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SPE Aberdeen Evening Dinner Meeting

Dave Moseley, Westwood Global Energy

November 2019





Unlocking Future UK Production

- Setting the scene - a reality check
- Corporate landscape - who holds the value?
- How much discovered but unproven potential exists?
- Can exploration drilling add sufficient future resources?
- Conclusions



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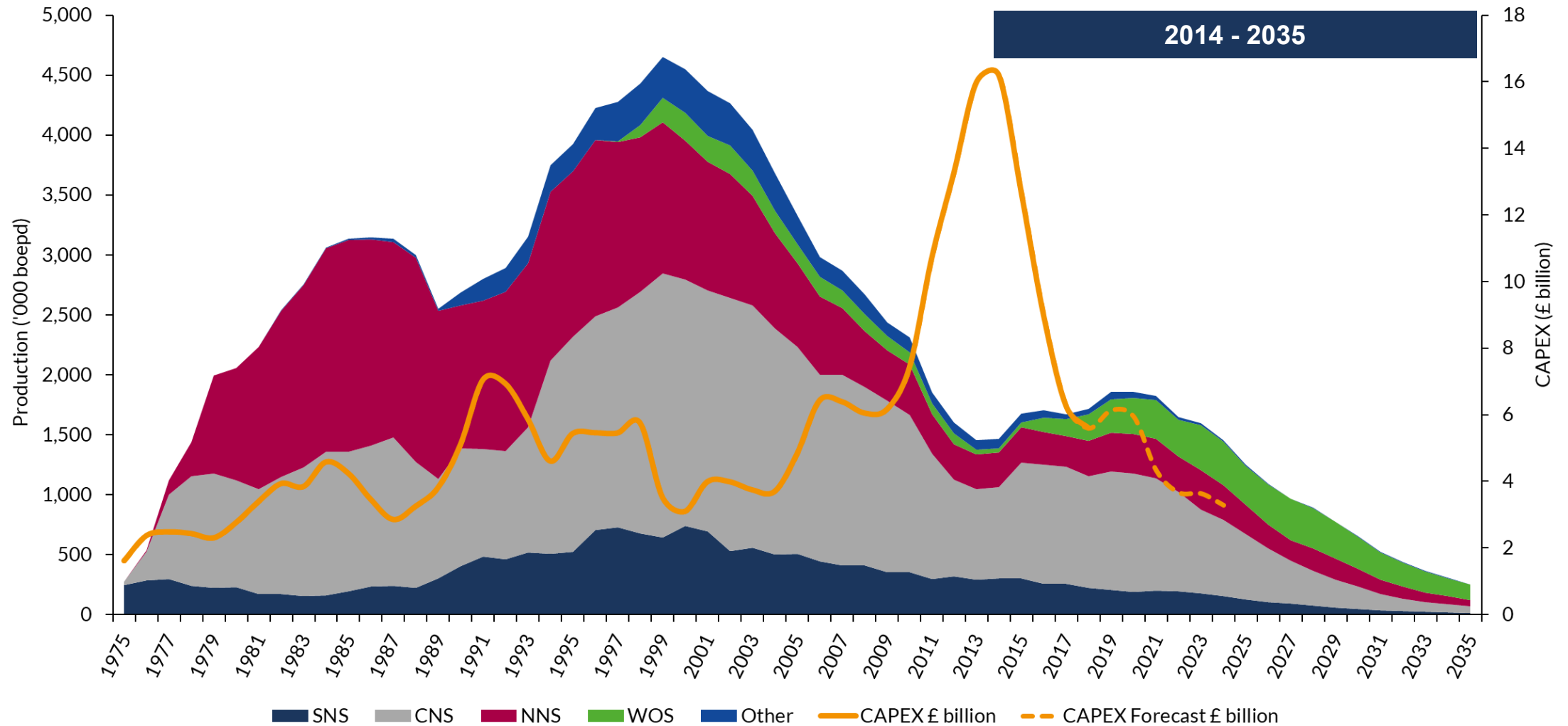
Setting the Scene - A Reality Check

UK Production and Capex

Riding the third wave of production



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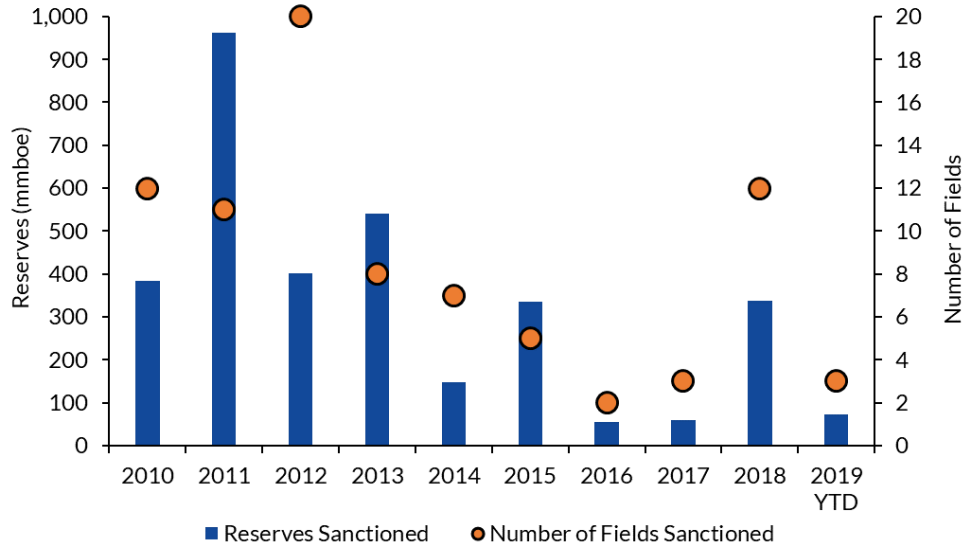
UK Developments Sanctioned 2010 - 2019

Drop in material project sanctions post-crash

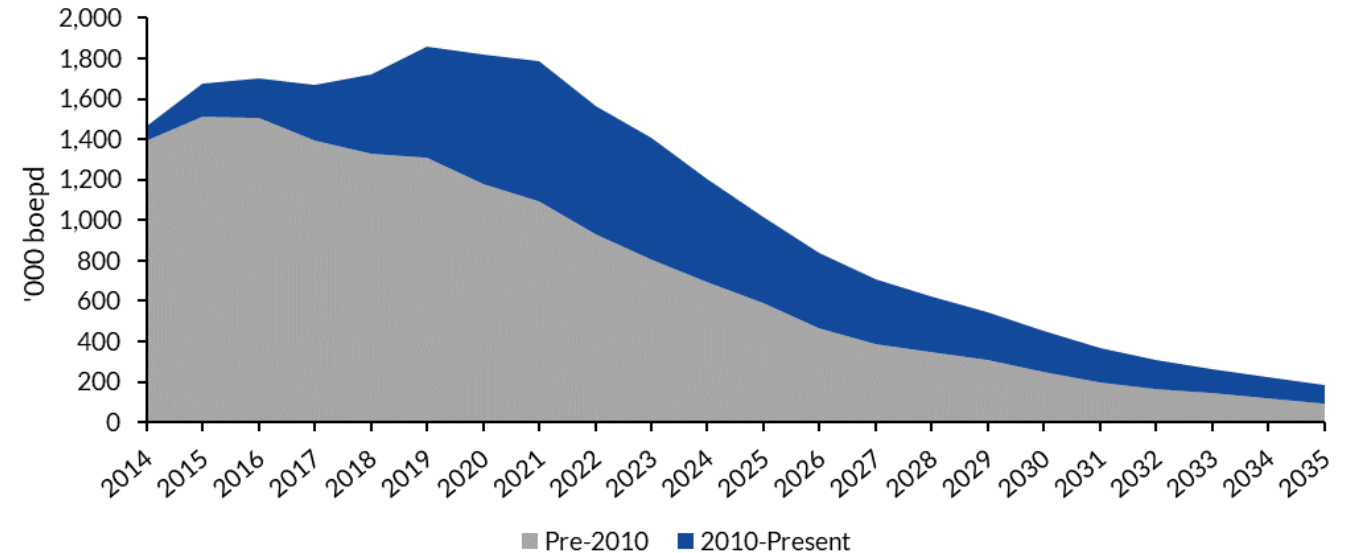


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Reserves Sanctioned per Annum



Production by Sanction Pre- and Post-2010



- 2.4 bnboe reserves sanctioned 2010 - 2014 has driven the recent production uptick
- A lack of material projects since the price crash means output will fall rapidly from next year

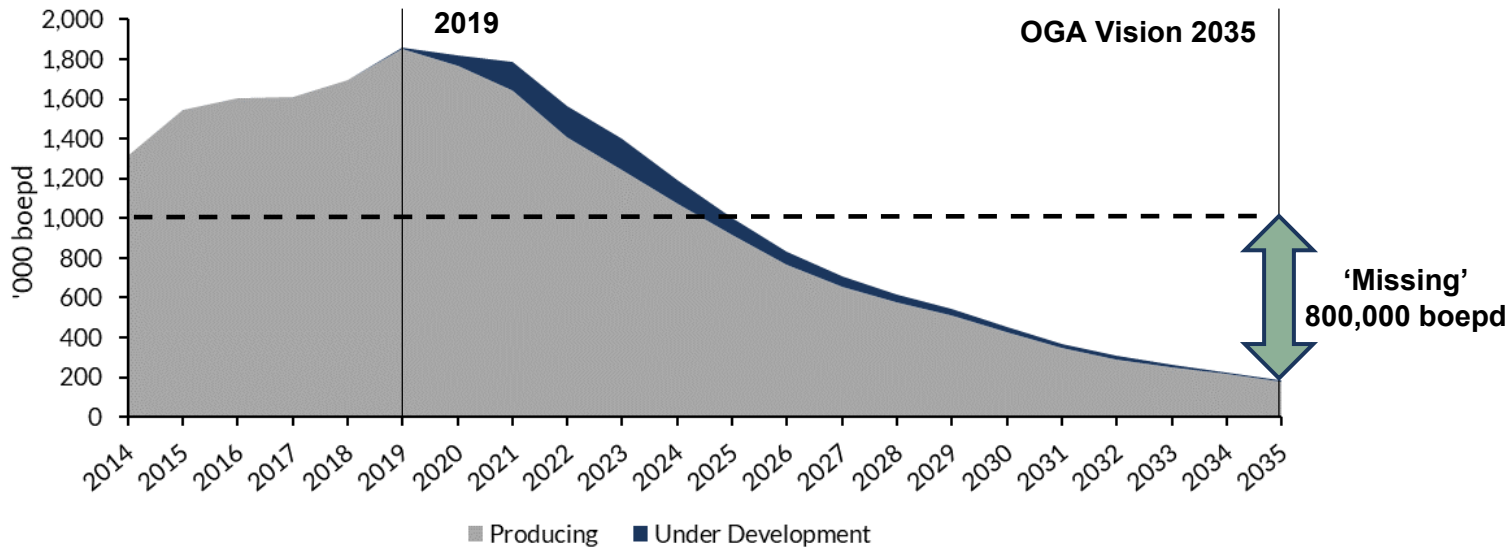
UK Production and Reserves 2014 - 2035

Production will decline as field size drops and reliance on tie-backs increases



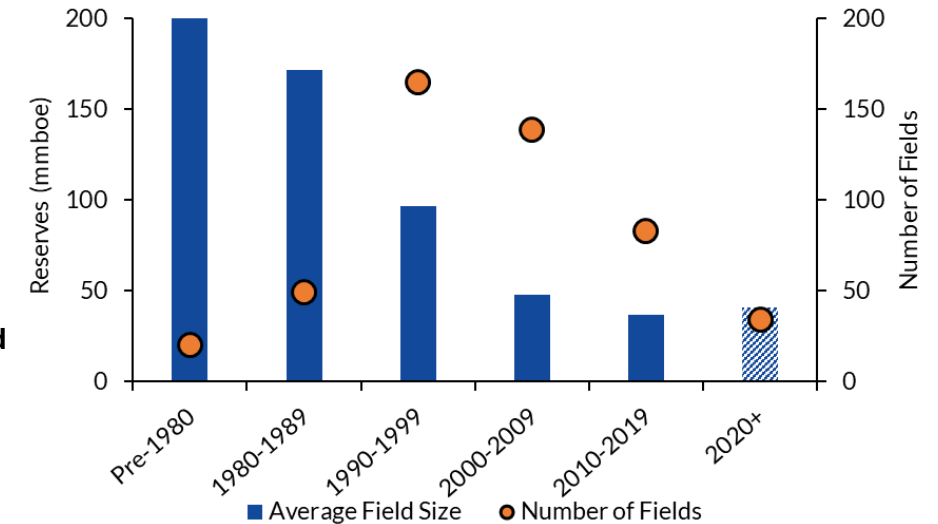
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Current Production from 2P Reserves

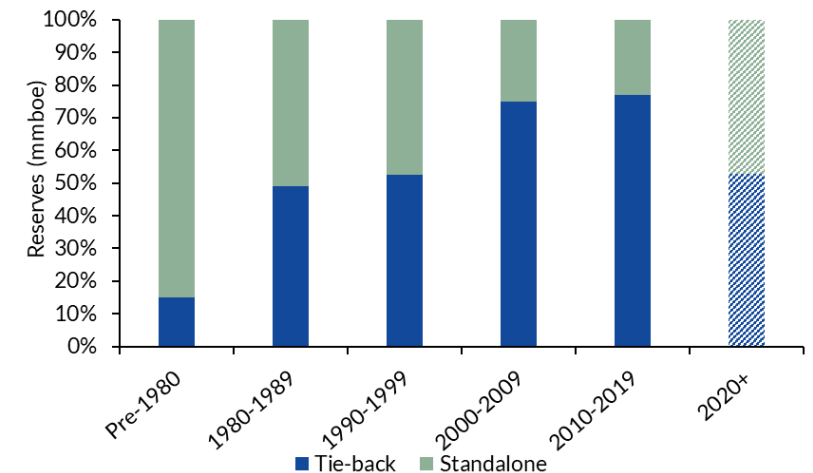


- 'Do nothing' delivers c. 180,000 boepd in 2035. 'Missing' c. 800,000 boepd additional production will need to come from a combination of:
 - MER – *but who is responsible and where is the value?*
 - Moving contingent resources to proven reserves – *how much discovered but unproven potential exists?*
 - Exploration drilling – *can this add sufficient future resources?*

Average Field Size by Decade



Development Concept by Decade





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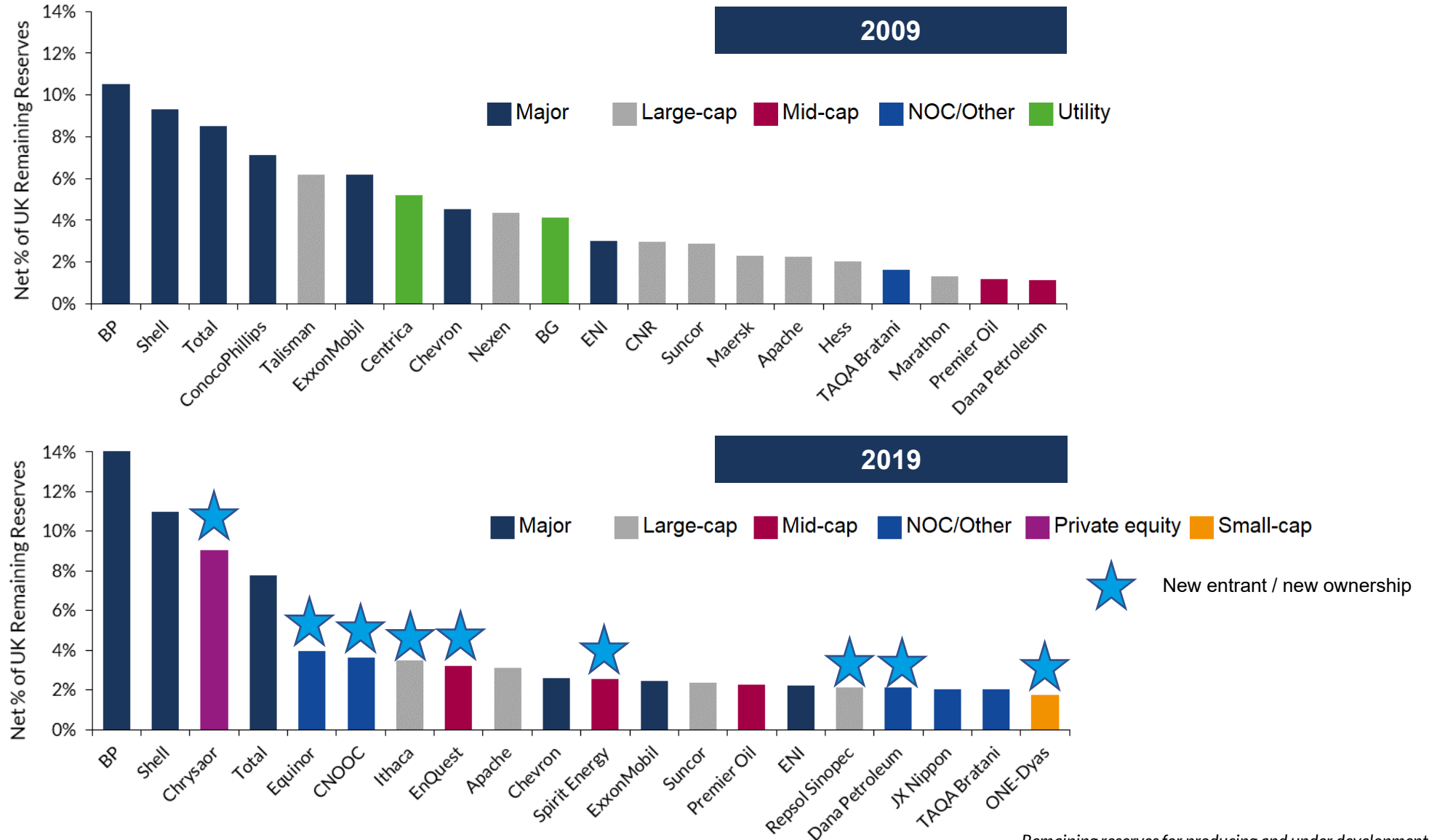
Corporate Landscape

Corporate Changes

Changing of the guard with five new entrants to the top ten in the last decade



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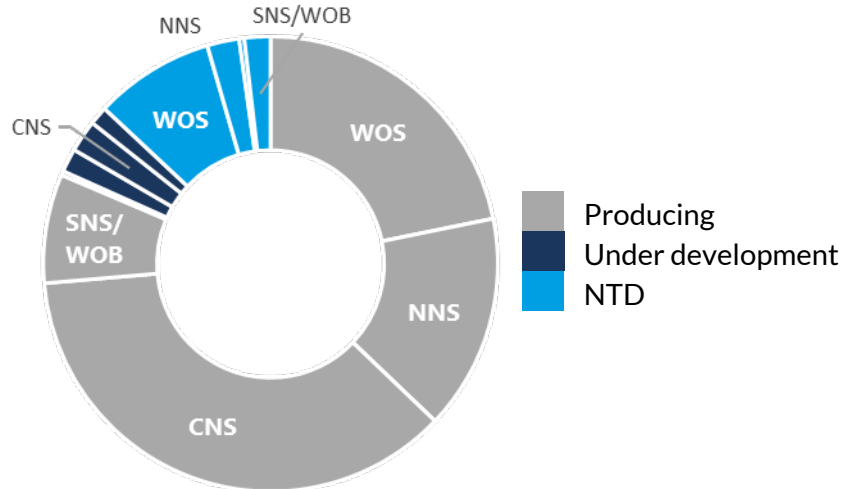
Where is the Remaining Value?

CNS holds the highest value but short-lived; West of Shetland holds the long-term value

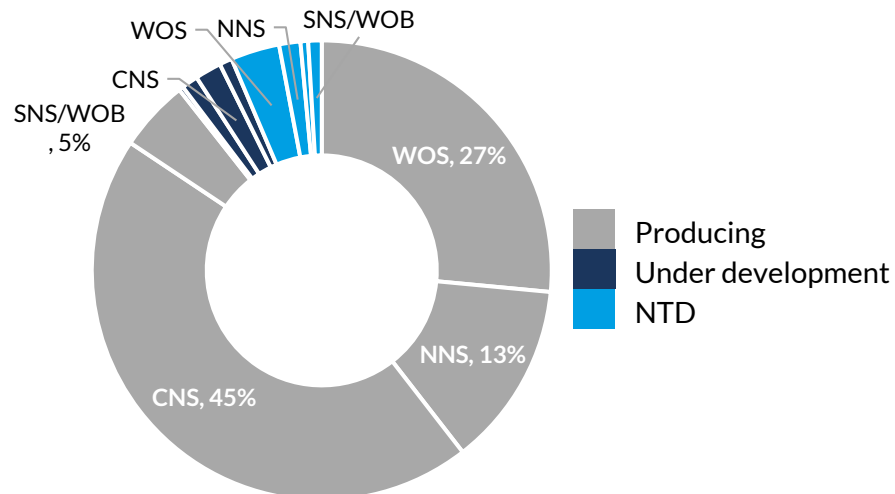


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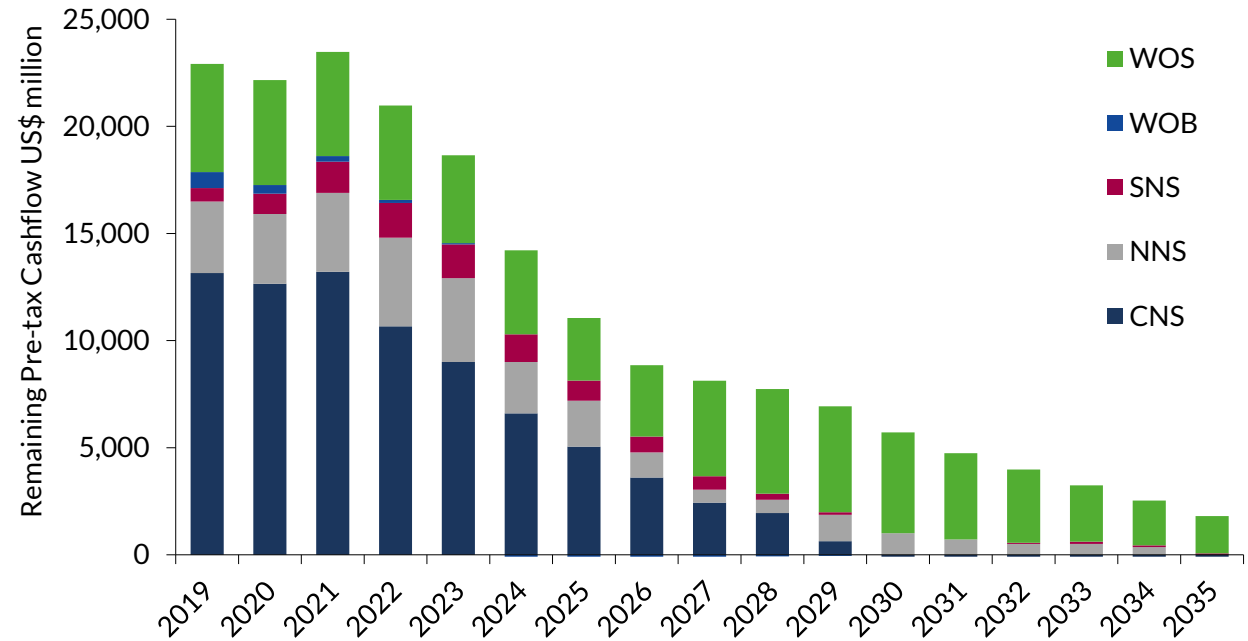
Remaining Reserves by Status – 6.9 billion boe



Remaining NPV10 by Status



Pre-tax Undiscounted Cashflow by Area



- 89% of remaining pre-tax value lies in producing fields
- Basin will generate 60% of this value (undiscounted) within five years
- By 2030 West of Shetland will hold >80% of remaining pre-tax value (undiscounted)
- Long term value eroded by increasing abandonment activity in the North Sea

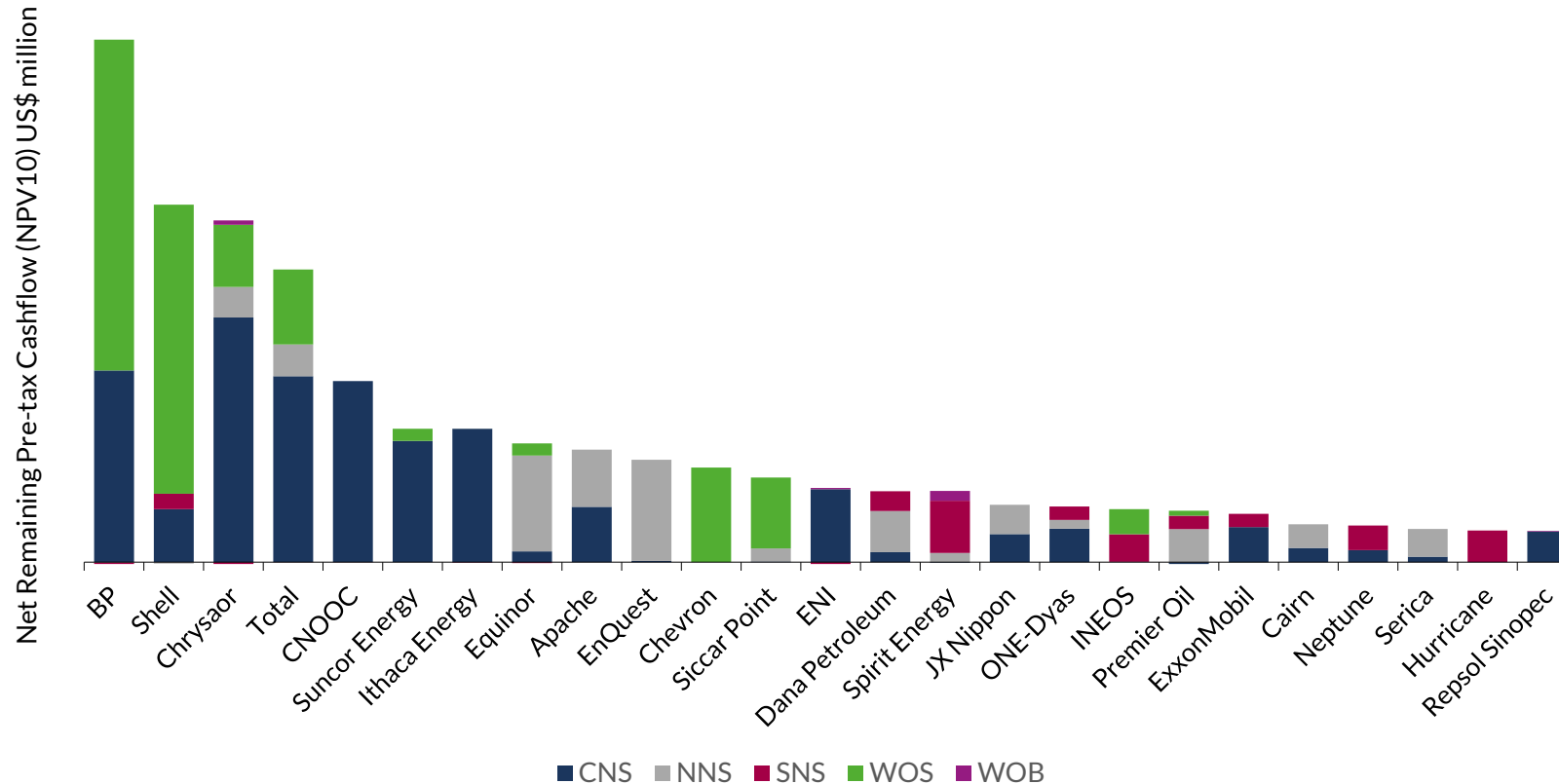
Who Holds the Remaining Value?

Nearly half the remaining value is held by four companies

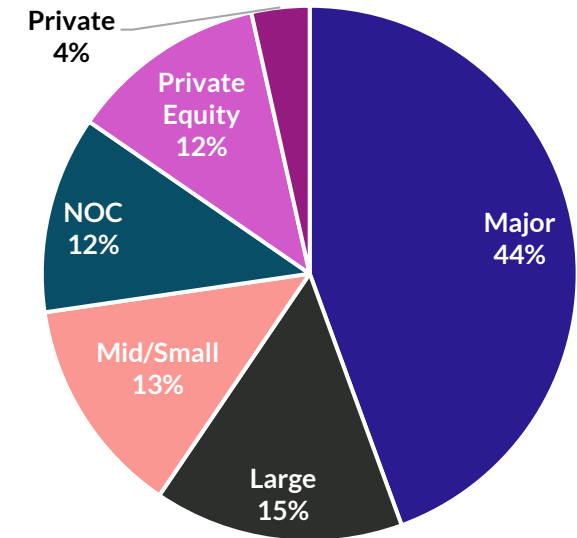


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Top 25 Companies by Remaining Value (NPV10)



Top 25 Companies by Corporate Type



- Top 25 companies hold 90% of the value. A long tail of 30+ companies make up the remainder



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Contribution from Undeveloped Discoveries

Commercial Discoveries

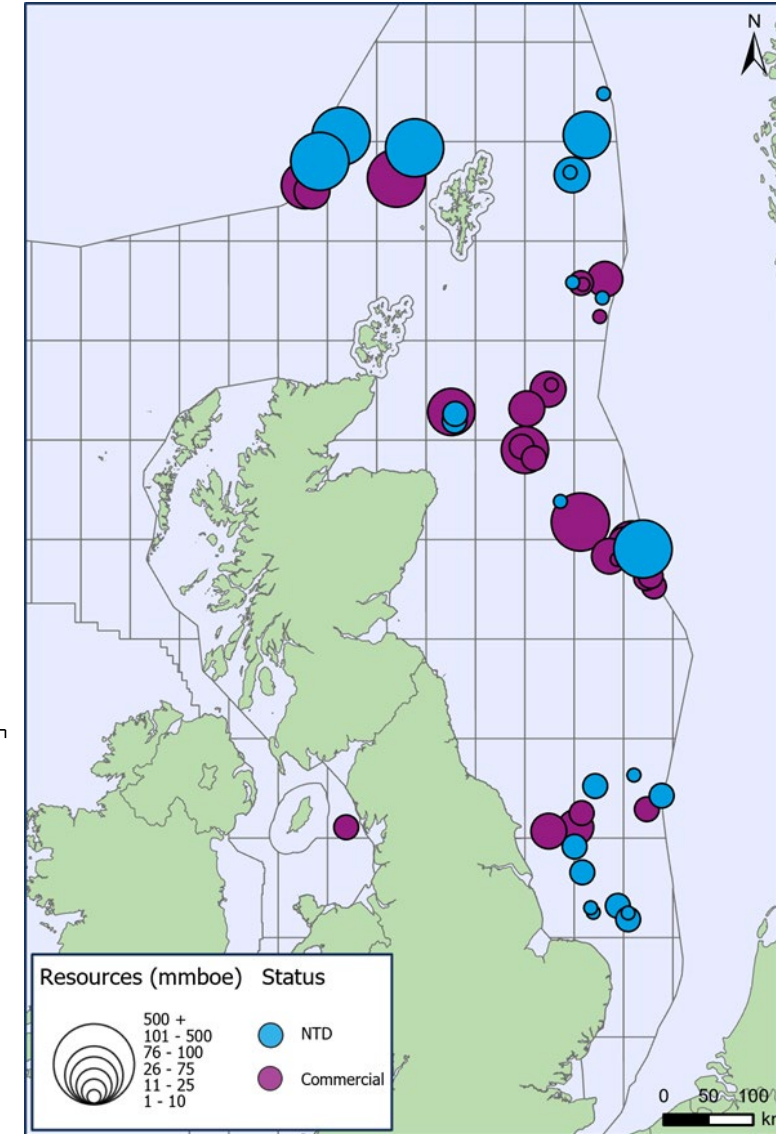
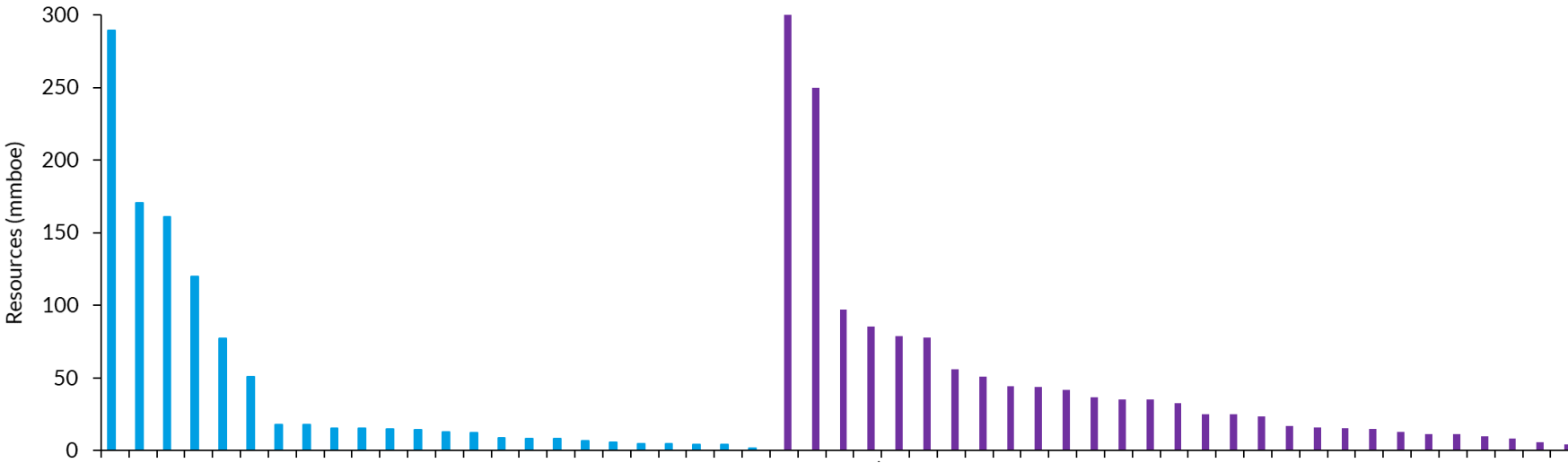
2.5 bnboe of pre-sanction commercial resources



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NTDs - 1 bnboe

Commercial Discoveries - 1.5 bnboe



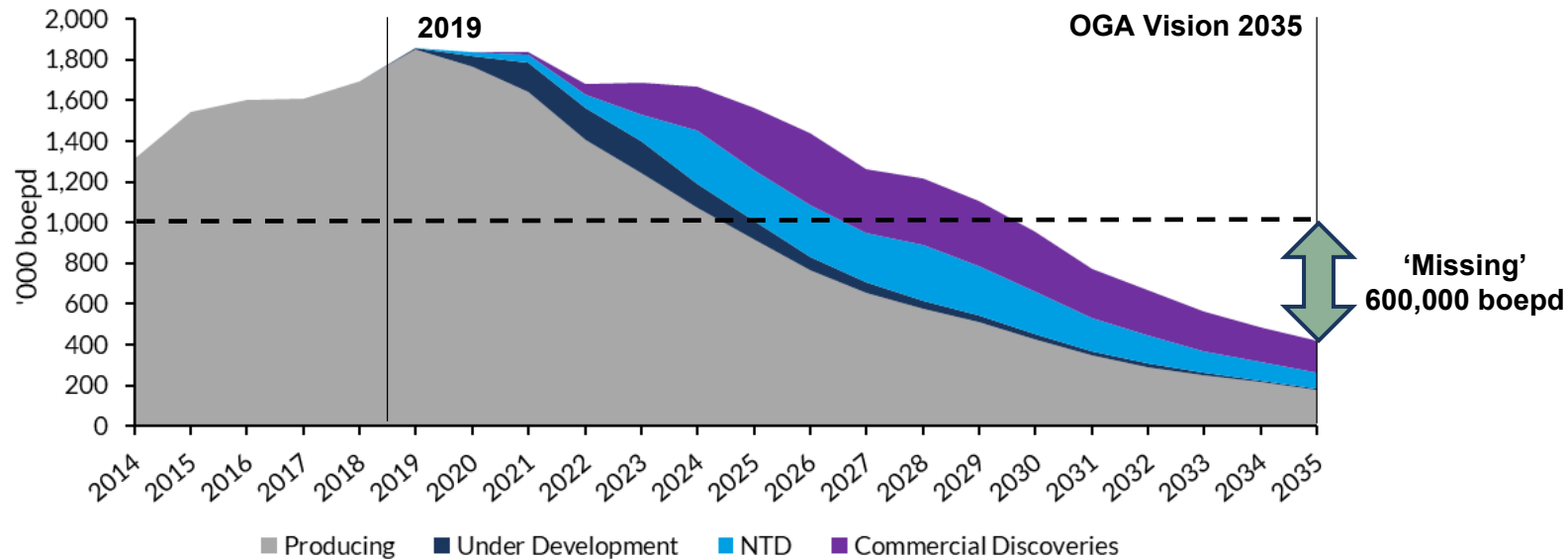
Current Production Forecast

Vision 2035 is unachievable based on current projections

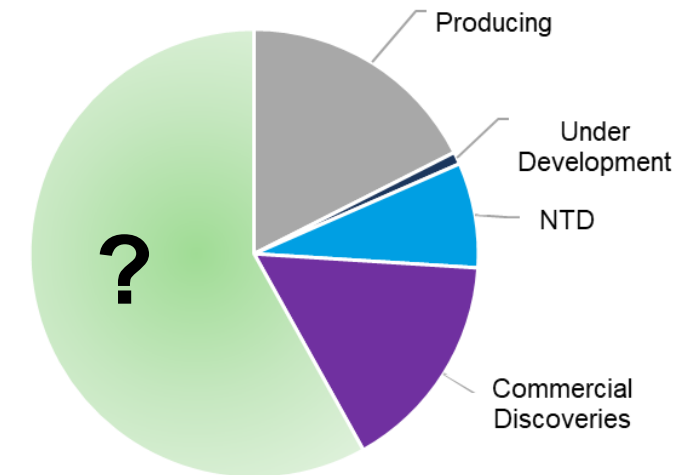


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UKCS Production Profile 2014 - 2035



UKCS Production Split by Status in 2035



- NTDs and commercial discoveries could add c. 230,000 boepd in 2035
- This potentially reduces the gap to c. 600,000 boepd of additional production required to meet the 2035 target

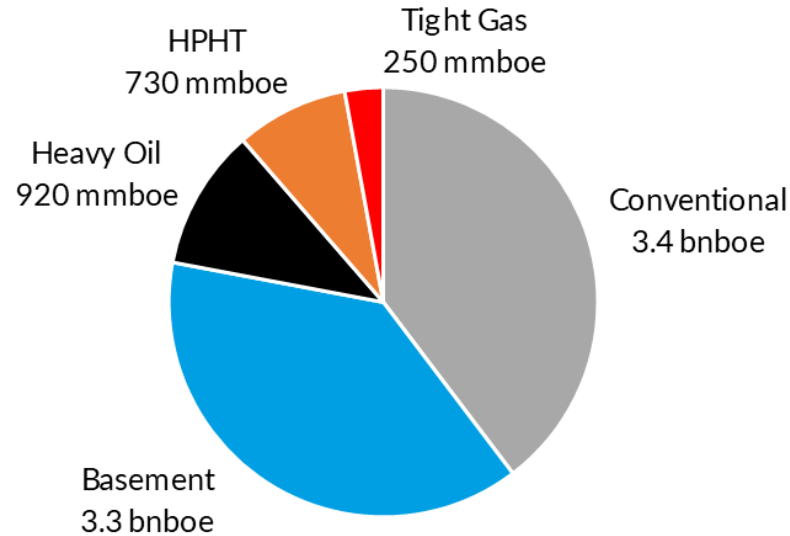
Technical Discoveries - Summary

8.5 bnboe discovered resources in over 400 discoveries

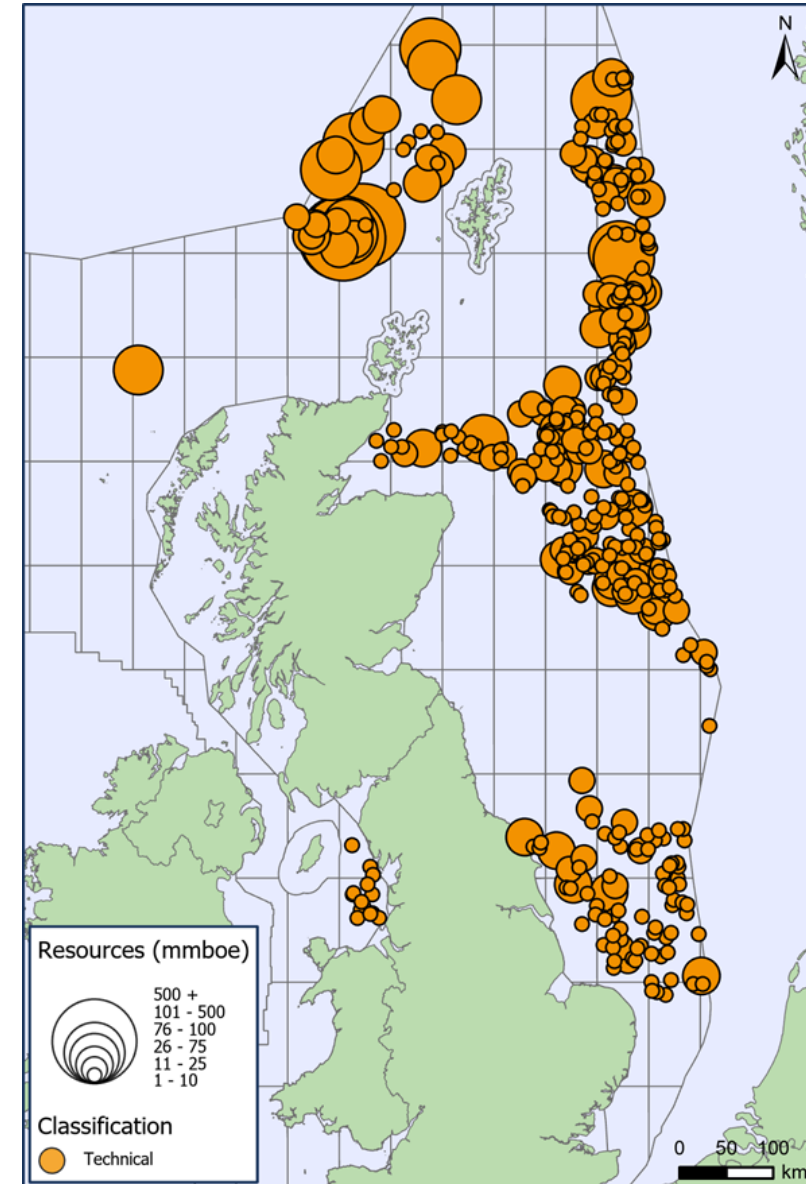


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Technical Discovery Resources (mmboe)



- The modest contribution from commercial discoveries means future production is partially reliant on the technical pool of discoveries
- Based on the pool of undiscovered resources, the UK does not appear to be opportunity constrained...
- One third of resources are 'conventional'



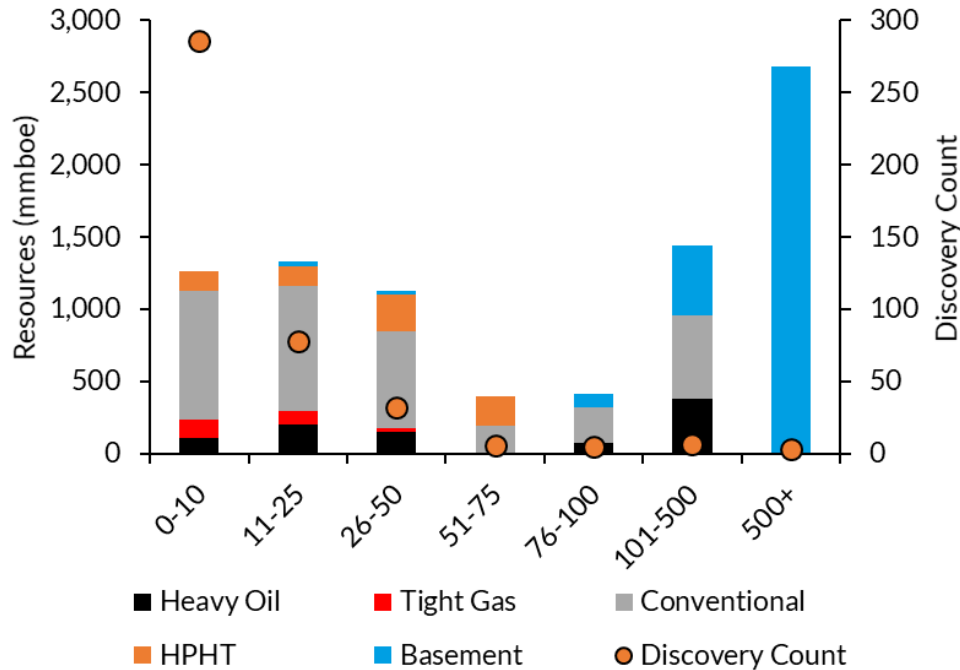
Technical Discoveries - Challenges

Pool of discoveries is either small or is technically challenged

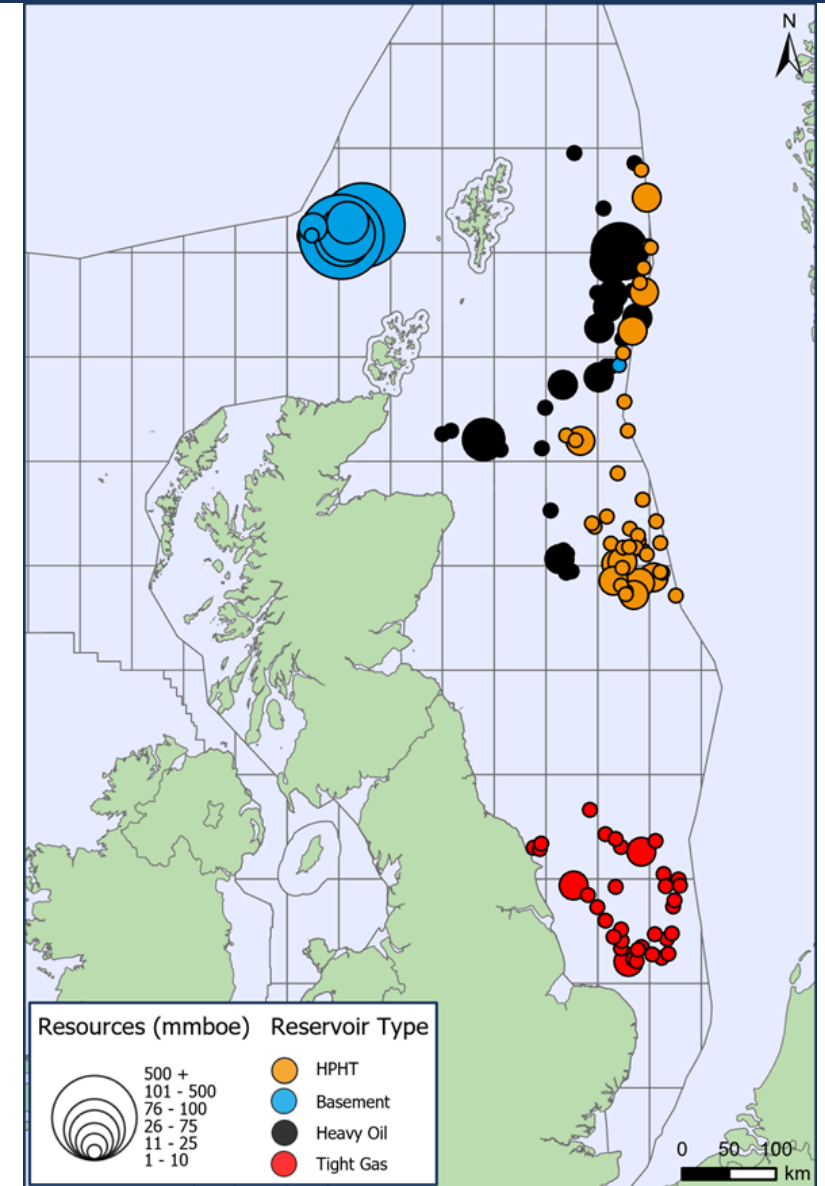


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Discovery Resources by Size and Type



- Size is greatest barrier to development. Nearly 300 discoveries are <10 mmboe
- Much of the material volumes are technically challenging
- Success of the basement play West of Shetland will have by far the biggest impact on the pool of technical discoveries



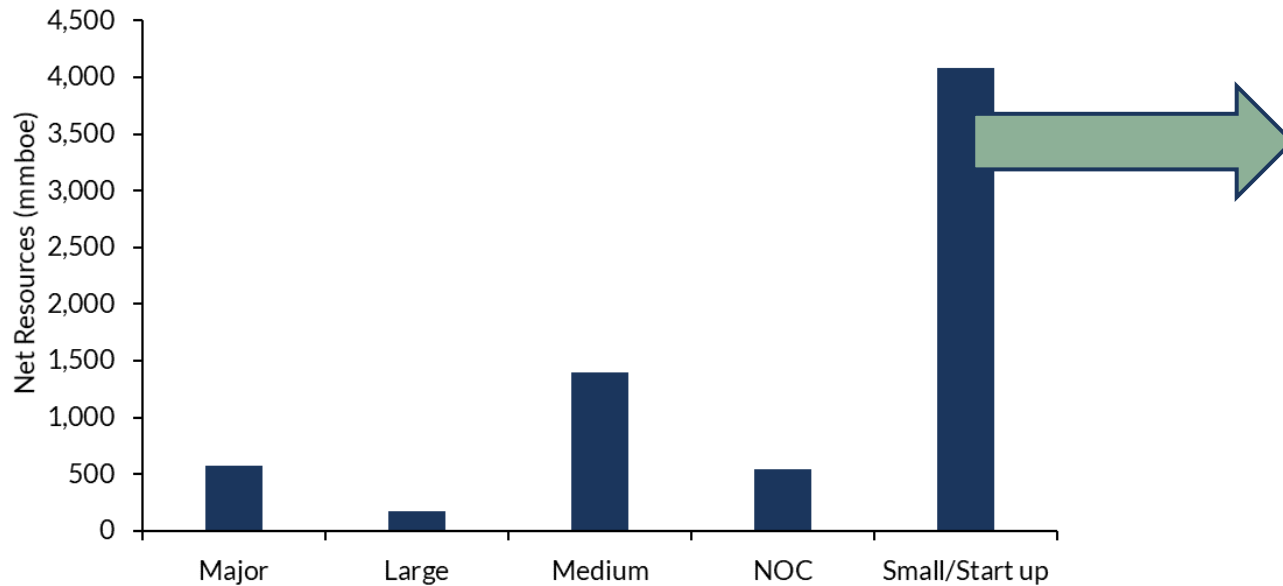
Technical Discoveries - Ownership

Dominated by small and start-up companies

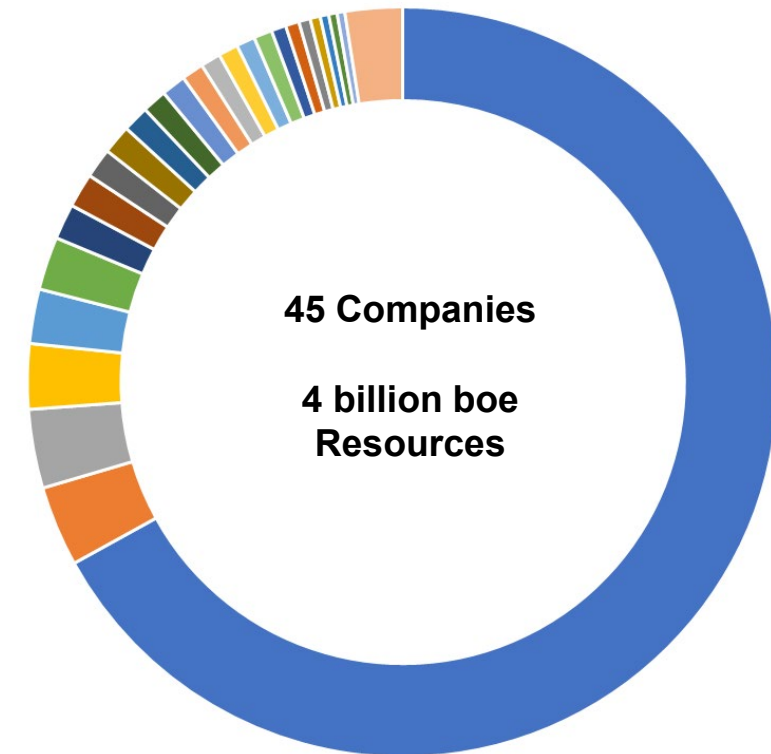


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Net Technical Discovery Ownership by Company Type



Net Resources for Small and Start-up Companies



- Mix of funding levels amongst the small companies. Many focused solely on individual developments/niche project scoping
- 1.5 bnboe resources is currently unlicensed – an opportunity?



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Exploration Drilling

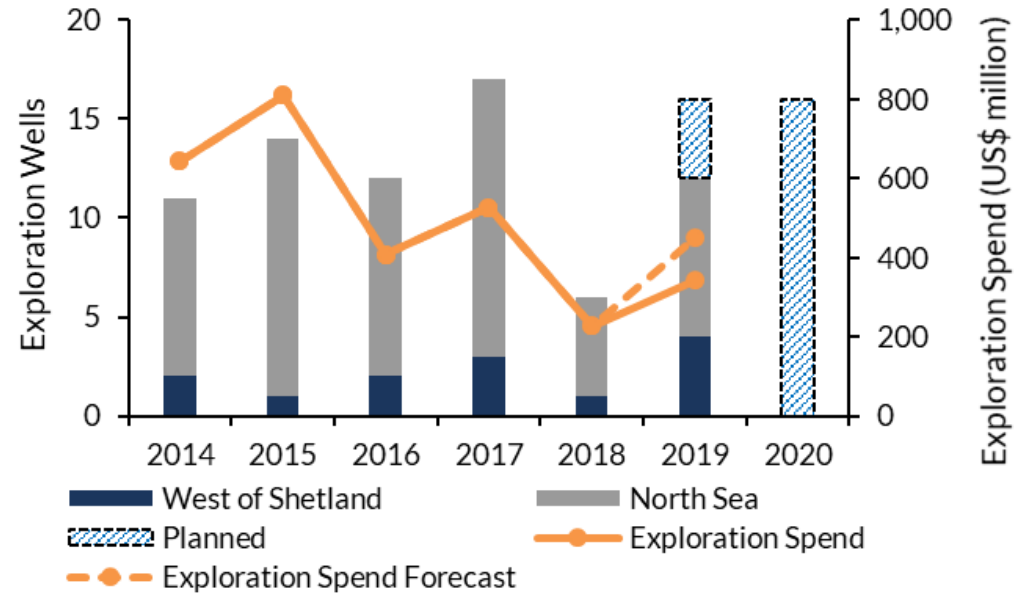
Exploration Activity & Performance 2014 - 2019

Increased activity but reduced performance as ILX drilling has dropped-off

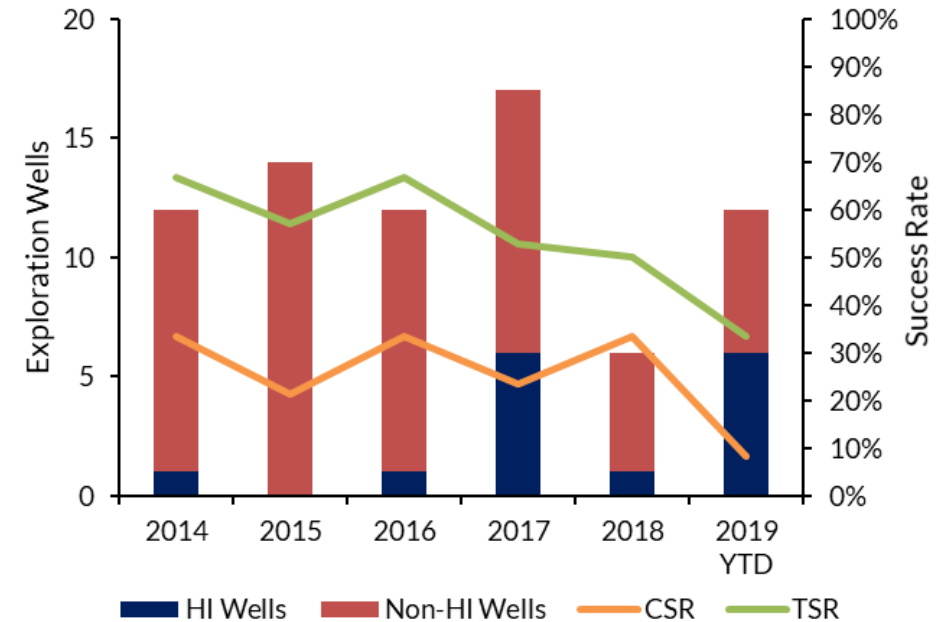


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Exploration Wells and Spend per Annum



High Impact Drilling and Success Rates



- Activity is up on 2018 with increased West of Shetland and high impact drilling
- Activity levels expected to be maintained in 2020
- However, performance in 2019 has been poor <10% CSR

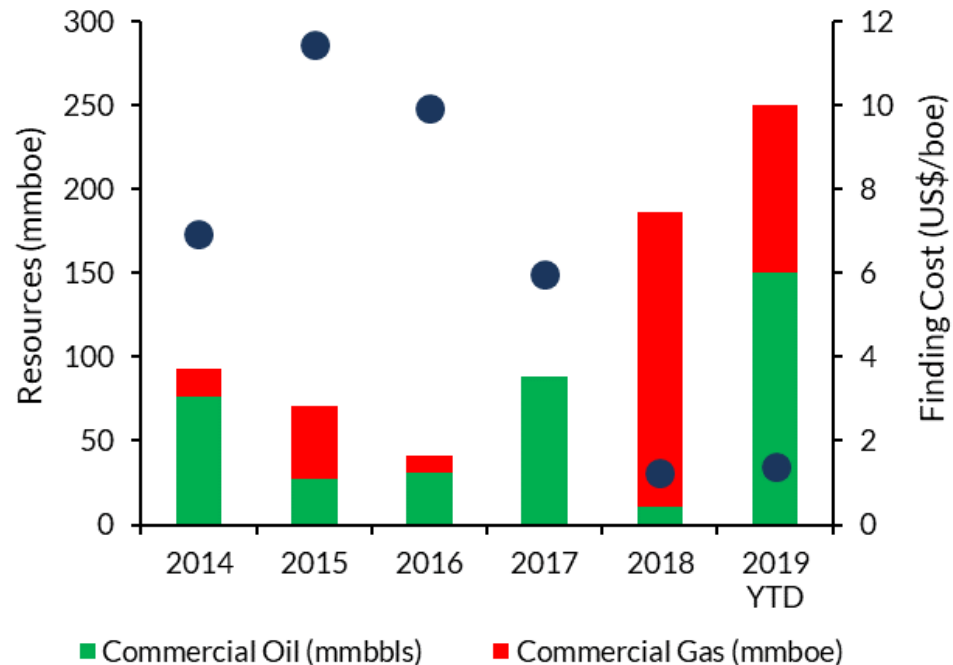
Exploration Volumes 2014 - 2019

Failing to replace production despite an increase in discovered volumes

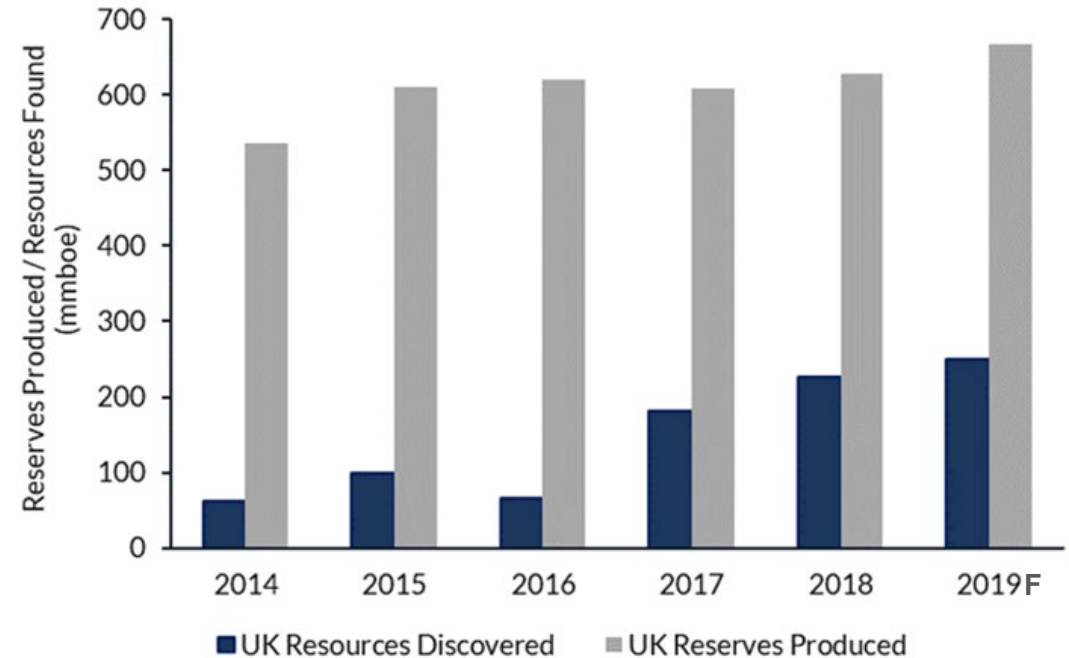


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Discovered Volumes and Finding Cost



Reserves Replacement per Annum



- Most discovered volumes for a decade. However, recent resources dominated by Glengorm (2019) and Glendronach (2018)
- 2014 - 2019 average reserves replacement is c. 25%
- Improvement in volumes found in the past three years increases average to c. 33% since 2017

Exploration Contribution 2014 - 2019

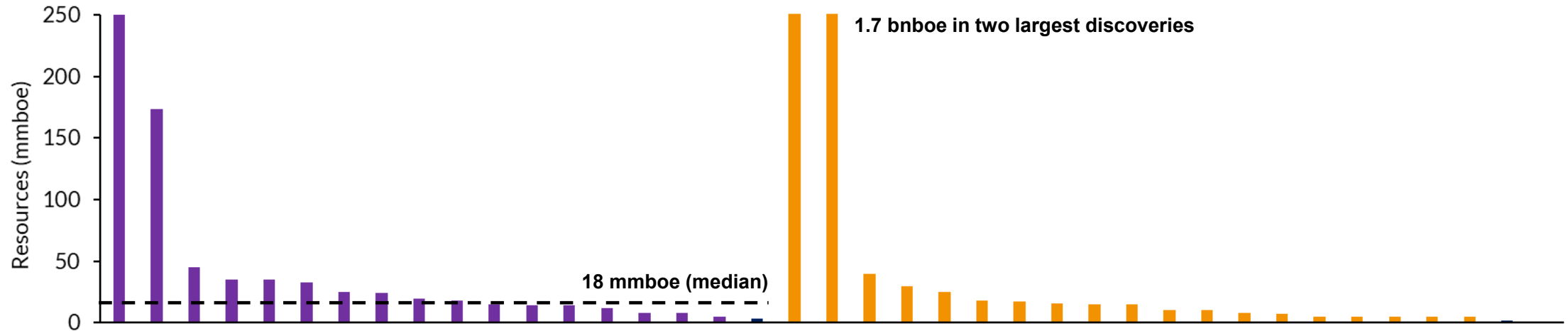
Near-field exploration has delivered mainly small discoveries



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Commercial Discoveries – 740 mmboe

Technical Discoveries - 2 bnboe



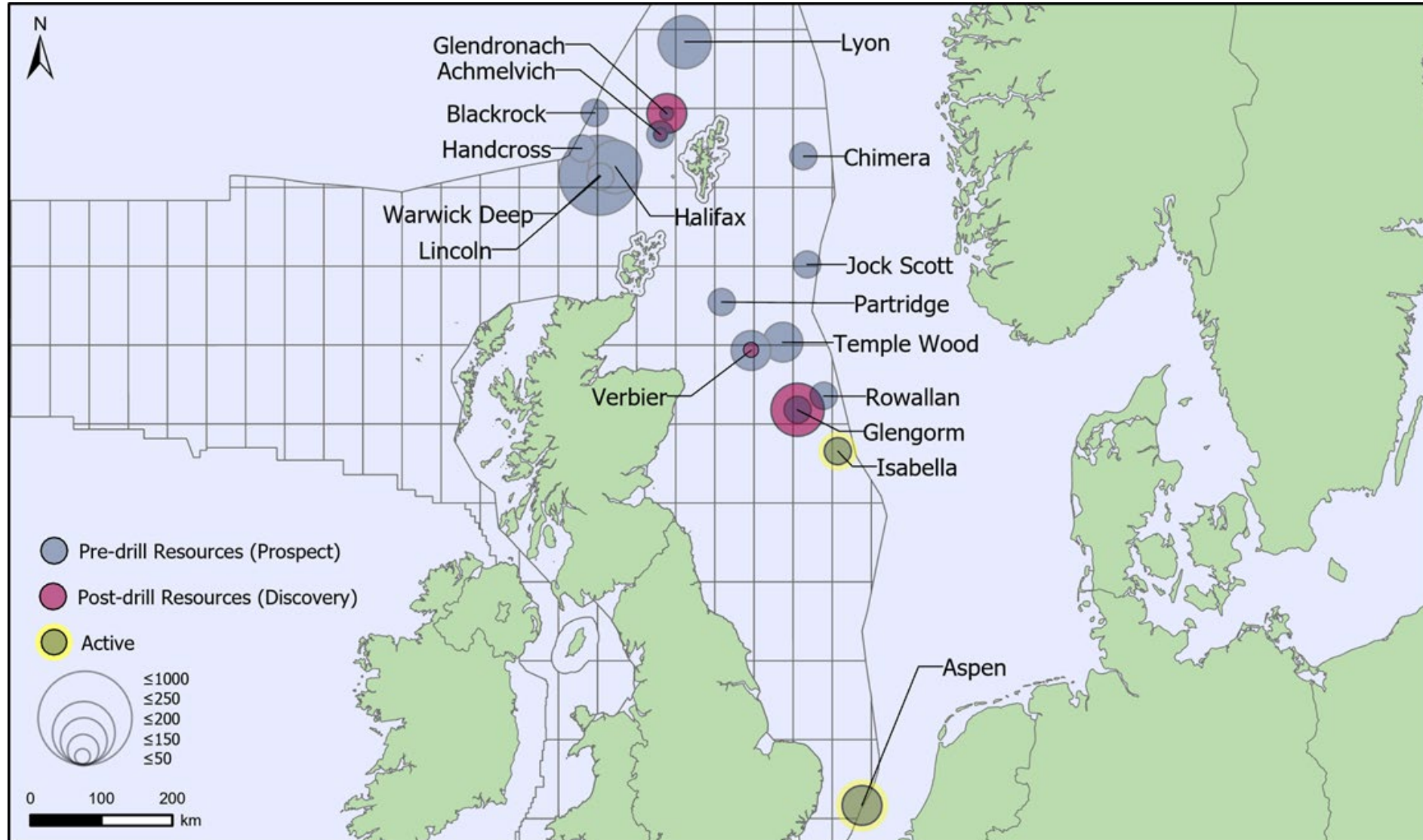
- 2.7 bnboe resources discovered since 2014 dominated by basement. Of this, c. 740 mmboe is considered commercial
- Average (median) commercial discovery size is just 18 mmboe as a result of a focus on ILX drilling
- Exploration is delivering near-field value, but few material discoveries

2014 - 2019: Has High Impact Drilling 'Moved the Needle'?

Increased risk/volume appetite has resulted in lower exploration success rates



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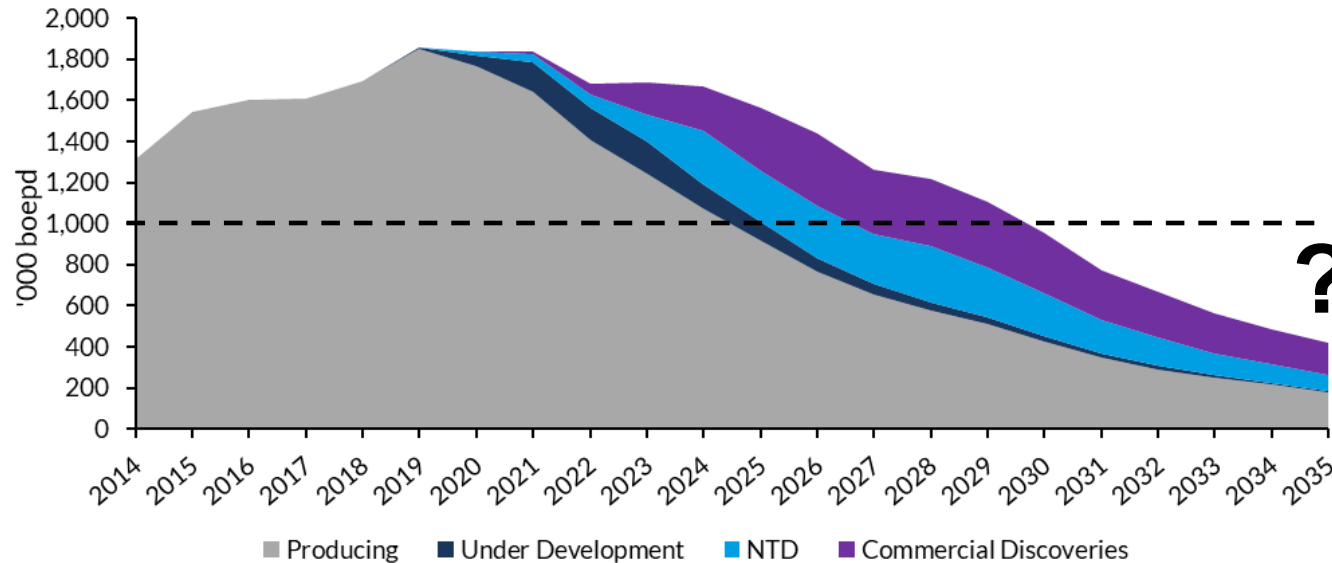
Conclusions

Conclusions

If we start now, Vision 2035 becomes potentially achievable



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- MER from producing assets
- Conversion of contingent resources to proven reserves
- Successful exploration

- A combination of the above will be needed to fill the gap of c. 600,000 boepd to meet the Vision 2035 target
- Main players are not capital constrained, but are they reinvesting enough?
- The small players hold a high proportion of the undeveloped discovery pool. Can they progress it?
- Infrastructure access will be critical to commercialising technical discoveries and influencing future exploration activity to help meet the Vision 2035 target

Infrastructure Access

Capturing future potential is becoming a race against time



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