



Shell.ai MAKING ENERGY SMARTER

AI for sustainable transformation in energy
AI for Good webinar, 7 April 2021

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Shell’s operating plan, outlook and budgets are forecasted for a ten-year period and are updated every year. They reflect the current economic environment and what we can reasonably expect to see over the next ten years. Accordingly, Shell’s operating plans, outlooks, budgets and pricing assumptions do not reflect our net-zero emissions target. In the future, as society moves towards net-zero emissions, we expect Shell’s operating plans, outlooks, budgets and pricing assumptions to reflect this movement.

PACE OF DIGITAL ADOPTION IS ACCELERATING AT AN ALMOST EXPONENTIAL RATE

DIGITALISATION AND AI TO DRIVE EFFICIENCY IN OUR EXISTING BUSINESSES

Strong foundation, capabilities and collaborations with industry leaders to accelerate the value from digitalisation:

1.3 trn

Rows of sensor data in data lake

~350

Staff in math & computer science discipline + 800 citizen data scientists

INDUSTRY COLLABORATION

- Shell and Microsoft entered strategic energy and technology alliance to support progress towards a world with net-zero emissions
- Shell, C3 AI, Baker Hughes and Microsoft Launch the Open AI Energy Initiative
- Shell and SAP collaborating on embedding carbon offsets in digital commerce platforms

Deployment of digital applications increased exponentially across all businesses, improving efficiency, improving safety and enabling new opportunities:

1.7mln

Registered users of AI powered loyalty program with 31 mln rewards issued

65

AI powered applications being developed and deployed in 2020

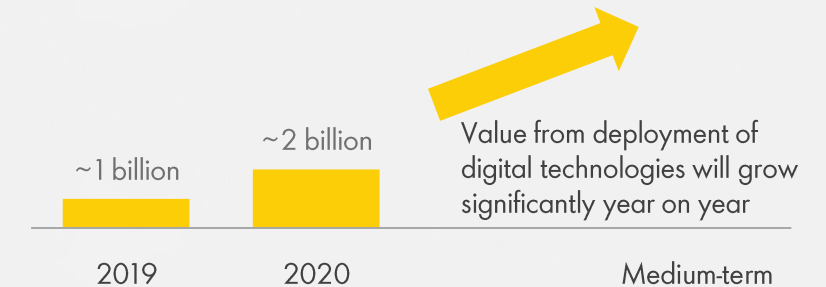
5700

Pieces of equipment monitored by AI across our assets

10x

Increase in use of virtual rooms in 2020 powered by augmented reality

Value enabled through digitalisation

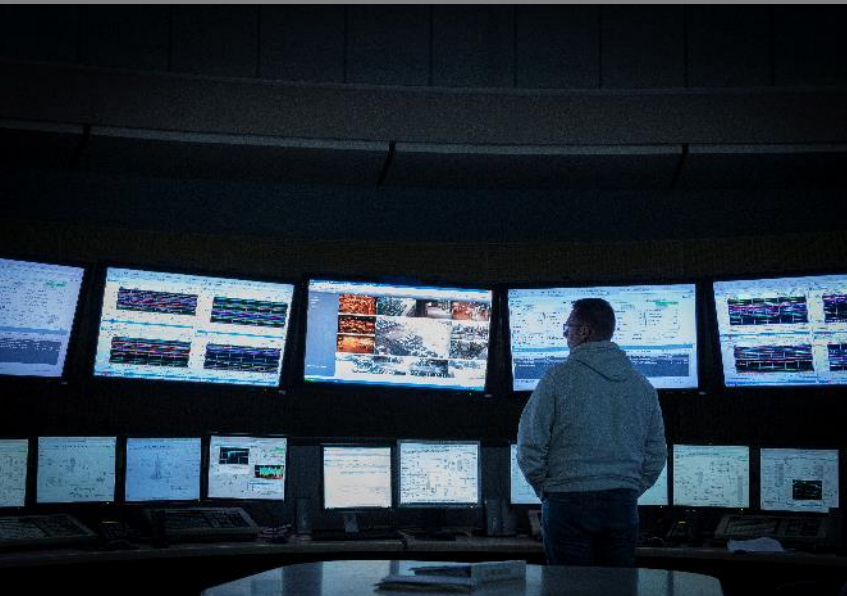


- Digital technologies are deployed throughout the integrated value-chain allowing us to better serve our customers with new and more convenient products/ services and improving how we design our projects and run our operations
- Enabling \$2 billion of value in 2020, doubling from \$1 billion in 2019, through:
 - Lower costs
 - Improved production
 - Improved utilisation / reduced downtime
 - Increased margins



Digitalisation and AI

Driving CO₂ efficiency in our existing businesses



Real time production optimisation

- Advanced data analytics technology for real time optimisation
- Deployed at LNG asset resulting in 1-2% production increase
- Significant CO₂ impact



Global Carbon Abatement Monitoring

- Help identify the most impactful capital investment opportunities for emissions reduction across the entire portfolio
- Inform CO₂ target setting processes



Digital twin

- A Digital Twin is a virtual representation of the physical elements and dynamic behaviour of an asset over its lifecycle
- Drives efficiency by enabling remote operations, automation and significantly improved collaboration
- Live in Nyhamna Gas Plant, Norway and deployment underway in 5 other assets.

Developing the Next Generation of Clean Technology

AI optimising electric vehicle charging



- Optimise the vehicle charging process to save customers money and protect the grid

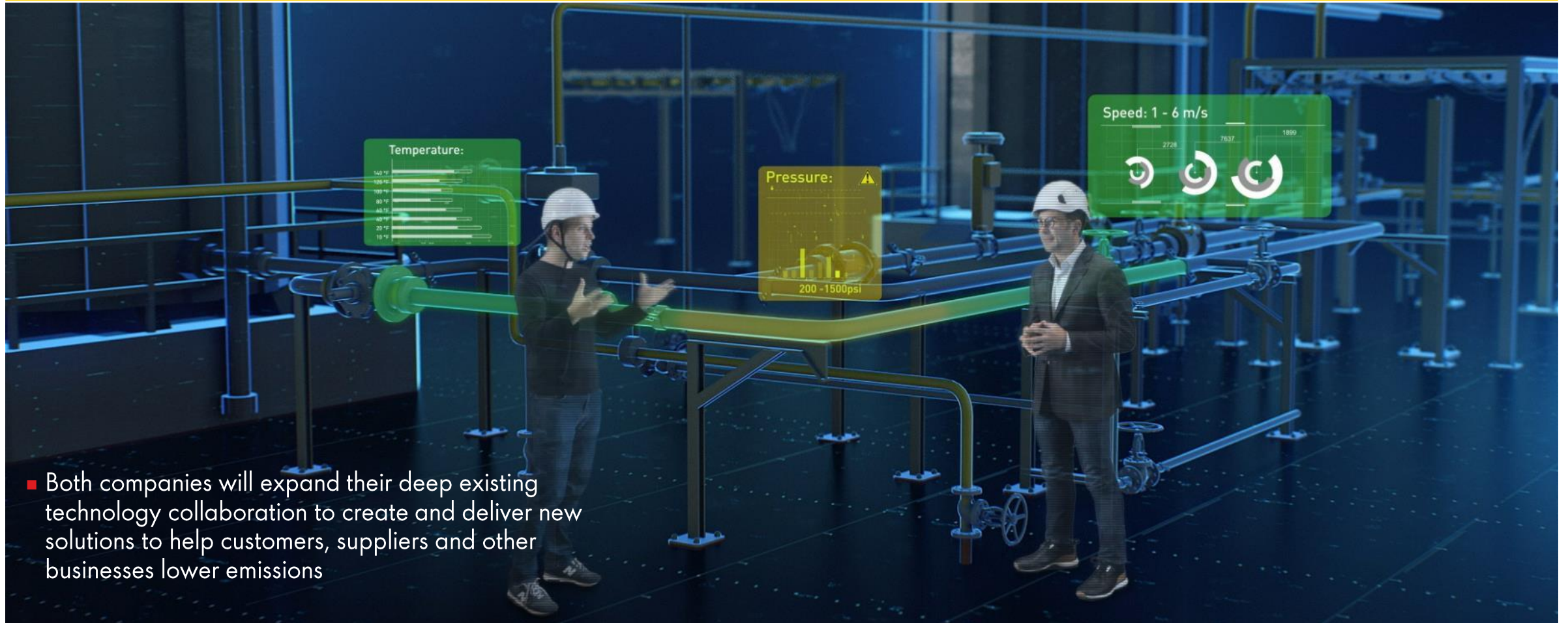
Digital technology & AI enables CCS



- At the Quest carbon capture and storage (CCS) project in Alberta, Canada, sensor systems use AI to assess the atmospheric gas composition and to identify possible carbon dioxide emission events

External collaboration is vital to developing technology at pace

Shell and Microsoft form a strategic alliance to help address carbon emissions





BakerHughesC3.ai



Open AI Energy
Initiative

Operational Efficiency for the Energy Industry



C3.ai



Baker
Hughes



Microsoft

