Oil & Gas Authority

OGA Bacton Energy Hub Launch

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Bacton Energy Hub

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Bacton is ideally positioned to become a significant hydrogen production site for London and the South East.

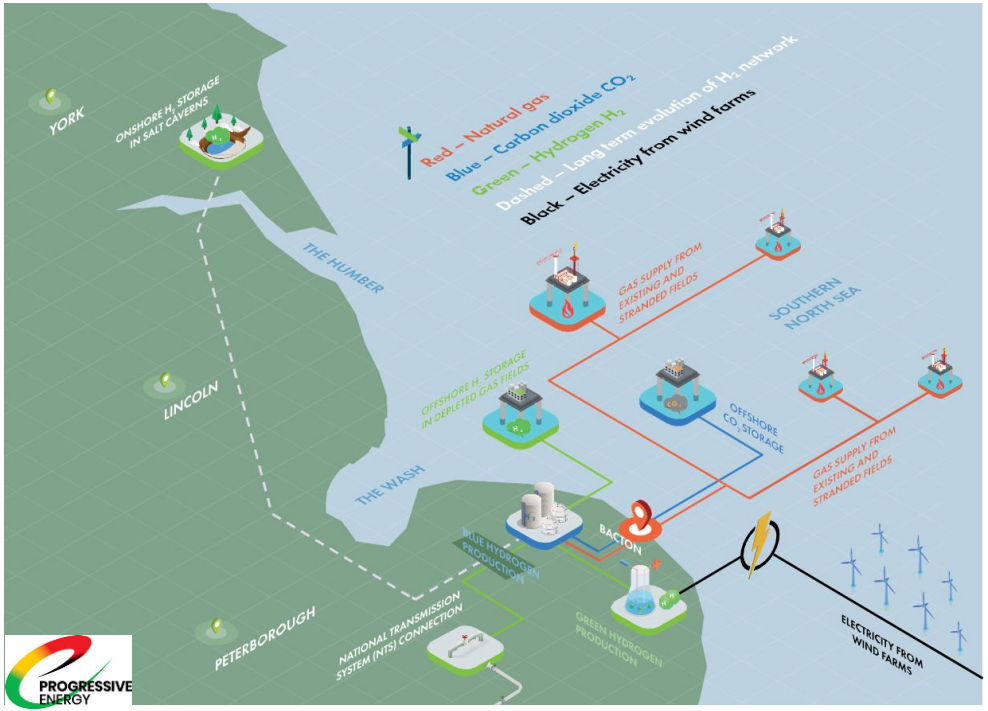

Figure 1: Bacton Catchment Area development

Close to market

CCS storage capacity

Infrastructure

Land

Skills

Supply chain

Bacton: A vision for the future

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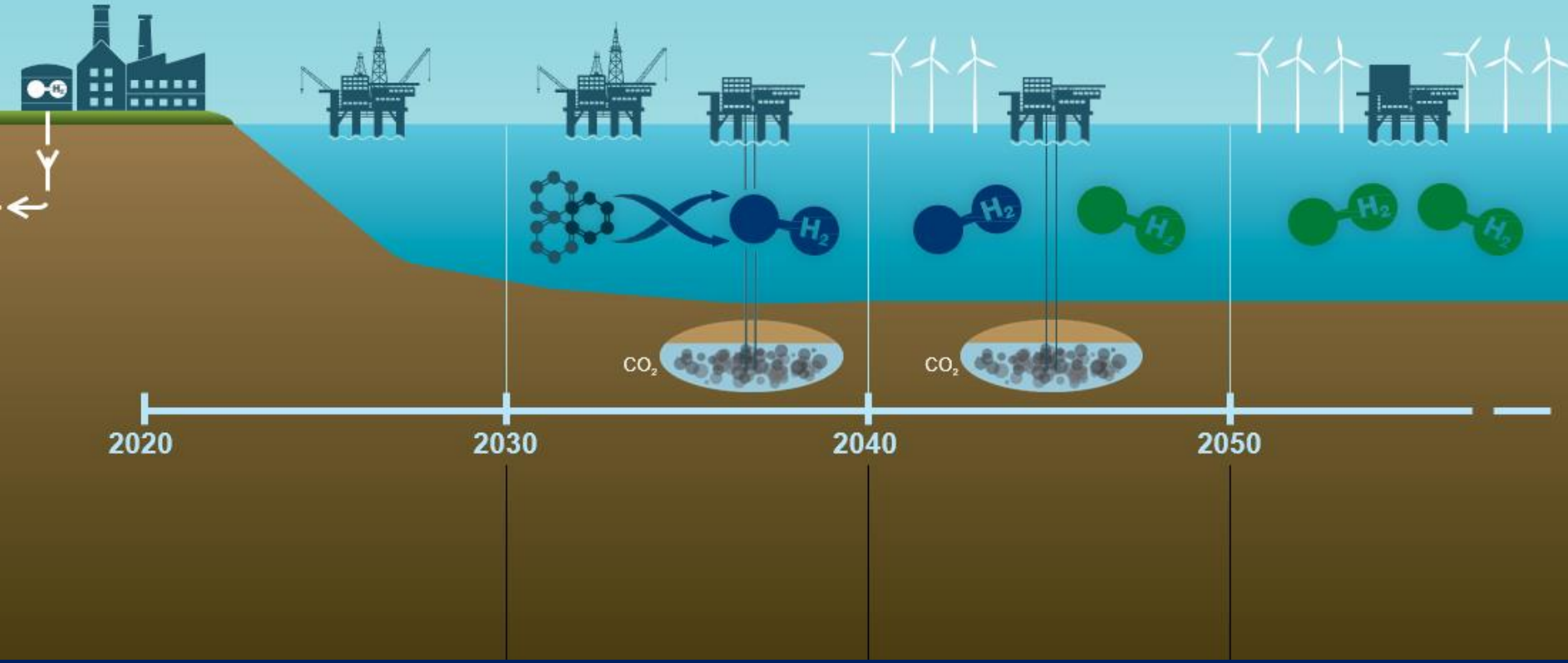

Utilising SNS hydrogen potential to support net zero

Value streams: Economic

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A credible value proposition exists from the development of a hydrogen led Energy Hub at Bacton.

Significant economic value

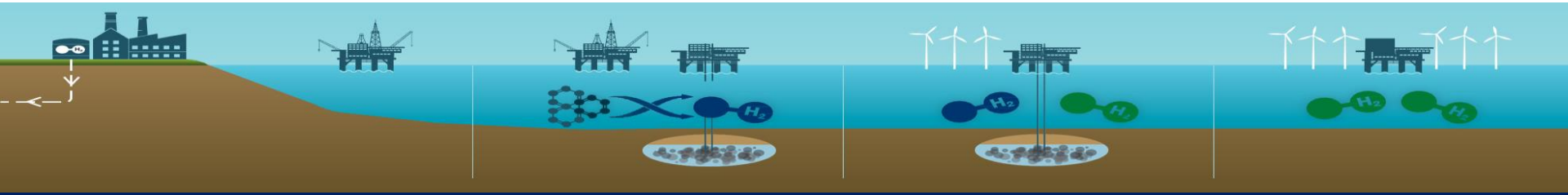
- Developing hydrocarbons as feedstock could unlock sizeable economic value.
- The value add from carbon abatement could be in the region of £1billion based on BEIS 2030 forecasts.
- Value from potentially undevelopable off-spec gas further adds to the economic potential.
- Redeployment of constrained wind power could result in a two fold increase in the total value unlocked from what would otherwise be wasted energy.

Incremental hydrocarbons

- Up to an estimated 2Tcf of additional demand.

Hydrogen demand

- Expected to increase from 8 TWH in 2030 to nearly 90 TWH in 2050 (circa 10GW).



An Energy Hub at Bacton could deliver significant value

Value streams: Net zero

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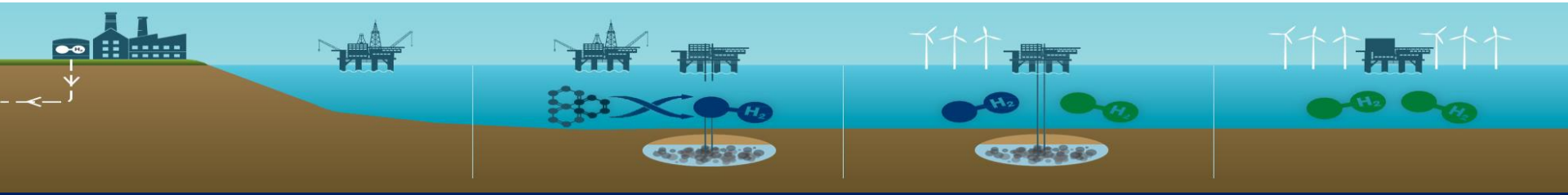
Pace

Key Bacton enablers could unlock the building of a sustainable hydrogen production hub in the nearer term:

- Hydrocarbon feedstock for a near term low carbon transition fuel.
- Hydrocarbon facilities, skills and supply chain capability.
- Access to wind power and proximity to a huge potential market.

Impact on achieving net zero

- Potential to meet all of the hydrogen demand across the Bacton Catchment Area.
- Fuel switching to hydrogen could reduce CO_2 emissions by as much 18 MtCO2/yr by 2050.
- Decarbonising indigenous hydrocarbon production will avoid associated carbon emissions from fuel imports.
- Redeployment of installed wind power for use as a storable dispatchable energy source.



Hydrogen production at Bacton could have a key role to play in the UK's net zero ambitions

Value streams: Close to markets

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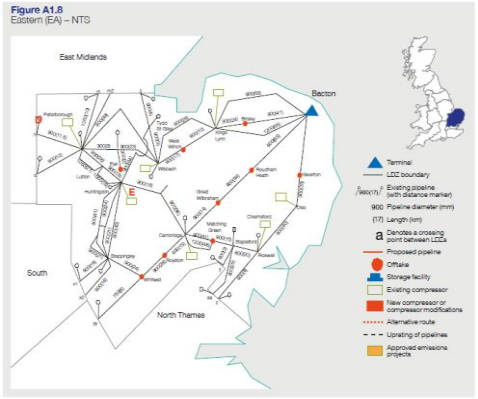
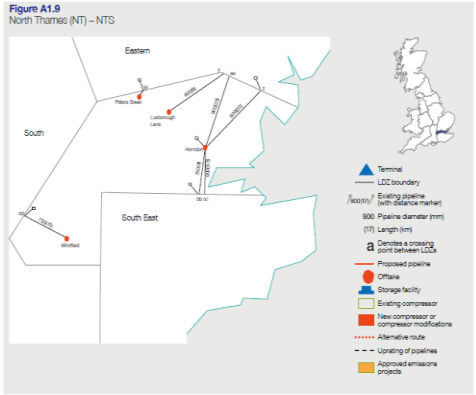
Access to domestic and international transmission systems is a key value driver:

- Bacton has five National Transmission System feeders; and
- Bacton also has two interconnectors connecting the terminal to mainland Europe.

Eastern NTS



North Thames NTS



Interconnectors

Bacton is ideally located to power to London and the SE of England

Value Stream: CCS carbon storage capacity

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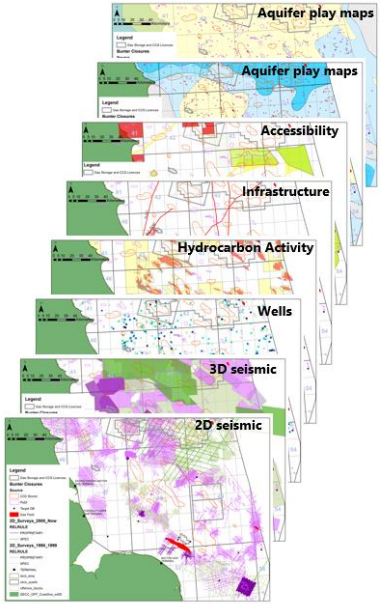
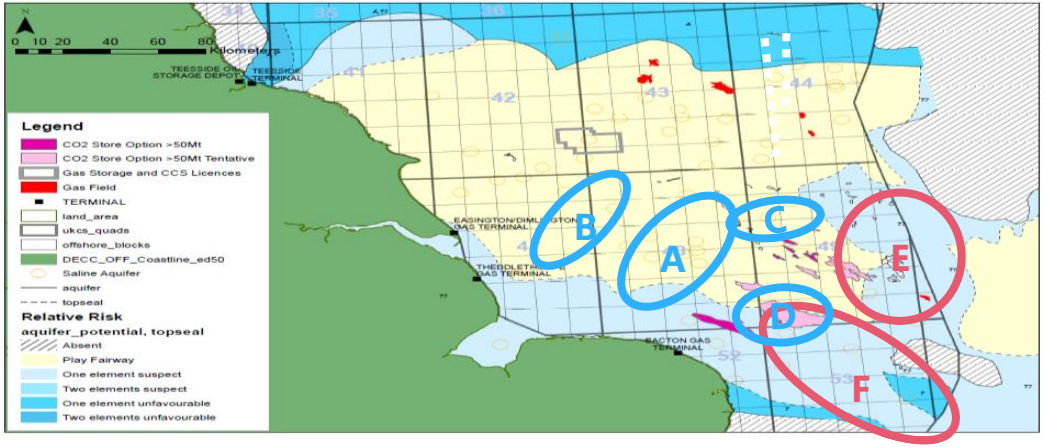
UKCS wide regional carbon storage evaluation is being undertaken by the OGA to inform future licensing activity.



Qualitative scoping level analysis has identified a number of potential storage opportunities in the Bacton Catchment Area (lettering is not indicative of preference).



Opportunities identified are a combination of either Bunter aquifer closures, stacked Bunter and Rotliegend aquifers, or a combination of aquifers with additional depleted field potential.

CO2 storage potential exists to enable low carbon blue hydrogen production

Value Stream: Infrastructure

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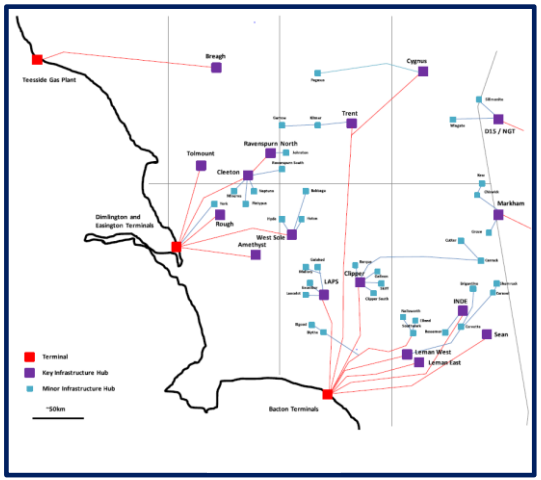
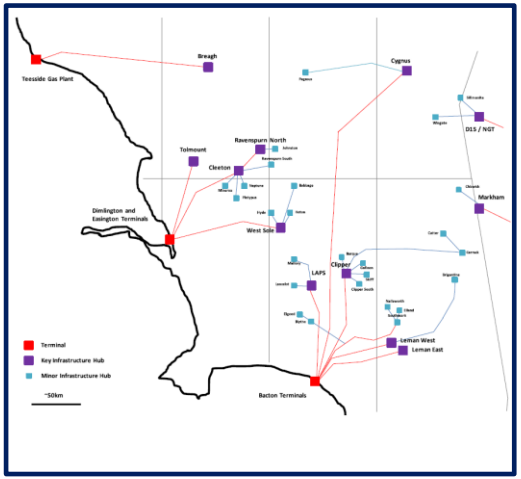
The is a limited window to seize the opportunity that regional infrastructure could offer:

- A hydrogen hub has the potential to unlock life extension(s) for key infrastructure of up to a decade.

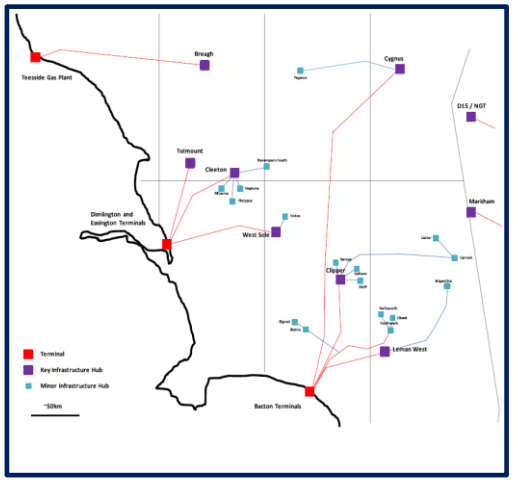
2020 - 2025



2025 - 2030



2030 - 2035



Existing SNS infrastructure could be a key enabler to realising hydrogen production at Bacton

Value stream: Land

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- Brownfield land adjacent to the Bacton terminal for development of hydrogen production facilities.
- Undeveloped land west of Bacton may offer future scaling up potential.
- 165,000m^2 could accommodate up to three 355 MW (3 TWh/yr output) blue hydrogen plants.

Bacton can accommodate hydrogen production

Value stream: Skills and supply chain

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Skills Retention

- Existing established skilled workforce.
- Maintenance of the current skilled work force through the development of an Energy Hub.

Knowledge development

- Future transferable skills for workers.

Supply Chain

- Established O&G Supply Chain to be leveraged for the production on blue hydrogen.
- Stimulation of the local hydrogen industry and expanding existing supply chain

Technology

- Blue hydrogen could provide a near to mid term entry point, enabling maturation of a cost competitive at scale green hydrogen in the longer term.

Hydrogen expertise developed at Bacton could be deployed at home and abroad

Value stream: Feedstock

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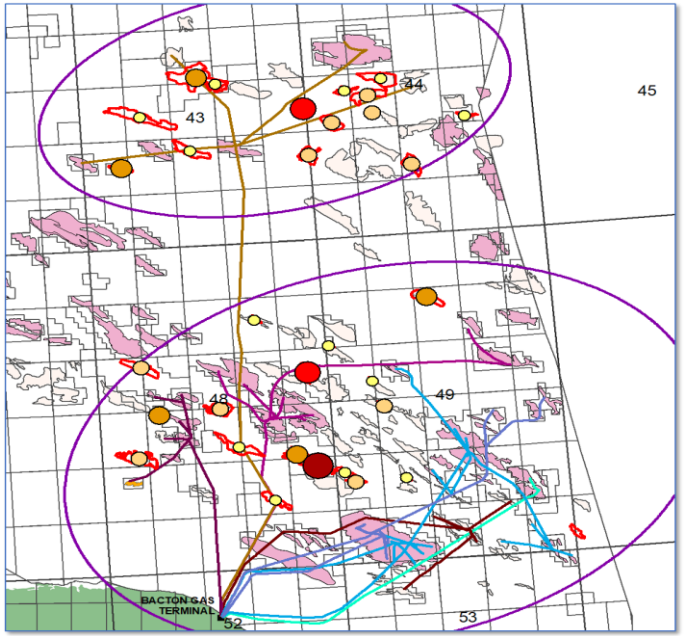
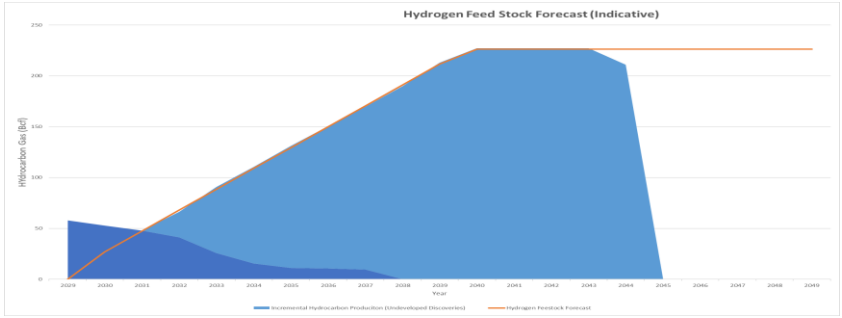
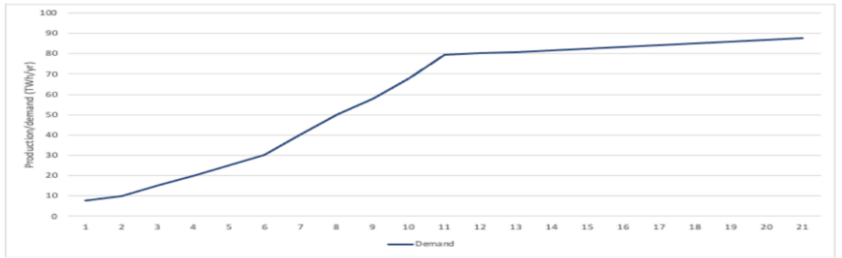
The current annual hydrocarbon gas demand in the Bacton Catchment Area equates to CO_2 emissions of c.23.4Mt/yr.



Regional undeveloped hydrocarbons could provide feedstock into the mid 2040's and in conjunction with CCS help to decarbonise this energy by a reduction in emissions of up to 70%





Hydrogen demand growth (indicative)

Hydrogen could unlock incremental hydrocarbon production

Area Plan

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Rationale

- Bacton has not been categorised as an industrial cluster.
- A cohesive approach to Bacton is needed to achieve MER and ensure longevity to the area.
- Unlocking the remaining hydrocarbon potential whilst integrating renewable energy opportunities.
- **Risk:**
  - Bacton No Further Investment hydrocarbon forecast will limit the energy potential from hydrogen.
  - Failure to ensure sufficient pace will erode the potential value outcome.
- **Opportunity:**
  - Development of regional hydrocarbons could increase the hydrogen potential ten fold.

Objective

To develop a Bacton Energy Plan that ensures a cohesive and collaborative future for the area, by:

- Framing the value proposition.
- Catalysing collaboration.
- Establishing a robust and complementary late life strategy for the Bacton area assets.
- Identifying MER development scenario(s).
- Having plans in place by 2023 to develop economically recoverable resources in the area.
- Informing future potential cluster licencing rounds; i.e., gas for hydrogen.
- Have one or more new fields on-stream, using appropriate infrastructure before 2025 (indicative date).
- Executing CCS permits.

Area Plan focus will deliver collaboration

Energy Hub Governance

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Expectations

- 5 Special Interest Groups (SIGs):
  - Hydrogen demand
  - Hydrogen supply
  - Infrastructure
  - Regulatory
  - Skills and technology
- Over arching Steering Group.
- Kick off meeting will be held with the SIGs and a calendar of meetings agreed for the first year.
- Establish a working consortium which is in a position to invest.
- Ready to be up and running by 2030.

SIG participation

- Draft Terms of Reference will be developed for each SIG.
- Each SIG will be expected to take ownership of the workstreams and deliverables.
- Participants are expected to make a clear commitment to executing workstreams.
- Relevant parties will be able to express their interest for the SIGs.

SIG workstreams

- **Hydrogen demand:** NTS engagement, local market opportunities, and necessary business models.
- **Hydrogen supply:** Blue and green, collaboration with pink, CCS storage opportunities, and hydrocarbon feedstock development scenario(s) and achieving MER.
- **Infrastructure:** Onshore and offshore requirements (including terminal(s)), protection / life extension, re-use, and blending.
- **Regulatory:** Blockers and enablers for project development.
- **Skills and technology:** Developing the competence and capabilities, and supply chain opportunities.

Strong governance is required to ensure pace is maintained

Next Steps

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Below are the key short term areas of focus required to take this project forward:

- Anonymised question and answers will be published.
- Questionnaire will be issued to attendees.
- Draft SIG Terms of Reference issued.
- SIGs and Steering Group kick-off session.
- SIGs short term goals and participants will be announced
- SIGs to define and agree workstream activities.

Contact Bactonenergyhub@ogauthority.co.uk with any follow up questions

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Thank you