



Delivering the Frontier Case of Field Solutions

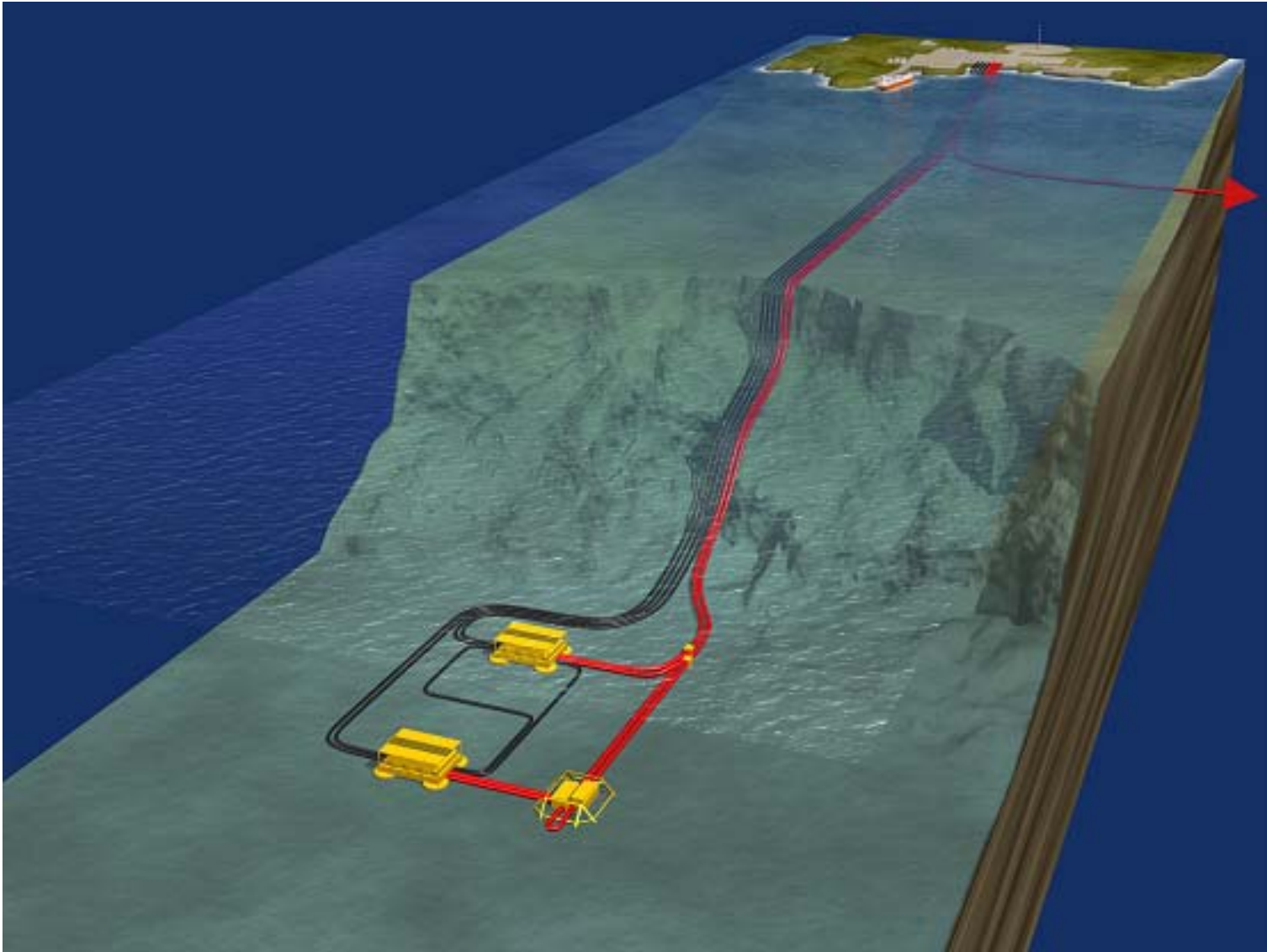
Oil and Gas Innovation in the Fossil Fuel Future
European Seminar and Dialogue

Brussels

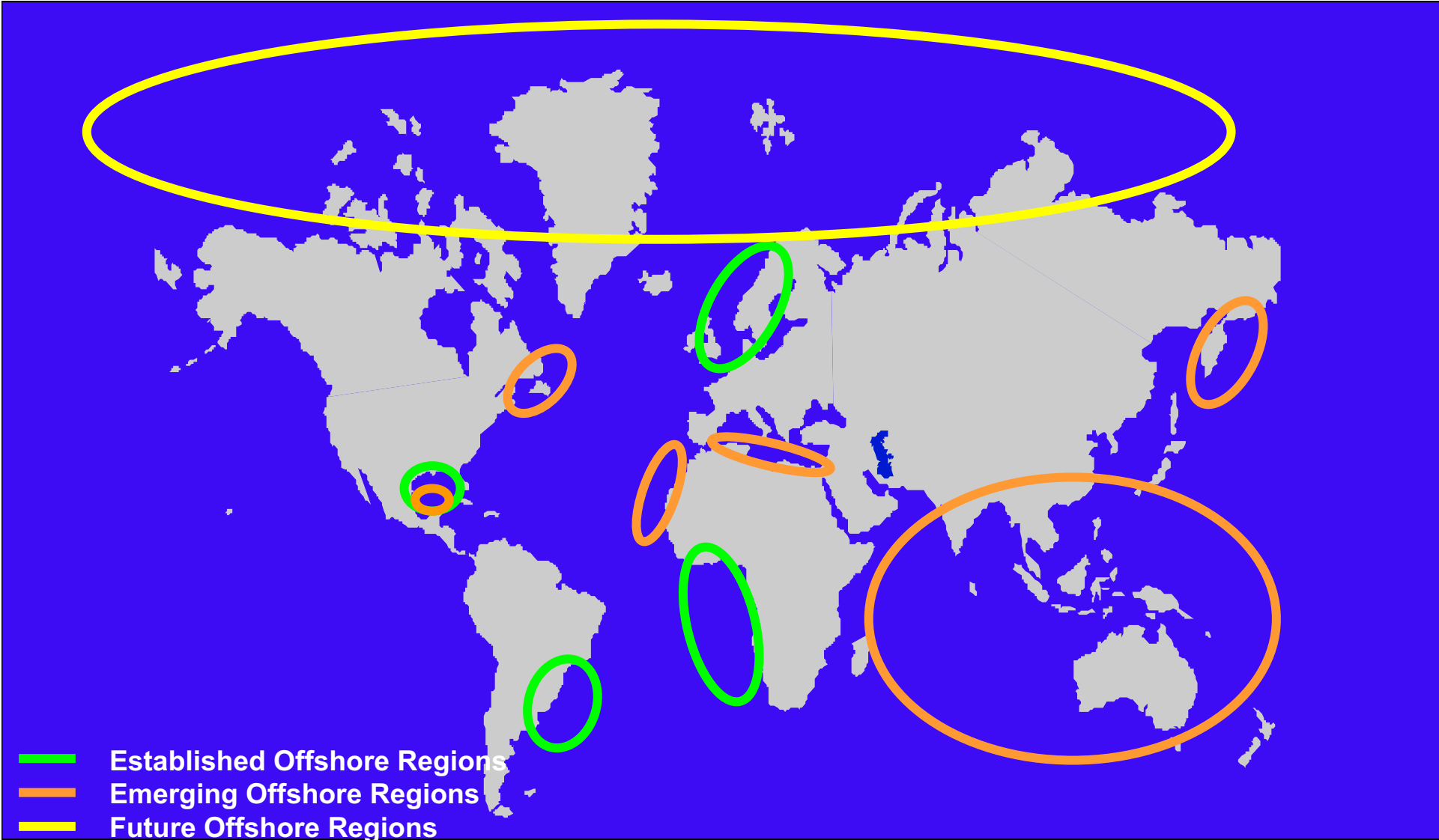
22 February 2006

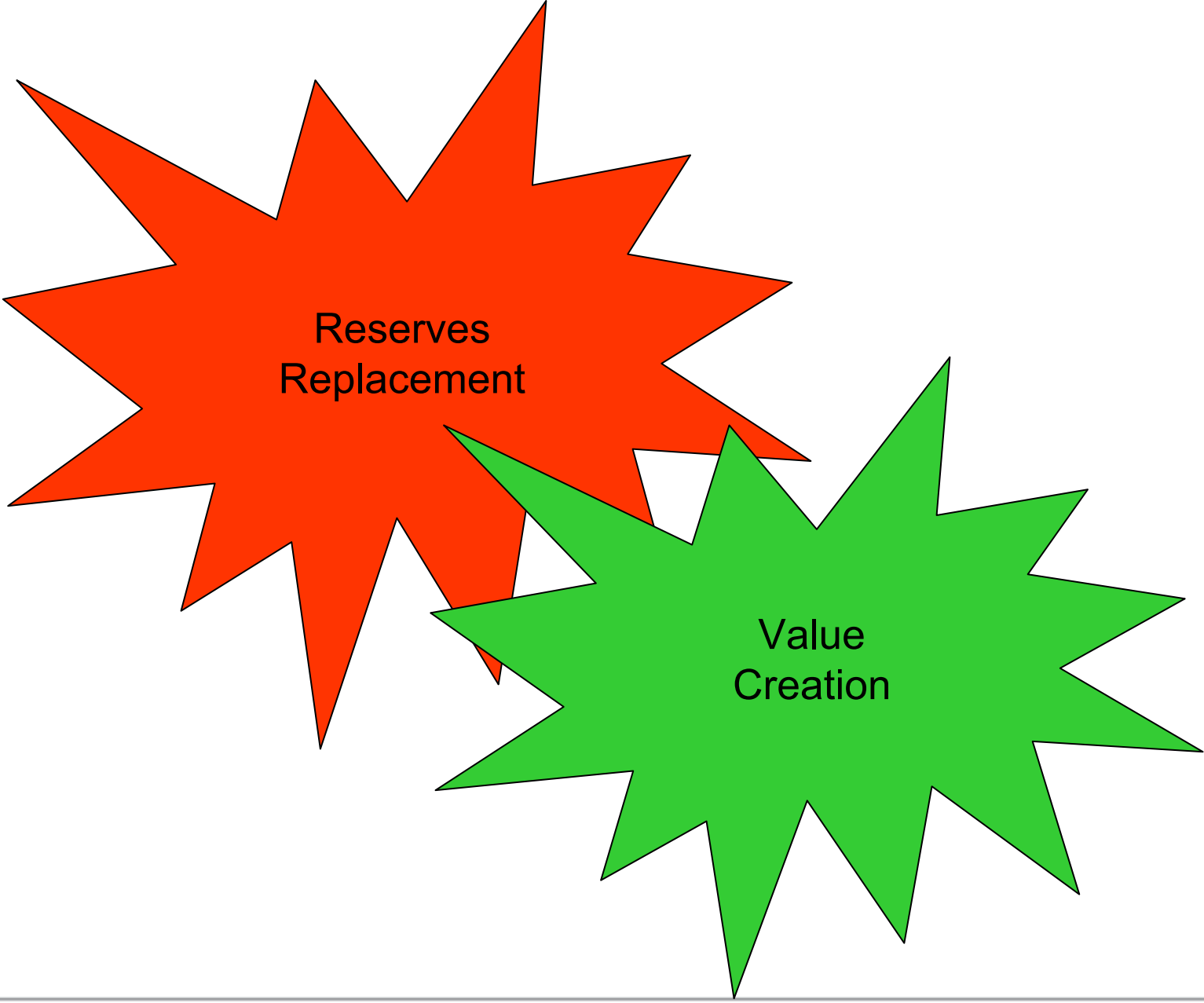
Jan Egil Arneberg





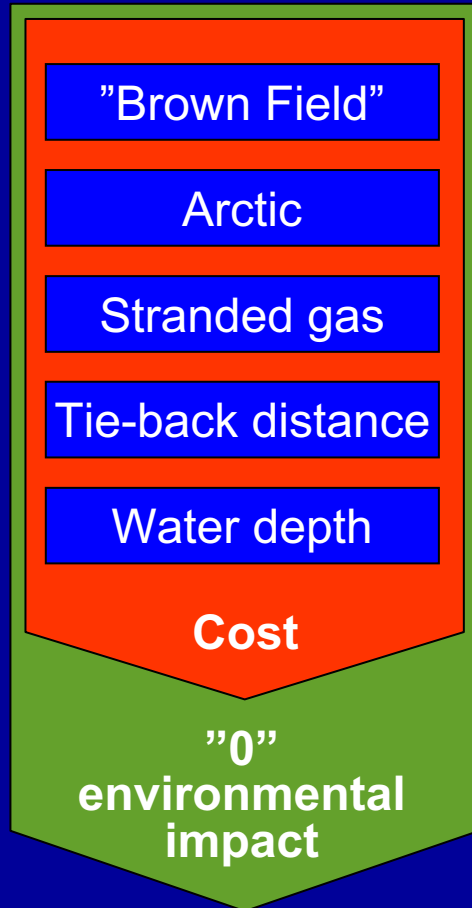
Subsea Arenas



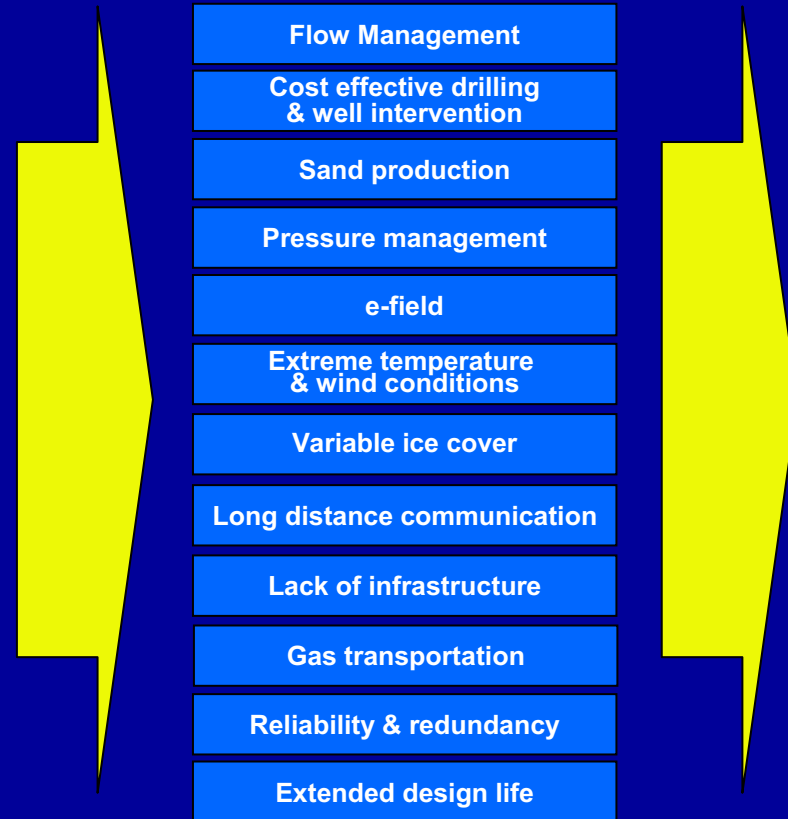


Subsea

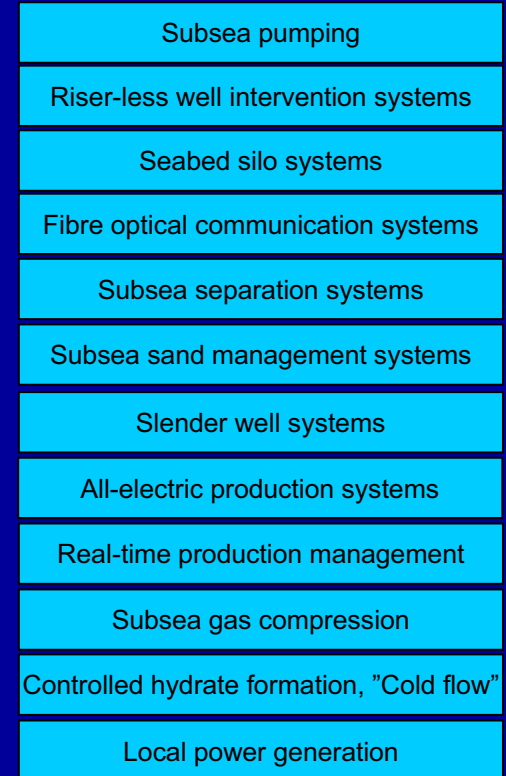
"Frontier" technology drivers



Challenges



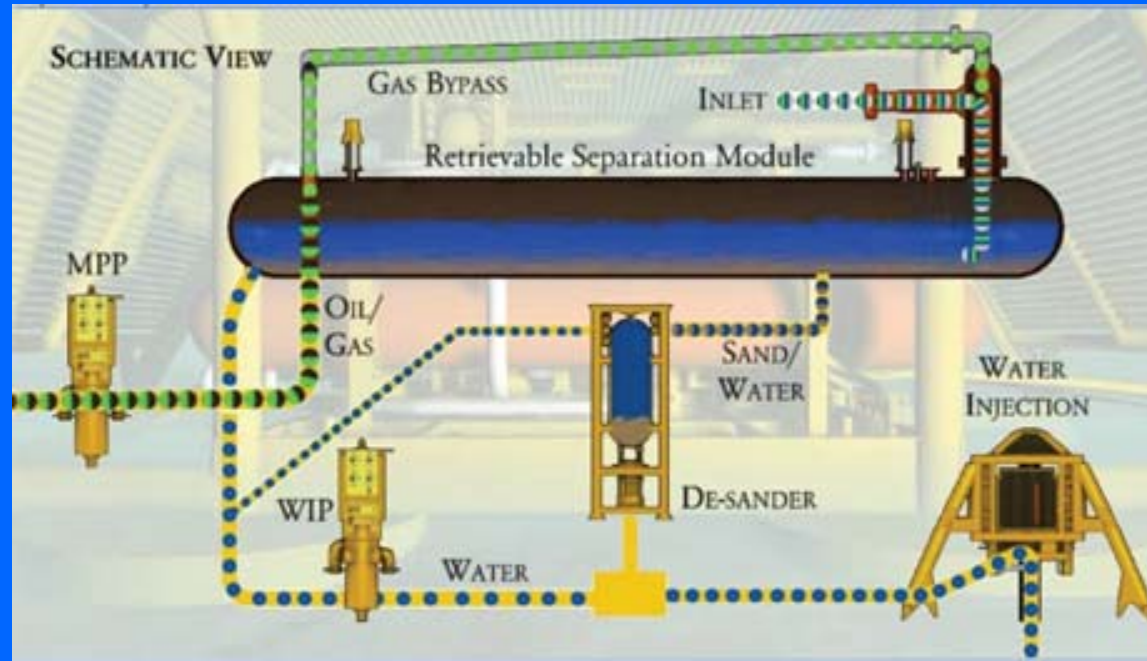
Solutions



Subsea

"5 11"

Subsea separation, boosting and sand management system



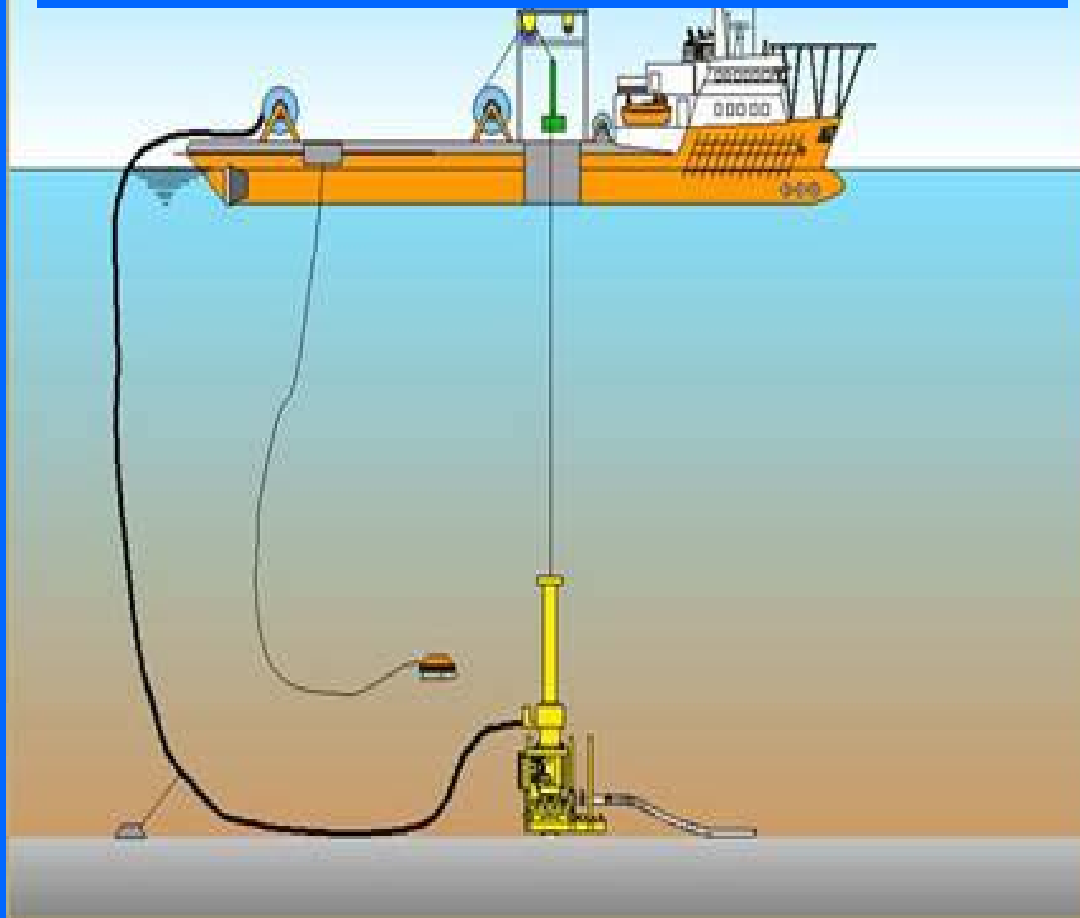
environmental
impact

Solutions

- Subsea pumping
- Riser-less well intervention systems
- Seabed silo systems
- Fibre optical communication systems
- Subsea separation systems
- Subsea sand management systems
- Slender well systems
- All-electric production systems
- Real-time production management
- Subsea gas compression
- Controlled hydrate formation, "Cold flow"
- Local power generation

Subsea

Riserless Light Well Intervention

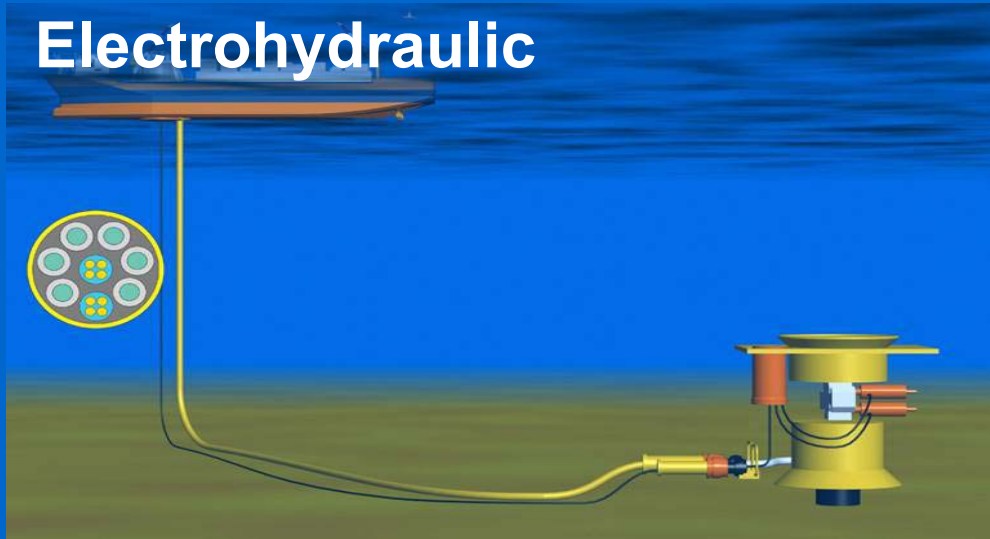


Solutions

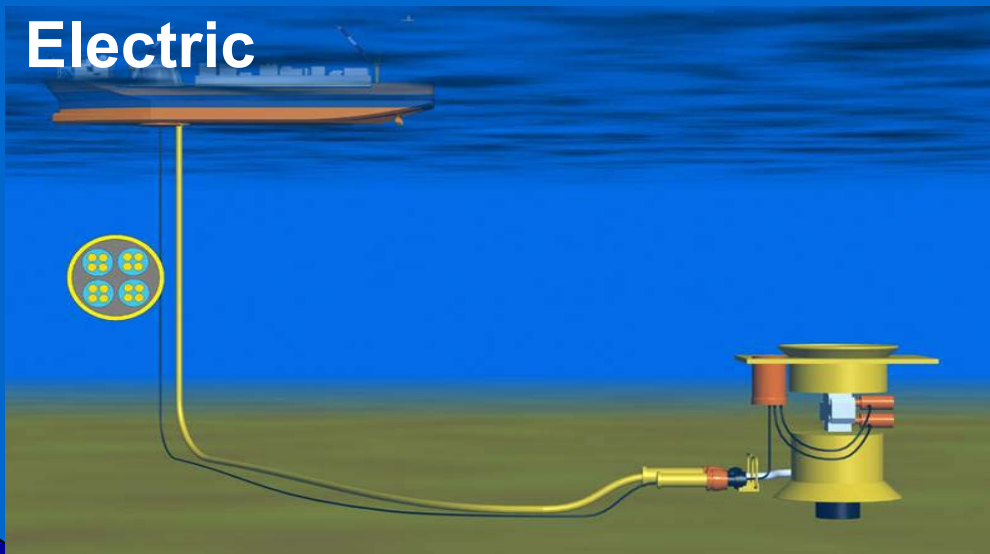
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Subsea

Electrohydraulic



Electric

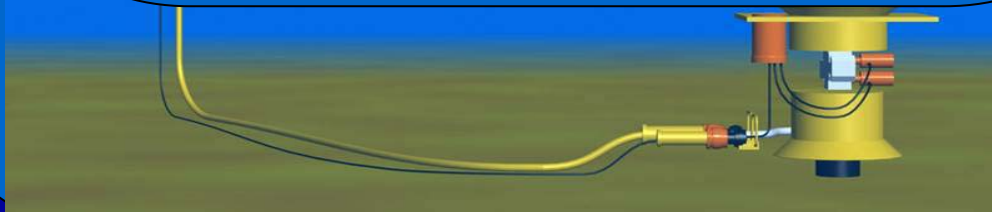
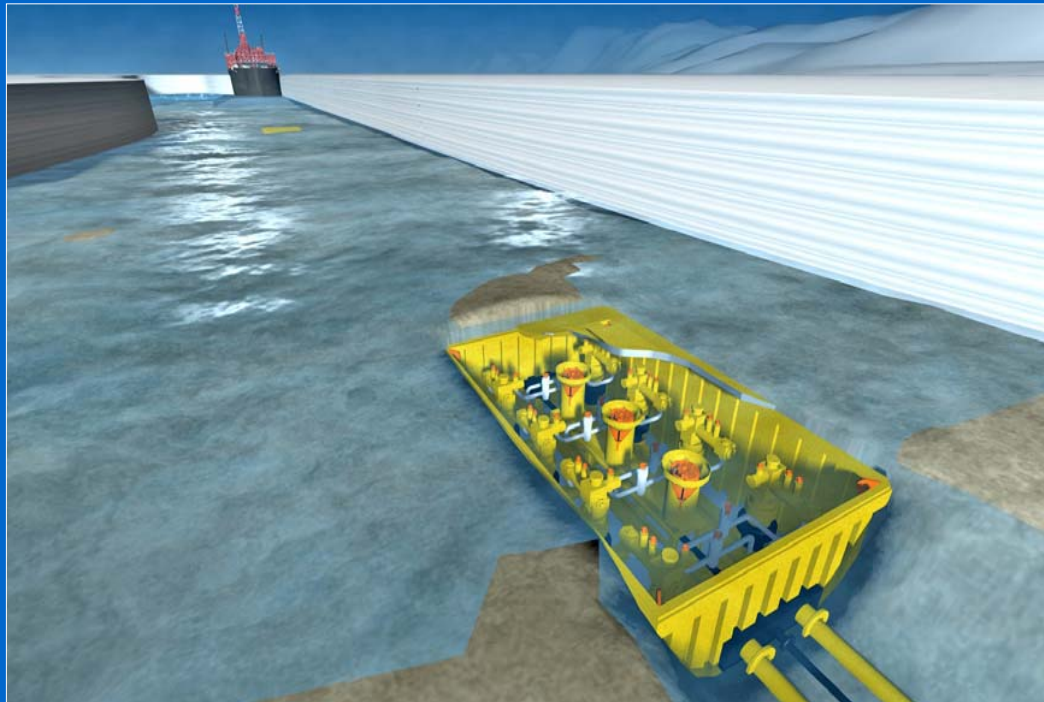


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Subsea

Seabed silo system

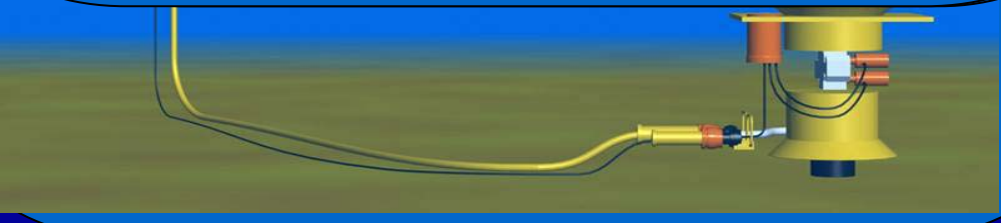
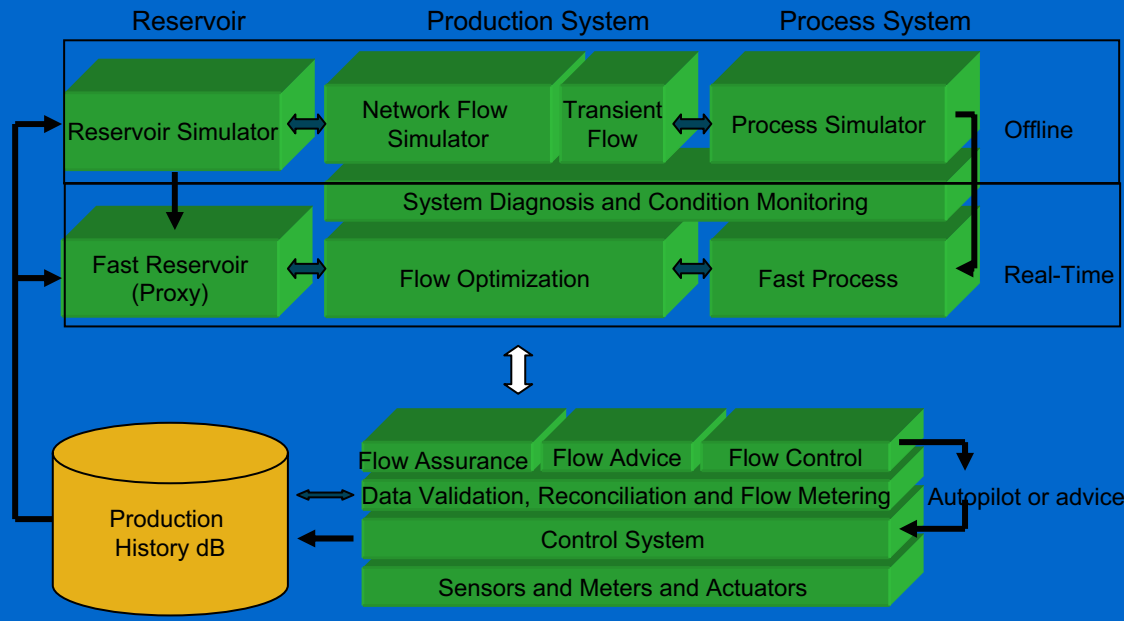


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Subsea

Real-time production management systems

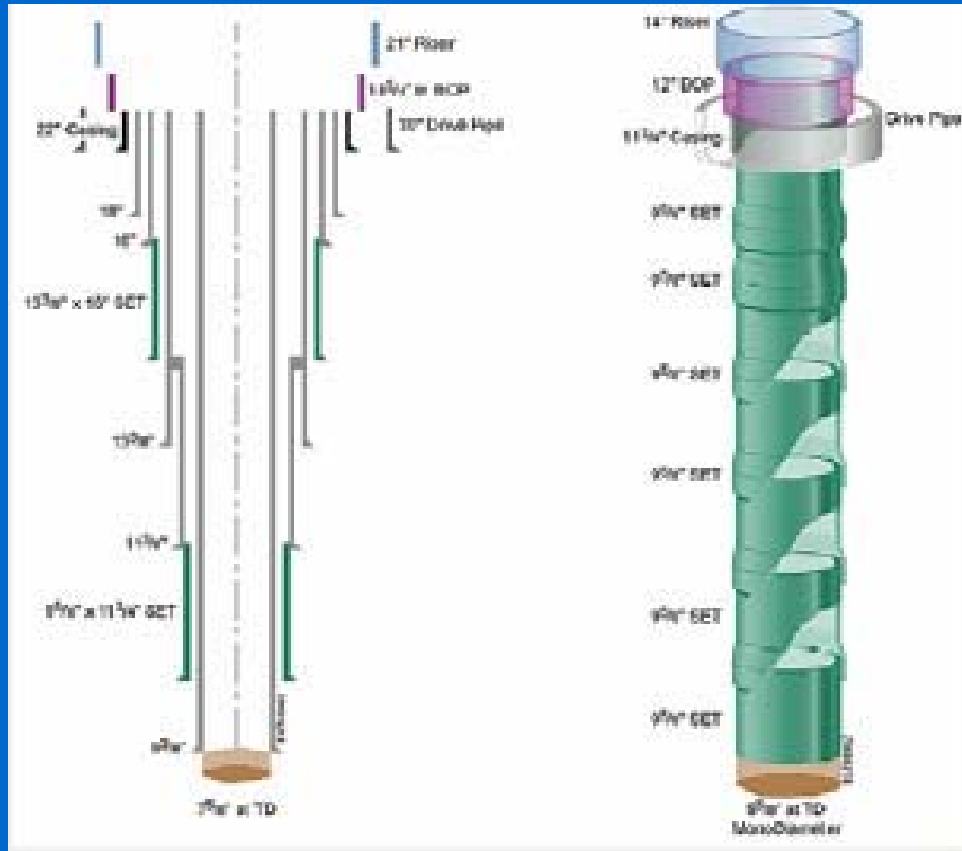


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Subsea

Slender well (monobore) systems

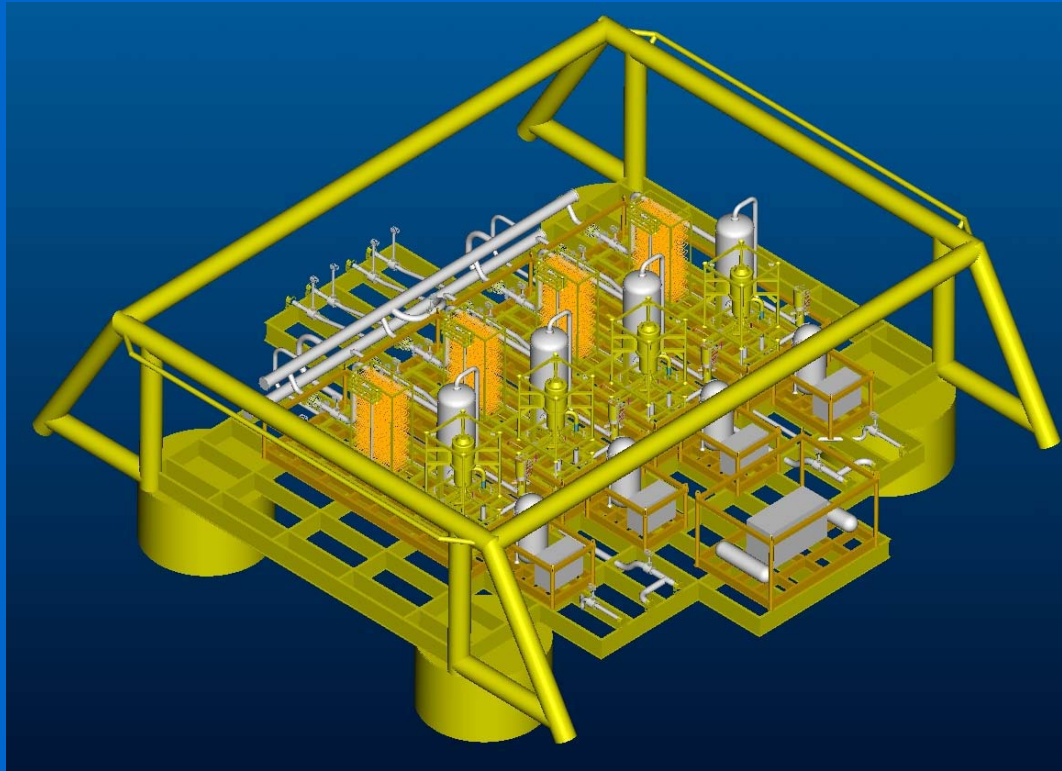


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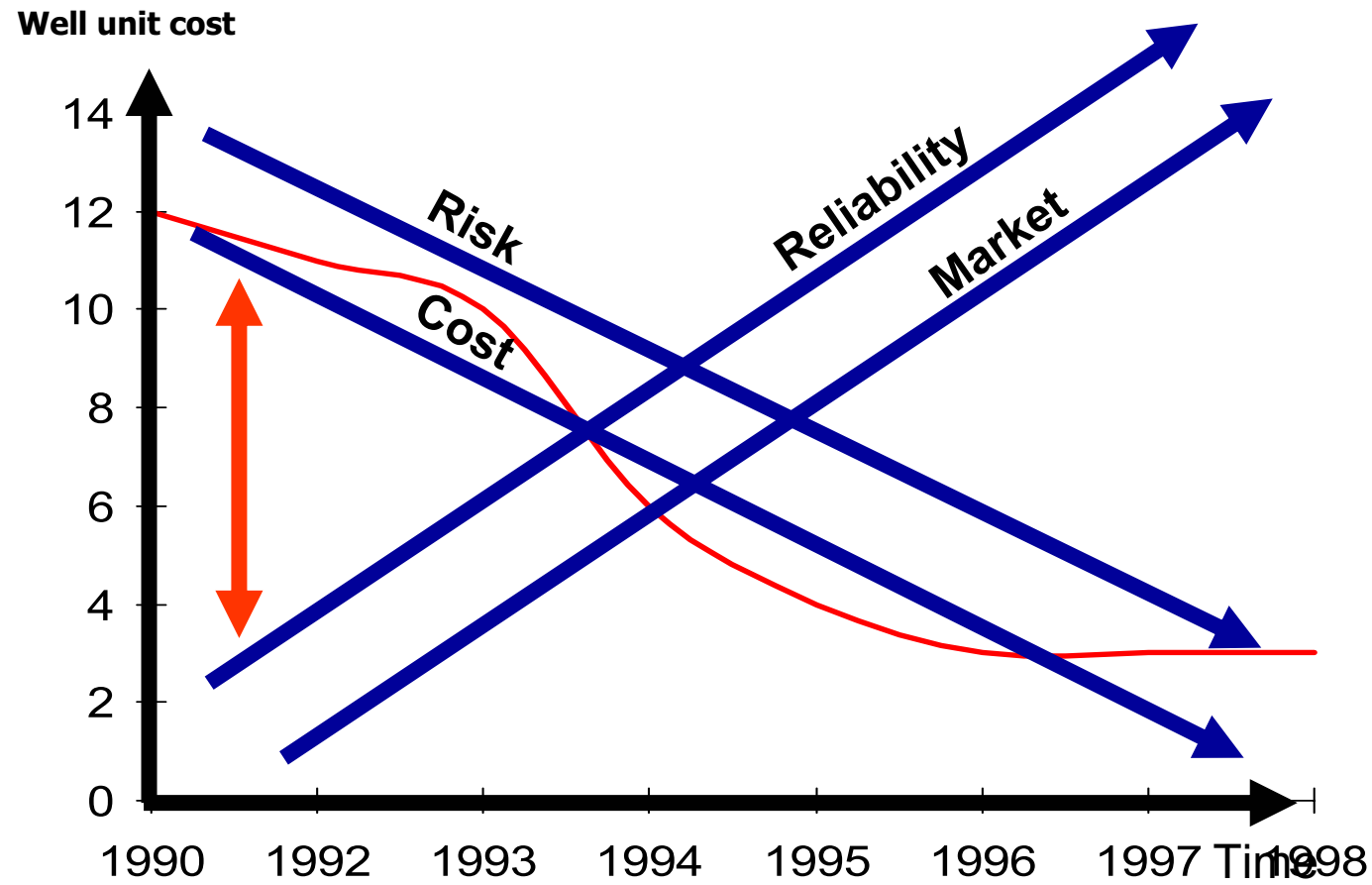
Subsea gas compression systems



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Technology development



Delivery of the frontier field solutions

- Field development project driven, the project enablers
- Oil company R&D driven, the tool-kit approach
- Vendor company driven, establishing a competitive edge
- Government driven, securing national interests

The successful receipt is often a mix



Thank you!