



Department for
Business, Energy
& Industrial Strategy

Carbon Capture, Usage and Storage

An update on the business model for
Transport and Storage

January 2022



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Disclaimer

This update sets out further details on the government's current proposals on potential business models for carbon capture, usage and storage ('CCUS'). The proposals, as set out in the document, in whatever form they are expressed, are indicative only and do not constitute an offer by government and do not create a basis for any form of expectation or reliance.

The proposals are not final and are subject to further development by the government, and approval by Ministers, in consultation with relevant regulators and the devolved administrations, as well as the development and Parliamentary approval of any necessary legislation, and completion of necessary contractual documentation. We reserve the right to review and amend all provisions within the document, for any reason and in particular to ensure that proposals provide value for money (VfM) and are consistent with the current subsidy control regime.

This update takes into account engagement that has taken place during 2021 since publication of the Carbon Capture, Usage and Storage Business Models in the December 2020 and May 2021 documents. This includes engagement with industry and relevant regulators.

BEIS will continue such engagement as it works to refine its proposals, including engagement with the devolved administrations, to ensure that the proposed policies take account of devolved responsibilities and policies across the UK.

List of Annexes to this document

Annex A: Updated draft heads of terms T&S Regulatory Investment (TRI) Model: Economic Licence

Annex B: Draft heads of terms for the Revenue Support Agreement (RSA)

Annex C: Updated draft heads of terms for the Government Support Package (GSP)

Annex D: Draft heads of terms for the Liaison Agreement (LA)

Section 1: Introduction

In December 2020 and May 2021, we published updates (referred to here as the December 2020 document and the May 2021 document) on a Transport and Storage ('T&S') business model ('T&S Regulatory Investment (TRI) model'). The TRI model consists of both the regulatory model and other support arrangements which will facilitate investment in T&S infrastructure. The purpose of this document is to set out further details about the TRI model, reflecting work undertaken since May 2021, and includes the consideration of information provided in response to consultations on the duties and functions of the Regulator for CO₂ T&S and establishing an offshore decommissioning regime for CO₂ T&S which were published in August 2021.

In November 2020, the Prime Minister set out his ambition that the UK will become a world-leader in technology to capture and store harmful emissions away from the atmosphere, with a ambition to remove 10 million tonnes (Mt) of carbon dioxide (CO₂) by 2030. In October 2021, the government's Net Zero Strategy expanded on this ambition. The UK's ambition is to capture and store 20-30 Mt of carbon emissions per year by 2030, with a further binding target to reach net zero carbon emissions by 2050. Carbon emissions will be captured from across the economy, including 6 Mtpa of industrial CO₂ emissions by 2030, increasing to 9 Mtpa by 2035.

For CCUS to be a key technology in supporting the government to achieve its net zero targets, there is a need to raise around £15 billion in private investment to construct and deliver the early phases of the CCUS T&S assets. This private investment needs to be raised between now and the end of the Sixth Carbon Budget period. This is why the TRI model is so crucial to delivering the government's Net Zero targets: it will be a primary driver of private investment into the CCUS T&S infrastructure.

The government is already taking steps to deliver these targets with the support of CCUS. Recently the government announced confirmation of those clusters which it intends to take forwards to Track 1 negotiations following Phase 1 of the Cluster Sequencing process, with the aim of deploying the two successful clusters by the mid-2020s.

The key objectives for the TRI model and their implications for the design of the TRI model were set out in the December 2020 document and are summarised again below:

Attracting investment in T&S networks to establish a new CCUS sector

Establishing a commercial framework that enables and supports stable investment in CO₂ T&S networks that are likely to have long operating lives and provides investors with a clear sight of the long-term revenue model to ensure they can earn a reasonable regulated return on their investment.

Enabling low-cost decarbonisation in multiple sectors

Balancing the need for anticipatory investment to address future demand on the T&S network with the economic attractiveness of the T&S network to near term users. Each T&S network must be able to accommodate multiple and different types of users with varying demand profiles and be sufficiently flexible to adapt to different growth profiles.

Developing a market for carbon capture – a long-term vision

Establishing an Economic Regulatory Regime (ERR) that provides sufficient flexibility to allow for future CO₂ market expansion (including NPT CO₂) whilst ensuring affordability and VfM for the users.

We are developing the TRI model with an expectation that the T&S infrastructure will support a thriving CCUS market, with a diverse user base, well beyond 2050. Given this, as the market develops, we expect allocation of risk to change over time. This is because we expect higher levels of utilisation of T&S infrastructure supported by an increasing CO₂ price/taxes (both domestically and internationally), and the technology and its use becoming established at scale and better understood. This will lead to the market becoming sufficiently developed to mitigate T&SCo's exposure to financial risk, including the potential for market-based products (e.g. insurance). Therefore, arrangements set out in this update for managing T&SCo's financial risk are primarily focused on the TRI model arrangements that we consider are necessary to establish the market and allow it to grow to meet our CO₂ storage ambitions by 2030. We expect the need for these arrangements to diminish over time.

This document broadly follows the same format as the May 2021 document. We include two new sections which were not addressed in the May 2021 document: (1) section 8, where we set out our minded to position to establish a Special Administration Regime for CO₂ T&S and (2) section 9, where we provide an update on our views on decommissioning of CO₂ T&S infrastructure. In addition, the annexes of this document include:

- updated draft heads of terms for the economic licence (last published in December 2020) (Annex A);
- draft heads of terms for the Revenue Support Agreement (RSA), which, as set out in section 6, would set the terms for the RSA Counterparty to provide Revenue Support in certain specified circumstances (Annex B); and
- updated draft heads of terms for the Government Support Package (GSP) (last published in December 2020) which, as outlined in section 7, consists of the Supplementary Compensation Agreement (SCA), and Discontinuation Agreement (Annex: C); and
- draft heads of terms for the Liaison Agreement (LA), which sets out proposed terms for the relationship between government and T&SCo, including in relation to proposed changes to project documents or variations to the T&S network (Annex D).

Section 2: The Role of T&SCo

The TRI model set out in our May 2021 document envisaged that T&SCo would have the following responsibilities:

- development, construction, financing, operation, maintenance, expansion, and decommissioning of the T&S network;
- ownership of the onshore and offshore transportation network, and obtaining relevant regulatory approvals for operation of onshore and offshore transportation and offshore storage sites;
- operation of the T&S network to ensure the operational parameters are within agreed specified limits, managing network access and performing network planning and administrative tasks (such as those set out in section 6 (Revenue Model));
- review of the CO₂ metering and compositional analysis equipment installed by the users at the point of connection¹; and
- ensuring that the transportation and long-term storage of CO₂ is safe, efficient, and compliant with defined requirements.

We have continued to develop our views on aspects of the TRI overarching framework following the May 2021 document, including on:

- delivery model;
- asset ownership;
- network planning; and
- system operation.

This section sets out further detail on the current position on the above issues as well as where further work is required to enable a detailed decision.

Delivery model

We remain of the view that a private sector delivery model (initially supported by targeted forms of government support) is the preferred approach for the delivery of the T&S network. We believe that this will enable CCUS to be delivered taking advantage of the greater speed of development and cost efficiency that can come with projects developed in the private sector, and the work already undertaken by the promoters of clusters. We believe that it is preferable to develop a wider regulatory system and a contractual framework to allow the private sector to

¹ We are minded to adopt a similar approach to that used in other regulated networks. Given this, we consider that the T&S network user will be responsible for ensuring the CO₂ entering the transportation system meets the required quality specification of the T&S network. However, the T&SCo (as licensee/storage permit holder) will be responsible for ensuring the CO₂ injected into the storage site complies compositional requirements set out in the licence/permit.

develop CCUS. Such a model has been effective in driving investment volumes and efficiency in network industries in the UK over the last 30 years, and consequently under this model we anticipate costs and risks to reduce in the CCUS sector as it matures and in combination with, for example, a rising carbon price.

We anticipate that knowledge and expertise from the UK's well-developed oil and gas sector and considerable experience developing and operating economic regulatory arrangements will be leveraged in the development of the UK's CCUS infrastructure.

Government recognises that the provision of capital funding via the CCS Infrastructure Fund (CIF) to T&SCo during construction may be required to support the development of T&S networks and to help mitigate risks during the initial settlement period as utilisation of the network is growing. Alongside the development of the TRI model, we are considering the different forms of funding which the CIF could utilise, including grants, loans, and equity².

Government also recognises that as well as funding requirements there may be a need for targeted public sector support for financing T&SCo (including either debt or equity) that may arise at certain points in T&SCo's lifetime. For example, the UK Infrastructure Bank (UKIB) as a component of the government's broader infrastructure strategy, can co-invest with the private sector to enable and accelerate the delivery of UK projects that are consistent with its mission to tackle climate change and support regional and local economic growth. Individual investment decisions will be made independently by UKIB, in line with its objectives.

Asset ownership

We continue to consider T&SCo owning both the onshore and offshore networks/systems to be the most appropriate model of ownership, particularly in the early phase of the development of this market when initial decisions are made around cluster sequencing and allocation of support to T&S network users – e.g.: Industrial Carbon Capture (ICC) contracts, Low Carbon Hydrogen (LCH) contracts, Dispatchable Power Agreements (DPA), and Bio-Energy with CCS (BECCS) contracts.

This is because it is currently thought that T&SCo is best placed to negotiate and develop solutions for resolving the commercial and operational interface risks between the different T&S elements of the infrastructure. Further, we consider that this integrated ownership model should make it easier for both government and potential network users to engage with an integrated T&SCo and therefore reduce delivery lead times and commercial complexity for the user and for government.

While T&SCo will be expected to own both the onshore and offshore networks/systems, it is recognised that applying an accounting separation across assets will be beneficial for enabling

² As with all contractual arrangements entered into under the TRI-model, any decision to award CIF funding is subject to government satisfaction that subsidy control requirements have been met, government is comfortable with any balance sheet implications, all relevant statutory consents have been completed, and government is satisfied that CIF funding represents VfM for users, the consumer and the taxpayer in the context of other government support mechanisms.

the business model to adapt over time. For instance, accounting separation should facilitate the development of charging structures as well as expansion of the network. It also provides flexibility towards accommodating different network structures in the future. It is therefore expected that T&SCo will be required to provide separated accounts for key segments of its value chain, (e.g. onshore transport, offshore transport, storage and system operation). However, we would not require T&SCos to have RABs separated on this basis.

Some industry stakeholders have argued that there could be benefits to allowing a separation of ownership between assets in the future. It is recognised that this would be likely to have significant implications for all aspects of the business model. For instance, it is expected that any separation of ownership of a cluster T&SCo would be likely to impact on the allocation of cross chain risk, and that this would have implications for the GSP (see section 7 (GSP)) and RSA (See section 6 (Revenue Model)). Therefore, while accounting separation also facilitates separation, for such a request to be considered, T&SCo would need to propose to the Regulator and government alternative arrangements that demonstrate provision of a net benefit to consumers or taxpayers compared to the position where T&SCo owns both the onshore and offshore networks and systems.

T&SCo will be established as a separate legal entity. Legal (and financial) separation between T&SCo, its investors and the users of the network provides an important means of mitigating against the potential for conflicts of interest.

Accommodating dispersed sites and non-pipeline transportation (NPT) of CO₂

We consider that the capacity for T&S networks to be able to accept CO₂ from dispersed sites and international sources, either transported by ship, road or rail (NPT), will be vital for our long-term objectives of achieving our Carbon Budgets and Net Zero.

We are continuing to develop the licence conditions and business model arrangements so that non-piped sources of CO₂ can be accommodated by the TRI model.

In our consultation on the duties of the Regulator, we sought stakeholder views on whether aspects of NPT should be subject to economic regulation. Many respondents acknowledged that the extent to which economic regulation of NPT services is required will be a function of the level of competition for the provision of the different services. Further, it was noted that the role of economic regulation may vary across different parts of the infrastructure (e.g., transport mode, receiving terminals etc).

We have been engaging with industry to better understand proposed arrangements for NPT services in the UK. This work is necessary to better understand the likely levels of competition in the provision of NPT and the corresponding implications for economic licencing and which aspects of the infrastructure should potentially sit within the regulated asset base of the network operator.

We will continue to engage with government and industry stakeholders on how to accommodate NPT within the T&S business model.

Network planning

It is envisaged that UK T&S capacity will initially be developed at separate clusters, with the potential for future expansion of clusters into a UK carbon network.

We continue to expect T&SCo to be responsible for developing economically efficient plans for new connections to the T&S network. However, in the early phase of the market's development and expansion, we also recognise that delivery against such plans will be highly dependent on decisions made by government on the timing and award of support to the proposed T&S network users (e.g., ICC, LCH and BECCS contracts and DPAs). Further, where there are support arrangements with T&SCo to manage financial risks, the government will need to engage on network planning decisions.

Over the longer term, we expect a decline in the dependency of network planning decisions on government decisions to award funding to proposed network users. This is because we expect CCUS to become commercially viable without subsidy as the price for CO₂ increases and as technology costs and risks fall across the sector.

As part of the network development, we are considering the requirements on T&SCos regarding how they assess applications for access to the network. We are exploring several options and evaluating their suitability particularly as the CCUS market matures and regulatory arrangements for network connections mature. Further work is ongoing to develop network access requirements, and to better understand the implications for developers, and the implications for existing legislation governing third party access arrangements³.

Network Codes

As part of the development of a regulatory regime for this new industry there is a requirement to develop network codes and a code governance process. It is anticipated that BEIS and the Regulator will be responsible for the coordination of network code development by the first T&SCos.

It is BEIS's position that it may be beneficial to have a level of consistency between the technical specification and network codes of each cluster. Consistency could facilitate network growth (for instance by promoting greater choice of networks for dispersed sites to which they can send their CO₂) and removing barriers to the potential integration of onshore CO₂ transport networks over time as well as facilitating international import and export opportunities. However, it is also recognised that having, for example, a uniform CO₂ specification could reduce opportunities for clusters to compete on cost.

³ Third party access requirements are set out in the Storage of Carbon Dioxide (Access to Infrastructure) Regulations 2011

It is envisaged that many organisations with different expertise and specialisms will be involved in developing the network codes and it is recognised that industry will have a significant role in this area.

The Regulator will approve changes to any T&S network code before the changes take effect. Where relevant, the Regulator will consult other technical regulators for CCUS (e.g., OGA and OPRED) before approving changes to the T&S network code.

The process for developing and governing network codes, including the role of BEIS and the Regulator, will require further work, including due consideration of the outcomes of the government's consultations on system operation and code governance⁴.

System operation

We expect that each T&SCo will have responsibility for the system operation of its own network. We expect T&SCo will develop guidelines, operating procedures, and management systems to allow it to operate the T&S network in an efficient and safe manner and in a way that meets regulatory requirements. This responsibility should also reflect the government's priorities on net zero whilst also maintaining a resilient and affordable system that supports growth and the future expansion of the sector.

A joint BEIS and Ofgem consultation on the establishment of a Future Systems Operator (FSO) was held over the summer and closed on 28 September 2021. This consultation set out proposed FSO responsibilities across the electricity and gas systems and potential future role in relation to CCUS networks particularly in relation to network expansion where there are interactions with gas/hydrogen and electricity networks. Responses from this consultation are currently being analysed and government aims to share responses on the consultation in due course. We will review the conclusions of that consultation and its implications for CCUS over the course of 2022.

We will continue to develop and refine our views on the roles of system operator and the establishment of network codes. With the completion of Phase 1 of the Cluster Sequencing process, BEIS will work with industry and other relevant organisations in working towards a new phase of delivery. To help inform this work BEIS is considering the following parameters to guide the establishment and design of a framework to establish the operation of T&S networks:

- **safe, resilient and affordable:** development and implementation of outcomes should support safe, resilient and affordable T&S networks;
- **pace:** delivery needs to be consistent with the Net Zero Strategy;

⁴ BEIS published a consultation on Future System Governance including Code Reform in summer 2021 (<https://www.gov.uk/government/consultations/reforming-the-energy-industry-codes>). We are currently considering the responses and will publish the government response in due course.

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- **collaboration:** recognition that in order to build a strong, sustainable and viable carbon capture sector, government, industry and other public bodies will need to work together and at pace;
 - **consumer and user focus:** all activities should be developed in a way that considers and benefits energy consumers and users and future users of T&S networks;
 - **sector growth:** all activities should be informed by the need to grow and develop the sector in the longer term and consistent with the evolution of the future system operator⁵;
 - **competition and innovation:** all activities should support and enable open market competition and wherever possible innovation to benefit sectoral efficiency and consumers; and
 - **transparency:** wherever possible, for activities and outputs to be open, transparent and easy to understand. This will help market participants and related parties to understand sectoral rules and their application to their activities.

⁵ See BEIS consultation on this (<https://www.gov.uk/government/consultations/reforming-the-energy-industry-codes>).

Section 3: Business Model Evolution

The UK is proud to lead the world in ending our country's contribution to climate change; not just because it is the right thing to do, but because we are determined to seize the unprecedented economic opportunity decarbonisation provides.

New CO₂ T&S infrastructure is needed for the use of CCUS which will require investment of around £15 billion, to capture and store around 20-30 Mt CO₂ per year by 2030 and meet the Carbon Budget 6 capture targets specified in the Net Zero Strategy, with a further binding target to reach net-zero carbon emissions by 2050.

To realise this ambition, the government is investing up to £1 billion to support the establishment of CCUS in four industrial clusters. The aim is to develop CCUS as an industry that will contribute to the creation of 'Super Places' in areas such as the North-East, the Humber, North-West, Scotland and Wales. It is estimated that CCUS could support up to 50,000 jobs by 2050, with many of these jobs being well-paid and highly skilled⁶.

When it comes to carbon capture and storage, the UK's position is highly advantageous. We have the excellent geology for carbon storage and the world-class technical skills, capabilities and supply chain⁷ to utilise it. This said, to deliver CCUS effectively and efficiently, it is critical that the UK does not rest on this advantage, but instead, builds on it. We will achieve this by pushing forward to strategically develop the country's CO₂ storage potential, through the strategic development of the UK Continental Shelf (UKCS). We recognise that to develop the UKCS further, there is a need for further understanding of potential UK CCS storage.

We recognise that there may be CO₂ storage sites of strategic importance that require a transport solution with greater flexibility than pipeline, both now and out to 2050. As such, we will explore the potential for non-pipeline transport to connect UK emitters to key CO₂ stores.

We also recognise that to deliver the dynamic and resilient CO₂ storage market we envision for the UK, the business models used to commercialise T&S services may, overtime, need to iterate. Reasons for this could be to better respond to the evolving realities of the carbon market or to include lessons learned from countries with more mature CO₂ storage markets.

To deliver this ambition it is important that the design of the TRI Model is able to evolve over time as the CCUS market develops.

To support the design of the TRI model we developed a notional base case cluster in order to understand how a T&S network might be regulated over time, taking into account the initial

⁶ <https://www.gov.uk/government/publications/carbon-capture-usage-and-storage-ccus-supply-chains-a-roadmap-to-maximise-the-uks-potential>

⁷ Government published the CCUS Supply Chain Roadmap in May 2021. The Roadmap sets out how government and industry can work together to harness the power of a strong, industrialised UK supply chain, whilst ensuring that the CCUS sector as a whole remains investible, cost effective and focused on delivery.
<https://www.gov.uk/government/publications/carbon-capture-usage-and-storage-ccus-supply-chains-a-roadmap-to-maximise-the-uks-potential>

phase of development; from final investment decision (FID) through to construction and then steady state operations. In doing so we have assumed the following:

Development period: the period from the cluster sequencing process to FID, during which time it is anticipated that the prospective T&SCo will agree with BEIS all conditions precedent to the FID for the initial phase of development, such as reaching an initial settlement on costs, returns and risk allocation (including any ex-ante assessment of costs), and agreeing all contractual delivery and support documentation for FID (see below)^{8,9}.

FID: upon FID T&SCo will be granted an economic licence which reflects the initial settlement between T&SCo and BEIS. T&SCo will also enter into the Government Support Package (GSP), comprising of the Supplementary Compensation Agreement (SCA) and Discontinuation Agreement (DA) granted by the BEIS Secretary of State; Revenue Support Agreement (RSA) likely granted by a RSA Counterparty (see section 6 (Revenue Model)) and any funding arrangements agreed under the CIF.

First regulatory period: this is the period from economic licence award (upon FID) until a specified period following completion of construction of the first phase of cluster development, to allow for commissioning and an early operational phase – during this first regulatory period the Regulator would be responsible for administering the economic licence which reflects the initial settlement agreed by T&SCo with BEIS.

Second regulatory period: a specified period running from expiry of the first regulatory period (for example, 5 years). The Regulator will set and then administer the price control(s) for this period, meaning that T&SCo and the Regulator will commence the price control process during the first regulatory period. As part of administering the price control(s) the Regulator will set allowed capital expenditure ("capex"), allowed operating expenditure ("opex") and the allowed rate of return, as well as performance targets and associated incentives, similar to the way in which price controls are set for regulated gas and electricity networks.

Enduring regime: being the second regulatory period onwards where the Regulator sets and administers price controls on an enduring basis pursuant to its statutory duties.

This work has been developed from our discussions with parties with an interest in developing CCUS assets in the UK and represents our current understanding of how possible CCUS clusters may develop and evolve over time. Timelines are illustrative only and non-binding in respect of future decisions to be made with regards to the Regulator's roles and functions and legislative provisions which will require Parliamentary approval.

⁸ Projects within the clusters sequenced onto Track-1 will have the first opportunity to be considered to receive any necessary support under the government's CCUS Programme. Being sequenced onto Track 1 does not mean that support will be awarded. Any decision to award support will only be made subject to government satisfaction that subsidy control requirements have been met, government is comfortable with balance sheet implications, all relevant statutory consents have been completed, and government is satisfied that the project represents VfM for users, the consumer and the taxpayer.

⁹ In the May 2021 document we set out our view on Early Works Support which set out how BEIS would use possible interim contractual support for critical path activities in order to keep cluster programmes to schedule should a T&SCo be FID ready before the economic licence can be granted - this position remains unchanged.

We have developed the TRI model to unlock investment in T&S networks and deliver our objectives for the CCUS programme. In order to establish a new CCUS sector we need a commercial framework that enables and supports stable investment in projects that are likely to have long operating lives. The TRI model will be underpinned by a regulatory framework to provide investors with clear sight of the long-term revenue model to ensure they can earn a reasonable regulated return on their investment. The Regulator will operate and exercise its functions within a defined regulatory framework and regulatory guidance will be provided to clarify how the Regulator intends to approach any regulatory decision-making in some areas to provide greater visibility to investors.

Section 4: Economic Regulatory Regime (ERR)

Under our proposals published to date, an independent economic regulator would oversee the framework of economic regulation of CO₂ transport and storage (T&S), consistent with the approach in other regulated utilities.

Since the May 2021 document, we have consulted on the duties and functions of the Regulator for CO₂ T&S¹⁰, and set out the government's position that Ofgem is the entity best suited to undertake the role of Regulator for T&S. After consideration of responses to the consultation, the government intends to appoint Ofgem as the Regulator for CO₂ T&S and provide for the duties and functions of the Regulator in statute, subject to the introduction and passage of the relevant legislation when Parliamentary time allows¹¹.

Our position since the May 2021 document remains that we expect T&SCos will agree the initial settlement with BEIS for the economic licence, as part of the conditions precedent to FID for the first regulatory period (see section 3 (Business Model Evolution)). This will include reaching an initial settlement on costs, returns and risk allocation (including any ex-ante assessment of costs). Determining the ERR will require establishment of a number of key parameters for T&SCo including:

- allowed revenues;
- outputs and incentives;
- uncertainty mechanisms; and
- duration of the first regulatory period.

This section sets out our latest thinking on these issues, focusing on the first regulatory period, and setting out where and why our thinking has changed since the May 2021 document.

After describing our current position on the ERR for the first regulatory period, we outline our position on the ERR for the second and subsequent regulatory periods.

Overview of initial settlement process

During the development period, the Track-1 T&SCos will be required to develop the proposals submitted under the cluster sequencing process into business plans that explain their proposed development, construction, financial, operational, maintenance, and risk management plans for their networks. BEIS will meet with each T&SCo to review their

¹⁰ [https://www.gov.uk/government/consultations/carbon-capture-usage-and-storage-ccus-duties-and-functions-of-an-economic-regulator-for-CO₂-transport-and-storage](https://www.gov.uk/government/consultations/carbon-capture-usage-and-storage-ccus-duties-and-functions-of-an-economic-regulator-for-CO2-transport-and-storage)

¹¹ A summary of responses received for our public consultation on the Regulator's duties and functions are published as part of the government's response to the consultation (see link above)

business plans. BEIS will aim to agree with each T&SCo the key set of regulatory parameters forming part of the initial settlement set out above as a pre-condition to FID¹². As a general rule, we expect T&SCos to have developed robust cost estimates for all parts of their network, but anticipate this may be difficult to do so for the construction of offshore elements such as the storage site. Where estimates are insufficiently robust, T&SCos will either be required to re-submit their plans with further supporting evidence and more robust estimates, or be subject to an ex-post assessment by the Regulator towards the end of the construction phase.

Whether the costs are assessed ex-ante or ex-post, BEIS's aim is still to determine the efficient costs that will be allowed to be collected from users (or other sources, as set out in section 6 (Revenue Model)), and the outputs that will be required to be delivered by T&SCo before the revenues are permitted to be collected. BEIS will review the evidence for the calibration of incentives (such as targets) and relevant evidence to represent users in order to agree incentive design. The return on capital (or WACC) will also be agreed with T&SCos, taking account of the initial settlement, such as the proposed network designs, incentive calibration, and agreed risk allocation.

In developing plans for their networks and including how to optimise costs (e.g. capex) with performance (e.g. availability), we encourage T&SCos to consider a broad range of impacts (e.g. user emissions), mitigations and solutions (e.g. whether redundancy, if any, is merited) before proposing their preferred option during the initial settlement process. This analysis and optimisation should consider the design of the network and the operational management of the network to clearly show how T&SCo's plans optimise investment over the life of the project, as well as its year-on-year activities.

Overview of regulatory mechanics for the first regulatory period

Development and construction costs are logged as shadow RAV. This attracts a WACC that compounds (or 'rolls up') during the construction phase and is capitalised into the shadow RAV value once the construction outputs are delivered.

It is likely that once a network is operational, there will continue to be ongoing development and construction of the network, for example to connect new users. In this case, subject to the assessment of risk during the initial settlement, the RAV of the operational assets will attract a lower-level WACC while the construction spend will accrue as new RAV and attract a higher-level WACC.

Once the network output is delivered, the allowed spend that has accrued as 'shadow RAV' will transfer to the RAV. The Regulator will then allow T&SCo to collect the allowed revenues associated with that output and RAV from users of the network.

The initial settlement process reflected in the economic licence (including, where applicable, any ex-post assessment) will determine the levels of efficient expenditure, RAV and allowed revenues. These figures will increase for additional network expansion that is assessed at

¹² Where T&SCos propose to acquire existing assets for reuse, we set out a bespoke process later in this section.

subsequent price controls (or, by exception through uncertainty mechanisms during the first regulatory period). Each year the existing RAV is depreciated and therefore reduces over time, notwithstanding network expansion potentially adding to the RAV.

The draft heads of terms for the proposed form of economic licence are set out in [Annex A].

RAV and allowed revenues

We previously outlined in the December 2020 and May 2021 documents that T&SCo's allowed revenues will be determined based on several building blocks:

$$Allowed\ Revenue_t = RoC_t + Depr._t + Opex_t + Decom._t + Tax_t + Adj._t$$

Where,

$$RoC_t = RAV_t \times WACC_i$$

Each of these building blocks of allowed revenues is discussed in more detail below.

RoC

The return on capital is the return which T&SCo will be expected to make during the first regulatory period. It is equal to the allowed weighted average cost of capital (WACC) multiplied by the year-average RAV¹³.

WACC

When setting the allowed (real) WACC we will take into account the expected costs of financing T&SCo and the risks borne by T&SCo which may vary between T&SCos¹⁴. Examples of risks borne by the T&SCo include construction risk¹⁵, development risk¹⁶, First of a Kind ('FOAK') technology risk¹⁷ and operational risk¹⁸. This WACC determination will also be subject to the risk allocation and mitigation measures incorporated into the ERR and wider T&SCo business model. We consider the difference in risk to be significant between construction and operations, and therefore we expect to determine a separate WACC for capex and opex to reflect the differences in risk to T&SCo. Similarly, we expect the WACC to be higher for initial clusters to reflect FOAK risk compared with later clusters where risks to a T&SCo are better understood and can be mitigated more effectively.

¹³ In our December 2020 document, we considered a separate WACC for the construction phase and a WACC for the regulated WACC during operations. We prefer two different WACC rates to distinguish the risks and protect users from paying a blended WACC in the event of construction delays.

¹⁴ For example, whether one cluster contains more or fewer offshore pipelines will impact the level of construction risk present.

¹⁵ Considering each element of the T&S network (onshore pipeline, offshore pipeline, storage assets etc.) as well as the risk of commissioning.

¹⁶ Covering aspects such as obtaining necessary permits, licences and completing the Development Consent Order (DCO) process

¹⁷ Capturing technological design factors specific to CCUS, including the difficulties to build and operate an efficient compressor system.

¹⁸ Concerning the likelihood of system issues across the initial cluster of CCUS projects during their operational lifetime.

It is important to note that T&SCo's actual return may be higher or lower than the allowed WACC as it will depend on T&SCo's actual expenditures (and how they compare to capex and opex allowances), actual financing arrangements (and how they compare to BEIS's view of a notional cluster), and T&SCo's actual performance (and how that compares to its performance targets).

We are proposing to maintain our previous position that the initial WACC in the first regulatory period will be determined by BEIS in dialogue with the T&SCo as part of the initial settlement process prior to FID.

We are still considering further whether it may be appropriate to include a refinancing gainshare mechanism and other mechanisms to adjust the WACC should the cost of financing T&SCo change materially during the first regulatory period.

RAV

The RAV is a regulatory construct that reflects T&SCo investment. It is the capital investment into the project including development spend ("devex"), construction spend and asset expansion (capex), and a 'rolled up' cost of capital (i.e. WACC during the construction period), less depreciation, that have been agreed in the initial settlement process.

We set out in the December 2020 document that the RAV would be calculated as:

$$RAV \text{ (at a specific time)} = \sum Devex + \sum Capex + \sum IDC - \sum Depreciation$$

We have not changed our view on the principles of the RAV composition. However, we consider that it is important to distinguish between capital investment that is complete (i.e. an operational new network for use by users), and ongoing capital investment that has not yet delivered an output. Once the output is delivered, the risk profile of the project materially reduces in large part because construction risk falls away and revenues flow to T&SCo. Accordingly, we intend to apply a different WACC level for capital investment compared with operational assets.

These positions are reflected in the use of a 'shadow RAV' for ongoing capital investment (i.e. capex and devex) and rolled-up construction WACC, and 'RAV' for completed investment and operational assets. As T&SCo constructs a project, the allowed spend is reflected in the accumulation of a shadow RAV, which attracts a construction-level cost of capital (a 'construction WACC') but no revenues. Once construction is complete and the assets are available for use, the shadow RAV and accumulated construction WACC converts to a RAV which is used to calculate allowed revenues.

We therefore propose a modified RAV formula to account for the transfer of shadow RAV (SRAV) (all in real terms):

$$RAV_t = RAV_{t-1} + Transferred\ SRAV_t + Devex_t + Capex_t - Depr._t - Disposals_t + Adj._t$$

Where the RAV is comprised of the previous period's RAV, the transferred shadow RAV (SRAV) is composed of capex associated with any new outputs that have been commissioned

and rolled-up construction WACC, other additional allowed devex and capex, less regulatory depreciation, disposals, and any other adjustments such as those arising from any ex-post assessment. Following completion of construction all of these adjustments will be reconciled in a Post Construction Review ('PCR').

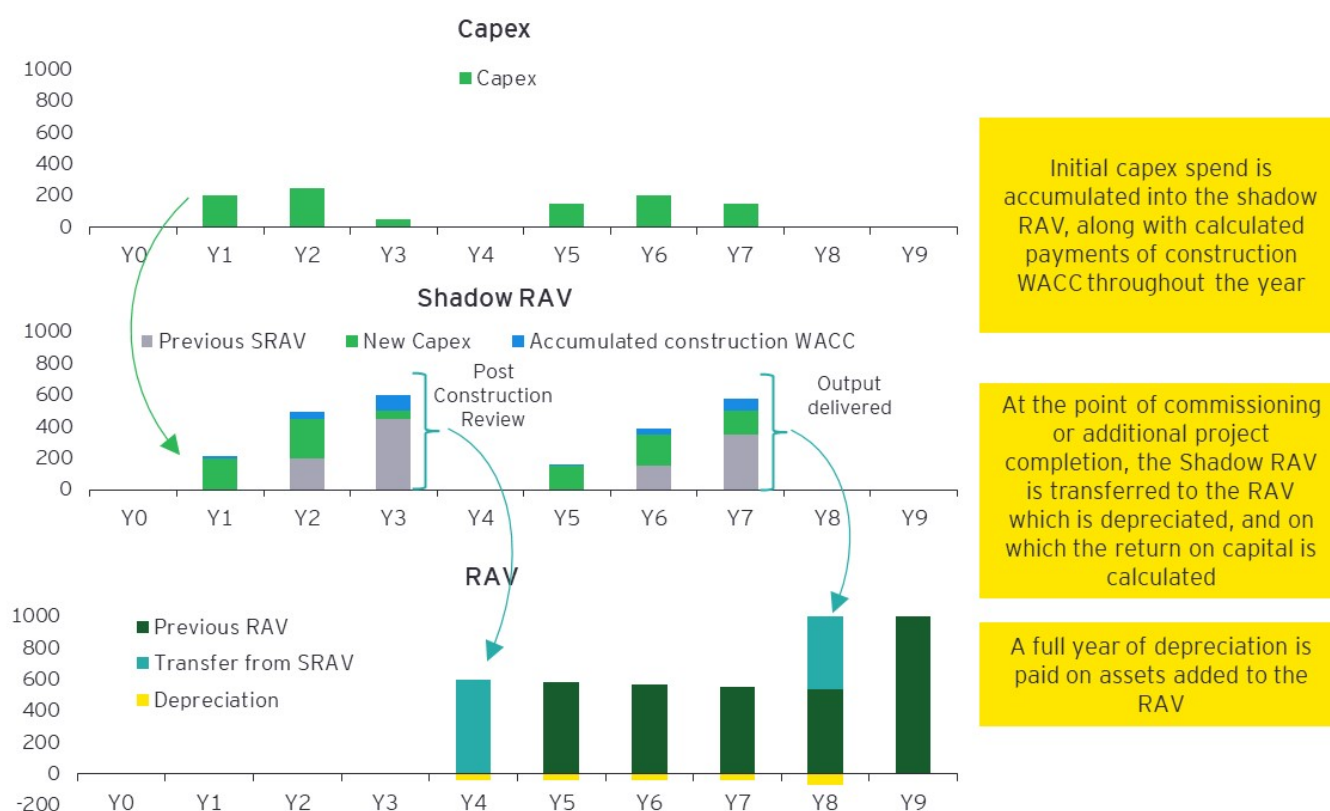
The RAV and WACC will be set in real terms, in a price base at the start of the construction period. This can then be re-indexed at future price controls if required. A revenue inflation factor will be used to convert real allowed revenues into nominal revenue payments to T&SCo.

Process for converting shadow RAV to the RAV

Once an asset is constructed and available for operational use, the shadow RAV is transferred to the RAV that is used to calculate the allowed revenues in each year.

We expect BEIS and T&SCos will agree during the initial settlement process the outputs that T&SCo will deliver for both the construction and operational periods (within the first regulatory period). Construction outputs are likely to take the form of a technical asset capacity for CO₂ flow per unit of time. Once these are delivered and verified through a pre-agreed process (which may include other relevant technical authorities), the Regulator will convert the shadow RAV to the RAV (see Figure 1).

Figure 1: Illustration of process for transferring shadow RAV to the RAV during the first regulatory period



Devex and Capex¹⁹

Depreciation

Depreciation will also be included in both the allowed revenue and RAV formulae, with the option for different components of capex to be depreciated at different rates.

In the December 2020 and May 2021 documents, we suggested that revenue will be collected from users to cover asset depreciation over the operational period. We continue to consider the options of applying either straight-line or backloaded depreciation to the RAV as part of the allowed revenue calculations in the first regulatory period. Backloaded depreciation would mean that depreciation increases in line with expected growth in utilisation, so that allowed revenue charges on users can be reduced in early years to support the initial stages of the

¹⁹ We are continuing to develop our position on the transfer of re-use assets to the RAV and will provide a further update on our proposed methodology in 2022. As set out in the 2020 Document, assets previously deployed in the oil and gas industry may be utilised/transferred as part of setting up the CCUS T&S network to save costs from building a new T&S network. As the asset is already largely constructed, the capital expenditure-based methodology for determining RAV would not be suitable to be applied directly on the transferred assets.

project and increased in later years when the network has more users. Shaping allowed revenue to better reflect the expected number of users on the network overtime will reduce any revenue gaps in the earlier years and the need to use Risk Mitigation Mechanisms (RMMs) and Revenue Support and enables the ERR to take into account revenue being received later so T&SCo is adequately compensated. We will continue to consider the impact of the two depreciation profiles both in relation to the efficient financing of T&SCo and securing VfM for users, the consumer and the taxpayer.

Opex

- Opex will be the allowed spend for efficient operational costs, which will have been agreed in the initial settlement. The opex allowance could also include an allowance for:
- expected user bad debt costs (discussed further in section 6 (Revenue Model));
- connections allowance (discussed under the Incentives subsection);
- expected hedging costs, such as for financial or energy price risks;
- expected private sector insurance premia including insurance required to access GSP arrangements (see section 7 (GSP)); and
- Supplementary Compensation Agreement (SCA) fees under GSP arrangements (see section 7 (GSP)).

The allowed opex may then be adjusted under the terms of the economic licence for allowed pass-through costs (such as business rates and licence fees) and reopeners.

Through dialogue with each T&SCo, BEIS will consider the operational risks of each project. In general, we will expect T&SCo to bear the risks that opex turns out higher or lower than the allowance.

Decommissioning

Allowed revenue will include an allowance to cover the decommissioning cost of the T&S network at the end of asset life. We discuss our approach to decommissioning in section 9 (Decommissioning).

Disposals

Asset disposals (including land), scrapping, and amounts recovered from third parties for costs associated with damage to their network should be included within the RAV calculation (through capex and opex being net of disposals). The value of disposals in these calculations should be on actual sale proceeds. We will require these transactions to be on an arm's length basis on normal commercial terms.

Tax

Allowed revenue will include an allowance for expected tax costs taking account of, for example, existing and announced corporation tax rates. A separate adjustment term for tax will be used to review expected tax costs based on changes in tax rates.

Adjustments (Adj.)

Allowed revenue and RAV will be subject to some adjustments each year and captured by the adjustment term in the allowed revenue and RAV formulae. These adjustments include:

- RMMs for difference between actual revenue and allowed revenue (e.g., because demand turns out differently from expected or bad debt is higher);
- reopeners, for example for change in scope and change in law– see the Uncertainty Mechanisms subsection;
- incentives – see the Outputs and Incentives section; and
- true-ups, corrections and reconciliations, such as corrections of allowed revenue using actual data where forecasts were previously used and Revenue Support payments reconciliation and corrections for changes in expected tax costs due to changes in tax rates etc.

Leakage fund

In the December 2020 document we said that it may be appropriate to accrue a financial reserve from allowed revenues during the operational phase which T&SCo could draw on to fund part of the costs for remedial activities associated with leaks from the storage site if the cost was above a certain threshold.

Our current position is that the T&SCo should be carrying out routine inspections and maintenance in accordance with its existing legal obligations, which should minimise leakage risk but that any residual leakage risk from the storage site should be insurable in the commercial market or managed via the SCA where commercial insurance is unavailable. As such, we do not propose T&SCos accrue a leakage fund.

Treatment of non-regulated revenues

Examples of non-regulated revenues could include, for example, revenues associated with the import of CO₂ from markets outside of the licence area for subsequent storage.

In the May 2021 document, we set out that two options that could be considered, and draw on precedent in other regulated industries, are a 'single till' approach, which would see the revenues from non-regulated activities used to cross-subsidise regulated activities and bringing down the cost of user charges, or a 'dual till' approach that would see the revenues and costs of non-regulated services treated separately with any profit retained by T&SCo.

We continue to consider that that a hybrid approach would be appropriate, sharing the benefits of non-regulated activities between T&SCo and users. However, we need to better understand what additional services T&SCos intend to provide and how they expect to offer those services in order to consider how to progress work on the details of how this hybrid approach should operate e.g., whether it is based on non-regulated revenues or profits from non-regulated activities, as well as the proportion of profits or revenues retained by T&SCo.

Outputs and incentives

Availability incentive

In our December 2020 and May 2021 documents, we considered that it may be appropriate for T&SCo to be subject to an availability incentive that rewards higher levels of T&S network availability during operations but penalises worse performance relative to a pre-set target. In turn, these penalties could be applied in-year, across multiple-years and/or be subject to a penalty floor. If the T&S network was unavailable, the DPA and ICC business model updates set out more information on the arrangements in place for users with a DPA or ICC contract²⁰.

We have explored this incentive further and recognise that the design of the incentive and any network availability target will need to account for the impact of planned outages that are required for ongoing maintenance, as well as unplanned outages that are outside of T&SCo's control. These are both features of other regulated networks that have incentives on availability and, as such, we believe that a well-designed scheme will address these challenges. We will also consider whether a small opex allowance is appropriate to manage unplanned outages. T&SCo would still be expected to bear risk for unplanned outages that are attributable to factors that lie within its control.

We have further developed the design of the incentive and its application. We propose to structure the incentive using a maximum target availability (which is likely to be lower than 100% due to planned outages for maintenance). Allowed revenues would be increased by an amount – to be determined during the initial settlement process – for each unit of availability above the target level, potentially up to full availability. However, allowed revenues would be also reduced by an amount for each unit of availability below the target level, down to a threshold. Where availability falls below this threshold, we propose to spread the resulting penalties across multiple years of the regulatory period so as to continue to incentivise maximum availability while not undermining T&SCo financeability. We expect to use a second threshold for greater falls in availability, leading to dialogue with the Regulator about why availability is so low and potentially resulting in financial penalties or other enforcement action.

A well-defined availability incentive should maximise the injection and storage of CO₂ from users, and therefore reflect the technical capacity of the network and the demand from users. For example, some users may require high availability during certain peak seasons, while others require constant availability. As such, we anticipate using capacity and seasonality weighting factors to increase the financial reward and penalties on T&SCo for ensuring availability or failing to provide the agreed availability. We will look to do this during the initial settlement process. At the current stage, in the absence of T&SCo and user proposals for the profile of CO₂ injection, we propose a simplified network-wide availability incentive without any weighting factors applied. When data becomes available, we will work with T&SCos to employ a more sophisticated incentive, as well as the availability target and incentive rates.

²⁰ See Dispatchable power agreement (DPA) business model: October 2021 update and Industrial Carbon Capture (ICC) business model: October 2021 update at: <https://www.gov.uk/government/publications/carbon-capture-usage-and-storage-ccus-business-models>

Containment incentive²¹

In the December 2020 and May 2021 documents we indicated that we intended to incentivise T&SCo to minimise the leakage of CO₂ from its network at or below a target level (that target could be zero).

The Oil and Gas Authority (OGA) is the regulator responsible for the storage of CO₂ on the UK Continent Shelf. The OGA will only issue a permit if it is satisfied that the storage complex has been sufficiently characterised and assessed and there is no significant risk of leakage (amongst other things).

The storage permit, regulated by the OGA, requires ongoing monitoring of the storage site to detect any leaks or irregularities, reporting on them, and undertake appropriate corrective measures. We therefore do not consider any further incentive is required in relation to minimising leakage from storage sites, given this regulatory regime.

For the pipeline transportation we consider T&SCos will be able to control leakage through operational management (including the need for venting) and technical design of the network. Our expectation is that design and operational management of the network should minimise CO₂ leakage. However, in considering the need for, and design of, an incentive to contain CO₂ within the transport network, we welcome views and evidence from cluster developers on their means (design, operational or other e.g., commercial) to minimise the risk of any leakage of CO₂ from the transport network.

We will also maintain consideration of other drivers and incentives such as the application of relevant Technical Screening Criteria (TSC) for the transport of CO₂ in the UK Taxonomy. These are currently being reviewed and government expects to consult on UK draft TSCs in the first quarter of 2022, ahead of legislating by the end of 2022. These TSCs will focus on economic activities which can make the most significant contributions to tackling climate change²².

Connections incentive

We expect that T&SCo would be responsible for any expansion of the T&S network and be required to connect new users. Efficient asset expansion would be funded by the users as part of regulatory allowances (and spread across all users), determined through the initial settlement process or, in exceptional circumstances, through uncertainty mechanisms set out below. We still consider that a separate connections incentive is not required to encourage efficient and timely connections as this will already be incentivised through the other proposed regulatory mechanisms (i.e., ex-ante allowance to drive efficient delivery, and allowed revenues conditional on the connections being constructed). In addition, we expect bilateral connection agreements between T&SCo and users to contain performance commitments to uphold each party's obligations. A general obligation to provide connections (subject to appropriate parameters) may also be included in the relevant legislation and/or economic

²¹Previously referred to as 'leakage incentive'.

²² <https://www.gov.uk/government/publications/greening-finance-a-roadmap-to-sustainable-investing>

licence conditions, in line with the approach taken in the context and gas and electricity networks. The T&S network code may also stipulate minimum standards for connections and provide regulatory recourse should bilateral negotiations between users and T&SCo fail. We will also work with T&SCo to determine the appropriate use-it-or-lose allowance to support outreach activities for the purpose of finding additional users.

Construction delay

Previously we set out how a delay in starting the operations of T&SCo could delay users from beginning to inject captured CO₂ into the T&S network²³. As such, we previously considered a penalty which would reduce the starting RAV if construction of the T&S network was delayed.

We now consider that withholding allowed revenues until operations commence to be a sufficiently strong incentive on T&SCo to manage its construction programme in a timely way. Construction delay will also stop the further accrual of construction WACC on allowed spend (i.e. the WACC does not further compound during the delay period). We are not currently considering further penalties such as a reduced RAV. Unless reopeners are triggered (see below), we expect T&SCo to manage the construction costs and timings itself against the allowed revenues determined in the initial settlement process. Our expectation is that construction delays would be managed in a similar way in the second and subsequent regulatory periods, although we note that the Regulator may explore the use of other measures to incentivise timely construction. The arrangements managing the risks to the first user that the T&S network is not available by the end of that user's target commissioning window (as set out in their carbon capture contracts) is addressed under the relevant user business models (e.g. DPA and ICC Contracts).

Uncertainty mechanisms

Reopeners are a form of uncertainty mechanism that the Regulator could use to adjust the RAV, allowed revenue, and timings of outputs during the regulatory period in response to material changes in circumstance outside of T&SCo's control that could not reasonably have been predicted and prepared for at the time of the initial settlement. These are important mechanisms to provide flexibility to the initial settlement. However, we consider that these mechanisms will only be triggered in exceptional circumstances, with the aim to balance risk between T&SCo and users. Since the May 2021 document we have further considered our initial proposals to use of reopeners in the discrete case of sharing the benefits of T&SCo refinancing with users and managing opex, and we now consider there may be merit in using reopeners to address specific uncertainties under the ERR.

To ensure the T&SCo retains the delivery risk of its projects, we have proposed reopeners that should only vary the initial settlement for one-off events that lead to material changes in expenditure or output timings. The events which would trigger a re-opener are intended to be

²³ A delay in starting operations of the T&S network could impact an anchor user's TCW. Under the Dispatchable Power Agreement (DPA) model, it is being proposed that the contract term will commence on the earlier to occur of the "Start Date" (i.e. when the project is commissioned) and the last day of a specified "Target Commissioning Window" of 12 months which will be adjusted day-for-day for any delays that occur due to "Force Majeure". A similar concept is under consideration for Industrial Carbon Capture Contracts.

ones which could not reasonably have been predicted at the time of the initial settlement, and the event is outside of the control of T&SCo. In any case, T&SCo will be expected to efficiently mitigate the impacts of the event.

These reopeners could potentially be triggered by T&SCo or the Regulator. While these are likely to be more reactive, due to the nature of events, reopeners may also be used proactively. For example, in a case where the need to invest will only become clear during the first regulatory period. In this case, it may be prudent to avoid the risk of a stranded investment and wait until the case for investment is more certain. We have relaxed the need to define application windows because of the inherent unpredictability of these type of events and their potential impact on T&SCo's ability to continue operations. As such, reopeners can be triggered at any point during the first regulatory period.

Our proposed set of reopeners, and additional conditions, will include change in law and change in scope. These will be the subject of further discussion with T&SCos during the initial settlement process.

How, or whether, the reopener will adjust the RAV, allowed revenues or outputs will be determined on a case-by-case basis by the Regulator.

The application of reopeners will follow a defined process set out in the economic licence. We have considered two distinct routes for a reopener application:

- Default ex-ante route: while the events triggering a reopener could not have been predicted during the initial settlement, we expect T&SCo will typically have sufficient warning to develop a business case submission to the Regulator for assessment. The Regulator will determine if the case is eligible and reasonable, and whether revisions should be made to allowed expenditures, timelines and outputs. A successful application to the Regulator under this model should be determined through a consultative process (allowing users to provide their views), and within one calendar year. This should generally allow variations to funding within 1-2 years, depending on the timing of the application.
- Accelerated model: where an event has occurred without warning and T&SCo requires urgent regulatory intervention, a real-time model may be used where the Regulator makes a rapid determination up to a certain envelope, and potentially with an ex-post review to allow further adjustments (such as for true-ups). We consider this envelope is required to ensure T&SCo retains the risk for managing the event efficiently as well as provide users with some protection from large variations that had not been consulted on. We will determine the envelope during the initial settlement process.

The expectation is that reopeners will not be used frequently, but will provide a contingency for unforeseeable events that are outside of T&SCo's control and a mechanism to manage those events.

Role of the Regulator

The determinations by BEIS of allowed revenue and other key features of the ERR described above for the first regulatory period would be incorporated into the economic licence awarded to each T&SCo. These determinations would be fixed for the whole of the first regulatory period except for limited, pre-determined circumstances (e.g., where there is a significant change in events that would warrant an adjustment to the allowed costs and revenues of T&SCo). These pre-determined circumstances, where aspects of the first regulatory period could be re-opened or adjusted, would be set out in the economic licence as well. These would include any agreed uncertainty mechanisms.

In the situations where some aspect of the first regulatory period needs to be re-determined or adjusted, the Regulator will be responsible for making this re-determination or adjustment. The Regulator would need to consult with T&SCo and other stakeholders before making a decision and it would need to make decisions consistent with its legal obligations and duties. We consulted over the summer on proposed duties, powers, functions and objectives of the Regulator for CO₂ T&S networks. The government response to the consultation, including a summary of consultation responses, will be published in due course.

Determining T&SCos capex

In the December 2020 and May 2021 documents, we outlined our position to adopt a combined ex-ante and ex-post assessment of construction and re-use costs. While it is likely that developers will have varying levels of confidence in their cost estimates across the different assets, we also consider that T&SCos should be responsible for developing high quality plans with well-evidenced and justified costs for their projects.

As part of determining the ERR applied to the first regulatory period, BEIS would perform an ex-ante assessment of T&SCo's proposed costs for the transport and storage assets and set a base case cost allowance. T&SCo would bear the risk of construction costs turning out to be higher or lower than the base case, except in limited pre-defined circumstances where adjustments could be made to the allowed construction costs (e.g. change in law). We also maintain our position of adopting a combined ex-ante and ex-post assessment of re-use costs. Assets previously deployed in the oil and gas industry may be utilised/transferred as part of setting up the CCUS T&S network to save costs when building a new T&S network. As the asset is already largely constructed, the capital expenditure-based methodology for determining RAV would not be suitable to be applied directly to the re-use assets.

Where costs are insufficiently certain or well-evidenced, BEIS may determine that T&SCo must resubmit its business plan addressing the shortfalls, or that the costs are more suitably assessed ex-post. This may be the case for certain elements of the offshore network. An ex-post approach will not be used to re-assess expenditure decisions made by T&SCo that were considered efficient at the time, and we would expect there to be a dialogue throughout the construction period to allow developers to test their spending plans with the Regulator in order to reduce the risk of expenditures being assessed to be inefficient on an ex-post basis.

Length of the first regulatory period

In the May 2021 document, we set out our view that BEIS would determine the length of the first regulatory period in consultation with the T&S network developer for each cluster. We set out that the starting point for these discussions would be that the first regulatory period would commence at the award of the licence and end after the first 3 years of commercial operations. As the aim is to have allowed enough time for operational understanding to increase ahead of the next price control period we may consider slightly longer periods of commercial operation.

In addition, we also set out that it may be appropriate to allow the first regulatory period to be extended in circumstances where the construction of the T&S network takes place over multiple phases. For this to be agreed, BEIS and T&SCos would both need to be confident that the rate of return offered was commensurate with the risks borne by T&SCo. Further, the T&SCo would need to provide sufficient confidence to BEIS about their cost projections, and the risks they will bear. In such cases, if agreed pre-conditions were met, the first regulatory period would be extended to cover the further construction subject to the specified allowed costs and WACC. If not, then the first regulatory period would not be extended and the Regulator would design and calibrate the ERR applied to T&SCo for the second regulatory period.

We will continue to develop the potential design of these arrangements in dialogue with T&S network developers.

Second and Subsequent Regulatory Periods

As previously set out in the May 2021 document, BEIS will determine the ERR for the first regulatory period. Following the initial settlement, the Regulator will play an important role in implementing the settlement according to the economic licence conditions agreed between BEIS and T&SCos. The Regulator will implement the economic licence mechanisms, working through an annual process of translating the settlement into charges during the operational period. Where uncertainty mechanisms are in place, the Regulator will review these and make any required adjustments (e.g. to allowed revenues).

The Regulator will assume responsibility for determining the settlements for the second, and subsequent, regulatory periods in line with its statutory duties and obligations. During these periods the Regulator would be responsible for designing and calibrating the ERR applied to T&SCo. This means that the Regulator would determine T&SCo's allowed revenues based on an assessment of capex, opex, allowed WACC and other building blocks of allowed revenues such as decommissioning costs and taxes. The Regulator would also determine the appropriate performance targets and associated financial rewards and penalties (incentives) for T&SCo, as well as any uncertainty mechanisms to include to address risks faced by T&SCo and other stakeholders.

The Regulator would also be responsible for determining the appropriate duration of the second and subsequent regulatory periods. Noting that the first regulatory period would finish at different points in time for each cluster's T&SCo (because construction would finish at different points in time for each of the clusters), the Regulator may seek to set the length of

future regulatory periods in a way that enables later regulatory periods to be concurrent for all of the T&SCos.

The Regulator would make these determinations subject to its statutory duties and obligations as determined by Parliament and the relevant legislation. We recently consulted on the duties and functions of the Regulator, to inform continued policy development and legislative proposals. We are carefully considering the range of views put forward through this consultation process. These included arguments for a more balanced approach to duties, as compared to a single principal duty for the Regulator, to reflect, in particular, the nascency of the T&S sector. Further consideration of the Regulator's duties is set out in the government response to the consultation, will be published in due course.

As a safeguard for T&SCo's investors, the decisions made by the Regulator are expected to be appealable to the Competition and Markets Authority or subject to Judicial Review, depending on the nature of the decision being challenged. Our current view is that the CMA's role in regulatory appeals in the T&S sector, and the types of decisions which are appealable to the CMA, should be consistent with the CMA's role in appeals in other regulated sectors including gas and electricity.

The Regulator would also be involved in undertaking enforcement action and, as a final step, deciding whether to revoke the economic licence. We consider that licence revocation would only occur in extreme circumstances in accordance with the revocation terms which would be set out in the economic licence prior to its award to T&SCo

We recognise that it is important to find the right balance between an independent economic regulator that is able to adapt the ERR to changing circumstances and one that can provide certainty and confidence to investors in T&SCo.

Section 5: T&S tariff arrangements

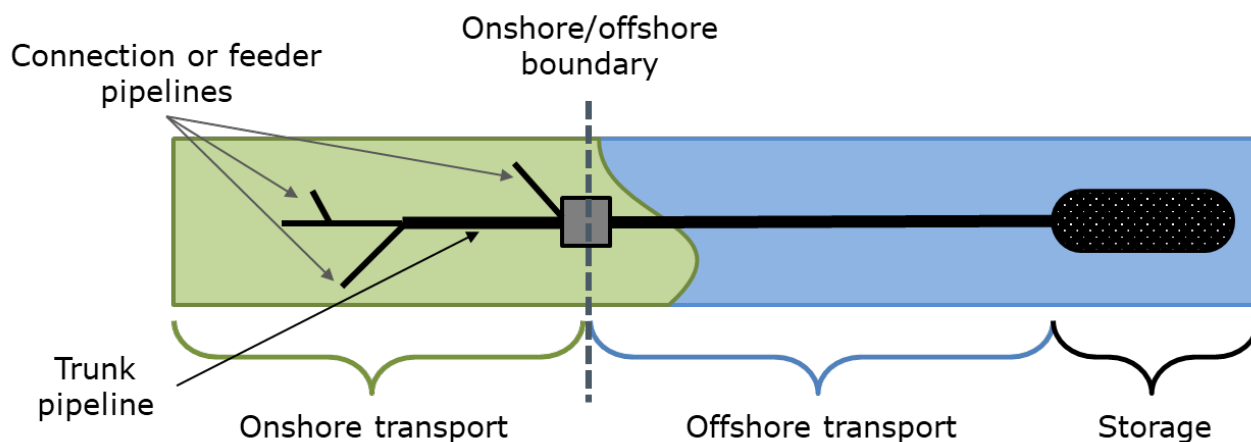
In the May 2021 document, we confirmed a User Pays revenue model for T&SCo. Under this model, T&SCo will collect its allowed revenue set under the ERR through T&S fees paid by users of the T&S network. We expect the T&S fees will be determined using a methodology initially developed by the government and industry, informed by a set of guiding principles.

If the charging methodology needs to be adjusted after it has been implemented, the Regulator will be responsible for making this adjustment. The Regulator would need to consult with T&SCo and other stakeholders before making a decision and it would need to make decisions consistent with its statutory duties.

Charging principles for the initial CCUS clusters will need to balance providing signals to users about the cost that their use of the network imposes and the need to encourage efficient use of the system against the need for sufficient simplicity to ensure that charges can be easily implemented and encourage users to join the network. Other principles that will be considered in the design of T&S fees include non-discrimination and transparency of methodology.

The T&S network will be made up of the main onshore pipeline, an offshore pipeline and a storage site. Some users will be directly connected to the trunk via a connection or feeder pipelines²⁴ and their CO₂ will be transported via the trunk of the onshore pipeline to the offshore pipeline. Other users will transport their CO₂ via NPT to either the onshore or offshore pipelines. These different types of pipelines could attract different types of charges. We have not yet taken a decision on appropriate charging arrangements for NPT of CO₂, however, as set out below, the proposed tariff structure provides a basis for accommodating CO₂ from non-piped sources.

Figure 2: illustration of a notional CCUS cluster



²⁴ Connection or feeder pipelines could be sole use or multiuse.

This section below presents our latest thinking on:

- T&S connection charges for connector or feeder pipelines;
- Use of system charges for the T&S network (the trunk of the onshore pipeline and the offshore pipeline and a storage site); and
- the T&S charging process.

Connection charges

T&SCo will incur costs for connecting users to the trunk of the CCUS onshore pipeline, and the costs will increase with the length and size of the connection, i.e. the cost of connecting a large user located far away from the onshore pipeline will be higher than the cost of connecting a smaller user located near the onshore pipeline.

Our position on connection charges remains unchanged since the May 2021 document. In the early operational phase users will have no or limited choice over their location, therefore limiting the effective signal that a connection charge could provide. Hence the minded to position was that no connection charge should be levied on users in the early operational phase of the T&S network and instead the cost of connections would be included in the use of system charges. However, we also noted that this position does not preclude the introduction of connection charges for users that connect to the onshore pipeline in later years.

Use of system charges for the T&S network

T&SCo will incur costs driven by the length and the capacity of the onshore and offshore pipelines²⁵, the volume and distance of the CO₂ transported, and the volume of CO₂ stored²⁶. Use of system charges will be levied on users to reflect the costs their use of the network imposes on T&SCo where users are able to respond to price signals.

In the May 2021 document, we outlined that it is possible that not all of the CO₂ injected into the T&S network will necessarily be transported via the onshore pipeline; some users may bypass the onshore pipeline by using NPT to transport their CO₂ to the onshore/offshore pipeline boundary, even in the early operational phase.

Therefore, in order to reflect that not all users could be connected to, or use, the onshore pipeline, our May 2021 position was to create two T&S use of system charges²⁷:

²⁵This will include connection pipelines if no connection charges are to be levied on users.

²⁶ The costs associated with conditioning and compression of a user's CO₂ will be paid by that user and will not be included in the use of system charge.

²⁷ The two charges could be included on a single charging statement. A user that is directly connected to the onshore pipeline would be subject to the onshore pipeline charge and the offshore pipeline + storage charge, whereas a user that transports its CO₂ to the onshore/offshore pipeline boundary via NPT would not have to pay the onshore pipeline use of system charge.

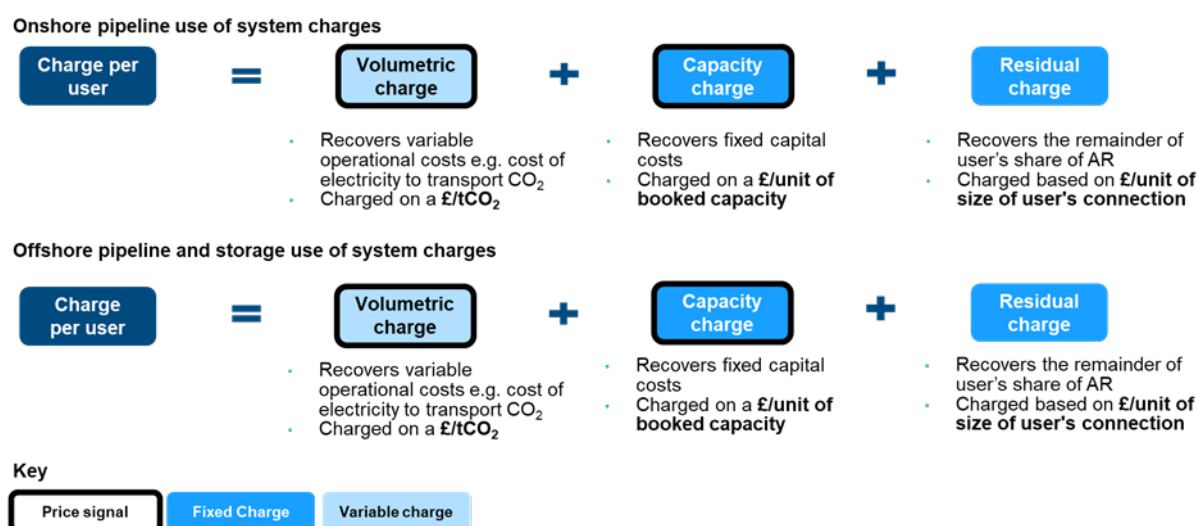
- onshore pipeline use of system charge; and
- offshore pipeline + storage use of system charge.

A user that is directly connected to the onshore pipeline would be subject to the onshore pipeline charge and the offshore pipeline + storage charge²⁸, whereas a user that transports its CO₂ to the onshore/offshore pipeline boundary via NPT would not have to pay the onshore pipeline use of system charge.

Updated position

Our minded to position remains to have two use of system charges, one for the onshore pipeline and one for the offshore pipelines and storage. Both charges will have the following high-level structure:

Figure 3: proposed structure of use of system charges



This tariff structure reflects that both variable and capacity costs are expected to be key cost drivers for the onshore, offshore and storage parts of the network.

The volumetric charge recovers variable operational costs e.g., cost of electricity to transport CO₂, and is charged based on a £/tCO₂. The capacity charge recovers fixed capital costs and is charged based on a £/unit of booked capacity²⁹. The residual charge recovers the remainder of user's share of allowed revenue and is charged based on £/unit of size of user's connection.

The charging structure is expected to be consistent across clusters, with different charging rates allowed to reflect differences in total costs and cost structures. We will work with industry to develop the detailed methodology for use of system charges for the T&S network.

²⁸ The onshore pipeline charge and the offshore pipeline + storage charge could be included on a single charging statement.

²⁹ Booked capacity is the maximum capacity of the T&S network that a user can use over a certain time period.

Onshore pipeline use of system charge

It is expected that in the early operational phase users will have no or limited choice over their location, and some users may have less choice compared to others. Hence in the May 2021 document, our minded to position was that the onshore pipeline charges should not vary by the distance over which the CO₂ is transported in the early operational phase. The exclusion of a distance charge creates a level playing field for users regardless of how far away they were located from the onshore/offshore boundary, and promotes the pace of development of the CCUS sector and connecting the most sustainable users, without financially penalising users further away from the onshore/offshore boundary.

Updated position

We continue to hold the view that users will have no or limited choice over their location in the early operational phase, hence our minded to position is that onshore pipeline charges should not vary by the distance over which the CO₂ is transported; these costs will be socialised across all users connected to the onshore pipeline through the onshore pipeline use of system charge. However, as set out in the May 2021 document this position will continue to be tested against T&S design plans.

Offshore pipeline + storage use of system charge

In the May 2021 document, our minded to position regarding offshore pipeline + storage use of system charge was that it should not include an element to take account of use of the length of the network, as users do not have control over the length of the offshore pipeline and their use of the length of the offshore pipeline will not vary. It is expected that in the early operational phase CO₂ will travel the full length of the offshore pipeline to be stored.

Updated position

Our minded to position for offshore pipeline + storage use of system charges is unchanged. Any decision on the design of use of system charges in the early operational phase does not preclude changes to the charges in later years, subject to consultation.

We acknowledge that injection of CO₂ at the storage site wellheads from ships may become a feature of CCUS clusters in the future. If this materialises in the future, we anticipate that the design of the system usage charges will be revisited to appropriately support this use-case.

T&S charging process

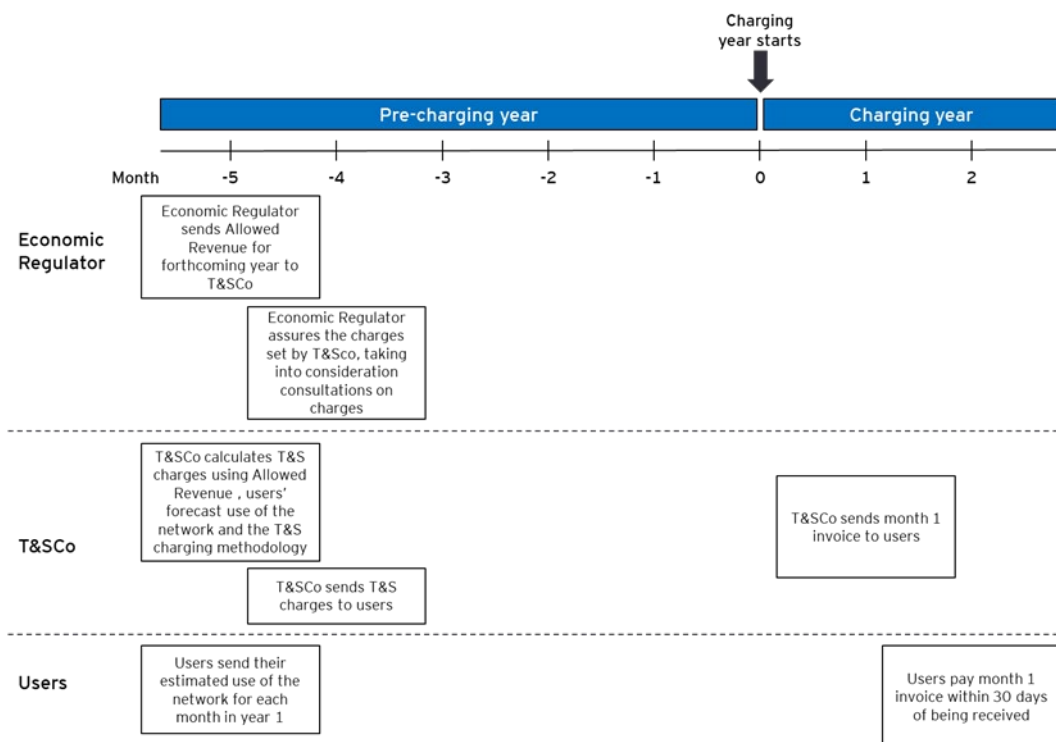
We have considered the charging and payment mechanisms for the T&S network for the early operational phase and set out our minded to position below.

T&SCo will be responsible for setting T&S fees to collect the allowed revenue set by the Regulator in accordance with the T&S charging methodology, and these charges will be assured by the regulator. T&S fees will be set annually, four months in advance of the charging year, based on users' forecast of volumes of CO₂ to be injected into the network, their booked

capacity and taking into consideration consultations on charges. At the same time that T&S fees for the forthcoming charging year are published, forecast T&S fees for the following two years will be made available. Setting T&S fees annually will provide a degree of certainty and stability for users, whilst providing flexibility to update them frequently enough to reflect the user environment and costs. Forecasting charges up to two years in advance will also inform users' decisions on future usage of the network.

During the charging year³⁰, T&S fee invoices will be sent directly to users each month, on an ex-post basis, i.e. each user will be invoiced for their utilisation of the network in the previous month. Charging invoices on an ex-post basis mitigates against the risk of users' inaccurately forecasting their use of the network, which may be higher during the early operational phase. Users will be required to pay their invoice³¹ to T&SCo within 30 working days of receiving the invoice, which accommodates the payment of CfDs to users.

Figure 4: illustration of proposed T&S charging process up to payment of month 1 charge



Regarding the enforcement regime if there is a late payment, our minded to position is that users will be issued with late payment notices³² and that interest will be applied to late payments to incentivise users to pay their T&S fees in a timely manner. T&SCo will also be able to draw down user collateral³³ to enable it to recover its allowed revenue. After each charging year, actual revenue collected through T&S fees will be reconciled against allowed

³⁰ The invoice will include all elements of T&S fee (capacity, volumetric and residual)

³¹ All elements of the fee are to be paid on a monthly basis.

³² A notice issued to the user, formally informing them that they are in default after a certain number of days past the invoice due date.

³³ This would involve drawing down user collateral, which is posted by all users to mitigate risk of non-payment of charges to the T&SCo.

revenue³⁴. The allowed revenue will be increased/decreased through the Revenue Adjustment Mechanism (RAM) in order to return any over recovery/collect any under recovery of revenue two years after the charging year in question³⁵. The increase/decrease in allowed revenue will in turn lead to an increase/decrease in the residual charge in the T&S fee.

³⁴ Taking into account any money T&SCo has received through RMMs, such as drawing down collateral, its bad debt allowance, its financial reserve, or from government or energy consumers. See section 6 (Revenue Model) for a description of these RMMs.

³⁵ Any difference between actual revenue collected through T&S fees and allowed revenue will be reflected in the residual fee two years after the charging year in question (e.g. year 1), as the reconciliation for the year in question will take place at the start of the next charging year (i.e. year 2), at which stage the year 2 charges would have already been set – hence the under or over recovery of year 1 revenue would be reflected in year 3 charges.

Section 6: Revenue model

The User Pays revenue model, which was confirmed in the May 2021 document, will be a sustainable model for T&SCo in the steady state. However, in the first regulatory period³⁶ there may be structural revenue risks to T&SCo.

In the May 2021 document we presented Risk Mitigation Mechanisms (RMMs) to mitigate the risks associated with the revenue model. The risks identified were:

- utilisation build-up during the early operational phase – users will join the network in phases and the T&S network will not be fully utilised for some time resulting in T&SCo collecting less than its allowed revenue, assuming users pay T&S fees that reflect their use of the network;
- timing mismatch of when planned capture projects connect – T&SCo will only start receiving user revenue when the first user joins the T&S network and so if the first user joins later than expected T&SCo will not be able to collect any revenue;
- underutilisation of the network – once the first user has connected to the T&S network T&SCo may collect less than its allowed revenue, for example, if further users don't connect on time, there are fewer users than expected, or if there is less CO₂ injected into the network than expected; and
- bad debt of users – once the first user has connected to the T&S network, T&SCo will collect less than its allowed revenue if there are unforeseen delays in payment of T&S fees or non-payment by users (e.g. insolvency of a user).

We have further considered how these revenue risks will be mitigated through the RMMs, as well as the processes underpinning these, and our update is set out below. If the initial proposals to mitigate the risks are not sufficient to enable T&SCo to recover its allowed revenue, Revenue Support³⁷ will be available to protect T&SCo. Revenue Support is a mechanism which provides for recourse from consumers or taxpayers.

Any decision on the RMMs and Revenue Support to address risks related to the revenue model in the early operational phase does not preclude changes to these mitigation measures under the enduring regime.

Utilisation build-up during the early operational phase

In the May 2021 document our minded to position was to include the following RMMs and

³⁶ In the May 2021 update we set out that structural revenue risk may extend beyond the first regulatory period. We continue to consider if this may still be the case as it will depend on market conditions and the levels of demand and system utilisation. From the second regulatory period, the Regulator will be responsible for determining the extent of and appropriate ERR mitigations for structural revenue risks.

³⁷ Revenue Support was previously referred to as the "Contingent Mechanism". See RSA heads of terms for more detail.

Revenue Support to address the impact of utilisation build-up in the early operational phase:

- upfront capital contribution through the CIF – the provision of upfront capital funding could reduce the capital cost incurred by T&SCo which it has to finance, and in turn this would reduce T&SCo's allowed revenue required;
- TRI model design – the allowed revenue profile could be shaped to match the expected utilisation profile of the T&S network, i.e. deferring revenue from the early operational phase to later in the operational phase. This could be achieved by adopting a non-straight-line depreciation of the RAV; and
- Revenue Support – if other proposed mechanisms fail to adequately mitigate the revenue risk to T&SCo then revenue could be recovered from taxpayers or consumers.

Updated position

Since May 2021, we have further considered how to protect T&SCo from the impact of utilisation build-up. We are considering ways to provide capital support through the CIF that may reduce this impact. We continue to explore the TRI model design by considering the use of straight-line or backloaded depreciation of the RAV as part of the allowed revenue calculations. Similarly, we will also consider the timing and profile for the accumulation of the decommissioning fund(s).

We are also minded to include mutualisation to address the impact of utilisation build-up. Mutualisation was not proposed as a mitigation for utilisation build-up in the May 2021 document, but was included as a RMM for underutilisation. Mutualisation involves increasing T&S fees in order to enable T&SCo to collect more of its allowed revenue than it would be able to if T&S fees were only charged in proportion to users' expected utilisation of the network and booked capacity.

Since May 2021, we have developed our approach to mutualisation, considering key CCUS business model principles. These include for policies to be market based – compatible with existing market frameworks – but retaining the flexibility to respond to market conditions and public needs as markets and the economy evolve, and also to be an investable proposition for both T&SCo and users of the network, attracting new domestic and international entrants to the market with the potential to be subsidy free.

Therefore, we believe that users' exposure to increasing T&S fees should be limited to a cap, and we are considering the UK carbon price as a basis for the cap. We think that using the carbon price provides an appropriate level of protection to users as it uses a visible and established external benchmark, while still incentivising utilisation of the network.

The increase in T&S fees from mutualisation for utilisation build-up will be set in advance of the charging year. T&SCo will forecast the revenue it expects to collect if T&S fees were charged in proportion to users' expected utilisation of the network and booked capacity. If T&SCo's forecast of revenue is less than its allowed revenue, T&SCo will increase the residual fee up to the cap. T&SCo will submit its calculation to the Regulator for assurance and once assured

(including industry consultation on proposed charges), the T&S fees will be set for the 'charging year'.

Subject to ongoing design of the TRI model, we are also minded to include Revenue Support to protect T&SCo if the RMMs described above are not sufficient to enable recovery of allowed revenue. Under this concept, for T&SCo to receive Revenue Support, we expect T&SCo to enter into a Revenue Support Agreement (RSA) with a RSA Counterparty upon satisfying certain initial conditions precedent.

There are a number of possible scenarios where this concept could apply. For example, during the early operational phase, at the beginning of each quarter, we envisage that T&SCo will be able to request Revenue Support to cover any expected shortfall from estimated revenue from users and RMMs in the future compared to its allowed revenue, pro-rated for the quarter.

T&SCo will inform the Regulator of its request to access Revenue Support and the Regulator will then assure T&SCo's request to access Revenue Support.

Once T&SCo's calculations have been assured by the Regulator, T&SCo will apply to the RSA Counterparty to access Revenue Support. If Revenue Support is to be funded by taxpayers, the RSA Counterparty will inform government of its intention to collect Revenue Support, whereas if Revenue Support is to be funded by consumers then the RSA Counterparty will inform energy suppliers or relevant entities.

T&SCo will be able to make its request for Revenue Support at the beginning of each quarter so that T&SCo can receive its allowed revenue in a timely manner. However, as the request for Revenue Support will be made based on expected shortfall in allowed revenue for the quarter, there will need to be a reconciliation process to ensure T&SCo does not receive too much or too little revenue.

Timing mismatch of when capture projects connect

In the May 2021 document our minded to position was to include the following RMMs to mitigate against this risk in the early operational phase:

- Rolled Up Interest (RUI) – the allowed return on capital and depreciation that T&SCo would have been able to collect as part of its allowed revenue if the first user had joined the T&S network on time could be deferred and "rolled up" into the RAV that T&SCo can recover across the remaining operational life of the T&S network;
- recovery of operating expenditure – T&SCo's opex within its allowed revenue will be paid for each year, potentially by consumers or taxpayers, until a user joins the T&S network; and
- Revenue Support – if other proposed mechanisms fail to adequately mitigate the revenue risk to T&SCo then revenue could be recovered from taxpayers or consumers.

Updated position

Since May 2021 we have further considered how to protect T&SCo from the risk of timing mismatch.

If the first user does not become operational during its Target Commissioning Window (TCW)³⁸ T&SCo will calculate the allowed revenue it should have received from that user. The Regulator will assure these calculations and once assured, it will roll-up the return on equity and depreciation that should have been received in the relevant period into the shadow RAV, in the process referred to as RUI, which will increase allowed revenue in future years.

Since the May 2021 document, we have decided that the operating expenditure and allowed cost of debt that T&SCo should have received from the first user will be provided through Revenue Support.

Underutilisation of the network

In the May 2021 document our minded to position was to include the following RMMs to mitigate against this risk in the early operational phase:

- mutualisation over the remaining user base – T&S fees for remaining users of the T&S network would be increased in order to close the revenue gap from underutilisation, with T&S fees capped; and
- Revenue Support – if other proposed mechanisms fail to adequately mitigate the revenue risk to T&SCo then revenue could be recovered from taxpayers or consumers.

We also set out our view that other RMMs may be implemented by the Regulator in the enduring regime, and that we were minded not to include the following incentives in the early operational phase:

- building a financial reserve – a financial reserve would be included as part of the allowed revenue and could be used to recover any allowed revenue T&SCo has not collected from users due to underutilisation; and
- T&SCo's utilisation incentive – T&SCo would be encouraged to increase use of the T&S network through rewards or penalties for higher than or lower than expected use of the T&S network, respectively.

Updated position

Since May 2021 we have further considered how to protect T&SCo from the risk of underutilisation. In the early operational phase we are minded to include mutualisation up to a cap and Revenue Support to mitigate this risk.

³⁸ See relevant emitter business models.

Mutualisation up to the cap for underutilisation will be applied following the reconciliation of T&SCo's allowed revenue against its actual collected revenue³⁹.

At the end of the charging year, T&SCo will reconcile the actual revenue collected in that year to the allowed revenue. If there is under recovery of revenue due to underutilisation T&SCo will calculate how much revenue is to be recovered from mutualisation subject to the cap and submit its calculations to the Regulator. The Regulator will assure T&SCo's⁴⁰ calculations and, once assured, it will increase allowed revenue through the RAM two years after the charging year in question to account for the under recovery of revenue in that year. The change in the allowed revenue in future years will take effect through an increase in the residual fee in the T&S fees.

If there is an under-collection of allowed revenues after mutualisation up to the cap, Revenue Support will be used to enable T&SCo to collect its total allowed revenues.

We remain of the view that the financial reserve and utilisation incentive are not appropriate RMMs for the first regulatory period.

Bad debt of users

In the May 2021 document our minded to position was to include the following RMMs to mitigate against this risk in the early operational phase:

- collateral – users of the T&S network could be required to post collateral equal to a certain percentage of their expected annual T&S fees or users could buy insurance (if available) against not being able to pay T&S fees; and
- bad debt allowance – a “use it or lose it” bad debt allowance in the calculation for T&SCo's allowed revenue which is returned to users at the end of every charging year if it is not fully utilised.

Updated position

Since May 2021 we have further considered how to protect T&SCo from the risk of bad debt.

The risk of bad debt is considered to be low in the early operational phase as it is expected that the majority of users will be in receipt of payments through CfDs which will cover the T&S fee. Despite the low risk these RMMs still offer important mitigations to revenue risk for T&SCo.

In the early operational phase we are minded to include collateral and bad debt allowance as RMMs to mitigate against this risk.

³⁹ This differs to the timing for mutualisation for utilisation build-up, whereby T&S fees can be increased in advance of the year based on T&SCo's forecast of expected revenue from T&S fees charged in proportion to users' expected utilisation of the network and booked capacity.

⁴⁰ Mutualisation is a two-way mechanism. If the T&SCo collects revenues in excess of the allowed revenue amount in a storage year, users fees will be reduced in subsequent charging years.

Users will be required to post collateral equal to their largest expected invoice for two consecutive months in the coming year (e.g. satisfactory letters of credit or parent company guarantees) once charges have been set ahead of each charging year.

The bad debt allowance will be included as part of the formula for determining allowed revenue.

During the charging year, following the end of every quarter T&SCo will reconcile the actual revenue received in the quarter to the allowed revenue it should have received⁴¹. If there is under recovery of revenue due to non-payment from one or more users it will first calculate how much revenue it can recover from collateral from the users that have not paid. If the under recovery of allowed revenue is larger than the amount that T&SCo can receive from collateral then it will calculate how much revenue it requires from the bad debt allowance.

In order for a user that has previously not paid its T&S fee to continue using the T&S network it will need to repost collateral so it meets the requirements again and pay the missed payments with interest.

Following the end of the charging year T&SCo will report to the regulator whether it used any of the bad debt allowance, and if so how much. Following an assurance exercise, the regulator will deduct any bad allowance not used from the allowed revenue for two years after the charging year in question as part of the RAM.

⁴¹ The reconciliation will take place over a month after the quarter has finished as invoices are charged at the end of the month on an ex-post basis, and users have 30 working days to pay their invoices

Section 7: Government Support Package

In previous updates, we published initial perspectives on a possible Government Support Package ('GSP'), but since the May 2021 document, the mechanism has been further developed to ensure adequate protection to the T&SCo from high impact, low probability risks, taking into account subsidy control rules, guidance on managing contingent liabilities in the public sector⁴², and the polluter pays principle.

Scope of the GSP

The overall scope of the GSP remains broadly the same as previously set out. For the avoidance of doubt however, the GSP will not provide protection to T&S network users from exposure to the risks of Asset Stranding and Leakage of CO₂, as the GSP is a suite of contractual agreements between government and T&SCo. Arrangements for T&S network users will be set out in user business models.

Updated definitions of the high impact, low probability risks identified are set out below (with more detail on the specific roles of the commercial insurance and the GSP in managing these risks set out later in this section 7):

- **Stranded Asset** – the asset would be considered stranded when the actual revenue falls consistently below the level of the allowed revenue so that the asset becomes uneconomic, and where other measures to support T&SCo through the ERR or through the RSA are either ineffective or have been discontinued.
- **Leakage of CO₂**⁴³ – is defined as where leakage of CO₂ from the store complex or specified significant irregularities (such as an unforeseeable geological event) gives rise to a requirement of the OGA or relevant technical regulator that T&SCo take material corrective measures in respect of the store complex or that CO₂ injection by T&SCo be prevented or suspended for the long term or indefinitely. This will not include mitigating measures which should be addressed by normal planned preventative or reactive maintenance or constraints on the level of CO₂ injection or the capacity of the store complex.

Leakage of CO₂ is expected to be managed in the first instances by commercial insurances but the Supplementary Compensation Agreement (SCA) is to provide protection in the remote circumstances where commercial insurances are not available or are insufficient. Work is ongoing to quantify the probability of risks materialising. The OGA is the regulator responsible for the storage of CO₂ on the UK Continent Shelf. The OGA will only issue a permit if it is

⁴²https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/871660/0602_2020_Government_as_Insurer_of_Last_Resort_report_Final_clean_.pdf

⁴³Leakage of CO₂ is used throughout this section and should be considered to have the meaning as set out in the definition above.

satisfied that the storage complex has been sufficiently characterised and assessed and there is no significant risk of leakage.

It was previously envisaged that GSP provisions would be a contractual arrangement between government and T&SCo and this view remains unchanged. The envisaged contractual structure is as follows:

- **The Supplementary Compensation Agreement (SCA)** is a contract which will provide certain payments to T&SCo if commercial insurance is unavailable (or not available on commercially viable terms, if for example costs are excessive) or has been exhausted, and a relevant liability of T&SCo arises. The objective of the SCA is to return the asset to a reasonable and sustainable level of operational readiness. More detail on the likely coverage of the SCA is in **Table 1** but it includes provision for business interruption (including debt service), remediation of the situation (including any damage to the environment) and the payment of carbon allowances. The SCA will be available to manage the Leakage of CO₂ risk, but not the Stranded Asset risk which will be addressed by the RSA.
- **The Discontinuation Agreement** allows for the Secretary of State to discontinue the GSP⁴⁴, and entitles T&SCo to be compensated for its equity and debt investments in the event that either:
 - the T&S network becomes a Stranded Asset (as defined in the introductory paragraphs of this section 7); or
 - the level of calls (or forecast calls) under the SCA have reached a specified threshold and government takes the view that ongoing SCA support is not sustainable (for instance because it does not believe asset can be returned to a reasonable and sustainable level of operational readiness and injection can recommence in a timely manner, which may be decided from the outset).
- **The Liaison Agreement** provides a framework for effective governance and information flow between T&SCo and government – more detail on this is set out later in this section.

T&SCo will not have the ability to choose between the individual elements of the GSP, as they are complimentary to each other. Draft heads of terms for these contracts are provided in Annex C and Annex D respectively.

Stranded Asset Risk

Government is putting in place a set of measures to deal with the demand risk faced by T&SCo. In the event that T&SCo is exposed to demand risk, e.g., where users are late in connecting to the network or subsequently demand falls, and there is an insufficient number of other users to make up any revenue shortfall, RMMs are included within both the economic

⁴⁴The draft heads of terms set out the consequences of discontinuation in full. An election by the SoS to Discontinue will result in the Regulator being entitled to revoke T&SCo's licence

licence and the RSA (funded by taxpayers and/or consumers). This provides a backstop to protect T&SCo from the full impact of the demand risk, thus helping it maintain its economic viability. These arrangements are outlined in section 6 (Revenue Model). Such support is expected to be particularly important during the early operational phase of the project, when timing mismatch and utilisation build-up risks mean that a larger than anticipated revenue gap could arise.

In later periods, if underutilisation were to persist or re-emerge, there is likely to be more emphasis on mitigation measures such as the mutualisation of costs among a remaining pool of users, which would be achieved through the ERR. However, Revenue Support may still be relevant in later periods, particularly if it is anticipated that demand, having fallen, could return in the future (for instance, with new users planning to connect to the network).

While we expect demand for CCUS to grow, there may be remote circumstances when the prospects of demand for T&SCo are very weak, and government determines that Revenue Support payments are no longer viable to support Stranded Asset risk such that the government support arrangements should be terminated. In these circumstances, government has the option to trigger the Discontinuation Agreement entitling T&SCo to compensation to compensate debt and equity investors.

With regards to the trigger for Discontinuation for Stranded Asset risk, the current thinking is that once compensation under the RSA reaches limits of affordability or practicality, government has the right to trigger the Discontinuation Agreement. On this basis, T&SCo would either be in receipt of Revenue Support or instead receive compensation under the Discontinuation Agreement.

Leakage of CO₂ from storage facilities

For the purposes of GSP and administration of the SCA, the risk of Leakage of CO₂ shall be as defined in the introductory paragraphs of this section 7.

Any requirement or direction by the OGA or relevant technical regulator that T&SCo take material corrective measures in respect of the store complex would be preceded by consulting with the T&SCo as operator of the storage permit to assist in determining what action was necessary. Where there is a Leakage of CO₂, in addition to any corrective measures, the OGA or relevant technical regulator would have the power to modify or, as a last resort, revoke the storage permit after having consulted with the T&SCo as operator of the storage permit.

The SCA could also be triggered prior to injection commencing if the OGA or relevant technical regulator directed that injection could not start because of a specified significant irregularity (such as an unforeseeable geological occurrence) and could be extended to cover the post-injection period where CO₂ is leaking from the store complex, where the OGA or relevant technical regulator determines that post-closure remedial action is necessary.

It is important to note that, while a Leakage of CO₂ is more likely to be linked to a time specific event such as mechanical equipment failure or some other factor associated with the store complex, it is possible that Leakage of CO₂ may emerge over a longer period of time.

Leakage of CO₂ could result in a loss of revenue if users can no longer send CO₂ to the store complex and the T&SCo would be required to cover additional costs e.g., additional opex and cost of purchasing any carbon allowances. In the first instance, we would expect these events to be insured by T&SCo such that a) the financial position of T&SCo is supported in the near term, with cover for business interruption (including debt service) and payment of carbon allowances; and b) cost to remedy the situation (including any damage to environment) and return assets to a reasonable and sustainable level of operational readiness are able to be paid. We would expect that the compensation available under the SCA to be based on the terms and heads of cover of the required insurance cover for T&SCo. These are set out in **Table 1** in the '*GSP and insurance*' section.

Where commercial insurance does not provide sufficient cover, funding through the SCA will provide protection where the limits of indemnity under commercial insurances are exceeded, or where sufficient cover is unavailable. Where work to return assets to a reasonable and sustainable level of operational readiness would include further capex that would accrue to the RAV (for instance the drilling of a new well) the decision to approve this cost would be for the Regulator, and this cost would be expected to be financed as an accrual to the RAV. The SCA will therefore interact with both commercial insurance and the ERR where further capex is required to remedy a situation. It is not anticipated that there will be interaction with the RSA in the event of Leakage of CO₂, i.e., Revenue Support for opex and for debt service will be via business interruption insurance and the SCA rather than the RSA.

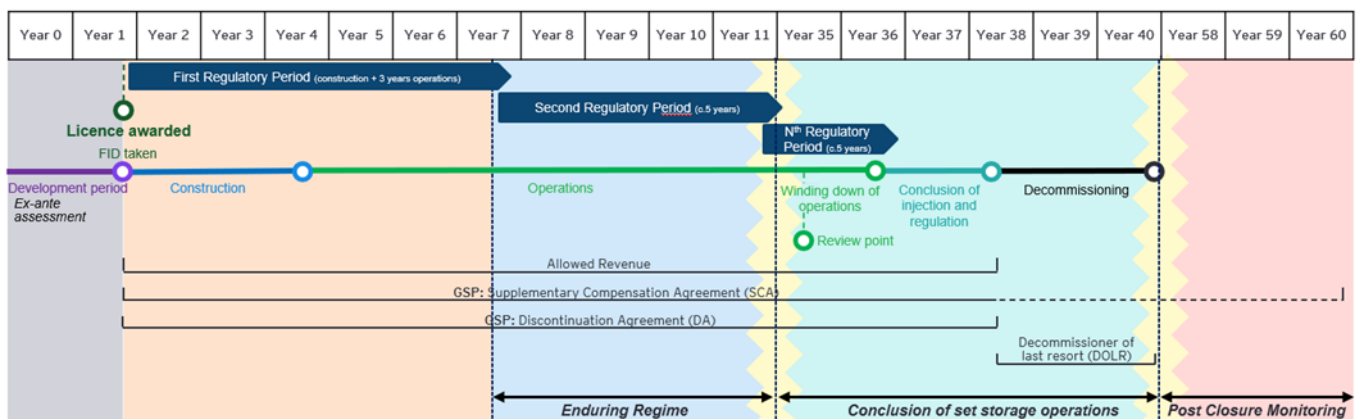
Whilst recognising that the regulators will be taking their decisions independently, in acute circumstances there will likely be a need for additional coordination, between the technical and economic regulators and between government and the regulators. In such a circumstance the OGA or relevant technical regulator may decide to permanently suspend injection or, the Regulator may conclude (having taken the necessary and appropriate advice) that there is no prospect of further investment efficiently and/ or cost effectively remediating the issue. These decisions would have implications for government and the management of the GSP. In such circumstances government will take appropriate action and reserves the right to trigger the Discontinuation Agreement and compensate debt and equity investors, rather than continuing to support remediation where the asset is identified as irreparable.

Timing and duration of the GSP

GSP support (both the SCA and Discontinuation Agreement) would commence when the economic licence is granted by the Regulator. The Discontinuation Agreement support for a Stranded Asset would cease at the end of injection because there would be no further revenue expected. The Discontinuation Agreement support for Leakage of CO₂ would also cease because its purpose (compensating investors for the RAV investment that they have made) will no longer be applicable as the RAV will have depreciated to nil value.

In respect of the SCA, a review point (which will take place during the tail end of the operational life of the asset) will be required for market sounding of the commercial insurance sector to assess whether the potential liabilities can be covered for the full extent of the decommissioning and post closure period. This review point would need to be scheduled during operations to allow for appropriate costs to be passed through the ERR regime if necessary. Where insurance cannot be obtained, or is not sufficient, government would extend the SCA through this period to ensure that remediation and liabilities resulting from Leakage of CO₂ can be covered.

Figure 5: outline timing and duration of GSP



Decommissioning

The UK is party to a number of international agreements that govern activity in the marine environment and, under these, has obligations in relation to the decommissioning of offshore installations and structures. As a result, in the event that decommissioning is not carried out by industry, any outstanding decommissioning obligations may ultimately fall to Government, with the associated costs to be borne by the taxpayer.

The Regulator will ensure provision for decommissioning is included as part of the allowed revenue calculation, enabling the decommissioning fund(s) to be accrued in full over the operational life of the asset. The Regulator will be responsible for reviewing any adjustments to the decommissioning fund(s) and reflecting these in the Allowed Revenue calculations throughout the operational period of the asset and as the end-of-life period approaches. This should ensure that the final fund(s) match the total expected decommissioning cost. These adjustments will be based on periodically updated estimates of the decommissioning liabilities provided by the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED), in consultation with the OGA, and determined using information provided by T&SCo.

The Petroleum Act 1998 (1998 Act) is the principal legislation governing decommissioning in the UK Continental Shelf (UKCS) and provides a framework for the orderly decommissioning of disused offshore installations and offshore pipelines on the UKCS. Decommissioning of offshore oil and gas and CCUS installations and pipelines is regulated by OPRED. One of OPRED's key responsibilities is to protect the taxpayer from decommissioning liabilities. To

enable this, it has a regime in place to assess the risk of this cost falling to the taxpayer and can take mitigating actions using powers set out in the 1998 Act and is therefore well placed to manage a range of situations. This includes where there is a shortfall in the decommissioning fund(s) in the event of the Discontinuation Agreement being triggered.

More details on the approach to decommissioning can be found in section 9 (Decommissioning).

Interface of mechanisms with GSP

As set out above, there will be interactions between the SCA and the Discontinuation Agreement with the ERR and the RSA. There will be a number of interactions between these mechanisms during the life of T&SCo, including the interfaces set out below:

- In the event of a revenue shortfall, the Regulator will need to act in accordance with its duties/power in determining whether to allow other RMMs. This could include mutualisation of the revenue gap (up to a cap to ensure users were not priced out of capture). Once the RSA is triggered, the Discontinuation Agreement protects T&SCo if the government decides to cease payments under the RSA.
- In the event of the SCA being triggered, decisions about further capex that would be additional to the RAV (as opposed to repair or remediation) would be a regulatory decision and not part of the SCA considerations. Any expenditure added to the RAV would be reflected in the compensation available in the event of the Discontinuation Agreement being triggered.

We have started to develop a process diagram to set out the user journey. This is included in **Appendix 1** to facilitate discussion.

Governance arrangements

In this update we are introducing the concept of a Liaison Agreement. This arrangement would be entered into to provide a framework for governing the relationship between government and T&SCo. There is a need for robust and effective GSP contract management procedures to ensure information is available and able to be considered in an effective way.

The Liaison Agreement will ensure that regular bi-lateral conversations between T&SCo and government are taking place and help to structure efficient information flows and reporting requirements between parties. Information flows and reporting requirements will likely need to change over time, so the approach will need to be responsive and flexible, with appropriate escalation routes.

The key elements of the Liaison Agreement, include:

- setting out the relationship between government and T&SCo, including in relation to proposed changes to the project documents or variations to the T&S network; and

-
- detailing the information and reporting requirements of T&SCo.

Obligations on T&SCo need to be part of the overall contractual structure. The draft heads of terms for the Liaison Agreement can be found in Annex D

Information flow between key stakeholders e.g., T&SCo, regulators, counterparty bodies, users and government will be very important and T&SCo will be expected to be transparent, especially in circumstances where the profile/likelihood of the GSP risk is impacted (e.g., if there is a risk of asset stranding or long-term/enduring network unavailability).

More broadly, government recognises that this is a complex regulatory environment, and there is a need for alignment and coordination across the landscape. There are a multitude of interdependencies that could impact decision making in the future and there is a need to consider how best to structure the strategic decision-making process. A significant number of interdependencies are potentially relevant to GSP arrangements e.g., allowing the continuation of SCA support while the Regulator considers whether to allow for additional capex.

Government is considering arrangements and is committed to putting in place a structure that enables robust and effective decisions to take place across the landscape.

GSP and calculating compensation on discontinuation

In the event of government triggering the Discontinuation Agreement, the T&SCo will be entitled to compensation.

It is expected that the compensation will be calculated in line with the following principles:

- debt will be compensated to the actual level of debt (subject to a cap at the RAV value), with an amount for debt breakage costs under an agreed hedging policy;
- compensation to equity holders is proposed as the residual value of the RAV, once debt have been paid; and
- equity compensation may be subject to a retention to fund immediate make-safe activities to an agreed discontinuation plan up to an agreed cap, to the extent not covered by the decommissioning plan.

A hedging policy will to be developed to help T&SCo understand what is likely to be considered an efficient approach. This will be relevant in the determination that any debt breakage costs are appropriate. If they are not appropriate, then excess costs will count against the compensation paid to equity.

The total value of T&SCo's portion of the RAV is expected to be depreciated over the life of the assets. We therefore anticipate that the profile of the potential compensation provided by the Discontinuation Agreement for an asset stranding scenario (i.e., discontinuation) would increase during initial construction (post-FID), and any further rounds of construction before declining to a nil value by the time that injection stops.

Once discontinuation has been triggered and T&SCo has received its compensation, all remaining assets and liabilities may be transferred – either to a post-operations successor entity ('T&SCo Successor') or to government pursuant to the Discontinuation Agreement, which may be supplemented by a statutory transfer scheme. A statutory transfer scheme would enable the SoS to transfer all or part of the property, rights, liabilities, powers and duties of the T&SCo to a regulator, another body or company (including the relevant licences). This would enable, the rights and liabilities associated with any licence or permit to transfer to the new holder of that licence or permit. This would be relevant for the management of any UK ETS liabilities.

In the context of Leakage of CO₂, there may be instances where government may look to reduce compensation to equity holders, if some form of gross negligence or wilful misconduct is proven on the part of the T&SCo. This is expanded upon in the 'GSP and Fault' section of this document.

GSP and insurance

Within the May 2021 document, we identified that T&SCo would be required to make use of commercial insurances and to maintain appropriate insurance coverage during operations to secure eligibility for the GSP. Since May 2021, this concept has been developed further, with key principles being set out below.

We expect that the SCA would work alongside commercial insurance for Leakage of CO₂, coming into play when insurance limits have been exhausted or where insurance is unavailable or not available on commercially viable terms (for example if costs are excessive). T&SCo will be contractually obligated to have insurance that is available on commercially viable terms and appropriate to cover the risk of Leakage of CO₂. There are certain types of commercial insurance cover likely to be needed to be able to access GSP support and the arrangements under the SCA, these are set out in **Table 1** below.

Table 1: Types of commercial insurance cover likely to be needed to access GSP arrangements

Coverage	Description	Duration	Interfaces
Business interruption	Insurance to ensure T&SCo can continue to service any business-critical needs whilst unable to earn revenue because of an outage caused by a leakage of CO ₂ . Insurance to include but not be	From the start of the first regulatory period through to end of operations (last injection)	1) No revenue support from RSA following the occurrence of a CO ₂ leak from store 2) May contribute to financial security the OGA will require a permit holder to maintain in order to meet

Coverage	Description	Duration	Interfaces
	limited to operational costs and debt service.		obligations of the operator arising under the storage permit.
Remediation of infrastructure	Insurance to cover the costs associated with taking remedial action to repair/replace any damaged storage site infrastructure to its existing status/condition. Critical keep safe costs would need to be covered in a discontinuation event.	Prior to first injection through to the end of the post closure period.	1) ER to determine whether any additional capex is efficient and appropriate to add to RAV. 2) May contribute to financial security the OGA will require a permit holder to maintain in order to meet obligations of the operator arising under the storage permit.
Environmental damage (remediation)	Insurance for the remediation of any environment damage that is caused by the operation of CO ₂ storage sites as necessary to comply with relevant regulations and site storage permits.	Prior to first injection through to the end of the post closure period.	As needed to comply with relevant regulations and site storage permits.
Carbon	Insurance to pay for the procurement of any UK Emission Trading Scheme allowances as a result of CO ₂ leakage from a storage complex.	Prior to first injection through to the end of the post closure period.	May contribute to financial security the OGA will require a permit holder to maintain in order to meet all obligations of the operator arising under the storage permit including for the offset of emissions which occur as a result of CO ₂ leakage.
Other	Other insurance as may be considered relevant by BEIS for the appropriate management of liabilities	As appropriate depending on the nature of	No requirement to have 3rd party insurance to cover user losses.

Coverage	Description	Duration	Interfaces
	associated with Leakage of CO ₂ from a store complex.	the risk being covered.	

There are some interfaces with other parts of the ERR and the broader regulatory landscape including Financial Security that the OGA will require a storage permit holder to put in place prior to first injection and maintain until termination of its permit under Carbon Dioxide Storage and Appraisal licence under the Storage of Carbon Dioxide (Licensing etc.) Regulations 2010 (or equivalent). It is important to note that while some of this coverage (and the SCA) is likely to address aspects of the wider regulatory environment (including some elements of Financial Security required to be put in place by the OGA or relevant regulator and will be determined depending on what coverage is put in place) additional cover may be required.

In addition, we would expect T&SCo to want to consider taking out other various commercial insurance policies typically taken out by corporates. Whether to take out such policies will be commercial matter for T&SCo and the insurance market. Fees for such cover would be assessed as part of the opex allowance under the economic licence.

In most circumstances, commercial insurance should be sufficient to cover the costs associated and make any remediation payments – in which case, the SCA would not need to be triggered. However, situations may arise where this is not the case and SCA support is required.

The SCA will likely mirror commercial insurance coverage and is there to cover the risk of Leakage of CO₂ until the end of injection, or possibly beyond through the post closure period, where the T&SCo or a post-operations successor entity, is unable to bear costs associated with Leakage of CO₂.

The level of SCA compensation would be dependent on the materiality of the situation, the remediation costs (including the need to remediate any environmental damage), the cost of purchasing carbon allowances and the length of time that remediation might take, impacting revenue availability. While the level of cover required may increase over time, the consequent calls (or forecast calls) on support under the SCA may reach the specified threshold level where government reserves the right to trigger the Discontinuation Agreement.

Where the asset is identified as irreparable, commercial insurances will be expected to continue to respond where appropriate (i.e., to address any environmental remediation and provide for coverage of critical opex and “keep safe” costs), before any call on the SCA. The government would then be entitled to elect to trigger discontinuation under the Discontinuation Agreement.

Normal insurance premia will be part of the opex of T&SCo and hence assessed as part of the opex allowance under the economic licence. This means that it may not be in the interests of users or of government to purchase insurance, which is not commercially viable (for example if costs are excessive). Insurance which is not commercially viable will be viewed as being

unavailable on the commercial market. At the outset and for the first regulatory period, the range and quantum of the insurance required will be determined by market conditions and will be jointly agreed by government and T&SCo. This will consider available coverage, quantum of coverage, excess and premia. Determination of the appropriate level of insurance should therefore remain flexible and government's approach will not be to insist on a specific amount of cover at any one time, as the market may change over time.

T&SCo will have an obligation to test the market (i.e., to achieve maximum efficiency quantum and coverage) and update regularly, in line with the latest market position, with the Regulator policing whether there has been appropriate market-testing undertaken. The level of insurance will be monitored, and government may challenge T&SCo if it feels that the quantum or coverage of insurance is not as extensive as it should be.

If any dispute arises between T&SCo and government on the appropriate level of commercial insurance required at a given time, there will be provision in the contract arrangements for a dispute resolution procedure.

GSP charging

Within the May 2021 document, we identified that government may consider charging for the GSP. We have since confirmed that government will charge fees for the SCA. It is currently proposed that there will be no charge for the Discontinuation Agreement because discontinuation is triggered by government and serves effectively to limit exposure under support arrangements in the event of Leakage of CO₂ or a revenue shortfall. Further work will be done on the structure of the SCA fee, but we currently envisage this will include administrative charges and excess arrangements.

The level of risk exposure will be informed by a probability-based analysis and assurance from the commercial insurance market, which should ensure an appropriate level of charging for adhering to subsidy control principles, appropriate management of contingent liabilities in the public sector and polluter pays principles.

It is assumed that government will charge on the basis of the overall risk exposure, and this will be significantly offset by the protection offered by commercial insurance. Charges will also be benchmarked against commercial insurance costs available. This may vary amongst clusters, as different stores will have different risk profiles and risk exposure at different times during the operational period. Charging will be required throughout the lifetime of T&SCo. As set out previously, arrangements for post-operations will be determined at an end-of-life review point. This review point would need to be scheduled toward the tail end of operations to allow for relevant insurance costs and SCA fees to be passed through the ERR.

Further work will be done on the structure of the SCA fee, but we currently envisage this will include an arrangement charge. As with insurance premia, the SCA fees will be assessed as part of T&SCo's opex allowance under the economic licence.

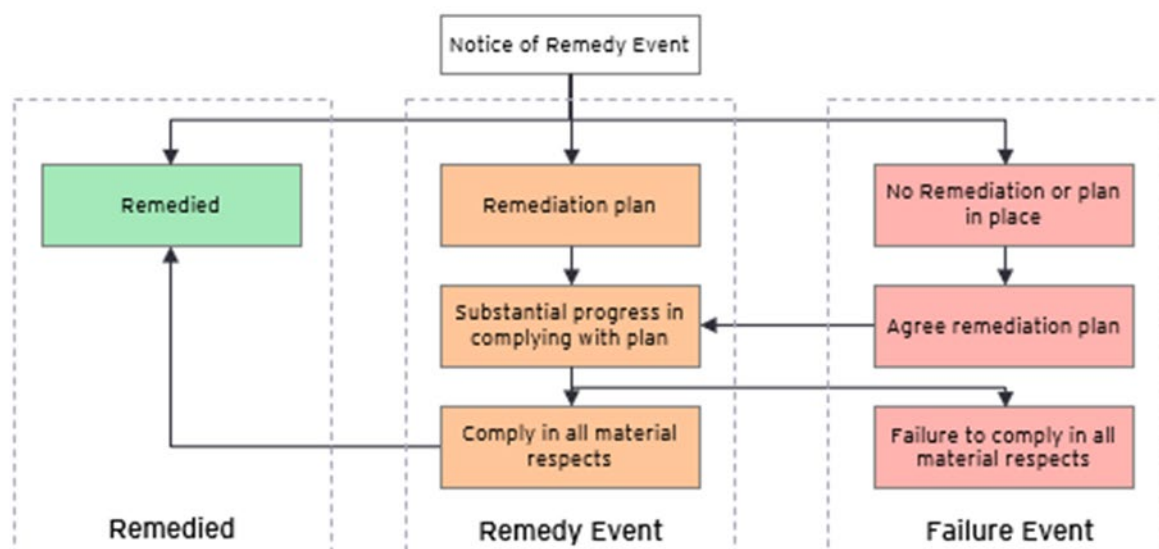
We would expect that the SCA charging mechanism will incentivise T&SCo to take out commercial insurance where it is available, because the SCA fee will reduce as higher levels of commercial insurance are taken by T&SCo, and therefore reduce government's exposure. To ensure the incentive is effective consideration is being given to the possibility of disallowing certain components of the SCA fee (such as the arrangement charge) and deductibles for calling on the SCA, from the assessment of allowed revenue under the ERR.

GSP fault / negligence

In previous updates, we had not yet considered the impact of fault under the GSP. In this update, we seek to provide clarity on initial principles for dealing with fault/negligence as follows:

- the fault and remedy regime (see Figure 6): this is designed to capture T&SCo's failures which take the T&S network outside the basis for the SoS's offer of the GSP. This regime deals with contractual breaches and breaches of obligations which have (or are reasonably likely to have) a material adverse effect (as defined). This type of fault will be constantly monitored. The remedy regime will have an incentivisation mechanisms (e.g., potential for increased SCA charges, and limitations on equity distributions) and would be designed to restore compliance and avoid the need to trigger the Discontinuation Agreement.

Figure 6: Overview of a fault and remedy regime



- equity compensation reduction: the equity compensation payable on discontinuation will be subject to a reduction in the event of gross negligence or wilful misconduct on the part of T&SCo (as further described below).

Identification of gross negligence or wilful misconduct will likely be a retrospective process, and there would be an evidential level that would need to be reached before government would look to change the compensation available to investors. The standard would be high, for

instance a prosecution of T&SCo for a safety breach that led to a leak or the event being consequent on the failure to undertake in a timely fashion an action ordered by a regulator (e.g., OGA or OPRED), or in very extreme cases the revocation of a permit. The prosecution or breach of order would need to be the cause of the leakage or other qualifying occurrence.

SCA

The SCA will seek to follow commercial principles. Any occurrence of fault will impact future SCA charging arrangements, e.g., increased charging in future years, and increased deductibles (which would be disallowed in assessment of allowed revenue under the ERR). If subsequent to the SCA being triggered, some form of gross negligence or wilful misconduct was found, this would either be reflected in the equity compensation available under the Discontinuation Agreement (if applicable) or would be reflected in the assessment of the allowed revenue under the ERR in the period following any restart of operations.

Discontinuation Agreement

In the context of Leakage of CO₂ where there is fault or gross negligence or wilful misconduct which leads to a triggering of the Discontinuation Agreement, compensation payable to equity may be reduced.

If T&SCo is subject to the fault and remedy regime when discontinuation occurs, then any capex spent by T&SCo during the period which T&SCo was subject to the fault regime would not be considered to accrue to the RAV for the purposes of compensation. This, along with other incentives is designed to move T&SCo to return to compliance.

Debt compensation to third party debt providers in this instance would not be affected, but government would be able to reduce or eliminate compensation to equity.

Identification of gross negligence or wilful misconduct will likely be a retrospective process and will inevitably take time. If gross negligence or wilful misconduct is suspected, equity compensation under the Discontinuation Agreement may be delayed (to allow for the process of agreement or determination of the reduction) and, if gross negligence or wilful misconduct is established, reduced or forfeited.

GSP and additional stores/separation of entity

In the future, there will likely be a need for additional stores, which will likely require a separate/new storage permit. There is also the possibility of a separation of entity in the lifetime of T&SCo. In each of these scenarios, T&SCo would be required to notify government of any planned alteration to infrastructure that might have a material impact on GSP contracts, and the ramifications for any existing GSP arrangements would need to be considered.

Expansion of the GSP mechanism and GSP availability for future stores will not be automatic and will be subject to scrutiny and approval by government.

Similar to other types of project variation, government would need to agree to expansion of an existing GSP mechanism, alongside the Regulator agreeing to expansion of the RAV – considerations would be made on a case-by-case basis.

In terms of separation of onshore/offshore assets (or different offshore assets) initiated by T&SCo or ordered by a regulator, there will need to be accounting separation. Initial work on this is considered in *Section 2 (Role of T&SCo, Asset Ownership)*. In all scenarios where there is an existing GSP arrangement, government should be no worse off by any separation of assets.

Section 8: Special Administration Regime

In circumstances where entities such as water companies, transmission and distribution networks of electricity or gas, national rail, certain electricity suppliers or smart meter providers are running out of funds or are likely to become insolvent, the relevant Secretary of State or Regulator can apply to the High Court for a specific administration order (which is commonly referred to as a “Special Administration Regime”) which would allow a specific administrator to be appointed.

The Special Administrative Regime is underpinned through legislation in the Energy Act 2004 for network companies, the Energy Act 2011 for energy supply companies and the Smart Meters Act 2018 covers the smart meter data and communications company. Under existing legislation, energy administration orders do not apply to electricity generation companies and CCUS Transport and Storage companies (T&SCo’s). Currently, all regulated asset base (“RAB”) projects in the UK have an administration regime set out in legislation.

This allows for the protection of essential services where normal insolvency would cause undue harm and ensures that the essential service continues. This also sets out how the special administrator will behave in such a circumstance, including the provision of support to continue the operation of the asset and how lenders will be treated. The aim of the special administration regime is predominately to prioritise the rescue of the company and continuation of the asset. For T&SCo, keeping the network and storage (the “Project”) operational is likely to offer the most optimal result for emitters and taxpayers.

However, keeping the Project operational may not always be feasible. Indeed, there could be scenarios in which it would not be economic to keep the Project running or other technical or safety reasons why the Project needs to be fully or partially shutdown and/or decommissioned earlier than the expiry of its expected asset life. In such circumstances, the SoS may wish for government to take ownership and/or transfer the Project to another operator using a CCUS statutory transfer scheme.

It is important to note that any transfer of the storage part of the project would be subject to the terms of the storage licence and storage permit, and OGA applicable guidance.

Although an Insolvency Event (in accordance with Insolvency Act 1986 insolvency procedure) for the CCUS T&S network is considered remote the risk does exist, which might trigger the SAR process.

To facilitate the objective of a SAR for T&SCo’s, we consider that new primary and secondary legislation is required. The legislation will set out the special administrator's role and provide for the option of a statutory transfer scheme which may be exercised by the SoS. The special administrator will have the discretion to continue operating or shut down the Project for reasons of public safety, or to minimise costs to the taxpayer. Even if T&SCo is owned by a government body, it would have to satisfy the OGA, that all the duties of the operator were to be fulfilled.

The aim of a SAR from a public policy perspective is to ensure that the project continues to (or becomes able to) transport and store CO₂ to generate revenue.

Keys aims include:

- safety (including through ensuring the ongoing monitoring and reporting obligations can be met and the decommissioning regime can be supported);
- enabling emitters to continue to capture CO₂;
- net zero climate emergency;
- secure an end to the special administration by returning the company to a going concern or through a permitted transfer; or
- early shut down, accelerate decommissioning, and monitoring phase earlier than planned if not viable to continue as a going concern.

In circumstances where the Investors have decided not to fund the T&SCo going forward, but the project was still operational or could be made operational with additional funding, the T&SCo could be sold to another T&SCo to enable the project or T&SCo to be run as a going concern to continue to fund the decommissioning or secure an end to the special administration by returning the company to a going concern or through a permitted transfer. To note, SAR is intended as a temporary solution, rather than a long-term fix.

Transfer Scheme

A CCUS transfer scheme would include a power for SoS to make provision (in secondary legislation) for any of the following:

- the transfer of all or part of the property, rights, liabilities, powers and duties of the T&SCo to a regulator, another body or company (including all relevant licences and storage permits);
- the disapplication of any rights to consent to such transfer under an enactment or agreement or otherwise;
- the modification of rights of termination, or other consequences under contract, of a transfer; and
- other consequential or incidental provisions to support the transfer.

The Department is continuing to develop the statutory transfer scheme, whilst being mindful of existing regulations relating to carbon storage and the Discontinuation Agreement.

A statutory transfer scheme may be relied on in the event of an insolvency, to facilitate the transfer of all or part of the property, rights, liabilities, powers and duties of the T&SCo to a regulator, another body or company (including the relevant licences). Again, in such a circumstance, the scheme may enable the rights and liabilities associated with any licence or permit to transfer to the new holder of that licence or permit.

Section 9: Decommissioning

The May 2021 document included only a short reference to decommissioning plans, indicating that the costs for decommissioning would be included in the allowed revenue. This was because of the government's imminent consultation on a funded decommissioning regime for CCUS, published in August 2021, entitled 'Establishing the offshore decommissioning regime for CO₂ Transport and Storage Networks'⁴⁵.

This consultation outlined the government's proposals for and sought views on establishing a funded offshore decommissioning regime, how it would operate in practice, and the requirements set on it.

The government is grateful for the engagement and responses which stakeholders provided on the consultation. This update will cover, in summary, some of the feedback which was received, and the direction of travel for the funded decommissioning regime. Greater detail on these will be set out in the government's response to the consultation, due to be published shortly.

Funded decommissioning regime

The consultation proposed that a funded decommissioning regime would be established to meet the expected costs associated with the decommissioning of offshore transport and storage infrastructure (including wells and the removal of injection facilities), and post-closure monitoring obligations. This regime would be implemented through the establishment of decommissioning funds for each T&S network which would accrue over their operational lives and ensure funding was available to cover the decommissioning and post-closure monitoring obligations associated with those networks. These funds would support the T&SCo, as the designated decommissioning entity, to pay their liabilities at the end of an asset's operational life, helping them meet their decommissioning and polluter pays obligations. Alongside this, it would provide assurance that the liabilities will be paid, mitigating the risk to the taxpayer.

The allowable revenue, under the ERR, of a T&SCo will be comprised of a number of building blocks, reflecting the costs and returns the T&SCo can reasonably expect to encounter. One of these components will be revenue allocated for the purposes of meeting the decommissioning liability of the T&S network and post-closure obligations. It is with this component of the allowed revenue that the decommissioning funds will accrue, meaning that funding will accrue over the operational life of the network that the decommissioning funds are supporting.

⁴⁵ [https://www.gov.uk/government/consultations/carbon-capture-usage-and-storage-ccus-offshore-decommissioning-regime-for-CO₂-transport-and-storage](https://www.gov.uk/government/consultations/carbon-capture-usage-and-storage-ccus-offshore-decommissioning-regime-for-CO2-transport-and-storage)

Scope of a funded decommissioning regime

Respondents to the consultation were very supportive of our proposals to distinguish between onshore and offshore decommissioning costs. However, many respondents requested clarity on where the boundary between onshore and offshore infrastructure should be laid, and which regulatory bodies would provide oversight and enforcement of decommissioning standards for infrastructure in the onshore regulatory area. As set out in the consultation, onshore decommissioning costs will form part of the decommissioning building block of the allowed revenue. We will continue to examine the treatment of onshore decommissioning to ensure clarity and coherence with the wider regulated model.

It is envisaged that each CO₂ site would have its own separate decommissioning fund to manage the costs required for decommissioning that site and its associated infrastructure, such as wells, pipelines and platforms. This way, decommissioning funds can map onto and be incorporated into the Carbon Storage Permit issued by the OGA.

Licensees will be obliged, as store operators, to build the decommissioning fund for that store. Integrating the decommissioning fund into the Carbon Storage Permit also ensures that the decommissioning fund is an asset attributed to a site and so would be transferred, along with the storage permit, in the event that a site changes hands. This regime ensures that the decommissioning liabilities of the site, and the means to meet those liabilities, sit with the site's custodian.

In practice, we recognise that a T&SCo's operation is likely to involve a complex network with numerous stores sharing some infrastructure such as trunk pipelines and platforms. Therefore, a T&SCo will manage a portfolio of decommissioning funds. We will continue to work thorough how best to incorporate shared infrastructure within this model.

Funding mechanism and cost estimates

The consultation set out our proposals for building the decommissioning funds. The principal mechanism for accruing funds will be through regular funding. A T&SCo will make regular payments into its decommissioning fund(s) through payments derived from user fees charged by the T&SCo, as set out in the ERR. Ensuring decommissioning costs are met by a T&SCo, through revenue charged to emitters ensures that the polluter pays principle is effectively delivered by this funding mechanism. Respondents to the consultation were very supportive of these proposals.

In support of the regular funding mechanism, we suggested the option of investing capital accrued in the funds. Respondents to the consultation were eager to recommend that investments should be made with the aim of retaining the funds' value over time against the impact of inflation, but cautioned against exposing the funds' capital to the risks associated with more ambitious investing decisions. Further details around the management of the fund and around the conditions for investment will be set out in due course.

The funded decommissioning regime is reliant on accurate and robust estimates for the overall decommissioning liability. The consultation set out to clarify the roles played by the regulatory bodies in this area: the OPRED and the OGA. The consultation proposed establishing OPRED as the primary regulator for estimating the decommissioning liability and undertaking periodic reviews; however, the consultation also recognised that the OGA would have a consultative role advising on the technical requirements and associated costs for decommissioning infrastructure associated with the injection site.

Respondents to the consultation stressed the need to involve industry, and in particular the T&SCo, in this process, given their expertise and knowledge of the network. We are supportive of this involvement, and envisage that OPRED, with support from the OGA, would scrutinise the T&SCo's methodology and either approve their figure or recommend where the estimate should be amended. This will ensure the most knowledgeable stakeholders are involved from the beginning.

Accrual period and profile

The decommissioning fund will accrue funds during the operational life of the CO₂ store, beginning when the decommissioning component of the allowed revenue is received by the T&SCo with first injection. Capital will accrue in the fund until it reaches its target value, which must happen in time for when decommissioning activities can take place. Some respondents to the consultation advised including a buffer into the accrual of the funds, either by aiming to reach the target value of a fund a few years ahead of a store's completion, or by adding a percentage contingency to the estimated decommissioning costs. We agree with the principle of safeguarding the accrual, and will continue to consider the most sensible and reasonable approach for doing so.

The consultation set out the government's expectation that the accrual would follow a straight-line profile as a default, as this was judged to be relatively simple. However, respondents noted their concerns with this, particularly the potential for different emitters to be disproportionately impacted. Given this feedback, the government will consider further the relative merits and disadvantages of each approach to determine the best mechanism.

As outlined in the consultation, when the funding has accrued and decommissioning activities are due to take place, the designated decommissioning entity will need to secure approval from OPRED before accessing the funds to pay for decommissioning costs. There will also be provision to cover decommissioning activities which may be required during operational life. This sits alongside wider conditions on the nature of, and access to, the decommissioning funds aimed at preventing mis-use or fraud.

Treatment of re-used assets and their decommissioning liabilities

The opportunity to re-use oil and gas assets for the purposes of CCUS presents potentially significant cost savings for T&SCos as well as the chance to avoid the environmental impacts that would be caused by the production and disposal of additional infrastructure. However, existing infrastructure must also be of suitable condition to satisfy the T&SCos and the necessary regulatory authorities that it will provide VfM and withstand the specific demands of CO₂ transport and storage. Furthermore, where re-used assets are brought into the CCUS networks, their costs and existing liabilities will need to be factored into the regulated model. In particular, we will need to manage the treatment of their decommissioning liabilities within the CCUS decommissioning funds.

Where an asset is viable for re-use, the consultation proposed making Change of Use Relief (CoUR) available in certain circumstances, and on the condition that the decommissioning fund is 'topped-up' by an amount reflective of the existing decommissioning liability associated with that asset. If this condition was met, CoUR would mean that the existing liability chain established under the Petroleum Act 1998 would sever, removing any obligation for decommissioning liabilities for all previous owners of the infrastructure. This proposal received broad support from respondents, and the government will look to make the necessary amendments to the existing legislation to facilitate this, when Parliamentary time allows.

The consultation also recognised that operators may not want to seek CoUR in all circumstances of re-use. For such cases, the consultation set out that the decommissioning funds would accrue as if they were new-build assets. However, responses to the consultation and further examination of this proposal have identified that it would not meet the polluter pays principle, and concerns around intergenerational fairness regarding long-term liabilities. Instead, we are considering alternative models which looks to deliver a more balanced approach to the treatment of existing decommissioning liabilities. Specifically, this will balance the upfront certainty provided by the top-up of the CoUR model, and the flexibility sought by respondents to the consultation. More detail on this will be set out in the government's response to the consultation, due to be published shortly. More generally, we are considering how re-used infrastructure is being treated overall in the regulated model. We want to encourage re-use where reasonable. But this must be done in a proportionate manner which does not create opportunities for abuse, particularly circumstances which might leave the taxpayer at a disadvantage. We will continue to engage stakeholders as we develop our overall approach to re-use, and further detail will be set out in due course.

Section 10: Next Steps

This document reflects the work we have done to date to progress the TRI model design following in the December 2020 and May 2021 documents. We will continue to develop further the detailed structures and mechanisms of with the objective of finalising the TRI model in 2022. This work will be undertaken in close coordination with the development of the business models for power, industrial carbon capture, Hydrogen and CIF. Further, as flagged in section 2 (The Role of T&SCo), we intend to commence working more closely with industry with technical expertise and specialisms to develop the network codes.

We intend to publish a further update by Q3 2022, then working with industry have finalised conditions precedents for the T&SCo's sequenced in Track 1 in line with government ambitions to have them operational in the mid-2020s.

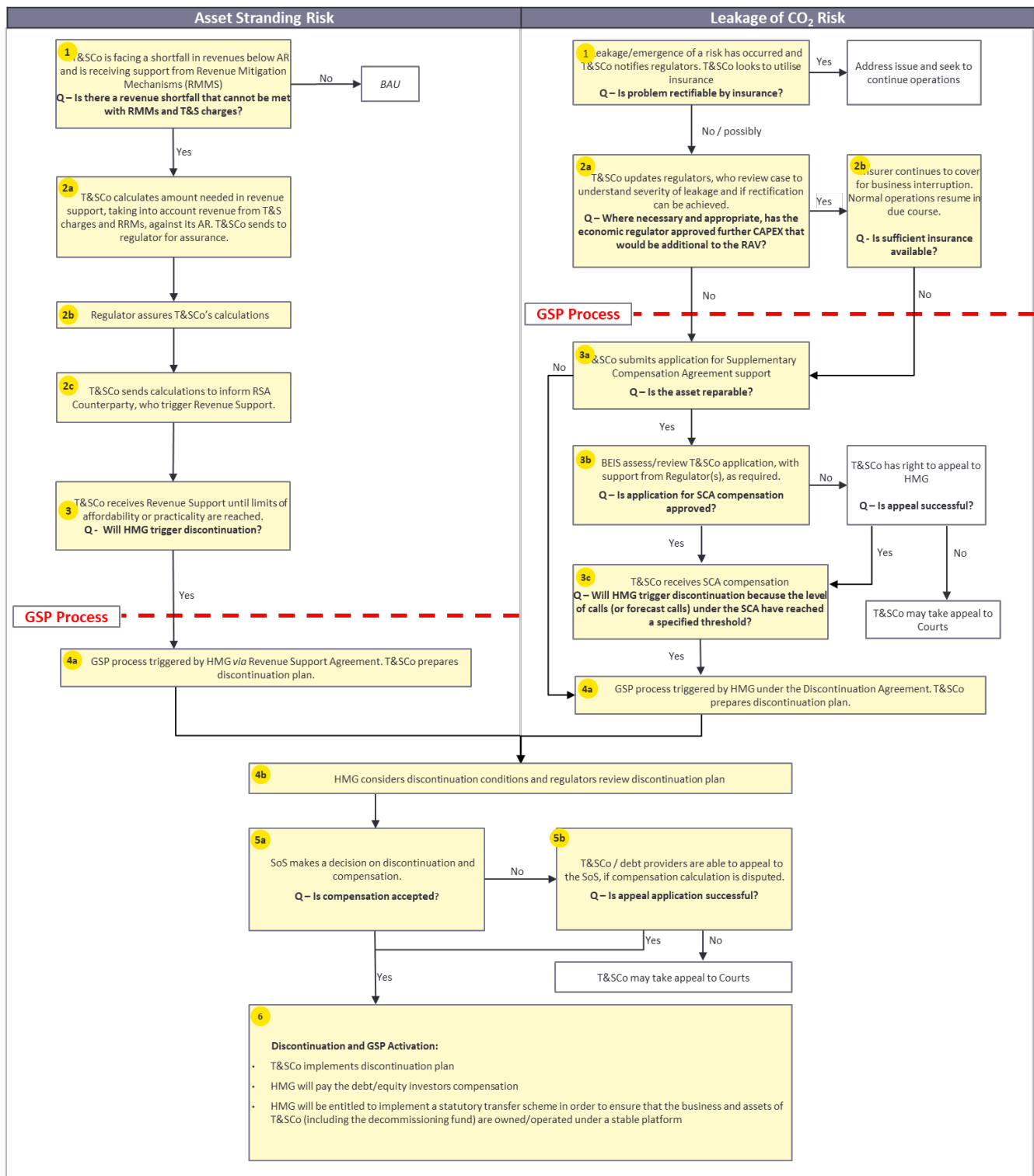
Section 11: Glossary

Term	Description
BECCS	Bio-Energy with CCS
BEIS	Department for Business, Environment and Industrial Strategy
Capex	Capital Expenditure
CCUS	Carbon Capture, Usage and Storage
CCS	Carbon Capture and Storage
Cluster	Transportation and storage network (incorporating the onshore and offshore network and offshore storage facility) and an associated first phase of carbon capture projects.
COD	Commercial Operational Date
CfD	Contracts for Difference, including the DPA and ICC Contract
CIF	CCS Infrastructure Fund
DPA	Dispatchable Power Agreement
December 2020 document	The Carbon Capture, Usage and Storage Business Models update published in December 2020: https://www.gov.uk/government/publications/carbon-capture-usage-and-storage-ccus-business-models
Economic licence	The economic licence expected to be granted by the Regulator to a company licensed to provide transport and storage services (T&SCo) under government's CCUS programme
ERR	Economic Regulatory Regime
EWS	Early Works Support
FEED	Front End Engineering Design
FID	Final Investment Decision
FOAK	First-Of-A-Kind
GSP	Government Support Package

ICC	Industrial Carbon Capture
ICC Contract	Industrial Carbon Capture Contract
LA	Liaison Agreement
LCH	Low Carbon Hydrogen
Leakage of CO ₂	This has the meaning given to this term in Section 7 of this document.
May 2021 document	The Carbon Capture, Usage and Storage Business Models update published in May 2021: https://www.gov.uk/government/publications/carbon-capture-usage-and-storage-ccus-business-models
NPT	Non-pipeline transportation
Offshore	The offshore element of the CO ₂ transportation network up to the point where CO ₂ enters the geological Storage. Note: This excludes shipping transportation.
OGA	Oil and Gas Authority
Onshore	The onshore element of the CO ₂ transportation network which may include intermediate CO ₂ storage for T&S operational purposes. Note: This excludes road and rail transportation.
Opex	Operating Expenditure
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning
PCR	Post Construction Review
Regulator	The independent economic regulator of the Economic Regulatory Regime
RAM	Revenue Adjustment Mechanism
RAB	Regulatory Asset Base
Revenue Support	Revenue support under the RSA
RMM	Risk Mitigation Mechanism
RSA	Revenue Support Agreement

RSA Counterparty	The counterparty to the Revenue Support Agreement
RUI	Rolled Up Interest
SCA	Supplementary Compensation Agreement
Storage	Geological store for the captured CO ₂ from the end of the injection well.
TCW	Target Commissioning Window, which is defined as
T&S	Transport and Storage
T&SCo	A company licensed to provide transport and storage services
TRI	T&S Regulatory Investment
VfM	Value for Money

Appendix 1: GSP Process Diagrams



This publication is available from: www.gov.uk/government/publications/carbon-capture-usage-and-storage-ccus-business-models

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