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Support mechanisms for demonstration and deployment of CCS – a UK perspective

George Day, Head of Economic Strategy, ETI

5th International CCS Regulatory Network,

International Energy Agency, 18th June 2013

Overview

CCS – strategic characteristics

Support mechanisms: in theory

Support mechanisms: in practice (to date)

Moving forwards?

Key strategic & economic characteristics of CCS

Large size of investments	• £ billions
Value delivery	• Dependence on policy for rewards
Potential economic benefit	• £ billions savings for UK decarbonisation costs
Option value	• Future applications in gasification & bio credits
Inter-temporal characteristics	• Long term uncapped liabilities
Technology maturity	• Mostly mature, but untried integration
Complexity of value chain	• Requires new integrated value chain
Economies of scale	• Critical mass to realise economies in storage and transport
Cost structure	• Higher marginal costs than competitors (renewables)
Interaction with other markets	• Potential for EOR or decommissioning deferral benefits
Path dependency	• Later opportunities (e.g. clusters) shaped by early choices

Understanding the value of CCS using energy system modelling

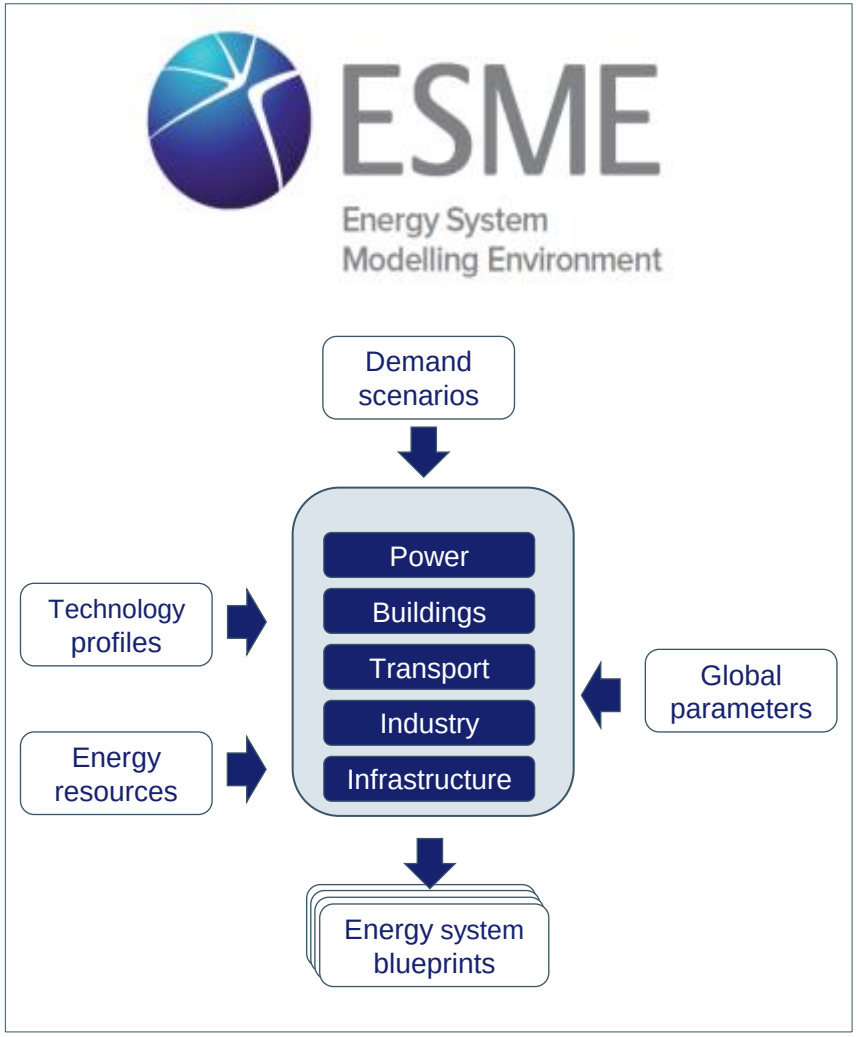
ETI's energy system modelling environment (ESME) is a national energy system design tool, integrating power, heat, transport and infrastructure

Modelling approach

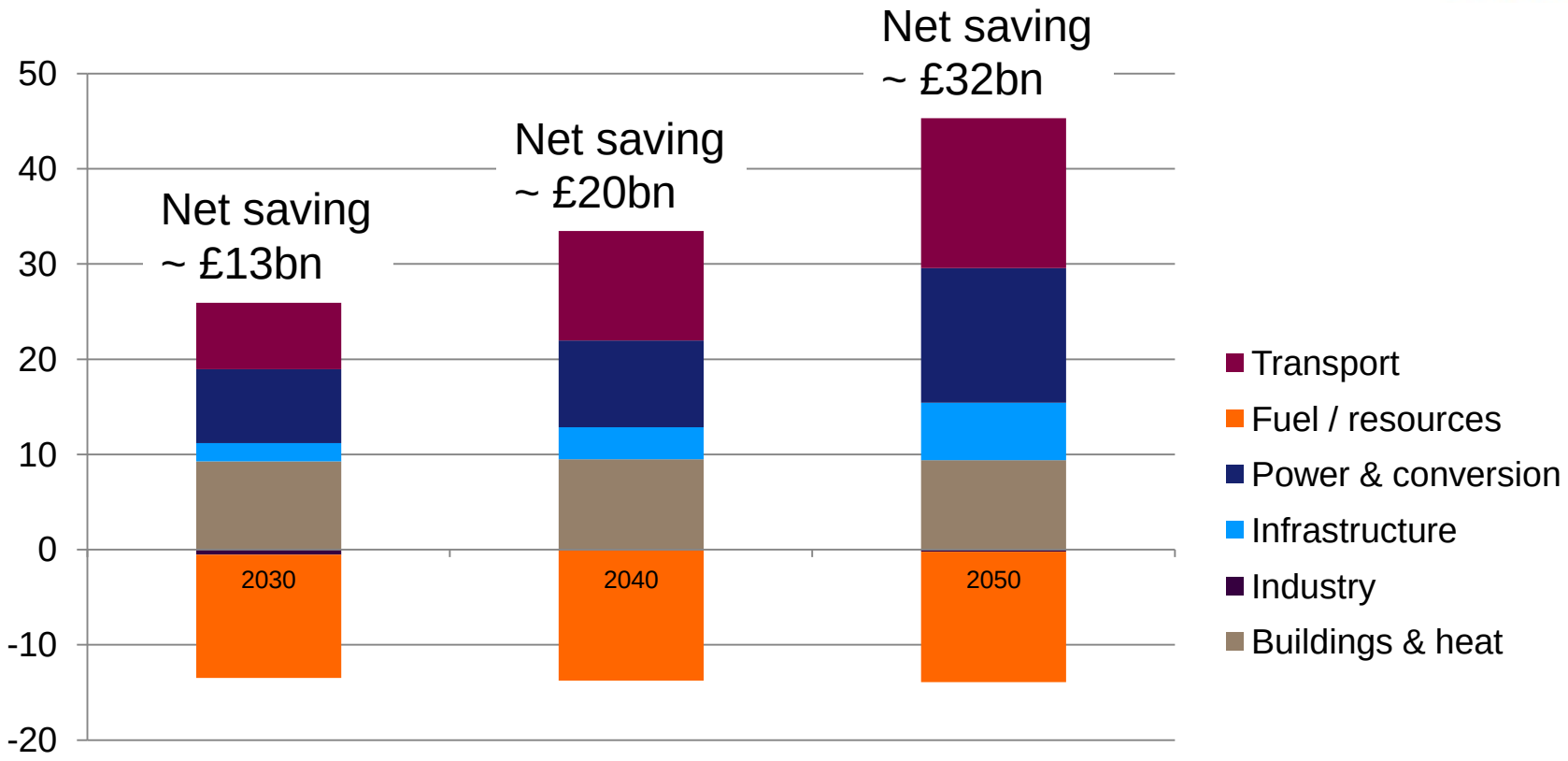
- Least cost optimisation (policy neutral)
- Back-casting from 2050
- Probabilistic treatment of uncertainty
- Spatial & temporal factors

Informed by ETI members/advisors

Internationally peer reviewed

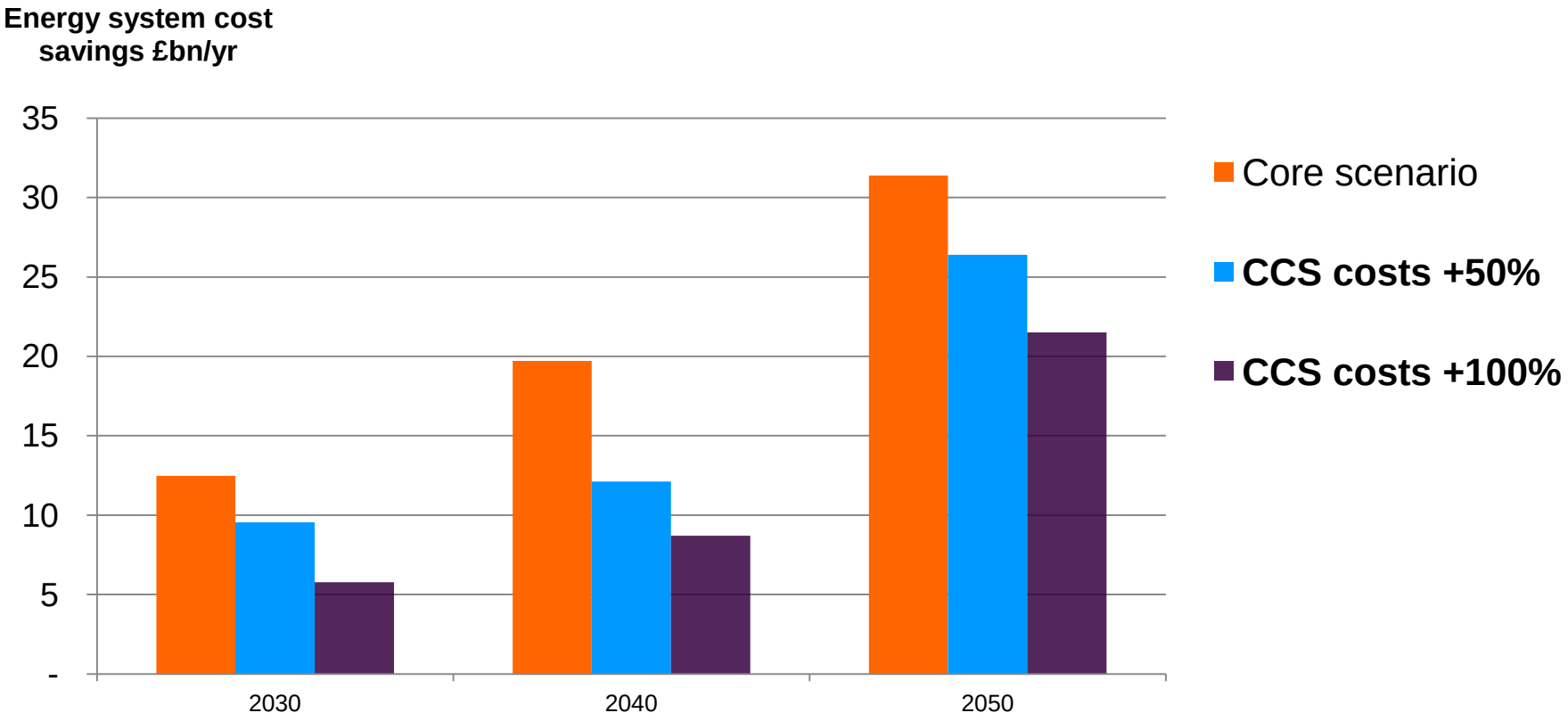


Deploying CCS reduces annual cost of (low carbon) UK energy system (£bn)



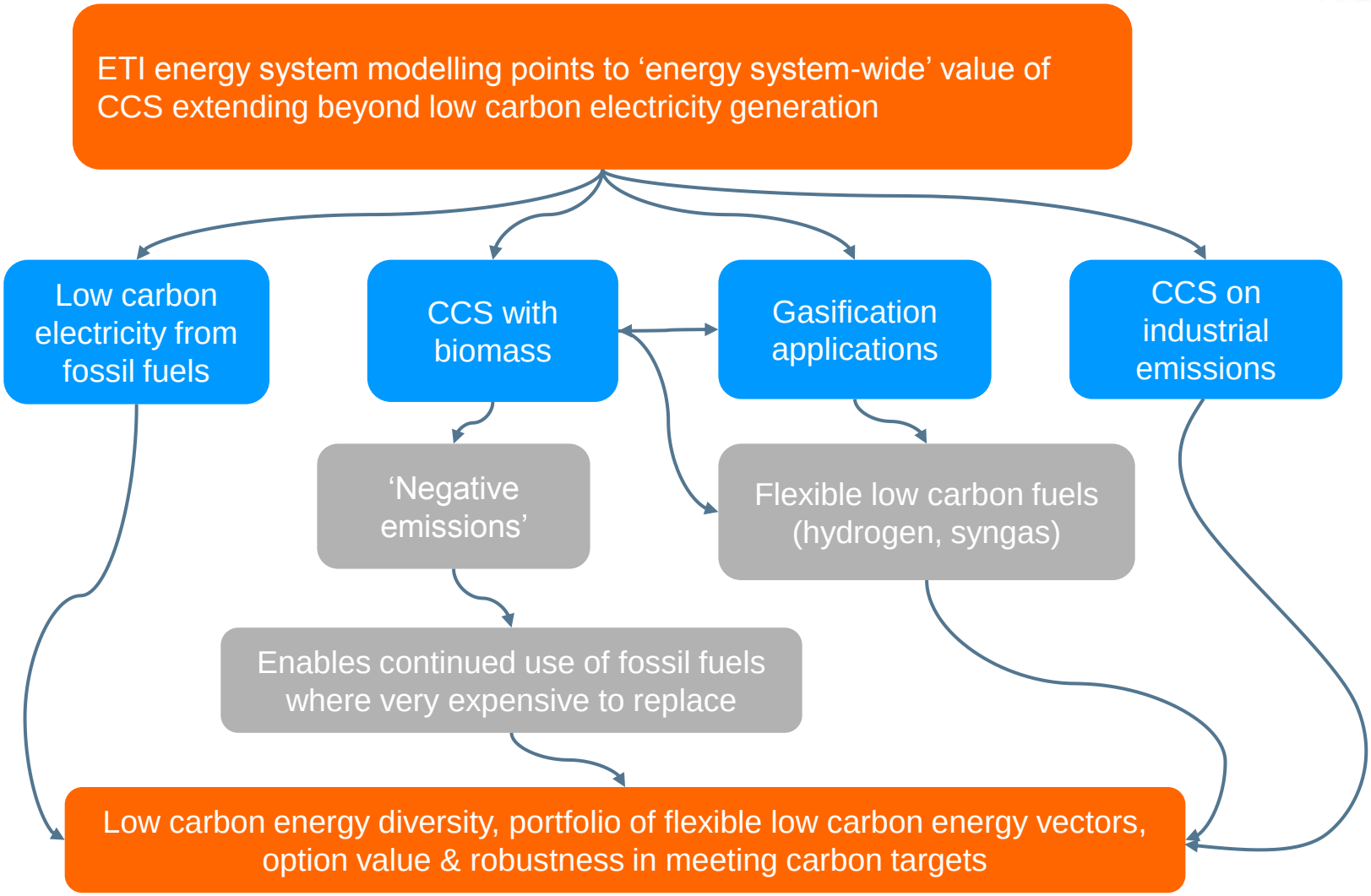
Fuel costs are higher, but avoid costs of expensive alternatives (hybrid vehicles, building retrofits, intermittent generation capacity & transmission infrastructure) resulting in net savings which grow over time.

Energy system value of CCS: sensitivity to cost pessimism



The value CCS delivers to the energy system is remarkably robust to more pessimistic view about future CCS costs

Why is CCS so valuable?



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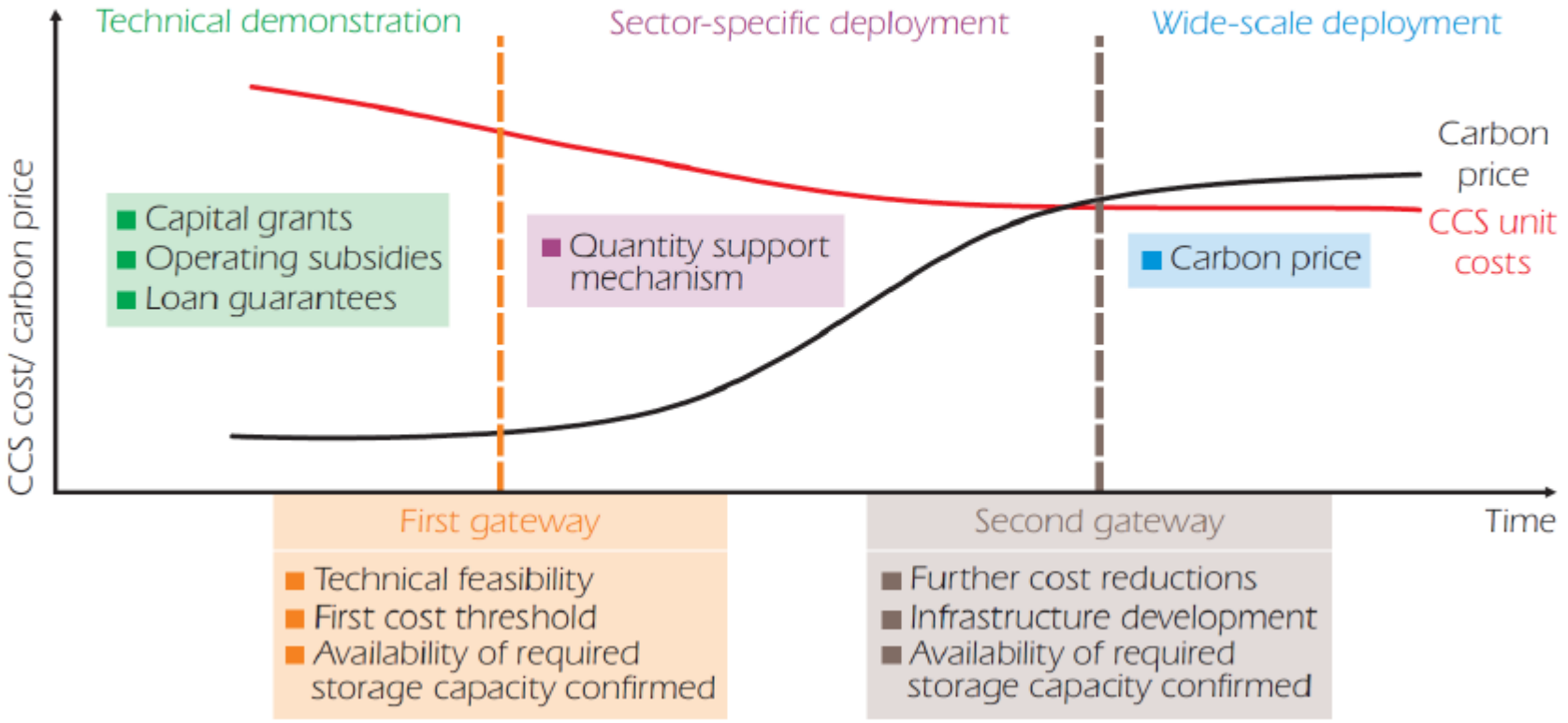
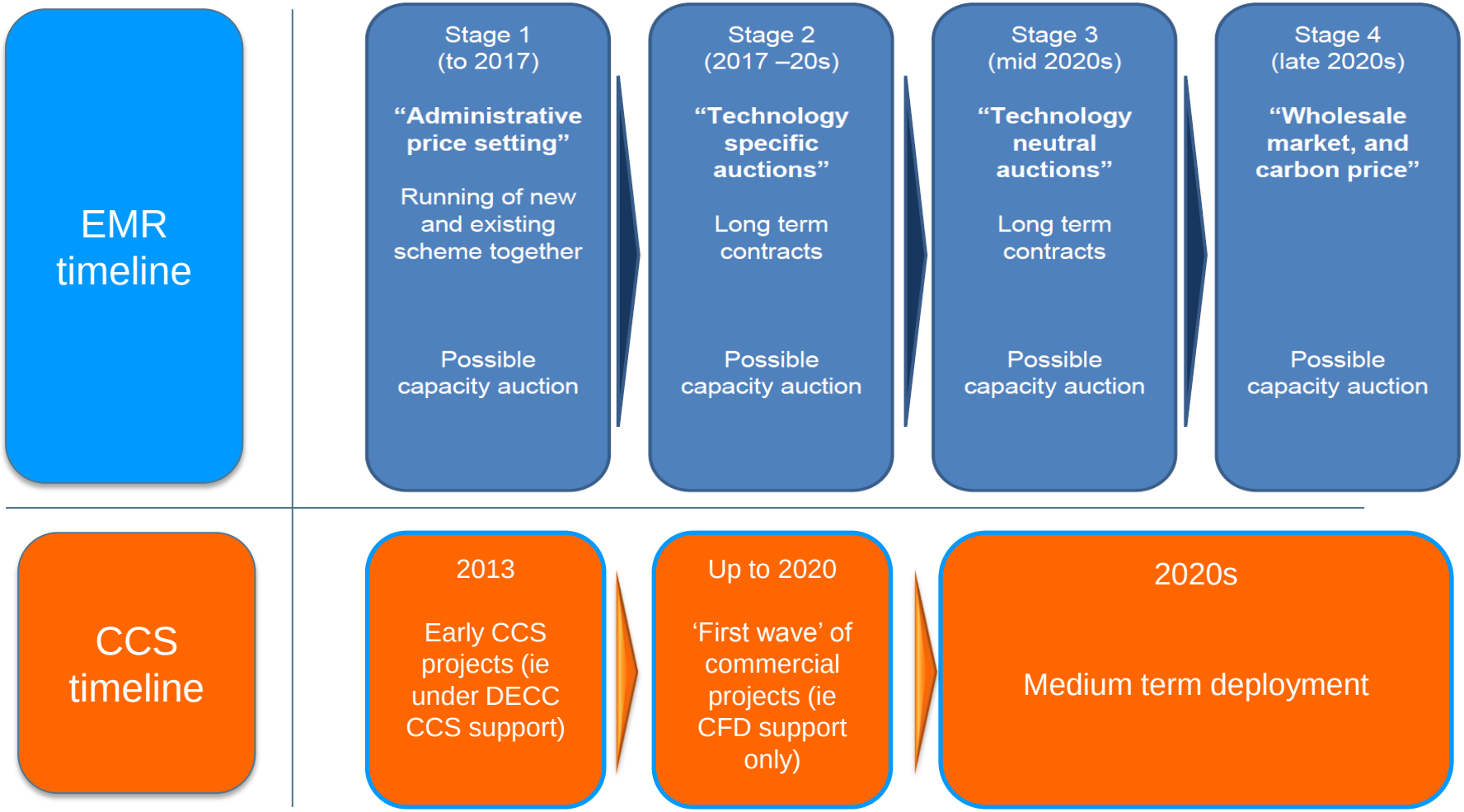
CCS support - IEA policy strategy view

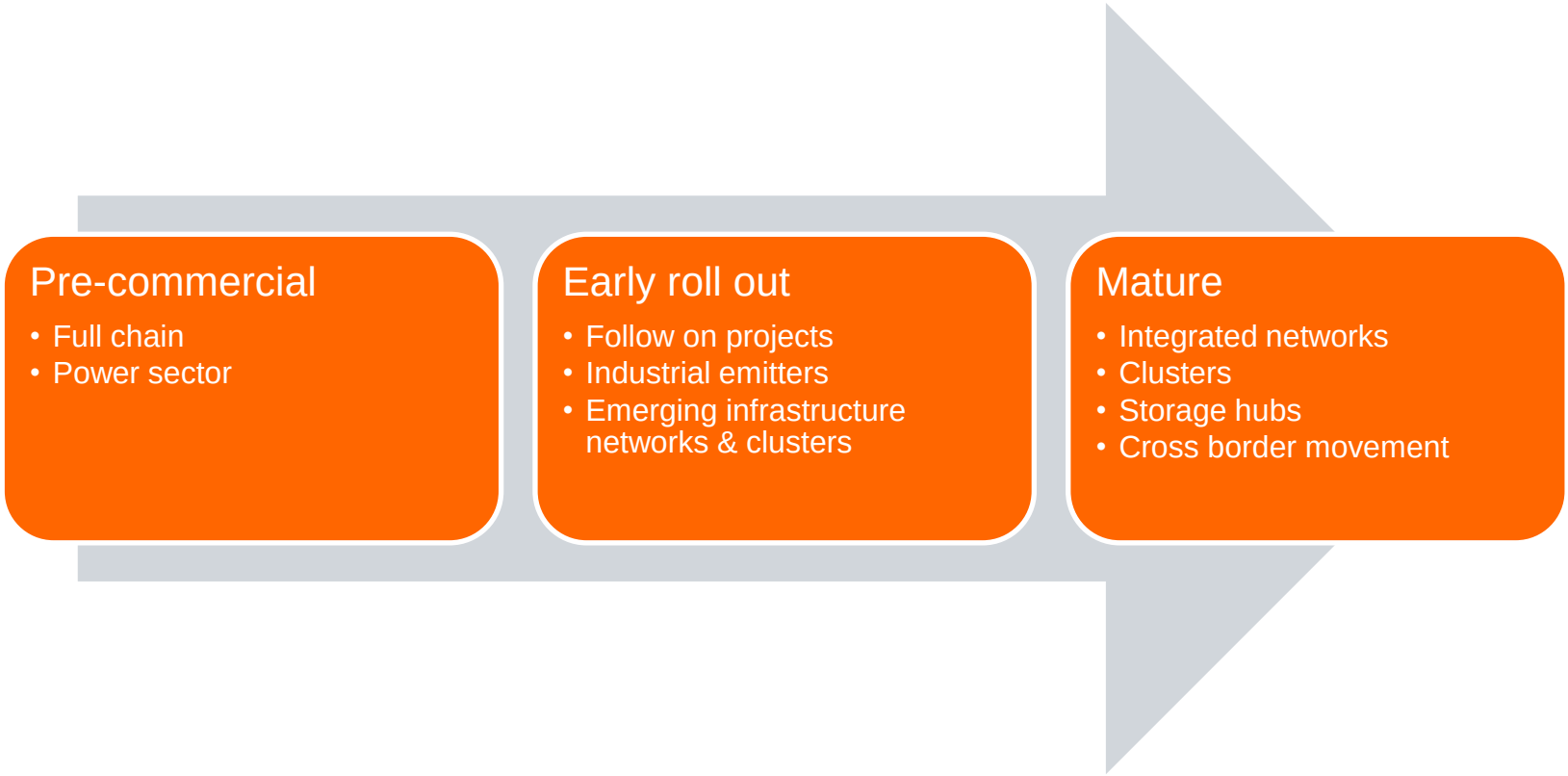
Figure 4 Possible gateways within a CCS policy framework



UK electricity market reform

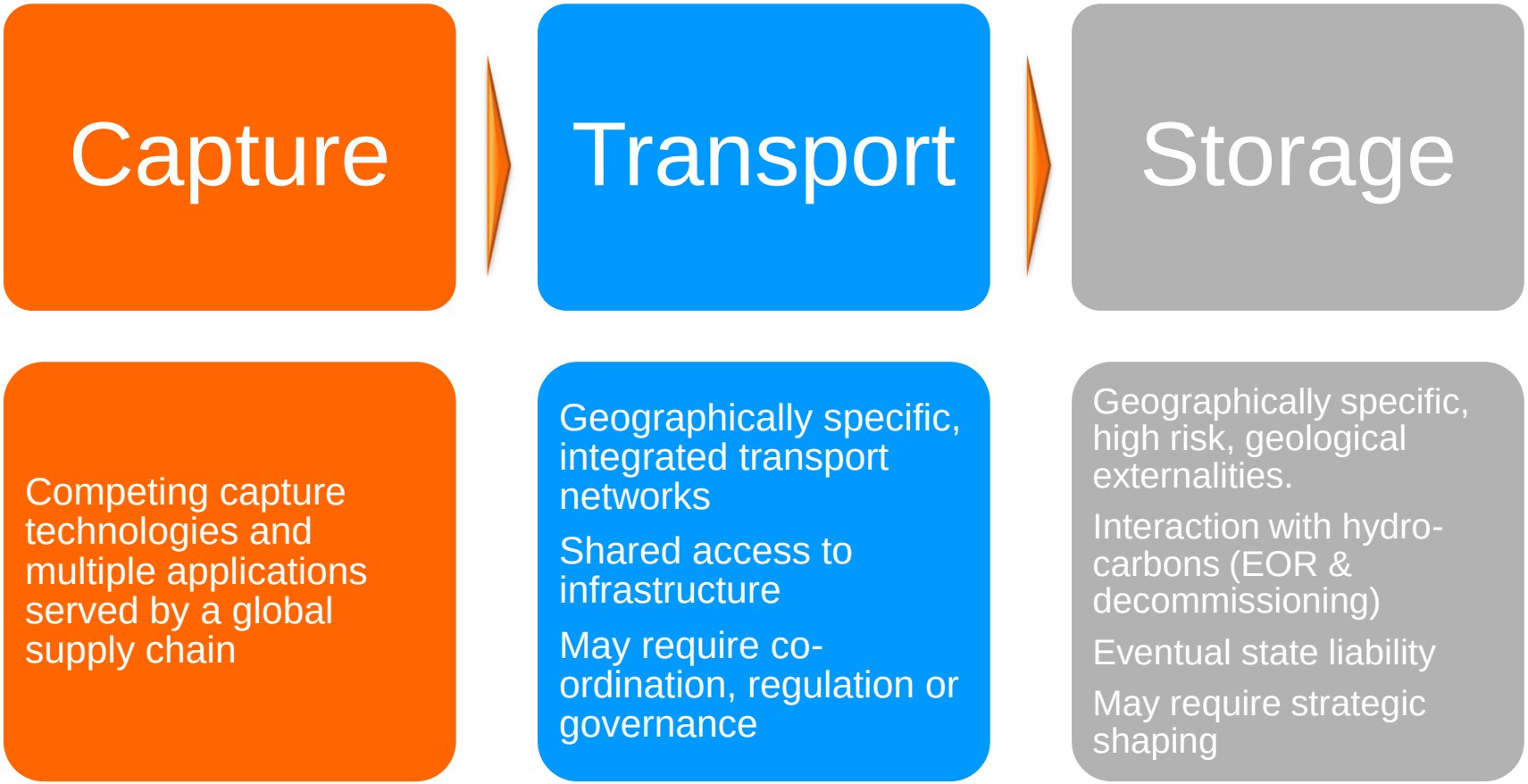


Potential evolution of a CCS sector



The type and profile of investments likely to evolve as a CCS sector develops – so will the challenges for support mechanisms.

Value chain components – differing characteristics



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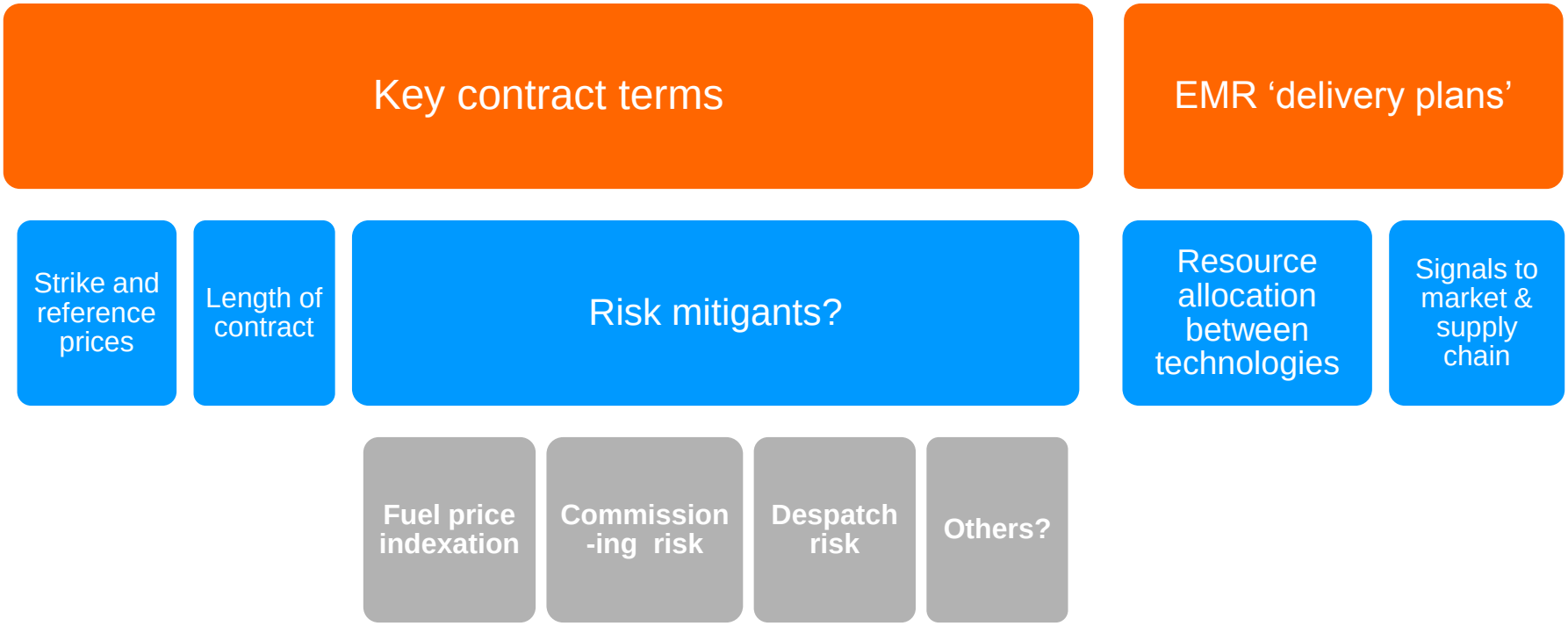
Support for CCS demonstration & deployment in UK

Public expenditure support	• For R&D and for full chain demonstration (capex grant) • Concerns about VFM – delays in implementation
Rewards & incentives	• Electricity market reform contracts can reward power projects • Power sector specific carbon price signal • Lack of route to rewards for industrial or biomass applications
Policy & regulatory framework	• Considered & clarified in some aspects, but so far little appetite for active government role and limited attention to future framework (institutions, governance etc)
Overall policy commitment	• Argument that it would be better value for UK to be fast follower • Key aspects of risk allocation remain unclear • Lack of clear pipeline

Choices in contracting for CCS electricity



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Attracting the investment needed to deploy CCS

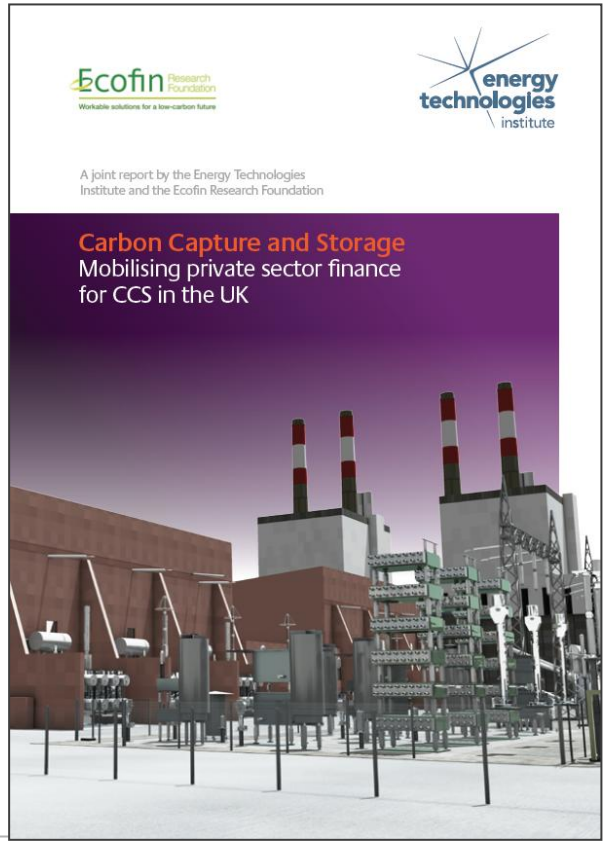
Mitigate and manage risks for investors

Create rewards

- UK will be competing for investment
- confidence and clarity
- Rewards for non-power applications?

Enabling regulation and governance

- complex new value chains
- Inter-dependency of projects – networks & clusters

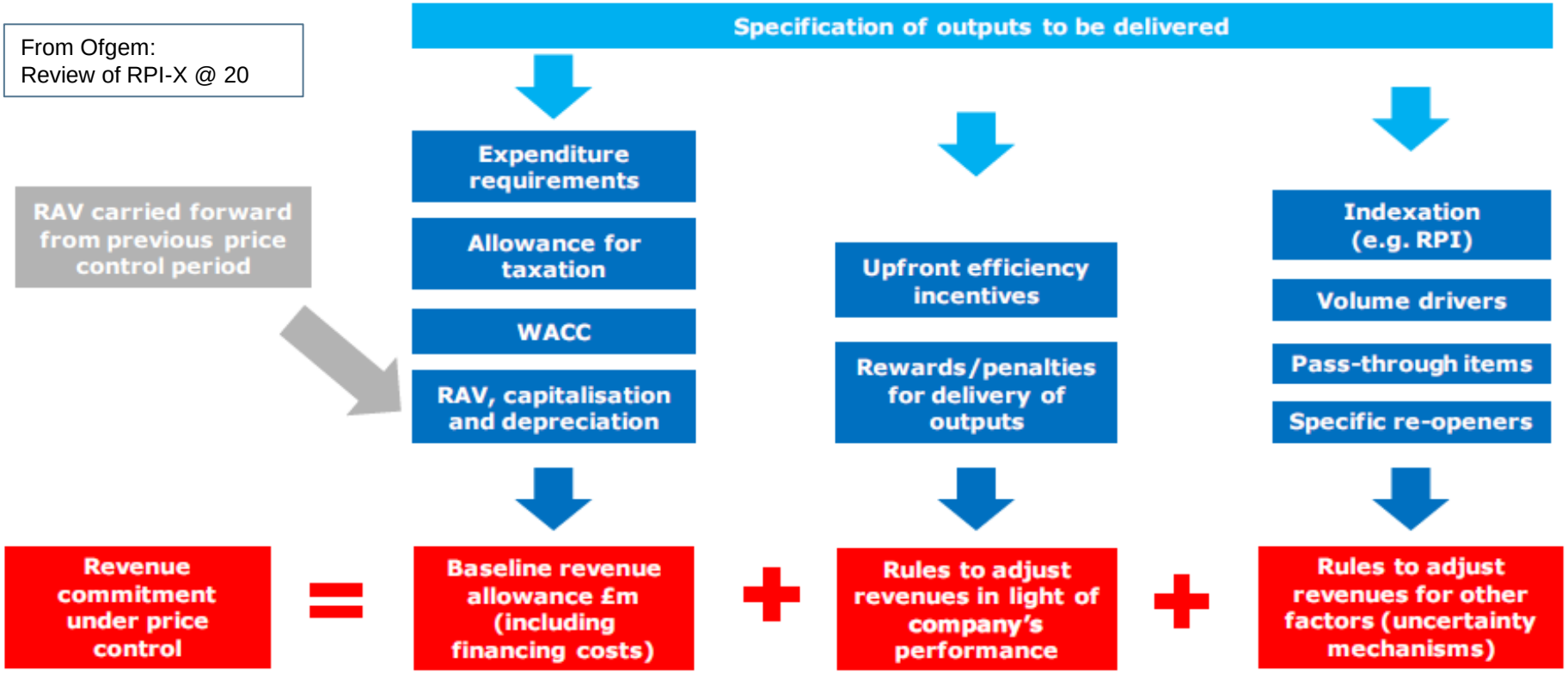


Moving forwards with UK support for CCS

Manage & mitigate risks for investors	• Design in long term reliability to incentives • Ensure risk profile is acceptable to investors • Adapt CFD mechanism to risks and strategic value of particular projects (cf. oil & gas fields) • Adapt risk mitigant tools from utility regulation?
Create rewards	• For industrial: subsidy or tax breaks funded through carbon floor tax proceeds (cf UK Climate Change Levy) • For BECCS: premium CFD, tax breaks or tradable instrument?
Enabling regulation & governance	• More active government role in shaping & enabling transport & storage investment (cf. offshore wind), & creating governance arrangements

Practical lessons from utility (price cap) regulation?

From Ofgem:
Review of RPI-X @ 20



Regulators have developed sophisticated tools to limit long-term exposure to unpredictable risks, while retaining incentives on operators

To conclude..

- CCS really does have specific characteristics and strategic value
- Early projects have particular characteristics – high value in choosing the right projects to support
- Bespoke support for early projects including risk mitigants – are long-term contracts the right tool?
- Need to create rewards for industrial CCS and BECCS – specific incentives, tax breaks or subsidy while carbon price is low
- Signals about long term commitment are vital – visible active engagement of government will help

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