

# DECOMMISSIONING INSIGHT 2022





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<sup>1</sup> These differences are acceptable as EEMS returns can be updated after year end in discussion with the regulator in the event corrections are required.



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## Decommissioning Insight 2022

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## 1. Foreword

elcome to OEUK's Decommissioning Insight 2022, the most comprehensive picture of anticipated activity in offshore energy infrastructure decommissioning in the UK over the next decade. While the decommissioning sector successfully navigated the challenges of the Covid-19 pandemic and commodity price collapse, new challenges arose with Putin's war in Ukraine, the UK cost of living crisis and the Energy Profits Levy. Some of those challenges remain and the decommissioning industry is already rallying to overcome them and build on the successes of the growing sector. Innovation and collaboration have been at the forefront of an energised sector which has firmly established a pivotal role within the energy transition in the UK continental shelf (UKCS) and overseas. Extensive works in emissions reduction during operations, repurposing existing infrastructure for CO<sub>2</sub> storage, identifying reuse opportunities during onshore disposal and supporting the offshore wind industry with designing for decommissioning are all setting up the sector with work for decades to come.

Last year, decommissioning expenditure rose by almost a fifth to £1.273bn. In 2022 the expenditure is likely to increase significantly and may reach the £2bn mark for the first time. The 2021 increase is in line with predictions and signals the start of a three to four year surge in activity where spending is likely to range between £1.7bn and £2bn. Wells continue to dominate the market with an overall 48% share of the spending, with topsides and subsea infrastructure removal also accounting for a significant portion. This signals

an upturn in activities throughout the UKCS, which will pose a challenge for the UK supply chain. Continued pressure from new energies also adds to this challenge as the UKCS battles to meet increasing demand for labour and materials.

The decommissioning sector will outlast oil and gas production and will continue growing for years to come. OEUK predicts an upsurge in activity as there are 612 wells, 59 topsides, 58 substructures, 1,820 km of pipelines and 14,029 tonnes of subsea infrastructure set to be decommissioned between now and 2024 alone. The decommissioning opportunity is snowballing and could be worth around £20bn to the supply chain between now and 2031.

Competing with new energies and other industries to encourage new entrants into offshore decommissioning has proved challenging. Multiple decommissioning sector recruitment drives as well as the OEUK Decommissioning Careers Roadshow continue to support the industry in attracting and retaining the people that will be the community's greatest asset.

There are also concerns about the rate of the implementation of new technologies. Well decommissioning activity will ramp up over the next six years, and is forecast to account for 48% of the total decommissioning cost in 2022. The Net Zero Technology Centre in Aberdeen continues to work

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with operators on technology workstreams including alternative barrier materials, inspection and verification and enabling technology. The North Sea Transition Authority, as the oil, gas and carbon storage industries regulator, has also included the uptake of well decommissioning technologies as a performance indicator to support the industry's continuing cost reductions following a 25% reduction since 2017.

This report shows that the operating environment for the decommissioning community continues to pose problems. The industry must stay resilient and continue to be innovative and collaborate if it is to realise the sector's full potential. With the right support from government and action from the operators, the supply chain and academia, the UK has the opportunity to make major gains from decommissioning, as well as retain thousands of jobs in the UK.



Mark Wilson HSE & Operations Director OEUK



## For further insights see our OEUK Decommissioning insight dashboard oeuk.org.uk/decommissioning/

## 2. Key findings

Decommissioning industry energised



## **Opportunities for innovation**



48%) Wells decommissioning accounts for 48% of expenditure

Cost per well (£mn)	2020	2021	2022
Platform well	2.76	2.70	2.56
Subsea well	7.96	7.81	7.89
E&A well	4.01	4.36	4.42

The opportunity for offshore wind decommissioning is now.

Offshore wind decommissioning programmes are submitted prior to construction.

Opportunity to share learnings in designing for decommissioning.

(£bn)	Spend	2022-2031 forecast spend	% of next 10 year spend
2021 Actual	1.27	19.73	6.5%
2022 Forecast	1.97	19.73	10.0%

## **Decommissioning upsurge**

2019 – 21: Average decom spend/year = £1.23bn

2022 – 25: Average spend/year forecast = £1.83bn

Well decom average spend/year expected to **RISE** by **£325mn** between 2022 and 2025 compared with the previous three years.

E325mn

## 3. Decommissioning

## 3.1 Short term outlook

Figure 1 Decommissioning activity: actual and forecast

Decommissioning activity		2021 (actuals)	2022 (forecast)
A		124 wells	196 wells
M/alla		104 platform wells	113 platform wells
weils		18 subsea wells	52 subsea wells
		2 E&A	31 E&A
Tonsidos	<u>}</u>	8 topsides	15 topsides
Topsides		51,544 tonnes	66,194 tonnes
Substructures	uctures	4 Jackets	14 Jackets
		10,121 tonnes	32,099 tonnes
	ved	1.19 km	6.5 km
Subsea Infrastructure		293 tonnes	1,094 tonnes
		227 mattresses	1,491 mattresses



#### Figure 2 Cost forecasts 2020-2022

Figure 3 Expenditure by Work Breakdown Structure



Decommissioning spend is forecast to increase dramatically over the next four years. Between 2019 and 2021 the average annual spend was £1.23bn, or roughly two thirds what had been forecast for the period 2022-25. Well decommissioning has seen the most significant change, forecast to average £325mn/year more than the average in the past three years. This rise has been dominated by the increased spend on platform and subsea wells, echoed in the number forecast to be decommissioned during this period. Likewise, subsea infrastructure, project management and running costs post-cessation of production (CoP) have all risen significantly in their forecast yearly spend. Increased decommissioning activity in the basin has been the biggest single contributor to this rise. By contrast the permanent isolation and cleaning of facilities and pipelines will probably see cost reductions average £25mn/year compared with 2019-2021.

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### Proportion of overall expenditure over the next decade (£mn)

		6%	10%	48%	2%	3%	9%	5%	3%	12%	1%	1%	TOTAL
xpenditure (£mn)	NNS & WoS	£508	£929	£3,457	£284	£286	£684	£391	£187	£885	£52	£31	£7,693
	CNS	£551	£926	£4,560	£138	£228	£606	£348	£269	£1,194	£60	£35	£8,914
	SNS & EIS	£190	£131	£1,363	£47	£108	£421	£280	£85	£343	£121	£32	£3,119
Û	TOTAL	£1,248	£1,987	£9,380	£470	£622	£1,710	£1,018	£542	£2,421	£233	£97	£19,727

Figure 4 shows the next ten years' spending, giving a clear insight for the UKCS supply chain in terms of opportunities for the near term. With expenditure in 2021 slightly lower than predicted, this seems to have had a knock-on effect on the predicted expenditure for 2022 and 2023, which are showing increases (£1.97bn and £1.99bn respectively). Last year's spend was £1.27bn which surpassed the total spend during 2020, the first year of Covid-19. This has resulted in a decommissioning upsurge from 2022 through to the end of 2024. While this trend bodes well for a healthy supply chain, there are some challenges emerging in the path of this heavy workload.

## New energies entering the market

The offshore wind industry will have the biggest impact on oil and gas decommissioning owing to the shared requirement for heavy lift assets.

Long campaigns for multiple windfarm installations are proving highly attractive compared with short technically challenging decommissioning projects. vessel market, which may have to choose between decommissioning works and offshore wind installation. Wind turbine installation poses difficult but not insurmountable challenges if forecast decommissioning programmes (the topsides and substructures) are to be executed as scheduled.
The 'push to the right': some predicted expenditure has been deferred to the late 2020s and early 2030s, with expenditure in 2028, 2030 and 2031 predicted to aveced 62 hp (vr. This is still a hangever from the Courid 10 downture as

late 2020s and early 2030s, with expenditure in 2028, 2030 and 2031 predicted to exceed £2bn/yr. This is still a hangover from the Covid-19 downturn as well as general commodity price volatility. However, certain instances are showing a pull to the left, with more project clusters being noted. Last year's figures provide a more stable footing for the predicted decommissioning uptick from 2022 onwards. However, uncertainties surrounding the Energy Profit Levy may have an effect on future decommissioning spending.

Demand for new energy projects is draining the market: in some of the key

supply chain areas for the decommissioning industry. Not least, the heavy-lift

Decommissioning	2021	2022	2023 - 31
Total expenditure (£bn)	1.27	1.97	17.75

**Subsea collaboration for just rewards:** Figure 3 shows more spending on subsea infrastructure in comparison with last year's Insight report. This is a direct result of increased collaboration in the subsea infrastructure space. Compressed schedules and shared campaigns have shifted future subsea infrastructure works into the present decade. This is a forward-looking and innovative way of amalgamating campaigns to streamline works and shows how multi-operator campaigns can contribute to compressed schedules, shared workloads and long-term spending reductions.

Collaborations are providing longer campaigns and allowing the decommissioning market to remain competitive. This forecast shows a more even spread of work across regional areas.



**Innovation and collaboration equal cost reduction:** the cost estimate for 2022 highlighted a substantial saving across the decommissioning industry. Execution efficiency across the operator and supply chain communities enabled a 25% cut in costs, despite the difficult operating environment.

This truly demonstrates the resilience and ingenuity of an energised decommissioning industry and shows that operators are willing to take innovative approaches to solve highly technical commercial challenges. The UK supply chain showed a proactive approach to the challenges of the everchanging landscape within the UKCS decommissioning sector which resulted in further efficiencies. Additional challenges however, do lie ahead as the workload rises in all sectors.

**UKCS energised and ready for action:** decommissioning will cost £19.7bn in the period 2022-31, which provides the UKCS supply chain with a steady stream of decommissioning work. However, the increased competition for resources and assets must be addressed to compete with new energies and overseas demands where the skills and expertise generated in the UK are becoming increasingly more desirable.

These skills must be retained and expanded to fulfil the work scopes on the UKCS. The decommissioning industry is caught between the demands of more work than ever in the coming years on one hand, and greater competition in all areas to execute the works on the other. This truly is an opportunity for the UK to firmly establish itself as a global leader in decommissioning excellence, driven by innovative engineering. This will be critical in the coming years if the greater workload is to be accomplished on time.

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### 3.3 Regional activity

**Decommissioning expenditure on the rise:** a tenth of UKCS oil and gas expenditure went on decommissioning in 2021, a proportion set to rise to 13.7% this year and to 19% by 2031. Overall, decommissioning will account for 15% of UK offshore expenditure over the next ten years.

Over three quarters of the UKCS decommissioning spend will be within the central (CNS) and northern North Sea (NNS). Figure 6 shows CNS spending, as a proportion of total UKCS spending, will peak in 2029, later than previously predicted. Well decommissioning accounts for almost half, with subsea infrastructure removal also contributing significantly.



#### Figure 5 WBS by region

Figure 6 UKCS regional expenditure breakdown by year



West of Shetland (WoS) activities have been brought forward and spread more evenly over the next decade. This is attributed to project share and collaboration initiatives.

Southern North Sea (SNS) activity has dropped to 12% owing to extensive activities at several major assets done last year. The remaining works in this area relate to well decommissioning and topsides/substructure removals, while the Irish Sea has CCS potential.

**Collaboration is key:** compared with previous insight data, this report accounts for collaborative campaigns. These campaigns have brought works forward and provide a more even spread of workload. This methodology is vital to keep a competitive supply chain within the UKCS.

#### **Case Study: TAQA**

TAQA followed up its successful 2021 Brae Bravo platform topsides removal campaign – one of the largest projects of its kind completed in the North Sea to date – with another Brae field programme founded on the principles of safety and responsibility.



The 2022 project involved the removal of the 11,000-tonne Brae Bravo upper main jacket and one of the 1,000-tonne drill rigs on the adjacent Brae Alpha. The latter scope was an early element of the overall decommissioning strategy for the platform and was completed

safely and successfully - a major achievement for an operational platform.

The two large-scale scopes were performed within a single offshore campaign which featured the deployment of one of the world's largest semi-submersible crane vessels, Heerema's Sleipnir.

As with the Bravo topsides project, all removed materials were shipped to an onshore dismantling yard for processing. TAQA has set a target for 95% of the materials to be reused or recycled. The latest campaign – the culmination of nearly 10 years of careful planning and preparation – demonstrates TAQA's position at the forefront of decommissioning activities in the UK North Sea.

It is building its learnings from the Brae contracting and execution work into the next stages of its NNS decommissioning programme to support even more efficient and cost-effective delivery.



This process is creating a blueprint for others to adopt, while also equipping its people with new skills and experience that not only bolster TAQA's capabilities but also help todeepenthepoolofdecommissioning expertise the industry will need to draw from in the longer term.

TAQA's contracting partners on the 2022 campaign was the HAF Consortium, comprising Heerema Marine Contractors and AF Offshore Decom.

Watch a video on the execution of this project.





### 3.4 Well decommissioning

**Well decommissioning activity increases until 2028:** Figure 7 shows the plan for decommissioning 2,102 wells on the UKCS over the next decade. This is up from the 1,782 forecast in the *Decommissioning Insight Report 2021*. Activity increases from 2020 until 2024, dips in 2025 and resumes in

2026. Activity peaks in 2028 with 313 wells forecast, close to the 2019 total of 288. Following this well decommissioning trends become uncertain as we return to early 2020 levels of activity in 2029.

Figure 8





2021

Subsea

2022

2020

2022

2020

Source: NSTA & OEUK

E&A

2022

**Cost of subsea wells:** the average UKCS subsea well costs £7.8mn to decommission now, compared with £7mn over the last three years. This might reflect a gradual increase in the more complex decommissioning operations yet to be completed. Rising inflation will also have a negative impact on average costs. Notably the number of rigs dedicated to well decommissioning in the UK market has gone up. Over the next decade there may be a reduction in the average costs of subsea and exploration and appraisal (E&A) well decommissioning as rig supply rises.

**E&A well costs continue to have the greatest range:** the often-multiple unknowns in the status of E&A wells result in challenging to predict 'well-by-well' basis operations, with operators often adopting the motto of 'expect the unexpected'. Multi-operator well decommissioning campaigns are a proven method of reducing costs and emissions and are becoming mainstream across the UKCS and in the wider North Sea. Campaigns will create the opportunity to share costs and create economies of scale, and the NSTA's new Decommissioning Cost Target will highlight the need for engagement and raise awareness across the industry.

#### Decommissioning by well type

2021 (Actuals)	2022 (Forecast)	Activity from 2023- 2031
124 wells	196 wells	1,906 wells
104 platform wells	113 platform wells	1,201 platform wells
18 subsea wells	52 subsea wells	619 subsea wells
2 E&A	31 E&A	86 E&A



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#### **Case Study: Oceaneering**

Oceaneering successfully completed its most recent RigChase campaign which involved two major operators who benefited from the optimised and integrated decommissioning approach. Oceaneering has completed the multi-client campaigns in each of the past 12 years, maintaining a 100% success rate and delivering effective services to its global clients by moving traditional rig-based work to more economical vessel-based solutions.

The annual campaigns for severance and recovery of subsea wellheads have included multiple clients in UK, Denmark, Germany and Norway in locations ranging from the southern North Sea to the Barents Sea. The project brings Oceaneering's total for wellheads recovered as part of the RigChase campaigns to 171. The latest campaign was completed without incident, and has come to the notice of additional operators looking to benefit from Oceaneering's experience with multi-client decommissioning scopes.

The method has evolved over the years to improve the safety and efficiency of the operations in shallow waters with high currents and low visibility and in water deeper than 400 m, confirming the reliable and predictable performance of abrasive water jet cutting in varied scenarios. Oceaneering uses the rig chase methodology to deploy a more economical and right-sized vessel to complete the specified wellhead removal work scopes for multiple clients in a single campaign and deliver multiple client benefits including:

- Reducing HSE exposure as no personnel need to be present on deck as wellheads are recovered to the vessel.
- Reducing environmental impacts as  $CO_2$  emissions are lowered by about 45%.

Reducing costs by moving scope from



- rigs to vessel and releasing drill rigs for other operations, optimising the operators' rig schedules and use.
- Providing a more predictable end-of-drilling schedule by removing cutting uncertainty.

Oceaneering's 2023 RigChase campaign continues to gain momentum with 24 wellheads confirmed and more than 30 optional wells under evaluation. More operators interested in the benefits of a multi-client campaign, including shared mobilisations and demobilisation costs, are being added to the coming year's efforts to deliver a more efficient, safe, and environmentally-friendly approach to decommissioning.

### 3.5 Removals

**Topsides to be decommissioned over the next decade:** last year's forecast of 125 has risen this year to 138. There is a steady increase from 2022, with decommissioning peaking in 2024 with 25 being decommissioned. A fall to nine is forecast to 2025, and from then on, the rate of topsides decommissioned steadies. The greatest tonnage can be seen in 2024 and the centre of gravity shifts to the CNS and NNS. The lowest tonnage can be seen in 2023, although that is the year when the second highest number of topsides is removed. This could be explained by all topside decommissioning activity happening in the SNS and IS where there is a larger number of smaller gas platforms.

**Substructures to be decommissioned over the next decade:** there is a sharp increase in the number of removals from 14 in 2022 to 22 in both 2023 and 2024, before a drop in activity from 2024 to 2025 where seven are likely to be decommissioned. Thereafter, activity levels off, ranging from 13 to eight substructures each year to 2031. There are spikes in 2026 for tonnage of substructures being decommissioned while the number being removed is lower than in previous years, which again could be explained by the heavier NNS and CNS substructures. Potential challenges around time frames for derogation applications may result in substructures being deferred in future editions of this report.

#### Figure 9 Topsides decommissioning



Figure 10 Substructure decommissioning

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#### Figure 11 Estimated cost per tonne



Figure 12 Offshore Wind Installation



**Consistent improvements in topsides and substructure removal costs:** the cost of removing a tonne of topside has remained fairly consistent over our last three *Decommissioning Insights*. The only real fluctuations occur in the spread of costs between assets. This can largely be attributed to the rise in topside and substructure removals reducing the 25% - 75% spread shown in the accompanying charts limiting the impact of outliers. In comparison we have seen a steady reduction in our 2022 – 2031 forecast, averaging £1,793/tonne, with the median cost on par with topsides. However, there has been an improvement in the range of costs of substructures which means better cost certainty. We have also seen an advance in technology with the likes of AllSeas Jacket Lift System which has a capacity to lift 20,000 tonnes thus reducing project scopes and making operations more efficient. This may lead to even greater cost certainty in future.

**Decommissioning opportunities in offshore wind:** next year OEUK's new Offshore Wind Decommissioning Network (OWDN) will create a platform for offshore wind developers to present their decommissioning programmes to OEUK members before the construction of offshore wind farms as a part of the stakeholder engagement process. This allows operators and the supply chain to share lessons learned with developers. This will help ensure that offshore wind infrastructure is designed for decommissioning at the outset. With at least 209 offshore wind farms expected to be under construction over the next decade, this presents a sustainable opportunity for the supply chain to continue decommissioning beyond oil and gas. Consideration also needs to be given to the availability of heavy lift vessels: as in 2024, 16 offshore wind installations will be under construction and over that period, 22 substructures and 25 topsides are forecast to be decommissioned.

### 3.6 Subsea infrastructure decommissioning

Subsea infrastructure to be removed						
2021 (actual)	2022 (Forecast)	Activity from 2023 – 2031				
1.19 km	6.50 km	908.22 km pipelines to be removed				
293 tonnes	1,094 tonnes	99,932 tonnes of subsea structures removed				
227 mattresses	1,491 mattresses	39,402 mattresses to be removed				

Of subsea infrastructure to be decommissioned over the next decade (2022-31)

To be spent on subsea infrastructure removal in the next decade



**Subsea Decommissioning Collaboration:** The SDC is a collaboration initiative that is having a positive impact on forecast cost reductions and project-sharing. Works that are completed via the SDC and similar initiatives in the coming years may result in even greater compression of schedules and greater cost savings.

> 100,000

tonnes

£2.42bn

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5.000

2023

2024

2025

2026

2027

2028

2029

Source: NSTA & OEUK

30.000

(t) 20000

**Subsea decommissioning expenditure rises sharply:** almost one pound in every eight spent on decommissioning will go on subsea infrastructure. And of that £2.5bn, most will be spent over the next decade with the lion's share of this to be within CNS, NNS and WoS. Significant spikes are noted towards the end of the decade which may be attributed to deferred activities. The push in this sector for collaboration may see this decrease in future years and allow for a more even distribution of work scopes.

**CNS sees steady flow of activity until 2029 boost:** subsea infrastructure is likely to provide a steady workstream over the next seven years before

seeing a boost in activity later in the decade. On average, around 3,500 tonnes/year of subsea infrastructure will be removed in the CNS until 2029. This is a much steadier stream than published last year where the forecast was more uneven. This may again be attributed to compressed work scopes and collaborative workshare campaigns.

**Most SNS and IS subsea works are projected early in the decade:** most subsea infrastructure in the SNS and IS is expected to be decommissioned between now and 2027. This accounts for £303.75mn within this period.



#### Figure 13 Subsea infrastructure removal

CNS

INNS & Wos

SNS & IS



#### Figure 14 Subsea decommissioning total cost

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### **3.7** Dismantling and reuse opportunities

**Over 1.3mn tonnes to come onshore for reuse or recycling:** Figure 15a shows that over the next decade there will be an increase year on year on topsides, substructures and subsea infrastructure tonnage coming ashore, peaking at over 250,000 tonnes in 2027. The figure does not include well decommissioning, pipelines or concrete mattresses. In 2028 tonnage coming onshore begins to reduce and steadies for the remainder of the decade.

The 1,333,839 tonnes coming onshore over the next decade represents dismantling and reuse opportunities for organisations, enabling them to support the UK's voluntary 50% local content target as outlined in the North Sea Transition Deal. An example of reuse in recent times is the well casings supplied by John Lawrie that have been used as piling posts in the foundations of Aberdeen's P&J Live.



Infrastructure coming on shore

**Reuse opportunities to support 2050 targets:** the recovery of concrete mattresses is consistent until 2029, where there is a steep increase in removal as the subsea infrastructure on larger CNS fields is decommissioned. This could present an opportunity for a dedicated mattress removal campaign on the UKCS towards the latter part of the decade. Supply chain organisations that provide waste services to the decommissioning industry can provide reuse options for concrete mattresses including aggregates being used for construction as demonstrated by Augean; and other more unexpected purposes such as flooring for agricultural sheds. The reuse of the plastic rope is also an opportunity for innovative solutions from industry.



#### Figure 15b UK tonnage coming onshore

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#### Case Study: John Lawrie Metals

With the announcement that the Petrojarl Foinaven floating, production, storage, offload (FPSO) vessel was to be taken off-station in summer 2022, BP made the decision to remove the recycling of the mooring system from



the recovery contract, dealing directly with John Lawrie Metals. A site visit to Montrose was hosted in late 2021, which led to an agreement that John Lawrie Metals would be responsible for managing the quayside discharge and the subsequent recycling and repurposing of the FPSO's moorings.

During early July 2022, five anchor handlers mobilised from Montrose to complete the disconnect of the mooring system from the FPSO. Our team liaised directly with representatives on the vessel, co-ordinating the offload of chain, wire, anchors and mid-line buoys, as well as supporting all of the anchor handling vessels as they returned to Montrose.

The mooring system was recovered and discharged by our chain handling specialist partner, over six port calls. In total, the five vessels delivered 4,127 tonnes of material. All vessels were discharged safely and without incident, returning them to the field ahead of schedule.

Our experienced team worked quickly to remove the chain from the quayside for export to a European electric arc furnace for smelting. Approximately 400 tonnes of mooring wire were prepared for reuse within the aquaculture industry.

Following a change in the design of floating fish farm pens, a new method of ballasting fish farm nets was required. Discussions between John Lawrie Metals and some of the largest fish farm manufacturers in Europe led to the use of the repurposed mooring wire. John Lawrie Metals has now been supplying repurposed wire to the aquaculture industry for over 10 years. To meet their requirements, specialist equipment is used to cut the wire to predetermined lengths and coil it ready for deployment.

By supporting the Petrojarl Foinaven FPSO off-station project, John Lawrie Metals demonstrated to the oil and gas industry its delivery capabilities, and the benefits of strong client and customer relations from an early stage.



## 4. The wider North Sea

### 4.1 North Sea decommissioning

The UK accounts for 73% of the North Sea's well decommissioning work, 74% of topsides tonnage and 76% of substructure tonnage. Industry regularly meets with its peers in the wider basin to share lessons learned and discuss

the market. Data has kindly been provided by Norway, the Netherlands and Denmark to highlight the decommissioning opportunities across the North Sea.

Figure 16a Well decommissioning in the North Sea



Figure 16b Topsides mass decommissioning in the North Sea



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Data from Norway was collected by Norsk Olije Og Gass (Offshore Norge), a trade association representing the Norwegian oil and gas industry. Norwegian data came from seven operators allowing greater insights as detailed in this section. Data from The Netherlands was provided by NexStep, a joint initiative of the state-owned Energie Beheer Nederland (EBN) and the Dutch oil and gas industry represented by Element NL. OEUK also collected data directly from operators in Denmark to develop a wider picture of the North Sea.





Country	Number of wells	Topsides (t)	Substructures (t)
UK	73%	74%	76%
The Netherlands	16%	11%	10%
Norway	8%	14%	11%
Denmark	3%	1%	3%

### 4.2 Norway: 2022-31 decommissioning

Number of wells to be decommissioned: 216 Number of platform wells: 196 Number of subsea wells: 20

Topsides tonnage to be removed: 175,013

Substructure tonnage to be removed: 81,404

Pipelines to be decommissioned: 547 km  $\,$ 

Umbilicals to be decommissioned: 174 km  $\,$ 

Mattresses to be decommissioned 457 tonnes



#### **Case Study: James Fisher Decommissioning**



James Fisher Decommissioning was contracted by our valued client Allseas, to support with subsea preparation, pile severance and drill-pin activities on the Gyda jacket decommissioning project in the Norwegian North Sea.

In preparation for the jacket lift, James Fisher Decommissioning scope of supply included:

 Subsea drilling to create drain and vent holes to allow the water to drain from the flooded jacket legs during recovery.

- Internal dredging of piles with our bespoke airlift tool.
- Jacket foundation pile severance using our abrasive water jet cutting technology and DCH IV cutting head.
- Abrasive water jet cutting with cutting head DCH III for template support pile severance 3 x 30" piles with 1" wall thickness.
- Orange peel grab for internal recovery of debris inside pile.
- Diamond wire saw cut on riser connected to the jacket.
- Drill, pin and lift of locating piles.

Over and above the original scope of work, additional work scopes were added by the client during the project:

- Hydraulic shear and 16-tonne twin grabs for pipeline cut and recovery.
- Diamond wire saw for severance of multistring conductor.
- Topside drill and pinning of platform conductors so they could be recovered prior to jacket lift.
- Drill pin and lift tool for 2 pile head inserts.

#### **Case Study: James Fisher Decommissioning**

There were 20 internal cuts completed on the jacket in total:

- 8 off 84" OD straight x 100mm WT average cut time 2 hours per cut.
- 8 of 84" OD angled x 120mm WT average cut time 2.5 hour per cut.
- 4 off 84" OD x 120mm WT average cut time 2.5 hours per cut.
- Subsea template cuts:
- 2 off 72" OD x 63.5mm WT locating piles average cut time 2 hours per cut.
- 3 off 30" OD x 25mm WT support piles average 28 minutes per cut.

The scope of work was completed successfully, resulting in the seamless removal of the Gyda jacket by Allseas' vessel Pioneering Spirit with jacket lift technology.

"The James Fisher Decommissioning crew were very knowledgeable with the equipment and the communication between them and the vessel was excellent," said Superintendent, Allseas





## 4.3 The Netherlands: 2022-31 decommissioning

Number of wells to be decommissioned: 452 Number of platform wells: 352 Suspended E&A Wells: 85 Number of subsea wells: 15

Topsides tonnage to be removed: 131,321

Substructure tonnage to be removed: 70,729

Pipelines to be decommissioned: 1,744 km

Umbilicals to be decommissioned: 179 km  $\,$ 

Figure 18 Netherlands well decommissioning



## **5. Appendices**

### 5.1 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 percent. This range narrows over time as more work is done to increase the understanding of the work involved.

Class 2 estimates represent projects that are in the contracting stage with some activities already being executed. These have a higher degree of accuracy of between -5 and +20 percent.

#### 100% 90% 80% 70% 60% 50% 40% 72% 30% 46% 20% 37% 36% 25% 10% 0% 2017 2018 2019 2020 2021 2022 Decommissioning Decommissioning Decommissioning Decommissioning Decommissioning Estimate Estimate Estimate Estimate Estimate Estimate Source: NSTA ■ Class 5 ■ Class 4 ■ Class 3 ■ Class 2 ■ Class 1 ■ Actuals

#### Figure 19 Maturity of estimates

## **CEUK**

## 5.2 Glossary

AACE	Association for the Advancement of Cost Engineering
Asset Stewardship Survey	A survey run by the NSTA 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.
CCUS	Carbon Capture, Utilisation and Storage
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; and c) All drill cuttings piles that are not screened out at Stage 1 of OSPAR
СоР	Cessation of production

COP26	The 2021 United Nations Climate Change Conference, more commonly referred to as COP26, was the 26th United Nations Climate Change conference, held in Glasgow 2021
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.
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.
DIT	Department for International Trade
EBN	Energie Beheer Nederland, state entity upstream
E&A	Exploration and appraisal

## 5.2 Glossary

FPSO	Floating production, storage and offload vessel			
HSE	Health & Safety Executive			
IS	Irish Sea			
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.			
NNS	Northern North Sea			
NOGEPA	Netherlands Oil and Gas Exploration and Production Association			
NZTC	Net Zero Technology Centre			
OGA/NSTA	Oil & Gas Authority (now North Sea Transition Authority)			

OPRED	Offshore Petroleum Regulator for Environment and Decommissioning
OSPAR	OSPAR is the mechanism by which 15 governments & the EU co-operate to protect the marine environment of the northeast Atlantic.
Post-CoP OPEX	Operational expenditure after production has ceased.
SNS	Southern North Sea
Topsides	The facilities which sit on top of an installation, typically including drilling, processing and living quarters.
Work Breakdown Structures (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.
WDON	Well Decommissioning Operators Network
WG4	Work Group 4
WoS	West of Shetland

**DECOMMISSIONING INSIGHT** 2022

### **5.3** Forecast activity in the UKCS over the next decade in detail

		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	410	479	425	1,314
	Subsea wells	240	379	52	671
	Subsea E&A wells	43	51	23	117
	Total	693	909	500	2,102
Number of topsides to be removed		18	26	94	138
Total weight of topside to be removed (tonnes)		371,805	354,431	187,382	913,618
Number of substructures to be decommissioned		14	23	95	132
Total weight of substructures to be decommissioned (tonnes)		242,653	204,354	121,011	68,018
FPSO weight to be removed (tonnes)		151,541	245,250	205,578	417,369
Subsea structures to be removed (tonnes)		41,595	55,596	3,835	101,026
Number of mattresses for removal		7,350	29,093	4,495	40,893
Length of pipelines, umbilicals and cables to be decommissioned (km)		4,047	4,875	1,631	10,552



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