



CALASH

North Sea Energy

Building a diversified offshore energy basin

Executive Insights

March 2022

LONDON ABERDEEN NEW YORK HOUSTON SYDNEY MANCHESTER

Introduction

A diversified North Sea energy mix protects against volatile energy prices, boosts energy security, and provides tangible progress towards net zero.

- In 2020, the COVID-19 pandemic saw falling commodity prices, including negative oil prices, but electricity and gas costs in the UK and Europe subsequently rocketed to record levels, driven by global supply chain issues and rapid economic recovery from the pandemic.
- Conflict in Ukraine has now placed further uncertainty on energy markets, with oil prices rising above the symbolic \$100-per-barrel for the first time since 2014.
- Against this backdrop, the UK appears to be re-assessing its position on fossil fuel investment, with six North Sea oil and gas fields expected to be approved this year, while Germany is set to double its yearly installation of offshore wind to achieve an accelerated commitment to 100% renewable power by 2035.
- Diversified use of the North Sea's energy potential offers a degree of protection from volatile energy price markets, a higher level of energy security, and a sustainable energy future.



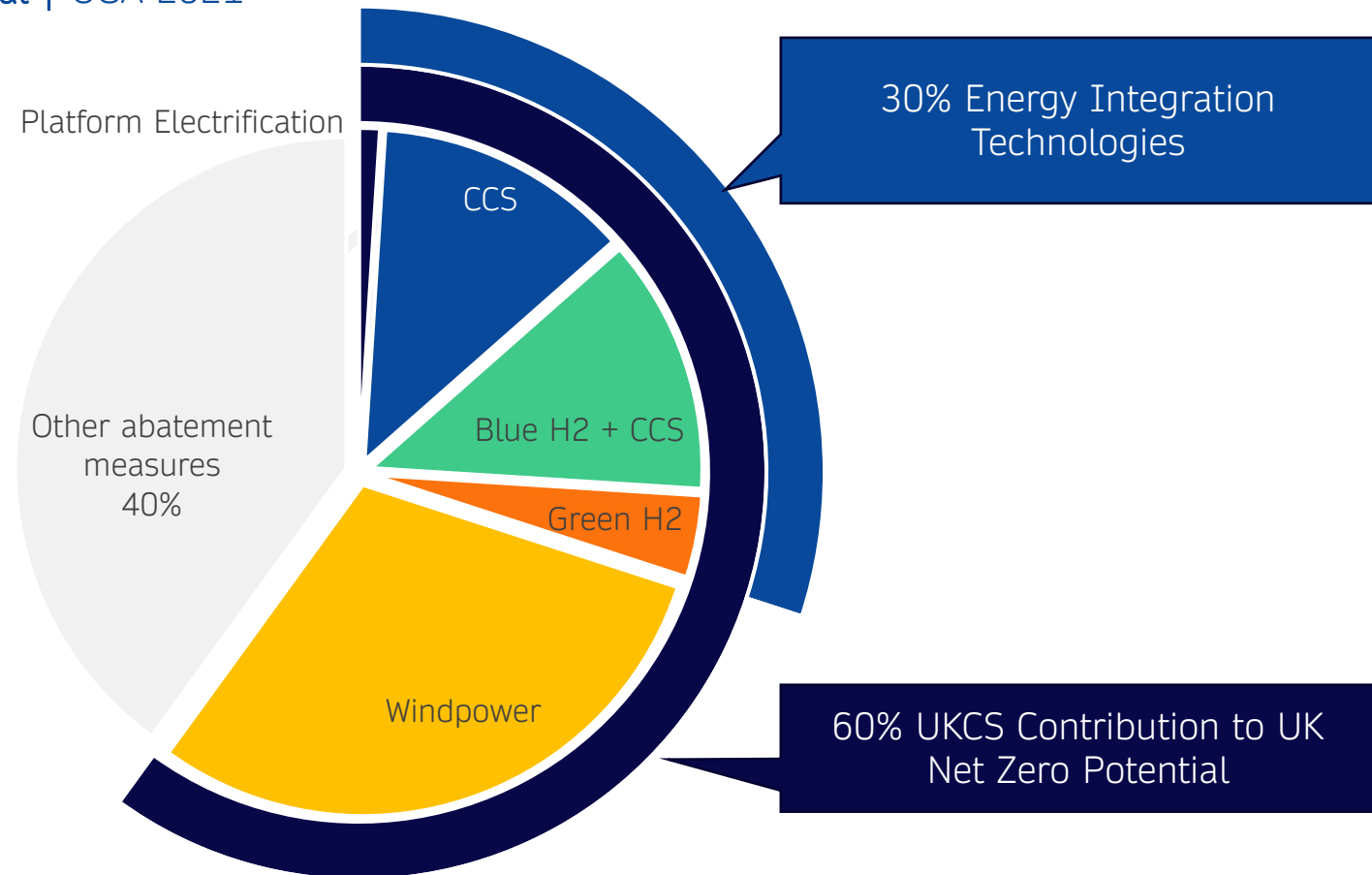
The North Sea is a critical energy resource to support net zero targets

The North Sea is a critical energy resource, which can support net zero targets, with up to 60% of the UK's net zero objectives to be driven by North Sea development, through both wind power and energy integration technologies.

UKCS Net Zero Emission Abatement Potential | OGA 2021

While six new fields have been reportedly fast tracked by the UK government, there will be an expectation that new developments will do more to reduce their carbon footprint. Measures could include:

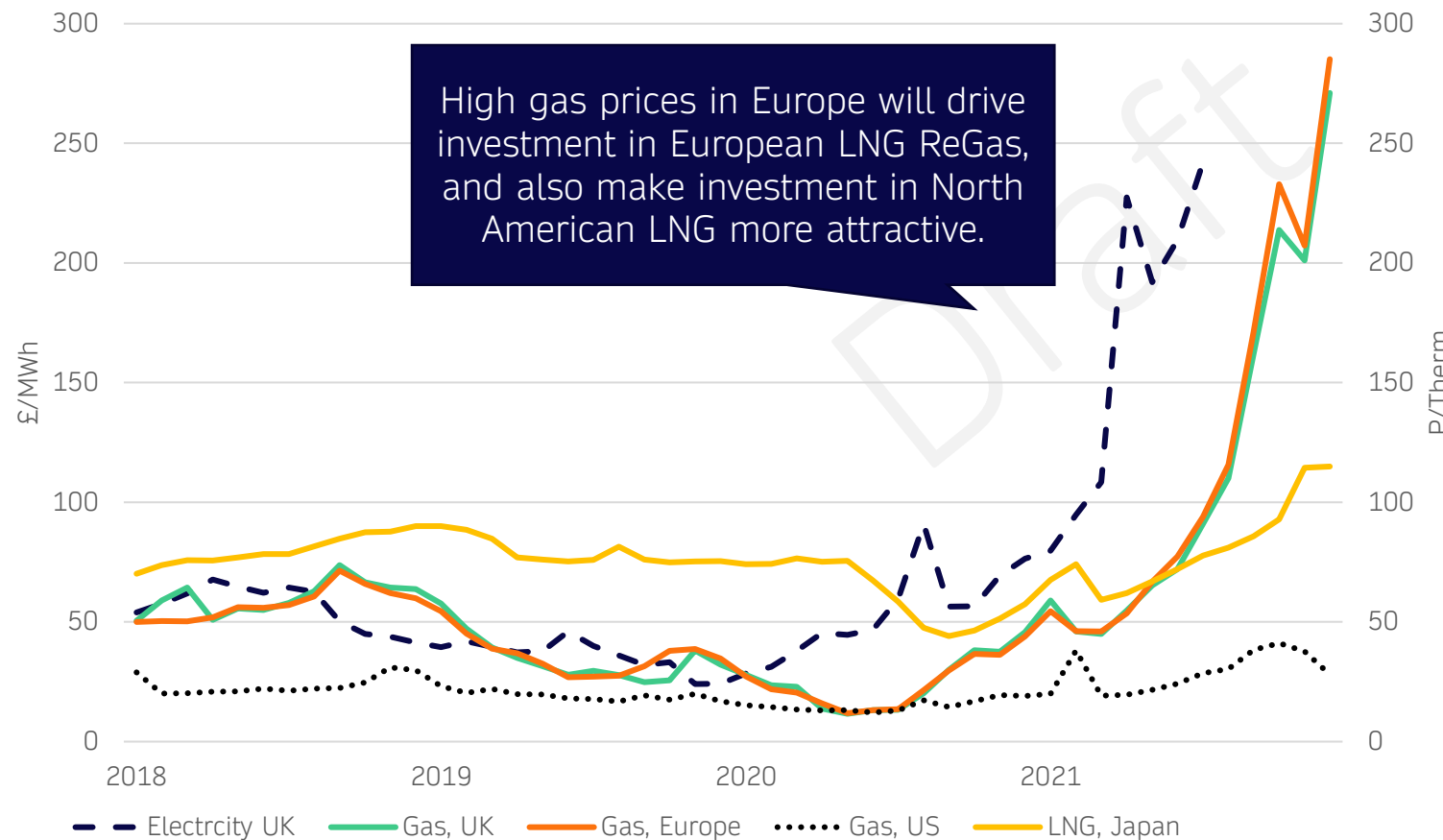
- Platform electrification
- "Gas-to-wire" where electricity is generated offshore and transported using existing windfarm cables
- Hydrogen and CCSU



UK energy prices have increased sharply since 2021

Despite demand reductions driven by COVID-19 restrictions and their economic fallout, energy prices have increased sharply since mid-2020, both in the UK and globally.

Day Ahead Baseload Contracts - Monthly Average (GB) | *Ofgem 2022, World Bank 2022*



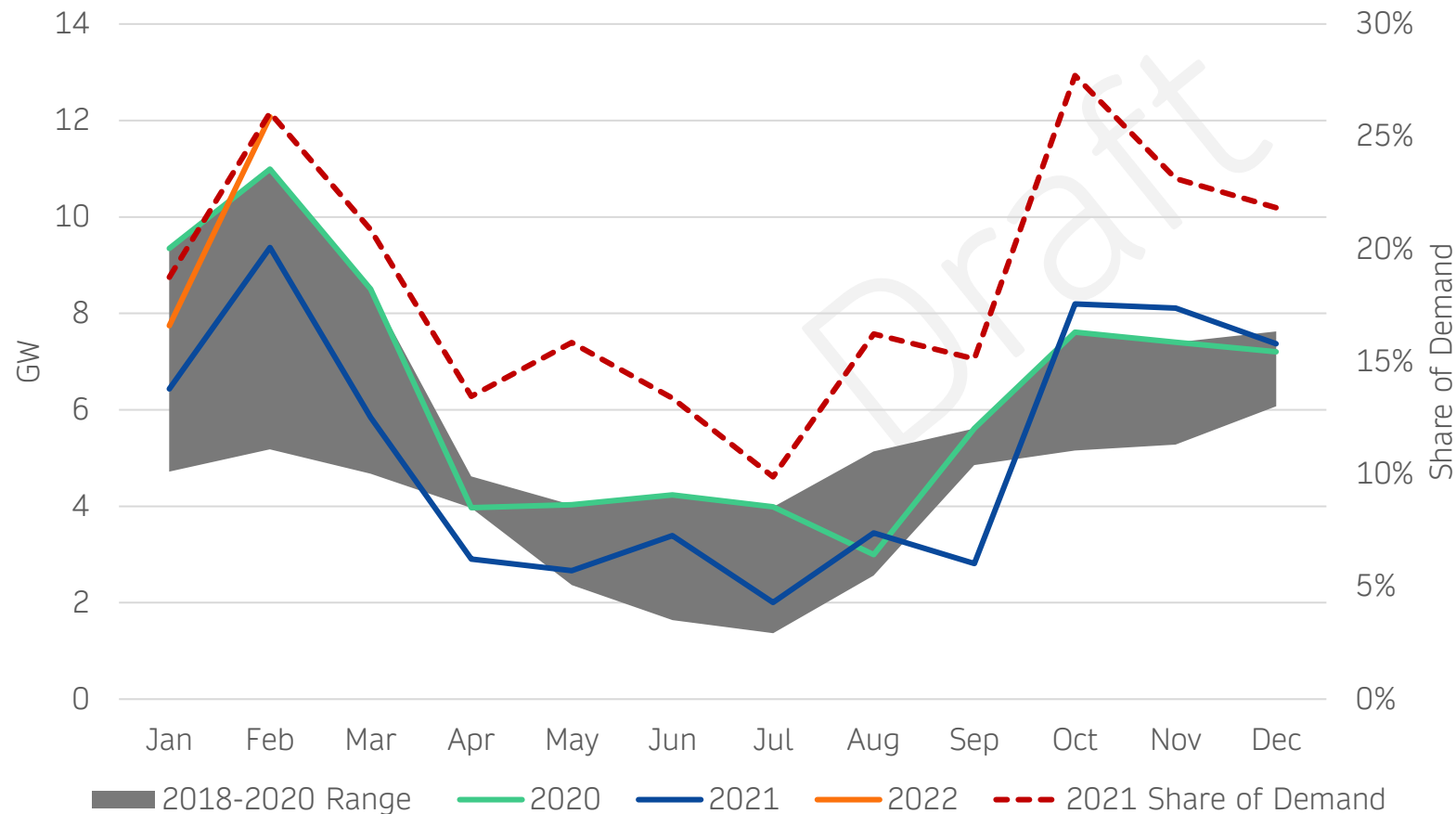
High electricity prices are not a result of increased fluctuating supply from North Sea offshore wind, and other renewable sources, but due rather to broader macroeconomic factors.

The rise in gas prices puts under the spotlight the lack of exploration and development spend, as well as the lack of gas storage and LNG infrastructure to match potential supply.

Lower wind production does not explain electricity prices

While wind power generation in winter 2020/2021 was lower than the previous year, winter 2021/22 has been in line with historic trends.

UK Median Monthly Wind Generation | *Gridwatch 2022*



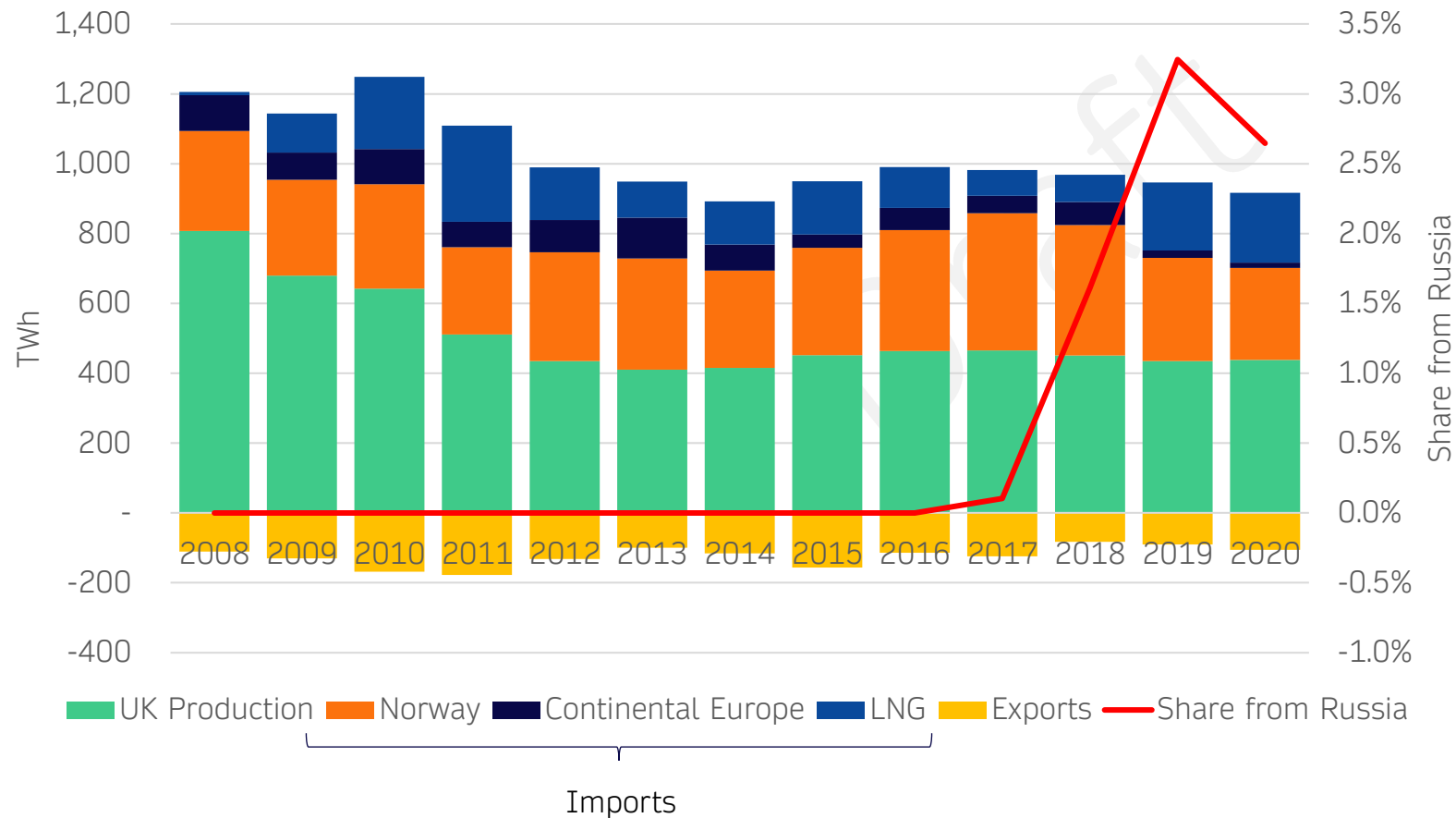
With a further 24.8 GW of capacity awarded in January as part of the latest ScotWind seabed leasing auction, and over half of this to floating wind projects, offshore wind is set to gain an even larger share of the UK energy mix.

Large-scale investments into flexible power generation, utility-scale battery storage, and green hydrogen production will mitigate the affects of intermittent energy supply.

Gas production has remained stable

Natural gas imports were heavily hit by declining demand in 2020, which fell by almost 6%, while domestic production actually increased by almost 1% - while the IEA calls for no new oil investment, it does recognise a continued need for investment in gas production.

UK Gas Supply by Source, 2008-2020 (TWh) | *DUKES 2022*



The Yamal LNG plant came online in 2017, and has driven increased imports of gas from Russia.

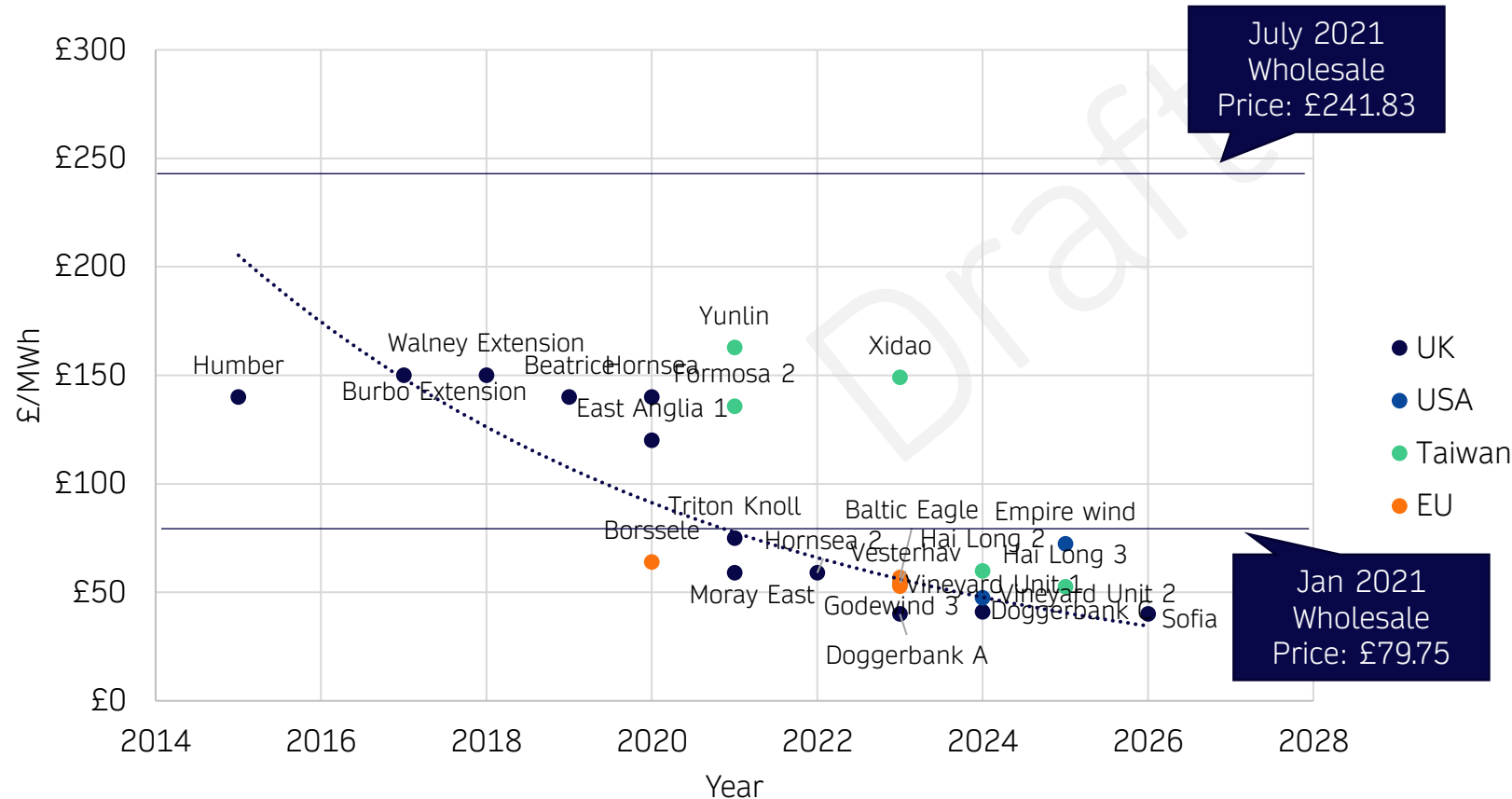
Although Russia has never accounted for more than 3.5% of UK gas supply, the UK is still exposed to European gas disruptions.

Investment in North Sea gas is consistent with the UK's energy transition goals and helps to increase energy security.

Offshore wind is becoming increasingly competitive

The contract-for-difference (CfD) subsidy structure applied to offshore wind developments means that higher electricity prices are now a source of income for many governments around the world, and if prices are sustained, subsidy free investment will be accelerated.

Project strike prices (£/MWh) | *Calash 2022*



The strike price is a guaranteed price to be paid to wholesale generators of electricity.

If the wholesale market price is less than the strike price, such generators receive a top-up.

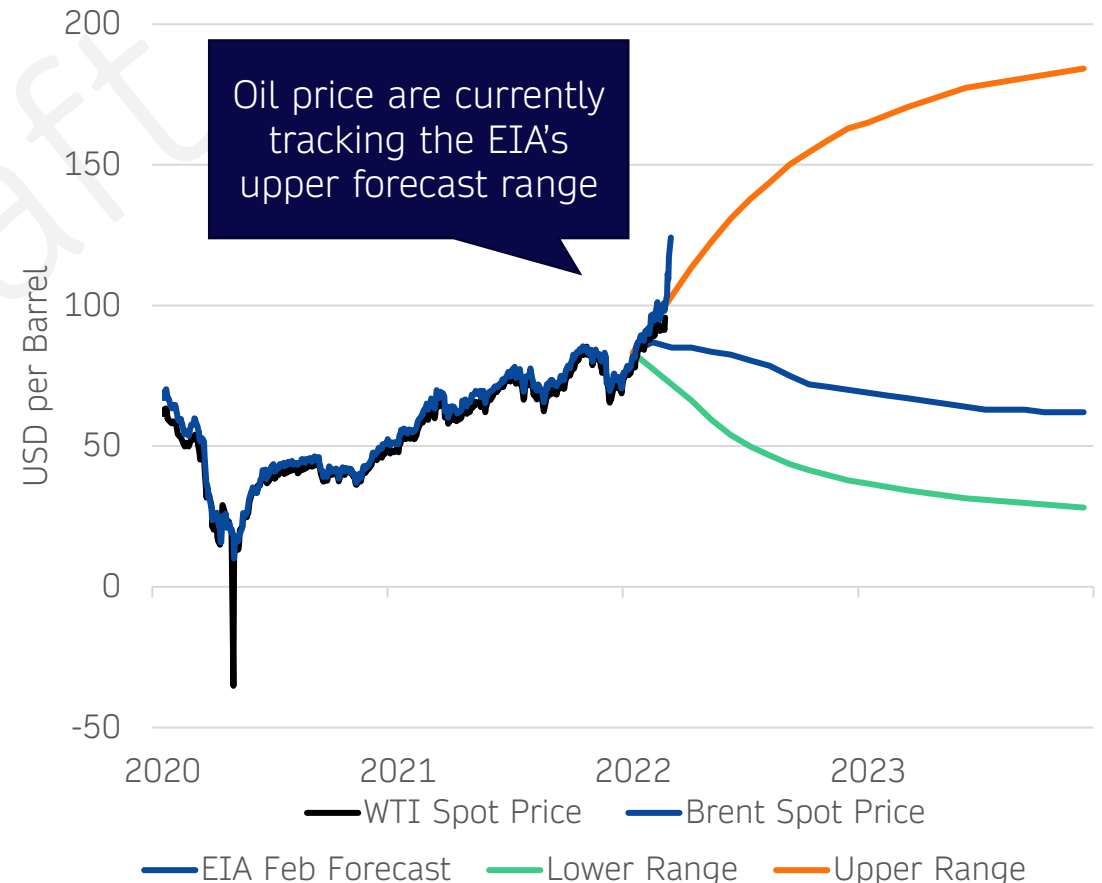
Importantly, if the wholesale price exceeds the strike price, generators pay back the difference.

What does \$100 oil mean for the North Sea?

Higher fossil fuel prices will make investment in North Sea energy more attractive, both for upstream oil & gas and offshore wind, but may be constrained by supply chain limitations

- Increasing commodity prices are being driven by a strong recovery in demand, declining upstream productivity, and long term underinvestment in global gas production and storage.
- Increased natural gas and oil prices will spur short-term investment into the North Sea, however, climate concerns and uncertainty about long-term price trends may deter long-term investments.
- Higher fossil fuel prices will also accelerate the shift to offshore wind and other renewable energy sources. Additionally, higher electricity prices now mean all offshore wind projects since 2016 are a source of income, and are not currently receiving subsidies.
- Supply chain limitations are already impacting the offshore wind sector, including availability of geophysical survey vessels, engineering expertise and port facilities. Increased oil & gas prices is going to increase competition for these services, and may impact the delivery times for projects.

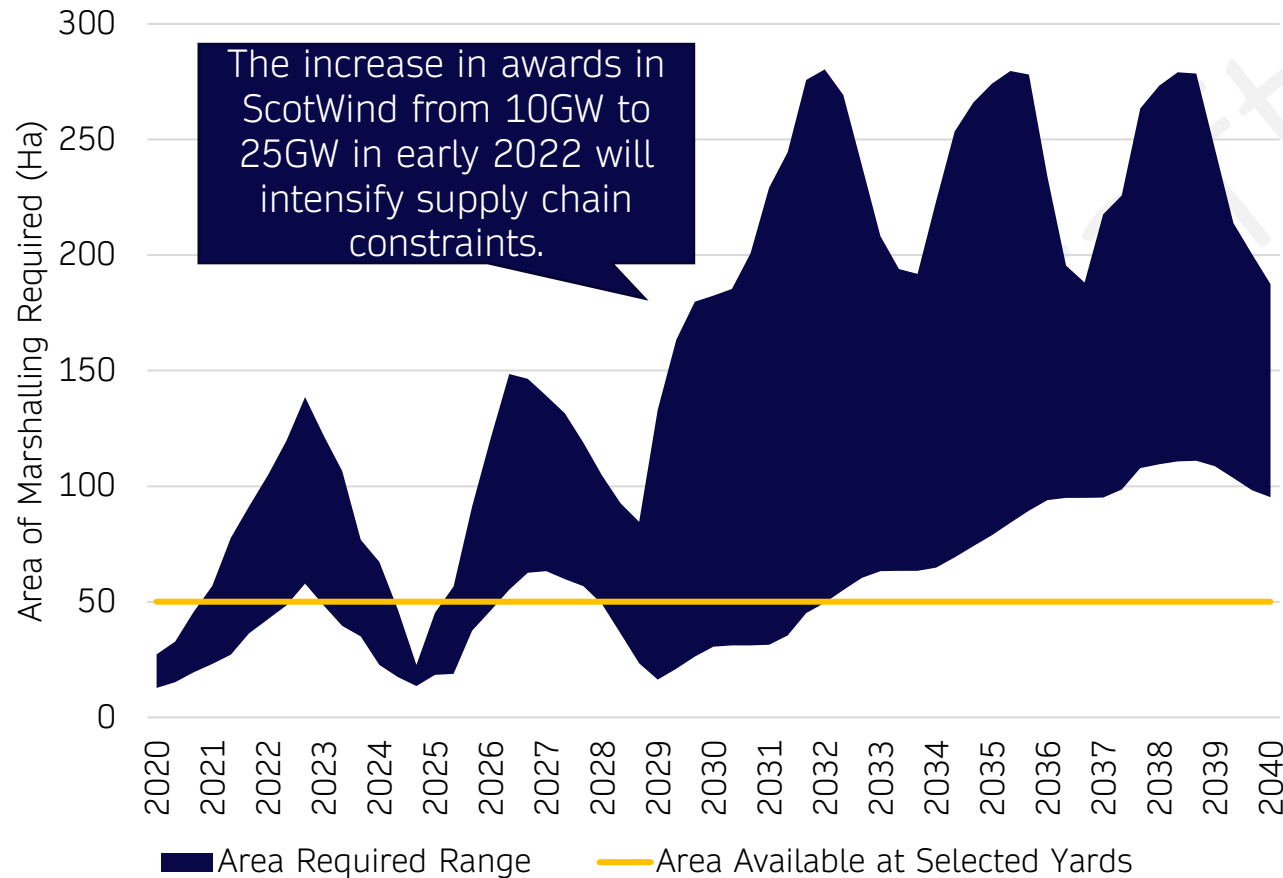
February 2022 Oil Price Forecast and Daily Spot Oil Prices | EIA 2022



Investment is required to avoid bottlenecks

A number of bottlenecks to offshore wind deployment are already emerging, with geophysical survey vessels, engineering expertise, and port facilities among the services shared by all offshore operators, including oil and gas. This represents a unique opportunity for investors.

Scotland Offshore Wind Port Capacity Requirement | *Crown Estate Scotland 2020*

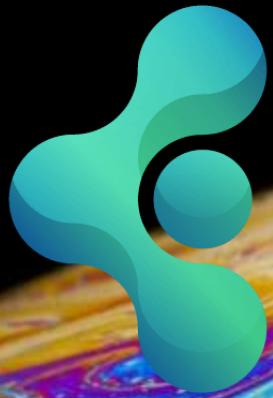


CAPEX

- Crown Estate Scotland highlights that there is a risk that demand for port capacity in Scotland for large scale uses in the offshore wind construction phase may exceed current capacity within the 2020s or 2030s.
- The figure to the left shows the marshalling area required vs current capacity, which is already operating at close to or above max capability.

O&M

- While there is broadly adequate technical capability in appropriate locations relative to development zones, capacity is constrained due to existing uses.
- As such, expansion of both berthing and onshore area capacity suitable for O&M may be justifiable in multiple locations.



CALASH

About Us

Calash offer a broad range of strategic consultancy support to investors and trade clients; independent market reviews and referencing, benchmarking, commercial turnarounds, strategic development, technical and product assessments and environmental reviews. Areas of expertise include energy (upstream, midstream, downstream), Renewables, Chemicals and Mining; covering development, operations, project management, engineering, IRM, supply chain, manufacturing and financing.

LONDON ABERDEEN NEW YORK HOUSTON SYDNEY MANCHESTER

Email: mail@calash.com

Phone: +44 1224 637 017



Strategy

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- Growth, new market and internationalisation support
- Target Identification & Market Entry
- Competitor intelligence
- Market sizing, identification and supporting initiatives



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- 100 day planning, post-merger integration and execution support
- Restructuring, divestment and cost-reduction
- Commercial, Operational and Technical Diligence



Energy Transition

- Incubator development and refinement
- Calash 'ESG Investor Filter' & market sizing
- White space potential client & monetisation identification
- Energy Transition strategic alignment and risk mitigation
- Guided technical workshops