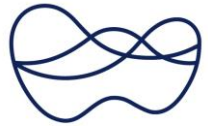
MEDWAY HUB CAMELOT CCS PROJECT

NG Grain LNG terminal

Project Development Companies

SynergiaEnergy

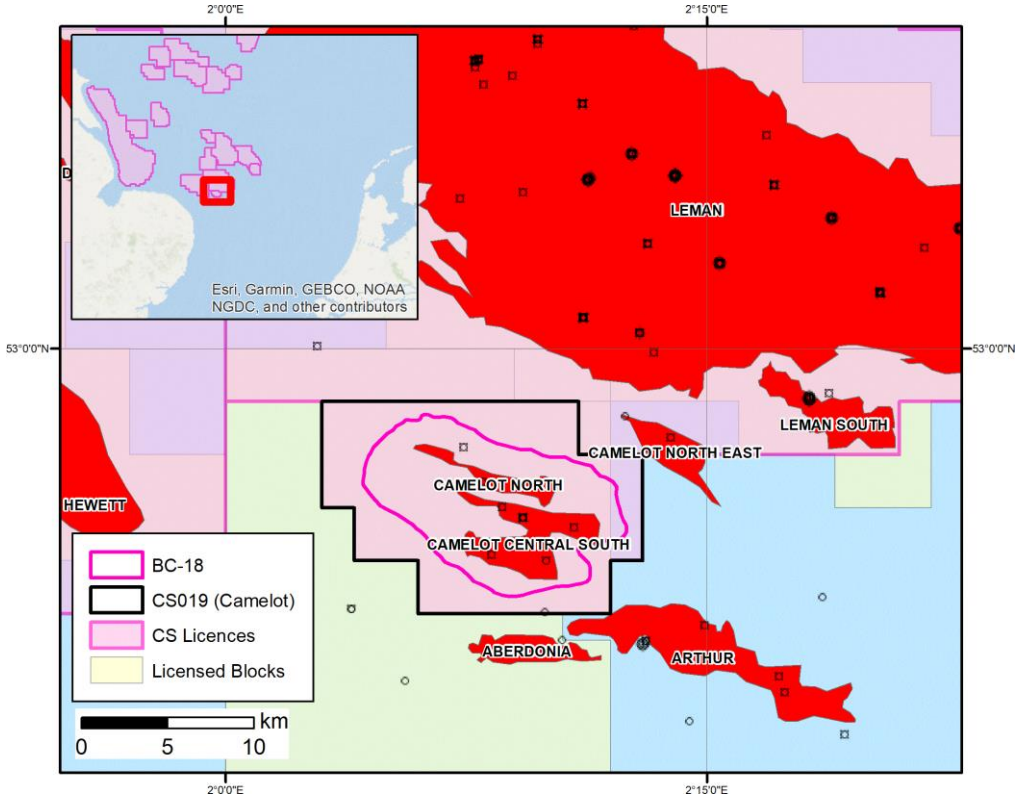
- Originator of Medway Hub CCS concept, initially tailored connect the Medway emitter cluster to the Esmond-Forbes offshore carbon storage sites
- In-depth experience of the Synergia management team concerning gas storage in the UK. Three of the Synergia team were instigators of the last commercial gas storage facility to be built in the UK – the Humbly Grove gas storage facility in Hampshire
- The same three team members were founders of Star Energy, which in addition to oil and gas production and power generation, became a leading gas storage development company. Star Energy studied most of the UKCS depleted reservoirs for gas storage suitability and had multiple gas storage projects under development
- Strategy is to initiate and develop CCS projects and have recently introduced the Cambay CCS Scheme based on its Cambay gas field in Gujarat State, India.

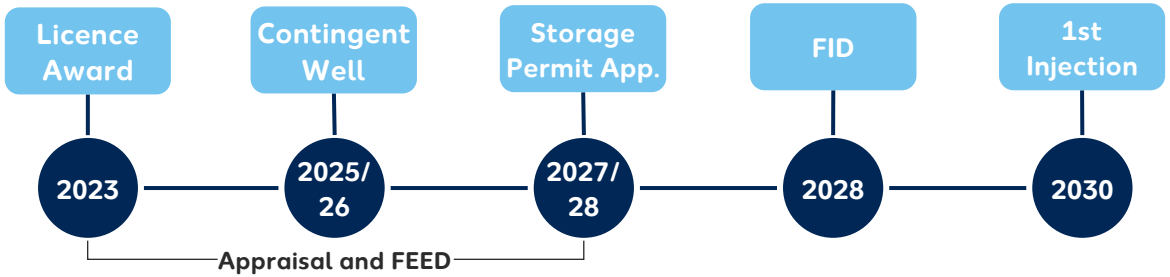


wintershall dea

- Transforming from the leading European independent Gas and Oil company into a leading European independent Gas and Carbon Management company
- Supports global decarbonization efforts by building up a business to potentially abate 20-30 million tons of CO_2 per annum by 2040
- One of frontrunner CCS companies in NW Europe in terms of active licenses: 2 in Norway, 1 in Denmark, 2 in UK
- UK, especially the SNS, is one of the focus countries in CCS strategy
- Created a dedicated Carbon Management & Hydrogen department, with access to the full corporate technical/non-technical resource pool
- Dedicated UK team to mature existing projects and new opportunities
- Fully funded to mature CCS projects through the early phases via its own cash position / free cash-flow

Camelot Licence





- Located c. 25-30 km off the coast of Norfolk in the east of England, the license area has been named "Camelot" based on the depleted Camelot gas fields
- Licence covers Blocks 53/01 & 53/02 of the UKCS and is approx. 68 km^2 in size
- Contains depleted Rotliegend gas fields, Camelot Central-South and Bunter Closure 18 (BC-18), which is a saline aquifer
- Synergia Energy CCS Limited ("Synergia") and Wintershall Dea Carbon Management Solutions UK ("WDCMS UK") were awarded the licence on a 50:50 basis in August 2023
- Synergia is the designated operator in the Appraisal Term
- Work program will initially focus on further technical and commercial evaluation and de-risking of the storage asset. Contingent on results this could lead to the drilling of an appraisal well, followed by a FEED study and the application for a Storage Permit
- Storage capacity of ~60-100 Mt with yearly injection rates above 5 Mtpa

CAMELOT MILESTONES

PARTNER SETUP
- Synergia Energy (50%, operator)
- WD (50%)

STORAGE PLAY
- Camelot (depleted gas fields)
- BC-18 (saline aquifer)

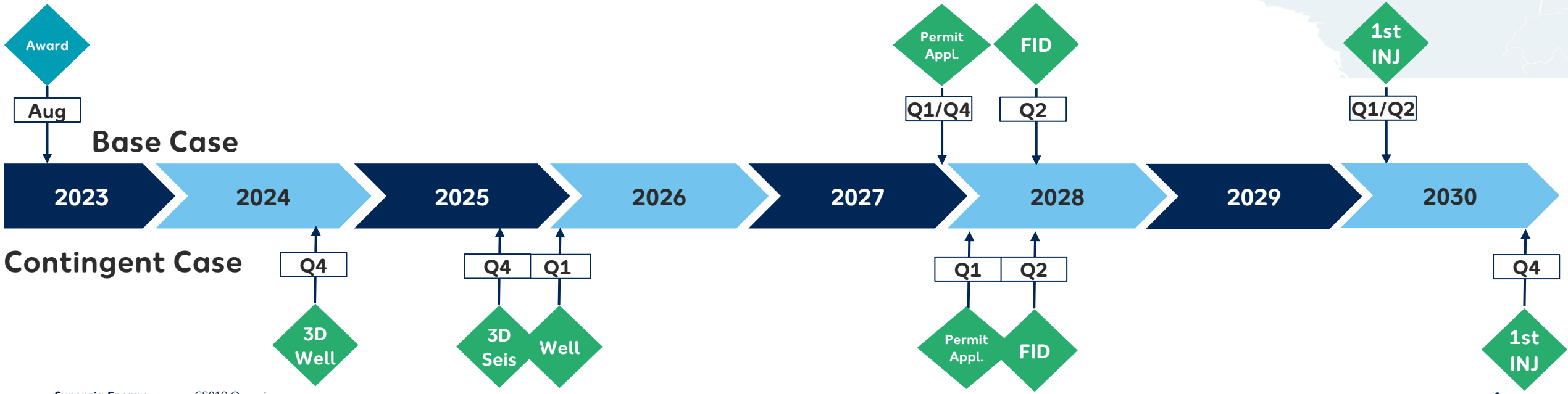
LICENCE AWARD / DURATION
- Aug 2023
- 5 years (Appraisal Term)

CO_2 STORAGE CAPACITY
- Gross: 66 - 95 Mt

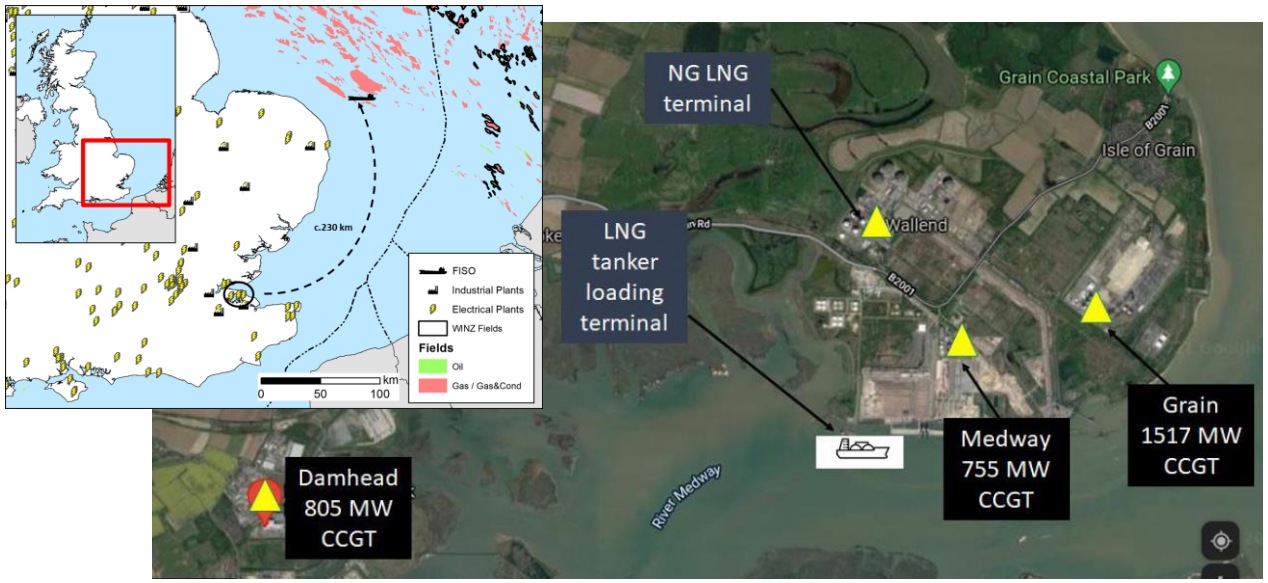
CO_2 INJECTIVITY (GROSS)
- c. 6.5 Mtpa

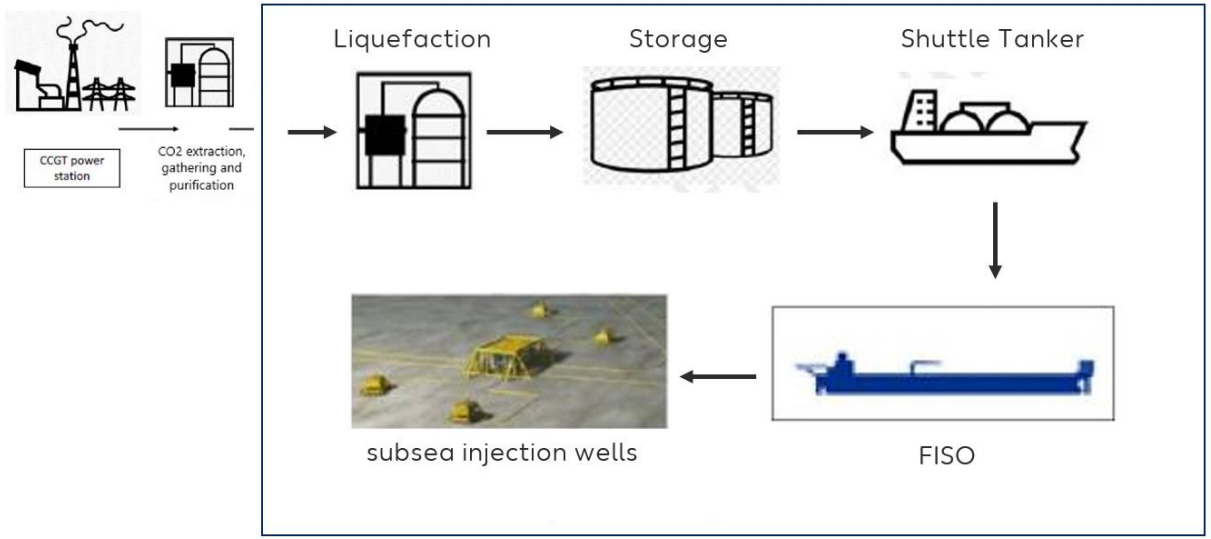
TRANSPORTATION MODE
- Shuttle tanker concept with a dedicated FISO favoured, but further options are being assessed

WORK COMMITTMENTS:
- Firm: Desktop studies, seismic reprocessing
- Contingent: New 3D seismic survey, appraisal well + injectivity test, FEED



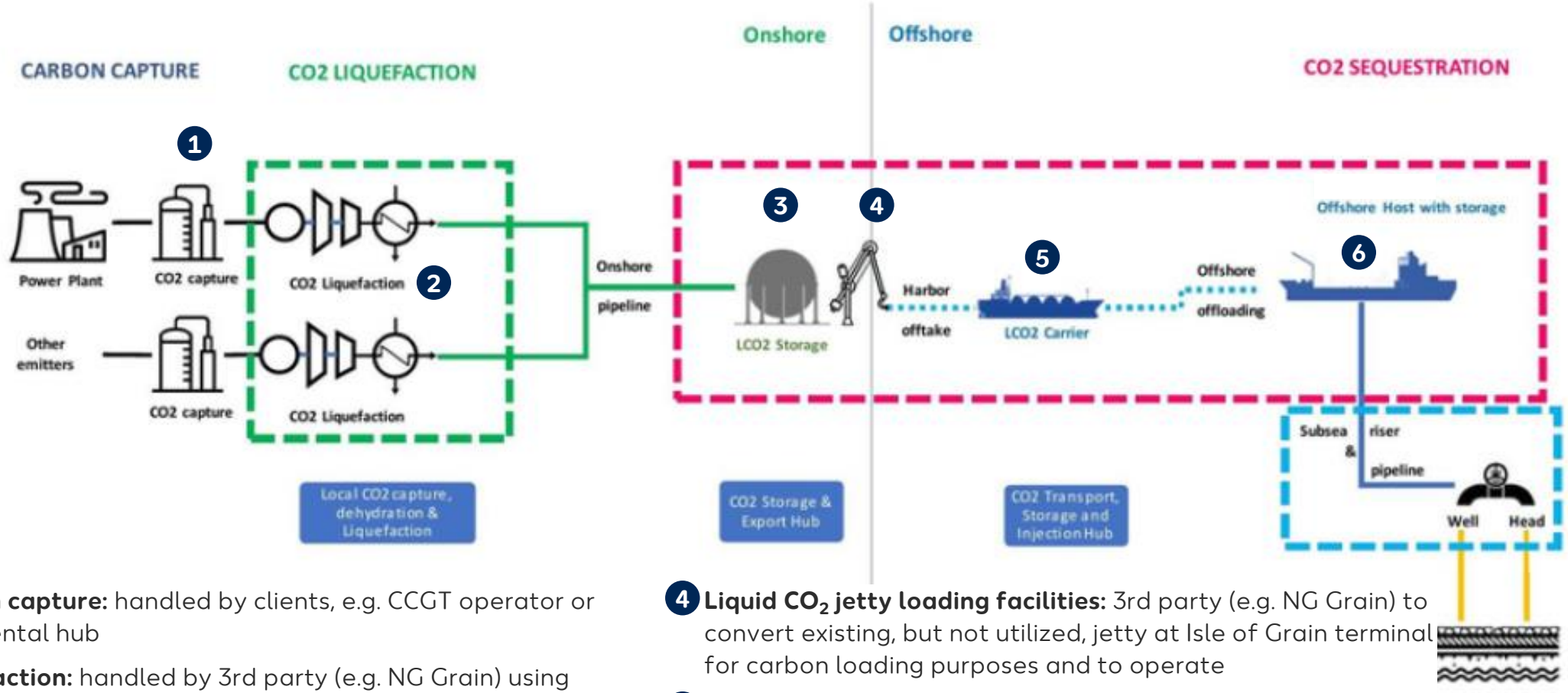
Camelot Development Concept





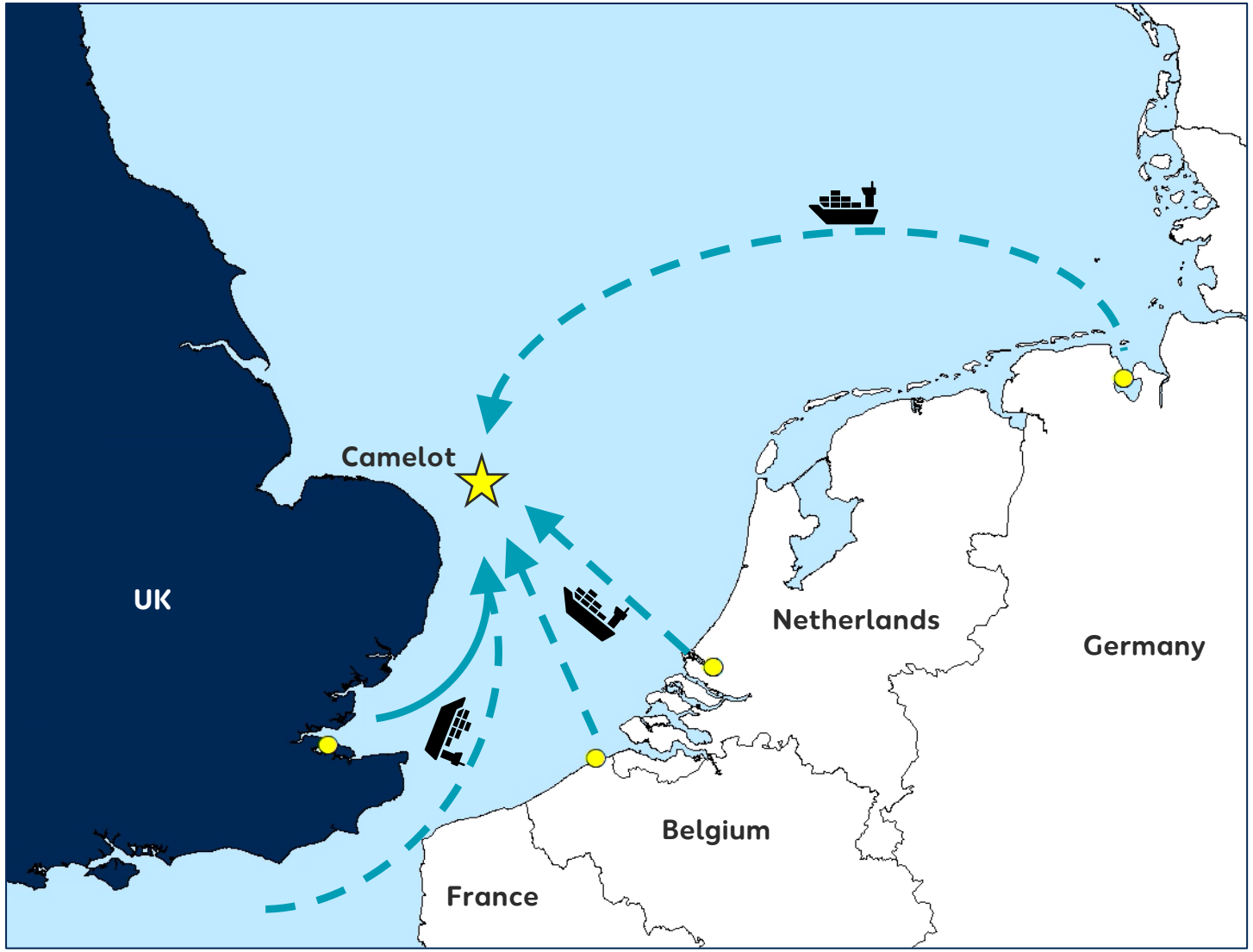
- During the application phase, the JV used the development concept based on the "Medway Hub CCS Project"
- The JV is also considering alternative development options in order to select the most robust and cost effective scheme, including the importation of CO_2 cargoes via marine tanker from continental Europe
- The base case hub scheme incorporates the following features:
  - In-situ separation of CO_2 from the exhaust stream of CCGT power stations in the Isle of Grain area, near Rochester, Kent
  - The combined peak power generation capacity of 3 target emitters is 3,077 MW with peak CO_2 emissions of 7.6 Mtpa
  - Liquefaction of the extracted CO_2 at the National Grid LNG terminal on the Isle of Grain
  - Storage of liquid CO_2 in insulated storage tanks close to the existing LNG terminal offloading jetty
  - Loading the liquid CO_2 onto purpose-built marine CO2 tankers via a purpose-built liquid CO_2 loading jetty operated by National Grid
  - Transportation of the liquid CO_2 to the Camelot carbon storage fields by the marine CO_2 tanker
  - Offloading of the liquid CO_2 from the marine tanker onto a purpose-built Floating Injection, Storage and Offloading (FISO) vessel moored over the Camelot fields
  - Processing of CO_2 on the FISO prior to injection into the Camelot reservoirs via umbilicals connected to sub-sea manifolds

Project Concept - Supply Chain



1. **Carbon capture:** handled by clients, e.g. CCGT operator or continental hub
2. **Liquefaction:** handled by 3rd party (e.g. NG Grain) using carbon-zero power from CCGT operators. Liquefaction equipment to be constructed at Isle of Grain
3. **Liquid CO_2 Storage:** Isle of Grain storage CO_2 tanks to be constructed and operated by 3rd party (e.g. NG Grain) and to be located close to CO_2 loading jetty
4. **Liquid CO_2 jetty loading facilities:** 3rd party (e.g. NG Grain) to convert existing, but not utilized, jetty at Isle of Grain terminal for carbon loading purposes and to operate
5. **Marine CO_2 tankers**: to be wet leased under long-term contract. Low-emission transportation utilizing LNG fuel
6. **FISO (Floating Injection, Storage & Offloading) vessel:** Leased under long-term contract. Power ideally from zero-emission wind power from adjacent wind farms

Camelot Concept - Commercial



Business model:

- Transportation & Storage (T&S) service
- Merchant scheme - long term contract offering Medway Hub customers cost advantage compared to carbon emission (UKA) costs

Customers:

- Medway Hub Power Plants
- Additional CO_2 emitters in Greater Thames Estuary region
- Marine CO_2 cargoes from other origins:
  - UK Southwestern and Southern coast
  - Zeebrugge, Rotterdam and Wilhelmshaven CO_2 Hubs

Strategy:

- Acquire Track Accreditation to enable emitter customers to access Government funding
- Apply for additional Carbon Storage licenses for future FISO utilisation

Camelot Project - Local Content

UK based companies have been selected to support the Camelot JV in the early Appraisal Term phase

- The London office of OPC (Oilfield Production Consultants) provides general geoscience and subsurface engineering expertise
- DUG has been selected to reprocess the existing Camelot 3D survey
- Axis Well Technology (UK) supports the Camelot JV in terms of well integrity analysis and ERA (Early Risk Assessment) reporting
- ERA auditing services will be provided by London based ERCE and RISC