



# Hvordan påvirke kostnadsnivået på undervannsutbygginger mest effektivt

**FFU Seminaret 2010**

**28 Januar 2010**

Tore Halvorsen

FMC Technologies

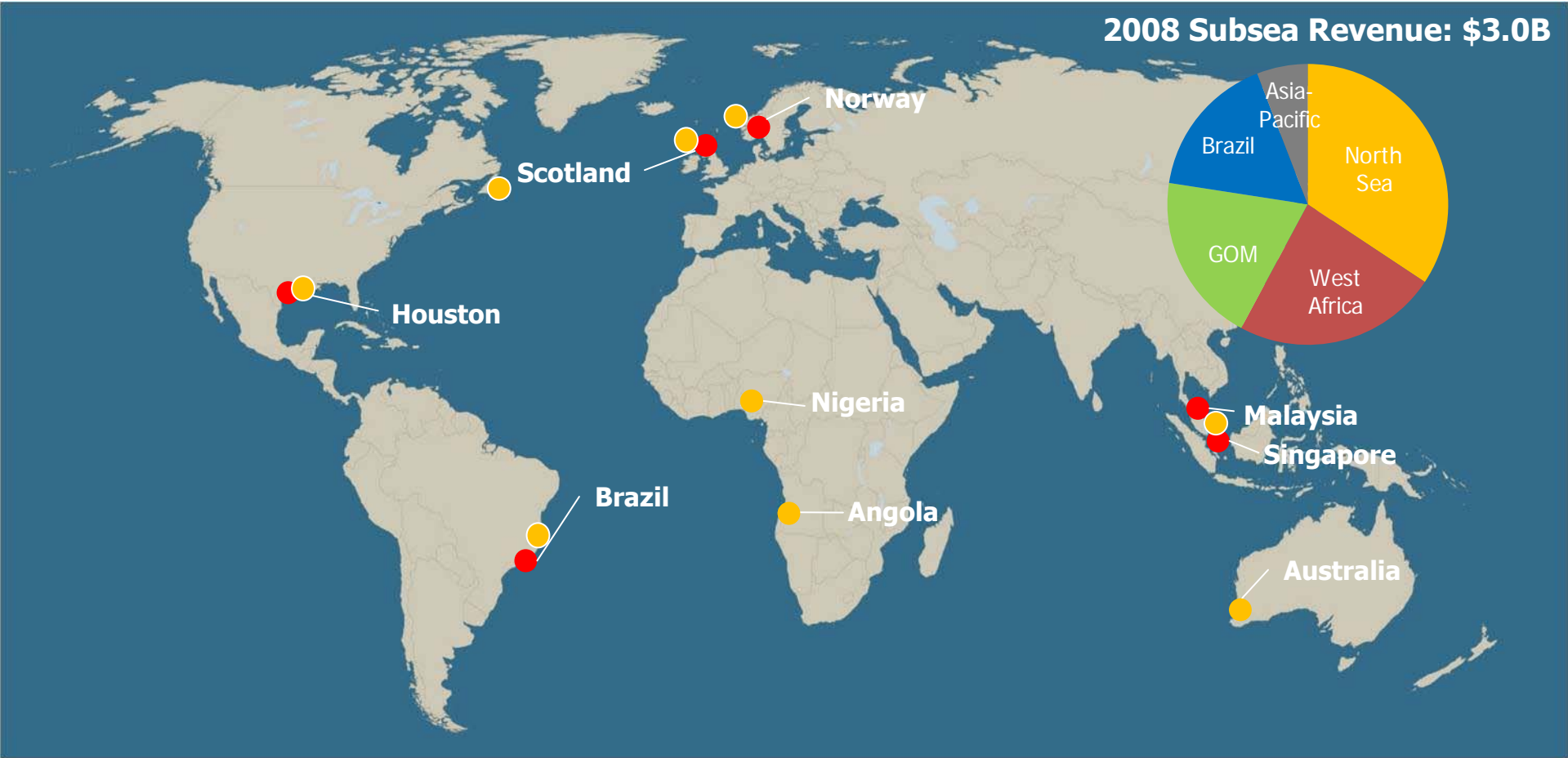
**We put you first.  
And keep you ahead.**

# Subsea Systems – More than trees and wellheads



# FMC's Global Subsea Presence

*Capabilities in all major deepwater basins*

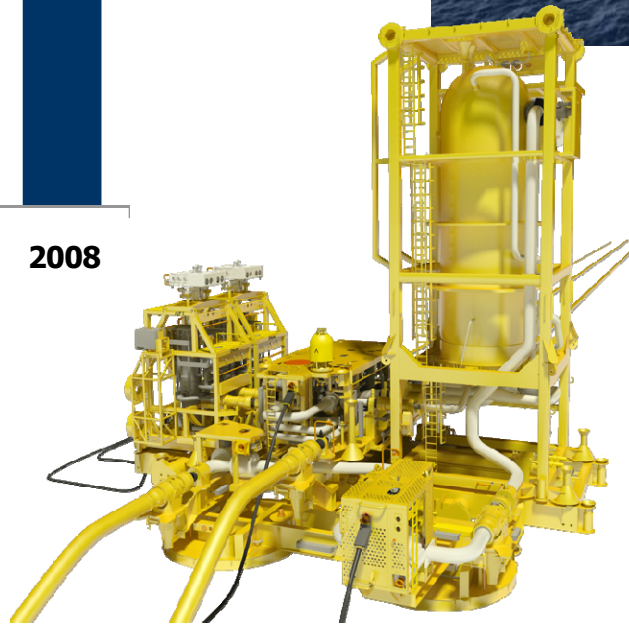
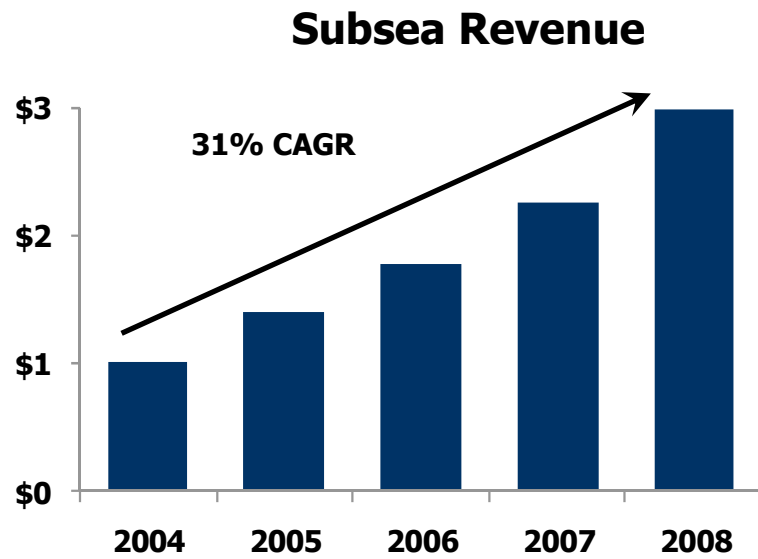


● Manufacturing Facility

● Service Base

# Subsea Systems

*Over 65% of FMC Technologies revenue*



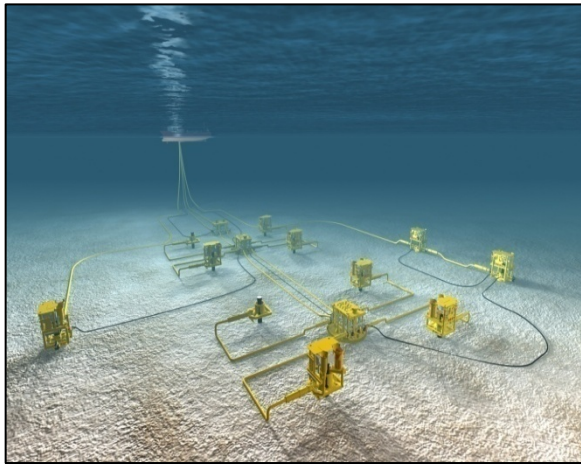


# FMC's Focus Areas next 5-10 years

Maturing

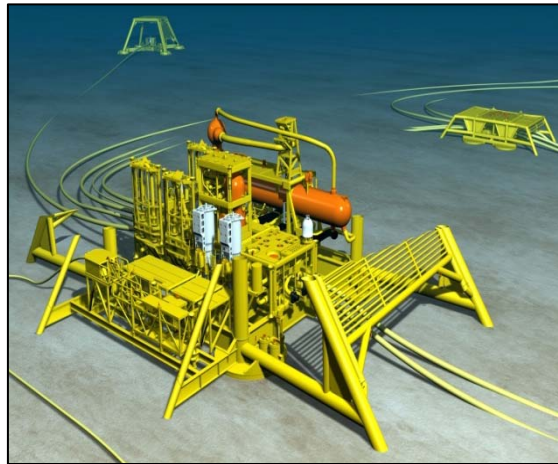
Emerging

Conventional Subsea Systems



Greenfield

Processing



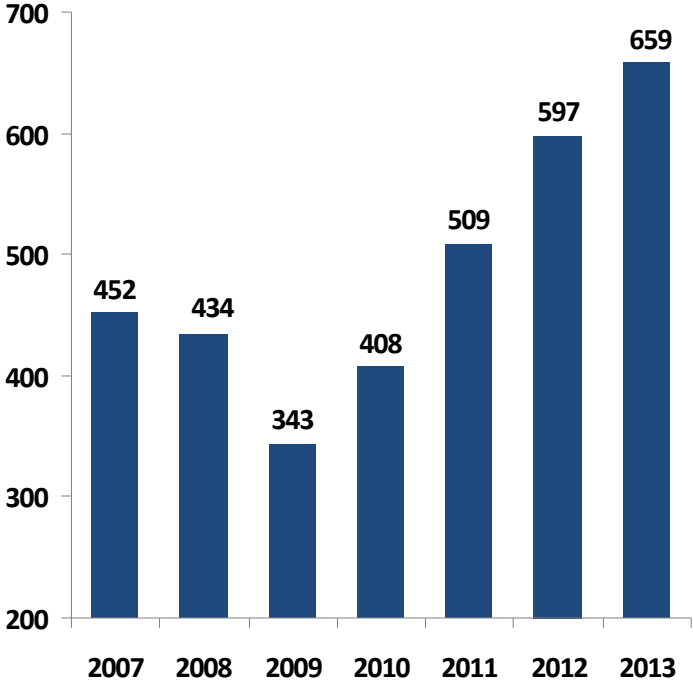
IOR / Brownfield

Production Services

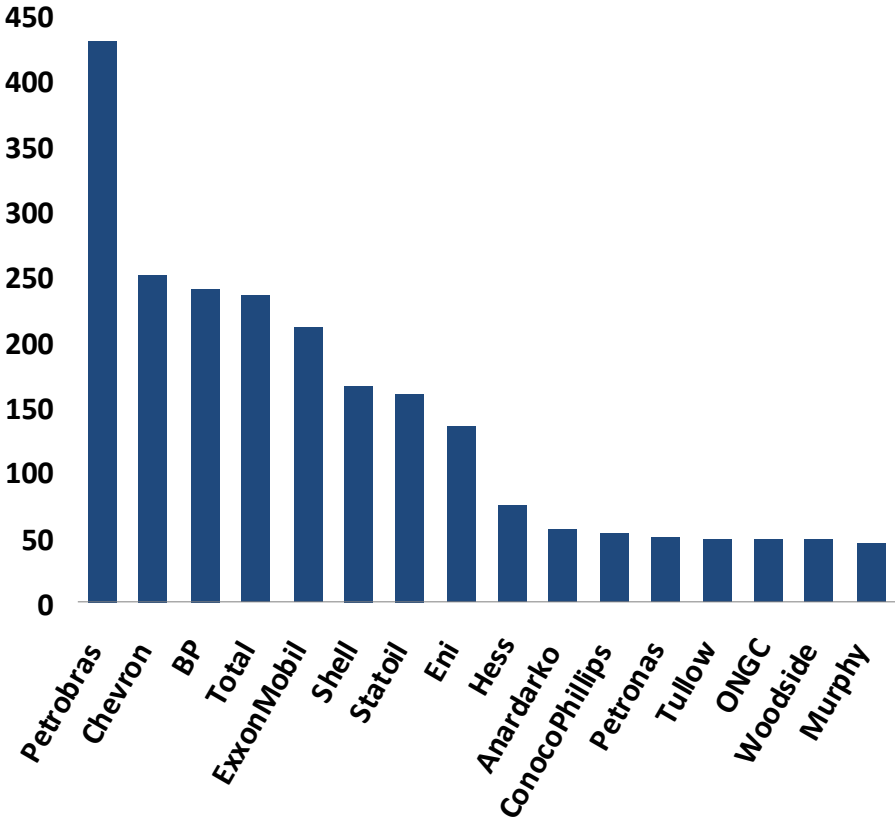


# Subsea Market Rebounds

Subsea Tree Awards



Subsea Tree Activity by Customer  
2009-2013



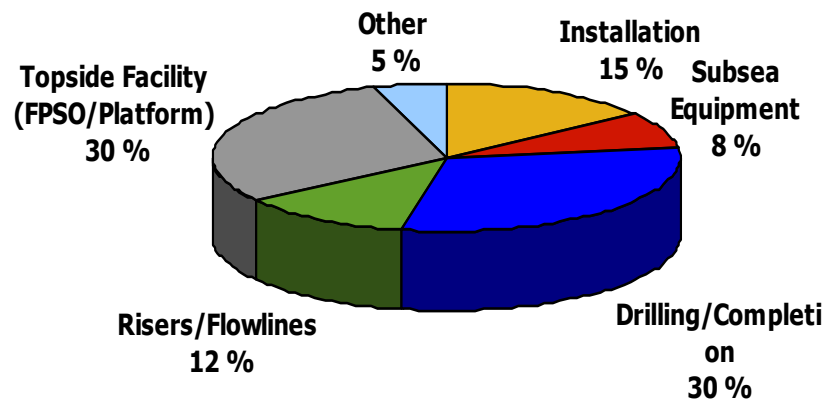
Source: Quest Base Case

# Current Market Trends – Global Subsea View



- New offshore developments are economic at \$60-70 a barrel
- Oil companies are focusing on oil prices, costs, and ultimate reservoir recovery:
  - Re-designing field layouts
  - Seeking reductions in major costs: rigs, installation, and equipment
  - Acceleration of standardization
  - Pursuing increased oil recovery
- Expectations that investments will begin to accelerate in late 2010 or early 2011

# Cost Distribution – Typical Offshore Field



Total Field Development Cost

## Cost Influence from a Subsea Supplier

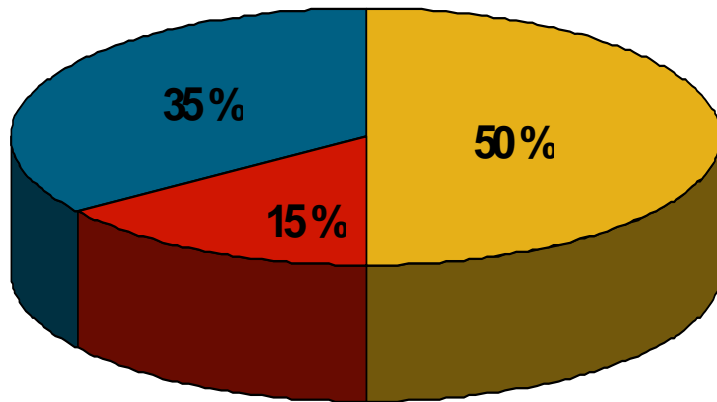
- Field Architecture
- Subsea Hardware
- Installation Cost
- Drilling Cost
- Risers / Flowline cost
- OPEX



# Cost Reduction Potentials

- Direct Influencing Subsea Equipment Cost
  - Standardization
  - Execution Model
  - Technology and Design
- Indirectly Influenced by Subsea Equipment
  - Drilling
  - Installation Cost
  - Intervention Cost
  - Operations and Maintenance Cost
- Other Important Cost Reduction Potentials
  - Technology Pilots outside Delivery Projects
  - Field Layout
  - Industry Technology Step Changes

# Cost Reduction – Typical Main Drivers



- Technology Step Changes
- Process Improvements
- Standardization

## Standardization:

- Design
- Material
- Quality Requirements
- Documentation

## Process Improvements

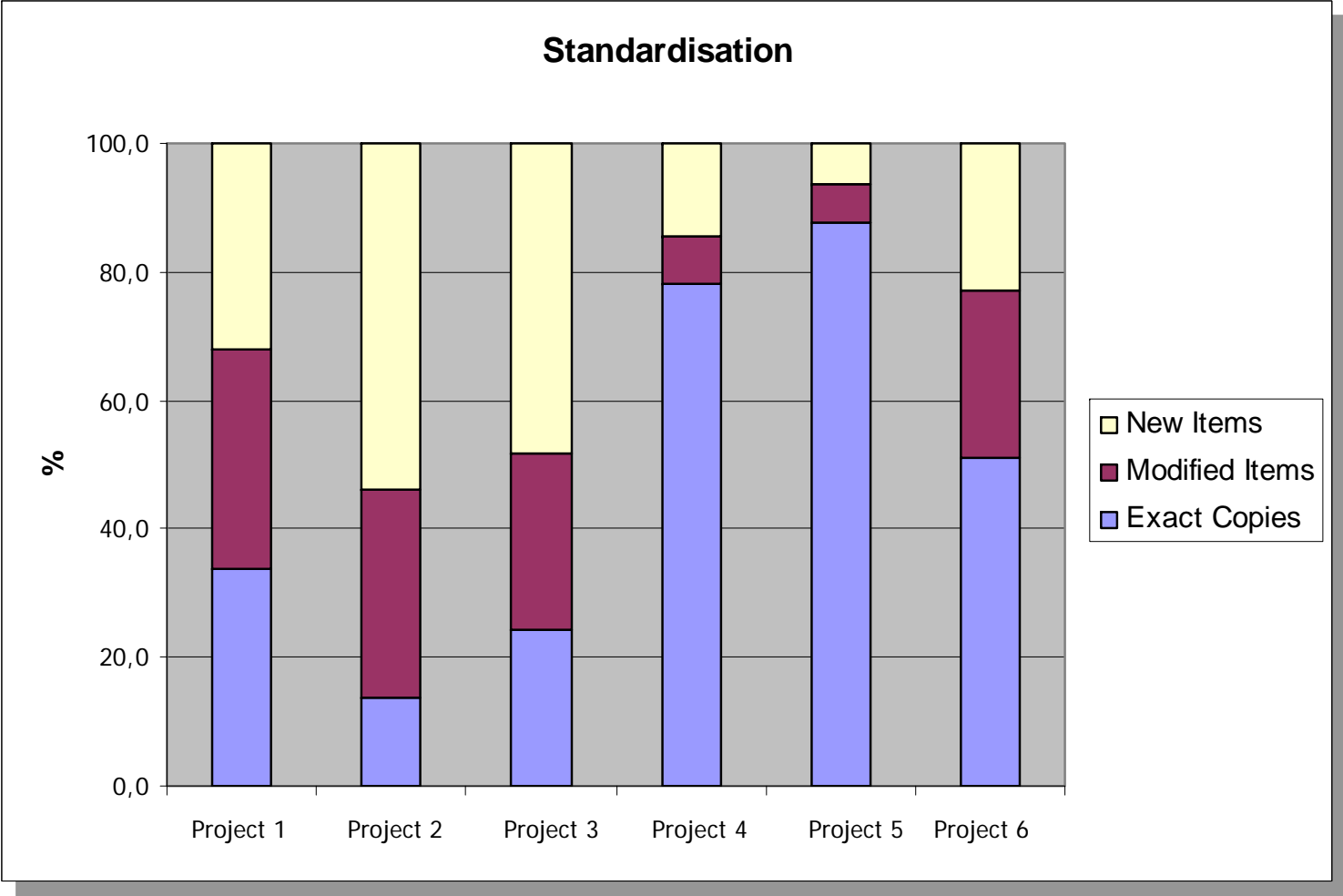
- Execution Model
- Customer Interaction
- Portfolio Management
- Supplier Relationships
- Manufacturing

## Technology & Design

- Lighter, smaller
- Fewer parts
- Less complex
- Configurability
- Eliminate

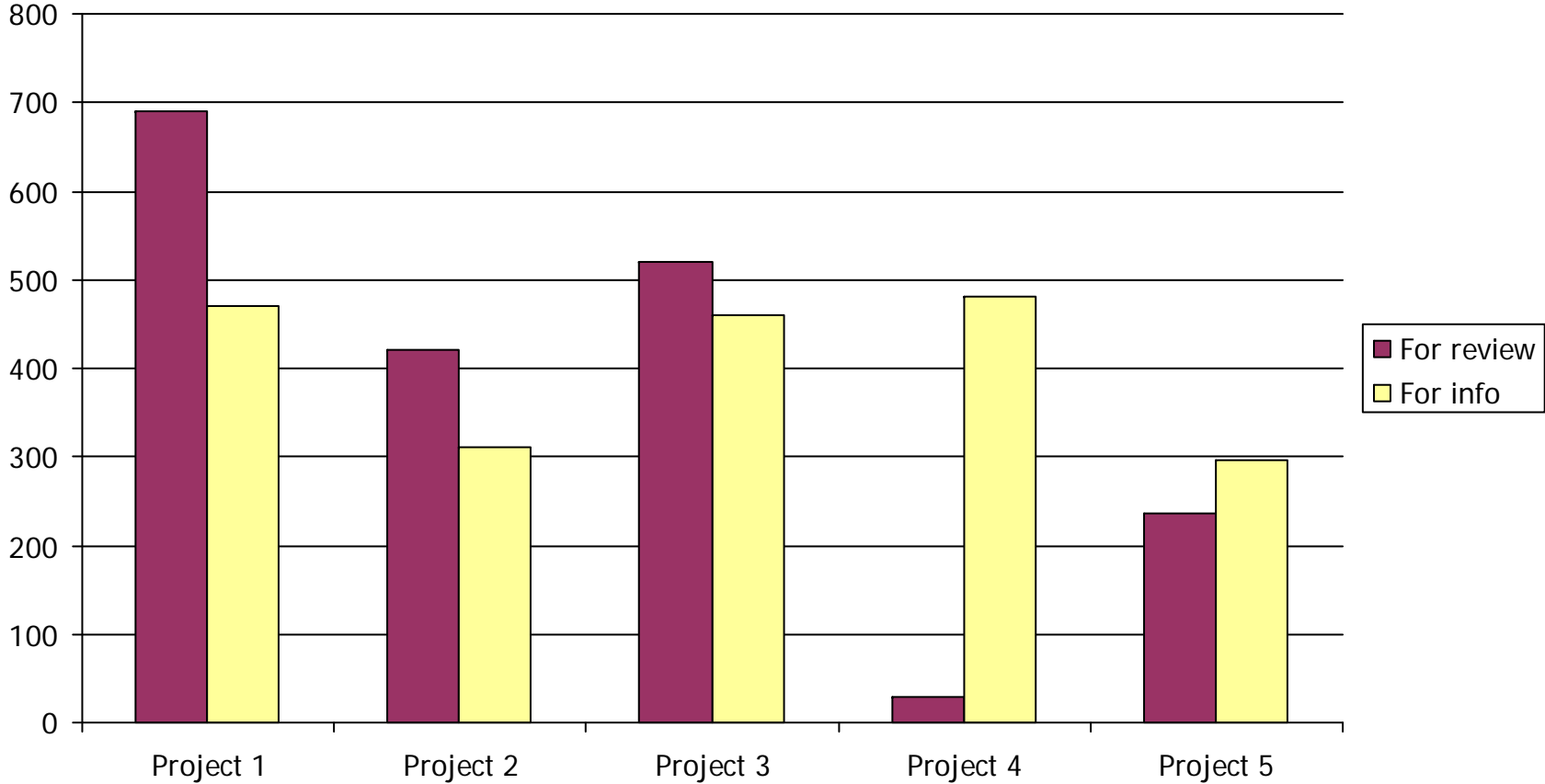
# Product Standardization

## Re-use of Part Numbers in Projects - Example

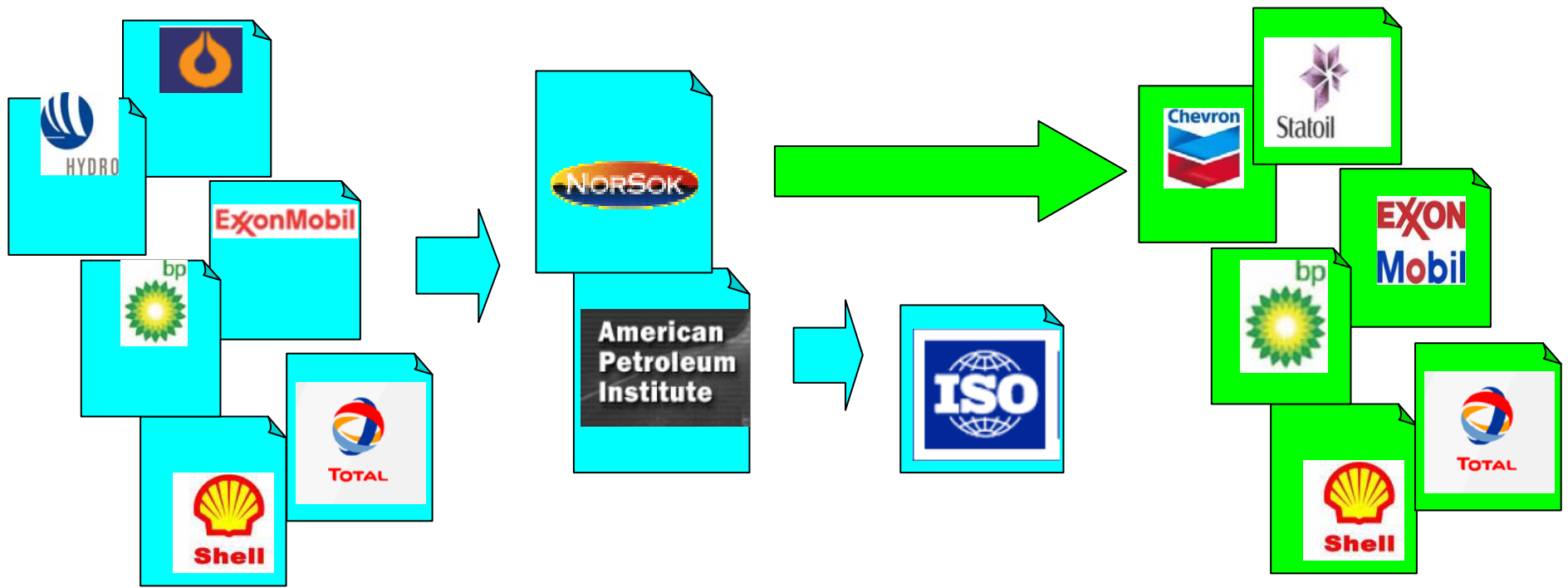


# Product Standardization

## Number of documents for review - Example



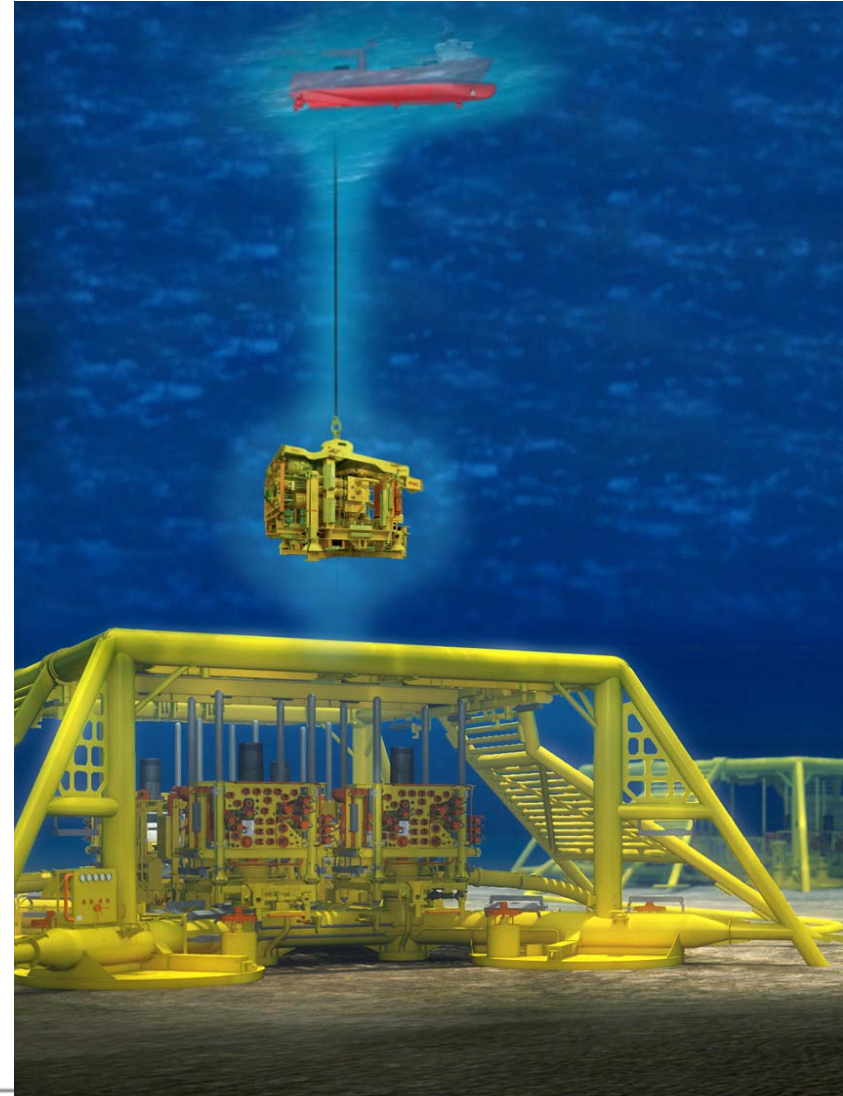
# Product Standardization Main Concern



**Customer Specifications are not converging!**



# Technology Step Changes Tree on Wire Installations



# Technology Step Changes

## Light Well Intervention

### Light Well Intervention Solution:

- Lower cost - riserless
- Faster interventions
- No hydrocarbons to surface

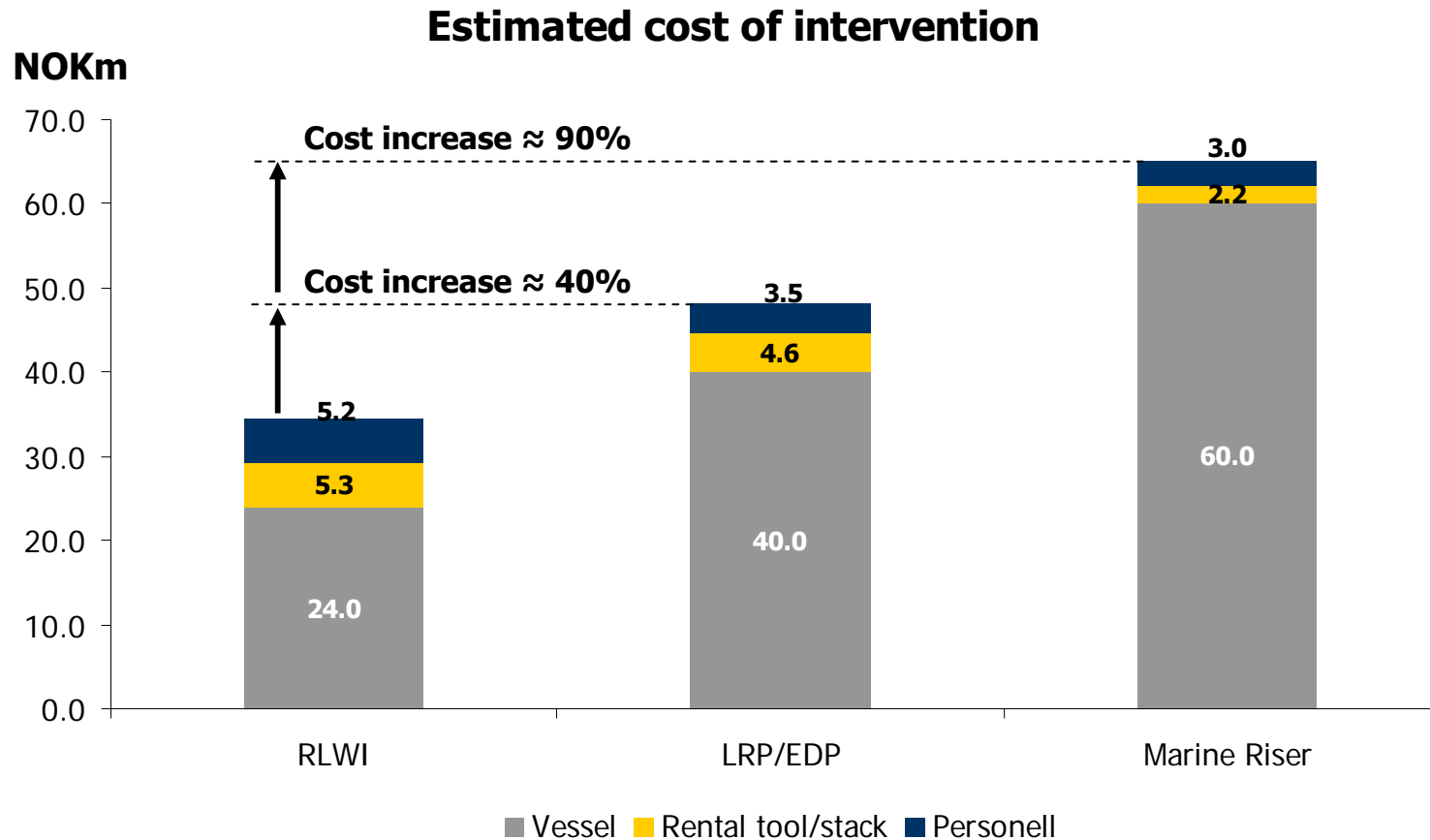
### Contracts Awarded to FMC

<u>Operator</u>	<u>Location</u>	<u>Term</u>	<u>Status</u>
StatoilHydro	North Sea	6 Yrs	In-service
StatoilHydro	North Sea	4 Yrs	2009 Start-up
BP	North Sea	3 Yrs	2009 Start-up



# Technology Step Change

## RLWI – An enabler to lower cost well intervention



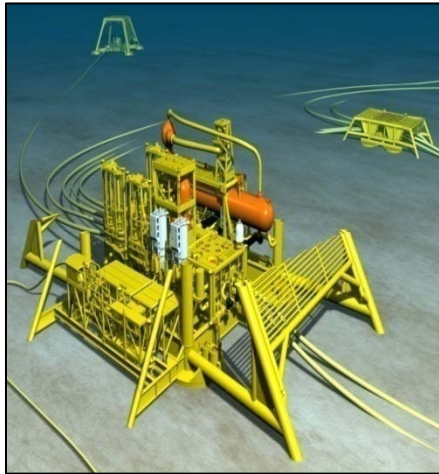


# Technology Step Changes Through Tubing Rotary Drilling

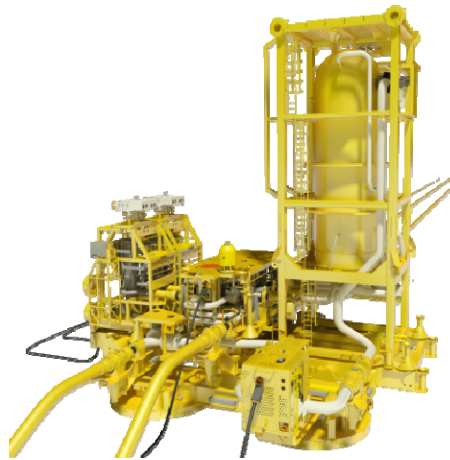


- Facilitates low cost, extended reach drilling from existing wells to tap into adjacent reservoirs
- FMC has one unit operating successfully for Statoil at Asgard field
- Oystein Haland (head of Statoil Subsea):  
***"TTRD enables us to produce oil that we would normally not have recovered"***

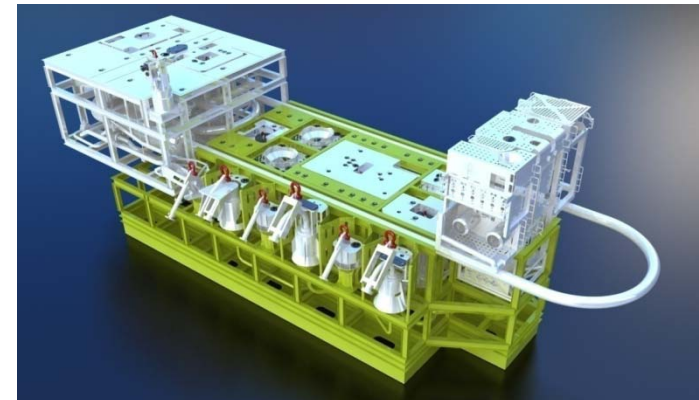
# Technology Step Changes Subsea Processing



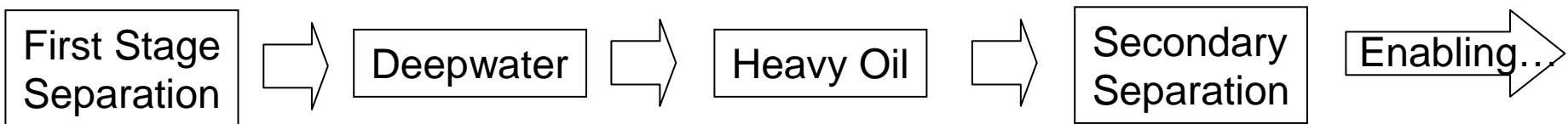
**Statoil Tordis**



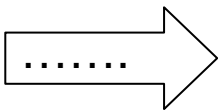
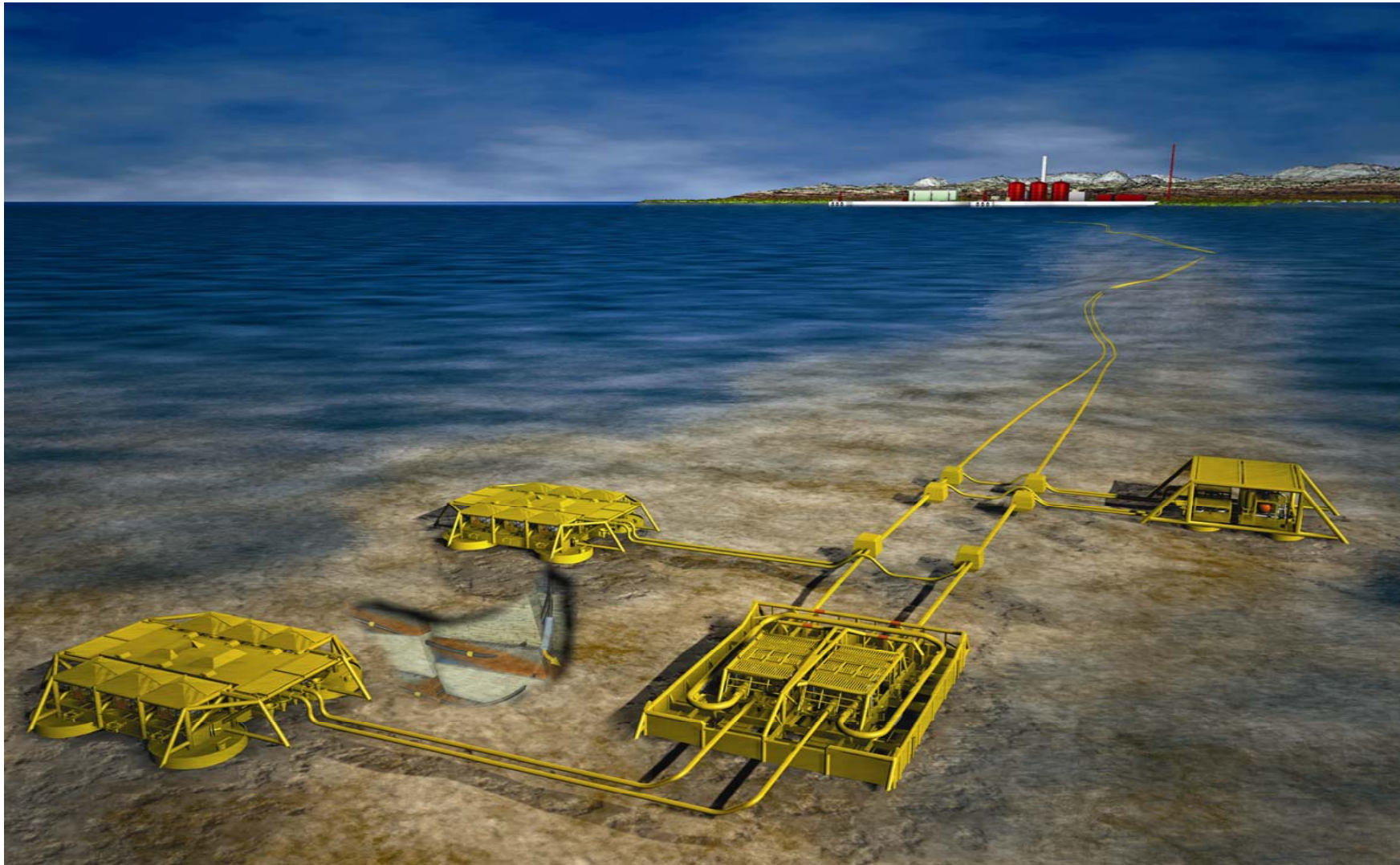
**Total Pazflor**



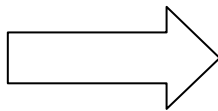
**Petrobras Marlim**







Subsea to Beach



Subsea to Market

## Closing Remarks

# Lowering cost for Subsea Systems is possible!

- Standardisation
  - SUBSEA ON DEMAND
    - Accept for vendor based standards
  - Stocking programs tuned to portfolios
  - Lighter execution models
- Step change in Quality
  - Supply chain management
    - Accept for standard supply chains
- More efficient decision making
  - Portfolio thinking
  - Predicability
- Optimal process for technology development
  - Access to pilots

