PUBLISERT 19. OKT. 2021 | OPPDATERT 4. NOV. 2021

Overview of technology priorities for all disciplines

The overarching goal of technology development and implementation is to realize value from the NCS safely and with minimal environmental impact.

The OG21's technology groups (TGs) have identified new technology and competence that could improve the NCS competitiveness in light of the future demand for oil and gas described in Section 2 and the challenges and opportunities described in Section 3.

A total of 30 technology and knowledge areas have been prioritized. In addition, the TGs have discussed and identified opportunities for new industry development based on the competence and solutions in the petroleum industry as well as opportunities for improved life-cycle management and circular economy.

An overview of the technology priorities per discipline (TG) and interconnections between disciplines, is shown in Figure 41. Estimates on potential value for technology opportunities is presented in Figure 42. A detailed description of the prioritized technology areas for each TG is provided in the following sub-sections.

As Figure 41 indicates, a broad range of technologies is needed to improve the NCS competitiveness. Each prioritized technology area offers significant improvements on at least one of the competition metrics. Combined, the prioritized technology areas hold a promise of improving the NCS competitiveness along all metrics, including volumes, costs, and CO_2-emissions.

The prioritized safety and environment technology areas are fundamental for the "license-to-operate". Addressing the technology and knowledge needs within these areas is therefore of vital importance for the further development of the NCS.

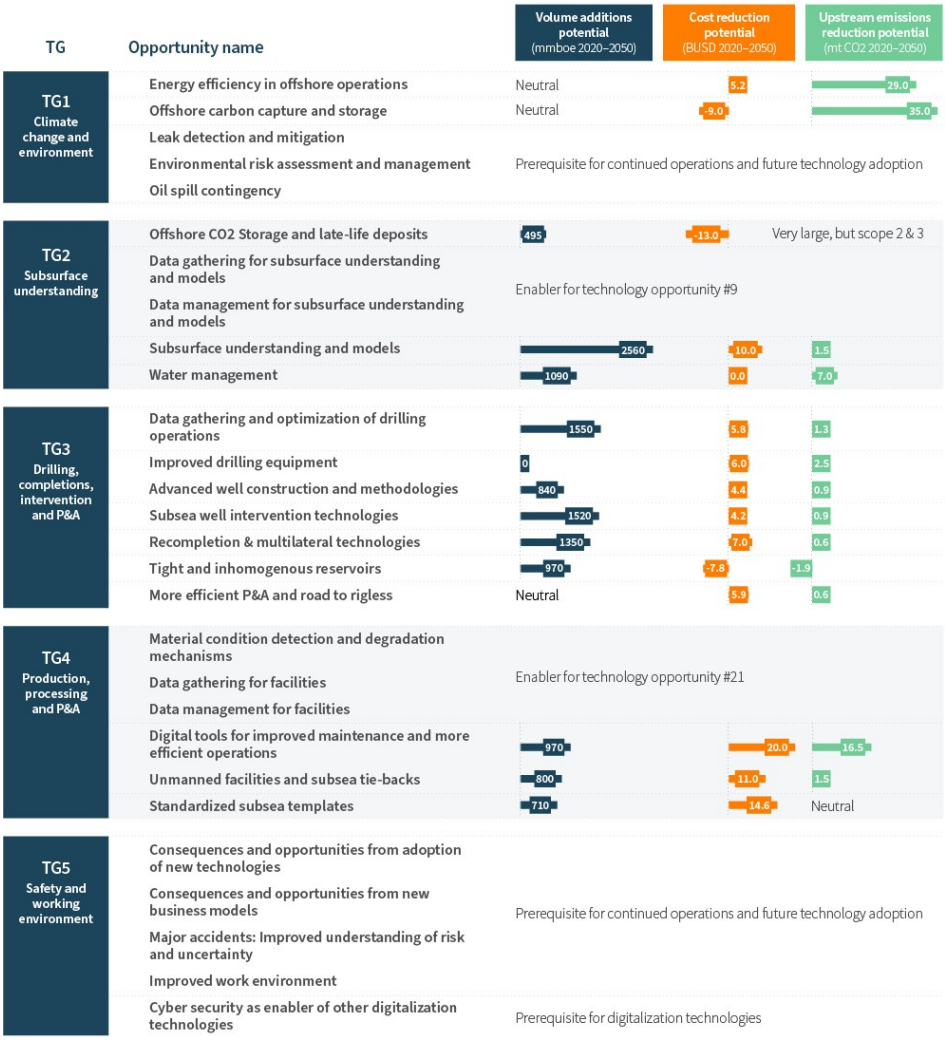
Stakeholders in the petroleum sector have a shared responsibility for addressing the technology priorities through R&D&I, and OG21 therefore encourage industry enterprises, universities, research institutes as well as public funding bodies, to reflect OG21 priorities in their R&D&I plans and programs.

We have not indicated current TRL-level for the prioritized areas. The reason is that even for prioritized areas where mature technologies exist in the market, there is still scope for radical new innovations, new components or new knowledge that could replace or improve existing solutions.

Figure 41. Overview of technology opportunities per discipline (TG) and cross-discipline dependencies

TG	Opportunity name	TG1	TG2	TG3	TG4	TG5
TG1 Climate change and environment	#1 Energy efficiency in offshore operations	●	○	○	○	○
	#2 Reduced cost of electrification	●			○	
	#3 Offshore carbon capture and storage	●	○		○	○
	#4 Lifecycle assessments	●	○	○	○	○
	#5 Leak detection and mitigation	●			○	○
	#6 Environmental risk assessment and management	●				○
	#7 Oil spill contingency	●			○	○
	#8 Environmental performance data	●			○	
TG2 Subsurface understanding	#9 Offshore CO2 storage and late-life deposits	○	●	○	○	
	#10 Data acquisition for subsurface understanding and models		●	○		
	#11 Data management for subsurface understanding and models		●		○	
	#12 Subsurface understanding and models	○	●	○	○	○
	#13 Water management	○	●	○	○	
TG3 Drilling, completions, intervention and P&A	#14 Data gathering and optimization of drilling operations		○	●	○	○
	#15 Improved drilling equipment	○		●		
	#16 Advancements in well construction and methodologies			●		○
	#17 Subsea well intervention technologies	○		●	○	○
	#18 Recompletion and multilateral technologies		○	●		○
	#19 Challenging reservoirs	○		●	○	
	#20 More efficient P&A		○	●		○
TG4	#21 Facility integrity and lifetime extension of fields				●	○

Figure 42 Overview of prioritized technology opportunities and estimated, potential effects on competition metrics for prioritized technologies * (Rystad Energy, 2021)



* There is a small discrepancy in the naming of technology opportunities in Figure 41 and Figure 42. The reason is that the opportunities have been further matured by OG21 after the final report from Rystad Energy was delivered.

Source: Rystad Energy research and analysis

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