

# Dan Swift

- An example of Danish excellence & innovation

**Torben Janholt**

President & CEO, J. Lauritzen A/S



**IAME 2009 International Conference:  
Understanding Shipping Markets**

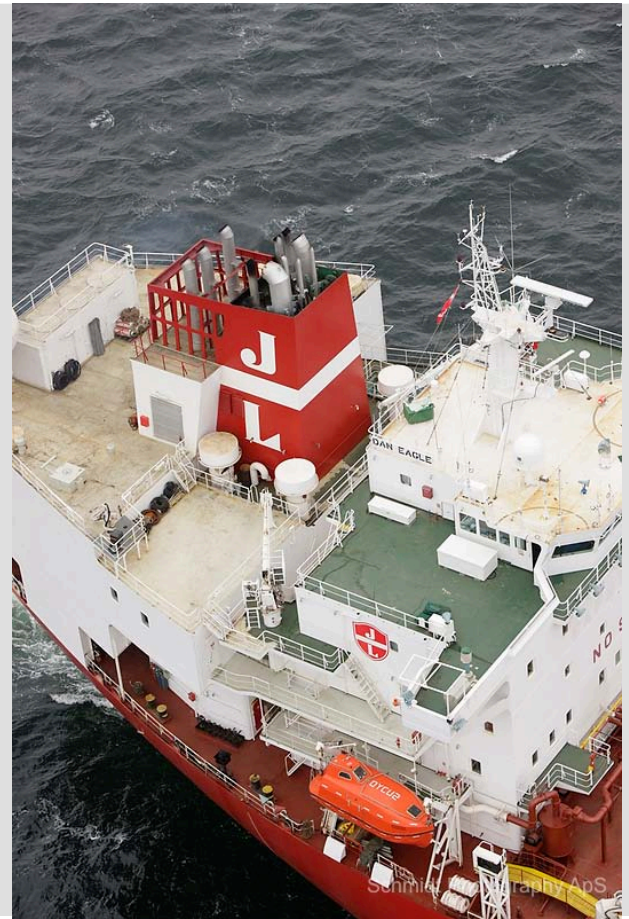
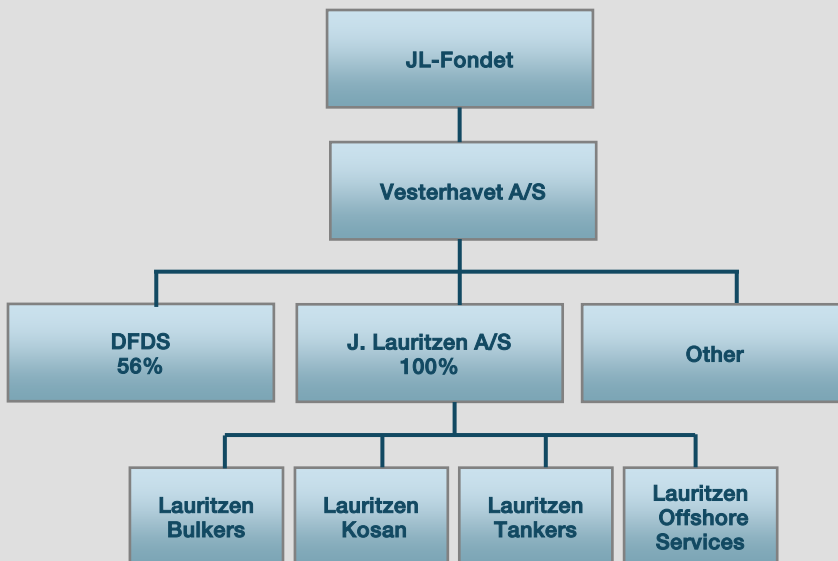
**June 24, 2009**



**J. Lauritzen A/S**  
Shipowners

## J. Lauritzen - Oceans of Know-how

- J. Lauritzen A/S (JL) is one of Denmark's leading ship-owning companies.
- Founded in 1884, tradition and ambition continue to create value for our business partners world-wide with our constant emphasis on customer service, safety at sea and environmental protection.



## Entry into Dynamically Positioned Offshore Support Vessels

- Established as a business unit in 2008.

- Technologically advanced support vessels for the rapidly rising markets in the off-shore oil exploration and production sectors
- Dan Eagle – recently converted to shuttle tanker
- Two purpose build shuttle tanker new-buildings under construction at Nantong, China, will enter long-term employment for Transpetro (Petrobras), Brazil
- Dan Swift – currently under conversion to Accommodation and Support Vessel (ASV)

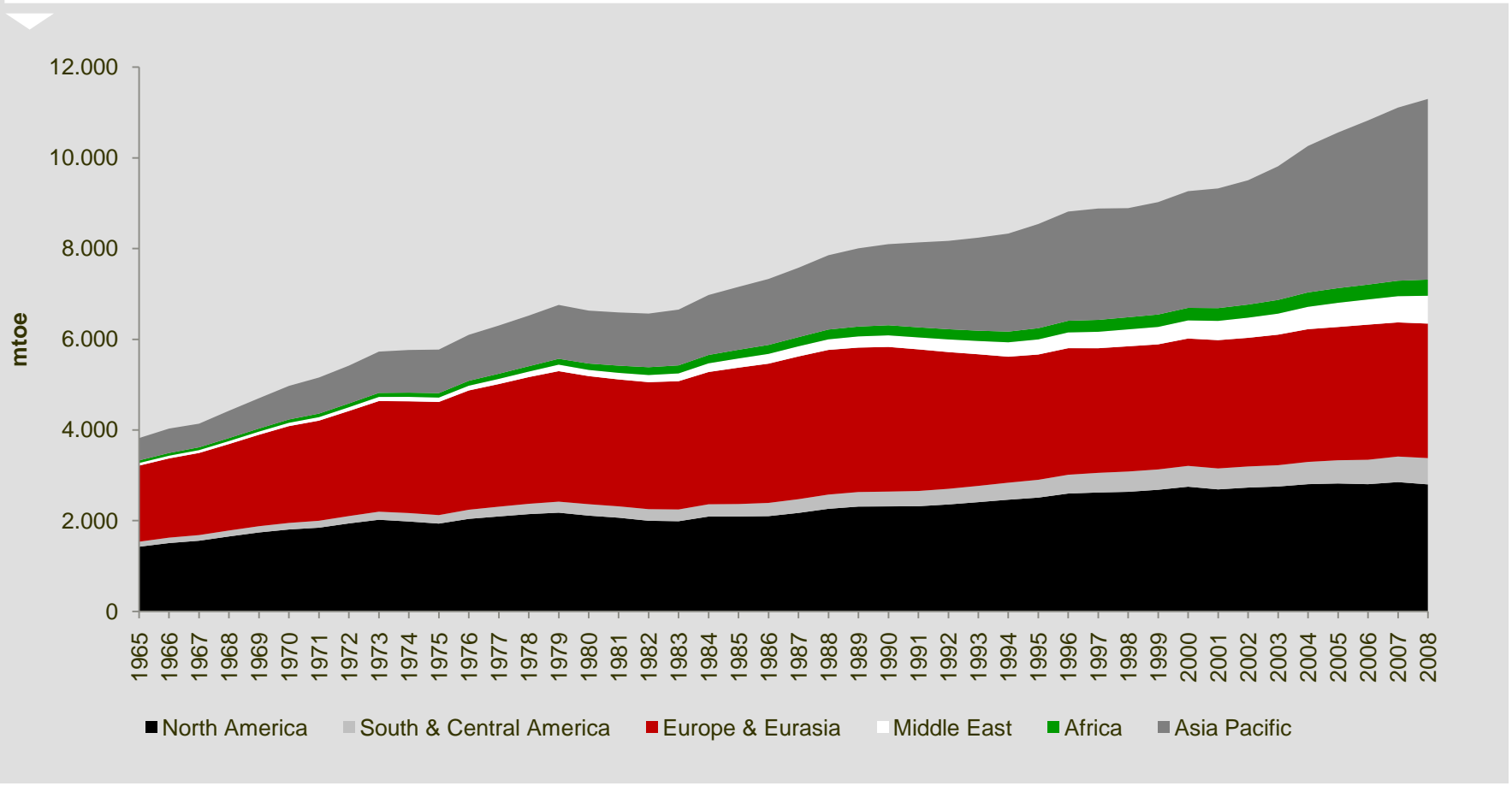


### Main commodities & services

- Crude oil (shuttle tankers)
- Accommodation, service & maintenance (ASV)

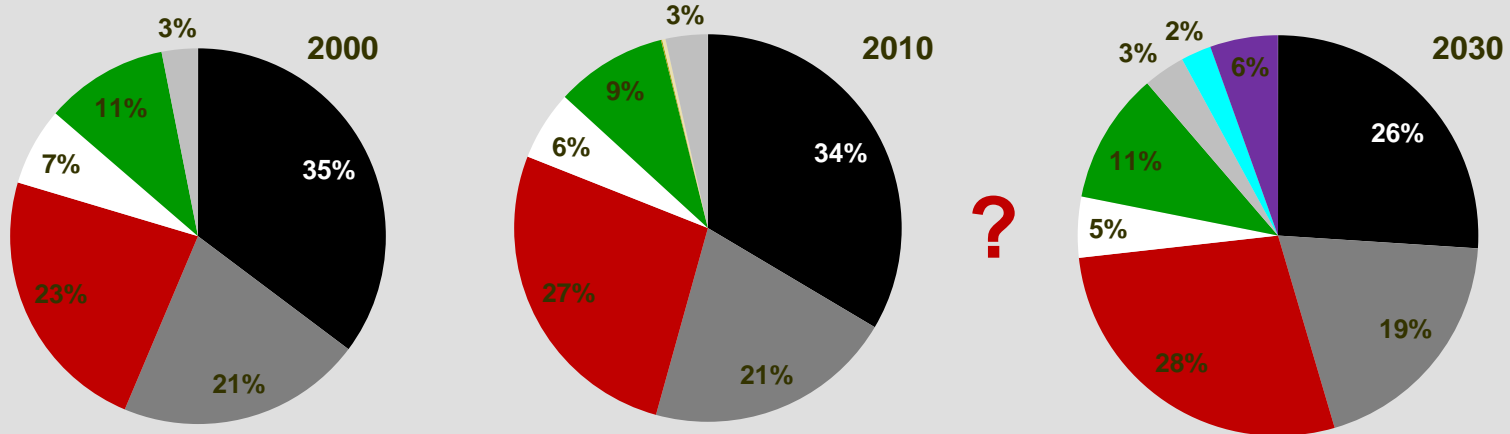
## Global Energy Consumption

- Total world energy consumption has increased by 44% over the last 20 years and by 27% the last 10. Asia/Pacific alone has increased energy consumption by 66% in the previous ten year period.



## Global Energy Consumption by Fuel Type

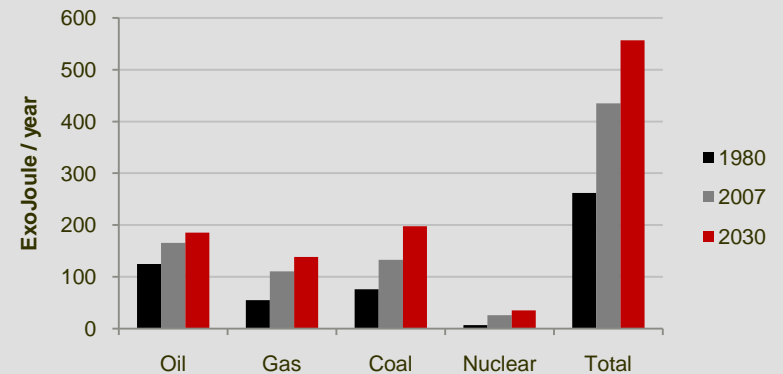
- Even though consumption of alternative fuel sources will likely grow, oil will likely remain a massive contributor to the energy mix – both in relative and in absolute terms.



- Oil
- Gas
- Coal
- Nuclear
- Biomass
- Solar
- Wind
- Other renewables

Note: projections are expressed as an average of Shell's 2008 *Scramble* and *Blueprints* scenarios. While this is in no way an indication of actual "projections", we want to make the point that oil as an energy source likely will remain a substantial part of the energy mix under different possible scenarios for future energy consumption.

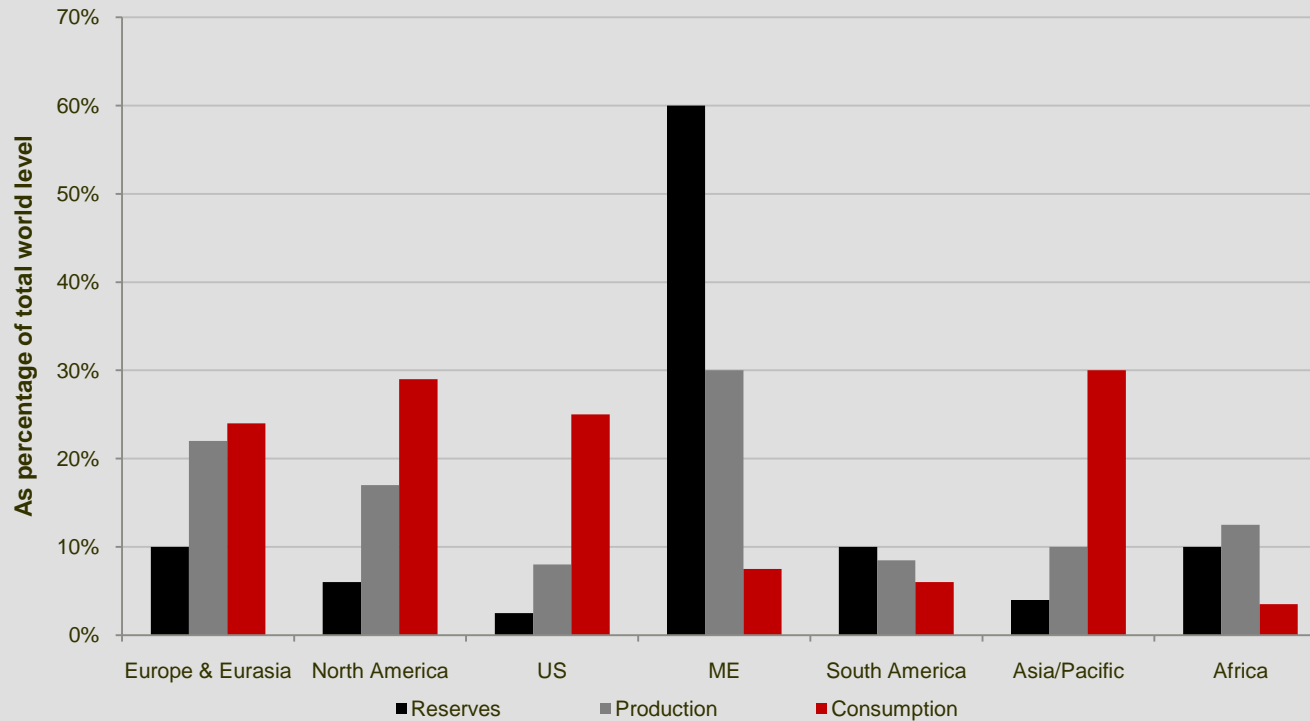
World energy consumption by type



## The "Geographical Challenge" of Oil Supply

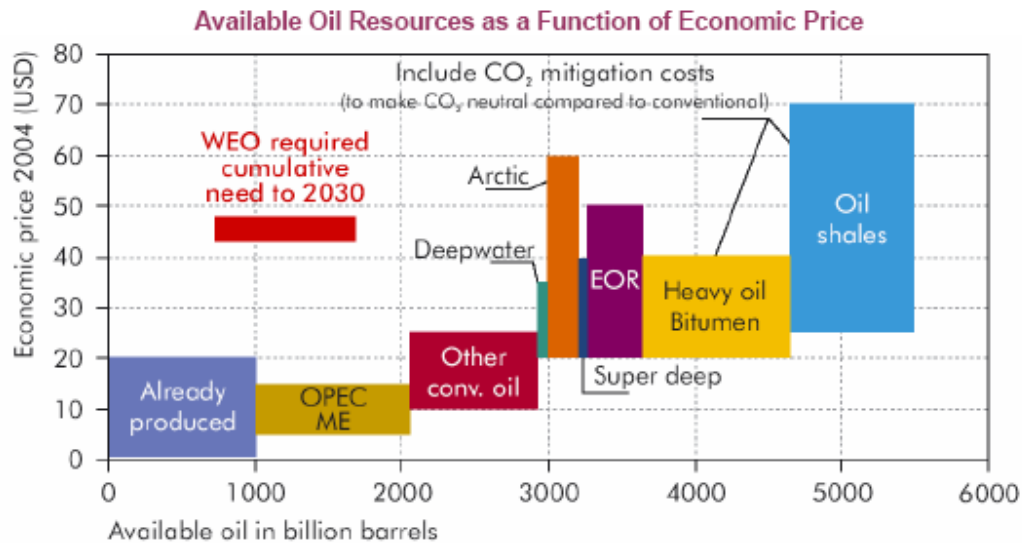
- Deepwater offshore oil exploration and production will become more important as other conventional oil reserves are in decline, with majority of production capacity located in problematic regions.

**Oil reserves, production and consumption**



## Deepwater Oil E&P will Become Increasingly Important

- We expect the offshore market to develop attractively over the coming years, and global investments into the sector will be substantial.

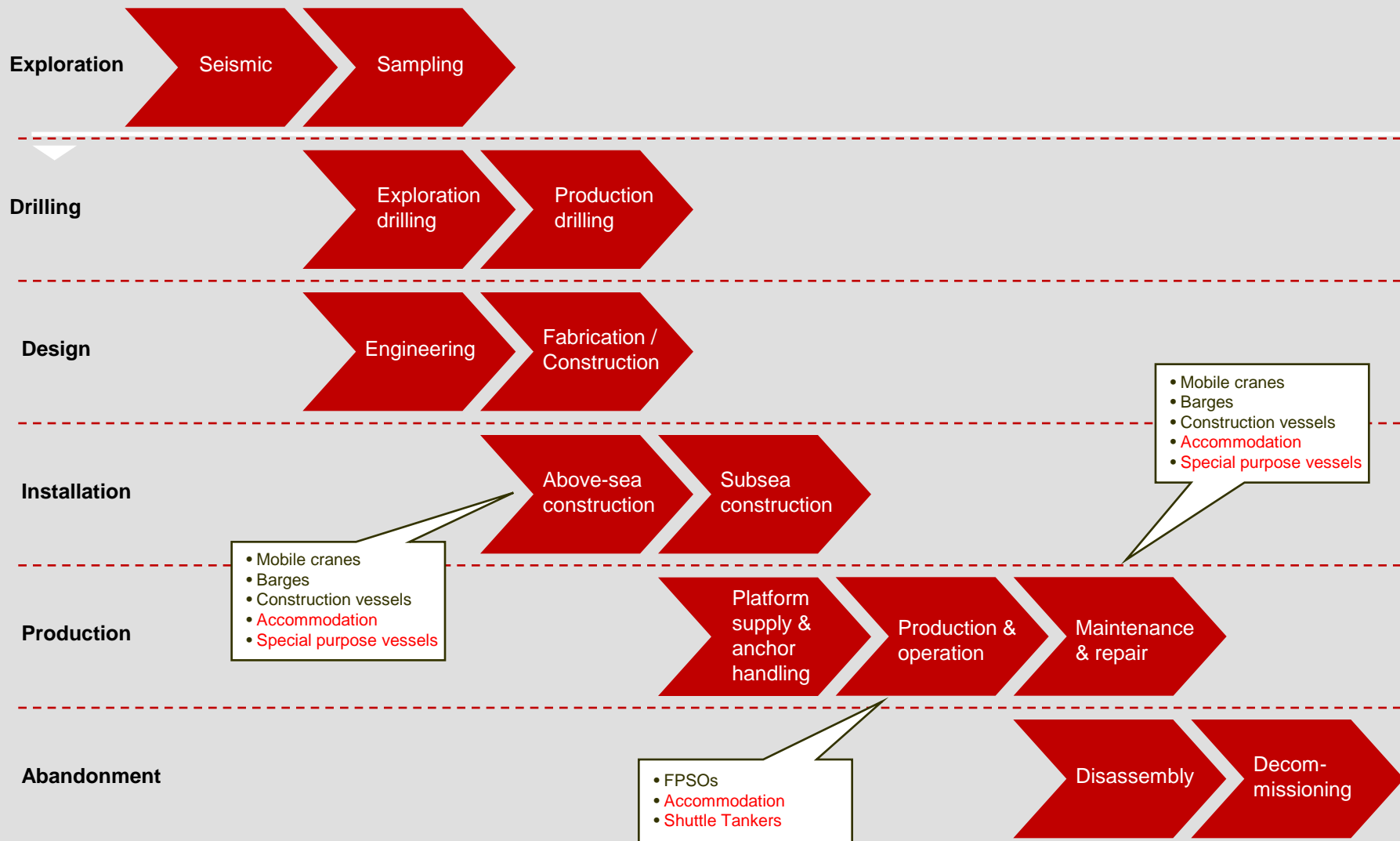


- Even though the current financial crisis has cut into global oil demand, it is widely acknowledged that when the economy recovers, oil supply will again become increasingly tight.
- There continues to be increasing scarcity of new exploration opportunities onshore and/or in shallow waters to meet global oil demand, thus deepwater oil exploration and production is increasingly targeted to expand reserves.

## Global Offshore Centers

- US Gulf of Mexico, Brazil, and West Africa are likely to be significant growth areas now and in the future.





## Demand Drivers for Accommodation & Support Vessels

- The FPSO sector is growing rapidly with large FPSO concentrations in Brazil, West Africa and Australia.
- The number of floating production systems in service is projected to grow by 100+ units by 2012.
- FPSO commissioning and maintenance optimized by using ASVs on location.
- Many existing platforms are getting old and require R&M. Increasing decommissioning operations also expected.
- Occasional emergency demand, e.g. arising from hurricane damage.
- Alternative solutions to ASVs (such as barges, etc.) only work in very benign weather conditions.
- Harsh weather alternatives (large crane vessels e.g.) are very expensive.



## Typical Client Criteria

---

- Station-keeping
- Gangway uptime
- Health, Environment & Safety
- Crane capability, versatile work areas
- General operational flexibility

## Monohull Accommodation & Support Vessels (ASV): Pushing the Boundaries for Offshore Accommodation

- Healthy demand for offshore accommodation
- No clear-cut industry standards
- Opportunity to pioneer ideas based on customer interviews

### Monohull solutions vs. “traditional” semisubs:

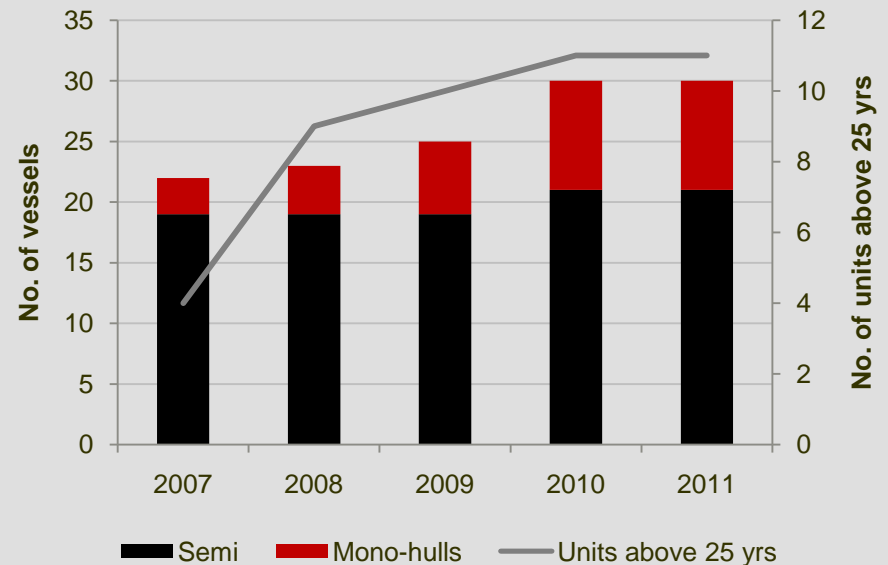
- Ability to move under own propulsion
  - Increased flexible as vessel can move between several client units in the same offshore oil field freely
  - Ability to disconnect and move away in response to hurricane danger
  - Cheaper mobilization/demobilization)
- Generally lower capital cost
- Conversion candidates offers room for contractors’ unique layout and design solutions



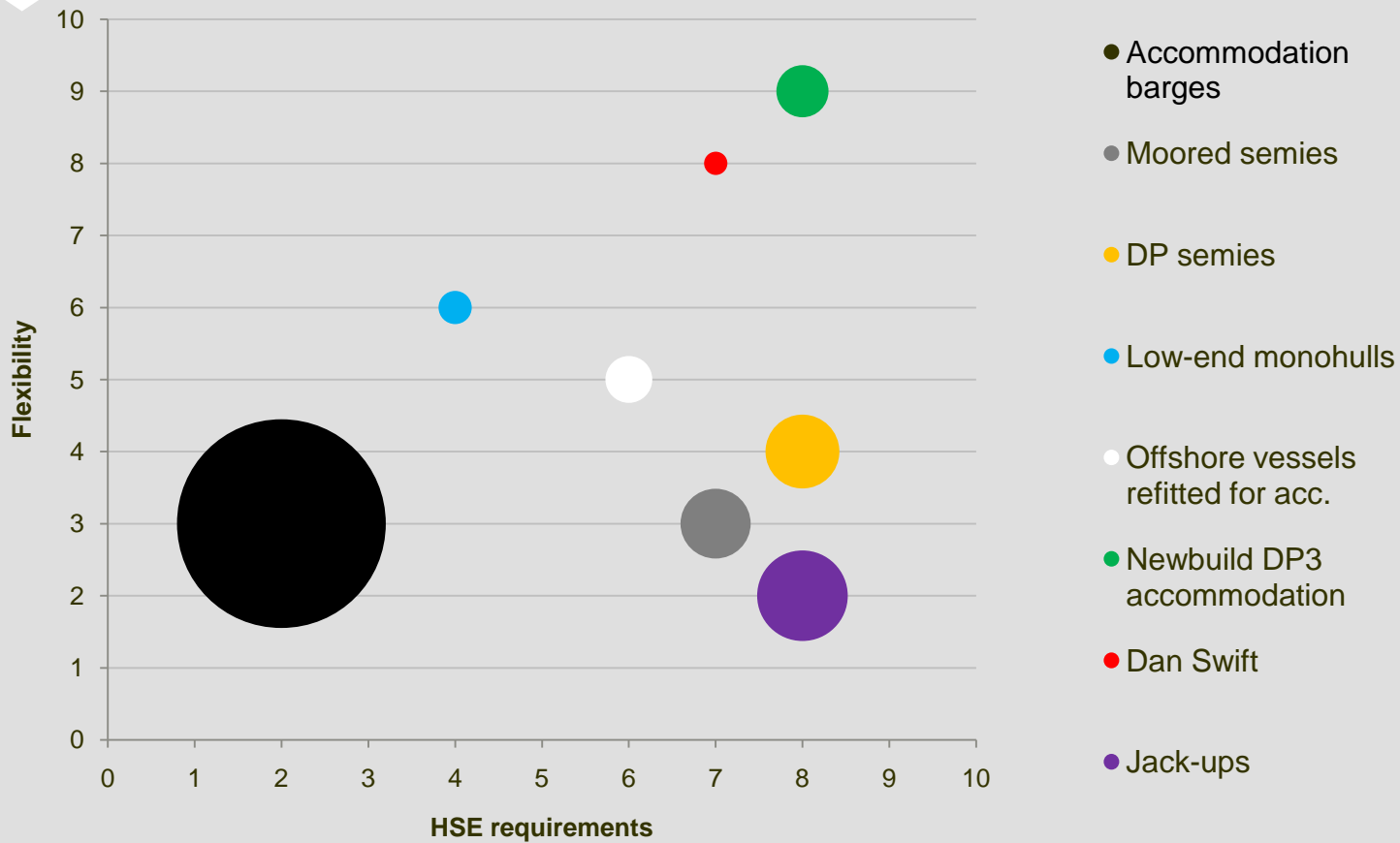
## ASV Competitors (High-end)

- The current active ASV fleet consists of 23 vessels, both including semi-sub and mono-hulls.
- The mono-hull fleet is limited to a current fleet of four vessels with Dan Swift, and another two vessels possibly, being delivered in 2009.
- 1-3 additional mono-hull projects may come out during 2010+, but these are currently uncertain.
- It is not considered possible for other additional ASVs to enter the fleet within the specified timeframe.

**Global offshore DP accommodation fleet & age**



## Dan Swift: Competitors



## Project History

- Former RoRo ferry Kraka
- Planned for conversion into cable-layer
- Purchased by Lauritzen Tankers in 2005
- Towed to Blohm & Voss in August 2007
- Currently undergoing conversion at B&V
- Renamed Dan Swift



## Outline Specification of Dan Swift

Total Number of Berths	291 pax
Berths Available to Charterers	256 pax
Station Keeping	DP2
Gangways	2 x telescopic gangways
Main Crane	100T AHC knuckleboom crane
Deck Area	About 600 sq.m
Workshops	About 350 sq.m

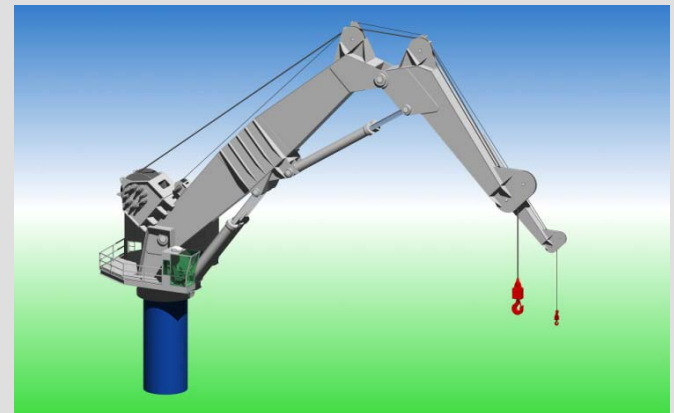
## Operational Roles for Dan Swift

### Offshore accommodation and support for:

- Platform maintenance, repair and upgrade
- Field hook-up, commissioning and start-up
- Decommissioning

### Can also perform:

- Light construction works and subsea operations
- Crane operations
- Fast mobilisation and evacuation for emergency or hurricane contingencies

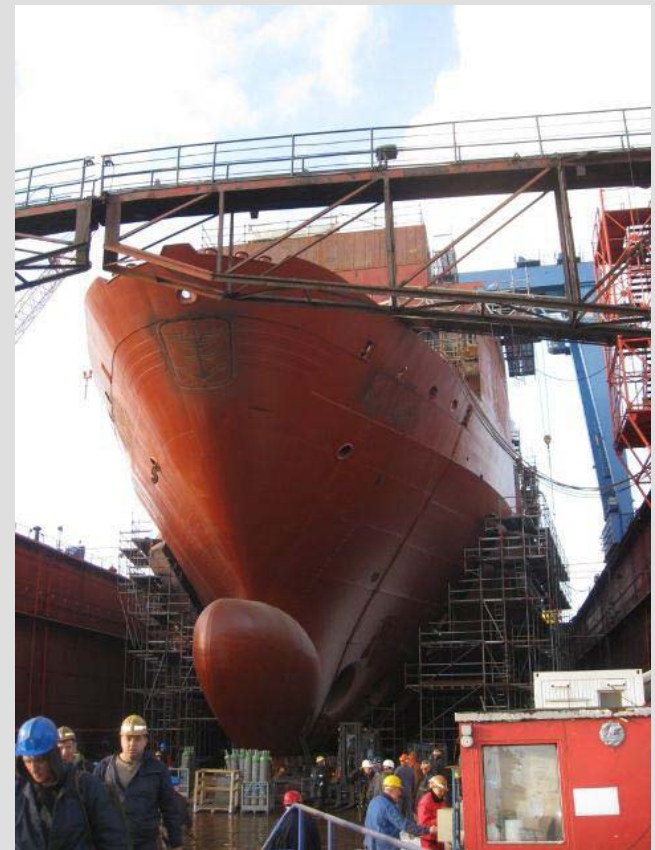


## Conversion Process and Shipyard/Owner Interphases

- Shipyard contract with Blohm & Voss for completion in 3rd quarter 2009
- Shipyard undertook detailed engineering during the conversion project

### Owner's Furnished Equipment:

- Azimuth thrusters
- DP system
- Tank stabilizing system (anti-heeling)
- 100 ton active heave compensated knuckleboom crane
- Offshore telescopic gangways



## Key Features: Gangways

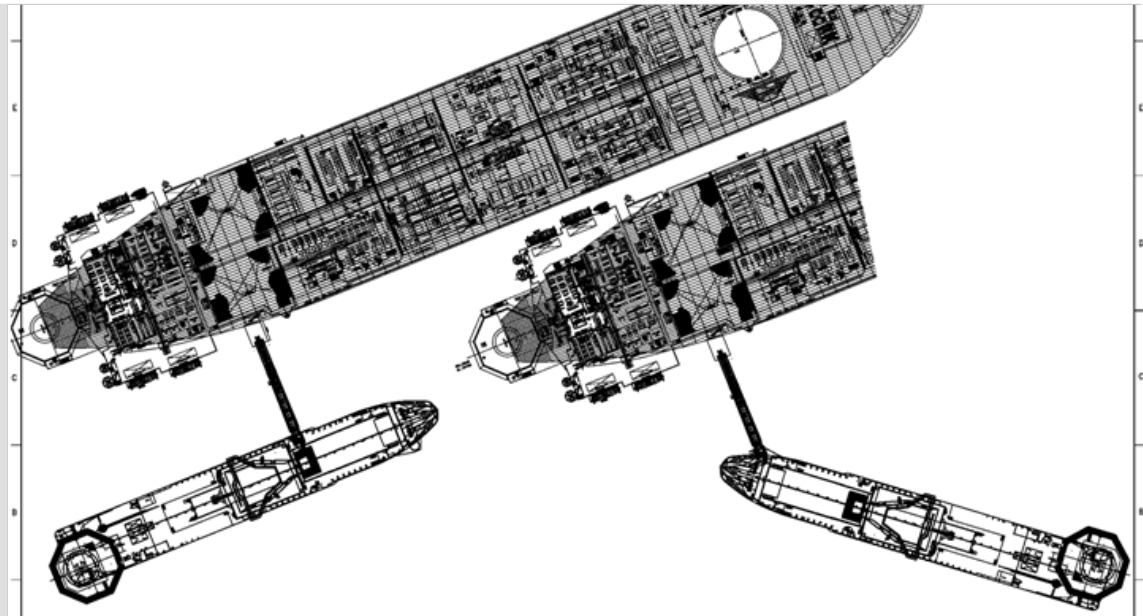
- Offshore Telescopic gangway
- Selected supplier: Marine Aluminium
- 2 gangways – flexible connections
- 38,5 meters + 8 meters stroke – the longest gangway ever produced by Marine Aluminium.
- Quick connection and fast abortion



## Key Features: Two Gangways

The two-gangway solution provides complete flexibility and redundancy:

- Gangways positioned on the bow and in the mid-ship area portside.
- Optional vessel positioning to suit all weather conditions
- Ability to facilitate rapid evacuation in emergency situation
- Gangways can be connected to platform and crew boat simultaneously.
- Redundancy – spare gangway should one be damaged or under maintenance



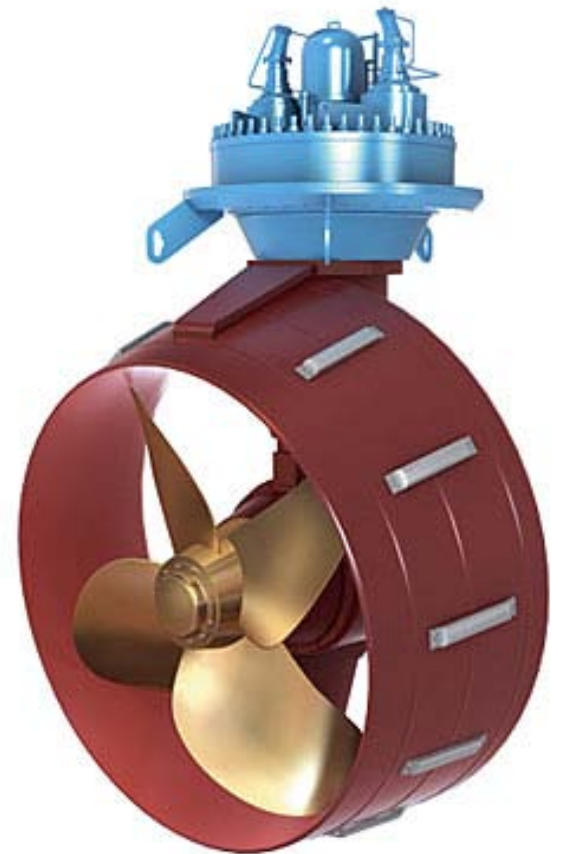
## Key Features: Power and Thrusters

### Power:

- Total installed power: 15,000 kW on 5 generators

### Thrusters:

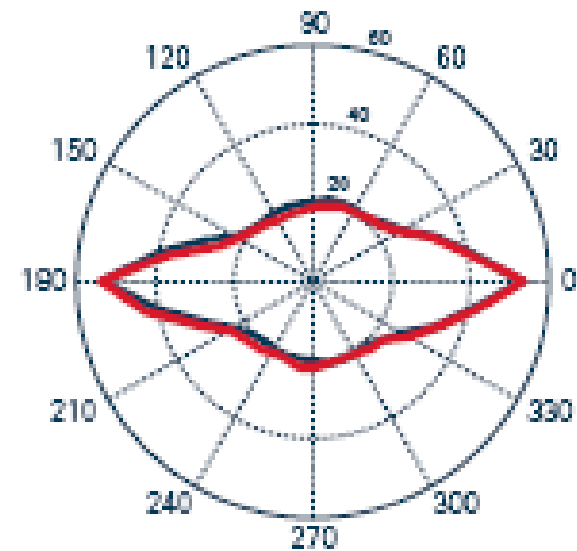
- 5 Azimuth thrusters (between 1,200 and 2,000 kW)
- 3 Tunnel thrusters (1,200 kW)



## Key Features: DP System

- DP2 Class
- All DP equipment is new (Kongsberg)
- 2 totally independent engine rooms
- ERN: (99,99,87)

DP capability with 5  
azimuth thrusters and  
3 bow thrusters



— Current head on  
— Current 30 deg from bow  
(Current 1,1 m/s)

## Model Testing at Marin Institute

- Extensive model tests were carried out at the Marin Institute, Holland in January 2007.
- Model scale 1:33, adjacent to turret moored FPSO at 200 meters water depth.
- Tests carried out in medium environments (Scatter diagram Campos Basin, Brazil)
  - Wind 15 m/sec.
  - Wave height, significant  $H_s$  3.5 m.
  - Wave period, peak swell  $T_p$  12.8 sec.
  - Wave period, peak wind  $T_p$  9.0 sec.
  - Current 1.1 m/sec.



## Model Testing & Results

### Gangway uptime

The Marin tank tests show that the gangway uptime is high based on Campos Basin scatter diagram:

- Gangway uptime (when connected) close to **95 percent** of the time
- Ability to connect in more than **82 percent** of the time

### Risk studies

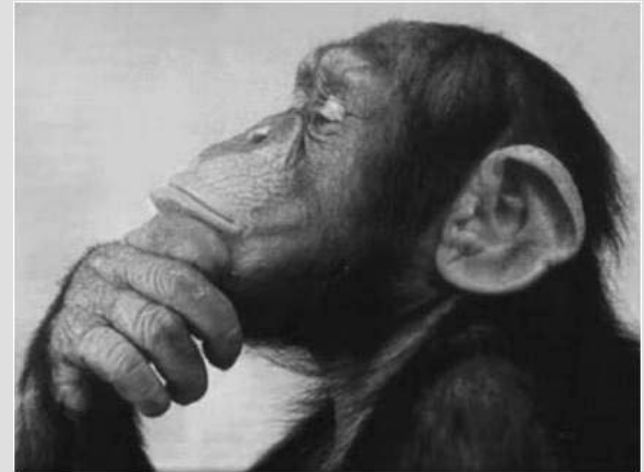
- With strong station keeping, collision risks are reduced
- The gangway solutions and the fast abortion time can enable the vessel to move quickly under emergencies, such as gas leakages or fire
- Operational safeguards & new equipment

### Passenger comfort

- Comprehensive study on passenger comfort performed by Marin Institute
- Probability is 99,6% that the crew will feel no worse than MIR 25 (motion illness rating)
- Rolls Royce 'Intering Tank Stabilization System':
  - Can reduce roll motions by up to 40%.
  - Will further improve gangway uptime.

## Conclusions – ASV Dan Swift

- The concept is fully model tested at Marin Institute to confirm:
  - Strong station-keeping abilities
  - Superior gangway uptime
  - High passenger comfort
- Flexibility: DP solution designed for both fixed structures and floating units such as FPSOs.
- Two gangways to maximise flexibility (fast connection & abortion).
- Versatile work areas (external and internal) & 100T crane capacity with active heave compensation.
- High standard of accommodation and HSE responsiveness in general.



---

Thank you.