



Dilemmas and Opportunities: The future of Oil and Gas Exploration

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Shell's Strategy

Our Purpose

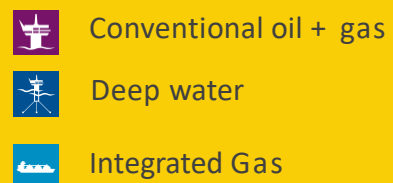
We power progress together by providing more and cleaner energy solutions

#makethefuture

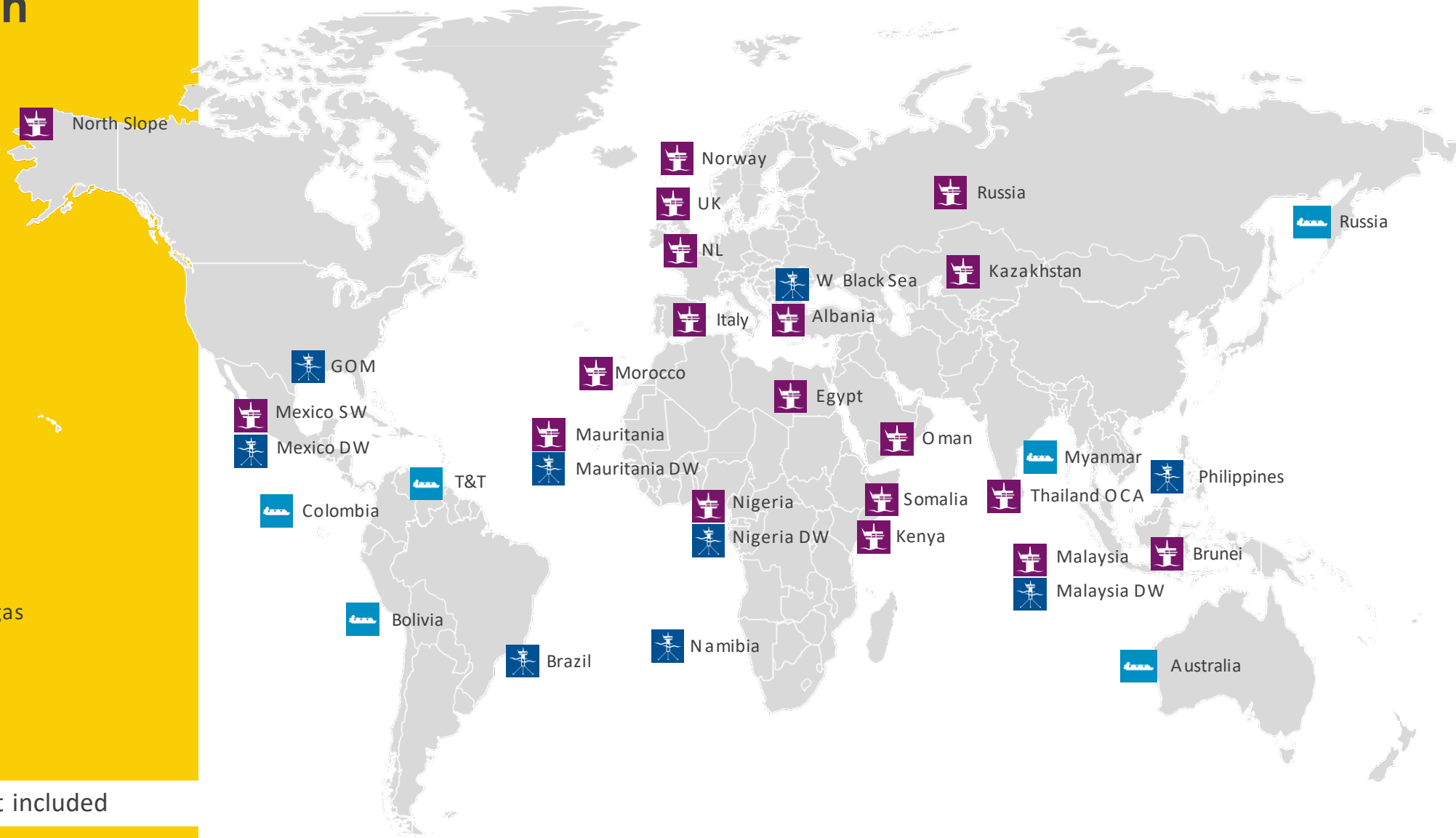


Underpinned by our Values, Goal Zero, and People

Exploration Portfolio 2018



Shales exploration not included



Dilemmas and Opportunities

Delivering our strategy however comes with dilemmas and opportunities. The dilemmas reflect wider societal challenges and are complemented by opportunities, which, properly grasped, will guarantee that exploration will thrive for decades to come.



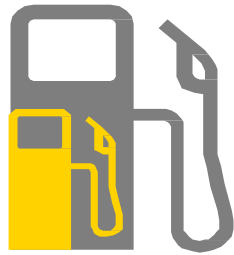
Energy for a changing world

There is more demand for energy globally as the world's population and living standards increase



Growing population

Global population is expected to increase from around 7.6 billion today to nearly 10 billion by 2050¹, with 68% living in cities²



Rising demand

The IEA's main scenario sees a 30% rise in global energy demand between today and 2040, with an increase in consumption of both oil and gas³



Ongoing supply

By the 2050s solar could emerge as the dominant primary energy source, but oil and gas needs will continue where substitution is difficult⁴



Mitigating climate change

Net-zero emissions is a potentially achievable societal ambition⁵

Sources: ¹UN World Population Prospects (2017 revision); ²UN World Urbanisation Prospects (2018 revision); ³IEA World Energy Outlook 2017; ⁴Shell Sky Scenario: Meeting the Goals of the Paris Agreement (2018); ⁵Shell *New Lens Scenarios* Supplement, "A Better Life with a Healthy Planet" (2016)

The future will be different

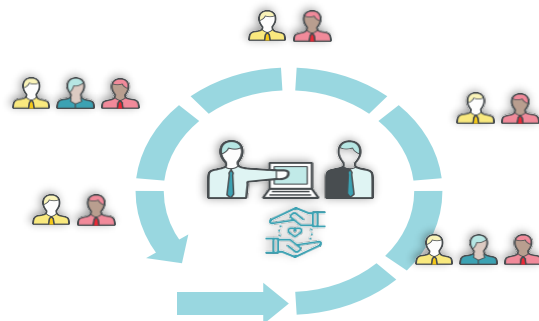
① More Standardization



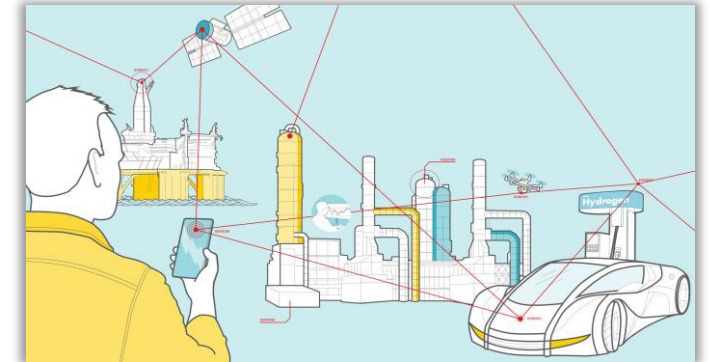
② Cutting Cycle Time



③ Industry Collaboration

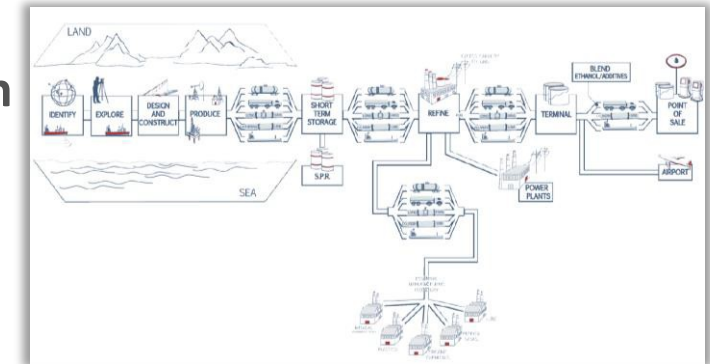


④ Digitalization



⑤ System Engineering/ Optimize Value Chain

*Innovative
commercial deals*

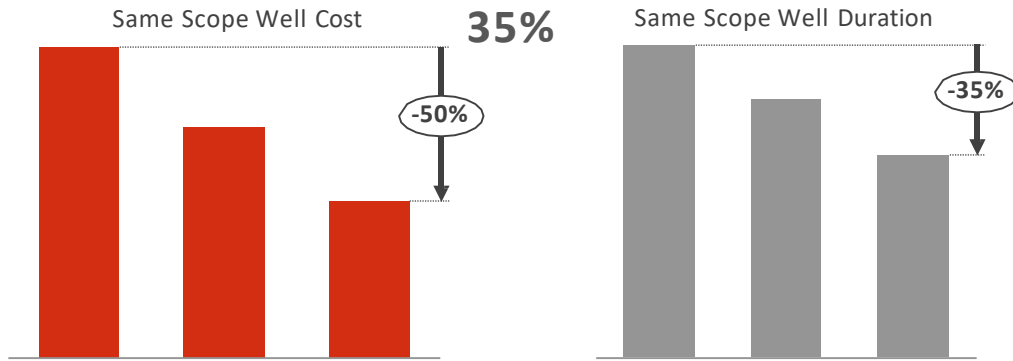


⦿ Subsurface Uncertainties

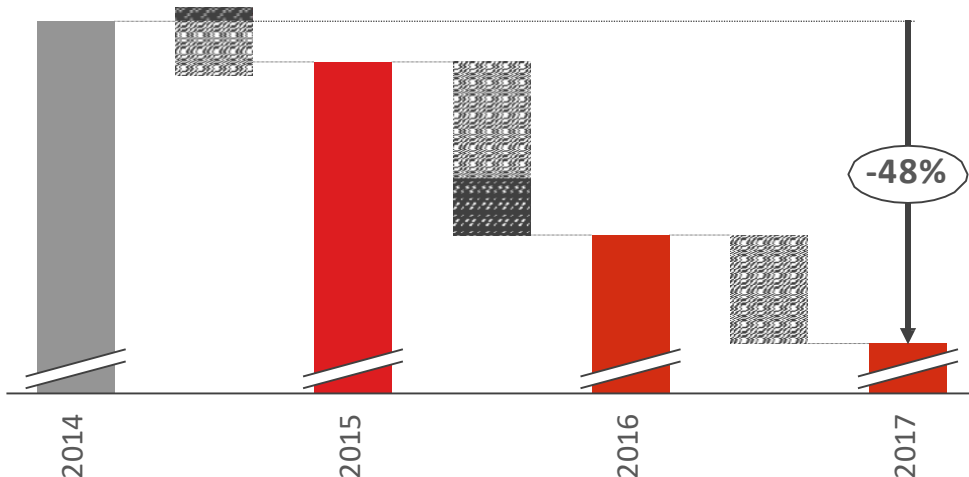


Changes need to be sustainable

Shell DW Well costs are down 50%, durations are down



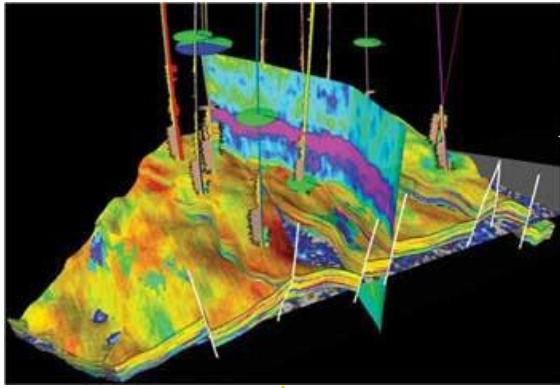
Shell DW Unit Development costs are down ~50%



- **Competitive Scoping:** Starting from a minimum technical scope and identifying key value adding scope additions.
- **Efficient Execution:** Being more capital efficient in execution.
- **Supply Chain Transformation:** Manage the supply chain “as a system,” understanding the critical interfaces that will deliver improved efficiency, driving out waste.
- **Technology & Innovation**
 - Cost reducing and enabling “big ticket technologies”
 - Automation/digitalization will be axial forces in the improvement journey.
- **Cutting Cycle Time**
- **System Engineering:** Optimize full value chain
- **Industry Collaboration** (open access, sharing)

Adapting for the future

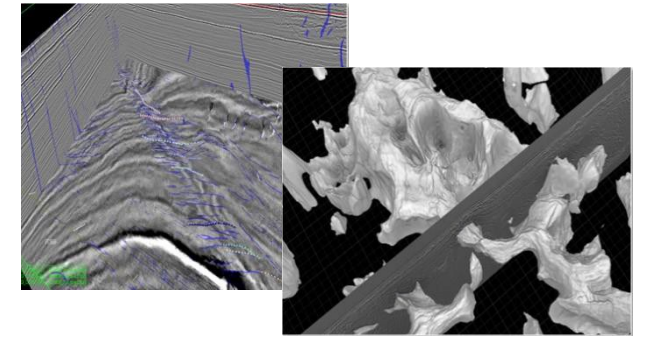
Self-evergreening
processors constantly
analyzing data



Collaboration-centric workflows



e.g. Automated
Seismic
Interpretation



Single, fully connected data
platform across subsurface



Vendors

Partners

Agencies

Academia

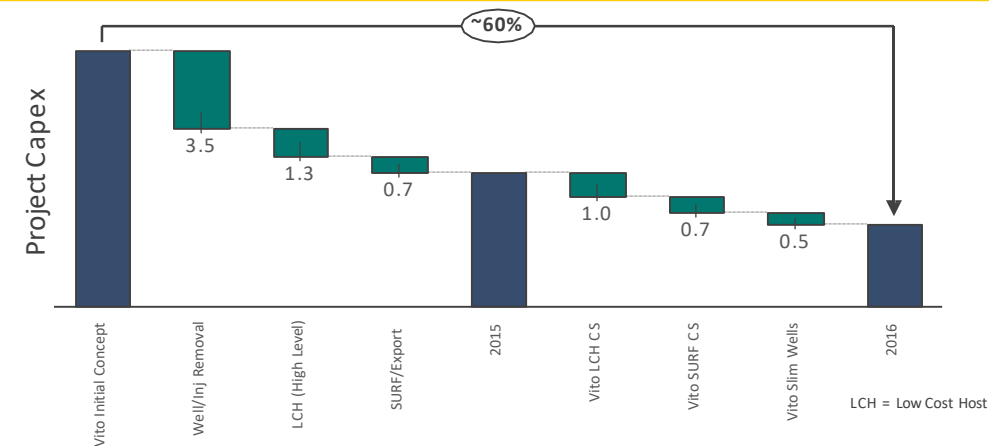
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Vito : Transformational changes make project competitive and affordable

1 Project Concept: Simple = Cheaper

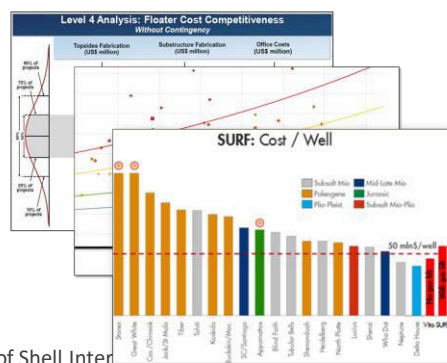


2 >60% Cost Reduction: Through Competitive Scoping



3 Further Cost Reduction: Through competitive benchmarking and leveraging partners

Competitive Benchmarking



Simplification -> Lower Cost



4 Re-invented Project: Focus on value levers with strong team integration and stakeholder engagement

