Oil & Gas Authority

UKCS Decommissioning
Cost Estimate 2021

July 2021

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Contents

1. Executive Summary

The total cost of decommissioning UKCS offshore oil and gas infrastructure has reduced to £46bn[1] equating to a projected saving of nearly £14bn (23%) since the 2017 cost reduction target[2] was first established. The substantial saving already achieved is good news for both industry and the Exchequer.

The £2bn (4%) reduction in the 2021 estimate is the result of continuous improvement and reductions in:

- Well decommissioning costs, driven by reductions predominantly in subsea well decommissioning costs across both Central North Sea (CNS) and West of Shetland (WOS)
- Cost estimating uncertainty and associated cost risk

An average annual cost reduction of 6% has been delivered over the past four years. If this average is maintained the 35% target remains achievable by end-2022.

Expenditure in 2020 was impacted by Covid-19 and the low commodity price, contributing to a continuation of a plateau in the rate of cost reduction reported last year. While short-term forecasts show a recovery from this slowdown, commercial transformation remains key to meeting the cost reduction target.

The costs of completed decommissioning projects are approximately 20% lower than initially forecast, tracking the downward trajectory of the overall cost estimate.

There are positive signs that operators are embracing lessons learned from across the industry whilst also embedding a culture of continuous improvement and setting ambitious best in class performance targets. This is helping drive the downward cost trajectory and, more will be needed to meet the target. At the same time however there remain some real inconsistencies in cost performance, reducing the overall improvement of the basin.

The majority of decommissioning cost is forecast to be incurred over the coming two decades and the window of opportunity to identify and embed the necessary changes to drive the next step change in cost efficient decommissioning is immediate.

[1] Costs shown in 2016 prices, for expenditure in 2017 and after
[2] Basis of 2017 estimate, 2016 Annual OGA Stewardship survey

The Oil and Gas Authority's updated Decommissioning Strategy[3] sets out the commercial transformation and strategic objectives required to deliver cost efficiency and achieve the UKCS cost reduction target of greater than 35%.

Significant opportunity and value still exist to drive the required cost reduction including:

- Decommissioning at scale: The value of campaigning is proven but not yet consistently established or mainstream to be able to fully capture its benefits
- Sustainable and stable supply chain: Increased visibility of key decommissioning data, including through Energy Pathfinder[4]
- Lessons learned: Transfer of knowledge plus good practices through improved communication, engagement and stewardship

Key threats and uncertainties with the potential to increase costs include operator commercial misalignment, lack of collaboration, delayed late life planning and execution and oil-sector inflation.

The UKCS full portfolio estimate stands at £48bn[5] including £2bn for planned but as yet unsanctioned/not-built projects.

[3] Oil and Gas Authority: Decommissioning Strategy - 2021 - Publications - News &
publications (ogauthority.co.uk)

[4] Energy Pathfinder provides a real time view of energy projects on the UKCS
https://app.powerbi.com/view?r=eyJrIjoiZTU3MmFmMDktMDI0Ni00MzllLTg1MTQtMDQxZmQzNWUxZTc5IiwidCI6ImU2ODFjNTlkLTg2OGUtNDg4Ny04MGZhLWNlMzZmMWYyMWIwZiJ9&pageName=ReportSection

[5] All costs are in 2020 prices, based on forecast expenditure in 2021 and after, unless otherwise stated

2. Introduction

2.1 Context

The revised OGA Strategy sets out a range of obligations on the oil and gas industry to meet its commitments, including reducing greenhouse gas emissions, supporting Carbon Capture and Storage (CCS) projects and working collaboratively with its supply chain.

With intensifying decommissioning activity in the UKCS, increasing commodity price[6] and an accelerating energy transition, the importance of ensuring that decommissioning is carried out in a timely and cost-effective manner not only helps value creation from the UKCS, but also demonstrates industry's commitment to responsibly managing the UK's petroleum legacy.

The updated Decommissioning Strategy supports the OGA Strategy[7] through four complementary areas of focus, driving delivery of the ambitious target to reduce decommissioning cost estimates by 35% by end-2022:

- Planning for decommissioning
- Commercial transformation
- Supporting energy transition from late life into decommissioning
- Technology, processes and guidance

Based on the information provided by infrastructure owners through the annual UKCS Stewardship Survey, the OGA takes a probabilistic approach[8] (Appendix 2) to estimating total UKCS decommissioning costs considering uncertainties inherent in cost estimation. Two cost estimates are reported:

- Like-for-like estimate[9]: Cost reductions are measured against the £59.7bn baseline calculated in the 2017 report
- Full portfolio estimate[10]: Addresses changes in the remaining, to-be-decommissioned, portfolio since 2017 baseline

Decommissioning activity is forecast to take place over the coming four decades with the majority of activity, and hence cost, expected to be incurred in the next two decades.

Decommissioning activity and plans were impacted in 2020 by Covid-19 and low commodity prices. Progress reported here in the Cost Estimate Report 2021 is in this context.

[6] Brent spot oil price $77/bbl @ 6th July 2021
[7] OGA Strategy ref. https://www.ogauthority.co.uk/news-publications/publications/2021/the-oga-strategy/
[8] Decommissioning Cost Estimate Report 2017,2018,2019,2020 - https://www.ogauthority.co.uk/decommissioning/cost-estimate/
[9] Costs shown in 2016 prices, for expenditure in 2017 and after
[10] All costs are in 2020 prices, based on forecast expenditure in 2021 and after, unless otherwise stated

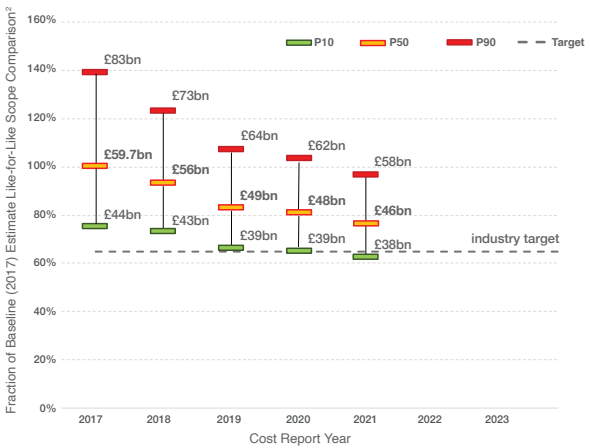
Oil and gas is expected to remain an important part of the UK's energy mix for the foreseeable future and the basin remains an attractive investment proposition. As a dynamic market, Mergers and Acquisitions (M&A) remain an inherent feature impacting on late-life and decommissioning plans which may present risks and opportunities to future decommissioning estimates and costs.

2.2 Cost Estimate and Target Status

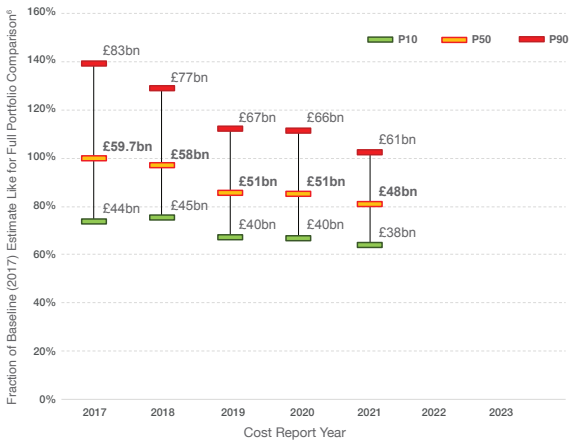
The 2021 like-for-like estimate stands at £46bn (Figure 1) which reflects a cumulative reduction of nearly £14bn (23% reduction) since 2017 baseline. The full portfolio estimate stands at £48bn including £2bn for planned but as yet unsanctioned/not-built projects.

Figure 1: Like-for-Like and Full Portfolio Cost Trends

Cost Estimate vs Time Like-for-Like (Probabilistic)



Cost Estimate vs Time Full Portfolio (Probabilistic)



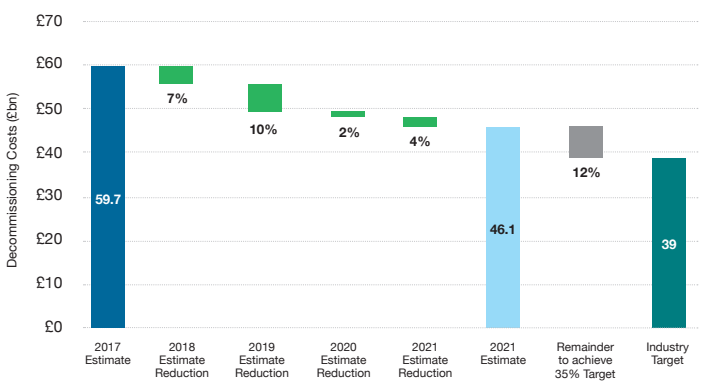
Decommissioning cost estimates continue to fall and have reduced by a further 4% in 2021 (Figure 2), giving an average annual cost reduction of 6% over the past four years.

If this average is maintained the 35% target will be achieved by end-2022[11]. However, the reductions have begun to slow. If the estimate trajectory continues at the reduced levels seen over the past two years, the target will not be achieved. Hence the need to build on the successes and continuous improvement achieved to-date, by capturing large, remaining opportunities from collaborative behaviours and aligned, incentivised contracting.

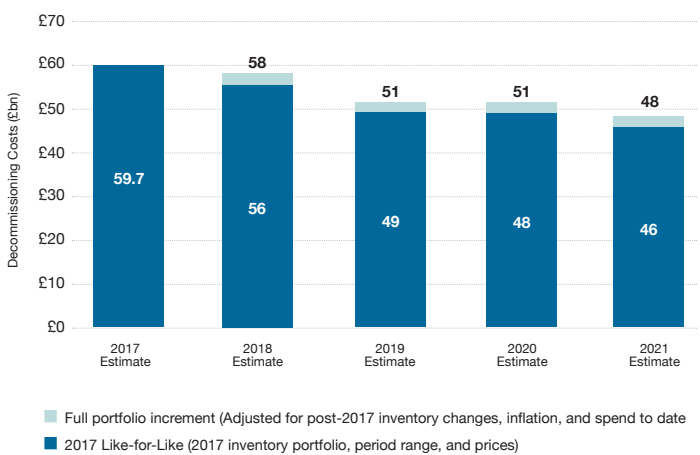
Despite the reduced rate of cost reduction there remains considerable opportunity (Appendix 6) for future cost improvements to meet the targeted UKCS cost reduction target of greater than 35% (to levels below £39bn).

Figure 2: Decommissioning Cost Reductions Towards 35% Target (Like-for-Like)

Progression Towards 35% Target (Probabilistic, bn)



Decommissioning Estimate Change (Probabilistic, bn)

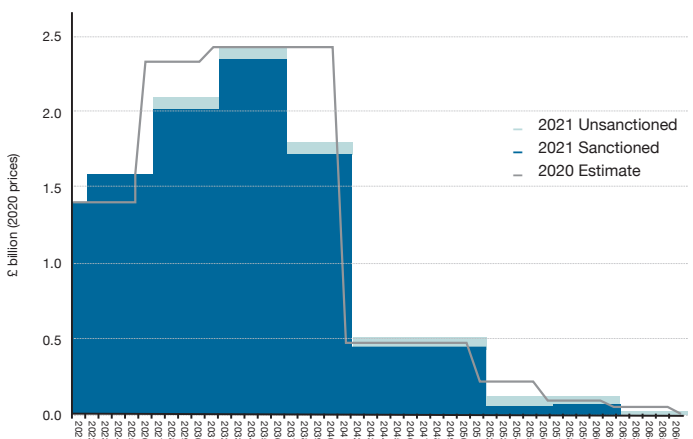


[11] 2022 Stewardship survey; 2023 OGA Decommissioning cost estimate report

Around 11% of the "like-for-like" cost estimate has been liquidated over the period 2017–2020, with significant decommissioning expenditure forecast to be incurred in the following 20 years in the range of circa £1.5bn–£2.5bn per year (Figure 3). A summary of the decommissioning scope is provided within Appendix 4.

Figure 3: Annualised Decommissioning Cost Profile

Projected Annual UKCS Decommissioning Costs, 2021+ Full Portfolio



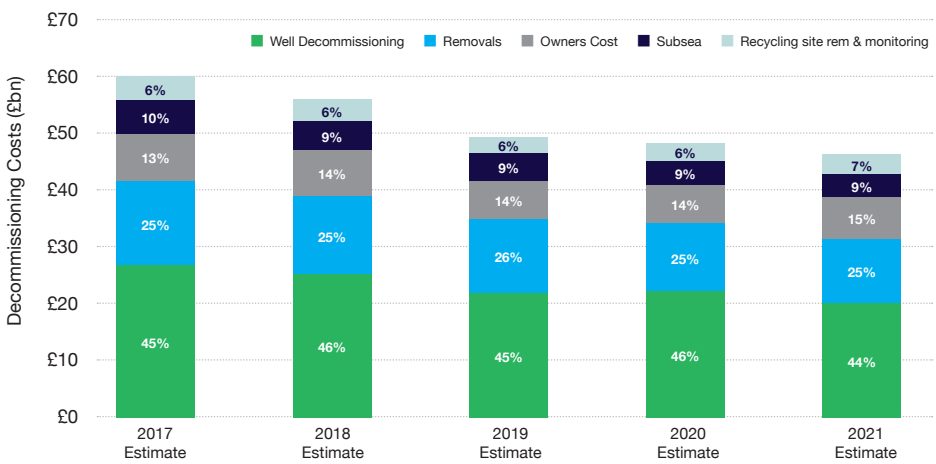
3. Cost Breakdown

3.1 Progress (2017–2020)

Over the four year period (2017–2020), reductions in the range of 25–35% have been achieved across three of the largest cost categories (well decommissioning, removals and subsea infrastructure) while post-Cessation of Production (CoP) running costs have predominantly remained flat over the same period.

Well decommissioning and removals account for nearly 70% of total cost estimate, with well decommissioning being the largest single cost category consistently representing around 45% of the total decommissioning cost estimate and providing the largest individual cost reduction opportunity. These two cost categories alone contribute more than £10bn[12] of the cost savings to date. The distribution of UKCS decommissioning costs by geography reflects a similar pattern, with well decommissioning being dominant across all geographical areas (Appendix 3).

Figure 4a: 2017 to 2021 Estimate Changes (Like-for-Like[13])

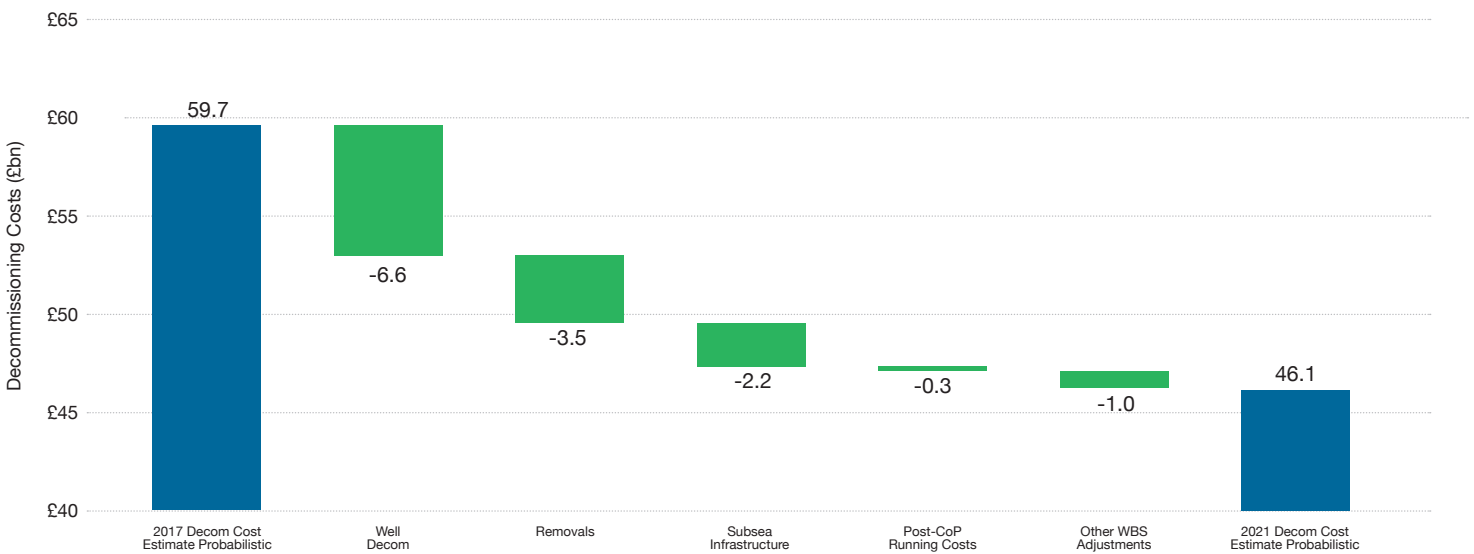


[12] Class Change and Probabilistic Impact included in relevant work breakdown structures

[13] Costs shown in 2016 prices, for expenditure in 2017 and after

Figure 4b: 2017 to 2021 Cost Estimate Waterfall by Category

(Like-for-Like – Applying Class Change Across Cost Categories)



For decommissioning scopes completed over the period 2017–2020 there is clear and encouraging evidence of actual (out turn) decommissioning costs being in the order of 20% lower than initial forecast, tracking the downward trajectory of the overall cost estimate[14]. Lessons learned from completed projects are now being used by operators as an input and basis for updates to future estimates. Additionally, decommissioning lessons learned and good practices are shared with the industry including through the OGA website[15].

The forecast expenditure for assets currently on the OGA Decommissioning Glidepath[16] (i.e. those with an estimated CoP date within 6 years) amounts to approximately £9bn (around 20% of the full portfolio decommissioning estimate), with 80% of this being distributed over 7 operators. While the operator is the entity executing the scope, the decommissioning financial liability is usually jointly borne by respective Joint Venture owners.

Figure 5: Completed Projects (Initial vs Latest Costs)

Completed Projects from UK Stewardship Survey

[14] Completed Scopes from Wells, Removals and Subsea Infrastructure Categories, total costs up to 2020, Source: UKCS Stewardship Survey

[15] https://www.ogauthority.co.uk/lessons-learned/

[16] Stewardship Expectation 10: Cost Effective Decommissioning (https://www.ogauthority.co.uk/media/5904/oga_se10_cost_effective_decommissioning_july_2019.pdf)

3.2 Progress and Outlook (2021+)

Compared with the 2020 like-for-like cost estimate, there has been a further £2bn reduction (Figure 6), due to a decrease in forecast and executed activity costs and reduced risk in the operator cost estimates.

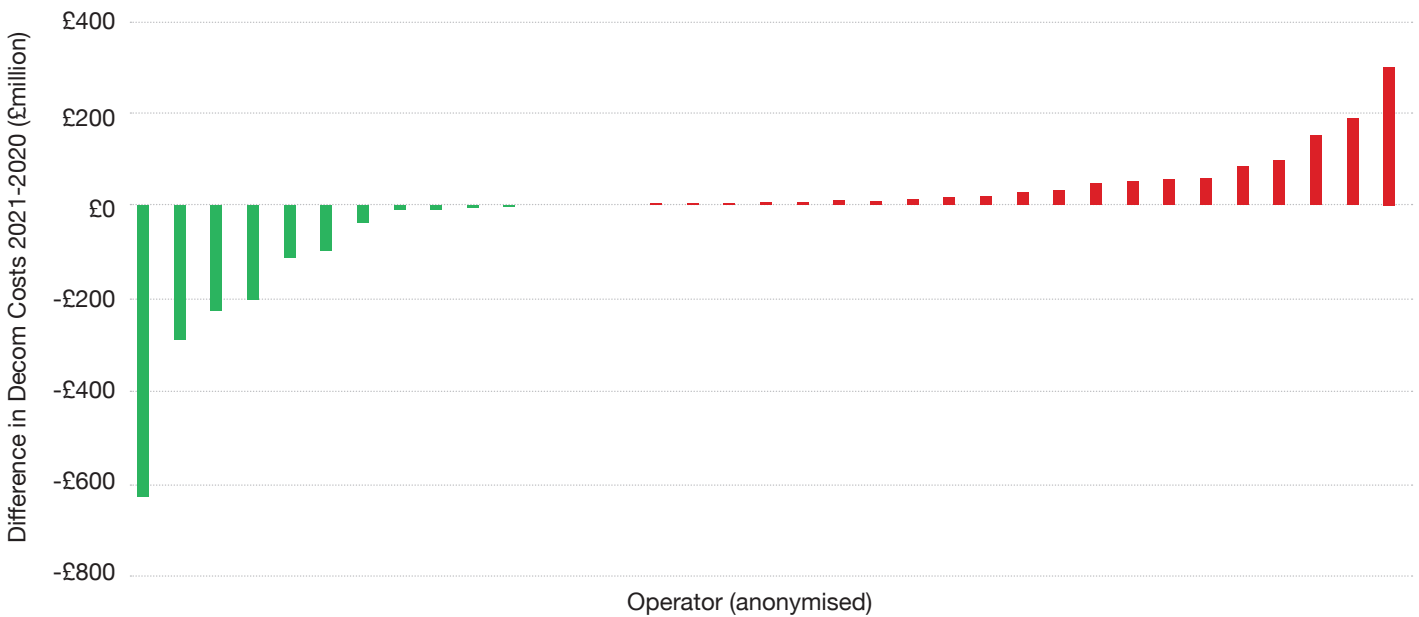
Figure 6: 2020 to 2021 Decommissioning Cost Estimate Reductions

(Like-for-Like, Probabilistic, £bn)

While substantial reductions in decommissioning cost estimates are reported by several operators, the value of these are partially offset by material increases elsewhere leading to a more modest net reduction (Figure 7).

Figure 7: 2020–2021 Estimate Change by Operator

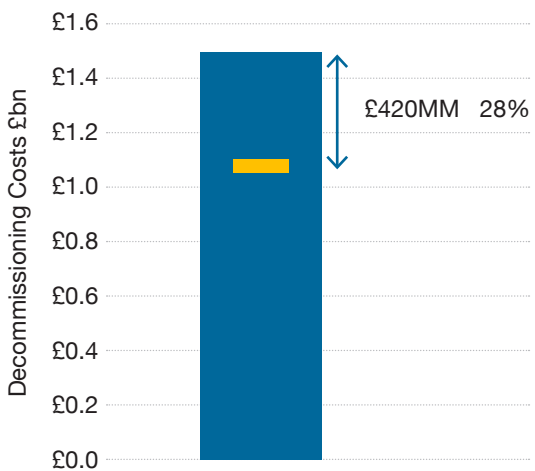
Estimate Change (Deterministic (2021+), excluding adjustments)



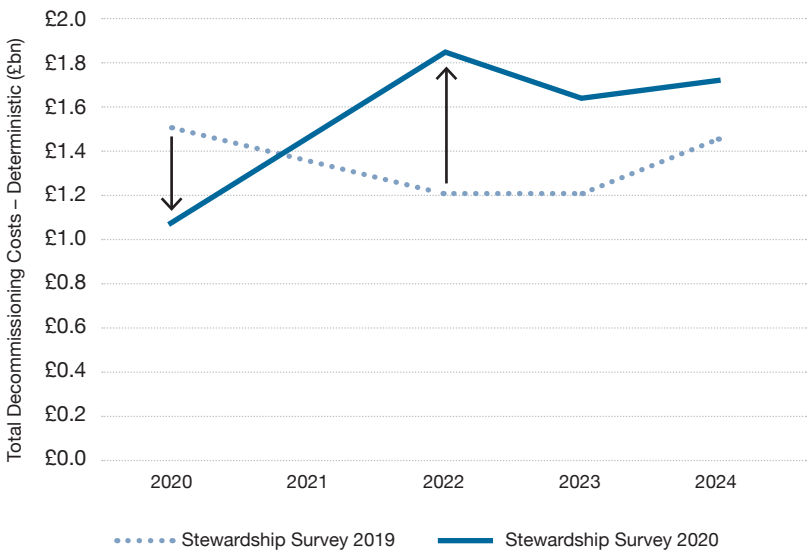
Actual decommissioning expenditure in 2020 was £420m lower (Figure 8) than estimated the previous year, in comparison to £170m reduction in 2019 and £432m in 2018. The reductions in expenditure in 2020 were in line with expectations as a result of Covid-19 and the low commodity price. Over the next four years (2021–2024) spend is forecast to rebound and increase, reflecting a recovery from 2020 slowdown.

Figure 8: Deferral and Forecast Analysis

2020 Estimate vs 2020 Actual Costs
(Deterministic, excluding adjustments)



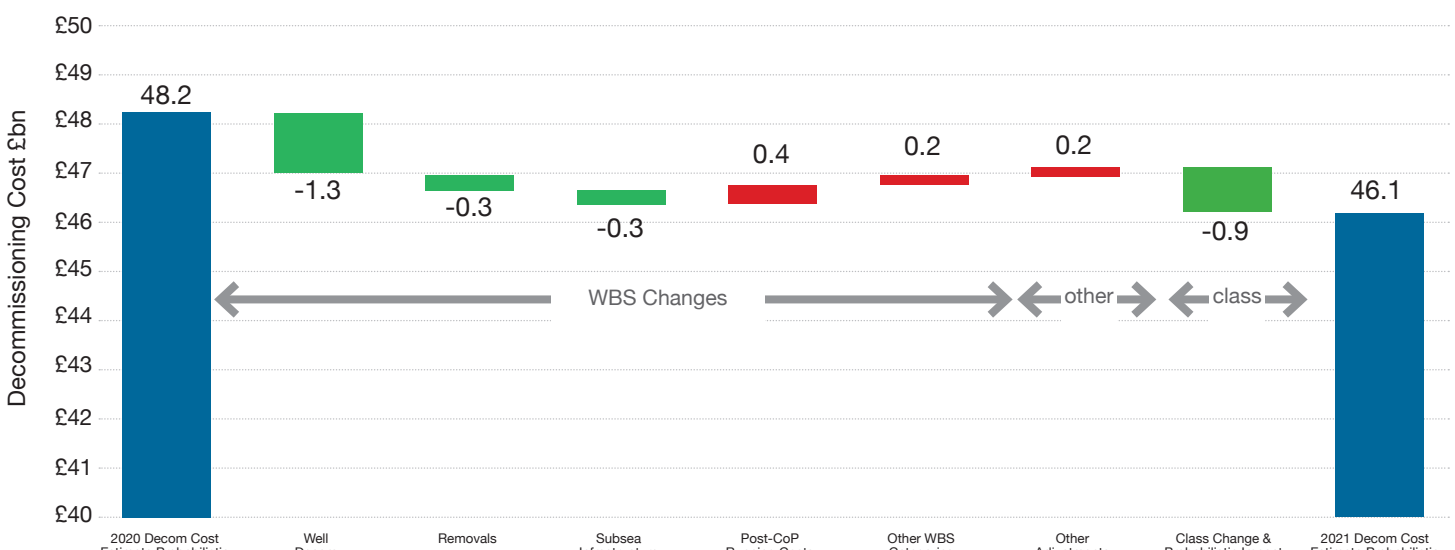
2020 to 2024 Profile/Cost Recovery Trajectory
(Deterministic, excluding adjustments)



Consistent with the four-year trend of cost reductions, forecast well decommissioning costs have reduced substantially with marginal reductions in cost estimates also being evident across the remaining cost categories, with the exception of post-CoP running costs where cost estimates have increased for the second year running (Figure 9). Incidences of accelerated CoP have and will likely continue to occur. Failure to adequately manage the risk of accelerated CoP, through contingency planning plus proactive and timely late life decommissioning execution, particularly well decommissioning, will have a significant resulting cost impact.

Figure 9: 2020 to 2021 Decommissioning Cost Estimate Reduction Categories

2020 to 2021 Cost Estimate Waterfall by Category (Like-for-Like, probabilistic, £bn)



Well Decommissioning

While well decommissioning costs are the largest contributor to the 2021 cost estimate reduction, this is influenced by material shifts in estimates by a small proportion of operators.

Further details of well decommissioning and associated cost insights are provided in pages 23-29.

Post-CoP Running Costs

The increase of post-CoP costs reported (2021 cost estimate) is largely due to two factors:

- Fields ceasing production earlier than planned leading to a longer period of warm-phase asset management than previously forecast, with increases in costs
- Reclassification of costs across WBS cost categories for fields planning to decommission in the medium-term (2030's)

A concerted effort by industry to address post CoP running costs is required. This will be supported through enhanced decommissioning stewardship (Appendix 5) including:

- Further sharing of lessons learned and best practice examples for efficient and timely transition from warm to cold phase, and
- Development of greater understanding and reduction of cost risks associated with earlier CoP

Removals and Subsea Infrastructure

Continuous improvement in expertise and project management that enables flexible scheduling of work is driving a steady reduction in topsides and substructure removal costs. Top quartile performance has been achieved in the area of topsides removals. The contributory factors underpinning these achievements should be captured and shared as lessons learned across the industry.

Operators and the supply chain are demonstrating collaborative behaviours which in turn is fostering innovation and leading to reductions in actual costs and estimates. However, the supply chain needs greater visibility of, and confidence in, future work to anchor the progress achieved to date and continue to improve competitiveness. Energy Pathfinder is improving the visibility of forthcoming work scopes by providing a one-stop shop for future UKCS work and collaborative opportunities.

East Irish Sea Decommissioning Campaign Enables Life Extension of the Morecambe Area

The Achievement

A campaign-based decommissioning programme has succeeded in consolidating the Morecambe offshore asset footprint from eight to six platforms, and the number of gas processing and export terminals onshore from two to one. This has been a major factor in materially reducing asset OPEX, hence enabling life extension across the Morecambe Hub area.

The multi-faceted technical and environmental challenges encountered both with the unique slant wells and legacy infrastructure have required several industry firsts to overcome. The supply chain has been widely engaged to develop solutions and a long-term, hub-wide contracting strategy has significantly reduced the cost to the taxpayers and operator.

Multiple new UK entrants and service lines to the decommissioning sector have been enabled and integrated together with established UK and international suppliers to safely and efficiently deliver the programme.

OGA Decom Team Comments

This is a good example of how innovative thinking, supply chain engagement and implementation of campaigns are all valuable tools to achieve decom cost efficiencies and ultimately fulfil the OGA Strategy.

Key Facts

- During the work phase, 37,000 tonnes of infrastructure has been decommissioned across two subsea tie-backs, two drilling platforms and a major onshore gas terminal.
- The full long-term, area-wide decommissioning and contracting strategies integrate circa 120,000 tonnes of infrastructure creating significant economies of scope and scale.

Campaigns and Collaboration

The OGA believes that commercial transformation based on collaborative working and delivering projects through the campaign approach offers significant opportunity to achieve further cost efficiencies.

While industry has experience of working collaboratively and delivering projects through the campaign approach, they are yet to become mainstream ways of working. Decommissioning campaigns have typically been limited to those which individual operators can assemble within their own portfolio.

Industry is demonstrating a positive move toward broader collaboration opportunities and the OGA is engaging with infrastructure owners to share lessons learned and promote joint operator campaigns with an expectation that campaign approaches will become standard practice.

To date the two areas that have seen greatest focus and support for campaigning are well decommissioning and subsea infrastructure removals.

Technology[17]

While there is evidence of the successful application of technology to enable cost effective decommissioning (e.g. single lift vessels), technology development targeted at decommissioning of both wells and facilities consistently shows limited funding support from operators while the supply chain continues to incrementally develop and deploy (decommissioning) technology. If this trend persists, the deployment at scale of technology options required to deliver performance improvement and help reduce decommissioning costs could be limited within the time window of high decommissioning activity.

Analysis of operator Technology Plans, submitted under the 2020 Annual Stewardship Survey, and industry engagement including through the Technology Leadership Board, Net Zero Technology Centre and other Energy Integration Project stakeholders, highlight two key enabling technologies to support the delivery of decommissioning cost efficiencies:

- Rigless abandonment (e.g. alternative P&A barriers, through tubing cement evaluation)
- Subsea decommissioning (e.g. cutting and lifting, inspection technology for repurposing)

[17] Oil and Gas Authority: Technology Insights Report - 2020 - Publications -https://www.ogauthority.co.uk/technology/oga-technology-survey-insights/technology-insights-2020-summary-findings/

Contracting and Supply Chain[18]

Decommissioning presents an opportunity for the offshore oil and gas industry to coalesce behind a common objective, working collaboratively with its supply chain to drive out inefficient practices and achieve successful decommissioning to the benefit of all parties.

Novel but proven contracting models delivering best in class decommissioning cost outcomes exist but uptake across the industry is inconsistent. Collaborative working offers a compelling opportunity to create value (by reducing cost and risk to both client and contractor), creating the solid foundation for a capable, efficient and motivated supply chain.

Repurposing

The potential repurposing of offshore oil/gas infrastructure to play a useful role in the transition to a low carbon economy is an area of increased focus. Emerging sectors which can potentially benefit from access to this infrastructure include Carbon Capture and Storage (CCS), hydrogen and renewables (e.g. offshore wind).

With limited technical experience and evolving regulatory and commercial frameworks the overall decommissioning cost impact of the energy transition plus any potential repurposing is uncertain and expected to remain so for the next 2–5 years. In some cases, to-date there have been minor cost increases, as additional work is done when infrastructure or wells are preserved or decommissioned to a different standard.

The potential cost effect of such repurposing of infrastructure is, with some minor exceptions, not reflected in the 2021 decommissioning cost estimate.

[18] Oil and Gas Authority: Stewardship Expectation 12 - Supply Chain Collaboration and Cooperation - 2021 - Publications - News &
publications (ogauthority.co.uk)

3.3 Class Changes and Probabilistic Impact

The balance of the 2021 estimate reduction (£0.9bn) is due to changes in operators' decommissioning cost estimate classifications with a corresponding reduction in probabilistic cost impacts.

Figure 10: Decommissioning Cost Distribution by Estimate Quality

Class estimate improvement

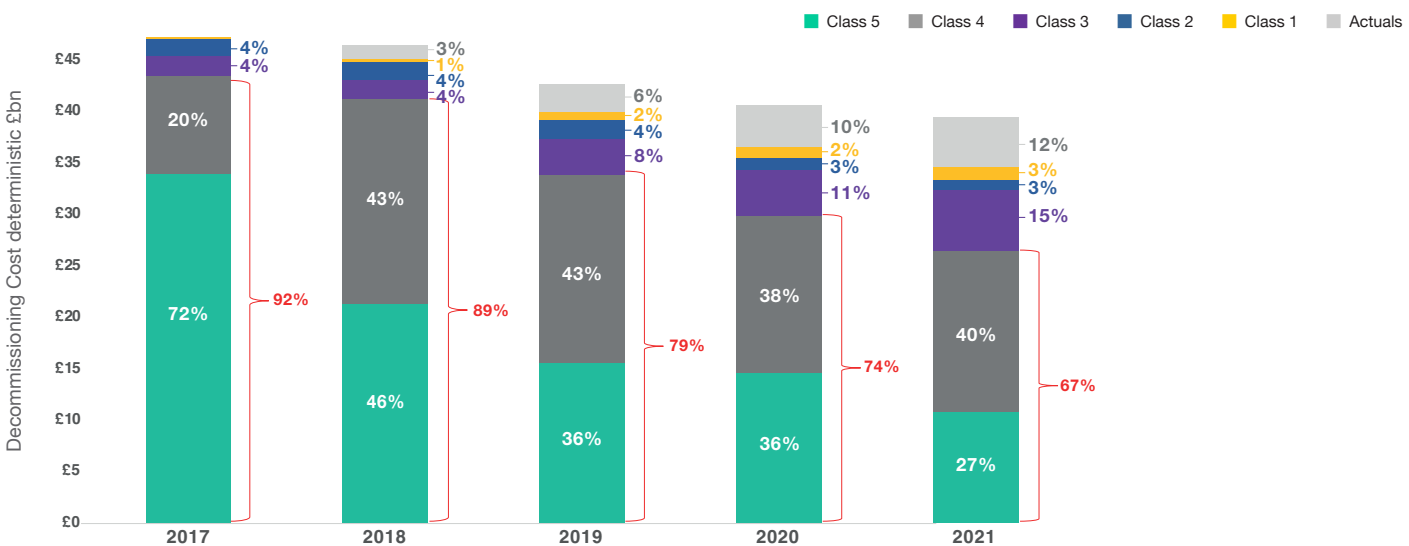
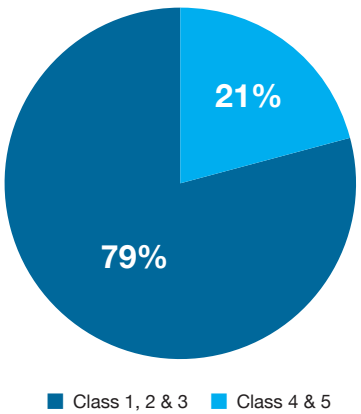


Figure 11: Estimate Quality for Spend in 2021-2023 and Comparison to OGA Key Performance Indicator

Estimate maturity for spend 2021-2023



The OGA's expectation is that, for 90% of expenditure within the coming three years, cost estimation quality should be of AACE Class 3 or better (see Appendix 1 for AACE definitions). Based on the 2020 OGA Annual Stewardship survey, 79% of three-year forecast expenditure met this expectation, an increase from the previous years' survey, where the equivalent value was 69%.

Several operators have improved their cost estimate classification by applying continuous improvement principles, where lessons learned from decommissioning execution are fed back into a cost estimation model. Operators are also adopting a strategy of ambitious goal setting and best in class decommissioning cost targets.

However, the material variance in annual estimates and allocation of costs across WBS categories, highlights the potential for inconsistency across the industry in the way that cost estimates are prepared and reported. The OGA will look to clarify existing definitions to improve consistency of cost classification and estimate certainty.

4. Well Decommissioning

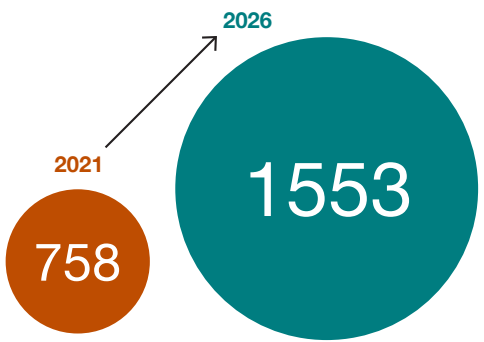
4.1 Scope

Currently, the UKCS has a well portfolio in excess of over 4000 wells which will require decommissioning.

Suspended Inactive[19] Wells

The UKCS has 758[20] inactive suspended platform and subsea wells. In the next five years, a similar number of wells are forecast to become inactive and available for decommissioning leading to a total of 1553 (Figure 12) inactive suspended wells by 2026 if no well decommissioning takes place.

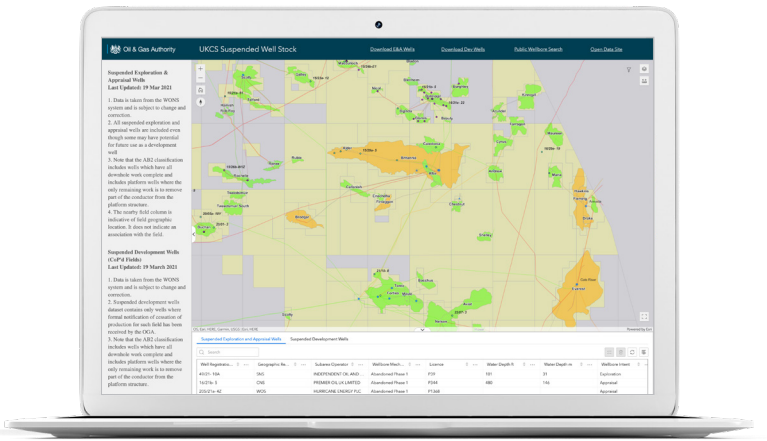
Figure 12: Number of Suspended Inactive Wells



[19] Suspended Well guidance https://www.ogauthority.co.uk/news-publications/publications/2018/guidance-for-applications-for-suspension-of-inactive-wells/
[20] Data as of March 2021

In November 2020 the OGA published the UKCS Suspended Well Stock interactive app[21] (Figure 13) which consolidates already publicly available data into a central source of information on inactive suspended wells. The data allows supply chain and operators to identify wells that are available for decommissioning, providing greater visibility of decommissioning work and enhancing the opportunity for collaboration.

Figure 13: Suspended Wells Map Viewer



Exploration and Appraisal (E&A) Wells

Of the 758 inactive suspended wells, 181 are suspended open water Exploration & Appraisal (E&A) wells. Presently, E&A wells are normally abandoned immediately after rig operations are complete. However, this has not always been the case and there is a legacy of open water wells that have been suspended on the UKCS. The OGA has recently actively engaged the industry to promote and agree upon decommissioning plans for all legacy E&A wells in line with the published suspended well guidance, and this remains a high priority for the OGA.

Well Decommissioning Progress

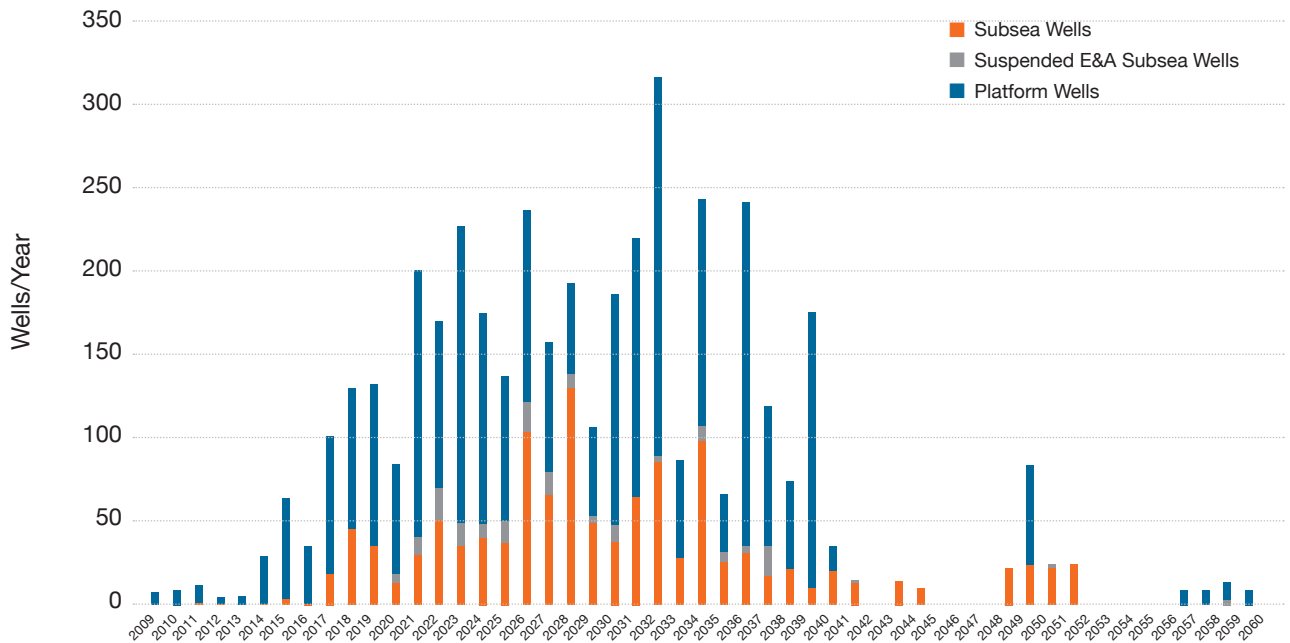
There have been high levels of well decommissioning activity[22] post 2017, with 130 and 132 wells decommissioned in 2018 and 2019 respectively. Only 84 wells were decommissioned in 2020 as a result of deferment of work predominantly due to Covid-19. Consistent with the short-term recovery and increased forecast, an increased rate of medium-term well decommissioning is foreseen, with an average of 185 wells per year forecast by the mid-2020's (Figure 14). Coordination and resource levelling of the well decommissioning profile provides the opportunity to create an efficient and stable schedule of activity.

[21] Oil and Gas Authority: Interactive maps and tools - Data centre (ogauthority.co.uk)

[22] Well decommissioning progress (2018/19) includes data for fully abandoned (AB3) and wells which have been abandoned to phase 2 status (AB2)

Figure 14: Annual Well Abandonment by Type

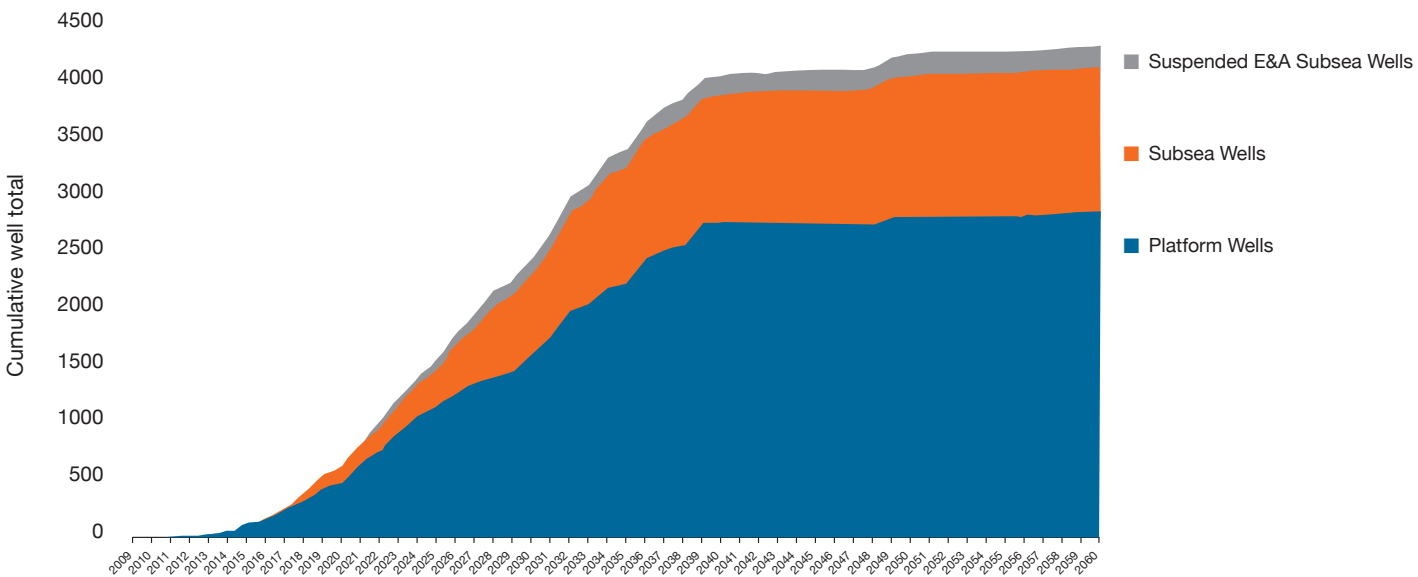
(As reported in Decom and Wells section of the Stewardship Survey)



Large-scale well decommissioning is still a relatively new activity on the UKCS. With the main volume of activity still to come (Figure 15), there are significant opportunities to increase efficiencies and lower costs. Aggregating scope to create campaigns could provide the opportunity to enhance efficiency through shared mobilisation/de-mobilisation costs, lessons learned and reduced time and cost of well operations.

Figure 15: Cumulative Well Abandonment Profile

(As reported in Decom and Wells section of the Stewardship Survey)



4.2 Cost Analysis

Well decommissioning costs are an aggregation of:

- Platform development well costs
- Subsea development well costs
- Open water suspended Exploration & Appraisal well costs

Since establishing the 2017 baseline, well decommissioning costs have decreased by £6.6bn[23], these nonetheless continue to represent a significant percentage (~43%) of the decommissioning cost estimate (2021+) and hence provide greatest opportunity for future cost reductions (Figure 16).

It is clear that substantial further well decommissioning cost reduction opportunities still remain, from 'levelling up' operator cost performance and large volume, incentivised contractual arrangements.

Figure 16: Decommissioning Estimate by Cost Category[24]

(Probabilistic, 2021+ Full Portfolio)

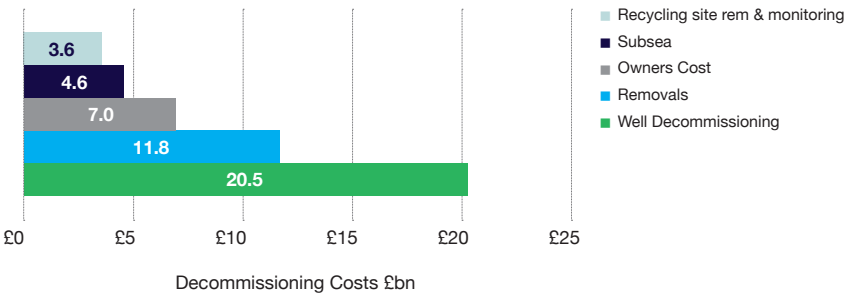
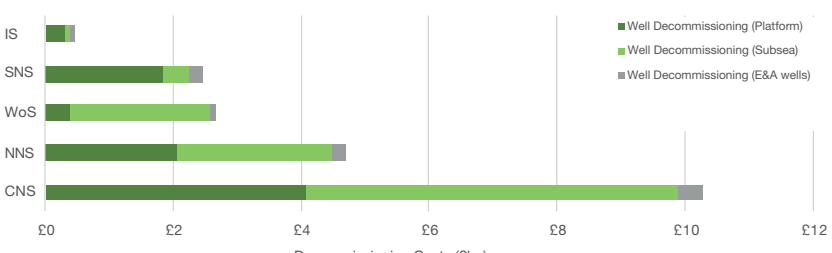


Figure 17: Well Decommissioning Cost Distribution by Geography & Type[24]

(Probabilistic, 2021+ Full Portfolio)



[23] Adjustment for cost estimate classification

[24] Calculation basis: Scaling factor applied to subcategories. Scaling factor determined by Probabilistic Total/Deterministic Total

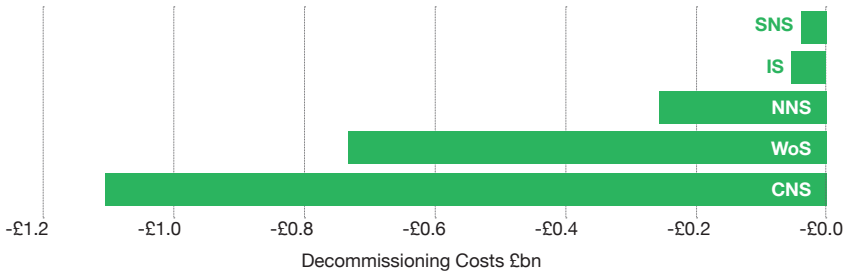
Reductions in well decommissioning costs are seen across all well types and UKCS sectors with the largest contraction seen in subsea well costs and in the Central North Sea (CNS) (Figure 18). Pockets of best in class cost performance are evident however, there remain substantial cost differences between the highest and lowest estimates. Well complexity and scope are two key drivers of cost and the OGA is committed to working with industry to provide additional clarity and granularity of costs to reflect these differences.

Large variances in well decommissioning estimates exist between operators. OGA stewardship is focussed on working with industry to develop a greater understanding of reasons for such variances and seeking to influence industry to improve cost performance to align with the levels achieved by the top quartile performers in the UKCS. Promoting best practices and sharing of lessons learned both from within the UKCS and other sectors/regions remains a key component of continuous improvement and driving the necessary cost efficiencies.

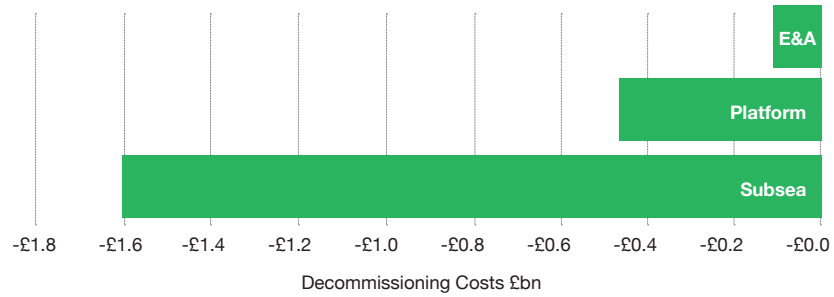
The CNS fraction of the overall well decommissioning cost estimate (2021 forward estimate excluding actuals) remains high (~50%), due to the remaining portfolio of high well decommissioning unit-cost subsea wells in the sector.

Figure 18: 2020 vs 2021 Well Decommissioning Estimate Change

(2021-2020) by Area (Probabilistic, Full Portfolio)



(2021-2020) by Type (Probabilistic, Full Portfolio)



Understanding the condition of wells, prior to offshore mobilisation, is key to developing robust execution plans, cost estimates and managing execution and cost escalation risk. However, poor historical well data continues to be a factor impacting planning and execution and hence cost.

The concentration of the wells in terms of ownership and geographical distribution highlights the potential for significant efficiencies, and the OGA is engaging with operators to promote an efficient liquidation of the scope through industry collaboration and execution of well decommissioning through campaigns. OGA initiatives and actions in support of furthering collaboration and campaigns include:

- Relaunching Energy Pathfinder to create transparency of scope including visibility of future rig and service demand profiles
- Sharing of experience, and learning from decommissioning execution
- Facilitating engagements between well operators/owners where decommissioning synergies are evident and cost savings could be realised

5. Cost Opportunities and Risks

Significant and compelling opportunities exist to drive increased execution efficiency and cost reductions

The headline opportunities are:

- Industry mainstream adoption of campaign and collaborative contracting models
- Creation of an environment and culture of stability and certainty including increased visibility of work-scopes and decommissioning milestones
- Increased sharing and transfer of lessons learned plus good practices through improved communication engagement and stewardship
- Cost-effective late life operating models

The risks to decommissioning cost escalation have been assessed, with the primary risks deemed to be as follows.

- Operator commercial misalignment/lack of collaboration
- Poor execution performance
- Delayed activity planning
- Lack of real-time visibility of decommissioning during execution
- Insufficient decommissioning skills or resources
- Oil sector cost inflation

6. OGA Actions and Next Steps

The OGA Decommissioning Strategy[25] sets out the commercial transformation that is required to achieve cost efficient delivery and meet the target to reduce the total UKCS decommissioning cost estimate by 35% by end-2022. Consistent with the strategy the OGA priorities in 2021–22 are focused on:

OGA Decommissioning Priorities 2021–22

Planning for Decommissioning	Stewardship engagement including: • Gather/share knowledge and learning from executing and delivering decommissioning • Strategy for decommissioning including "right assets-right hands" • Plan for decommissioning including review of cost estimate classification • Plans for well decommissioning including campaigning
Commercial Transformation	• Promote collaboration throughout stakeholder engagement • Improve visibility of future decommissioning work including through Energy Pathfinder • Work with operators, supply chain and trade bodies to establish well decommissioning campaign(s)
Support Energy Transition	• Development of a framework for industry to help assess repurposing opportunities • Stewardship engagement to be widened to include repurposing opportunities
Technology, Process and Guidance	• Explore opportunities for trialling and deploying new and emerging technologies • Continue to promote, clarify and implement a robust regulatory process on well decommissioning • Collaborate with regulators to ensure regulatory processes support the delivery of cost-efficient decommissioning

[25] Oil and Gas Authority: Decommissioning Strategy - 2021 - Publications - News &
publications (ogauthority.co.uk)

Appendix 1: Glossary of terms and definitions

2017 base line:
2016 OGA Annual Stewardship survey and portfolio formed basis of 2017 decommissioning cost estimate

Like-for-Like estimate:
Adjusted for inflation and aligned on a like-for-like basis with the original portfolio

Full Portfolio:
The remaining decommissioning cost for the updated full portfolio (i.e. the latest view of remaining inventory, as from the beginning of each report year)

AACE – Association for the Advancement of Cost Engineering

CNS – Central North Sea

CoP – Cessation of Production

E&A – Exploration & Appraisal

IS – Irish Sea

M&A – Mergers and Acquisitions

NNS – Northern North Sea

NZTC – Net Zero Technology Centre

OGA – Oil & Gas Authority

P&A – Plug & Abandon

SNS – Southern North Sea

UKCS – UK Continental Shelf

WBS – Work Breakdown Structure

WoS – West of Shetland

Appendix 2: Methodology

The OGA's 2020 UKCS Stewardship Survey was used as the data source, with decommissioning cost inputs provided by all operators for all current and proposed offshore facilities, pipelines, development wells, suspended open water exploration and appraisal wells and onshore terminals. Data was collected using the Oil & Gas UK Work Breakdown Structure (WBS).

The OGA's approach, unchanged from previous years, has been to develop a probabilistic cost estimate which takes into account the wide range of uncertainties in estimates submitted by operators. Estimate classes in the survey were requested with reference to the Association for the Advancement of Cost Engineering[26] and AACE guidance followed for selecting the values from these ranges (Figure 19).

The estimate is comprised of various elements, where not all components have the same level of estimate definition. The estimate classification was requested from the operators responding to the UKCS Stewardship Survey and no adjustments were made to these operator self-assessments.

Figure 19: AACE Classification of Estimates (Simplified)

Estimate Class	Expected Accuracy Range Typical variation in Low and High ranges at an 80% confidence interval	
	Low	High
Class 5	-20% to -50%	+30% to 100%
Class 4	-15% to -30%	+20% to +50%
Class 3	-10% to -20%	+10% to +30%
Class 2	-5% to -15%	+5% to +20%
Class 1	-3% to -10%	+3% to +15%

[26] AACE Recommended Practice No. 18R-97 (simplified)

Figure 19 is a simplified version of the AACE classification. For purposes of the probabilistic calculation, the narrower downside (Low) range value was used. e.g. class 5 estimates were given an expected accuracy range of -20% / +100%. This is a computationally conservative option, as it will, if anything, result in a slight overstatement of total cost. This decision is to address the possibility of estimating optimism from operators for decommissioning scope.

The estimate raw data has been collected using the Oil & Gas UK Decommissioning Work Breakdown Structure (WBS) which has the following categories:

- Project Management
- Post-CoP Running Costs
- Well Decommissioning
- Facilities/Pipelines Permanent Isolation & Cleaning
- Topsides Preparation
- Topsides Removal
- Substructure Removal
- Topsides and Substructure Onshore Disposal
- Subsea Infrastructure[27]
- Site Remediation
- Post-Decommissioning Monitoring

Where required, deflation factors have been taken from the "GDP deflators at market prices, and money GDP Statement", published by HM Treasury from data provided by the Office for National Statistics (ONS) and Office for Budget Responsibility (OBR)[28]. Values are taken from the Spring statement each subsequent year.

- 2019–2020 deflation factor[29]: 2.00%

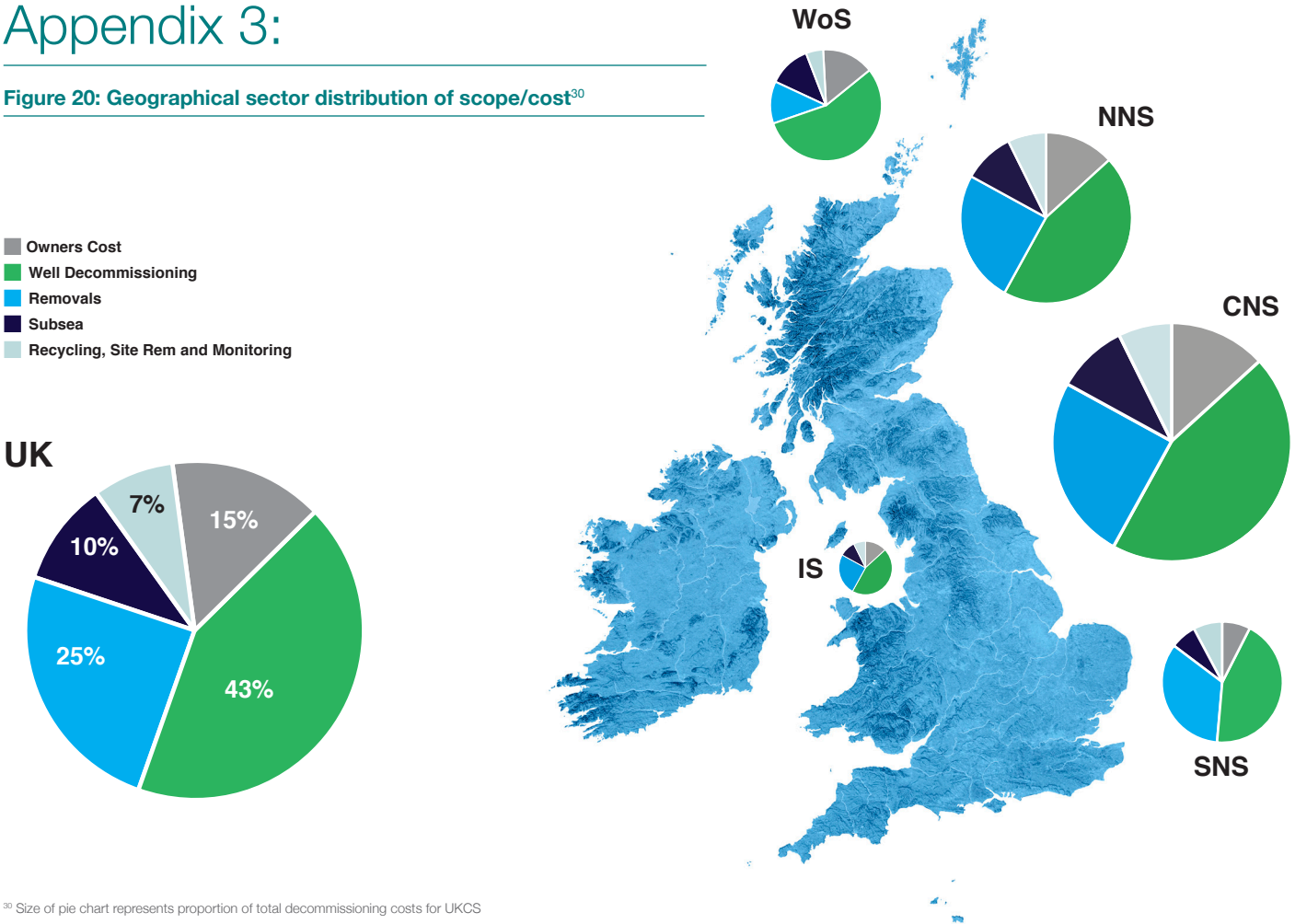
[27] incl. subsea structures, pipelines, mattresses, etc

[28] https://www.gov.uk/government/collections/gdp-deflators-at-market-prices-and-money-gdp

[29] Average from the last 3 years of GDP deflation factor (Source: HM Treasury)

Appendix 3:

Figure 20: Geographical sector distribution of scope/cost[30]



[30] Size of pie chart represents proportion of total decommissioning costs for UKCS

Appendix 4: Scope

The scope of the cost estimate is based upon the decommissioning of all UKCS infrastructure including:

- Facilities and development wells still in place and yet to be decommissioned
- All infrastructure and development wells currently undergoing decommissioning, excluding work performed prior to 2017
- All sanctioned facilities and wells not yet in place
- Proposed project developments, not yet sanctioned or built
- All intra-field pipelines and export lines
- Suspended open water exploration and appraisal wells
- Onshore terminals

UKCS Decommissioning Scope[31]	
	>4000 wells
	>320 platforms to be re-used/removed
	>2,000,000Te's topsides
	>1,000,000Te's substructures
	>75,000Te's subsea structures
	>20,000kms pipelines to be re-purposed/removed

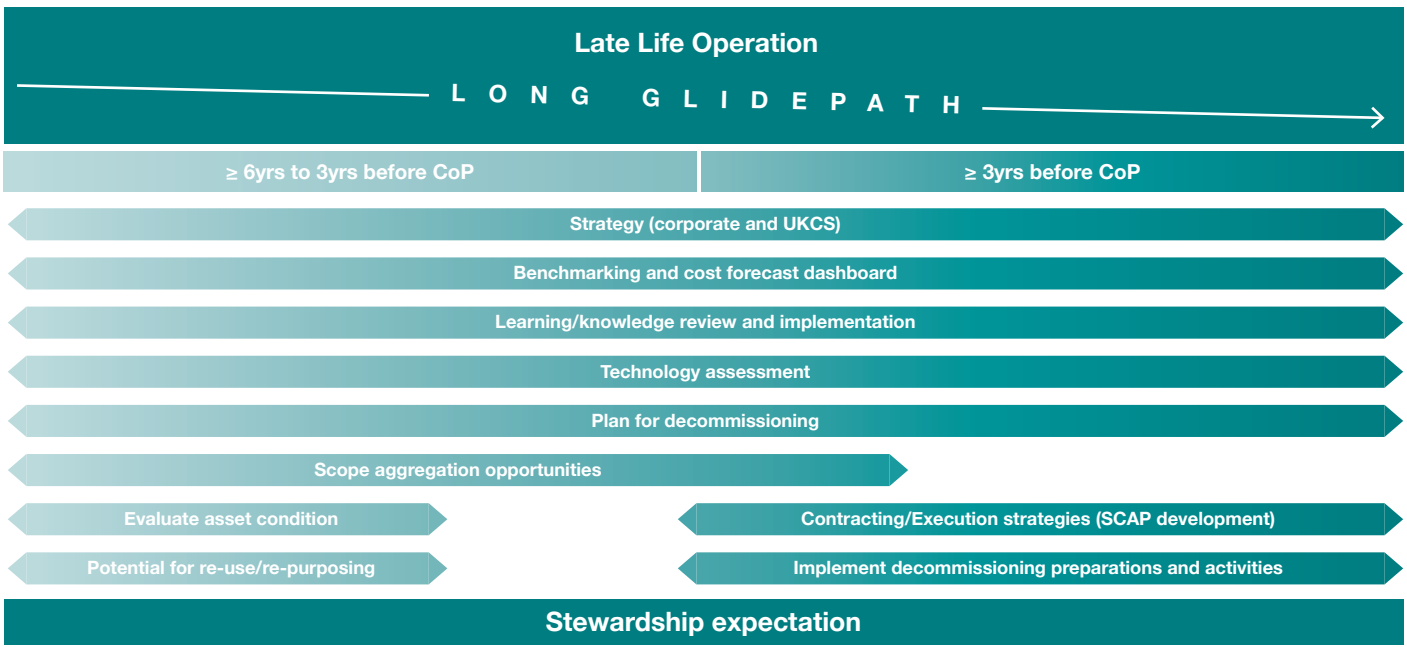
[31] Estimated scope as at Dec-2020

Appendix 5: Stewardship review process

The OGA's stewardship process is central to meeting the strategic objective and priorities set out in the updated Decommissioning Strategy. It provides a focal point to review decommissioning readiness and a forum to consider individual infrastructure owner's strategies and plans for delivering decommissioning.

The OGA's Decommissioning Strategy plus Stewardship Expectation SE-10 including 'Glidepath for success' (Figure 21) set out the framework for successful planning and execution of cost-effective decommissioning.

Figure 21: OGA Decommissioning Stewardship Glidepath



Appendix 6: Opportunity cost saving

Figure 22: Achieving the 35% Reduction

2017 baseline: £59.7bn	Target: 35% reduction to £39bn by end 2022

Cost Category	2017 Baseline		Reduction Target		Progress to 2021
Well Decommissioning	46%	£27bn	35-65%	£9-18bn	25%
Removals	26%	£15bn	15-30%	£2-5bn	24%
Subsea Infrastructure	10%	£6bn	30-50%	£2-3bn	35%
Post CoP Running Costs	7%	£4bn	20-40%	£1-2bn	6%

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