



Rice Global E&C Forum  
**Engineering &  
Construction**



# 2016 RICE GLOBAL E&C ANNUAL FORUM



## Opportunities and Challenges in Exploration and Production

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**September 19, 2016**

**[www.forum.rice.edu](http://www.forum.rice.edu)**

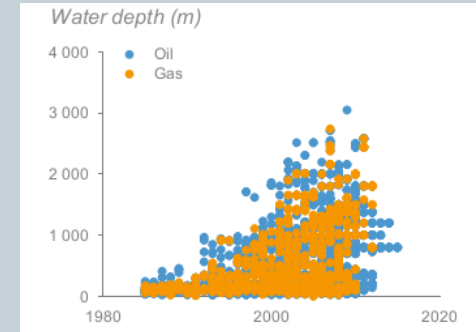
# The situation

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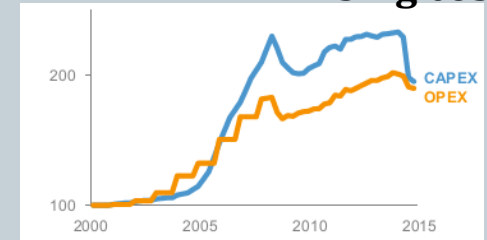
- **Constant increase of oil prices over the last decade, induced:**
  - An important increase of Exploration & Development activities
  - A severe escalation of CAPEX/OPEX and projects complexity, in line with increased demand
  - Tougher host countries expectations (contractual terms, government take, local content)
  
- **In the current situation, characterized by oversupply and a laggish demand, oil prices fell from over \$100/bbl to below 30, leading to:**
  - Complex and highly capitalistic projects being more challenging
  - Projects being delayed or abandoned
  - Flexibility applied, whenever possible, impacting onshore, offshore and shale developments

**Lowering Projects breakeven is a priority**

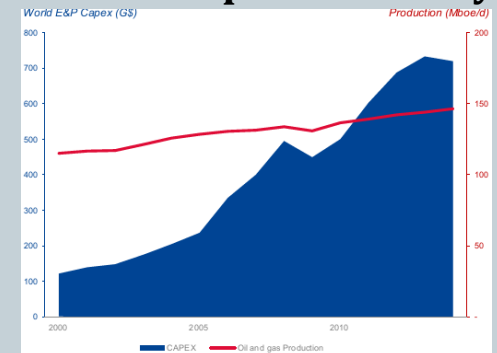
## Increased complexity



## Rising costs



## Capital intensity



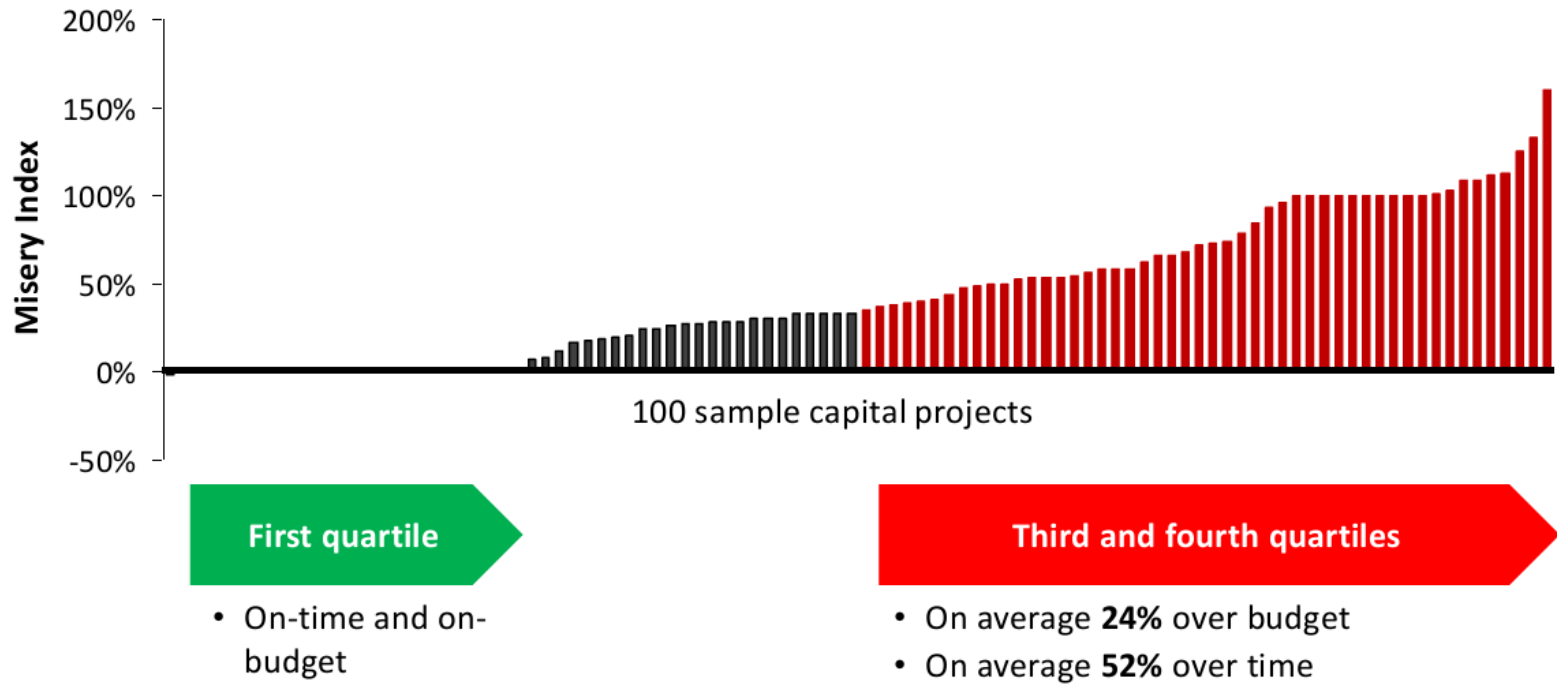
Sources: BCG, Wood Mackenzie

# The good old days...

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## Capital Project Misery Index

accenture



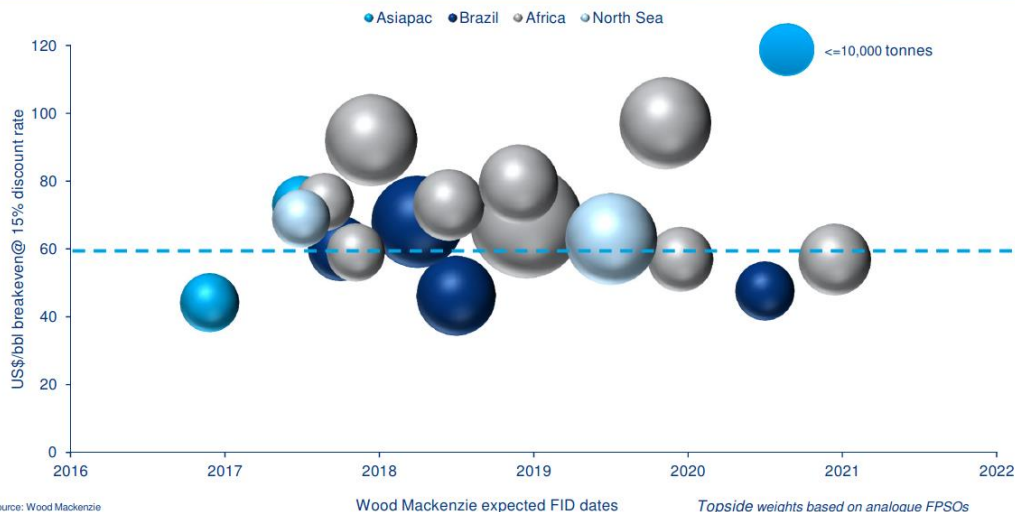
**Only 25% of projects were on time & on budget...**

**The Project Misery Index (cost overrun % plus time overrun %) highlighted the difficulties of our industry.**

# How to adapt to the downturn?

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Expected FID timeline vs breakeven price for pre-FID FPSO projects, by region



Most deepwater projects do NOT breakeven below US\$60-80/bbl.

Significant activity slowdown with little chance to rush back to high levels seen in the 1<sup>st</sup> half of the decade.

## To weather the storm and launch new Projects:

- ☐ Secure cost reductions (easy cuts have been made...)
- ☐ Capitalize on strengths
- ☐ Be innovative, introduce new technologies
- ☐ Review design practices/specifications, standardize, look for synergies & operating optimization
- ☐ Adapt contracting strategy, supplier relationships management

## Improve capital efficiency

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# TOTAL: subsea to deepwater projects

constantly adapting through exploration & development innovations

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WTI prices corrected from the inflation

30\$

1980

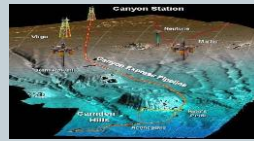
1990

2000

2010

Source: macrotrends

## North East Frigg



**Canyon Express**  
Deepest sub-sea pipeline at time of dev. (2200m)

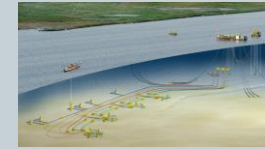
**Rosa (1400m)**  
20km tie-back & largest deep offshore brownfield works



**Akpo (1350m)**  
Steel catenary risers, 1<sup>st</sup> all-electric FPSO



**Usan (800m)**



**Moho North**  
Sub-sea and TLP (650-1100m)

**Kaombo**  
(1400-1900m)

1979 1983

2001 2002

2006

2007

2008

2009

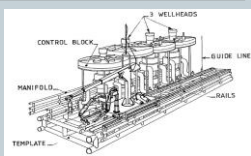
2011

2012

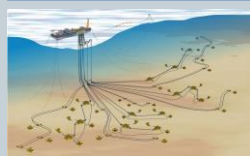
2014

2016

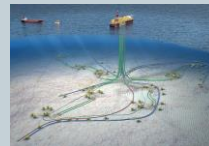
2017



**Grondin North East**



**Girassol (1400m)**  
1<sup>st</sup> deepwater dev. in West Africa



**Dalia (1400m)**  
8 x Integrated Production Bundle risers

## Moho Bilondo



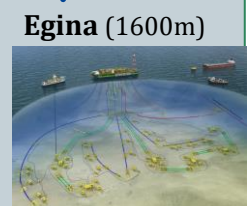
Subsea seawater treatment & injection (540-740m)



**Pazflor (900m)**  
Subsea G/L separation & pumping modules



**CLOV (1100-1400m)**  
SS multiphase pumps, variable speed drive tech.



**Egina (1600m)**

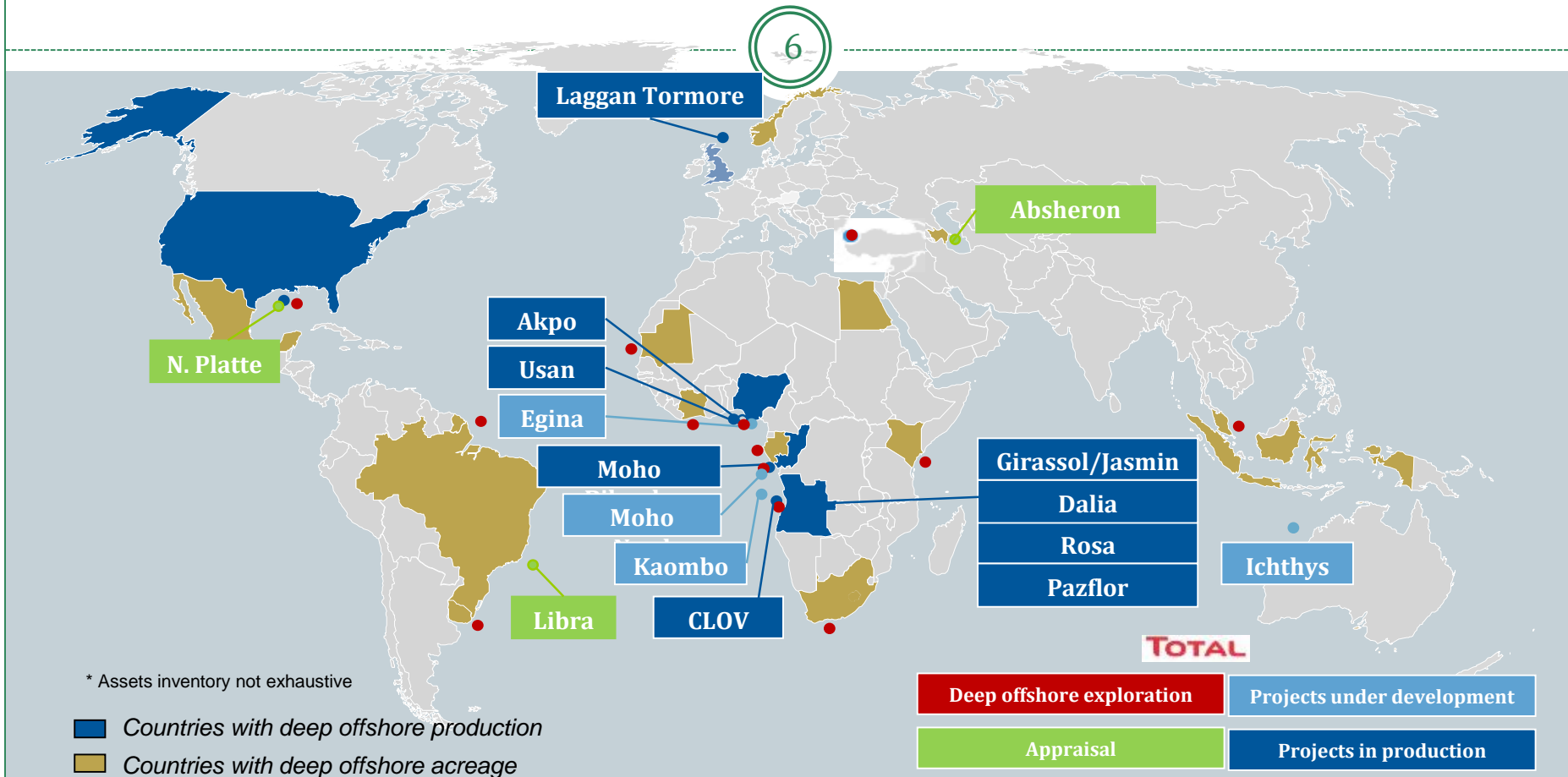
Research program

1<sup>st</sup> SPS in North Sea

... a path w/o interruption despite fluctuating environment

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# Deep offshore areas remain largely under explored



**Capitalize on Company's deepwater expertise on emerging areas  
Share knowledge and funding, a vast array of opportunities**

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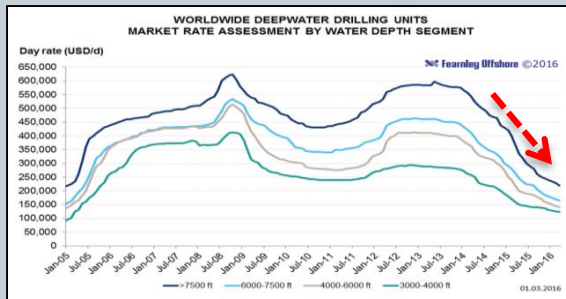
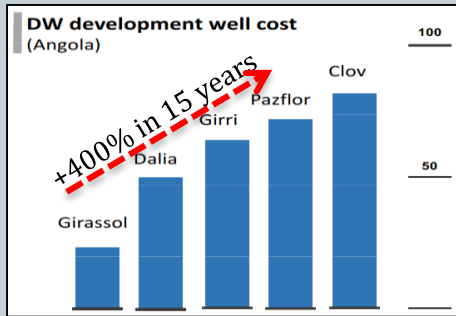


# Costs

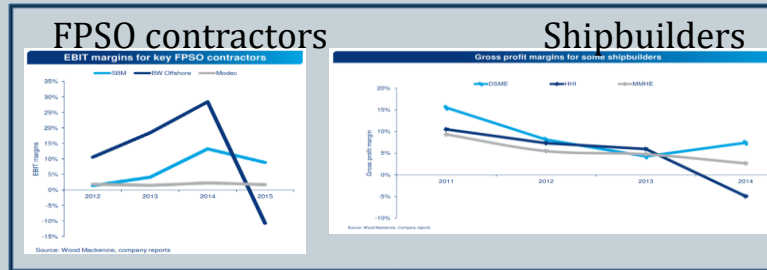
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**FPSO topsides getting more complex (>40.000t)  
... is the design “good enough”?**

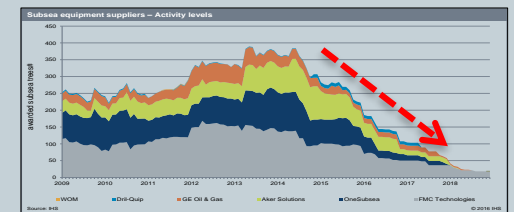
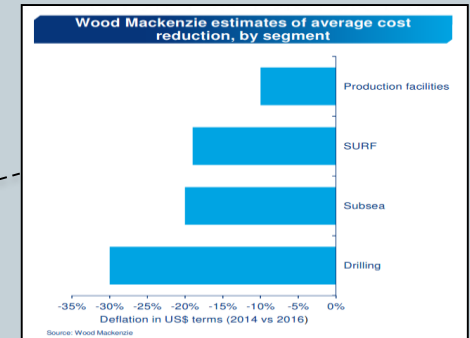
FPSO costs have remained resilient ... but new projects will remain frozen, until more significant cost reduction are achieved.



UDW drillships now have only one marker, around 240K\$/d, and are not expected to rise in the near term.



SS equipment: a market shrinking rapidly (2016-17: -31%), w/ Petrobras, a leading buyer, (±15% of market share over 2003-15).



**Secure industry-wise cost reductions / Contractors to adjust capacity**

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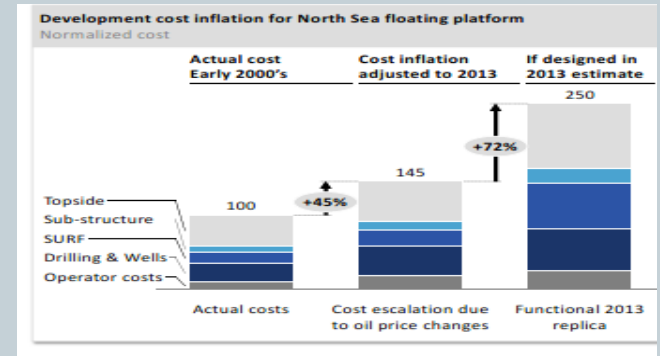
# SS solutions: value from standardization

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Projects have become increasingly complex, but:

- unique-to-company specifications have proliferated
- suppliers have been unable to leverage scale and continue to manufacture in custom, bespoke regimes

→ prices have almost tripled & schedule is more than 2x longer compared to less than 10 years ago – for comparable deliverables.



Source: McKinsey analysis

Standardization & harmonized specs become a business imperative.

Industry must move towards a vision of common design solutions (off-the-shelf for  $\pm 80\%$  of applicable common modules, customizing as little as possible), enabled by collaboration across the supply chain, through organization changes.



Subsea Tree

Industry-level changes are needed to drive common initiative (WEF/IOGP).

Some initiatives and efforts to harmonize across Operators already started (XT: BP, Statoil, Total... -> expectations= 30% direct costs savings + 12m schedule compression).

**Technology can play a significant role, but we must simplify and adopt new contracting strategies**

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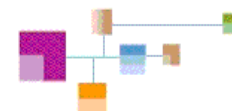
# Conclusions

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## What future for offshore E&P?

- ❑ Times are tough and just getting tougher
- ❑ No compromise on HSE, a core value for TOTAL's Group
- ❑ Resilience in a degraded environment, cost reduction program, decrease finding & development cost/boe, shift to lean and reduce breakeven development price
- ❑ Maintain strong discipline on spending, value is key
- ❑ Operational efficiency and excellence, capitalize on strengths
- ❑ Technology pivotal in increasing recoverable oil in existing areas, helping identifying HC in new and/or less accessible areas and driving costs & risks down
- ❑ Maintain technical expertise and partnership with Contractors for the next row of Projects

## Boundaries to be continuously pushed



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