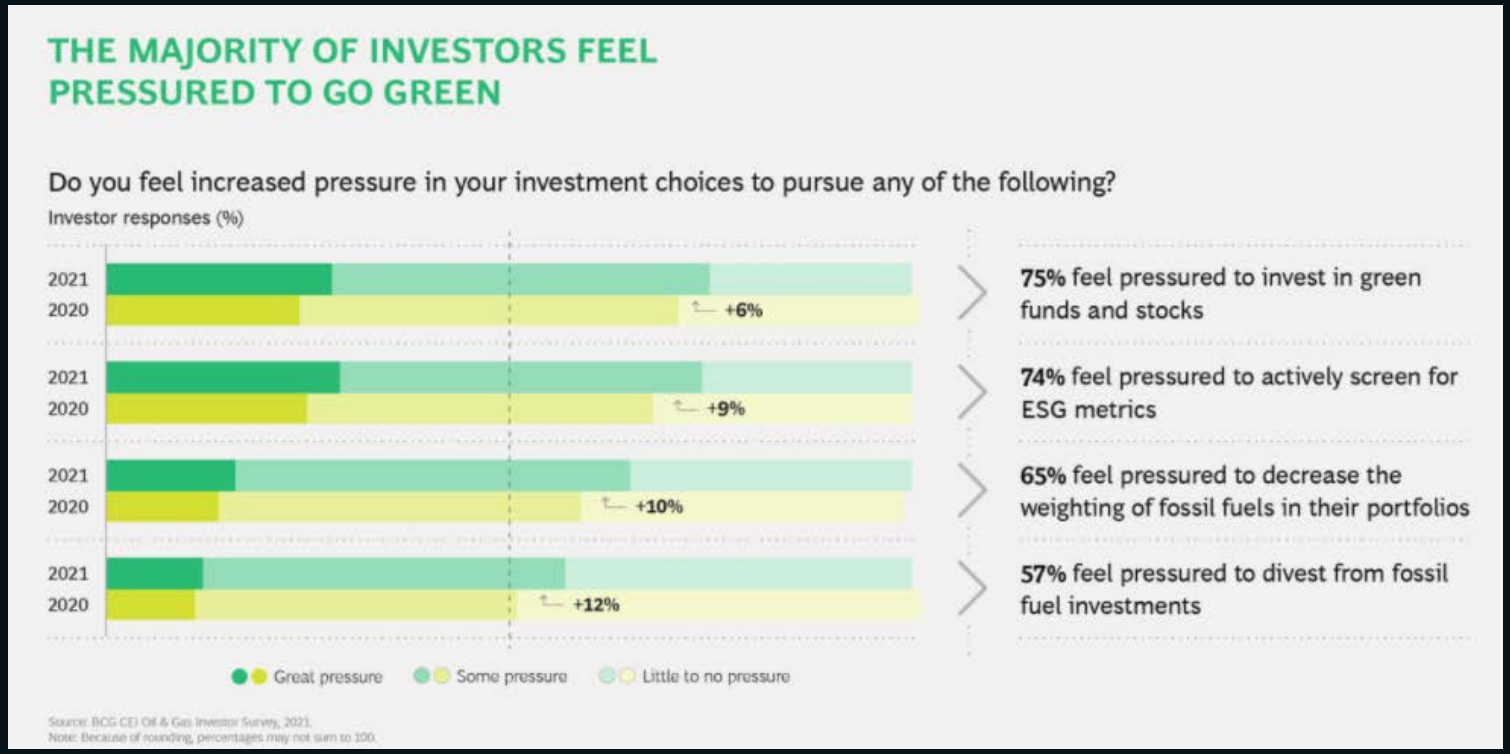
OG21 -A New Chapter

Digitalization and innovation in the O&G industry strategy

Gunnar H. Lille, MD OG21
BRU21 Conference,
June 2, 2022

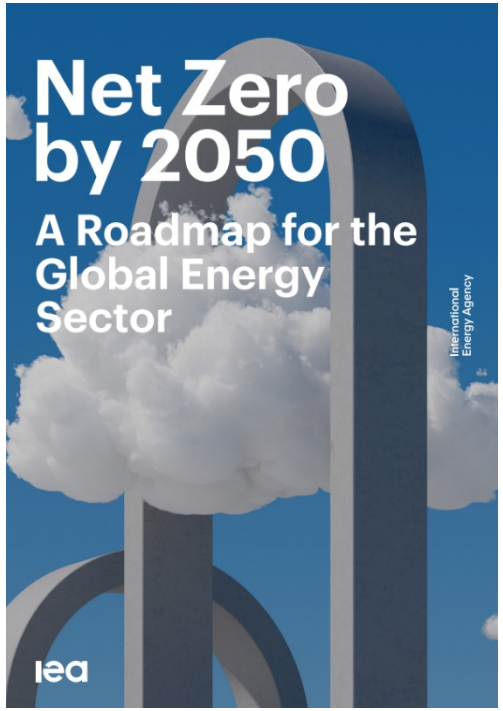
"Climate risk is finance risk"
"In the near future – and sooner than most anticipate – there will be a significant reallocation of capital"

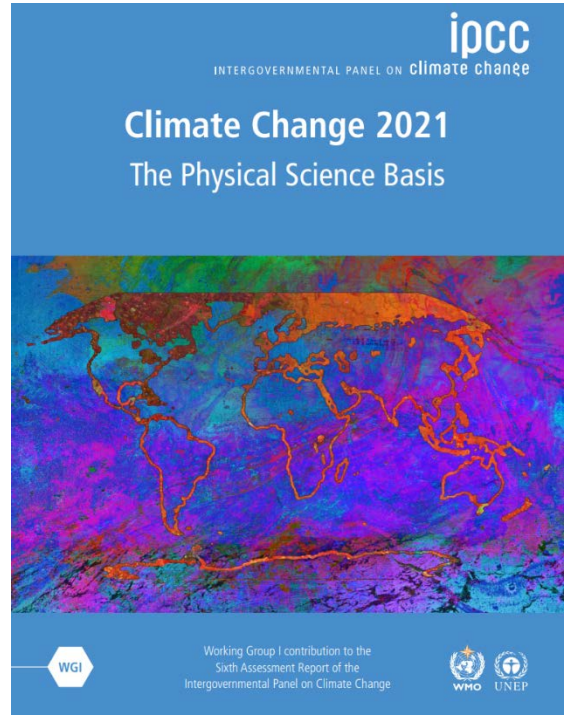
Larry Fink, CEO BlackRock, 2020



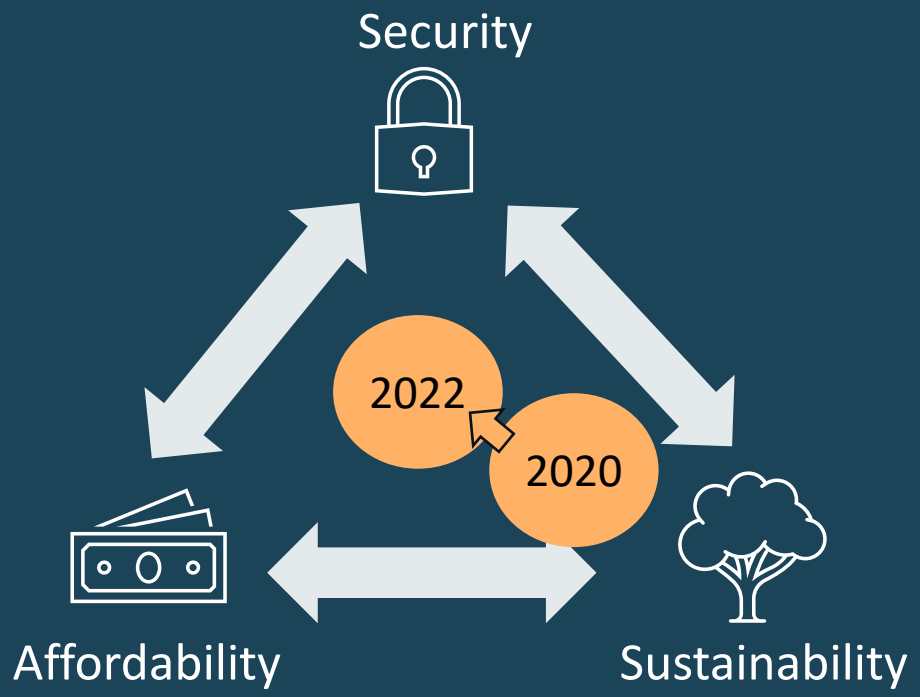
"How Institutional Investors See the Future of Oil and Gas"
BCG Report, Jan.6, 2022

The world needs to reduce GHG emissions





The Ukraine war demonstrates the importance of energy and the trilemma challenge



But the future market for Norwegian natural gas still remains uncertain

EUROPEAN COMMISSION

Brussels, 18.5.2022
SWD(2022) 230 final

COMMISSION STAFF WORKING DOCUMENT

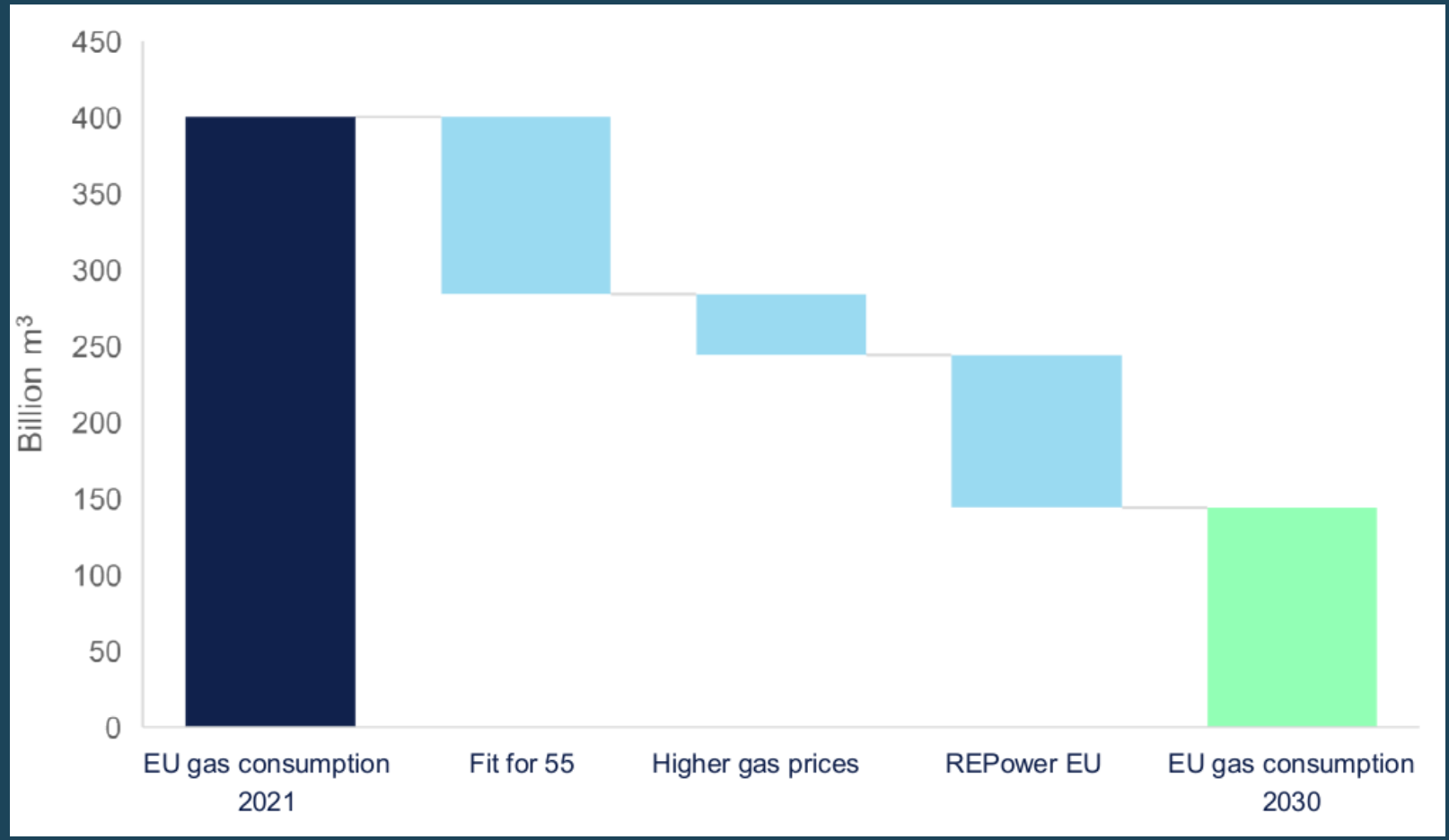
IMPLEMENTING THE REPOWER EU ACTION PLAN: INVESTMENT NEEDS, HYDROGEN ACCELERATOR AND ACHIEVING THE BIO-METHANE TARGETS

Accompanying the document

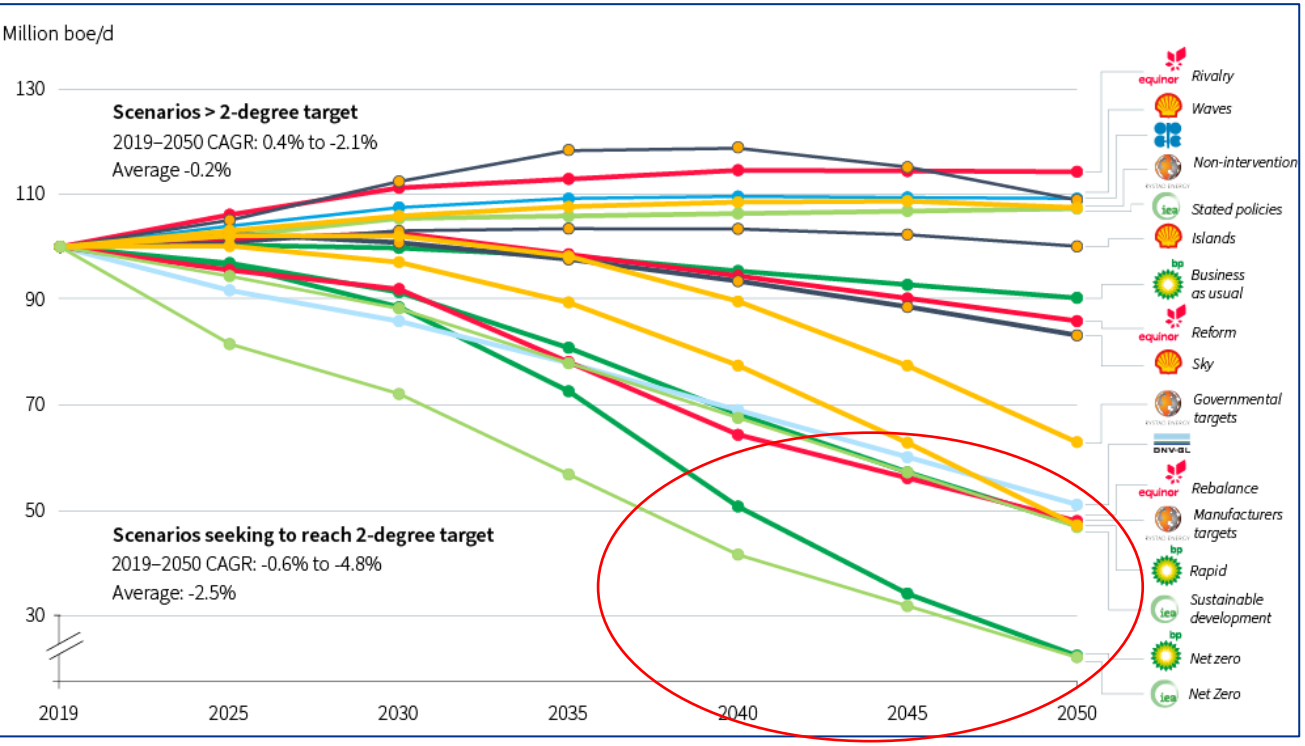
COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN COUNCIL, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

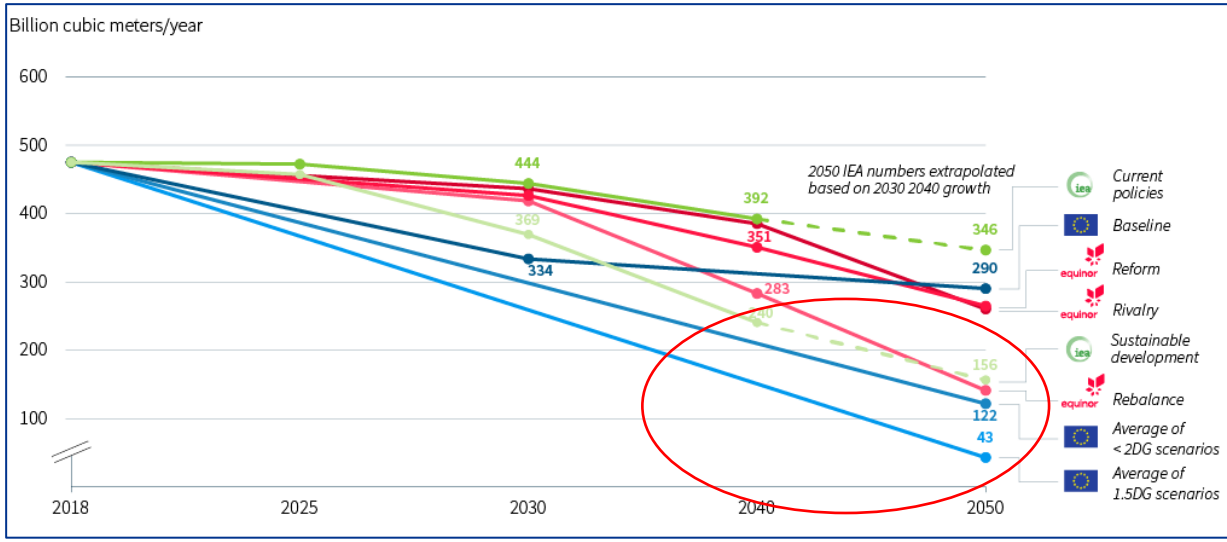
REPowerEU Plan

{COM(2022) 230 final}

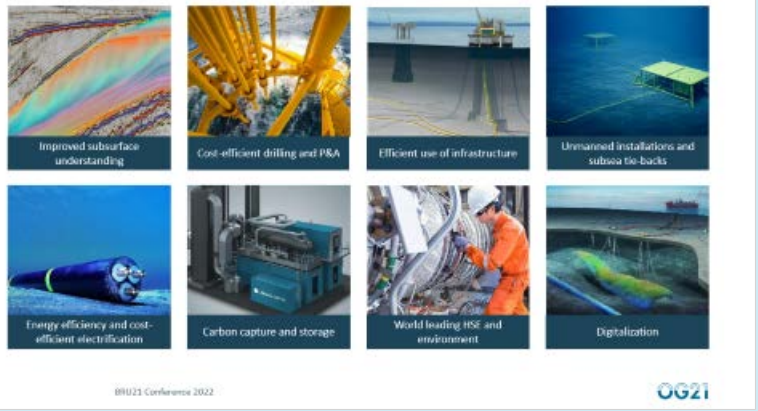


The future is uncertain, but the desired state sets direction for R&D&I

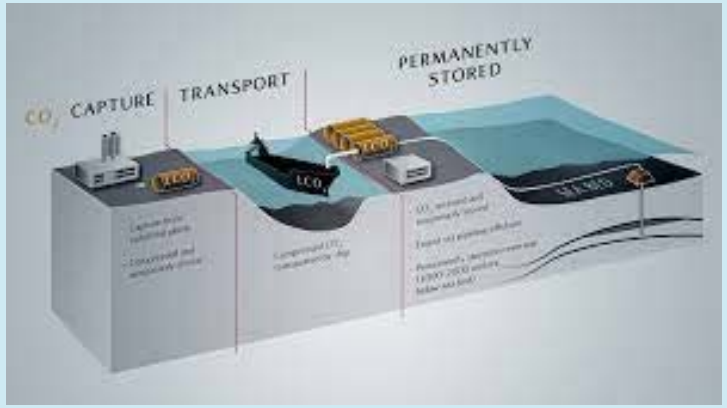




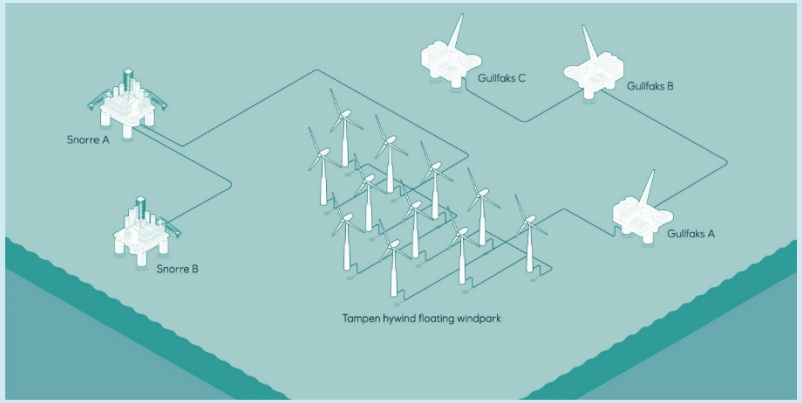
Desired state



Compete for O&G market shares – Need variety of new technologies



Secure future market- Decarbonize value chains



Create new industries - Contribute w/ knowledge and solutions

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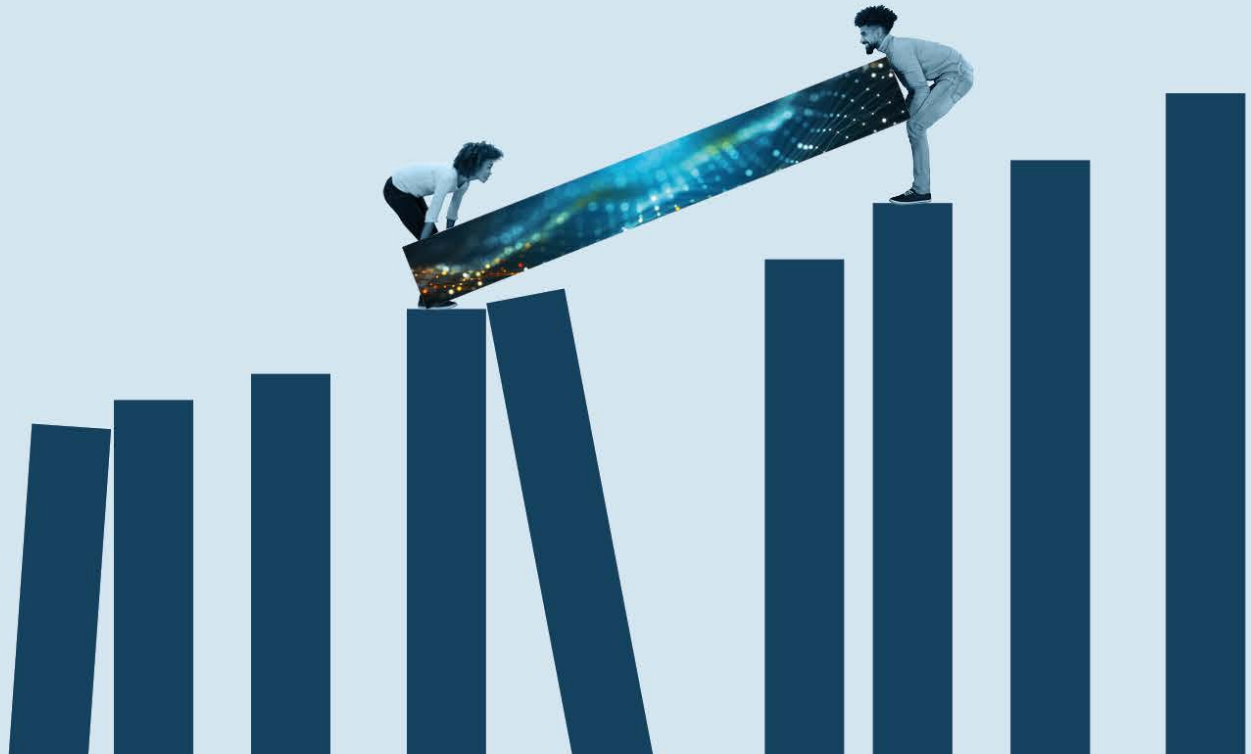
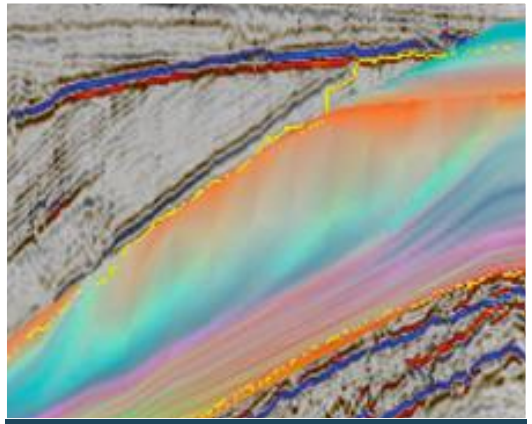
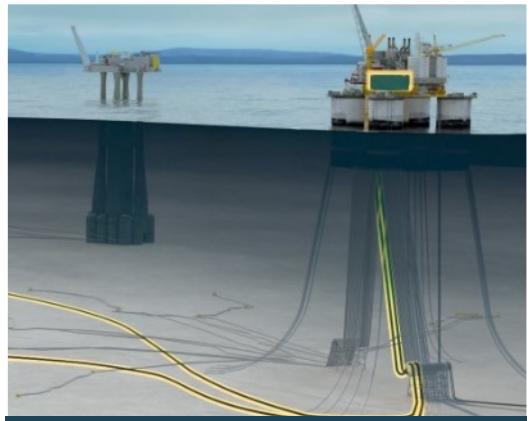
No silver bullet –
need a variety of technologies to compete for market shares





Improved subsurface understanding

Cost-efficient drilling and P&A



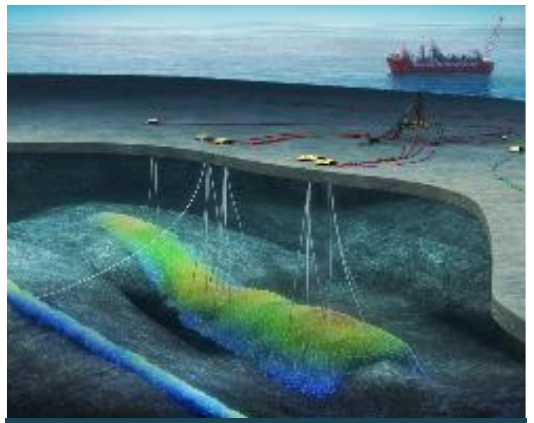
Efficient use of infrastructure

Unmanned installations and subsea tie-backs

Energy efficiency and cost-efficient electrification

Carbon capture and storage

World leading HSE and environment

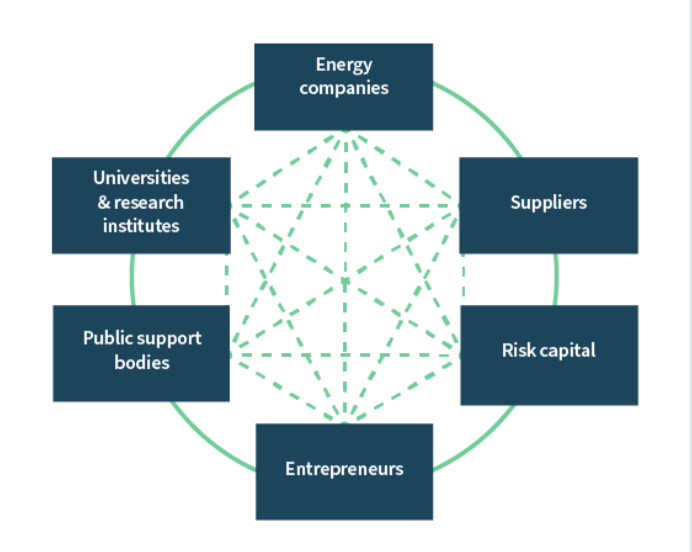


Digitalization

Technology

Data

Organizational capability



Pursue technology through the innovation system

Technology leadership

Attract and develop talent

UiO

Det matematisk-naturvitenskapelige fakultet

Matematisk institutt

Meny

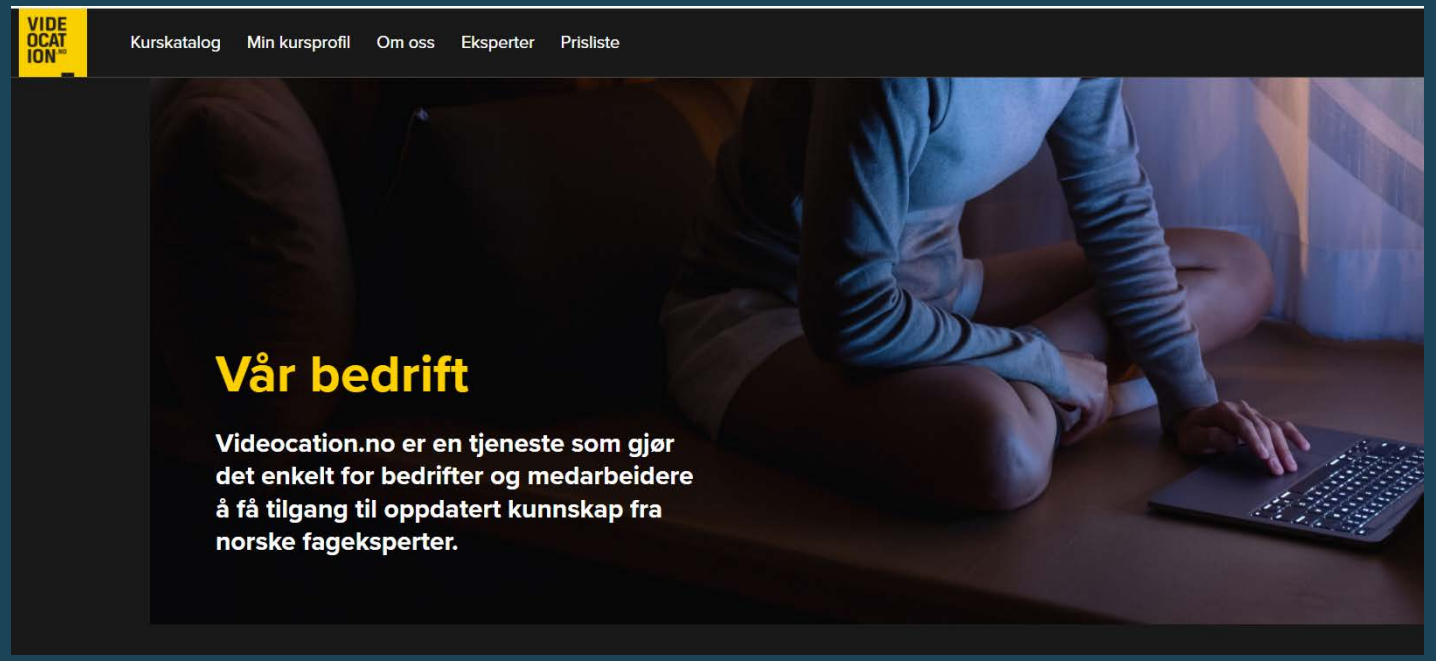
← Studier ← Etter- og videreutdanning

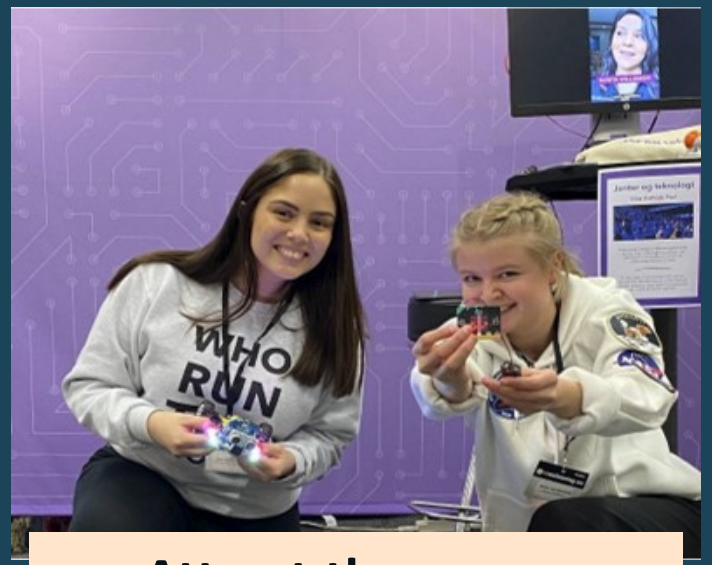
Fra data til innsikt

Fra data til innsikt

- Om programmet
- Praktisk informasjon
- Kontakt oss

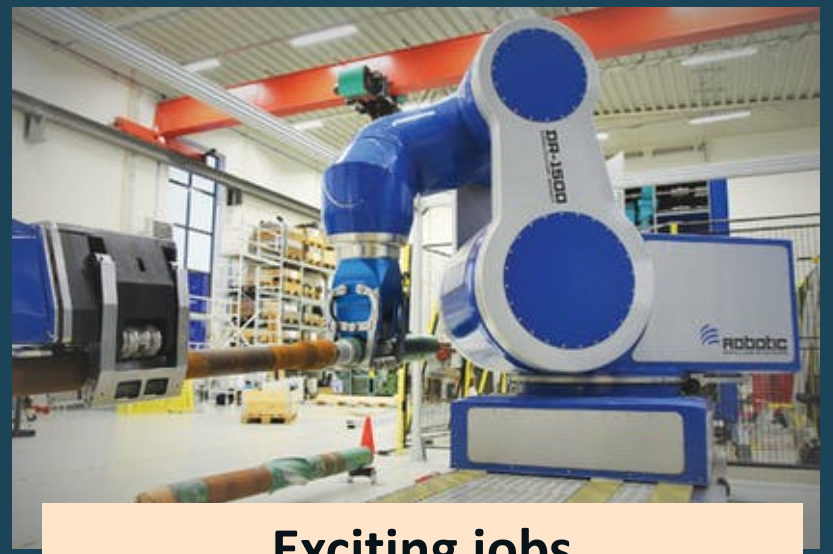
Hørt om deep learning og kunstig intelligens? Har du lest suksesshistorier hvor data science og datadrevne beslutninger har revolusjonert små og store bedrifter? Fra data til innsikt er et videreutdanningsprogram i data science for deg som er i jobb og ønsker å vite mer om hvilke muligheter og utfordringer data gir deg og din bedrift.





Attract the young

Meaningful jobs



Exciting jobs

The Research Council of Norway

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A new chapter

Oil and gas for
the 21st century

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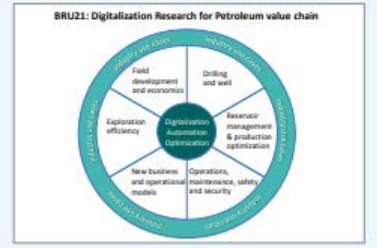
THE BRU21 INITIATIVE

The BRU21 initiative on the NTNU currently engage 30 Ph.D. students and 3 post-docs, of which 10 Norwegians and 23 foreigners from 17 countries. The initiative has been successful in attracting talent partly because it recruits already experienced people from the industry that want a career boost, partly because it recruits from a diverse set of academic backgrounds, and partly because it offers projects that combine digital and domain disciplines. Another success from the initiative is the close collaboration with the industry, where the students are engaged to solve concrete challenges (use cases). This is motivational for the students and it provides real value in return for the funding that the industry partners provide.



BRU21 program focuses on value creation in 6 areas of petroleum value chain. It conducts research and educates future specialists in the overlap of petroleum and digital domains, which include automation, big data, artificial intelligence, machine learning, digital twins, autonomy and robotics, cyber security, organization, optimization and other areas.

"We regard BRU21 as an innovative and exciting model for collaboration between the industry and NTNU.

We participate in educating the next generation of petroleum technologists with digitalization «under their skin» on top of addressing critical challenges for the future. Digitalization is a necessary enabler inherent in most future value creation. Our fields of interest range from sub-surface technology to risk-based maintenance, remote operations, future operation models and cyber security. Through our participation in BRU21 we contribute to competence development and innovation and thus high value creation in the future."

Tor Ulleberg
Equinor, Senior Advisor Innovation and Collaboration

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Additional slides

Reducing CO_2-emissions through value chains important for long-term competitiveness

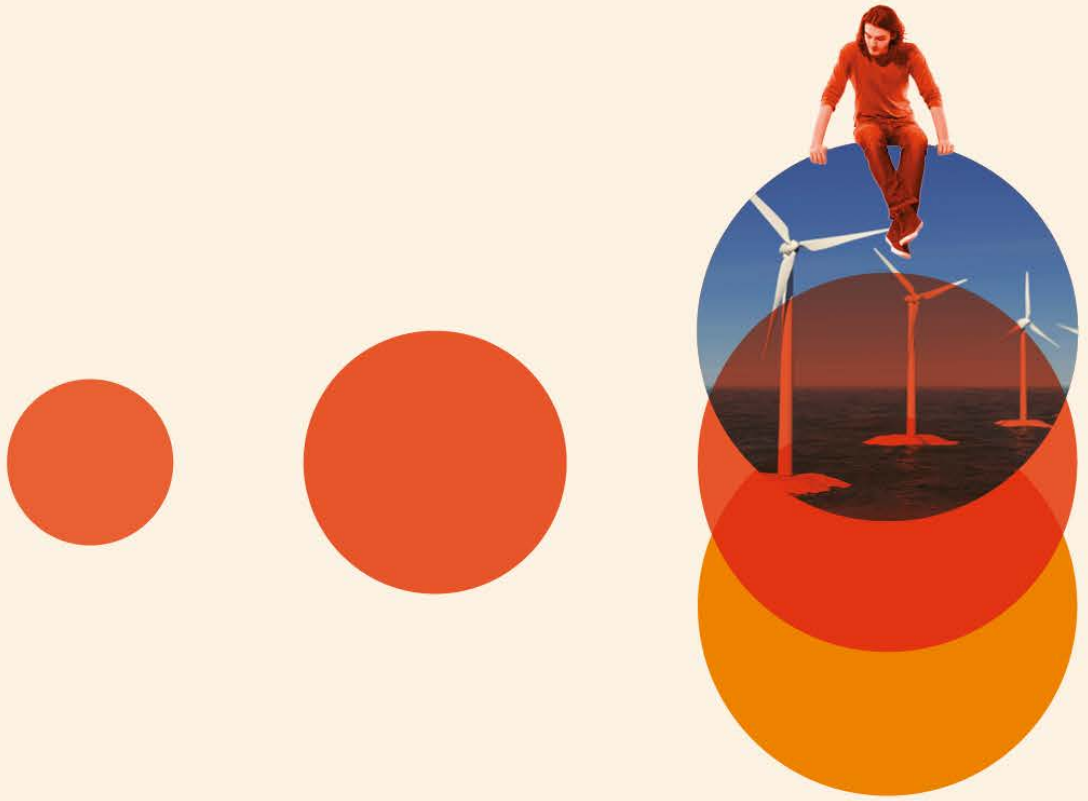
CCS

Blue hydrogen

Gas power w/CCS

Bilder: Statkraft, Equinor, ZEG

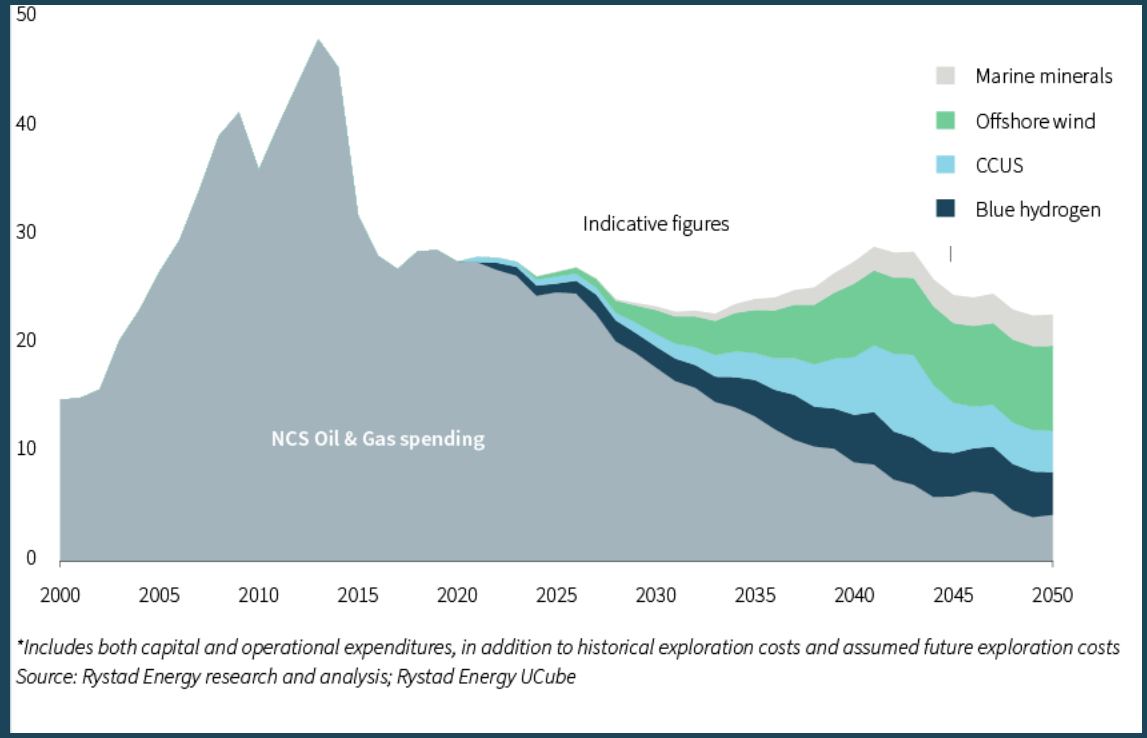
Knowledge and solutions from petroleum – a steppingstone for new industries



Norwegian competence				Commodity industry relevance				
Norwegian geographical cluster	Field of industry competence	2019 Norwegian employment *[# employees]*	Examples of relevant players*	Oil and gas	Hydrogen 1	CSS 2	Offshore wind 3	Marine minerals 4
Eastern Norway	Seismic TG1	2 500	TGS, emgs, fugro, allton, PGS, magseis fairfield	●●●	●●●	●●●	○○○	●●●
	Geology TG2			●●●	●●●	●●●	●○○	●●●
	Enginering TG4	9 500	OLAV OLSEN, GLOBAL MARITIME, mossmaritime	●●●	●●●	●●○	●●○	●●○
	Subsea TG4	16 500	AkerSolutions, TechnipFMC, subsea 7	●●●	●●●	●●●	●●○	●●○
West coast	Marine operations	9 000	DEEPOCEAN, DOF, Ostensjø Rederi, SOLSTAD OFFSHORE	●●●	●●●	●●○	●●●	●●●
	EPC- and shipyards TG4	15 000	aibel, VARD, KVÆRNER, KLEVEN, ULSTEIN	●●●	●●●	●●○	●●○	●●●
	Drilling TG3	10 000	Transocean, Seadrill	●●●	●●●	●●○	○○○	●○○
South coast	Drilling rig- and topside equipment TG3	22 000	Schlumberger, ABB, mhwirth, NOV, WÄRTSILÄ	●●●	●●●	●●○	●○○	●●○
Country Wide	Automation and digital technologies All	26 000	Sekal, Cognite, Eelume, KONGSBERG	●●●	●●●	●○○	●○○	●●●
	Other, incl. maintenance services TG3		DNV·GL, AXESS, IKM, JOTUN	●●●	●●●	●●●	●●●	●●●

*Many of the listed oil field service companies perform work within several fields of competence, logos placed based on their main activities
Source: Rystad Energy research and analysis; Brønnøysundregistrene; Statistics Norway; Norwegian Petroleum

○○○ Relevance degree - from high (3 filled) to low (1 filled)



*Includes both capital and operational expenditures, in addition to historical exploration costs and assumed future exploration costs
Source: Rystad Energy research and analysis; Rystad Energy UCube