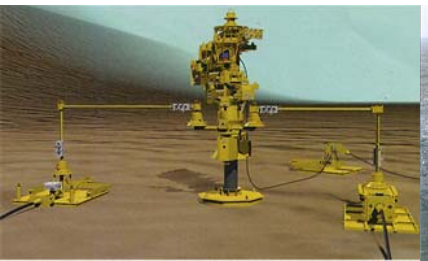
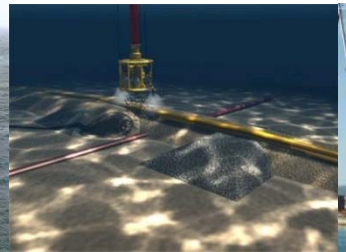
infield
THE ENERGY ANALYSTS

Global Supply/Demand Imbalances in the Offshore E&C Sector: Implications on Expenditures, Scheduling and Production

Will Rowley – Director of Analytical Services

Rice University - September 2008






Infield – brief introduction

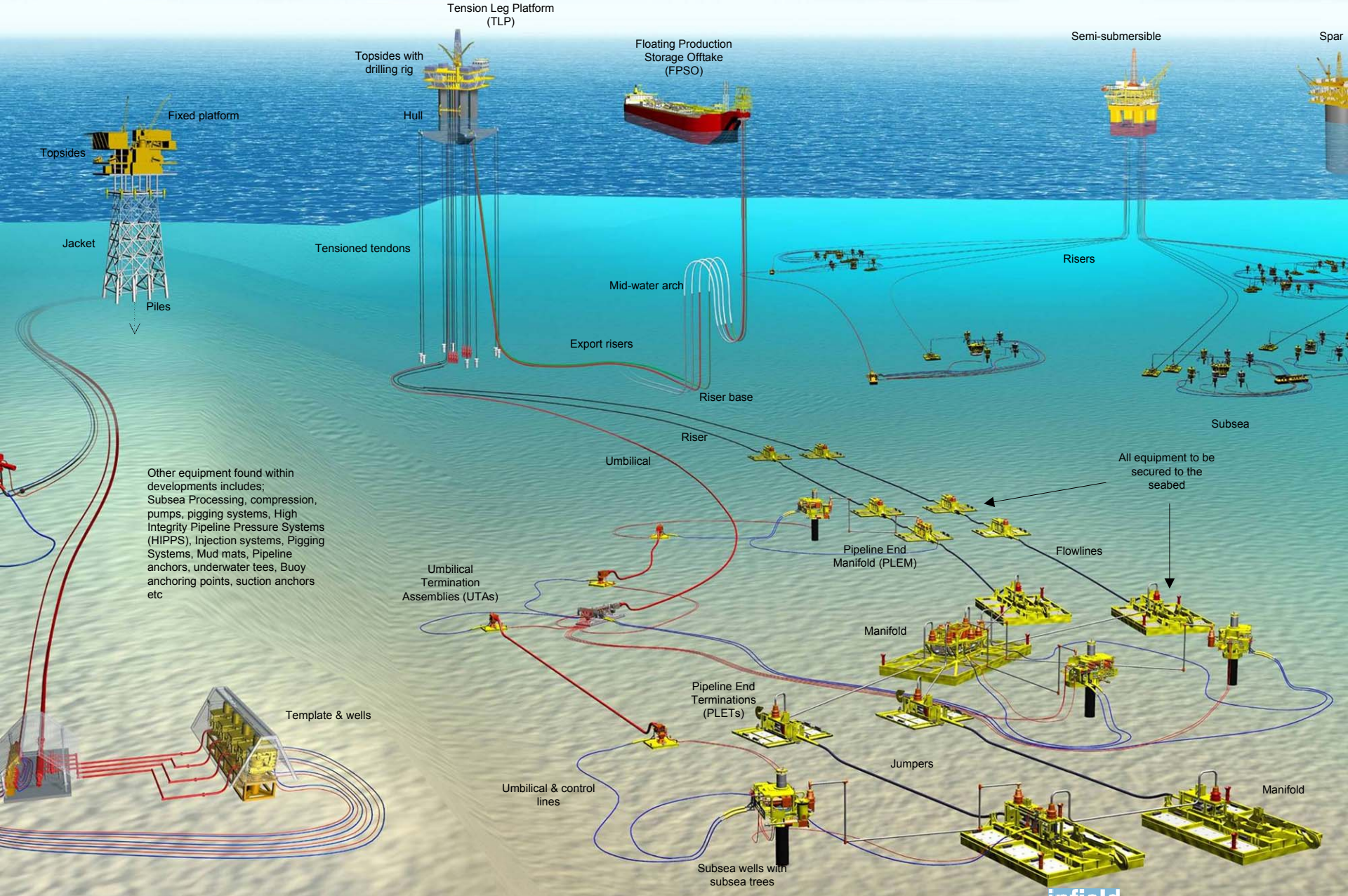
- Specialist provider of **offshore energy** data, analysis, information & due diligence globally
  - Macro, offshore, onshore, fields, platforms, pipelines, subsea, drilling, deepwater, rigs & vessels , yards, plants, companies etc..
- Used by **every** major offshore operator, global oilfield service company & significant financier
  - Majors, NOCs, Manufacturers, Suppliers, Contractors, Engineers, Government
- Mixed discipline team of economists, statisticians, engineers, physicists, management, geologists & others
- Unique & proprietary databases & models of activity & infrastructure
  - Offshore Energy Database
  - OFFPEX™ Market Modelling & Forecasting System
  - EnergyGateway™ GIS Mapping System
  - Supply/demand Matrix
  - Specialist Vessel Database
  - Contracts Database
  - Manufacturers/suppliers
  - Companies
- Peer-reviewed, bottom-up methodology with 22 years experience
- Transparent & proven track record of accuracy – highest rating in industry
  - Have supported >$36bn of investment, M&A, debt and equity financing in past 3yrs

Key market segments

In detail with >50 million data points

Fields – production, reserves, Operators & owners, Platforms – fixed & floating, Pipelines & risers, Subsea infrastructure, Development drilling, Control lines & umbilicals, Specialist offshore vessels.

Units, capex, historical, forecasts
Data, information, reporting



Project data in detail & supported by...

Extensive Detail

- Name
- Type
- Size
- Material
- Cost
- Schedule
- Operator
- Contractor
- Sub-contractors
- Suppliers
- Contracts
- Sub-contracts
- GIS Position
- etc..

>65 million data points

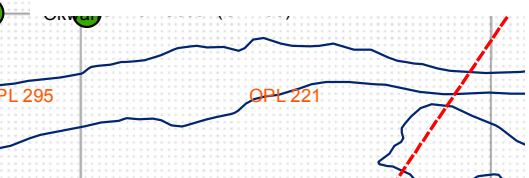
Supported by

- Suppliers
- Construction yards
- Fabrications yards
- Shipyards
- Steel mills
- Pipe mills
- Flexible pipe plants

- Umbilical plants
- Tree manufacturers
- Engineering contractors
- Project managers
- Specialist construction/support vessels
- MODUs
- Critical supply/service items

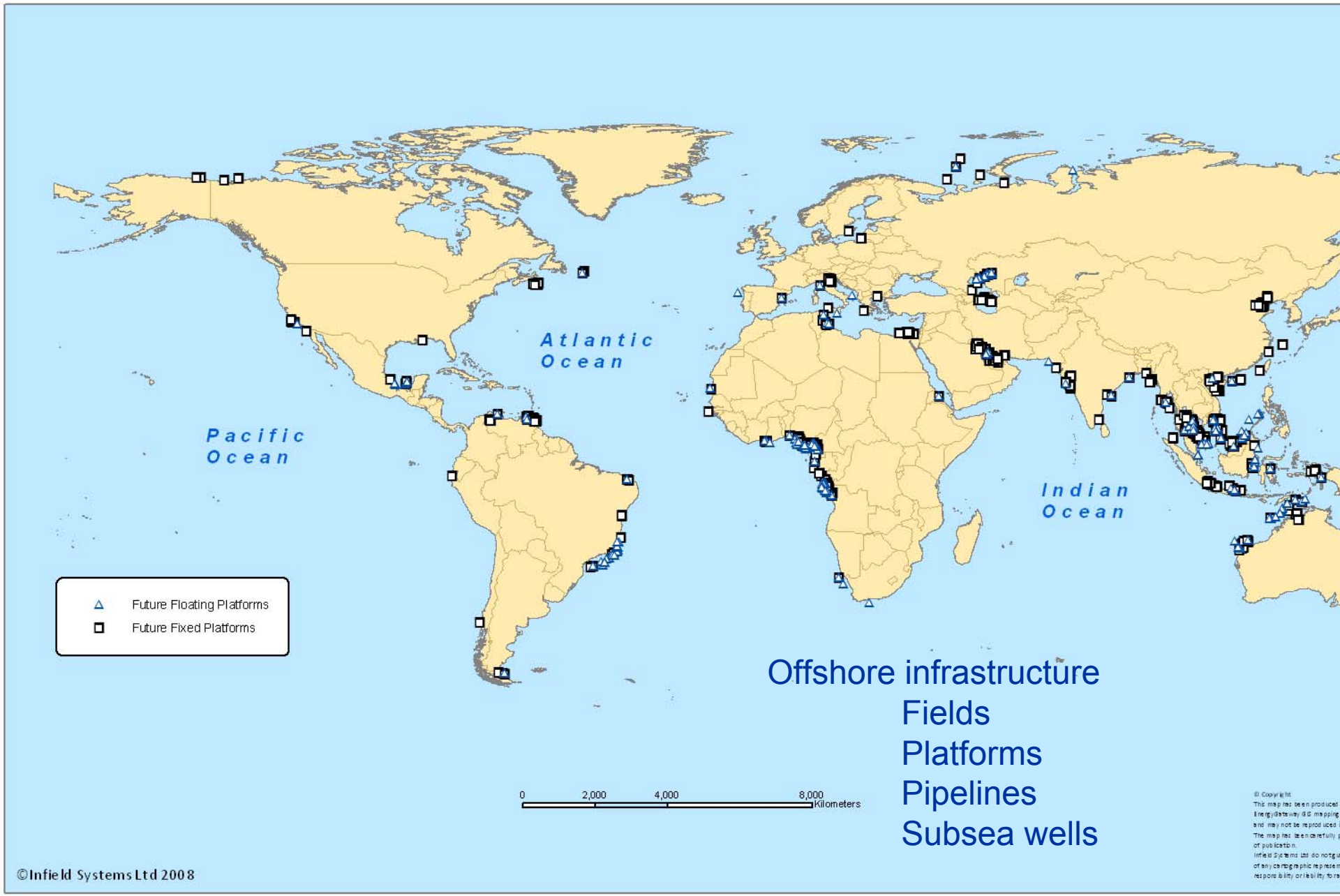
Infield maintains

The only data driven and peer reviewed, bottom-up model of offshore demand & supply



Structure of presentation

- Brief industry overview
  - Diversity
- Fabrication/construction
  - Aspects of demand
  - Offshore & onshore
  - Supply/demand
  - Case studies
- Engineering
  - Aspects of demand
  - Offshore & onshore
  - Supply/demand
- Specialist Vessels
- Implications
  - Scheduling
  - Costs
  - Production
- Conclusion


Atlantic Ocean
Pacific Ocean
Indian Ocean
Future Floating Platforms
Future Fixed Platforms
0
2,000
4,000
8,000
Kilometers
Offshore infrastructure
Fields
Platforms
Pipelines
Subsea wells
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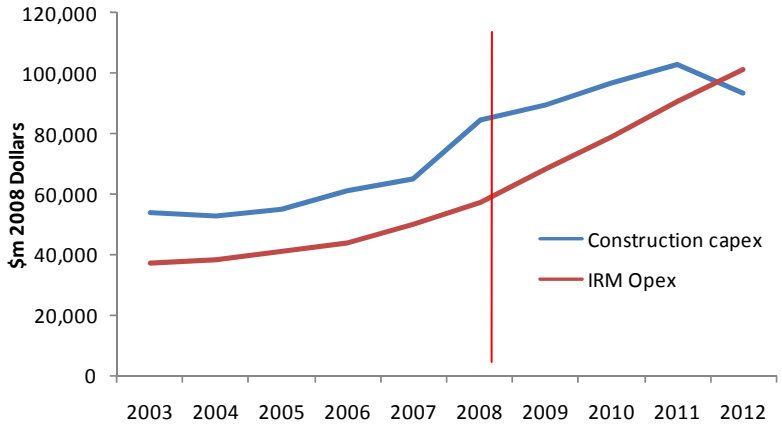
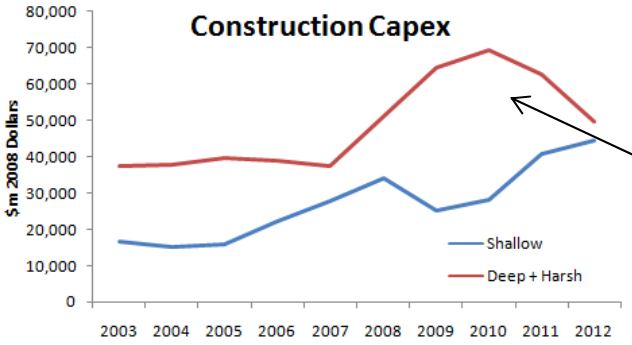
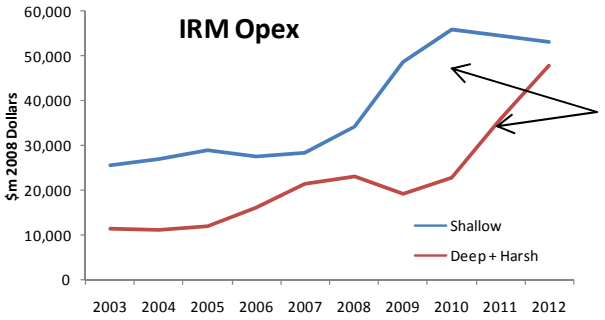
Key indicators

Expenditure trends - up

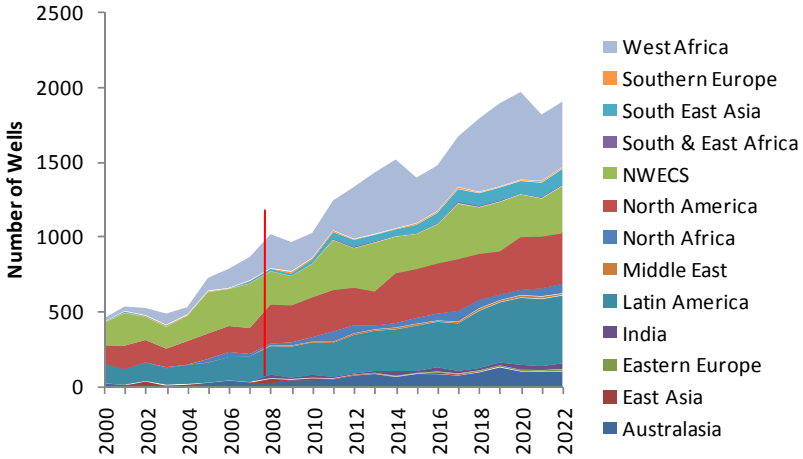




Deepwater driver



Shallow water followed by deepwater driver

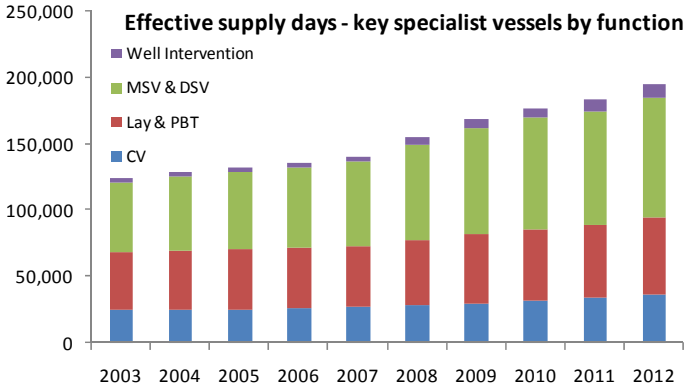


Drilling activity - up

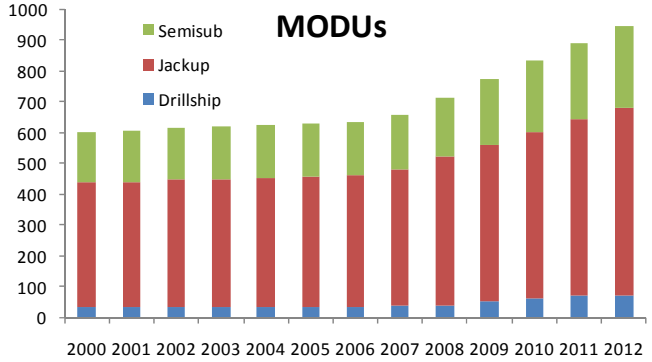
Including exploration, appraisal, development and work-over activity

Supporting assets & services increasing

Specialist vessels increasing



MODUs increasing significantly



But also expansion in key areas including;

- Construction/fabrication yards
- Rigid pipeline manufacturing
- Flexible pipeline manufacturing
- Umbilical manufacturing
- Subsea tree manufacturing
- Engineering and service/support personnel

However:

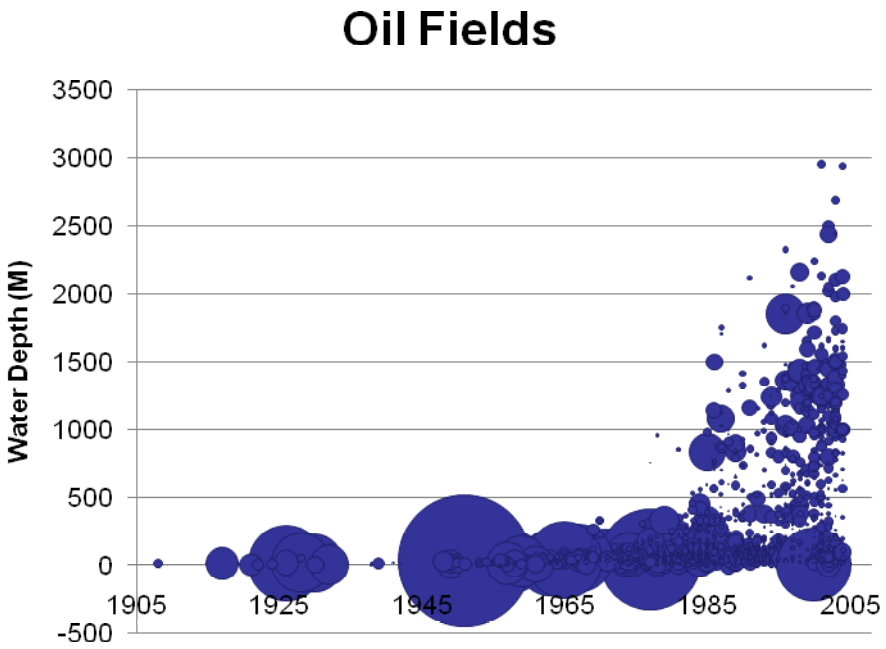
Still a wide range of supply constraints and development issues, all within a political and market context that is increasing in complexity

Key aspects

- Increasingly offshore O&G is an important source for our energy needs
- The “low-hanging fruit” has been picked
- Industry prides itself on record breaking developments (deeper, hotter, greater pressure, further to host etc.)

- *Graphic shows discoveries by size of reserve and WD*
- *Smaller discoveries*
- *Deeper water is increasingly important*
- *Discoveries further from host facilities*

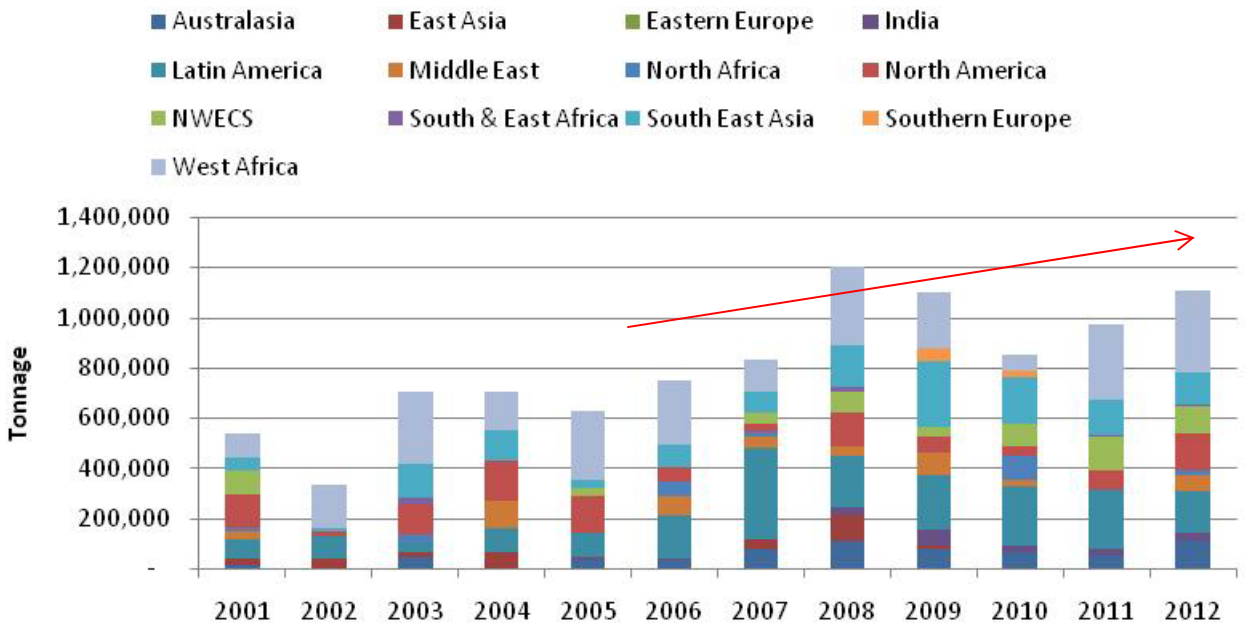
- *Platforms will continue to be an important aspect of future developments*



Infrastructure Requirements - Focus on Floating Platforms

- Floating Market Forecast
- Shows the growth of the demand for fabrication by region
- Most regions showing growth in units & tonnage
- Widespread Globalisation of technology
- Growth plateaus as Supply Constrains and costs bite

Tonnage based on year of installation & deployment location

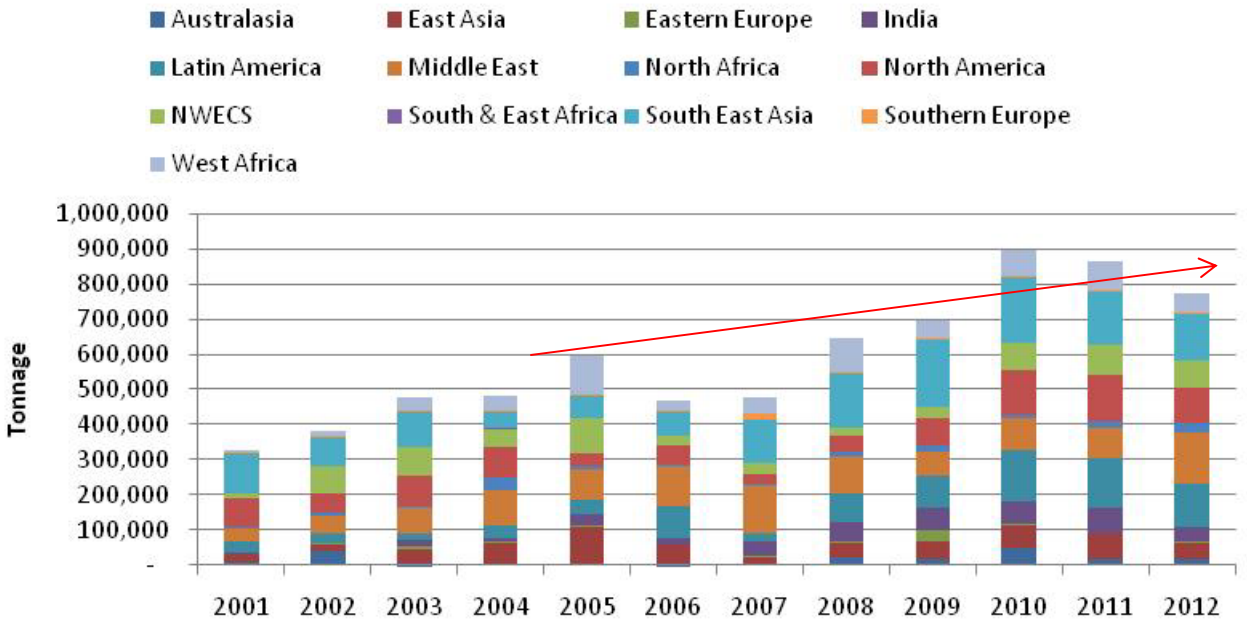


Infrastructure Requirements – Focus on Fixed Platforms

- Growth of the demand by region of installation

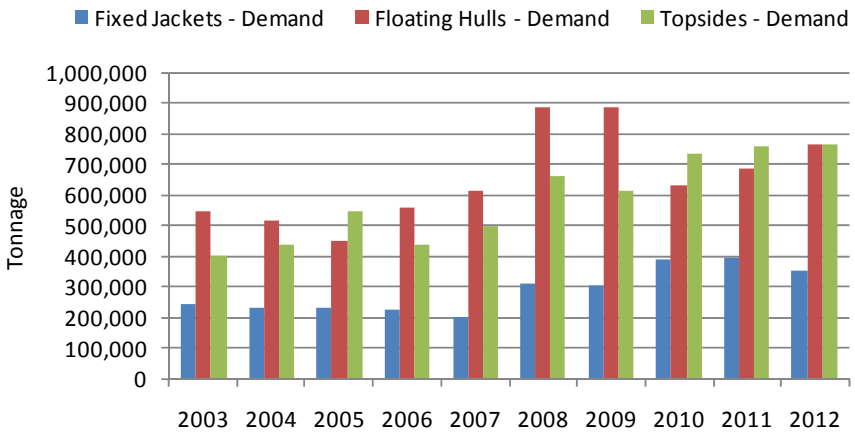
  Declining solution?
- Still significant amount of shallow water plays
- Subsea and fixed platforms can be complementary solutions not alternatives
- Tie back deepwater fields to platforms on the shelf
  - E.g. Pluto (Aus) and Mexilhao (Bra)

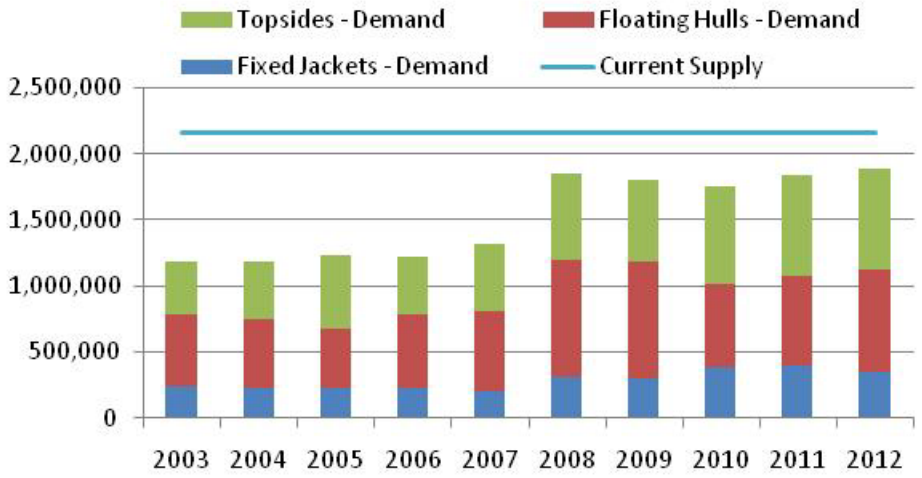
Tonnage based on year of installation & deployment location



Global S&D assessments - offshore

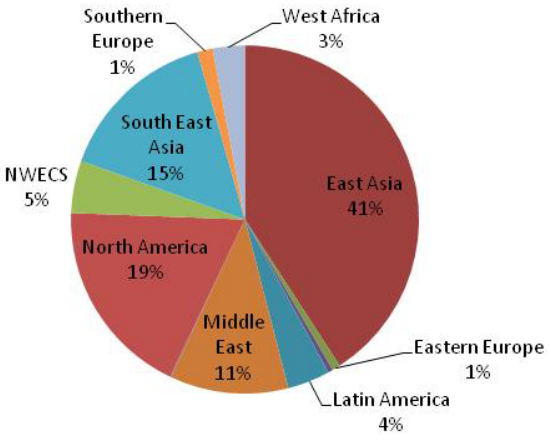
- Assessment shows current fabrication capability. Expansions are taking place but not quantified (ongoing work)
- Only showing our assessment of fabrication of topsides and jackets/hulls
- In a perfectly efficient market there should be no capacity constraint
- However, regional views are significantly different

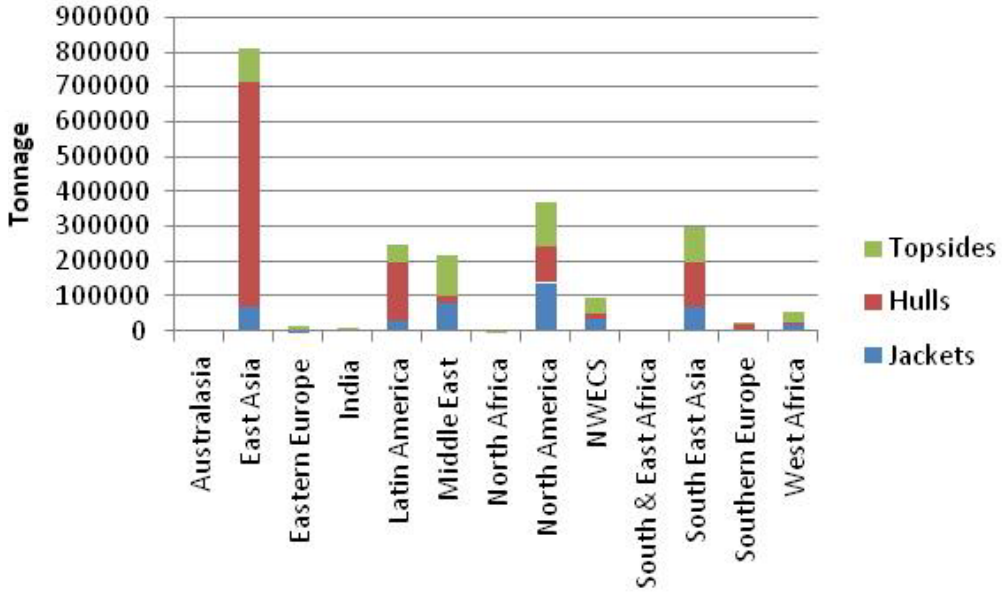


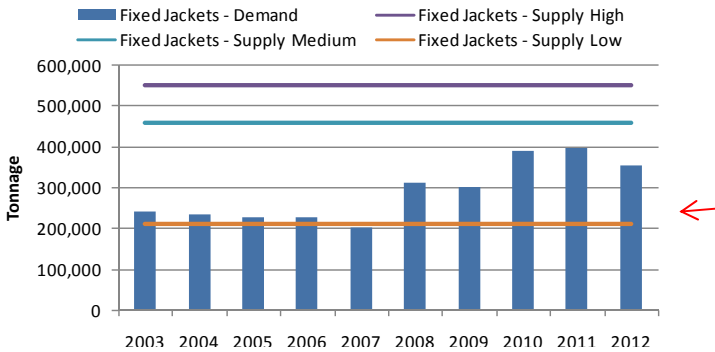


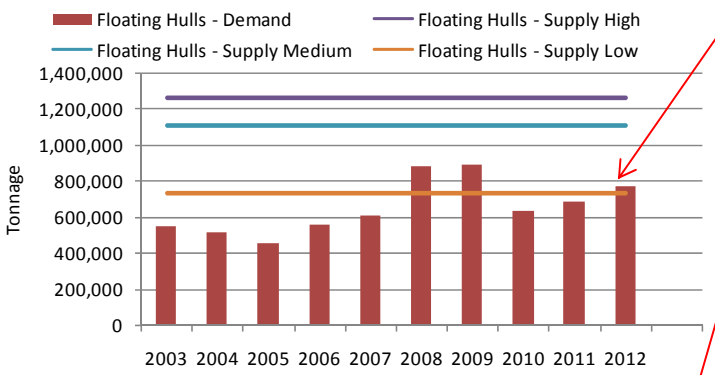
Regional Capacity – selected capabilities

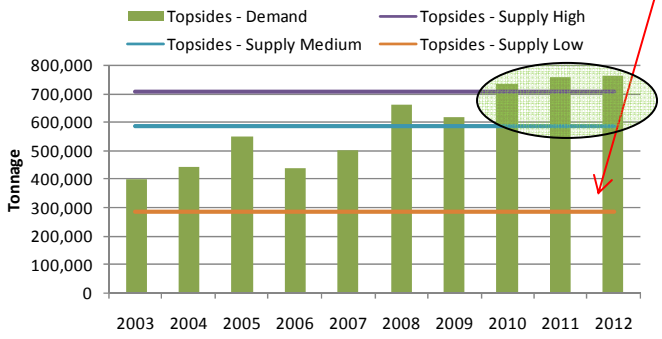
- Graphic shows the fabrication capacity of all regions by sector
- Yard assessment made by capability/size, work history, current backlog and potential throughput
- No surprises – however remain plenty of challenges
- Growing geographical spread of demand/increasing local content requirements











Demand and supply – global by sector

All above view of low supply case

With topsides exceeding high case

Demand growth by volume is already stretching global capacity, but volume alone is not the only issue....

Local Content (LC) Requirements

- Almost all countries face some levels of protectionism whether in the form of import tax or stringent LC requirements

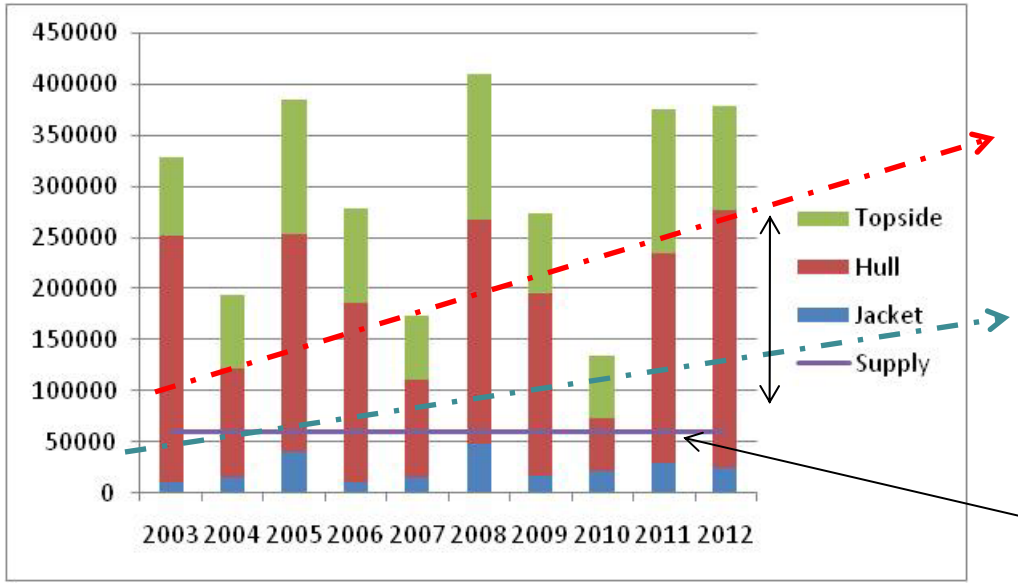
Why is local content important?

- As Offshore industry expands globally more countries try and piggy-back economic growth through legislation (capital: both technical and human)
- However, LC impacts on project sanction and delivery

Why Good?	Why Bad?
Develop local industry	Market distortion
Use O&G industry to drive economic growth	Inefficient
Transfer of knowledge & expertise	Creates artificial S&D picture

Regional Case Studies – West Africa

- Tonnage (y-axis) reflects the installation profile of demand rather than actual tonnage profile thus the 'lumpy' profile
- Arrows reflect indicative growing LC requirements - up to 70% in Nigeria
- As LC increases the balance between supply and demand increases locally

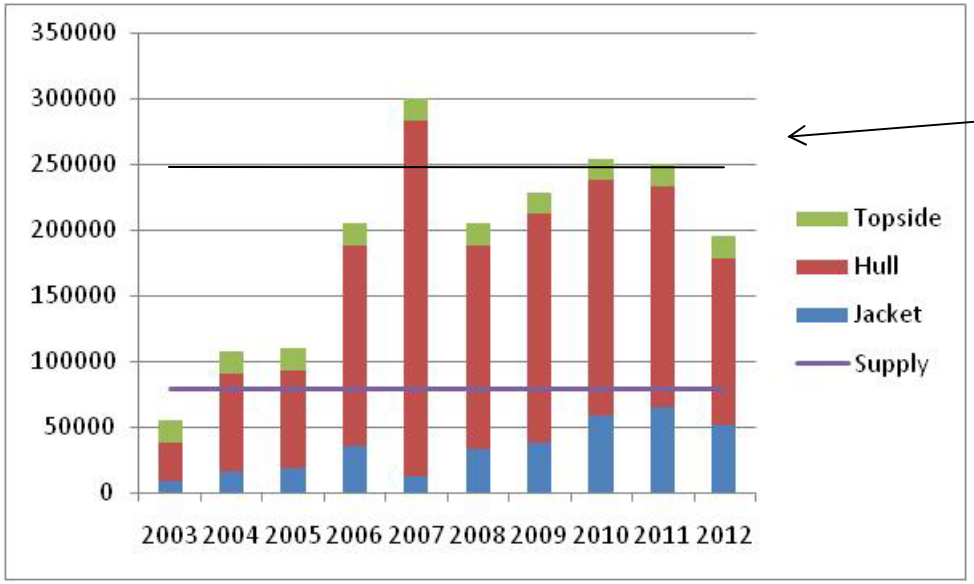


Growing disparity between regional demand and supply

Note – supply level

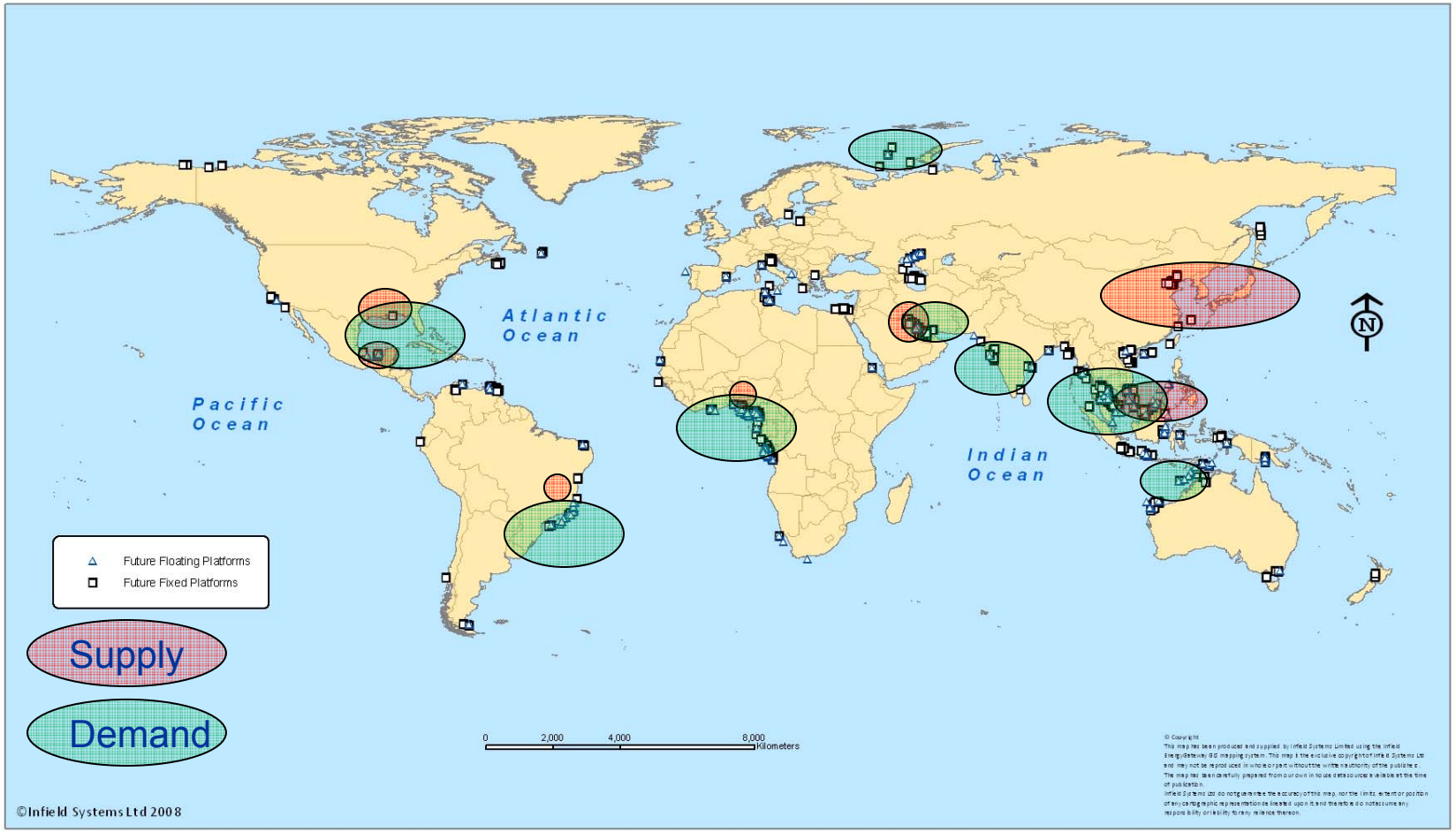
Regional Case Studies – Latin America

- Supply difficult to assess with Mexican capacity and large Brazilian yards
  - Supply reflects effective capability (both high and low case shown)
- Demand should expect to increase with Pre-salt developments
  - Currently rigs but platforms to come
- Local content requirements high – disparity with demand and supply – source internationally.
- Brazil has a poor track record in terms of delivering fabrication - both on-time and on-budget- specifically FPSO conversions
- Growing demand will put pressure on supply chain and logistical networks



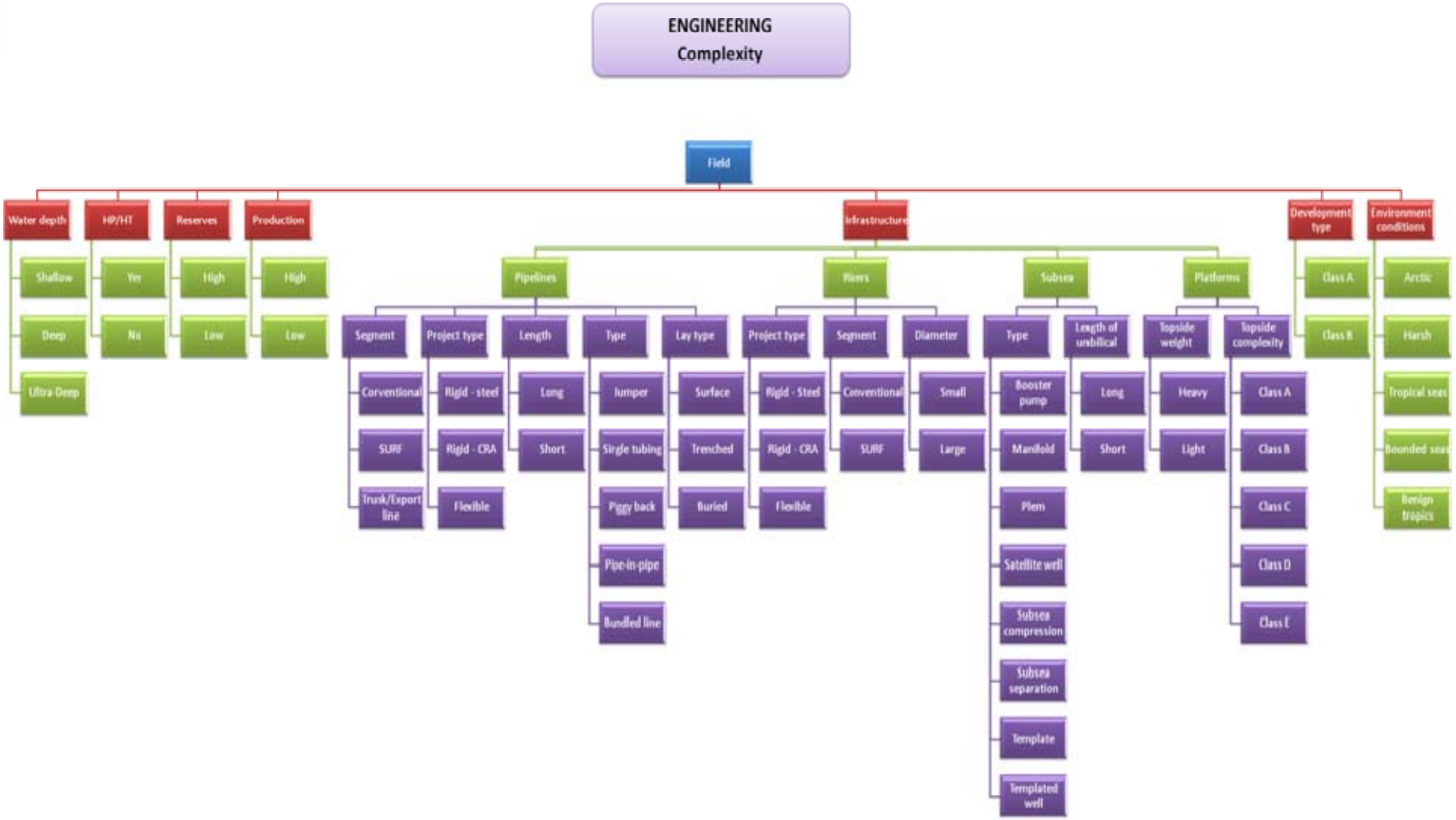
Demand could explode through Pre-Salt discoveries

Implications



Geographic diversity & incompatibility of demand and available local resources = increased schedule challenges & increased costs

Engineering – model complexity



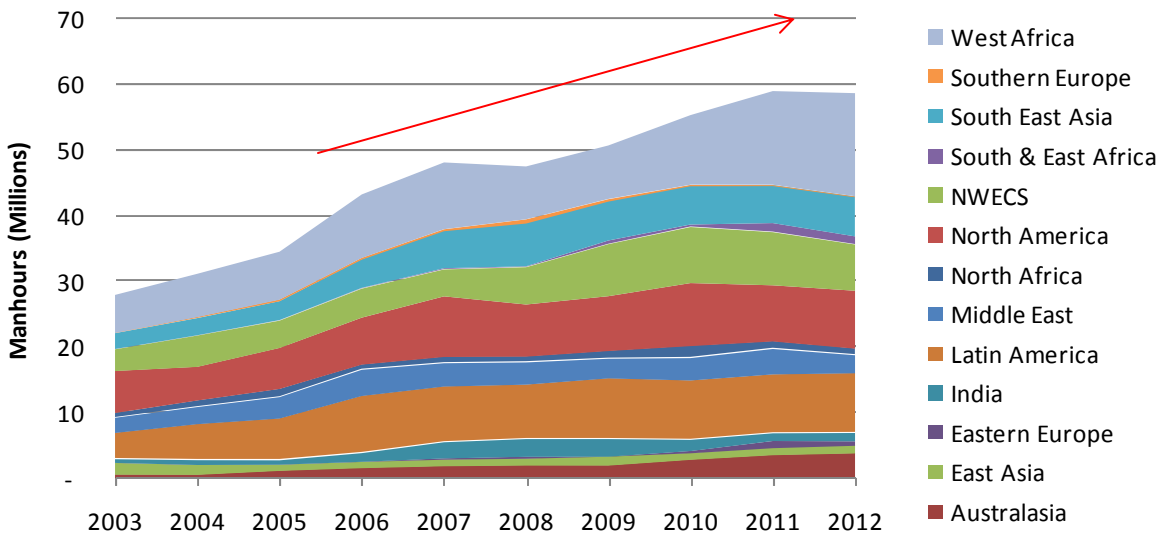
Offshore engineering demand

Units of fields, platforms, pipelines, control lines, subsea, taken from main Infield model

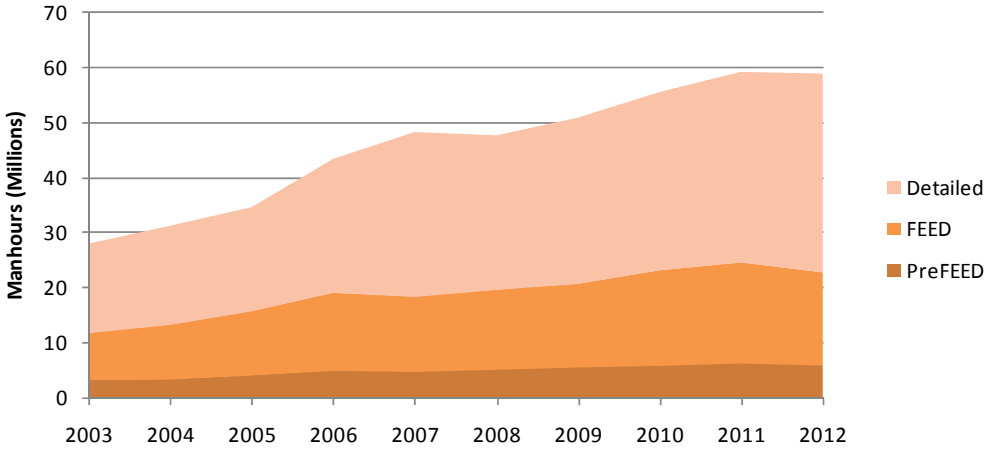
Manhours based on unit differentials including size, type, materials, complexity all cross-checked & calibrated against known and identified contracts

Includes – Concept, FEED, detailed & project management

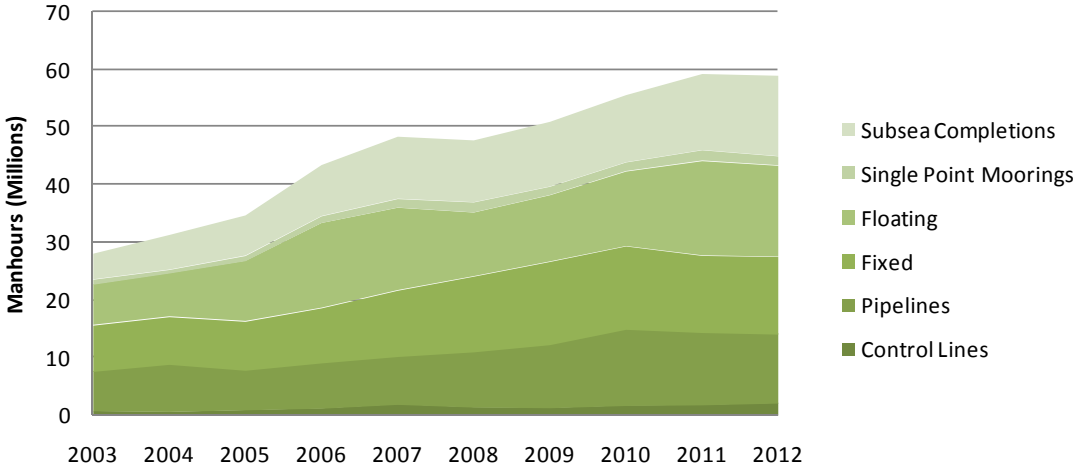
As with construction/fabrication – growth in demand is robust



Engineering detail



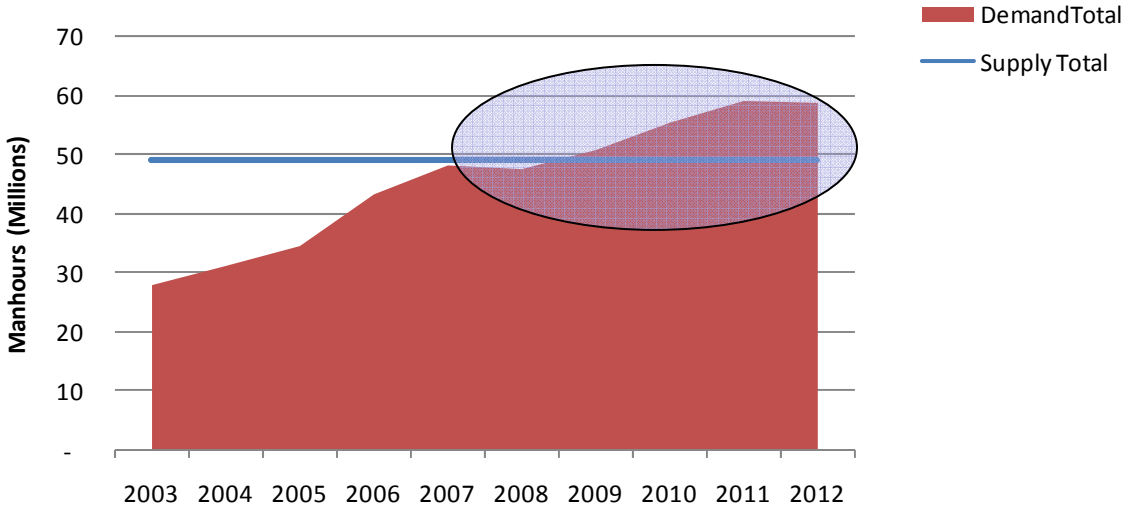
Underlying increase in both FEED & Detailed engineering manpower



Demand driven by activity across every sector

Excluding any potential further expansion (if possible) our current assessment suggests that the offshore industry has little to no spare engineering capacity and has more work coming its way

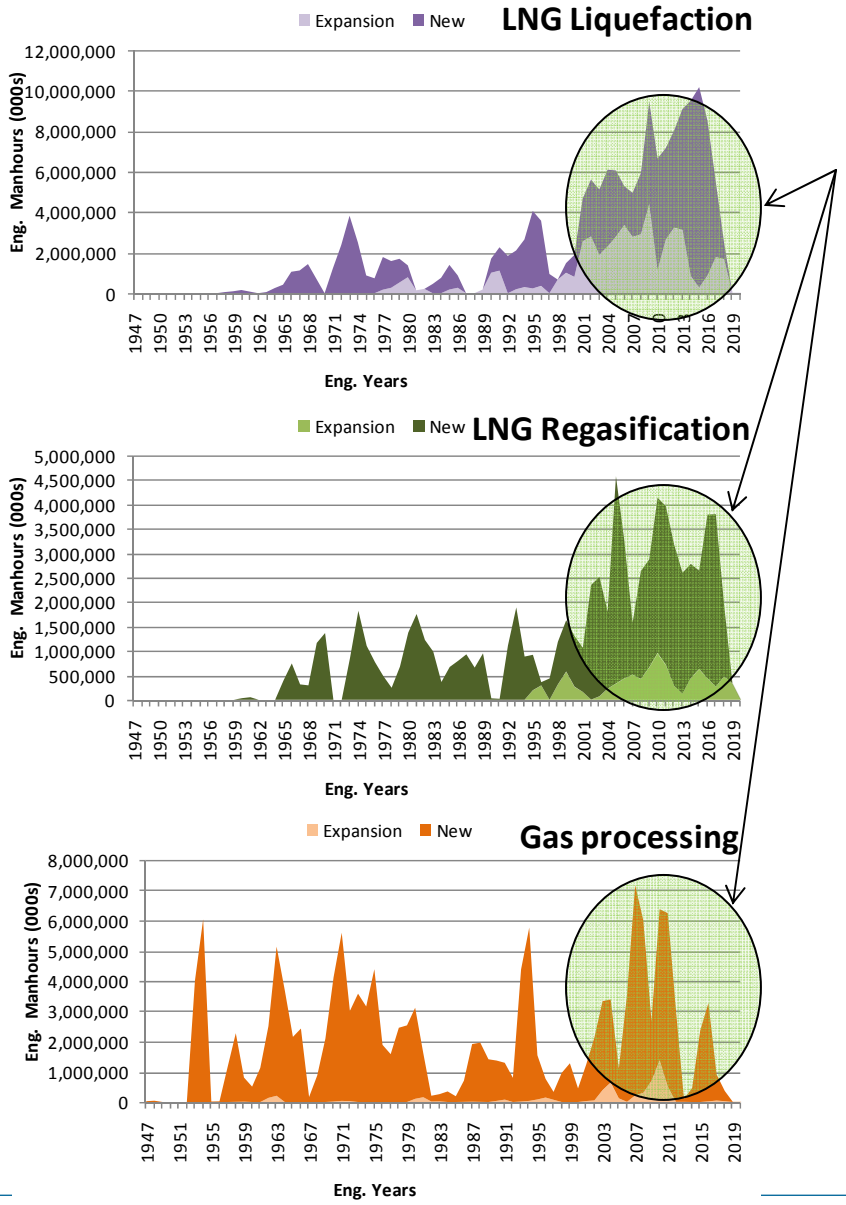
Efficiency gains may ease some pressures but..... How much more can the industry do and what are the implications....



If there are no engineers to work on this extra then further delays and cost overruns are likely, plus

Production targets are likely to be missed

Onshore

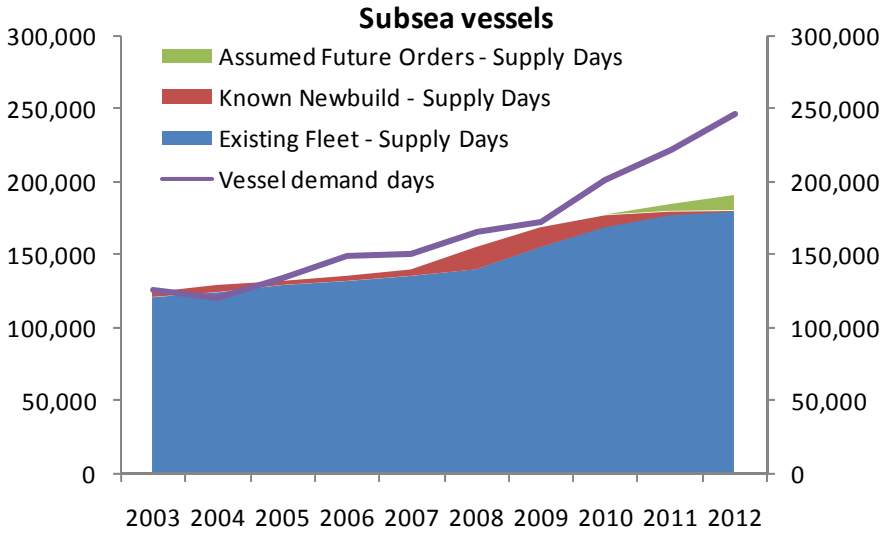


New developments & upgrades driving volume increases in engineering demand

Whilst some offshore engineers are actively targeting downstream as a potential resource, there is little resource to be had

Refinery upgrades & GTL also pushing demand

Specialist vessels



Assessment based on main vessel groups including crane/lift, lay, MSV/DSV, construction support and accommodation

Vessel market effectively full past 2 years and forecast to remain so for next two years

Normal market elasticity takes account of slight imbalances but...

Current demand forecasts really stretch even the expanded fleet capacity

And, regional and some sector differentials (such as deepwater) mean that there are expected shortages in some key markets – more delays on schedules and increased costs

Conclusions

- Fabrication remains tight
- Regional distortions of the market mean that global S&D can not balance
- Local Content creates artificial demand – these requirements are growing
- High prices and no competitive market forces mean that efficiency remains poor
- Continuing project delays
- Perpetual tightness in effective supply?
- High project costs remain and demand for infrastructure is stunted
- Engineering complexity is increasing
- Engineering manpower shows little spare capacity
- Further problems to come

Final comment

Concerns over fabrication/construction supply/demand have been growing, particularly in the past three years as the market has tightened but...

Concerns over engineering resources have been flagged for more than the 15 years of my experience and our work just confirms what many have said for years.

The oil & gas industry has a great track record of doing more with less but we may be closer to the limit than many think and any limit on further expansion of capacity and capability will impact wider society....

Sources & Contact info

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