OGUK

DECOMMISSIONING INSIGHT 2020

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DECOMMISSIONING INSIGHT 2020

2. Foreword

Welcome to OGUK's *Decommissioning Insight 2020*, which captures a year like no other the industry has ever experienced. The oil and gas sector continues to deal with the effects of COVID-19 and the collapse of commodity prices. Decommissioning has not escaped the impact of such unprecedented conditions.

Now in its eleventh year, as the *Insight* report enters a new decade it will continue to provide a key source of knowledge for the UK decommissioning industry. Its initial aims remain the same as always: enhancing our understanding of the decommissioning market — at home and throughout the wider North Sea — and demonstrating the sector's unique expertise and capabilities to the world. The report has now widened in scope to incorporate new priorities, in particular industry's action to accelerate the energy transition and embrace opportunities to support a low-carbon future.

Over the past few years, this report has been built around data received via the Oil and Gas Authority (OGA) Asset Stewardship Survey. However, given the major disruptions and challenges faced this year, OGUK conducted an additional interim survey of operators in June 2020 to provide deeper insight of the impact of COVID-19 on decommissioning activity. This survey showed that continuing market uncertainty has led to around £500 million of decommissioning expenditure previously scheduled for 2020-22 being deferred into the future.

It is clear there is no rush to decommission and as with every part of the oil and gas business, reduced cash flow is impacting decommissioning plans. Accordingly, anticipated expenditure on decommissioning this year has fallen from £1.47 billion in early 2020, to around £1.08 billion — a 30 per cent reduction. Reductions in expenditure have affected the supply chain, and reduced activity is now expected across almost all areas of decommissioning work during the next three years. Despite this, 2020 has seen the decommissioning of around 116 wells, almost 260km of pipelines and the removal of 15 topsides, including a record two northern North Sea platforms — proof of the resilience within the supply chain even in these hard-pressed times.

Over the longer term, the impacts of the virus, the commodity price collapse and ongoing volatility in decommissioning remains to be seen, with this year's survey reporting that up to £15 billion is still expected to be spent over the next ten years. Amid our ongoing challenges, it is imperative that we focus on ensuring the resilience of our supply chain through, for example, ensuring visibility of work so that when conditions change, our industry remains competitive.

Year on year the Decommissioning Insight report tracks the success and continual improvements the UK decommissioning industry achieves. This year there have been significant milestones in performance improvement, with the OGA's latest *UKCS Decommissioning Cost Estimate Report* showing a 19 per cent reduction in the overall costs of decommissioning over the past three years. This demonstrates industry's concerted efforts to drive progress are having a real impact as we maintain our focus on delivering a 35 per cent reduction in decommissioning costs by 2022, from an initial estimate of almost £60 billion set in 2017.

The remaining 16 per cent of our 35 per cent cost reduction target will be harder to achieve, but we must build upon the progress we have already made. Industry views safe and environmentally sustainable decommissioning as a priority and needs to ensure these are continually pursued within our projects. Technology and research are also key focus areas, with industry using services offered by the Oil and Gas Technology Centre (OGTC) and now the National Decommissioning Centre, both of which play a role in identifying areas where innovation is required and to bring solutions to market, helping anchor capability here in the UK.

In the short term, it's vitally important that we stimulate activity across the oil and gas industry, including in decommissioning, so that work can be conducted on those assets that are "decommissioning ready". Ensuring a steady, sustainable and predictable workload will keep key portions of the industry in business during these tough times. This is critical if we are to meet our cost targets and key to helping us ensure our world-class supply chain remains anchored in the UK, providing jobs and growing revenue from exports. Driving a collaborative mindset, which has been evident in many of the removal projects executed during 2020, will help ensure that operators and supply chain companies can work together to make the most of the opportunities of the future.

This year, we have seen the decommissioning sector demonstrate resilience, determination and innovation in its response to considerable challenges. We will need all these qualities to ensure we can play our role in the energy transition, enabling us to seize the opportunities presented by energy integration, carbon capture and storage and innovation in low-emission decommissioning.

Katy Heidenreich
Supply Chain & Operations Director, OGUK

Decommissioning in 2020

Total spend on decommissioning in 2020 is estimated at **£1.1bn** – around **10%** of total annual expenditure

Short-term expenditure is reduced, indicating no rush to decommission

Expenditure under increased scrutiny

2020 forecast spend has fallen **30%** from **£1.47bn** to **£1.08bn**

Revised forecast spend:

2021 = £1.2bn

2022 = £1.2bn

~£500m of expenditure has been removed from operator budgets 2020-22

A varied year for the decommissioning supply chain

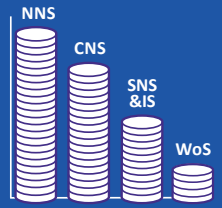
- Removals activity progressing
- Well activity sees reduction with **116** wells decommissioned in 2020

- A record **2 NNS lifts** in one year, totalling **30,000t**
- 15 topsides lifted
- 258km of pipelines decommissioned

For the **4th** consecutive year well decommissioning activity **(116 wells)** outweighs exploration **(4)**, appraisal **(3)**, and development **(60)** combined

In the next 10 years...

Full impact of COVID / commodity price collapse remains to be seen but industry expects to spend up to **£15.1bn**



EXPENDITURE

NNS - 40%
CNS - 32%
SNS&IS - 20%
West of Shetland - 8%

Well decommissioning accounts for 49% of expenditure

£7.4bn to be spent on well decommissioning

1,616 wells over next decade

Majority of North Sea activity happening in the UK: **60%** of well activity; **73%** of topsides; **53%** of the substructure activity

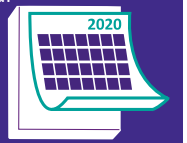
Almost £2.2bn (14%) to be spent on removals

Greater efficiencies and project completions mean that expenditure on removals has **reduced from £2.7 bn** in the 2019 *Insight* forecast

Building on what we have achieved so far...

Industry is working to become more effective and efficient

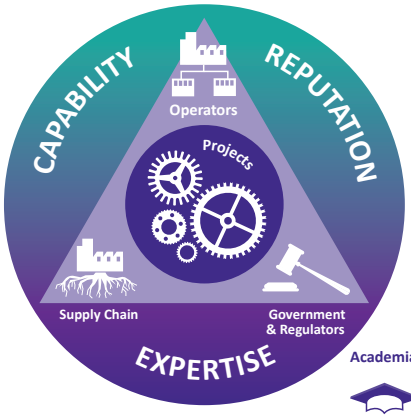
Long execution windows – helping successful supply chain-led schedules



Current perfomance already outperforming expectations:

Subsea well costs
NNS — £1.2m less per well
SNS — £0.88m less per well

Establishing the UK as a global hub



KEY FOCUS AREAS

- Safe and environmentally sound
- Multi-operator campaigns
- Innovative contracting models
- Exports
- Technology
- Academia

Decommissioning in the Energy Transition

Low-carbon decommissioning

Decommissioning can be an energy-intensive exercise — we must find ways to reduce our total carbon footprint in decommissioning, like any other part of the industry and the rest of the economy

Supporting the circular economy

Decommissioning industry is working hard to re-use equipment before recycling or disposal

Re-using and Re-purposing

Re-purposed topsides facilities have been used in new oil developments, but there are also tangible opportunities to repurpose for use in new industries like CCUS, hydrogen and offshore wind

CO_2

4. Decommissioning in 2020

4.1 2020 – A Challenging Year

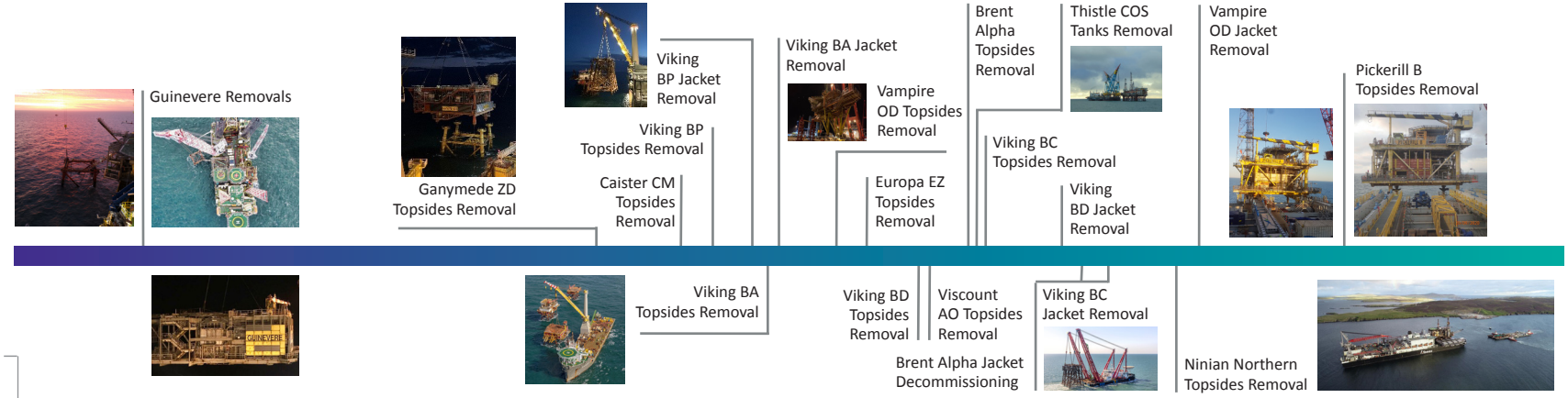
2020 has been a challenging year for all of us — Due to the impacts of the coronavirus pandemic, we have seen oil prices collapse in the spring, followed by partial improvement in Q2. The oil price fluctuations and ongoing uncertainty have influenced the business environment in the oil and gas industry and impacted the UK decommissioning sector in many ways.

Decommissioning expenditure under increased scrutiny — At times of uncertainty, operators' budgets are constrained and all expenditure is subject to increased scrutiny. Decommissioning expenditure is viewed alongside capital and operational expenditure and during uncertain times it is likely that reductions will be made in all areas where possible. However, decommissioning activity is not discretionary, which means that if activities are not conducted now, they will be moved into the future. Estimates of deferred work are set out later in the report.

Constraints on the workforce offshore — As well as expenditure reductions, the industry has endured the effects of the virus itself. The oil and gas industry is essential to providing affordable energy for homes and businesses across the country, with our offshore industry supplying enough to meet more than 60 per cent of the UK's oil and gas demand. The nation needs energy to keep the lights on and heat our homes, which is why the government designated many oil and gas personnel as "key workers" to ensure production from our offshore assets could continue. However, along with key safe working protocols, offshore personnel numbers are being kept to a minimum to restrict exposure to the virus. OGUK's *Workforce Insight* 2020,[1] released in October, showed that offshore personnel on board (POB) numbers fell from just over 11,000 POB in early March 2020 to just over 7,000 POB in mid-April. This meant that almost all non-essential activity was ceased, and although numbers partially recovered to about 9,000 POB through August, the focus has remained largely on continued operations and safety critical maintenance.

A varied year for the decommissioning supply chain — Decreased expenditure and restrictions offshore have increased pressure on the decommissioning supply chain, who were still recovering from the previous downturn. Most of the offshore decommissioning workscopes at present take place during the summer months, and this year's requirement to reduce POB and focus on essential activity has prevented many such projects from progressing. Nevertheless, the industry has still been able to complete some projects, with a resilient supply chain eager to maintain an active workforce during these testing times and creating a flurry of activity, particularly around the removal of offshore assets in the latter part of summer 2020, as shown in Figure 1.

[1] https://oilandgasuk.cld.bz/Workforce-Insight-2020/4/



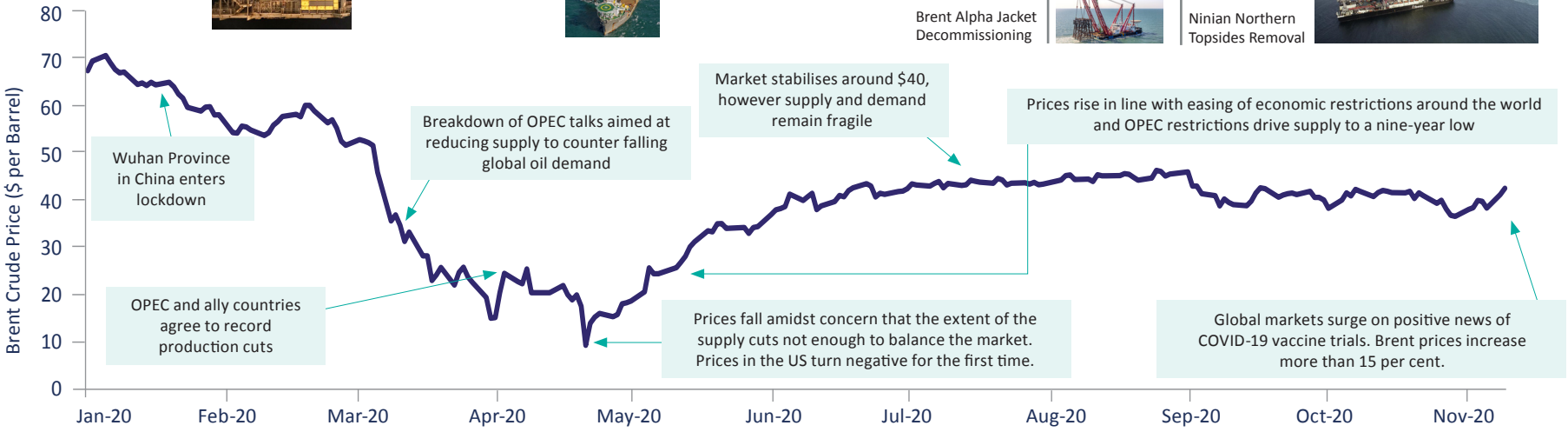


Figure 1: Oil Price and UKCS Removals Activity, 2020

Source: EIA, OGUK

4.2 The Impacts of COVID-19 and Commodity Price Collapse

Reliable and definitive information is invaluable in uncertain times, which is why for *Decommissioning insight 2020*, OGUK has conducted an additional survey to test the impact of COVID and the commodity price fluctuations on decommissioning activity and expenditure.

Industry is still spending almost £1.1 billion on decommissioning in 2020 — Figure 2 shows that over the next three years industry expects to spend about 13 per cent (£514 million) less than anticipated at the beginning of 2020. Reductions carry through into 2021 and 2022 with around 8 per cent and 1 per cent less expenditure anticipated, respectively. It is not unusual for the forecast expenditure at the beginning of each year to be higher than actual expenditure realised at year-end. Last year the industry anticipated that around £1.6 billion would be spent during 2019, whereas only around £1.4 billion was actually committed. The OGA's UKCS *Decommissioning Cost Estimate 2020* [2] attributed 70 per cent of this to project efficiencies rather than deferral of scope.

The future is uncertain — Figure 3 shows the cumulative expenditure in June 2020 (solid purple) in comparison with the start of 2020 (orange). Although hopes of a vaccine have risen, there remains a high degree of uncertainty over near-term oil supply and demand profiles. Low oil prices may bring forward Cessation of Production (CoP) for some assets but will also put pressure on cash flow within operators, which could prevent progression of decommissioning projects. The full impact of COVID and the commodity price volatility remains to be seen. The UK oil and gas industry has proved in the past to be resilient and it is likely that this resilience will be tested once again.

Budgets could be further reduced — As shown, budgets set at the beginning of 2020 have been reduced substantially throughout the year. Budgets are now set for 2021 at a lower level and could be reduced further, depending on market environment.

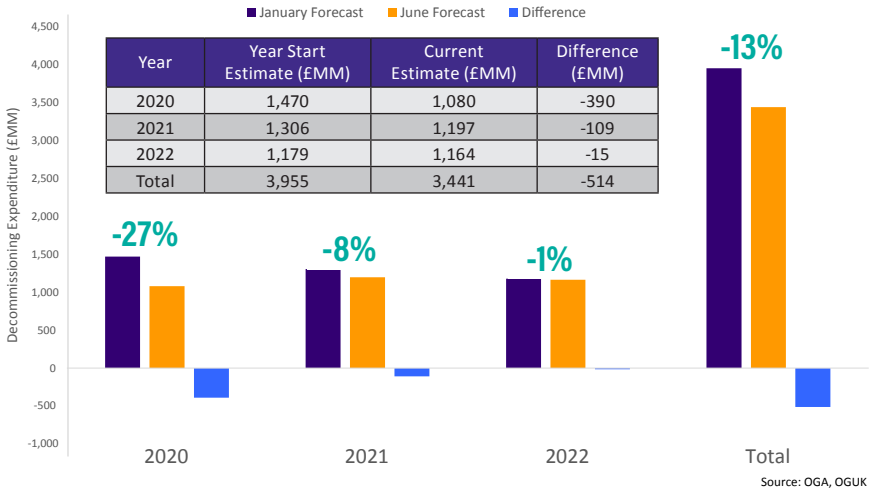
Survey methodology
Data for the *Decommissioning Insight 2020* have been provided by all 31 operators across the UKCS as part of the Asset Stewardship Survey, overseen by the OGA. The survey collates information from all UK operators between November and February each year. The impacts of COVID-19 took hold around March 2020, which meant that the information provided by operators for the survey had changed, particularly for short-term activity and expenditure. Recognising this, OGUK conducted a survey in June which sought to understand differences in activity and expenditure from 2020–22. The data from the response to this survey have been used to make assumptions over the remainder of the dataset. The forecasts in this report are provided by operators and represent their best estimates at the time of the survey. Timings are therefore subject to change.

All decommissioning activities affected — Figure 4 shows that all areas of the decommissioning Work Breakdown Structure (WBS) have been affected by the events of 2020. Platform and subsea well decommissioning activity have fallen by over 30 per cent and topsides and substructure removals activities are also down by 18 per cent and 11 per cent this year, respectively. All areas see an anticipated rise in activity in 2022, suggesting some work has been deferred to this point and beyond.

Supply chain-led scopes — Encouragingly, a lot of removals scopes have progressed in 2020. Many topsides and substructure removal workscopes are placed with long execution windows, enabling the supply chain to select when to conduct work, and ensuring better asset utilisation. Many companies have selected 2020 as the time for these removals, with order books otherwise quiet. This is a good example of collaboration between operators and supply chain co-ordinating schedules to make activity occur — a co-operative behaviour industry and regulators have been advocating for some time.

[2] https://www.ogauthority.co.uk/media/6638/ukcs-decommissioning-cost-estimate-2020.pdf

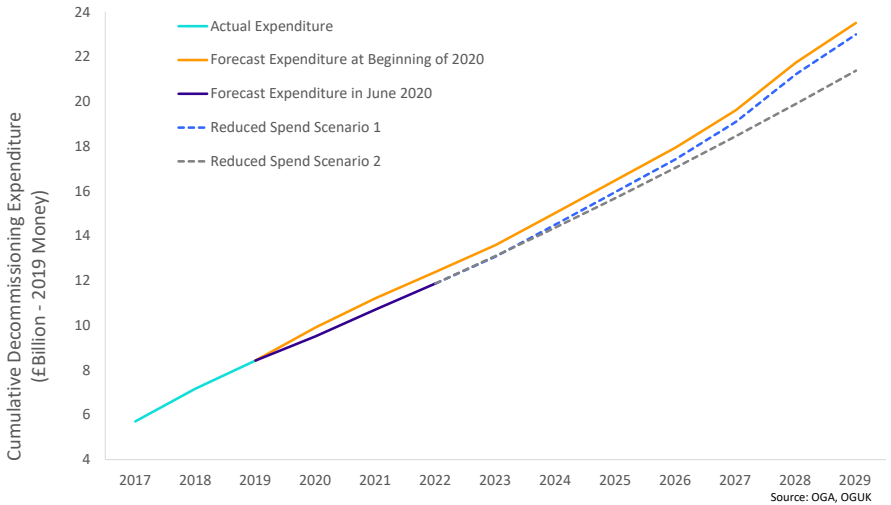
Figure 2: Forecast Expenditure Comparison, January and June 2020



Year	Year Start Estimate (£MM)	Current Estimate (£MM)	Difference (£MM)
2020	1,470	1,080	-390
2021	1,306	1,197	-109
2022	1,179	1,164	-15
Total	3,955	3,441	-514

Source: OGA, OGUK

Figure 3: Cumulative Decommissioning Expenditure Comparison



Source: OGA, OGUK

Figure 4: Forecast Activity Comparison, January and June 2020

	Number of Platform Wells (quantity)			Number of Subsea Wells (quantity)			Substructure Mass to be Removed (tonnes)			Topsides Mass to be Removed (tonnes)			Length of Pipeline to be Decommissioned (km)		
	Pre	Post	%	Pre	Post	%	Pre	Post	%	Pre	Post	%	Pre	Post	%
2020	141	95	67%	25	17	68%	25,570	22,861	89%	61,598	50,730	82%	514	258	50%
2021	83	75	90%	47	41	87%	23,033	18,825	82%	81,465	89,695	110%	496	375	76%
2022	95	118	124%	28	31	111%	22,415	24,435	109%	45,967	52,891	115%	375	377	101%
Total	319	288	90%	100	89	89%	73,018	66,121	93%	189,030	193,316	102%	1,385	1,010	73%
Work Deferred / Advanced	-31 wells			-11 wells			-4,897 tonnes			+4,286 tonnes			-375km *Including pipelines decommissioned in situ		

4.3 Removal Activity Continues to Progress in 2020

Despite the challenges presented in 2020, many removals projects have progressed across the North Sea. The case studies below demonstrate the resilience of the decommissioning supply chain, and are good examples of supply chain-led schedules, campaigning and effective partnerships.

Shell U.K. — Brent Alpha

Brent Alpha is the third platform to be removed from the Shell U.K.-operated Brent field, following Delta in 2017, and Bravo in 2019. Despite the effects of COVID-19, this year saw successful single-lift removal of the 17,000-tonne Brent Alpha topsides by Allseas using its Pioneering Spirit vessel. A large execution window allowed Allseas to plan the lift as part of a larger campaign of work across the UK and Denmark during the summer of 2020.

Hereema Marine Contractors' Sleipnir heavy-lift vessel was also deployed to lift the 10,000-tonne Alpha jacket vertically, complete with the well conductors secured inside – the first time this has been done on this scale, saving a considerable amount of time offshore.

Large supply chain windows and previous experience have also improved results. The time Pioneering Spirit spent at the field for each lift has been reduced from two and half days on Delta to less than 24 hours for Alpha. Topsides lift preparation effort for lifts has also been reduced, with Bravo requiring 60 per cent less than Delta and Alpha 30 per cent less again.

Chrysaor — Southern North Sea Decommissioning Campaigns

Chrysaor is carrying out an extensive decommissioning and removals campaign in the southern North Sea (SNS). This multi-year project is spread across 38 offshore platforms, 145 wells and over 2,000 kilometres of pipeline. It also includes an onshore gas terminal at Theddlethorpe, which is currently being dismantled. Using pre-mobilisation quarantine periods, personnel testing and the creation of vessel "bubbles", removals work in the SNS proceeded uninterrupted by COVID-19 in 2020. With work continuing as planned, the teams removed 10 platforms, carried out preparation work at several other sites, and decommissioned 20 wells.

Removal and disposal contracts across the SNS were awarded to four companies via separate tenders. Chrysaor's tender strategy allowed contractors a period of up to two years to plan removal activities, which allowed them to create efficient work campaigns. Chrysaor also mobilises its own removal preparation and well decommissioning teams on the same rig, allowing work to continue simultaneously on wells with topside and jacket preparation. This simultaneous operation has been a key differentiator in terms of costs

TOTAL — Tyra Field Redevelopment, Denmark

The Tyra field has been the core of the Danish North Sea's energy infrastructure for almost 40 years, processing 90 per cent of the nation's natural gas. The field is currently being redeveloped by TOTAL and Danish Underground Consortium due to subsidence of the main platforms. The rejuvenation of the infrastructure represents a unique opportunity to secure natural gas supply for several decades while reducing CO2 emissions by 30 per cent.

Despite the challenging conditions imposed by the COVID-19 pandemic, the decommissioning of the subsided platforms was successfully completed this summer using the world's largest construction- and crane vessels 'Sleipnir' and 'Pioneering Spirit' to remove around 45,000 tonnes steel in more than 30 lifts. In the first phase, wellhead and riser topsides, bridge modules, flare towers, bridges and support braces were decommissioned with high precision to ensure that existing jackets and wells can be reused as part of the new Tyra. In the second phase, the 15,500 tonnes and 7,800 tonnes integrated accommodation- and process platforms were both removed in single lifts.

After removal, the old Tyra modules have been delivered onshore to Frederikshavn, Denmark and Vlissingen, Holland where more than 95 per cent of the materials will be reused and recycled.

5. UK Decommissioning in Perspective

5.1 Decommissioning Over the Next Decade

Figure 5: UKCS Decommissioning Expenditure, 2020–29

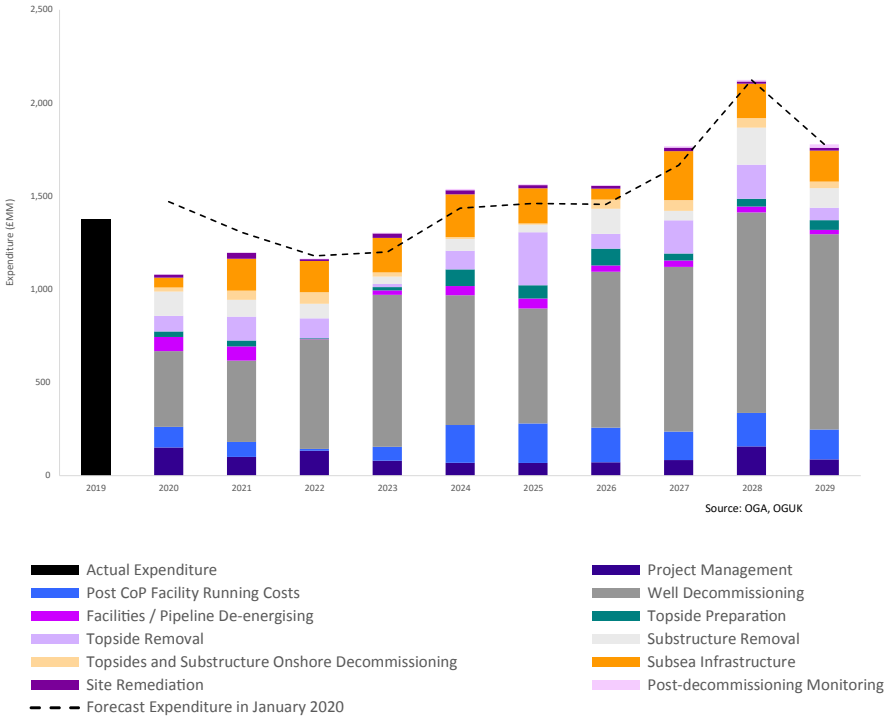


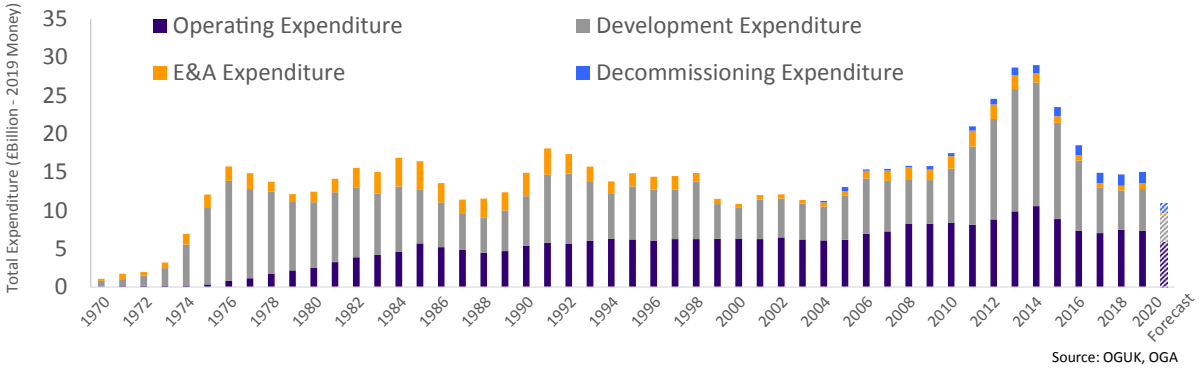
Figure 6: Well Activity in the UKCS, 2010–20

As with previous reports, *Decommissioning Insight 2020* also focuses on cost and activities over the next decade, placing a spotlight on tangible opportunities for the UK decommissioning supply chain.

Decommissioning expenditure expected to rise steadily over the next ten years — Previous *Insight* reports have shown that decommissioning expenditure is expected to be around £1.5 billion per year. Figure 5 shows a gradual increase in expenditure over the next three years which reaches about £1.5 billion in 2024-26 before increasing at the end of the dataset where the data become less certain. The black dotted line shows a comparison between the asset stewardship submissions in February 2020 and the OGUK survey returns in June 2020.

More than £15 billion spent over the next ten years — While short-term activity remains uncertain, the longer-term view is not too dissimilar to that seen in the 2018 and 2019 *Decommissioning Insight* reports. Over the next decade industry is still expected to spend up to £15.1 billion on decommissioning activity. The 2018 and 2019 reports anticipated a ten-yearly expenditure of £15.3 billion and £15.2 billion, respectively.

Figure 7: UKCS Expenditure



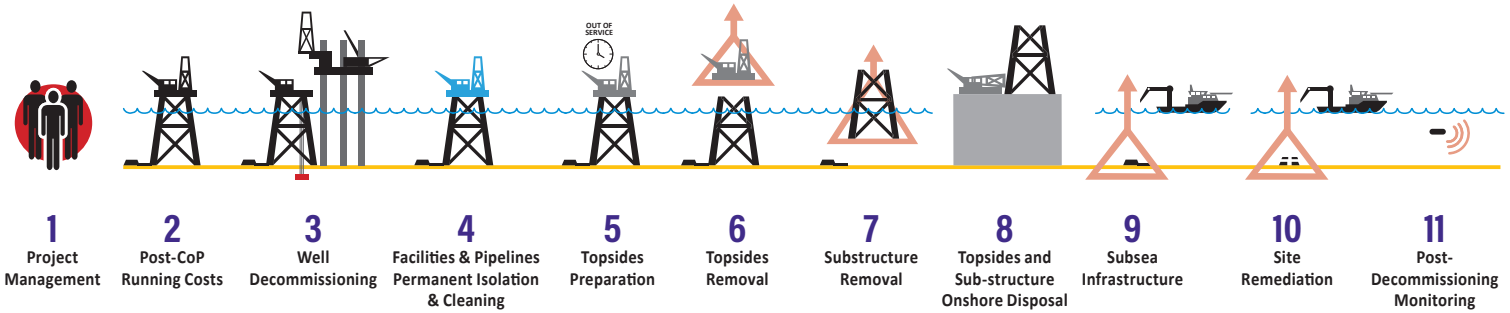
Source: OGUK, OGA

UK well activity reduced — Figure 6 shows well activity over time. Since 2017, well decommissioning activity has outweighed exploration, development, and appraisal activity combined. This year has been exceptional, and current market conditions have driven drilling activity to its lowest levels since the early 1970s. Exploration and appraisal activity is at the lowest level in the basin's history, with only four explorations wells spudded this year to date. Whereas well decommissioning activity had seen a steady increase since 2014, this year sees a major reduction compared with the activity in the past few years.

Decommissioning is 10 per cent of UK oil and gas expenditure — In 2020 the UKCS oil and gas industry is forecast to spend a total of £10.9 billion across all activities, as shown in Figure 7. Around £1.1 billion of this is on decommissioning, representing around 10 per cent of the overall expenditure and consistent with previous years. This shows that, even in the current business environment, investment in the basin and expenditure on continued operation of our current assets significantly exceeds decommissioning expenditure.

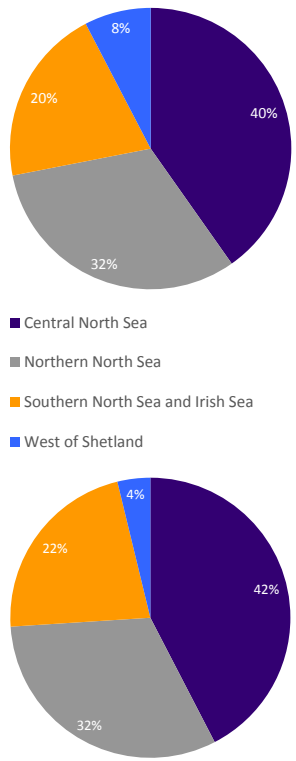
5.2 The Decommissioning Work Breakdown Structure — Ten-Year Expenditure Forecast

Figure 8: Work Breakdown Structure and Expenditure Proportion, 2020–29



Proportion of Overall Ten-Year Expenditure (£MM)	7%	9%	49%	3%	3%	8%	6%	2%	11%	1%	<1%	TOTAL
Northern North Sea & West of Shetland	£389.04	£520.75	£2,940.09	£241.40	£193.39	£703.01	£265.59	£123.96	£519.68	£39.14	£14.35	**£5,950.40**
Central North Sea	£418.52	£672.60	£3,162.60	£95.90	£183.65	£300.47	£247.17	£147.19	£786.15	£39.49	£19.50	£6,073.25
Southern North Sea & East Irish Sea	£191.15	£176.22	£1,287.77	£87.90	£105.20	£253.84	£417.00	£94.23	£316.61	£94.23	£25.53	£3,049.69
TOTAL	**£998.71**	**£1,369.57**	**£7,390.46**	**£425.20**	**£482.24**	**£1,257.32**	**£929.76**	**£365.38**	**£1,622.44**	**£172.86**	**£59.38**	**£15,073.34**

Figure 9: UKCS Regional Expenditure Breakdown, 2019 vs 2020 Forecast



CNS and SNS see slight reductions in forecast spend — Figure 8 shows the breakdown of expenditure across each WBS element and by region. Just over £6 billion is expected to be spent in the central North Sea (CNS) region and over £3 billion in the southern North Sea (SNS). This represents a slight reduction in overall expenditure when compared to *Decommissioning Insight 2019* for these areas, which stated £6.4 billion and £3.4 billion, respectively.

Decommissioning spend growing in West of Shetland — Perhaps one of the most notable developments apparent in this region is in well decommissioning. This year's forecast sees over £1.1 billion of anticipated decommissioning spend over the next decade, £900 million of which is for well decommissioning occurring closer to the end of the decade.

Last year's report showed that around £5.4 billion would be spent on decommissioning in the NNS and WoS region combined. By comparison, this year's report forecasts almost £6 billion in these regions. The increased proportion of expenditure is also apparent on review of the percentage breakdown by region over the next decade. Figure 9 shows this year's dataset compared with data presented in *Decommissioning Insight 2019*. The data show that the proportion of spend in the west of Shetland has doubled to 8 per cent, from 4 per cent last year. Both central and southern North Sea regions have reduced by 2 per cent while the northern North Sea has remained the same.

Almost £7.4 billion is to be spent on well decommissioning — Well decommissioning still accounts for the vast majority of decommissioning costs over the next decade, at 49 per cent of total decommissioning expenditure. This has increased from the £6.8 billion (45 per cent) reported in *Decommissioning Insight 2019*. While the spend has increased, the number of wells slated for decommissioning over the next decade has fallen, from 1,630 forecast last year to 1,616 as of 2020. Some of this change will be down to the fact that there is a higher proportion of subsea wells in this year's dataset, which are generally more expensive to decommission.

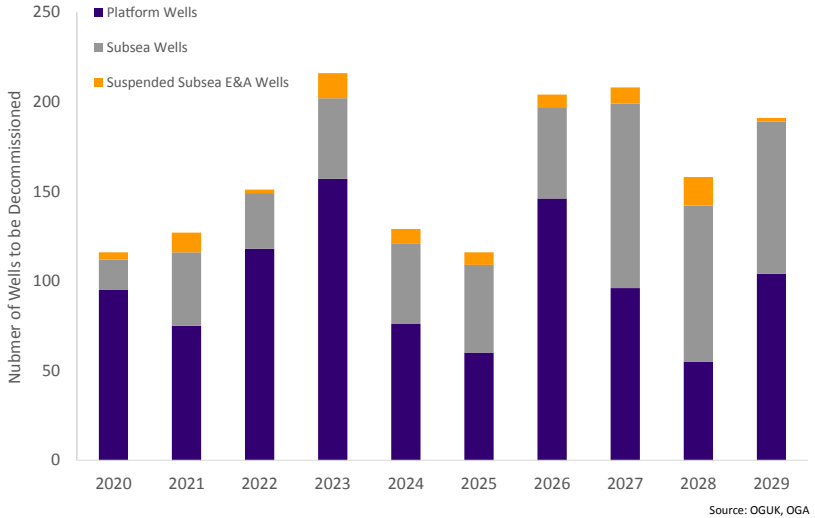
Expenditure on removals has reduced — *Decommissioning Insight 2019* showed that over £2.7 billion (18 per cent) would be spent on topsides and substructure removal activity, represented by a combination of elements six and seven of the WBS. This year's report puts forecast expenditure at £2.2 billion (14 per cent), owing to some expenditure being liquidated in 2019 and progress in cost reduction. Forecast expenditure on subsea infrastructure decommissioning (such as pipelines, mattresses and subsea structures) has risen to over £1.6 billion (11 per cent) from around £1.3 billion (9 per cent) reported last year.

5.3 Forecast Activity in the UKCS — A Detailed Snapshot

Figure 10 shows that 1,616 wells are to be decommissioned on the UKCS over the next ten years. While *Decommissioning Insight 2019* saw a relatively steady workload fluctuating between 120 and 170 wells per year between 2019–26, this year's data show fewer wells slated for decommissioning in the short term. Activity is seen to rise steadily from just over 115 wells in 2020, to just over 150 wells in 2022. The deferral of short-term activity is creating a spike in 2023, however history has shown that this tends to flatten out as budgets are revisited, which may also affect the increased activity profile seen towards the end of the dataset. It should also be noted that many of these wells are "decommissioning ready" with projects planned and pre-engineering work completed — in many cases they may simply be awaiting budget to proceed.

Figures 11 and 12 show that just under 660,000 tonnes of topsides and just over 370,000 tonnes of substructures are to be decommissioned over the next decade. The majority of the removal weight (40 per cent) comes from platforms in the northern North Sea, followed by 32 per cent in the southern North Sea and 28 per cent in the central North Sea. Installations in the central and northern North Sea are much larger than the installations in the southern North Sea and Irish sea, inferring that the number of installations being removed in the southern North Sea over the next ten years is far greater that those in the central and northern North Sea.

Figure 10: Well Activity in the UKCS 2020–29



Source: OGUK, OGA

Well Type	NNS & WoS	CNS	SNS & IS	Total
Platform Wells	328	283	371	982 (61%)
Subsea Wells	204	303	47	554 (34%)
Suspended Exploration and Appraisal Wells	20	29	31	80 (5%)
Total	552	615	449	1,616

Figure 11: Topsides Decommissioning Activity in the UKCS, 2020–29

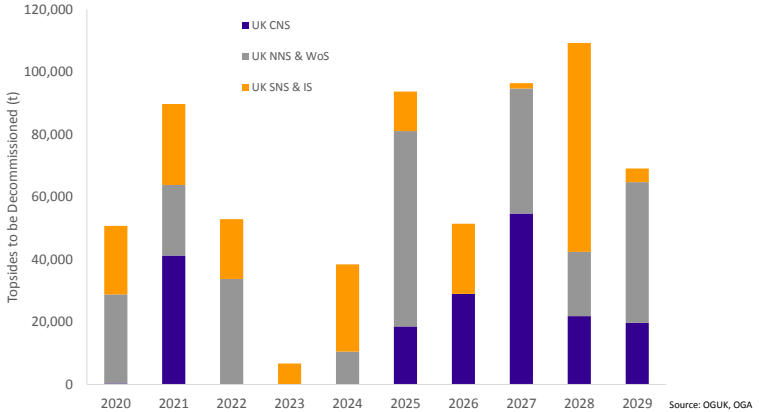
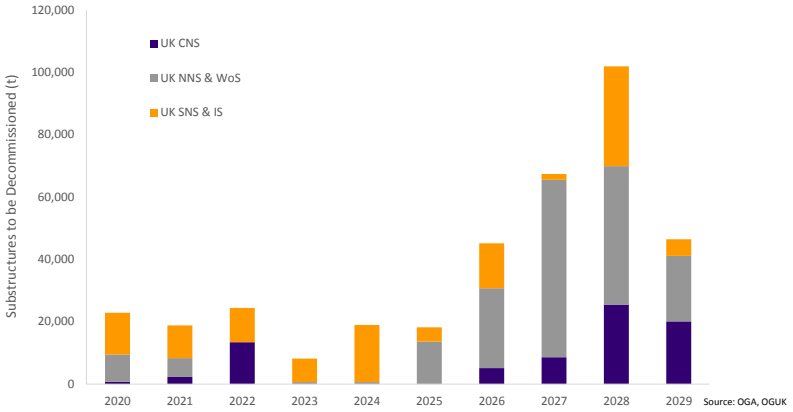
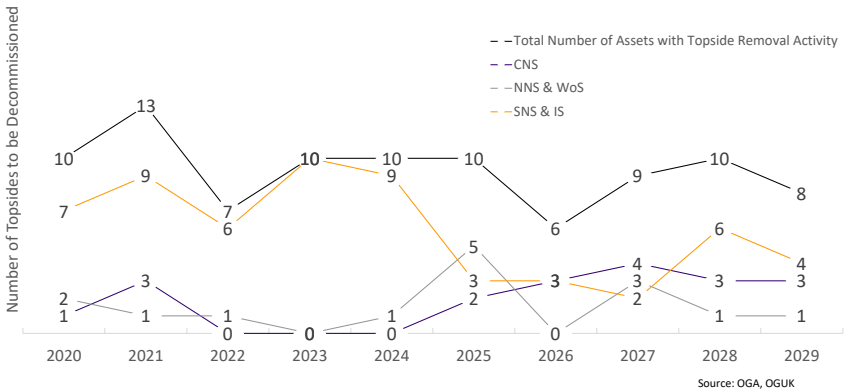
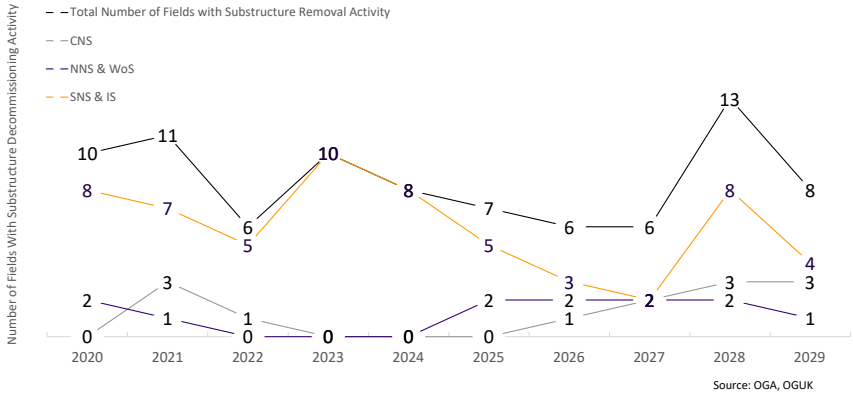


Figure 12: Substructure Decommissioning Activity in the UKCS, 2020–29







5.4 Cost Performance and Benchmarking

Since 2014, *Decommissioning Insight* reports have included forecasts for well decommissioning and topsides, shown here in Figures 14 and 15. As the report focuses on forward-looking data, these figures show how operators expect to perform in future decommissioning projects.

Cost performance better understood — 2020 saw the first publication of the OGA's *UKCS Decommissioning Benchmarking Report*.[3] This report compiles benchmark data based on actual performance on completed projects by operators. The OGA's report provides the opportunity for the first time to compare actual decommissioning expenditure against forecast expenditure, as summarised in Figure 13.

CNS, NNS & WoS see steady cost performance — This year, for the central and northern North Sea and west of Shetland, there is a very slight increase in the anticipated costs to decommission a platform well, although the average cost per well still remains below £3 million — a significant reduction from £4.28 million in 2018. The decommissioning of subsea and suspended exploration and appraisal (E&A) wells sees the general downward trend continue. A subsea well in this region is expected to be decommissioned for just over £8.1 million per well and a suspended E&A well for £4.5 million. There has been a slight increase in the expected costs per tonne for topsides decommissioning in this region, with this year's survey estimating £2,190 per tonne compared with £1,757 last year. The cost per tonne for substructure removal has continued to reduce and is now expected to be £2,189 for structures removed over the next decade.

SNS and IS well costs increase, while removal costs continue to fall — In the southern North Sea and Irish Sea there has been a slight increase in expected well decommissioning costs across all well types. With a platform well now expected to cost £2.44 million, a subsea well £6 million and a suspended E&A well £3.25 million.

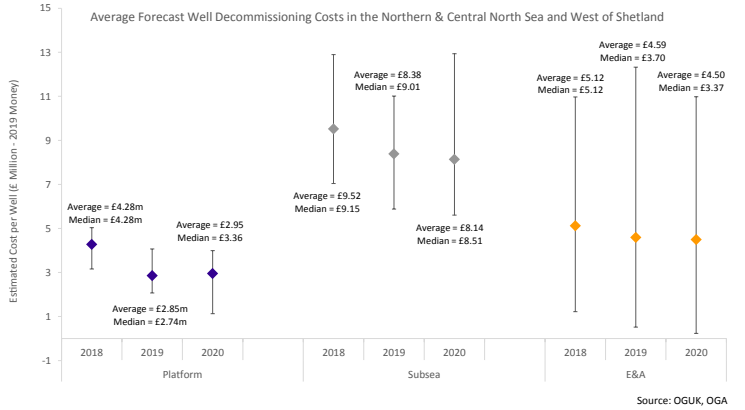
[3] https://www.ogauthority.co.uk/media/6798/oga_decommissioning_benchmarking-report-2020_spreads.pdf

Figure 13: OGA 2019 P50 and Decommissioning Insight 2020 Medians

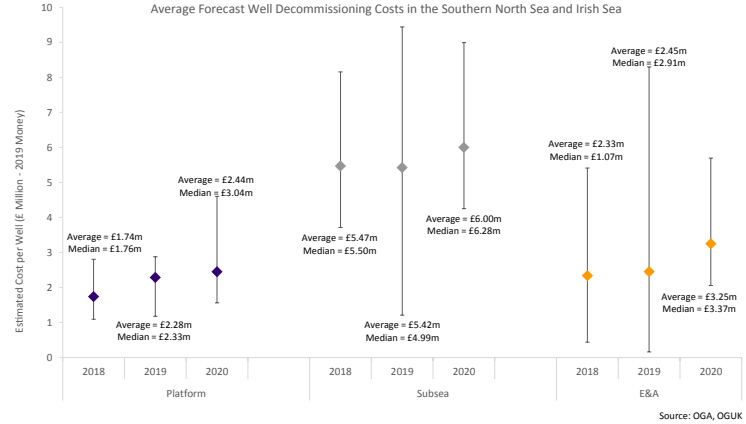
Well Type	Area	*Decommissioning Insight 2019* Forecast (Median Over Next 10 Years)	*Decommissioning Insight 2020* Forecast (Median Over Next 10 Years)	*OGA Benchmarking Report* (P50) 2019 Actual Performance
Platform	Northern and Central North Sea	£2.74 million	£3.36 million	£3.7 million
	Southern North Sea and Irish Sea	£2.33 million	£3.04 million	£2.5 million
Subsea	Northern and Central North Sea	£9.01 million	£8.51 million	£7.3 million
	Southern North Sea and Irish Sea	£4.99 million	£6.28 million	£5.4 million

Topsides and substructure removal projects are generally performed under the same contract in this region, so the costs are combined. These removals scopes have continued to decline, with the 2020 survey showing £2,020 per tonne — a significant reduction from £3,767 per tonne in 2018.

Figure 14: Historical Variation in Well Decommissioning Forecasts in the UKCS

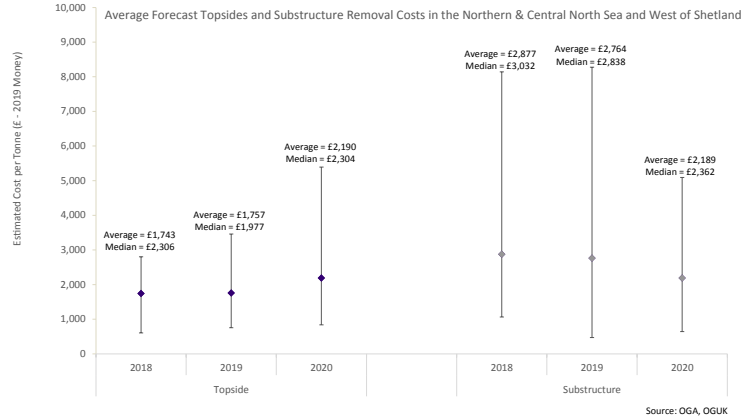


Source: OGUK, OGA

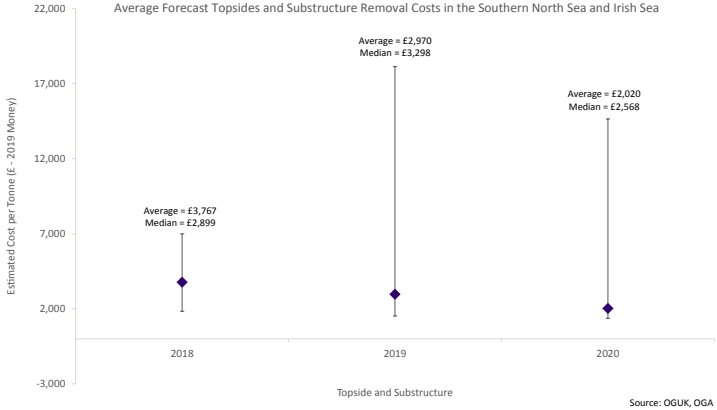


Source: OGA, OGUK

Figure 15: Historical Variation in Topsides and Substructure Forecasts in the UKCS



Source: OGA, OGUK



Source: OGUK, OGA

5.5 Building on What We Have Achieved So Far…

Over the years, the UK decommissioning industry has demonstrated its capability to conduct decommissioning workscopes more cost effectively. The OGA's *UKCS Decommissioning Cost Estimate 2020*[4] shows that forecast decommissioning expenditure has reduced on a like-for-like basis to £48.2 billion, from an initial estimate of £59.7 billion in 2017. On top of this, the maturity of estimates is improving — as shown in Appendix 1 — showing greater confidence in our ability to conduct projects at these lower costs.

Looking to the future, industry should seek to build on what it has achieved to further pursue cost-effective decommissioning, explore opportunities to better collaborate, continue to focus on technology and seek ways to conduct activity in a safe and environmentally sustainable manner. Success in these areas will not only enable UK decommissioning projects to be conducted effectively, but will also develop expertise which make our decommissioning supply chain a compelling option to help other nations around the world.

Operators and the supply chain: improving partnerships — One key opportunity could be the aggregation of decommissioning scopes across multiple operators into decommissioning campaigns. The supply chain would benefit from increased project visibility, the ability to drive schedules, better asset utilisation and improved continuity of work increasing profitability and retaining personnel and equipment in the region.

Well decommissioning activity — Well decommissioning accounts for around 49 per cent of UKCS decommissioning expenditure over the next decade. This high percentage is due to a large quantity of activity in the shorter term compared to other areas of the Decommissioning WBS. Well decommissioning activity is undertaken early in the process and is generally a high-cost element in any decommissioning project due to its complexity and specialism. A lack of activity in the short term will have a severe impact on the wells supply chain and without work, rigs and equipment are likely to be redeployed to other regions, or scrapped, and personnel made redundant. This could cause a sharp increase in future well decommissioning costs. If some older rigs are scrapped, there may be a lack of capability to decommission some older North Sea wells in future, with equipment on newer rigs being too heavy to attach to an older well stock.

Recognising the opportunities of such an approach, OGUK is working with the OGA's MER UK Wells Task Force, Improving Partnership Group to publish a white paper on multi-operator, multi-well campaigns. The paper focuses on demonstrating the business case, along with identifying the blockers which have prevented uptake in the past and any associated mitigations.

The OGA is also exploring all avenues to stimulate activity and encourage further collaboration and has recently updated regulatory powers in this area. The OGA's *Guidance for applications for suspension of inactive wells*[5] sets out a two-to-five-year timeframe for decommissioning suspended wells. The OGA will continue to engage with licensees to ensure robust plans are in place for wells that fall within the scope of that guidance. Introduced by The Energy Act 2016, the OGA also has as-yet unused powers to require collaboration between operators to reduce decommissioning costs.

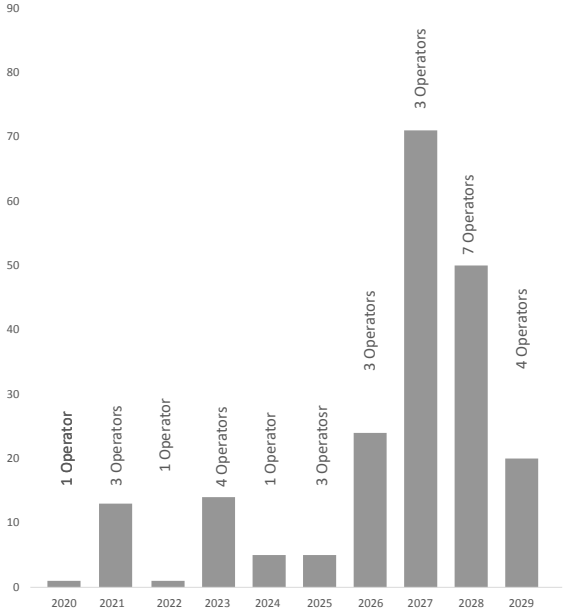
Subsea wells in particular may offer opportunities for multi-operator, multi-well campaigns. Figure 16 shows the number of subsea wells to be decommissioned in each area of the North Sea and the number of operators present in the dataset, highlighting the potential. A campaign-led approach should not be solely restricted to well decommissioning, but as a large proportion of expenditure, enabling success in this area could lead the way for others.

[4] https://www.ogauthority.co.uk/media/6638/ukcs-decommissioning-cost-estimate-2020.pdf

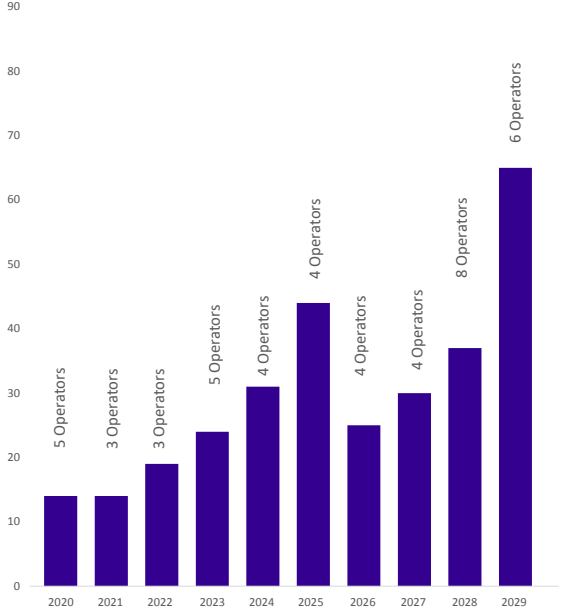
[5] https://www.ogauthority.co.uk/media/5108/oga-suspended-wells-guidance.pdf

Figure 16: North Sea Subsea Well Decommissioning by Region and Number of Operators

Subsea Well Decommissioning in the NNS & WoS



Subsea Well Decommissioning in the CNS



Subsea Well Decommissioning in the SNS and IS

Decommissioning campaigns can:

- Increase cost effectiveness
- Maintain and attract high-skilled jobs
- Further strengthen exportable expertise
- Reduce emissions and improve safety
- Provide technology focus

Source: OGA, OGUK

6. Decommissioning in the Wider North Sea

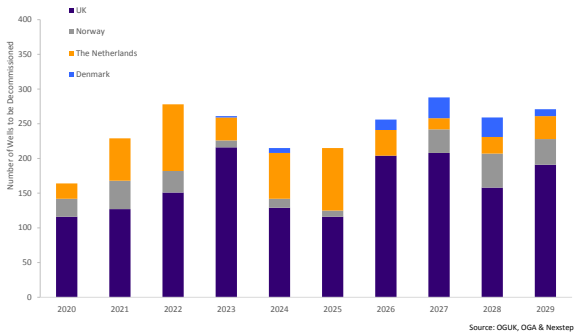
North Sea well activity down in 2020 — Figure 17 shows that the impacts of COVID and the commodity price fluctuations have been felt by the well decommissioning supply chain across the North Sea, with only 164 wells slated to be decommissioned across the four countries' portfolio of work. Well activity is then due to pick up in 2021 and fluctuate between 215 and 280 wells per year across the North Sea to 2026. The majority of well decommissioning activity happens in the UK, where 1,616 wells are slated to be decommissioned over the next decade. In general terms, there has not been any rush to decommission in other areas of the North Sea. This is particularly notable in Norway, which sees a significant reduction in well decommissioning activity when compared with *Decommissioning Insight 2019*, with much activity moved into the future. Last year's report stated that around 417 wells would be decommissioned over the next decade, whereas this year's forecast is around 250.

Over 900,000 tonnes of topsides to be removed — 900,103 tonnes of topsides are to be removed from the North Sea over the next ten years — a reduction on the 1.2 million tonnes reported in *Decommissioning Insight 2019*. This is due to the number of removals projects completed in 2019, and some larger removals scopes being pushed out beyond the end of the ten-year window.

Survey methodology
For the sixth year, data have also been contributed by other offshore oil and gas producing countries around the North Sea, specifically the Netherlands, Norway, and Denmark. Four key operators provided data from Norway, 11 from the Netherlands, and three from Denmark. Data from the Netherlands came from Nexstep, a joint initiative of Energie Beheer Nederland (EBN) and the Dutch oil and gas industry, represented by NOGEPA. OGUK also collated data directly from operators in Norway and Denmark. The co-operation of all operators, industry and regulators is greatly appreciated.

Substructure removals activity sees steady work profile — There is a steady stream of substructure removal activity over the next five years to 2024, with between 30,000–40,000 tonnes removed each year. The data then show a large rise in the forecast substructure removals activity across all areas, but perhaps most prominently in the Netherlands, where mass increases from just under 8,000 tonnes in 2025 to above 60,000 tonnes in 2026. Denmark sees some removals activity commencing in 2026 and continuing towards the end of the ten-year window of activity considered in this report.

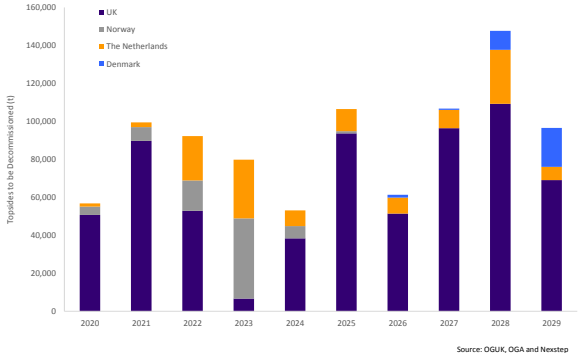
Figure 17: Well Decommissioning Activity in the North Sea, 2020–29



Country	Number of Wells	Percentage
UK	1,616	66%
The Netherlands	478	20%
Norway	250	9%
Denmark	92	4%
TOTAL	2,436	100%*

**May not add to 100% due to rounding*

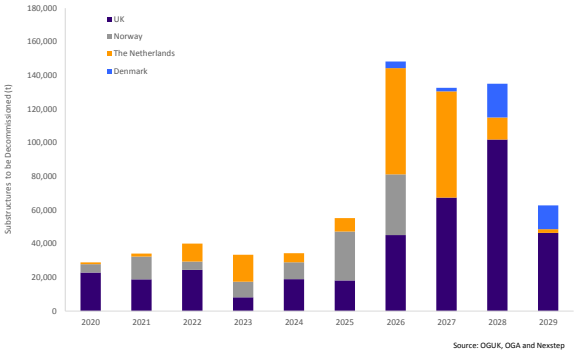
Figure 18: Topsides Decommissioning Activity in the North Sea, 2020–29



Country	Topsides Mass (t)	Percentage
UK	658,230	73%
The Netherlands	131,782	15%
Norway	77,481	9%
Denmark	32,610	4%
TOTAL	900,103	100%*

**May not add to 100% due to rounding*

Figure 19: Substructure Decommissioning Activity in the North Sea, 2020–29



Country	Substructure Mass (t)	Percentage
UK	372,439	53%
The Netherlands	184,429	26%
Norway	107,918	15%
Denmark	40,214	6%
TOTAL	705,000	100%*

**May not add to 100% due to rounding*

7. Decommissioning in the Energy Transition

The offshore oil and gas industry is becoming more integrated with the wider energy sector, and a variety of projects are ongoing around the UK ranging from the production of green and blue hydrogen, to platform electrification and Carbon Capture Utilisation and Storage (see Figure 20). In the future, contracts will be won based on sustainability performance as well as conventional performance indicators such as safety and cost. Decommissioning has a major role to play in this transition, with particular opportunities in the following areas:

Further improvements in the efficiency of the decommissioning process — Decommissioning can be an energy-intensive exercise and the use of vessels and rigs contributes to the industry's carbon footprint. Improvements in the efficiency of scope can reduce the amount of time a vessel or rig spends on site and help lower emissions, as can improvements in the overall energy efficiency of these vessels. Cost-effective decommissioning can also unlock opportunities, as decommissioning for less than expected can free up capital for investment in emissions reduction initiatives as well as future oil and gas projects.

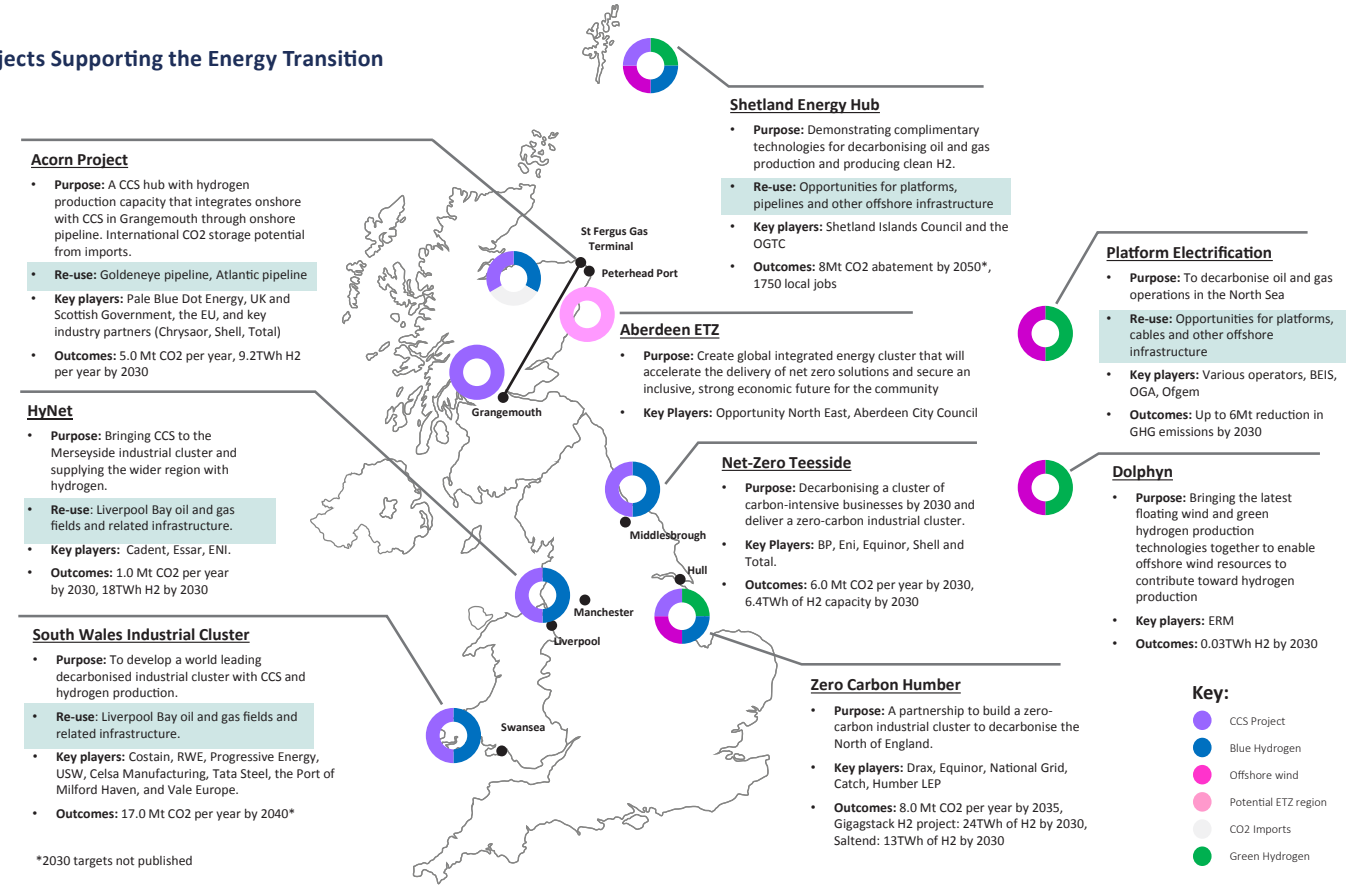
Supporting the circular economy — Re-use of assets or their component parts is already occurring throughout our industry. There are many examples of success in this area, with high-value components such as valves and turbines finding new homes, to entire topsides or FPSOs finding new life being repurposed in new projects (see case study overleaf).

Re-purposing of offshore assets — As well as opportunities to re-use offshore infrastructure for the purposes of oil and gas, there are also opportunities to re-purpose infrastructure for use in industry such as CCUS, hydrogen production and offshore wind. The recently published *OGA UKCS Energy Integration Report*[6] stated that re-purposing an oil or gas pipeline for CCUS results in 20–30 per cent savings for a CCUS project — demonstrating that using existing infrastructure could be a key enabler for these projects. Equally, the re-focusing of skills and expertise present in the oil industry will be essential for success in energy transition projects.

A push towards an "Integrated Energy Sector" — Oil and gas will continue to be required as we transition towards a lower-carbon future. Integrating our energy resources, for example by electrifying a portion of the UK's offshore assets, could result in significant emissions reductions, while supporting jobs, extending the life of our assets and delivering UK oil and gas demand from domestic supply. The skills, infrastructure and resources present in the oil and gas industry will play a major role in the UK's ambition to reduce emissions.

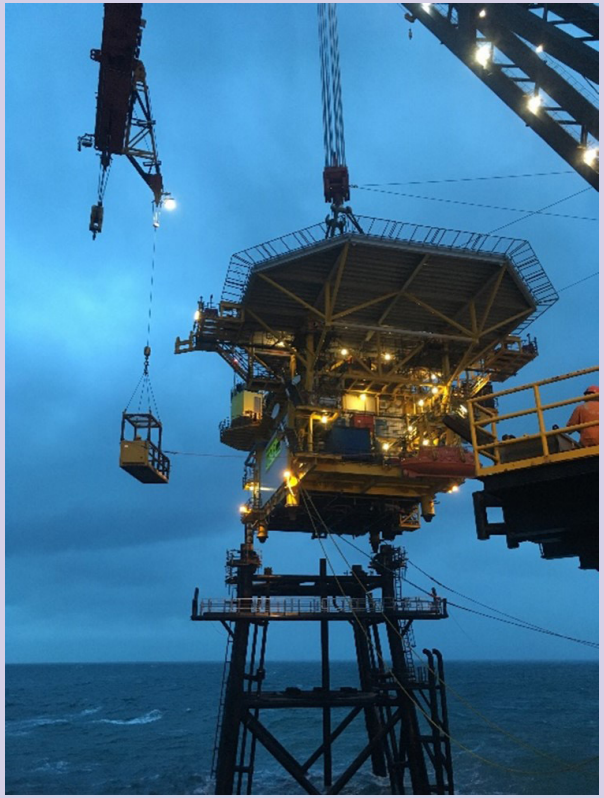
[6] https://www.ogauthority.co.uk/media/6625/ukcs_energy_integration_phase-ii_report_website-version-final.pdf

Figure 20: UK Projects Supporting the Energy Transition



*2030 targets not published

Source: EY, OGUK



The Wintershall Noordzee Sillimanite Field: A Sustainable Re-use Development

The unitised Sillimanite gas field stretches across the UK and the Dutch continental shelves in Licence Block 44/19a on the UK side and blocks D12a/b on the Dutch side. In the concept select phase the internal re-use of the E18-A gas platform, in Dutch waters, was selected to be most beneficial since it accelerated first gas and offered synergies with the planned decommissioning scope. It should be highlighted that this is the second re-use for this topside.

During project execution in 2019, the choice for re-use meant that very close coordination was required between the various project milestones and operations, including: platform removal and installation; necessary process facility modifications; pipeline installation; subsea preparations; and the subsequent drilling operations. A highlight in the decommissioning scope was the decision to execute part of the preparational work (e.g. pre-cutting of legs) with the well decommissioning rig onsite, reducing expensive heavy lift vessel days.

Meanwhile, D12-B produces with three wells, all safely delivered in time under COVID-19 circumstances, which makes this project even more unique and one that Wintershall Noordzee is very proud of.

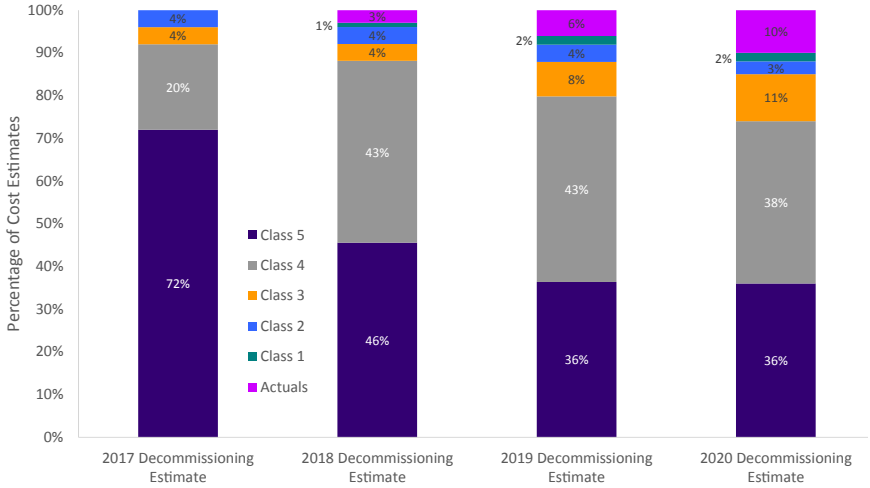
Appendix 1 — Maturity of Estimates

Each year, UK operators provide the cost classification for each of their decommissioning projects using the Association for the Advancement of Cost Engineering (AACE) classifications. These seek to define the stage of each project and indicate the degree of uncertainty in the estimates.

Class 4 or 5 estimates mean that the projects are in the early planning stages where the scope of work is still being defined and feasibility studies are being carried out. Class 5 estimates have an expected accuracy range of -20 to +100 per cent; this range narrows over time. Class 2 estimates, meanwhile, represent projects that are in the contracting stage with some activities already being executed. These have a higher degree of accuracy, of -5 to +20 per cent.

The OGA has been working with industry to improve the level of certainty for the decommissioning estimates within the Asset Stewardship submissions. Just under 75 per cent of the estimates provided by operators to the OGA are now Class 4 or better, with 16 per cent Class 3 or better.[7] While there has been some success there is still room for improvement, particularly for projects with intended activities in close proximity.

Figure 21: OGA Decommissioning Cost Distribution by Estimate Quality



Source: OGA

[7] https://www.ogauthority.co.uk/media/6638/ukcs-decommissioning-cost-estimate-2020.pdf

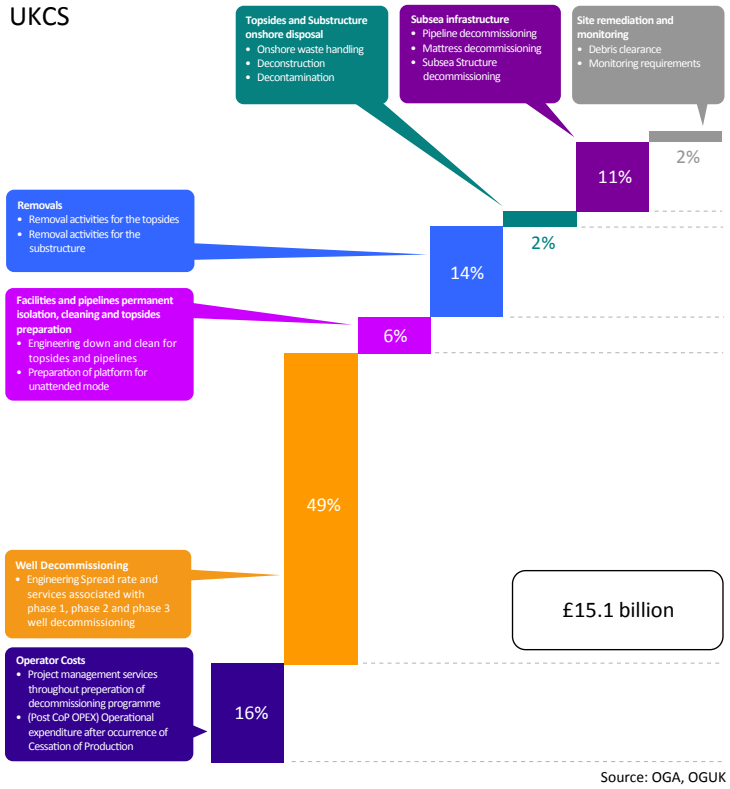
Appendix 2 — Glossary

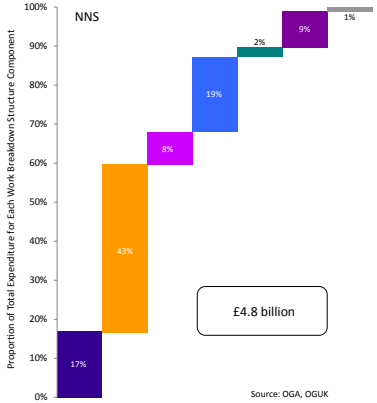
AACE	Association for the Advancement of Cost Engineering
Asset Stewardship Survey	A survey run by the OGA which creates a single source of robust data. It is used to inform stewardship reviews and provide meaningful insights into current and forecast activity in the UKCS.
BEIS	The Department for Business, Energy and Industrial Strategy
CCUS	Carbon Capture Utilisation and Storage
CoP	Cessation of production
CGB	Concrete gravity-based structure
CNS	Central North Sea
Comparative assessment	Used to compare options, examine differences and identify the 'most preferred' option in the development of decommissioning programmes for: a) All installations for which derogation is sought under OSPAR Decision 98/3 b) All pipelines being decommissioned under the Petroleum Act 1998 c) All drill cuttings piles that are not screened-out at Stage 1 of OSPAR
Decommissioning Programme	The Petroleum Act 1998 requires owners to set out the measures to decommission disused installations and/or pipelines in a decommissioning programme. A decommissioning programme must identify all the items of equipment, infrastructure and materials that have been installed and describe the decommissioning solution for each.
De-energising	Ensuring any pressure sources on a platform or pipeline are removed and that the installation is free of hydrocarbons and contaminants.
Derogation	In the case of offshore installations, derogation is related to leaving a structure wholly or partially in place as an exemption to the OSPAR convention which prevents disposal of waste at sea.
EBN	Energie Beheer Nederland
Environmental Assessment	An assessment of the environmental impacts for the activities planned to take place during the decommissioning workscope.
E&A	Exploration and appraisal
FPSO	Floating production, storage and offload vessel
HSE	Health & Safety Executive
Making safe	'Making safe' of facilities includes cleaning, freeing equipment of hydrocarbons, disconnection and physical isolation, and waste management. 'Making safe' of pipelines involves depressurising them and removing any hydrocarbons. Then the pipelines are cleaned and purged, in line with the cleaning programme based on the specific needs of the system.
Mattresses	A structure laid over or under a pipeline to provide protection, stabilisation or structural integrity.
MER UK	Maximising Economic Recovery from the UKCS

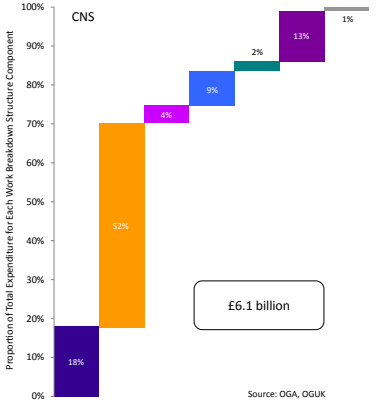
NNS	Northern North Sea
NOGEPA	Netherlands Oil and Gas Exploration and Production Association
OGA	Oil and Gas Authority
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning
OSPAR	OSPAR is the mechanism by which 15 Governments & the EU cooperate to protect the marine environment of the North-East Atlantic.
POB	Personnel on Board
Post-CoP OPEX	Operational expenditure after production has ceased.
SEPA	Scottish Environmental Protection Agency
SNS & IS	Southern North Sea & Irish Sea
Topsides	The facilities which sit on top of an installation, typically including drilling, processing and living quarters.
Work Breakdown Structure (WBS)	The WBS shows all elements of a typical decommissioning project and forms the basis for calculating decommissioning expenditure during different stages of the process.
WoS	West of Shetland

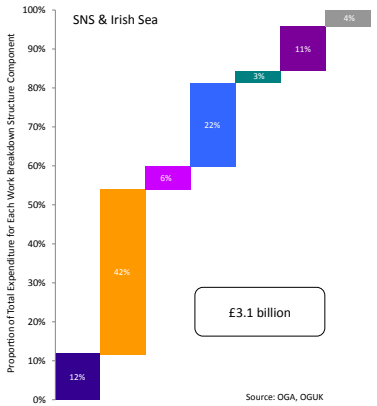
Appendix 3 — UKCS Expenditure Breakdown 2020–29

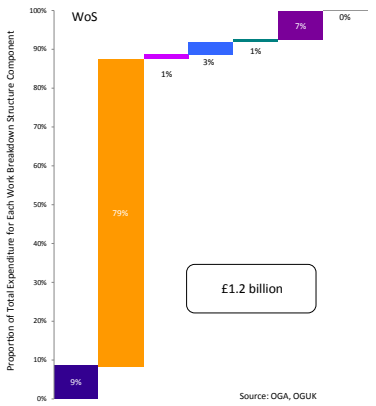
Figure 22: UKCS Expenditure Breakdown, 2020–29











Appendix 4 — UKCS Decommissioning Activity Overview, 2020-29

Figure 23: Decommissioning Activity in the UKCS 2020–29

		Northern North Sea & West of Shetland	Central North Sea	Southern North Sea and Irish Sea	Total UKCS
Number of Wells to be Decommissioned	Platform Wells	328	283	371	**1,616**
	Subsea Wells	204	303	47	
	Subsea E&A Wells	20	29	31	
	Total	**552**	**615**	**449**	
Number of Topsides for Removal		15	19	59	93
Number of Substructures for Removal		12	13	60	85
Topsides Weight to be Removed (Tonnes)		263,317	185,342	209,571	658,230
Substructure Weight to be Removed (Tonnes)		177,622	75,774	119,043	372,439
FPSO Weight for Removal (Tonnes)		155,770	23,844	20,576	200,190
Subsea Structures to be Removed (Tonnes)		29,265	36,243	4,805	70,313
Number of Mattresses for Removal		2,900	14,336	4,840	22,076
Length of Pipelines, Cables and Umbilicals to be Decommissioned (km)		1,065	4,317	2,408	7,790

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