



Towards investible CCUS value chains

The UK Cluster Sequencing Programme
as a case study

March 2025



Baringa is a certified B Corp™
with high standards of social
and environmental performance,
transparency and accountability.



Agenda

1. Introduction to Baringa and our work on CCUS
2. Policy considerations
3. International comparisons
4. Case study on the UK's CCUS clusters

AGENDA

Today's talk on investible CCUS value chains

- 1. Introduction to Baringa and our work on CCUS**
- 2. Policy considerations**
- 3. International comparisons**
- 4. Case study on the UK's CCUS clusters**

Our energy and resources practice is a globally leading advisory business helping organisations navigate the energy transition

>800 energy experts

300+ clients

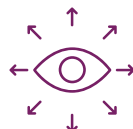
60 countries where we model the energy system

\$150bn of capital advised on into low carbon

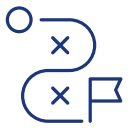
What we do



Analyse and design markets and policy



Determine strategy and investment decisions



Identify new commercial opportunities and manage risk



Structure and run more effective businesses



All underpinned by a world leading energy market modelling capability

Our impact

- ▶ Voted Leading Energy & Utilities Advisor by the *Financial Times* in their annual survey of Management Consultants for 5 years running
- ▶ Awarded World's Best Management Consultants by *Forbes* 2023 in the US.
- ▶ Climate Risk Advisory Firm of the Year *Energy Risk Asia* 2023
- ▶ Most Highly Regarded for Power Market Forecasts in independent research undertaken by *Kroll* (formerly Duff & Phelps) in 2020

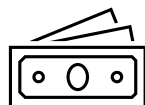
Capacity for private sector to manage risk

- ▼ Low ability
- Some ability
- ▲ High ability

Unique sector challenges face early-stage CCUS projects and clusters

CCUS project development pipelines are rapidly growing, but early projects must overcome business case, financing, and deliverability challenges to reach financial close and become operational.

1. BRIDGING THE FUNDING GAP



Customer ability to pay for CO₂ capture and T&S is often lower than cost today

Green product premium

- ▼ Carbon pricing and markets
- ▼ Product mandates
- ▼ Regulatory guidelines

2. MANAGEMENT OF PROJECT RISKS



Delivery and operation of CCUS value chains carries significant project risk

Cost & performance

- Cross-chain infrastructure exposure
- Long-term leakage
- First-of-a-kind, large scale infrastructure

3. COORDINATION BETWEEN PARTIES



CCUS development is complex, requiring timing and geographic coordination

Aligning stakeholders

- Aligning multiple investment decisions
- ▲ Partnerships for capabilities
- ▼ Funding support and private sector risk allocation



Government facilitating role

BUSINESS CASE

FINANCEABLE

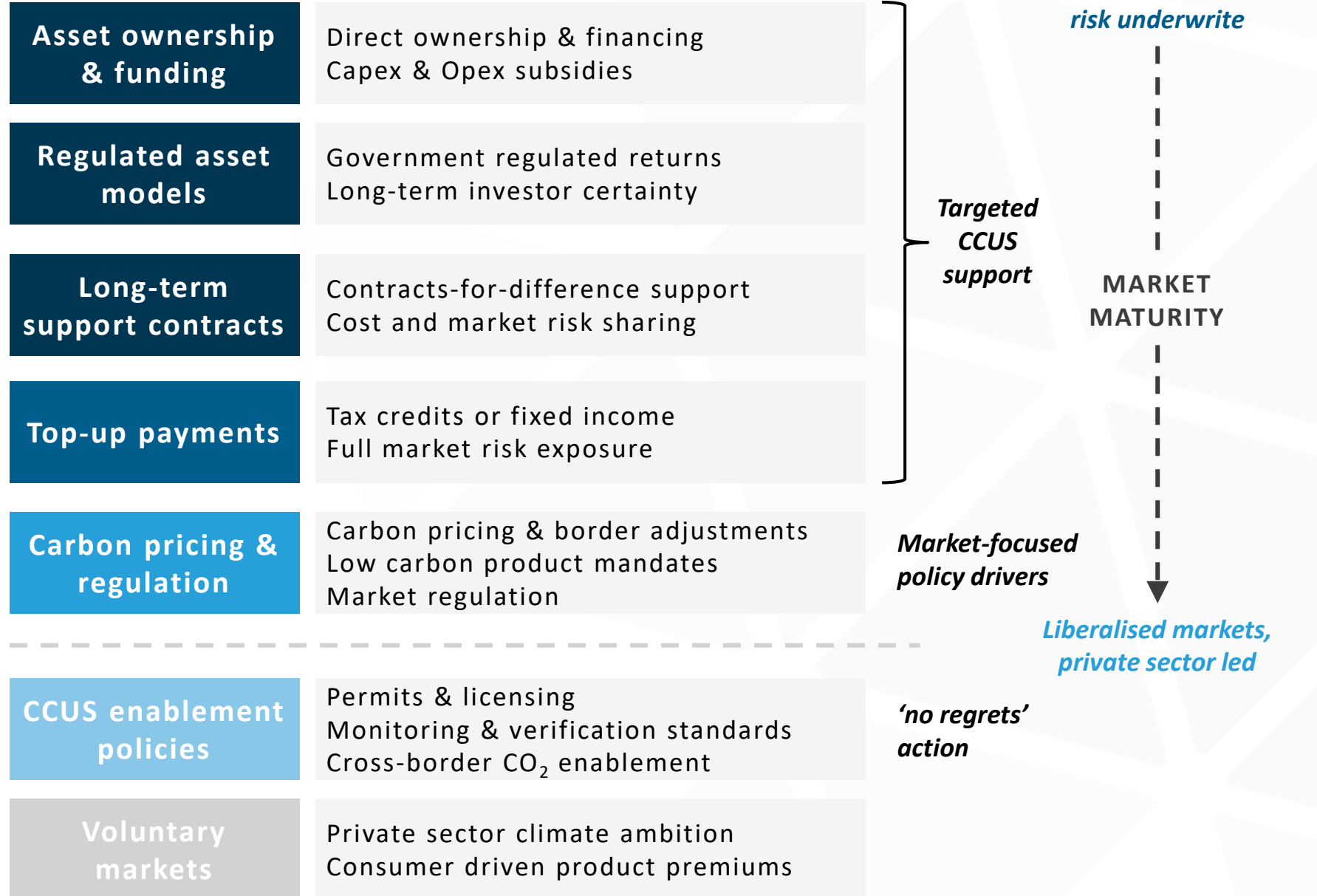
DELIVERABLE



GOVERNMENT POLICY TOOLBOX

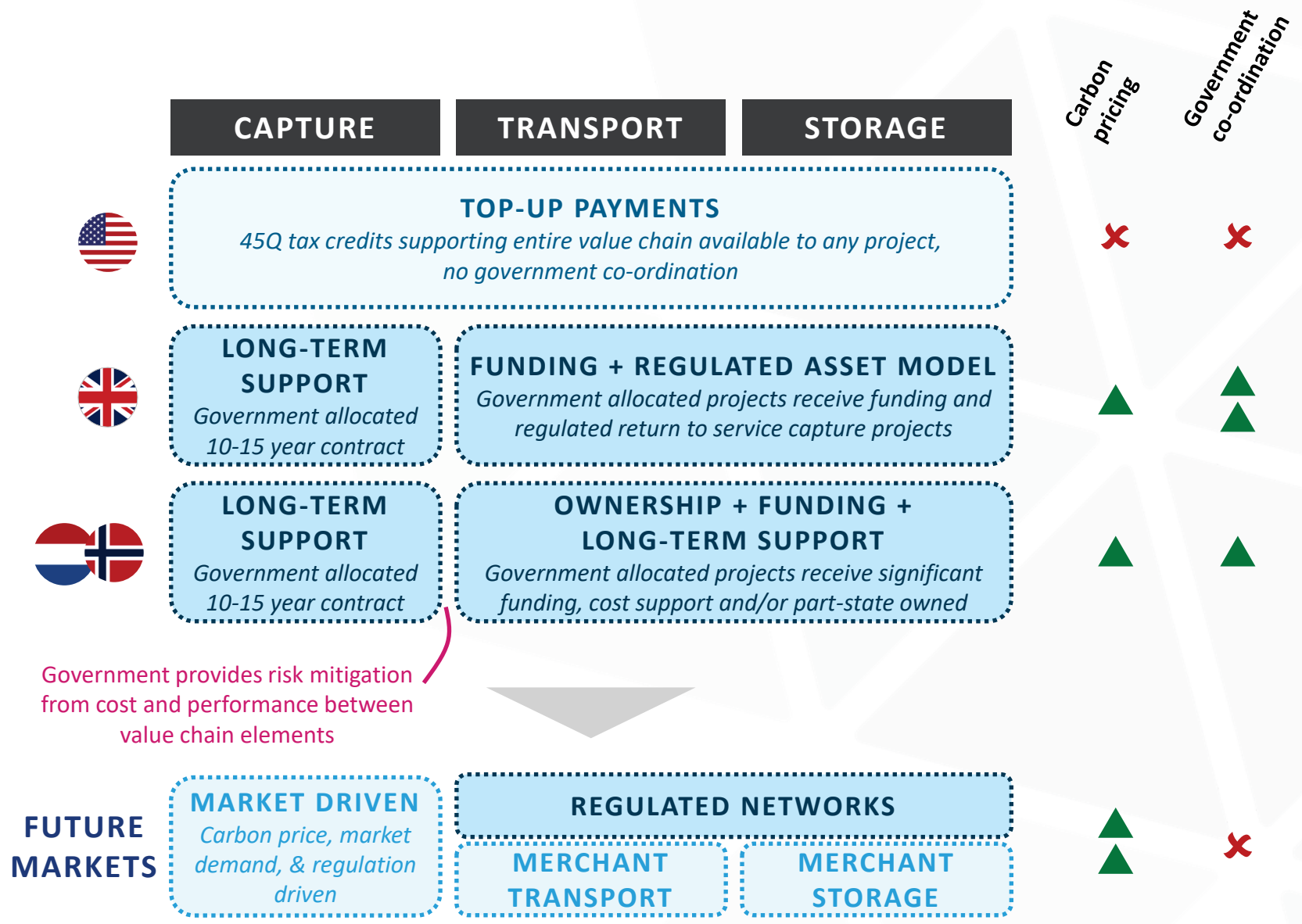
Government is a key enabler in market creation

Governments should ensure policies to enable CCUS projects are in place – then consider how best to unlock private sector investment through project support.



No one size fits all policy solution, but trends for success are clear

End-to-end projects in Europe have received targeted government support to manage development across the value chain. The US has a higher private sector risk exposure approach.





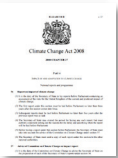
UK CASE STUDY: JOURNEY TO CCUS INVESTMENT

CCUS strategies will differ based on regional specifics

CCUS' role must consider its interlock with wider decarbonisation strategies. Country-specific CCUS strategies will differ based on local emission sources, geography, storage assets, and risk appetite.

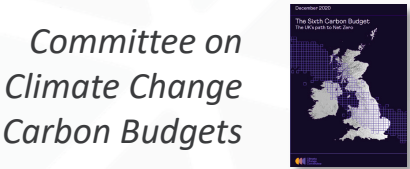


- Legally binding climate targets
- Economy-wide modelling & decarbonisation roadmap



Climate Change Act 2008

- Power
- Carbon removals
- Industrials
- Hydrogen & Fuels
- Heating & cooling
- Biomass



Committee on Climate Change Carbon Budgets

- Geographic focus
- Sector focus
- Value chain focus
- Market pull vs supply push



Net Zero Growth Plan 2021 & 2023



CCUS Vision Report 2023



UK CASE STUDY: GEOGRAPHIC CLUSTER STRATEGY

The UK strategy leverages geographic advantage & shared infrastructure

Government ran a competitive process seeking bids from the market to support shared T&S network development in regions with high emissions – and then from emitters within those regions to receive carbon capture support

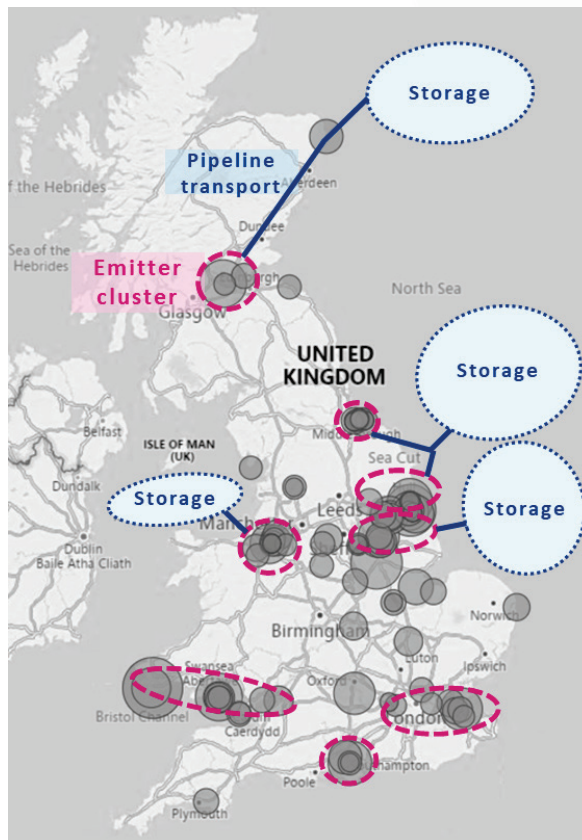
Government process & contracts

Government process stage 1: TRANSPORT & STORAGE SELECTION

Support

Regulated network asset support

- Operational code & regulated tariffs
- Regulated return (no customer risk)
- Long-term leakage insurance



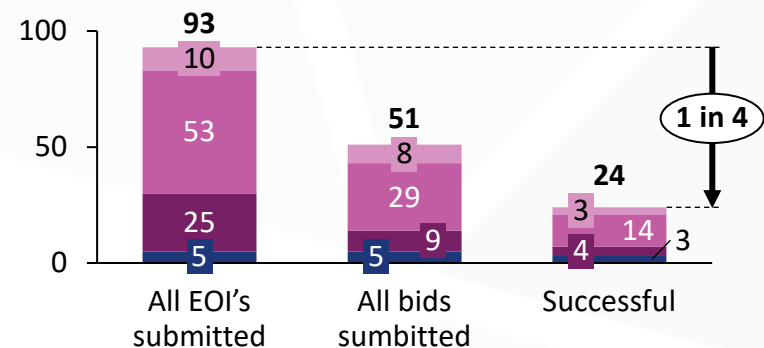
Government process stage 2: EMITTER CAPTURE SELECTION

Specific sectoral capture agreements

- 10-15 year contracts
- Contract-for-difference style support to cover CCUS cost gap
- Risk mitigation from T&S performance

Projects selected by government

Bids submitted (*# of projects*)

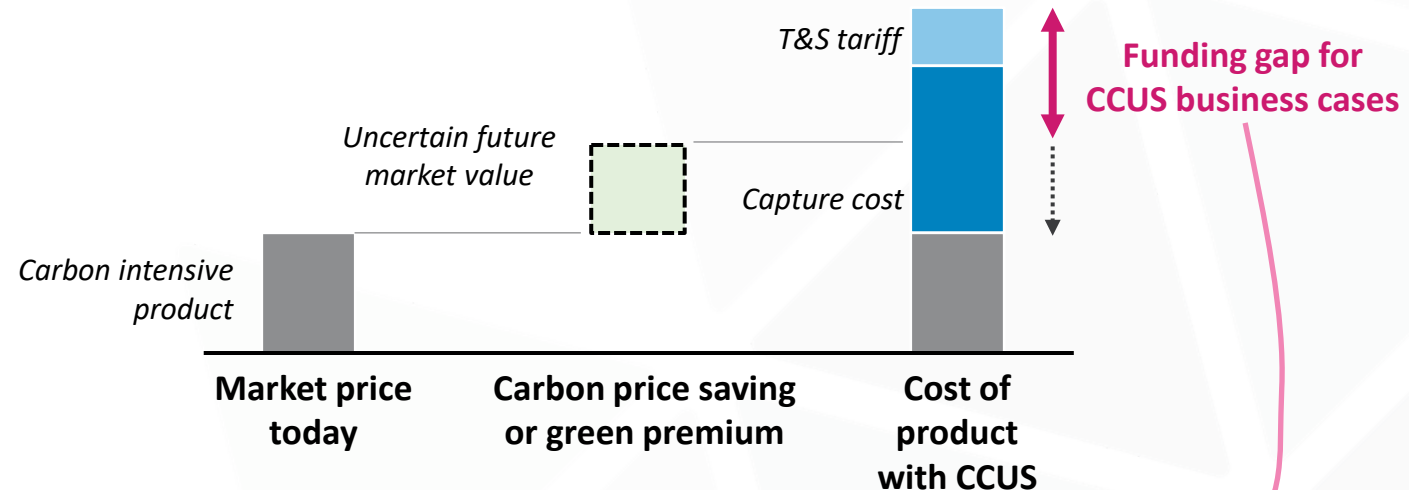


Phase 2: Power emitter Phase 2: H₂ emitter
Phase 2: Industrial emitter Phase 1: T&S clusters



EMITTER SPECIFIC CONTRACT DEVELOPMENT

Indicative CO₂ capture economics



Emitter support contracts differ by sector to meet the cost gap

Emitters operate into end-markets with different pricing and demand dynamics. UK has several support contracts to account for this, rather than use a single contract, such as an agreed strike price payment per tonne CO₂ abated (as used in Netherlands).

Assets pay the T&S operator a regulated fee, which can be covered within funding support

UK capture contract strategy

Decarbonising asset	Government contract	End-market
Gas power station	Dispatchable power agreement	Power
Heavy industry facility	Industrial carbon capture; waste capture contract	Steel, cement, waste refined products
Bioenergy power station, Direct air capture	Greenhouse gas removals; power BECCS contracts	Carbon removals
Hydrogen producer	Low carbon hydrogen agreement	Hydrogen offtake

KEY TAKEAWAYS

CCUS can be made financeable if policy drives commercialisation

CCUS faces specific acute commercialisation challenges, which must be addressed in order to make these large and often complex infrastructure projects financeable

1. **There are different approaches being taken to CCUS policy** internationally, with a spectrum of intervention and varied levels of funding available.
2. **The North Sea basin in Europe has the most advanced and sophisticated policies** with many projects in development
3. **CCUS is investible for the private sector where three economic challenges have been addressed;**
 1. bridging the cost gap,
 2. management of cross chain risks, and
 3. effective cluster coordination.
4. **The UK model is the most comprehensive in it's approach to addressing these three core problems.** It has driven major the first major project finance event, but it does have some drawbacks of complexity and pace.