



Resources to Reserves in the United Kingdom

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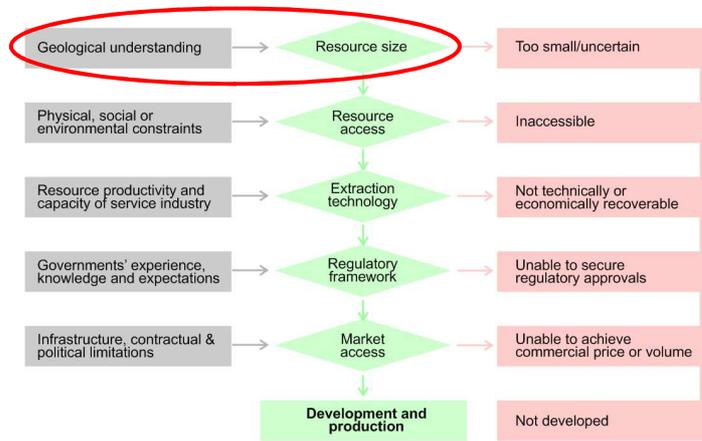
British Geological Survey, Edinburgh, UK

How to estimate shale gas resources

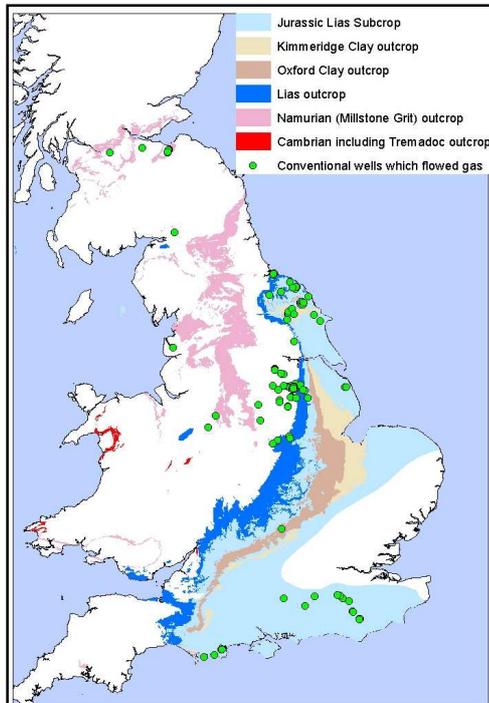
- **In-place resource estimates** based on a geological model, volumetrics and gas contents ('**bottom-up approach**'), and
- **Technically recoverable resource estimates** based on well technology, well performance, well density ('**top-down approach**')



Factors determining the viability of natural gas developments (IEA 2011)



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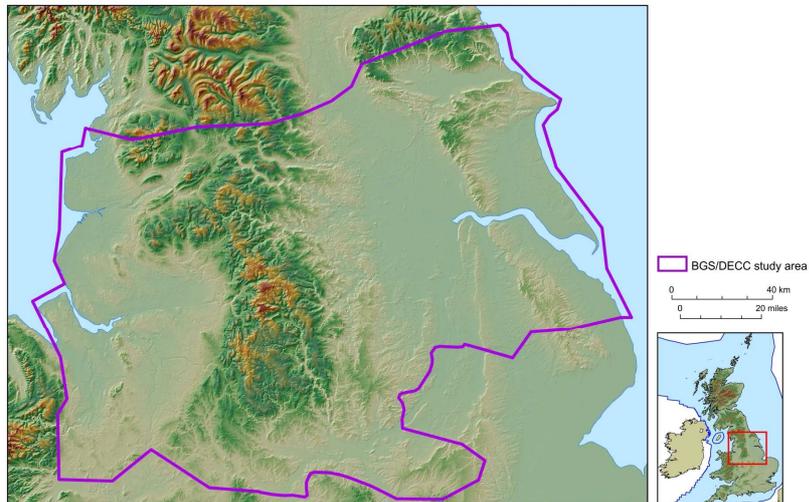


No commercial production in Britain –

but there is tremendous interest

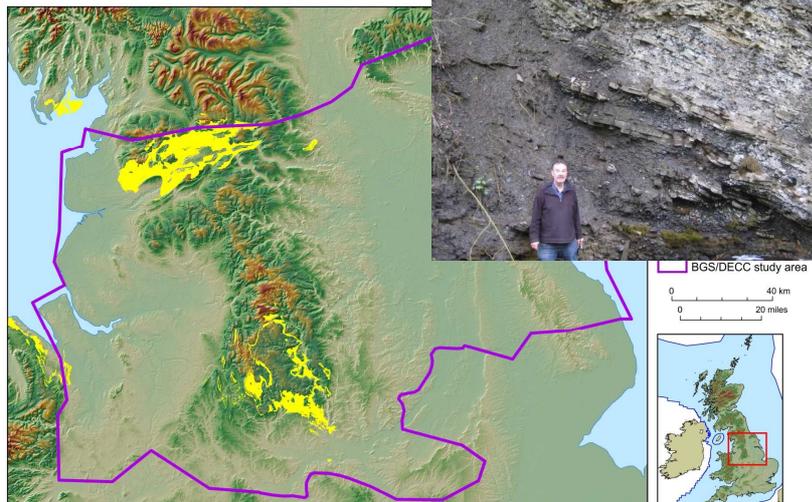


“Bowland Shale” study area and data sources



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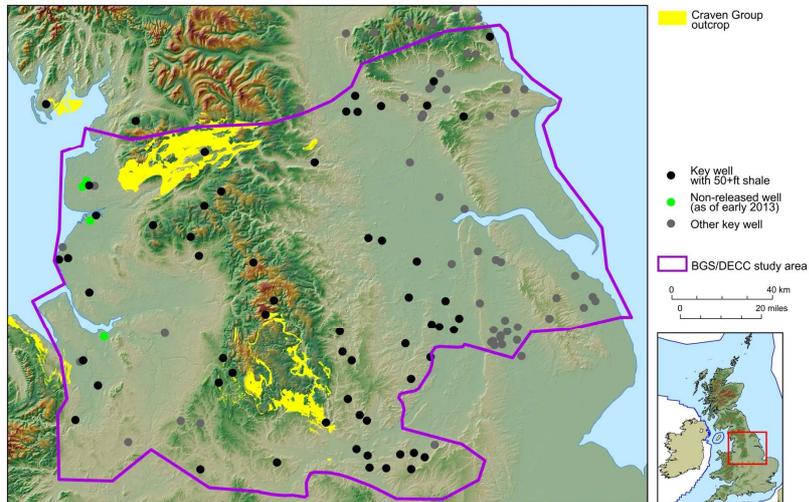
“Bowland Shale” study area and data sources



Outcrop studies

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Data sources

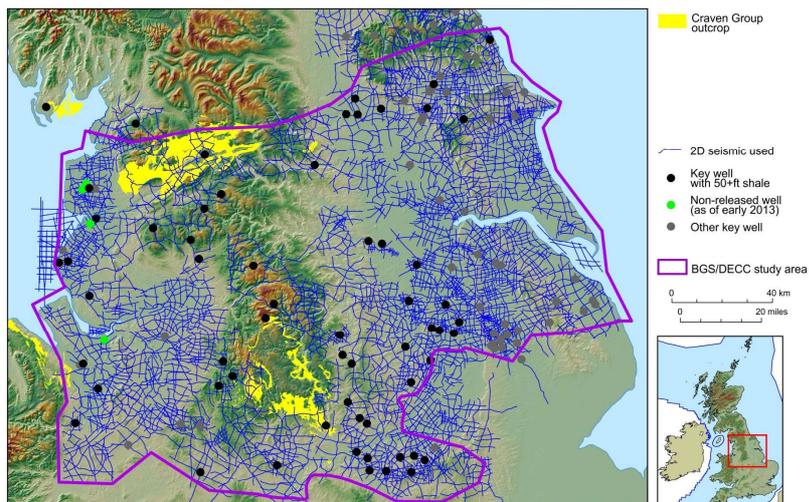


Outcrop studies, 64 key wells

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Data sources

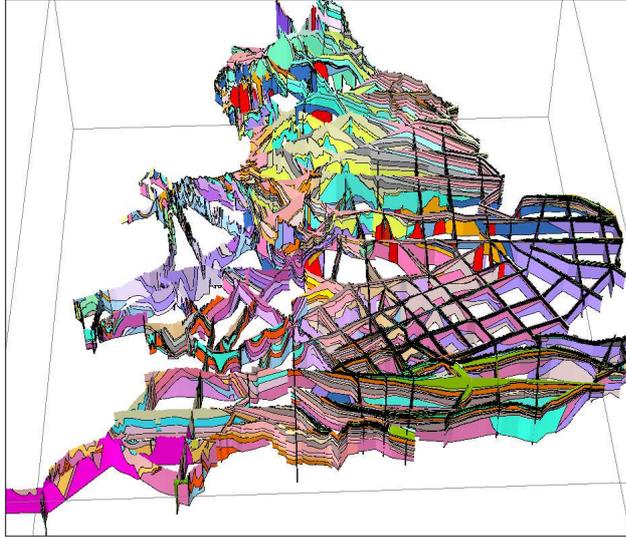


Outcrop studies, 64 key wells, 15,000 miles of seismic data

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National 3D Geological Model

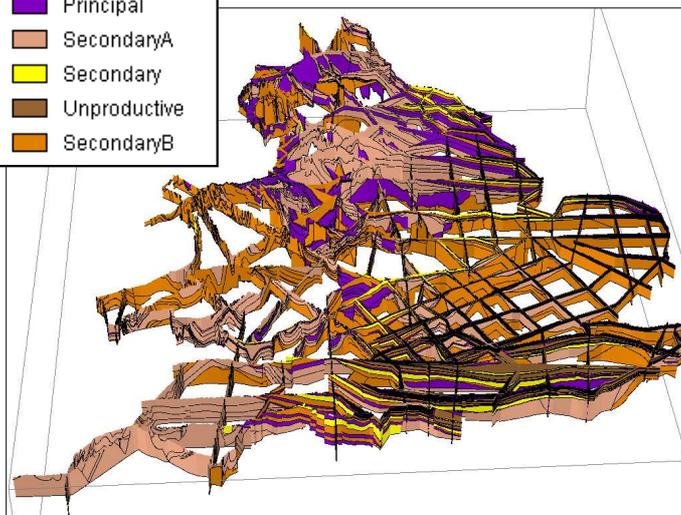
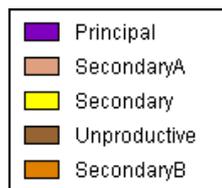


- 84 sections (England & Wales)
- ~12,000 km of section lines
- Sections down to ~5km
- Section spacing ~30km
- 227 rock units included in the model

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National Aquifer Model



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