Sources: BP Statistical Review of World Energy; US Census, IEA WEO 2014, Bloomberg, OPEC World Oil Outlook, McKinsey, OECD Working paper No 285

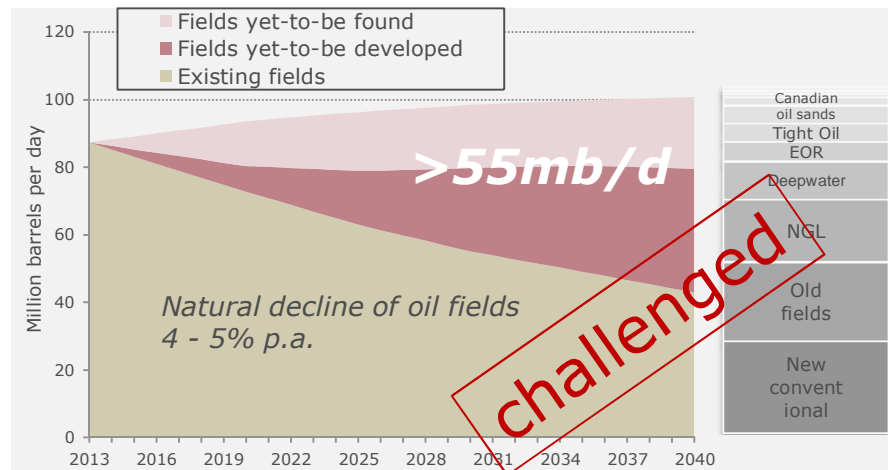
Competition for Energy Supply challenge

- “ The competition between the different primary energy sources will also intensify
- “ The soaring demand will occur at a time when finding new sources of supply and extracting them is becoming increasingly challenging and expensive
 - IEA estimates that \$51 trillion in investment is needed in the world’s energy supply system until 2040
 - In fact oil represents today the biggest energy source with 31% of total and is expected to continue being the biggest energy supply source by 2040 but on a lower relative level due to the increasing share of renewables and natural gas
- “ On the oil supply side, over the next 20 years the equivalent of 4 Saudi Arabias need to be added just to replace declining production and to keep oil output flat
 - The IEA World Energy Outlook 2014 (released in early November 2014) expected the US (tight oil) and Brazil (deepwater) step up until the mid-2020s, but the Middle East is critical to the longer-term oil supply outlook
 - However, Goldman Sachs warns that \$1tn of spending on future oil projects is at risk with oil at \$70/bl or 7.5mb/d of new output over the coming decade, that’s 8% of current global oil demand

World primary energy consumption by source



Supply outlook for oil



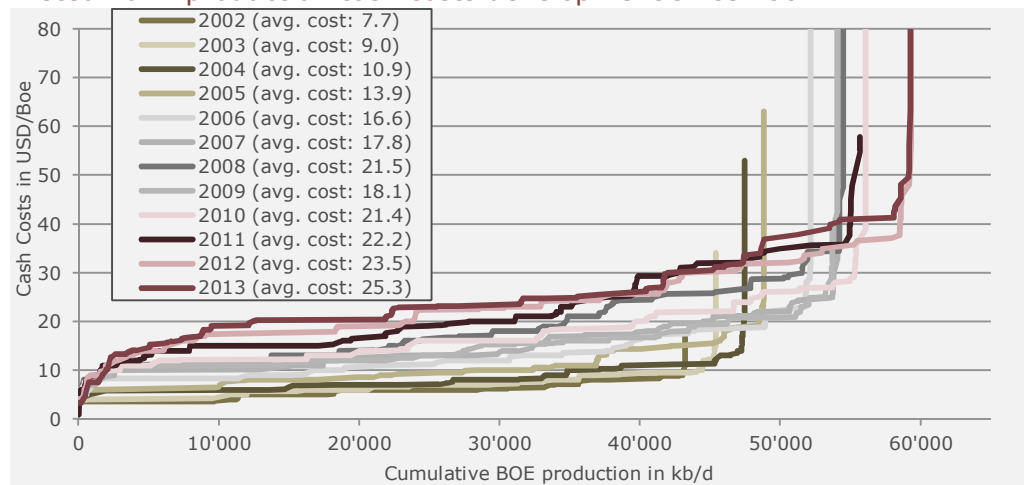
Sources: BP Statistical Review of World Energy; US Census, IEA WEO 2014, Bloomberg, The World Bank, Total, Goldman Sachs

Oil & Gas Companies

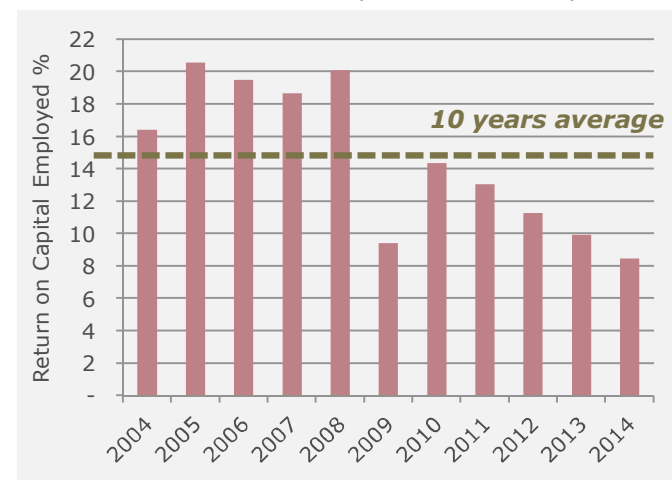
The oil landscape is changing

- “ Over the last few years the O&G sector has seen a toxic combination of declining production (ex US) and rising costs eroding returns to relative low levels
 - . In aggregated terms 4Q14 was the lowest level of earnings generated by the sector since 2Q09
 - . The average production cash costs per boe tripled in 10 years from \$8/boe to over \$25/boe
 - . The average F&D costs per boe of production has risen from \$17/boe in 2008 to \$32/boe
 - . Most probably it’s currently cheaper to buy a company (based on EV/Risked Resources) as to search for new resources
 - . The average ROCE over the last 10 years was nearly 15% and in FY14 it fell to about 8%
- “ Shale has transformed the oil costs curve for new projects on all-in break-even levels
 - . Its contributing a big volume part in the upper middle of the cost curve and it’s unique drilling economics makes it the most flexible and fastest production capacity to adjust to new oil price levels. That is what the market is expecting to happen
 - . Currently prices are below all-in break-even levels on a full cycle cost basis (incl. F&D) for most US shale plays
 - . Longer-term it’s not necessarily US shale oil production that is killed but most probably high cost offshore projects

Listed E&P* production cash costs development since 2002



ROCE of listed E&P* companies over 10 years



Sources: Bloomberg, company reports; listed E&P companies from proprietary research >140 listed companies

Oil & Gas Companies

Supply driven crises of the 1980s / 1990s

The current supply driven oil crisis is nothing new to the O&G industry as it already happened twice

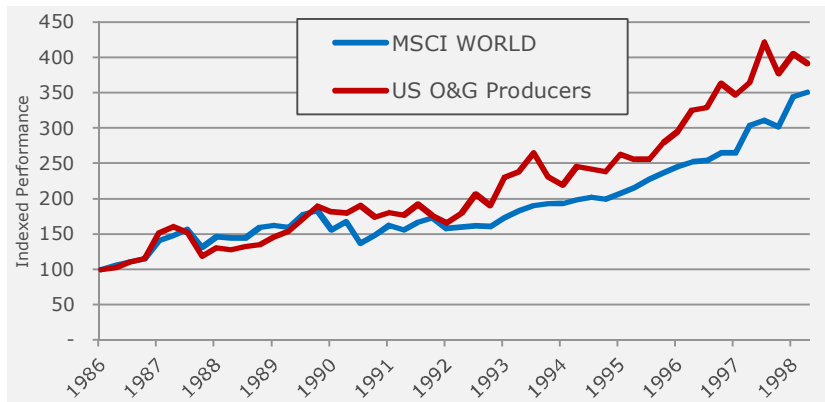
1980s: Serious surplus caused by the falling demand following the oil price peak (1980 at \$35/bl)

- " After 1986 (Oil price low at \$10/bl) O&G stocks outperformed the market
- " O&G majors FCF's and dividends were unchanged on reduced capex (>20%), saved cost (>40% in operating costs and F&D costs) and strong refinery business
- " US active drilling rigs was nearly halved in 1986. North Sea rig rates fell from \$90k/d to \$12k/d in 1986

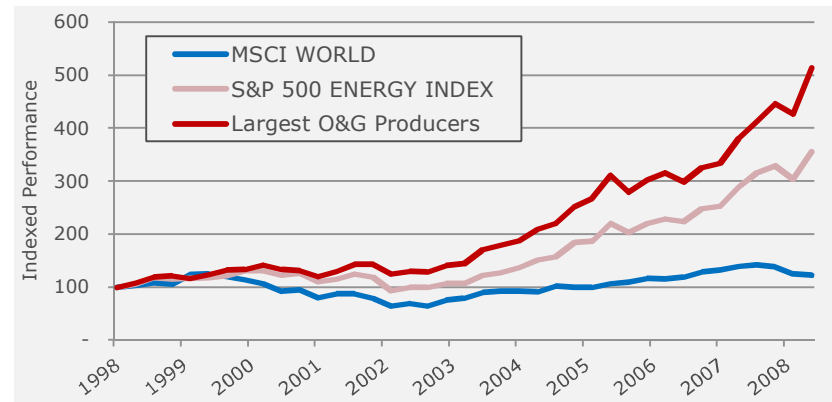
1990s: Surplus caused by OPEC's quota increase shortly before the Asian financial crisis peaked and demand felt

- " After 1998 O&G companies outperformed the market
- " Companies slashed budgets and laid off employees
- " The price collapse set of the most far-reaching reshaping of the structure of the petroleum industry with a big M&A wave
 - . 1998: BP acquired Amoco \$55bn
 - . 1999: TotalFina acquired Elf €53bn, Exxon acquired Mobil, \$82bn, BP Amoco acquired Arco \$27bn
 - . 2000: Chevron acquired Texaco \$40bn
 - . 2001: Conoco and Phillips merged

1980s Performance of O&G stocks vs. MSCI World Index



1990s Performance of O&G stocks vs. MSCI World Index



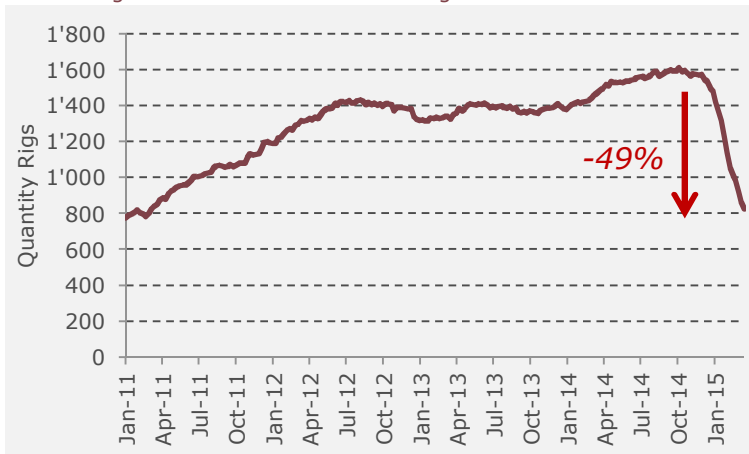
Sources: Ned Davis, IEA, Bloomberg, OPEC, WSJ, Goldman Sachs, Morgan Stanley
 US O&G Producers consisting of Exxon, Chevron, Conoco, Occidental, Apache, Noble

Oil & Gas Companies

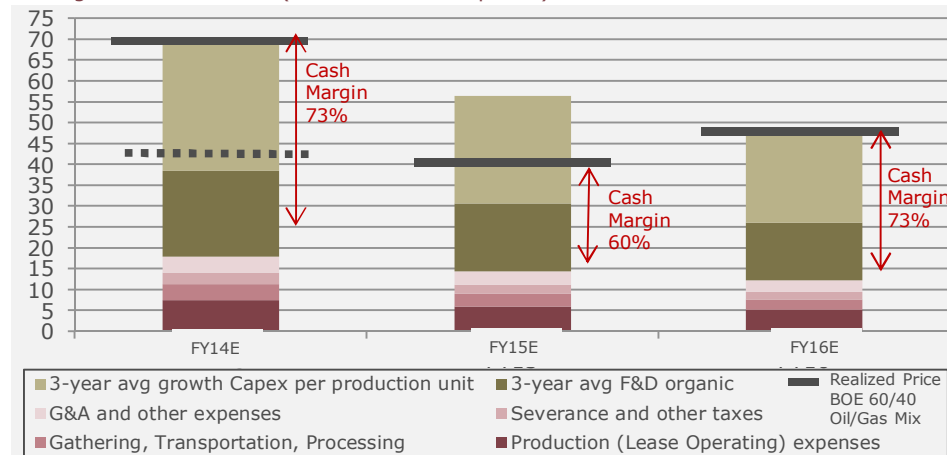
A structural change is underway

- “ CEO’s see this period right now as an opportunity to clean up the cost base of the company and readjust the economics of the industry
- “ O&G companies are announcing meaningful efforts to cut capex and opex to bring it down to levels of cash neutrality and optimizing cash timing.
 - Projects will be spend longer in the conceptual and FEED phase because the scope to have a major influence on the overall costs of a project is highest in the planning, selection and defining stages of a project
 - Capex in the US is down 35% and Barclays expects 25% total capex reduction in 2015
 - Companies reduce personnel and salaries. Strong interest in improving field economics and recovery rates.
 - Drilling fell more quickly than in previous bear markets. The US oil rig counts has already halved from the peak in Oct 2014
- “ Underestimated cost dynamics as successful measure may result in flat cash margins from 2016 on
- “ Remember, in history downturns have been followed by strong rebounds and O&G companies
- “ The O&G companies that survive the downturn will come out much stronger

Drilling fell more quickly than in previous bear markets
Baker Hughes United States crude oil rig count data



US shale costs cuts of 20% in 2015 and 15% in 2016 may result in flat cash margins from 2016 on (based on futures prices)



Sources: Bloomberg, Goldman Sachs, Company Reports, Baker Hughes, US Shale cost cuts based on major US Shale players

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