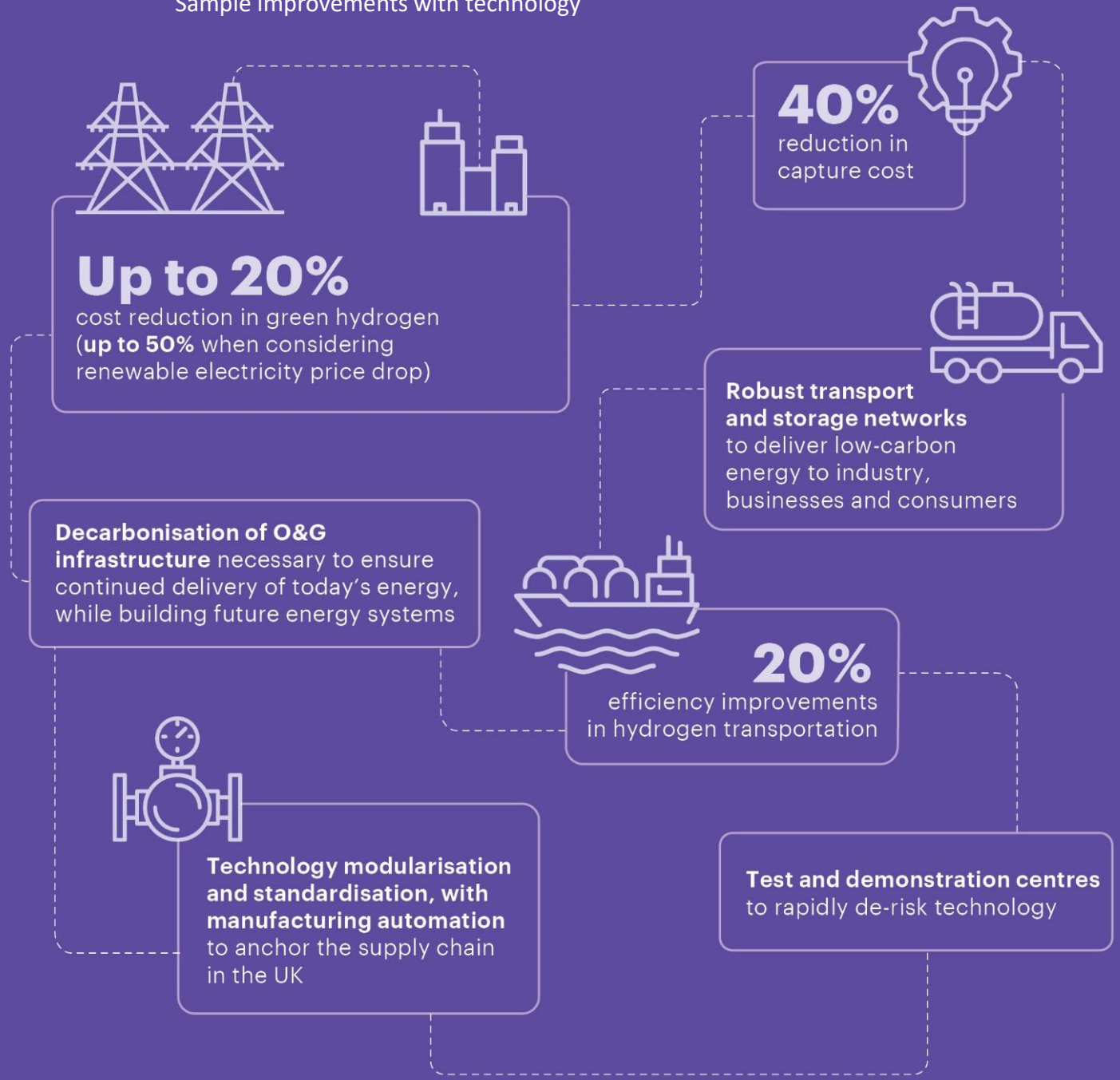
# Technology driving green energy growth

## The North Sea Transition Deal

accenture | Net Zero Technology Centre — Technology Driving Transition | technology leadership board

# Technology will unlock a low carbon and affordable future, but urgent action is required

Sample improvements with technology



# Industry and Government have agreed to deliver:

**£16 bn**

in joint investment between Government and industry by 2030 to reduce carbon emissions

**40,000**

supply chain jobs in decarbonising the UKCS and the CCUS and hydrogen sectors

**50%**

offshore decommissioning and new energy technology projects to be provided by local businesses

**10%**

sector emission reduction target by 2025, 25% by 2025 and 50% by 2030

**60Mt**

reduction in greenhouse gas emissions

# Industry and Government must act now to rapidly develop and de-risk technologies at scale

## The Call to Action

**INDUSTRY TO:**

Develop, test and deploy technology

**GOVERNMENT TO:**

Sponsor and champion test and demonstration centres

**TOGETHER TO:**

Ensure development of a robust infrastucture, scaling up the UK supply chain

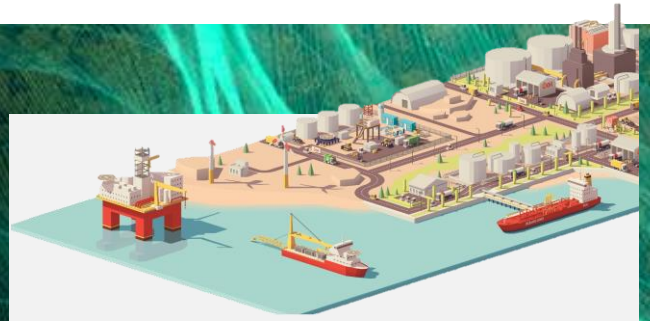
# Green hydrogen cost must drop by 60% to become the UK's primary hydrogen resource

Leveraging technology to address:

## COST

**By improving efficiencies** using newer, more durable materials, optimised stack designs and catalyst improvements

Potential 20% cost reduction



## SCALE

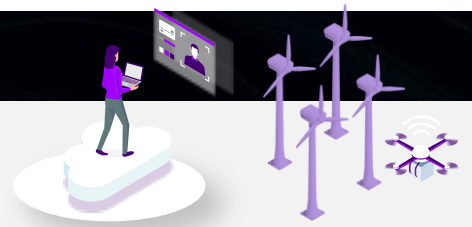
**By developing emerging electrolyser technologies** that operate more efficiently at more favourable conditions

**NSTD & Energy Security Strategy Green $H_2$ goals**

- At least 5GW by 2030

# We must leverage expertise in technology integration to reduce floating wind price by 40-50% and support green hydrogen

Leveraging technology to address:



## INNOVATION

**By rapidly trialling** multiple floating designs through the deployment of test and demonstration sites.

Up to 25% reduction from anchoring and mooring design improvements

## PACE

**By implementing component modularity** of floating offshore wind throughout construction, installation and maintenance.

**NSTD offshore wind goals**

- Additional 30 GW by 2030

# Colocation and integration between green and wind is key to delivering an affordable transition

## Green hydrogen cost must drop by 60% to become the UK's primary hydrogen resource

*£3.50/kg Is the upper threshold for LCOH to be commercially viable. Green hydrogen is currently £4.30/kg*

### High Impact Technology Opportunities

**COST**

Reduce the cost of offshore wind, which contributes up to **84% of the green hydrogen cost**

**EFFIECIENCY**

**Improve electrolyser efficiencies** using newer, more durable materials, optimised stack designs and catalytic improvements.

**EMERGING TECHNOLOGY**

**Develop emerging electrolyser technologies** that operate more efficiently at more favourable conditions

## We must leverage expertise in technology integration to reduce floating wind price by 40-50%

*15% - 25%* cost reductions available from anchoring and mooring design improvements

### High Impact Technology Opportunities

**Rapidly trial** multiple floating designs through the deployment of test and demonstration sites.

**DEMONSTRATE AND TEST**

Deploy projects to electrify offshore infrastructure through **integration with floating wind.**

**INTEGRATION**

**Implement component modularity** of floating offshore wind throughout construction, installation and maintenance.

**MODULARITY**

# To achieve the required 50% reduction in blue hydrogen LCOH, disruption is needed

Leveraging technology to address:

## EFFICIENCY

**Raise existing Autothermal Reforming (ATR) efficiencies** through heat recovery and new auxiliary component designs.
Integration with CCS technology.

## COVERAGE

**By advancing disruptive technologies such as pyrolysis** to provide blue hydrogen in the future in remote locations.

**NSTD Blue $H_2$ goals**

- Up to 5GW

# CCS projects must be delivered now to decarbonise industries and kickstart the hydrogen economy

Leveraging technology to address:

## COST

**By testing & developing** cheaper non-amine capture technology with lower energy demands

Potential 40% cost reduction in capture stage

## PACE

**By developing modular capture units** and standardising components to reduce cost and speed up delivery.

**NSTD CCS goals**

- 4 CCS sites by 2030
- 20 – 30 MTPA $CO_2$ captured

# CCS must be delivered now to decarbonise industries and kickstart the hydrogen economy

## CCS projects must be delivered now to decarbonise industries and kickstart the hydrogen economy

*£25/$tCO_2$ could be achieved for capture using modular solutions and new innovative technologies*

### High Impact Technology Opportunities

**MODULARITY**

**Develop modular capture units** and standardise components to reduce cost and speed up delivery.

**ACCELERATED INNOVATIONS**

**Fast-track innovative** capture technologies with lower energy intensities and greater efficiencies

**DIGITAL**

**Leverage UK expertise** in digital to create advanced MMV tools and optimise operations

## To achieve the required 50% reduction in blue hydrogen LCOH, imminent disruption is needed

*£1.60/kg is the target LCOH needed by 2030 for blue $H_2$ to be cost competitive*

### High Impact Technology Opportunities

**Raise existing Autothermal Reforming (ATR) efficiencies** through heat recovery and new auxiliary component designs

**EFFICIENCY**

**Rapidly develop pyrolysis** with improved catalytic performance to be a leader in blue hydrogen.

**DISRUPTIVE TECHNOLOGIES**

**Roll out modular production units in remote areas** to reduce midstream costs and increase penetration.

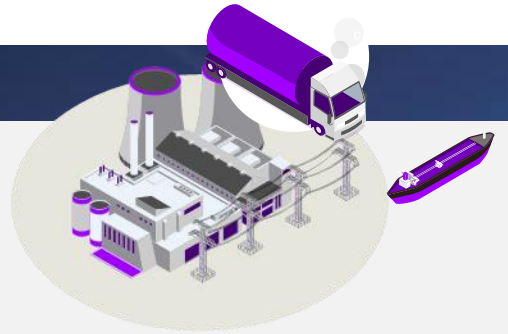
**MODULARITY**

# A robust midstream network is key to connect domestic and global markets

Leveraging technology to address:

## PACE

**By retrofitting infrastructure** with suitable materials fit for $H_2$ and $CO_2$ operating conditions



## NETWORK

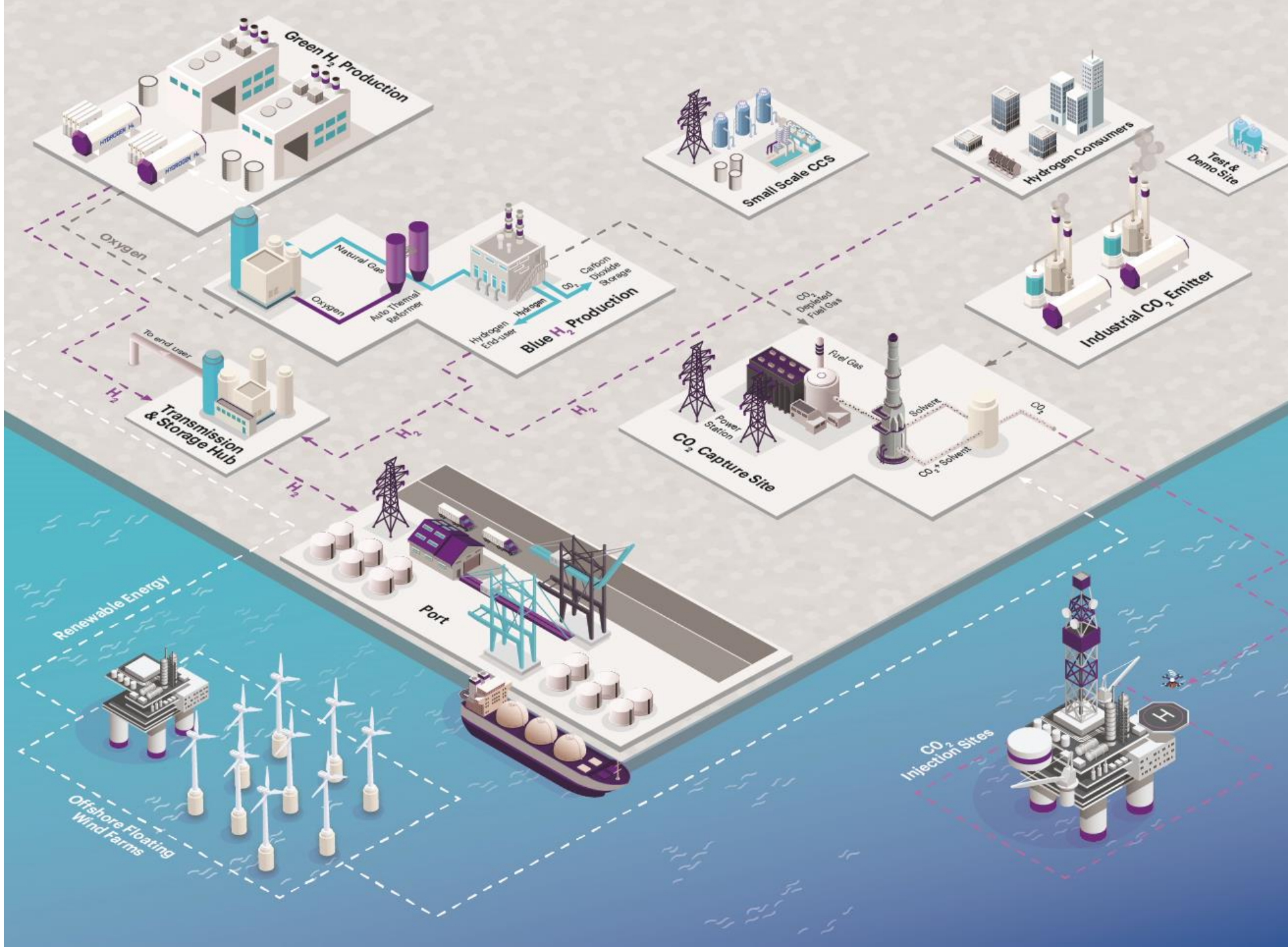
**By expanding the footprint** of pipelines, gasholders and salt caverns to enable flexibility and storage

## FLEXIBILITY

**By growing existing ammonia and methanol** production capability to use them as hydrogen carrier, providing alternatives to pipelines.

# The Future Integrated North Sea Eco-system

The road to Net Zero is complicated and requires all parts of wind, hydrogen and CCS to advance together

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