



North Sea
Transition
Authority

Delivering Carbon Storage on the UK Continental Shelf

The NSTA's role in regulating and stewarding activity at pace and scale.

Matt Farris

13 September 2023

© NSTA 2022

This presentation is for illustrative purposes only. The NSTA makes no representations or warranties, express or implied, regarding the quality, completeness or accuracy of the information contained herein. All and any such responsibility and liability is expressly disclaimed. The NSTA does not provide endorsements or investment recommendations.

The North Sea Transition Authority is the business name for the Oil & Gas Authority, a limited company registered in England and Wales with registered number 09666504 and VAT registered number 249433979. Our registered office is at 21 Bloomsbury Street, London, United Kingdom, WC1B 3HF.

Enhanced CCS roles & responsibilities

Licensing and permitting authority for offshore carbon storage

Stewardship of issued carbon storage licences

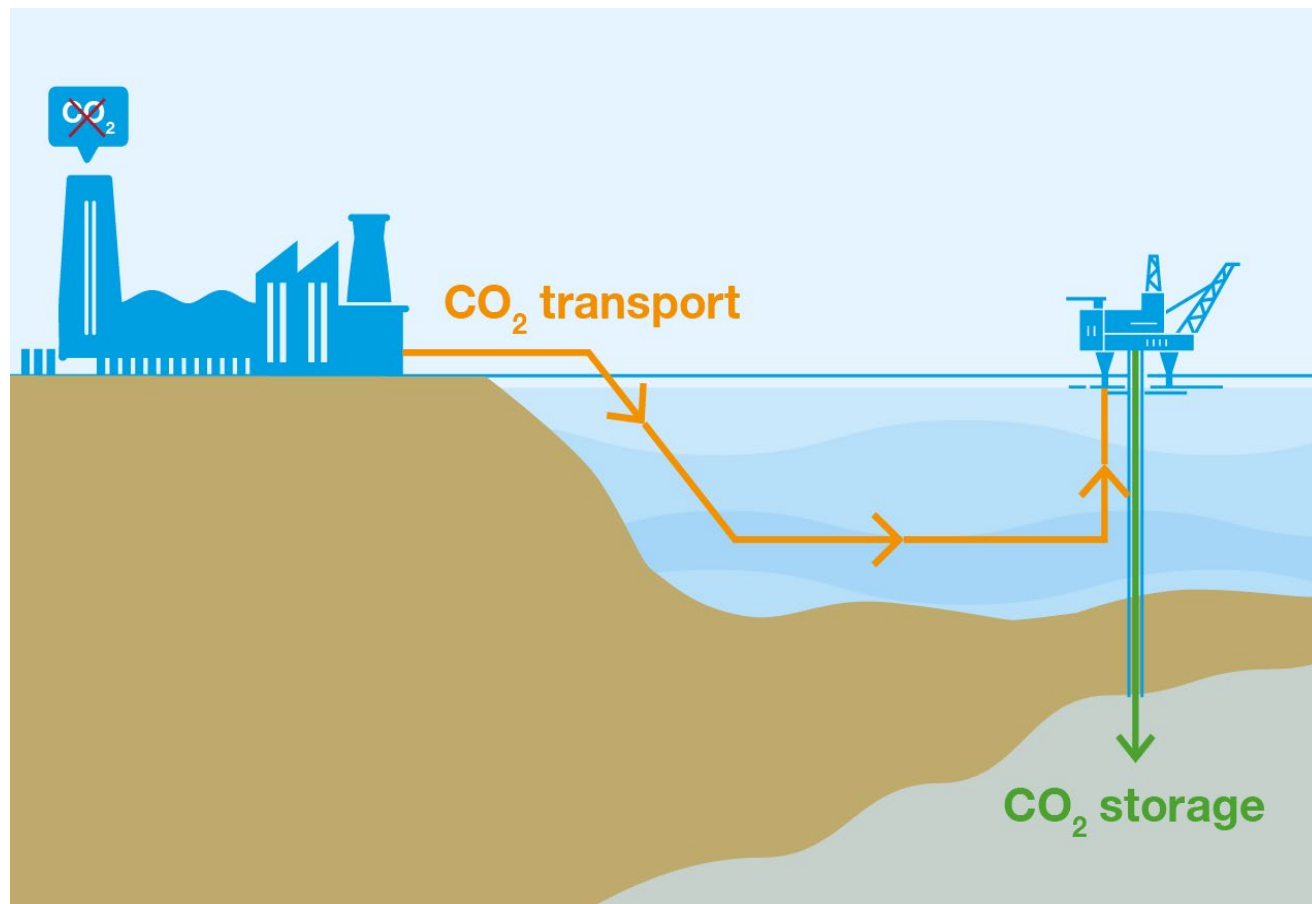
Collaboration with other key external bodies, including on spatial co-location and co-ordination

Technical expertise to build portfolio of **carbon storage opportunities**

Consultee to OPRED on operators' decommissioning plans

Provide **advice and expertise** to government and collaborate with other regulators in support of CCS policy and regulatory development

Maintain **carbon storage public register**



78
GtCO₂

total UKCS CO₂ storage
resource estimate

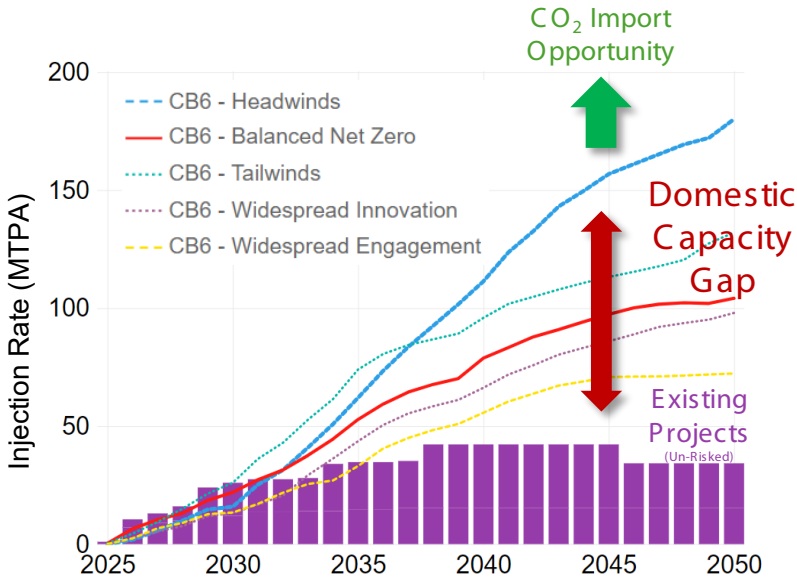
75-175
MtCO₂

CCC estimate of annual
requirement in 2050

20-30
MtCO₂

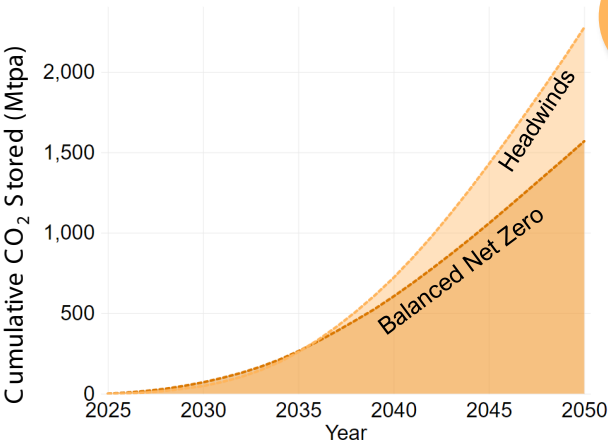
UK govt 2030 annual
target

Carbon storage potential and activity

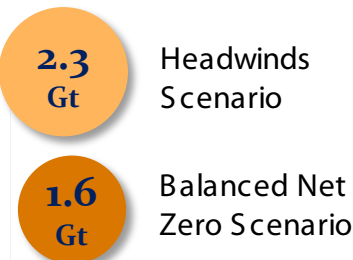


Note that existing projects represent a mix of depleted field and aquifer stores

CCC Carbon Budget 6 Targets



Cumulative Target Volume Stored by 2050

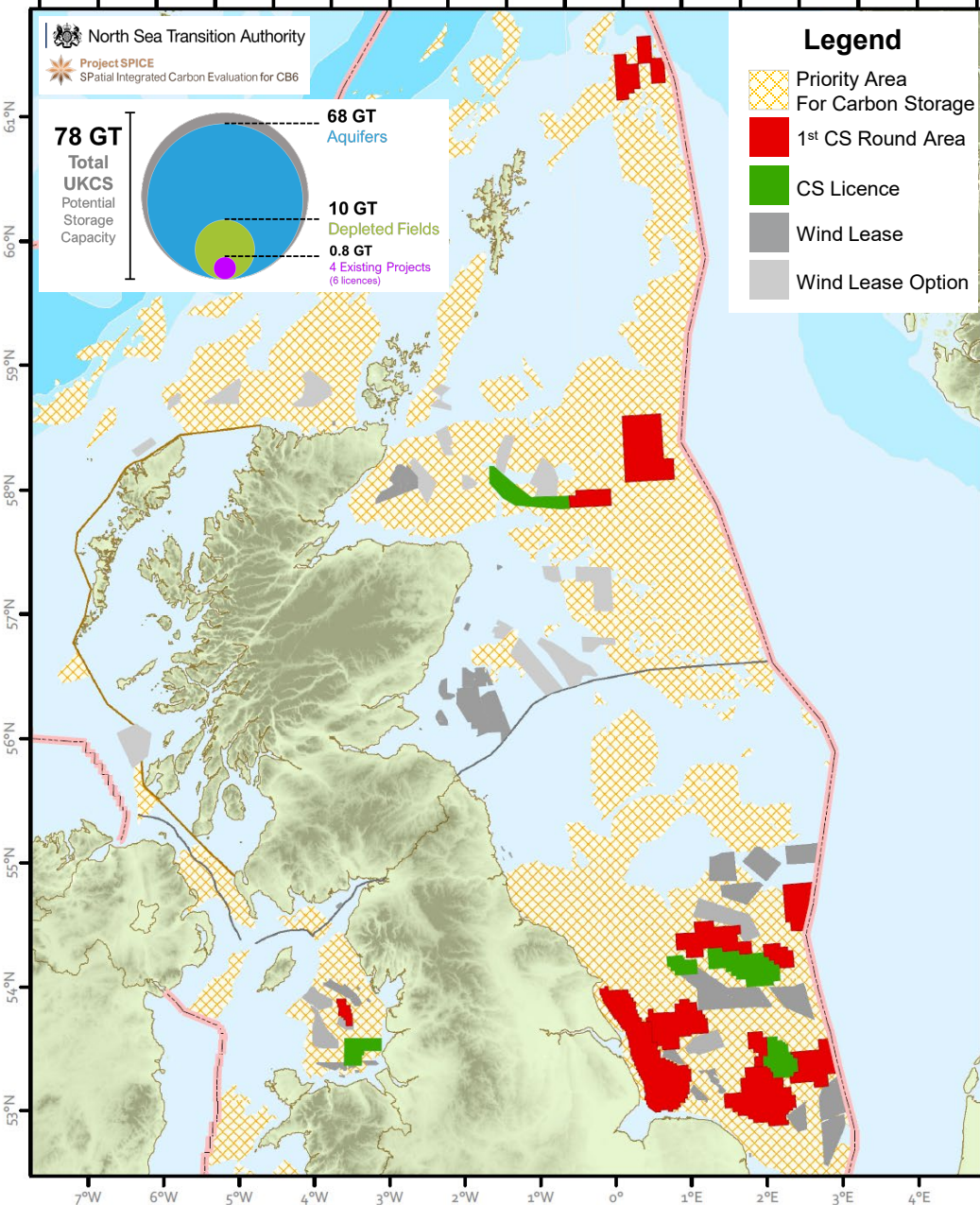
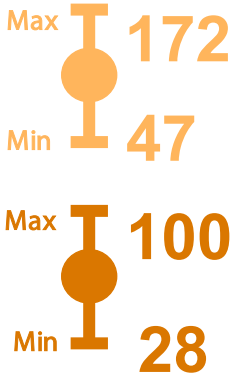


UK targets require Pace and Scale.

By 2030, deliver 4 CCUS clusters with 20-30 MtCO₂/year 'Capacity' (including 6 MtCO₂/year of industrial emissions capture)
50 MtCO₂/year by 2035

More projects required to meet targets post 2030s

Estimated Number of Appraised Stores to meet 2050 Targets



NSTA CCS role: activity

Working with government and industry

Supporting government and others to identify infrastructure with reuse potential for CCS or hydrogen projects

Guiding and stewarding developers and applicants through NSTA processes

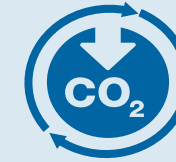
Engaging with CCS project developers

NSTA Digital Energy Platform

NSTA, incl. through its National Data Repository, collects, holds and shares CCS relevant data – seismic, wells, etc. – and publishes data packages to support and promote licensing rounds

Interactive app mapping all UKCS energy sites – O&G infrastructure, wind, cables, CCS

Current project identifying CCS data gaps on regional basis



Progress

As of August 2023
the NSTA:

- is **stewarding 6 carbon storage licences** across 4 projects towards storage permit application and first CO₂ injection
- has **awarded 5 carbon storage licences**, and **extended duration of two carbon storage licences**
- In 2022 the NSTA commenced a nominations process and in response to nominations, opened the **UK's first ever carbon storage licensing round**
 - 13 offered areas
 - 26 applications received
 - successful applications from 13 companies

NEP, Teesside



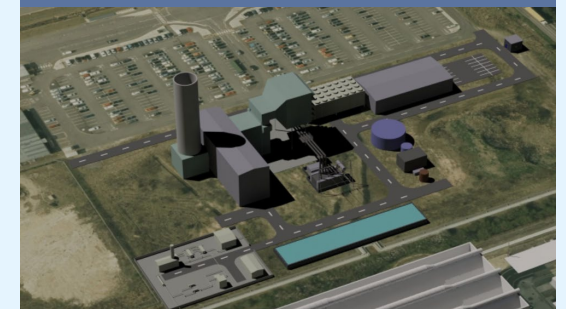
HyNet, North West England



Acorn, St Fergus



Viking CCS, Immingham





North Sea Transition Authority

UK 1st Carbon Storage Round Offers of Award Announcement

21 Licences Offered for Award
Covering ~12,000 km²
Awards in all offered areas

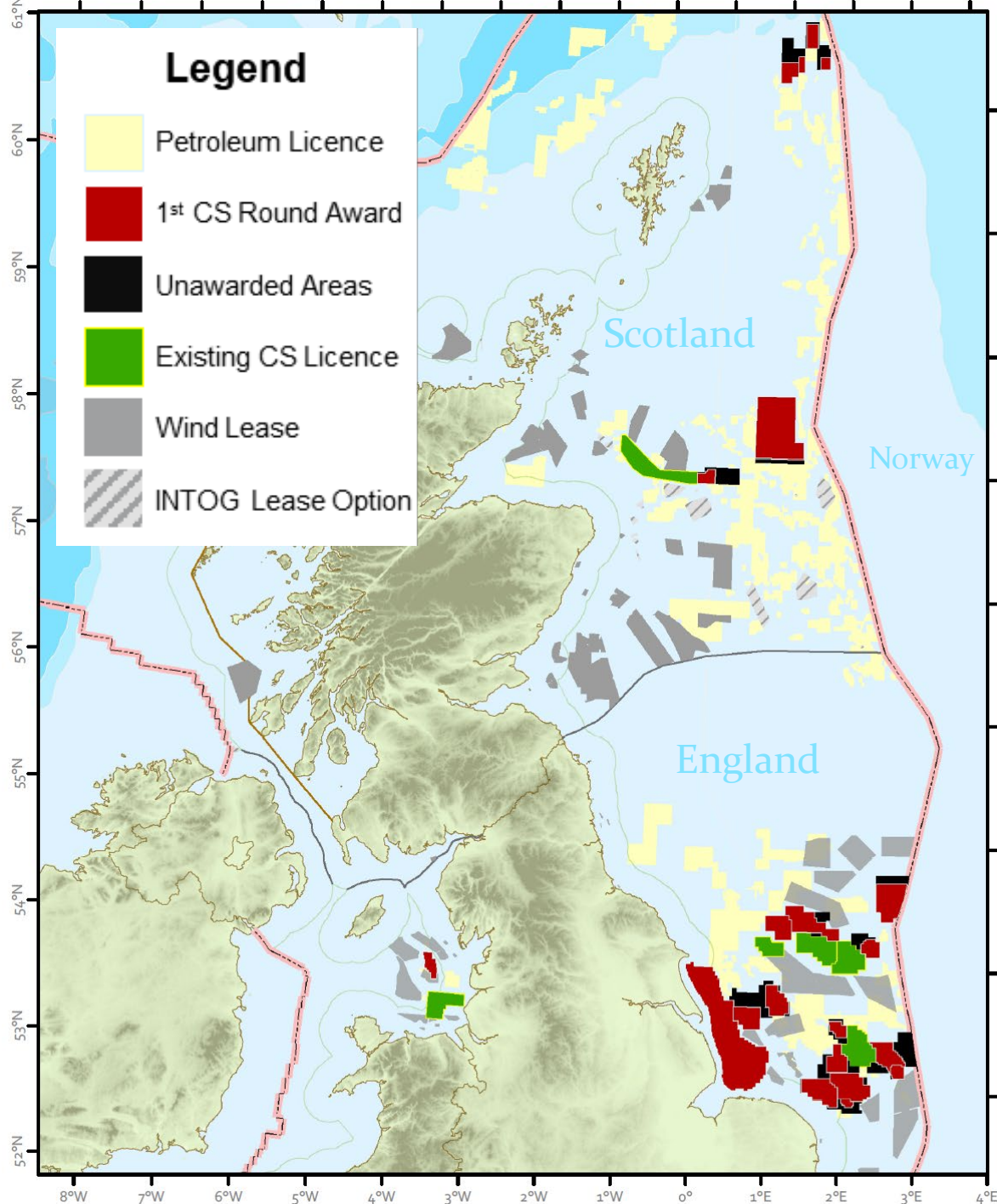
Diversified Portfolio (Aquifers & Depleted Fields).
Some projects potentially injecting before 2030.

Key Success Metrics

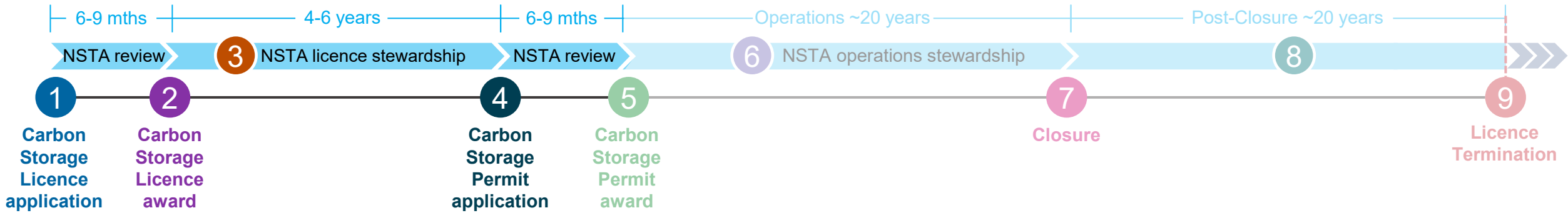
Based on accepted final offers:

- 5 Firm Wells/Tests (9 Contingent)
- 4 Firm Seismic Shoots (5 Contingent)
- Additional reprocessing and studies commitments

Expectation that licensees will work collaboratively with each other, and with marine users from other sectors.



Carbon Storage: from licence to permit



1 Carbon Storage Licence application

NSTA reviews

- **Work Programme** – activities to get from licence to storage permit, e.g.
 - seismic data acquisition
 - drilling of appraisal wells
 - commercial agreements
 - risk assessments
 - development plans
 - plan for storage site characterisation
 - monitoring plans
 - corrective measures plans
- **Financial information** to assess financial viability and financial capacity to complete work programme

2 Carbon Storage Licence award

Licence gives exclusive access to explore and appraise (with a lease from The Crown Estate/Crown Estate Scotland) a licensed area, and later apply for a storage permit

Licence includes

- **Work Programme** – legally binding plan to submit storage permit application within Appraisal Term (~4-6 years)
 - NSTA reviews progress against Work Programme elements

3 NSTA Licence Stewardship

NSTA stewards work programmes and licensees towards carbon storage permit

Regular NSTA-licensee engagement to identify and mitigate technical and commercial project risks, e.g.

- CO₂ containment risks
- plans for building, operating, closing and decommissioning related infrastructure
- spatial co-location issues
- commercial alignment between parties
- formation of Joint Ventures

4 Carbon Storage Permit application

NSTA reviews

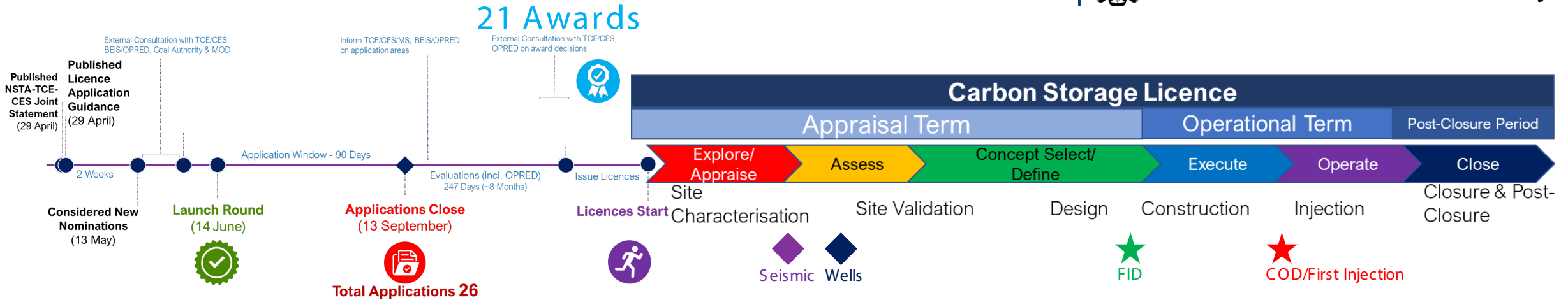
- Plans and information, including
 - development strategic goals
 - suitability of operator
 - location of storage site
 - co-location issues mitigation
 - quality and quantity of CO₂ to be stored
 - plans for monitoring and correcting CO₂ leakage
 - reporting obligations
 - storage site closure/decommissioning
 - proposed capital and operating cost estimates and profiles
 - financial information
 - financial security arrangements

Licence Timelines

Official – Sensitive - Commercial



North Sea Transition Authority



Key Work Programme Elements:

E&A Phase

- Early Risk Assessment
- Initial Site Characterisation
- Seismic
- Wells/Tests
- Preliminary Above Ground Assessment

Assess Phase

- Final Site Characterisation
- Risk Assessment
- Monitoring (MMV) and Corrective Measures Plan
- Development Plan
- Financial Security Assessment

Define Phase

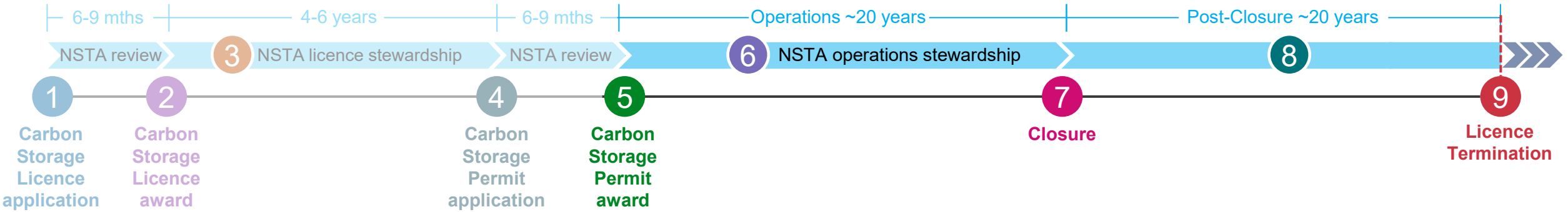
- Storage Permit Application Submission
- Development Plan
- MMV & CM Plan
- Provisional Closure & Post-Closure Plan
- Financial Security

Carbon Storage Permit

- Risk Assessments
- Development Wells
- Well Plugging & Abandonment
- Repeat Monitoring
- Closure & Post-Closure Plan

- NS TA published guidance on Applications for a Carbon Storage Permit.
- NS TA will publish further detailed guidance on deliverables / Expectations.

Carbon Storage: post permit



5 Carbon Storage Permit award

Allows permit holder to store CO₂ in site

NSTA awards permit when satisfied that

- storage complex and surrounding area sufficiently characterised and assessed
- there is no significant risk of leakage or harm to environment or human health
- operator is technically competent and has financial situation sufficient to carry out its duties
- operator will provide financial security sufficient to cover obligations under permit
- proposed facilities in development plan will achieve goals

6 Operations

First CO₂ injection

NSTA

- stewards operations, reviews monitoring and reporting information, considers changes needed to permit or further action
- can enforce remedial measures and transfer operatorship
- tracks performance and cost metrics for inclusion in benchmarks
- ensures compliance with CCS licence conditions/clauses

7 Closure

Permit holder applies to NSTA for authorisation to stop injection and close site, in line with Storage Permit provisions outlined in the Storage Permit

Storage site closure requires NSTA approval of post-closure plan

8 Post-Closure

Storage Permit holder will decommission asset

Significant monitoring and verification to ensure no significant risk of leakage

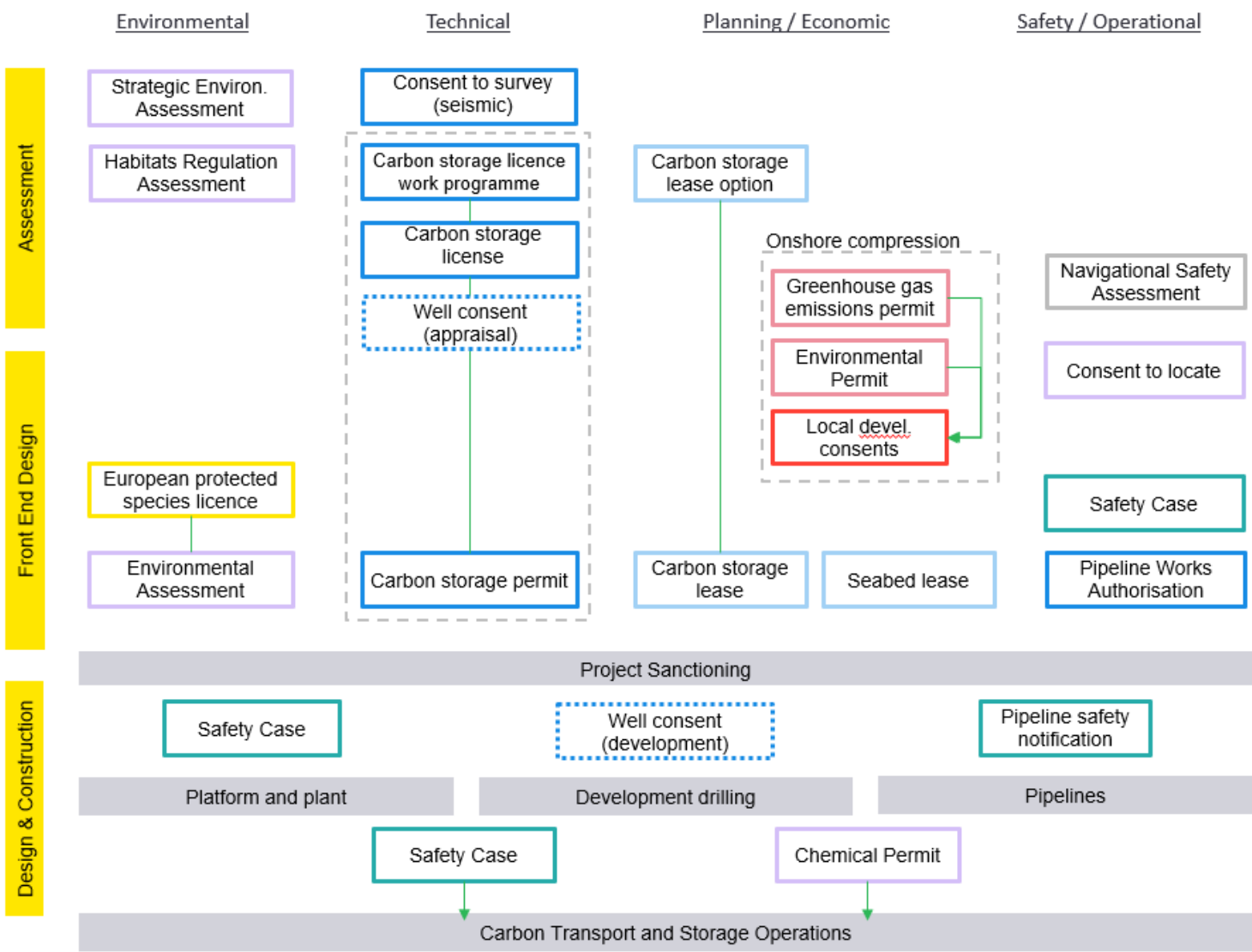
9 Licence Termination

When all obligations under licence and storage permit are completed, the appropriate Minister may accept liabilities inherent the licence

NSTA terminates licence

Liabilities transfer to SoS

Carbon transport and storage: high level regulatory map



- As part of the NSTA-led Energy Integration Project*, the NSTA mapped out key consenting and regulatory steps for selected energy integration technology concepts, including carbon transport and storage
- For carbon transport and storage, the storage licensing framework is well under development, with good coordination between the NSTA, The Crown Estate/Crown Estate Scotland, OPRED and DESNZ
- There are specific areas in the management of licences and leases which are being addressed, or where further clarification may be required, e.g. in relation to consenting to later project phases, or clarifying specific aspects of wells consenting, pipelines, operations, safety, decommissioning

* *Note: Ofgem will issue economic licences for carbon transport and storage companies – not reflected on this slide*

1) MMO – Marine Management Organisation, NRW – Natural Resources Wales, PINS – Planning Inspectorate National Schemes, SEPA – Scottish Environmental Protection Agency

2) OPRED (Offshore Petroleum Regulator for Environment and Decommissioning) is responsible for environmental consenting for offshore O&G operations

	TCE / CES
	Marine Directorate/MMO/NRW
	DESNZ / PINS
	North Sea Transition Authority
	Health and Safety Executive
	Local and Harbour Authorities
	Environment Agency / SEPA
	OPRED ²

Disclaimer: This map is illustrative of the process for consenting and licensing projects, and as such it should not be relied upon.

NSTA current co-location initiatives

- NSTA Project SPICE (Spatial Integrated Carbon Evaluation for CB6)
 - Mapping UKCS storage potential and capacity estimation; develop a comprehensive, evidence-based understanding of the subsurface characteristics, opportunities and challenges associated with CO₂ storage on the UKCS
- Providing technical expertise to DESNZ 'BOOST' (Best Opportunities Of Storage) initiatives
 - BOOST 2 – develop coordinated approach to accelerating appraisal activities to meet government targets
- TCE Offshore Wind/CCS Co-location Forum
 - NSTA leading multiple workstreams on CCS MMV near offshore wind farms, including exploring alternative seismic technology to reduce spatial conflict - completion Q3 2024
 - NSTA supporting new projects on simultaneous operations and demonstrating co-location
- Defra Marine Spatial Prioritisation (MSPri) programme
 - NSTA providing spatial data and expertise to all workstreams
- Scottish Spatial Planning Initiatives
 - Working with CES and Marine Scotland, including input into NMP2
- NSTA digital and data services
 - Ongoing development of applications, data and map services to facilitate and support CCS activity (e.g. Energy Portal enhancements)

