

INSIGHT



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UK energy exports and shale gas: aspiration or pipedream?



Executive summary

The UK's new Prime Minister, Liz Truss, has announced an energy plan targeting net energy exports by 2040. The plan includes lifting the ban on hydraulic fracturing in unconventional shale plays in England and offering a new offshore licensing round this year.

The Prime Minister suggested that over 100 new exploration licenses could be awarded, and that production of shale gas could start within six months, if local communities support development. It was also re-iterated there will be no further windfall taxes on the oil and gas sector. Few other details were given, but the specifics have been promised within the next two months.

The announcements came as part of a broader response to the [UK's energy crisis](#) including price caps, and Paris Agreement reaffirmation. The government remains committed to the 2050 net zero target – though the plan for achieving this will be reviewed.

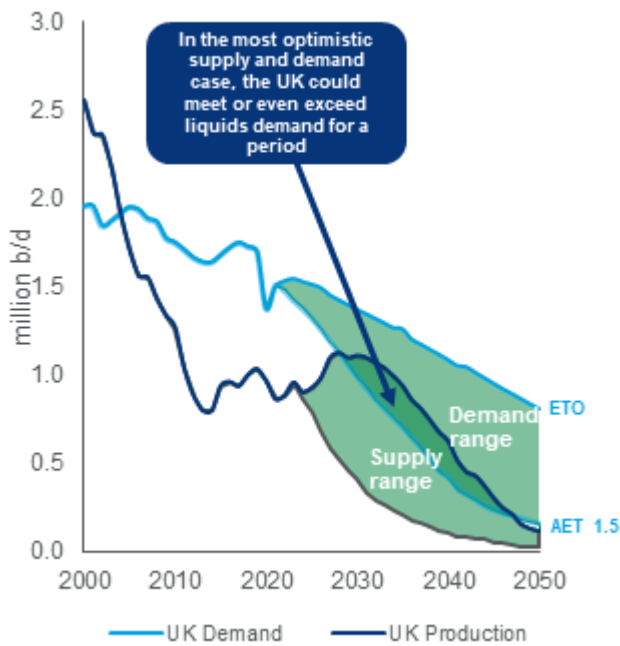
The net exporter target can be viewed positively. But so far, the government has only communicated its intention to increase oil and gas production and has pinned at least some of its hopes on shale gas. We believe shale gas faces too many political, technical, economic and funding headwinds to make a material impact this decade.

For oil, it is plausible that the UK could become self sufficient. But only if demand is driven down rapidly – by the electrification of transport and other measures needed to reach our Accelerated Energy Transition 1.5 degrees scenario (AET-1.5) – and supply reaches our high case. Achieving self-sufficiency in gas is not achievable by 2040. Even with demand falling in line with our AET-1.5 scenario, and production at our high case, the UK will remain a net importer of gas.

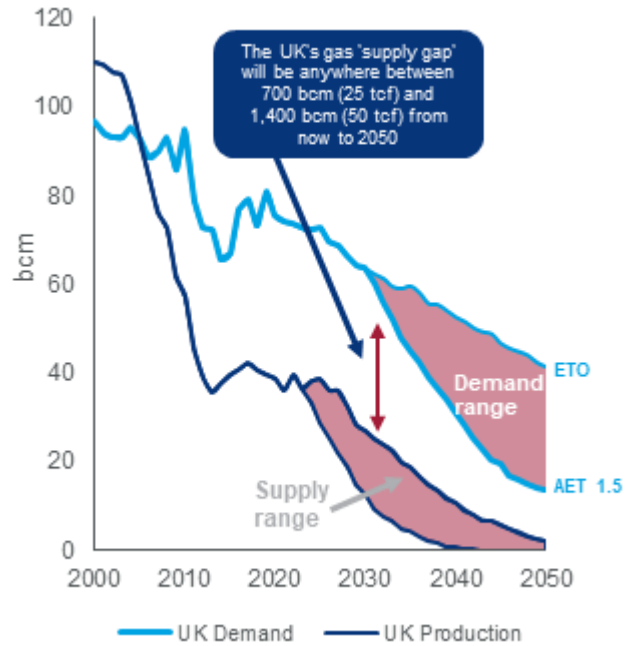
Ultimately, it is renewables, hydrogen, CCUS, electrification and efficiency that are the most critical components for net zero and self-sufficiency ambitions. As the plan is fleshed-out over the next two months, there needs to be clarity from the government on incentivising and accelerating capital allocation into these vital areas. Doing so would take the UK closer to its ambition to become a net energy exporter.



UK liquids supply and demand outlook



UK gas supply and demand outlook



Source: Wood Mackenzie Lens Upstream, Energy Transition Practice Source: Wood Mackenzie Lens Upstream, Energy Transition Practice

Will lifting the shale ban make a big difference?

Removing the ban on hydraulic fracturing is a big step forward for shale proponents. But for new supply to materialise, E&Ps would need to commit to exploration and appraisal work, and a shale oilfield service (OFS) sector would be required. History tells us it takes at least 20 wells to appraise a shale play.

Even if drilling were to start straight away, 2023 volumes would likely be negligible. With only a handful of wells drilled to date, the exploration and appraisal process could easily run into the latter half of the decade if a shale oilfield service sector is not quickly scaled-up.

The size of completions – which generally correlate to production rates – would lag the optimal engineering design. Reliable proppant and water supplies must be sourced. Pumps and rigs will need to be imported and potentially modified to fit on UK trucks and roads. Flaring from test wells situated away from infrastructure would be a non-starter.

This is not international shale’s first rodeo

There are plenty of global shale exploration plays where drilling wasn't banned, yet no commercial projects have materialised. However, changing macro supply and demand drivers has been a catalyst for some breakthroughs. Supply crunches kick-started unconventional projects in China and Argentina, home to the only two commercial shale projects outside the US. Shale plays have altered gas market dynamics in both countries, albeit it on a much smaller scale than the US.

In terms of resource, UK gas initially in-place (GIIP) volumes appear vast. But GIIP numbers are always high in shale basins, particularly those with multi-zone pay or exceptionally thick strata. In the UK’s highest-profile Bowland-Hodder shale basin, the British Geological Survey has estimated GIIP volumes of 264 tcf in the upper unit and 1,065 tcf in the lower unit.

Purely for indicative reference (drawing technical or economic analogies at this stage would be misleading) the upper unit’s GIIP estimate of similar scale to the Fayetteville, a mature shale play in the US Lower 48.



The Fayetteville is nearly fully developed with over 6,500 wells drilled to-date, and 10 tcf of cumulative production from a technically recoverable estimate of 38 tcf. Production reached approximately 3 bcf/d in six years from a standing start, with over 700 wells one-mile lateral drilled in some calendar years.

The wells are small in comparison with the monsters drilled in the Haynesville and Marcellus today, but the technology and expertise learnt heavily on the plays which had gone before, such as the Barnett. Replicating this in the UK, from a standing start, even assuming similar or better well performance (which is unproven) is a gargantuan challenge.

The ban was just one of the commercial hurdles

While the ongoing European energy crisis may have softened some attitudes towards new oil and gas projects, onshore developments will face even higher levels of public scrutiny that led to Shell stalling on Cambo offshore. One key issue outlined in the announcement is the requirement for community support before approvals and permits are issued. Things are very different in the US, where mineral rights are owned by private individuals and royalties are paid directly, bar some onshore Federal acreage in the Permian and Rockies.

In the UK, incentives need to be sufficient to align all stakeholders. The impact from shale operations needs to be offset with specific benefits to local communities. The UK Onshore Operators Group (UKOOG) acknowledged the need for local fiscal incentives in its community benefits packages in 2013, whereby E&Ps would make direct investments in nearby towns. But hydraulic fracturing has proven to be a highly contentious issue in the UK and even the ongoing energy crisis will not be enough to galvanise positive public opinion.

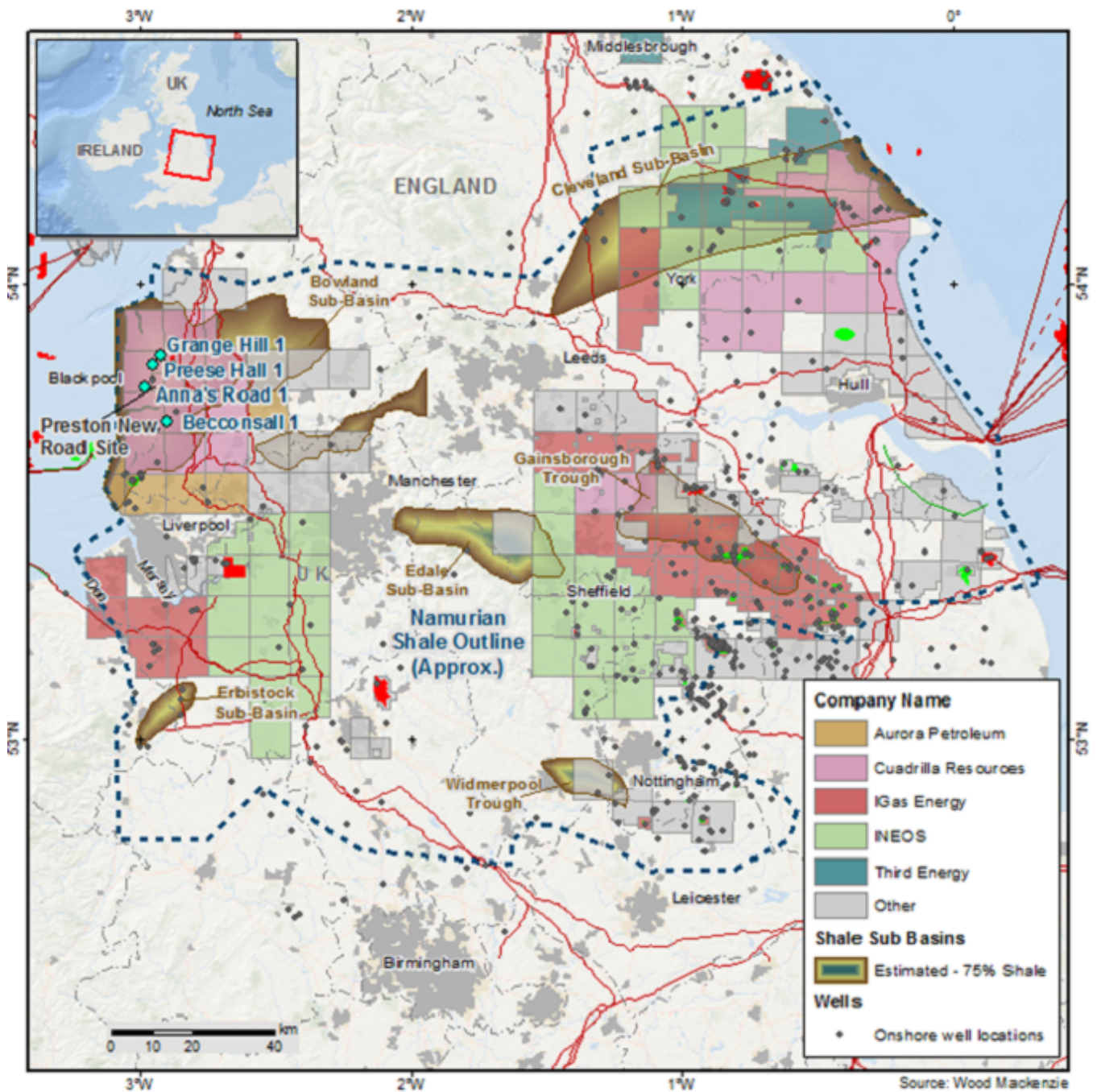
Since seismic activity was observed near Blackpool in 2011, all unconventional activity has been heavily scrutinised. That means additional permits, slower timelines, more monitoring, and inevitable delays. Meaningful production starting within six months – per Liz Truss' statement – is hugely optimistic. That goal may have been achievable if commercial projects had been established before the fracturing ban was introduced. Instead, 2022 projects will be re-starting, almost from scratch.

New operators would need to step up. INEOS has already messaged a desire to drill but historical participants in onshore shale licences such as Centrica, GDF Suez and TotalEnergies, have either subsequently wound down their upstream businesses or are pursuing other opportunities. It is unlikely the Majors will see the opportunity as material or be interested in more public scrutiny. Selling a UK exploration play to investors is unlikely to light the fire of independent US E&Ps either.

The commercial proposition will also be influenced by the industry's view on gas prices. We expect European gas demand to start declining by the late 2020s just as a raft of new LNG projects are ramping-up. Europe's REPowerEU plan represents further downside risk to gas demand.

The 2030 gas demand targeted in REPowerEU, coupled with additional supply could lead to a temporary oversupply and suppressed prices below the estimated cost of UK shale gas extraction. For further analysis of alternative gas pricing scenarios, see our reports on the [potential future of gas and LNG industry in the Net Zero world \(AET-1.5 scenario\)](#), and a [scenario analysis of European ban on Russian piped imports from 2023](#).

UK Bowland-Hodder Shale Map including licenced areas



Will there be appetite for a new offshore licensing round?

A new UK licensing round was expected to be announced in the autumn of 2022 and Liz Truss' appointment appears to have cemented the decision. There are no details on what will be on offer at this stage, but the Prime Minister suggested over 100 new licenses could be awarded. In the last round held in 2019, 113 licenses were granted to 65 companies, though it was notable these awards included no well commitments.

New licensing was paused in 2020 as the government conducted a review into the licensing regime in response to its 2050 net-zero goals set out in 2019. A key condition for exploration will be a 'climate compatibility checkpoint'. Details have yet to be announced but is expected to ensure any project is consistent with the governments net zero goals. This may limit the viability of some prospects on offer.



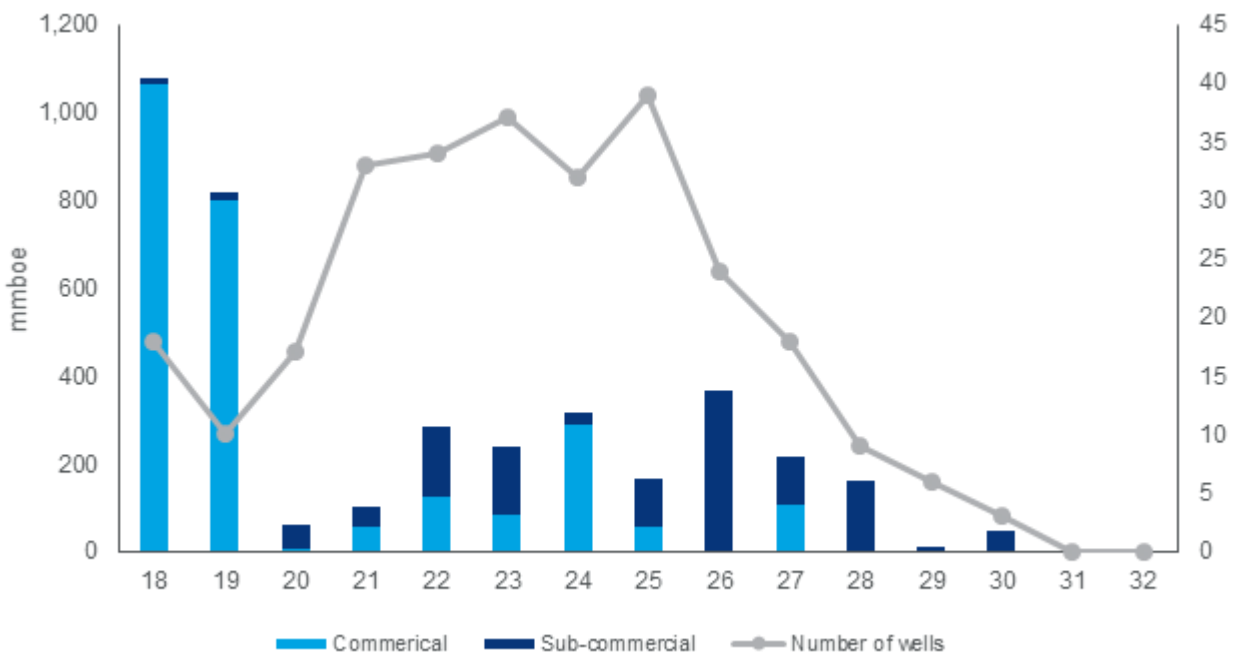
While we think exploration still has a role to play in the UKCS, drilling activity is already at historic lows and the addition of new acreage – which will have been offered up in previous rounds – is unlikely to reverse that trend significantly. Smaller explorers have faced funding challenges in recent years and in some cases drilling decisions are contingent on farm-downs and partner alignment.

While there have been discoveries in recent years, not since the 27th round in 2012 has new acreage delivered a commercial discovery. And the first well from the last round (2019) is not expected until 2023. There will still be appetite from some UK explorers for small, quick pay-back opportunities. But the maturation and drilling of big prospects that could boost supply will be limited, likely to be technically challenging and would take several years to bring onstream.

The introduction of a windfall tax (the Energy Profits Levy) and the challenges (technical, commercial, and environmental) to develop high-profile projects such as Cambo may also put doubts in the mind of management teams about the long-term prospects for value creation through new offshore exploration licences.

There is an argument that the regulator and operators should focus on maximising the potential of existing acreage. Most of the 750 prospects we map sit within licensed acreage. With tax relief on exploration spend increasing from 40% to 85% under the Energy Profits Levy, there is an immediate incentive to ramp-up exploration drilling activity over the next three years while the levy is in place. If activity increases and there is notable success, there could be a case for extending exploration capital allowances.

Volumes discovered by round v number of wells



Source: Wood Mackenzie. Discovered resources and wells allocated to the year of acreage licenced. No wells drilled in the 2018 (31) and 2019 (32) rounds and time of publishing

Could the UK become a net exporter of energy by 2040?

The UK is currently a net importer of oil, gas, coal, bioenergy, and electricity. We do not forecast the UK’s net import position across these fuels to be reversed in our base case outlook or our AET-1.5 scenario (which meets the UK’s net zero target by 2050).



Even the most optimistic forecast of oil and gas production would not take the UK to a net export position. Rather, a much faster and larger build-out of renewable power generation – paired with wide-scale electrification and efficiency gains – would bring the UK closer to meeting this ambition.

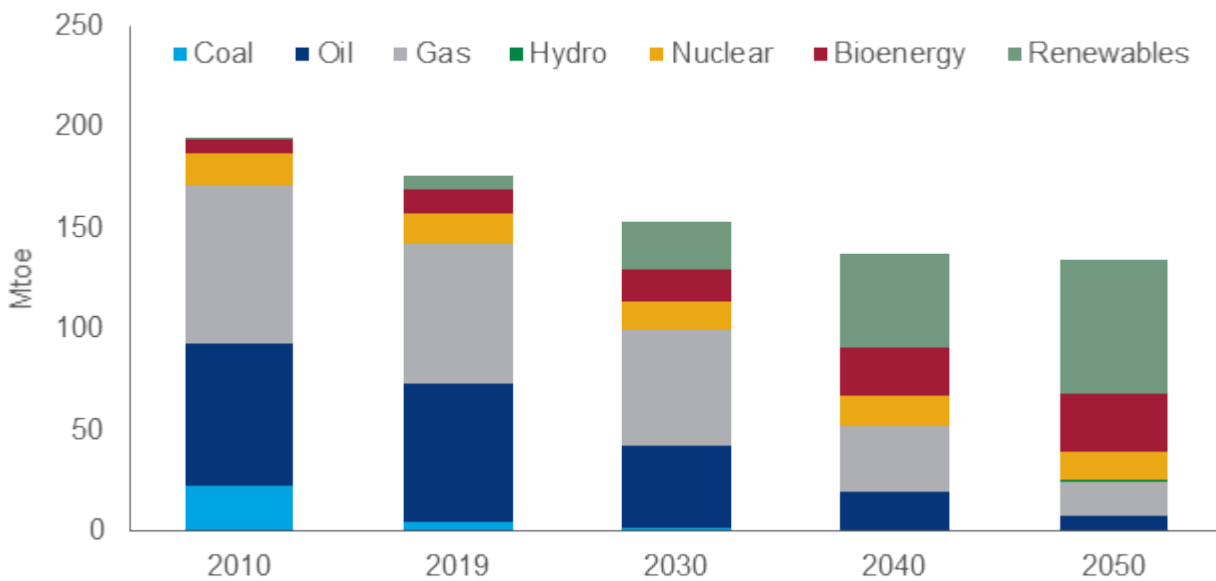
The UK is blessed with tremendous wind potential – contributing almost two-thirds of the UK’s electricity requirements by 2050 in our AET-1.5 scenario. The UK’s solar potential lags many markets, but still contributes 8% in this scenario. Despite the cost and delivery challenges, the UK’s nuclear target of 24 GW by 2050 has been reiterated by the government. Together, these would support efforts to reduce gas in the generation mix but even our AET-1.5 scenario still needs gas generation paired with CCUS as a low-carbon dispatchable generation source.

Electrification of transport and buildings delivers much needed efficiency gains. The government will need to provide details on its assumptions for both, which will have to be extremely aggressive to meet the government’s 2040 net exporter target. Meanwhile, the UK’s Energy Price Guarantee removes some of the incentive for households and businesses to manage consumption more carefully in the short-term. However, there is no doubt the government needs to intervene to manage end-user prices.

The UK’s target to become a net exporter of energy by 2040 can be viewed positively. But the government has so far focused just on increasing oil and gas production and has pinned at least some of its hopes on shale gas, which faces too many political, technical, economic and funding headwinds to make a material impact.

Without the underlying detail, the target could simply muddy the water for the UK’s net zero ambitions, without providing investors with the clarity and confidence they require. Renewables, hydrogen, CCUS, electrification and efficiency are the most critical components for net zero and self-sufficiency ambitions. As the plan is fleshed-out over the next two months, there needs to be clarity on incentivising and accelerating capital allocation into these spaces. Doing so would take the UK closer to its ambition to become a net energy exporter by 2040.

UK energy production by source (AET-1.5 outlook)



Source: Energy Transition Practice

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