Oil & Gas Authority

Unlocking marginal fields

UKCS opportunity

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2 February 2017

UKCS – the big picture

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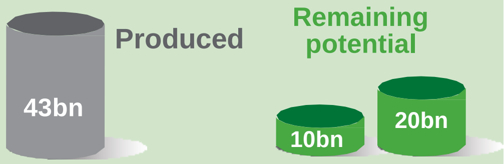
Infrastructure

5,000+ wells
250+ subsea systems
3,000+ pipelines
250 fixed installations

Resources



Source –OGA

Oil and Gas Revenues

~£20bn gross revenue

>£330bn corporate taxes since UKCS began

Source – Oil & Gas UK

Production (boepd)

2014	1.4 million
2015	1.6 million
2016	1.65 million

Source – OGA and Oil & Gas UK

Developed

6.3bn boe

Developed, or under development

Source –OGA

Supply chain

~£30bn turnover

60% UK

40% Exports

Source –Oil & Gas UK and EY

Costs

Unit costs down by nearly 30%

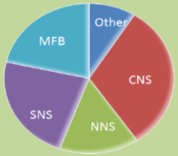
Average unit operating costs have fallen from **£18** per barrel in 2014 to an estimate of **£13** per barrel in 2016

Source –OGA

Unsanctioned Discoveries

3.4bn boe

Currently not being pursued



Source –OGA

Jobs

330,000 jobs in the UK

Delivered through or supported by upstream oil and gas activity

Source – Oil & Gas UK

Active basin with significant future potential

Production and discoveries

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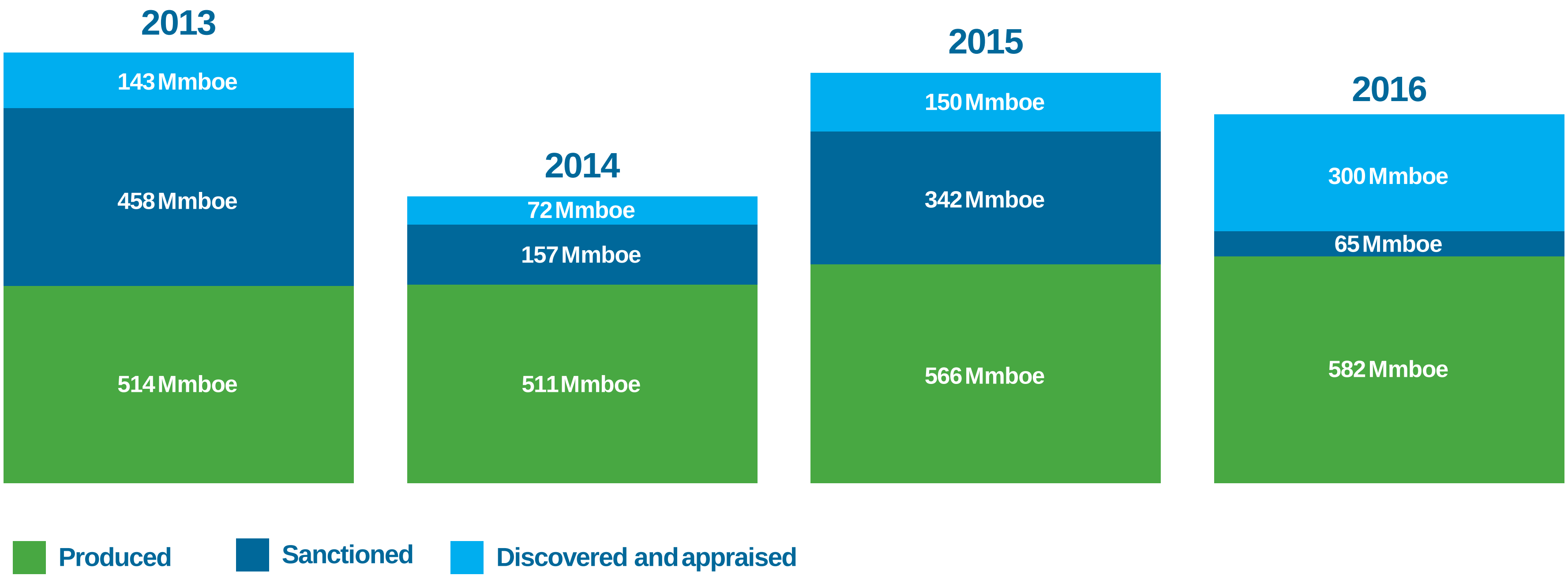

UKCS production increasing but need to sanction reserves

Development plans and decom

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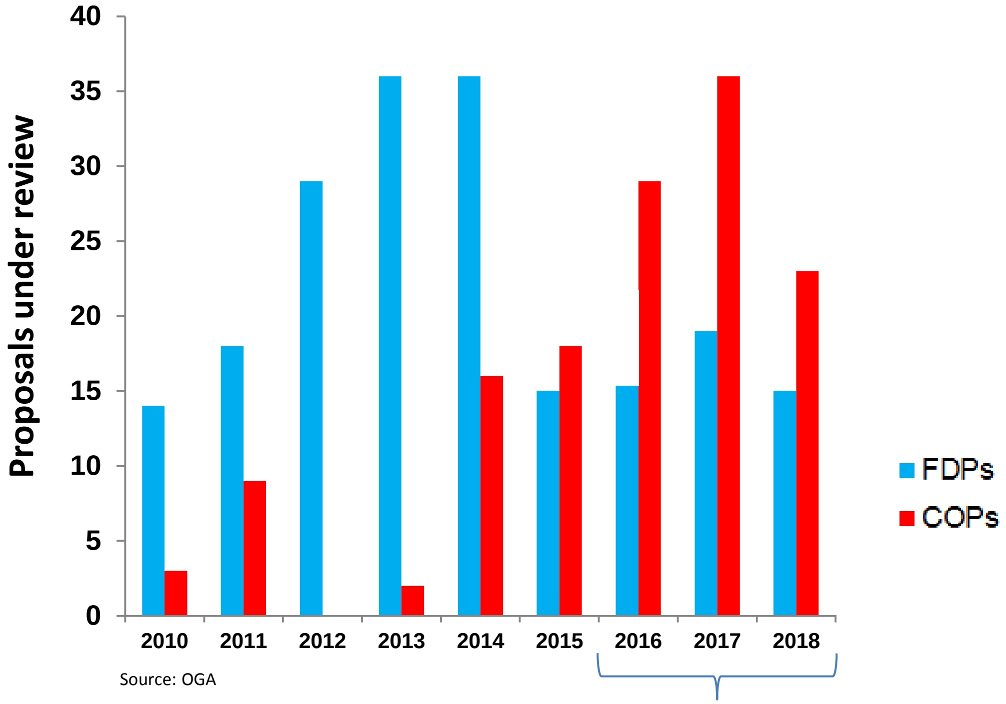

Source: OGA

Project pipeline back to **pre-peak** levels

Post-2016, **50%** of spend is sanctioned

Growing risk of COPs

Source: OGA

Ongoing development discusions but growing risk of COPs

Unsanctioned discoveries

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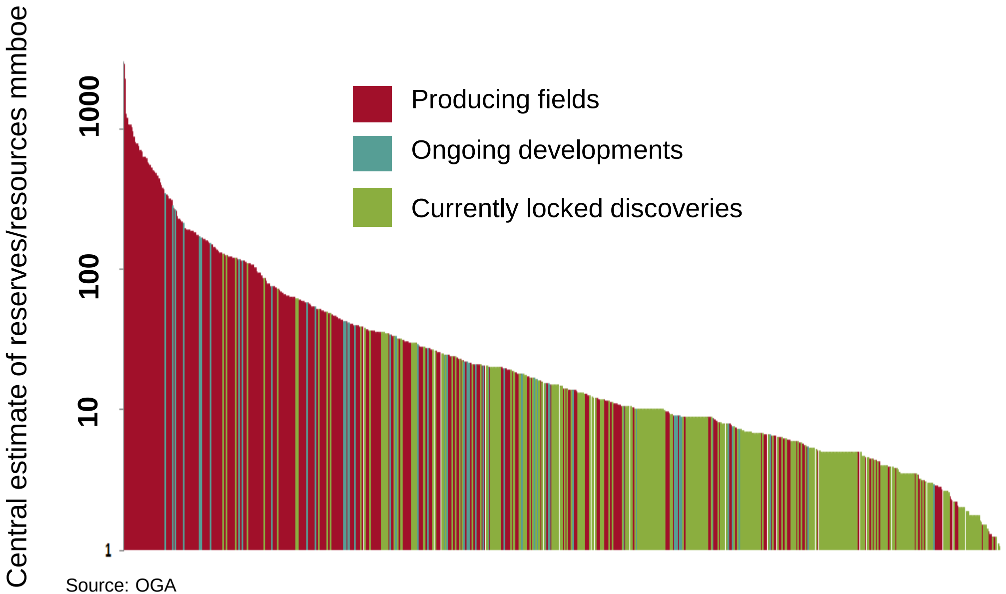
Ca. 350 discoveries, 3.4bn boe technically recoverable



Source: OGA

70% are **small** (<10mmboe)

Various degree of **technical challenge**: e.g. heavy oil, tight gas, HPHT, fluid quality

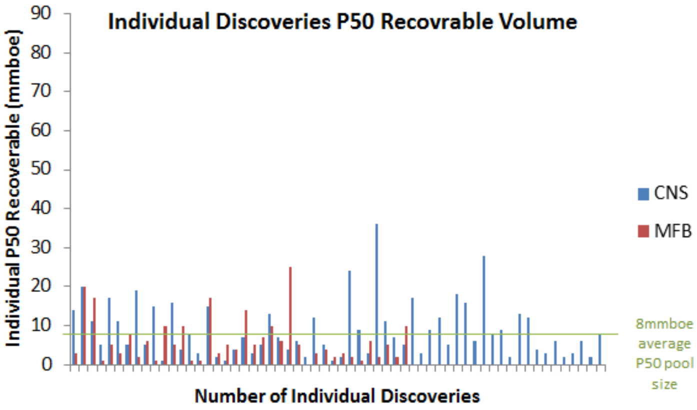
150 discoveries **unlicensed**,
200 have **fragmented ownership**
(>50 operators)

Largest near-term development opportunity in UKCS

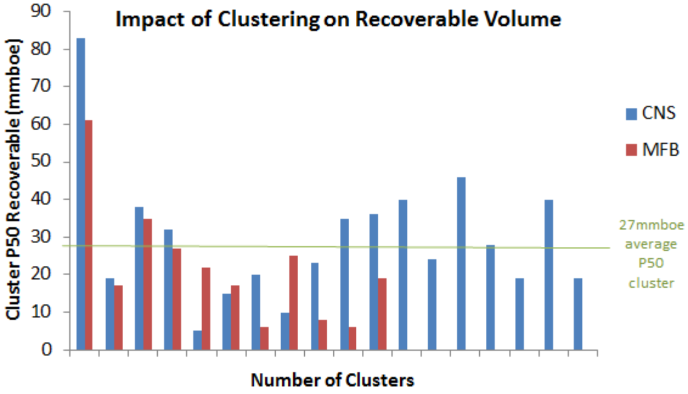
Unlocking marginal fields

1. Clusters and collaboration
2. Infrastructure access
3. Licensing
4. Development efficiencies
5. Technologies

Clusters and collaboration

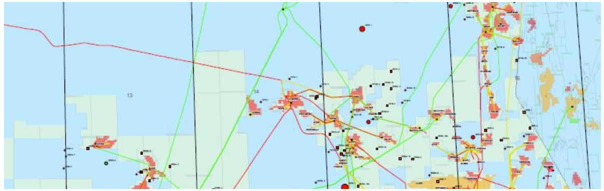


Source – OGA

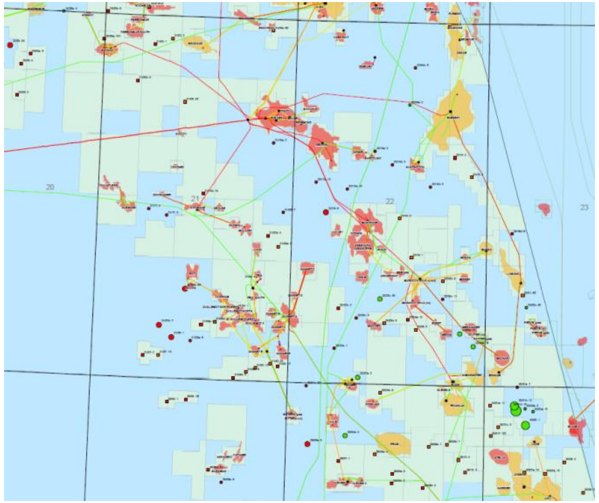


Source – OGA

Moray Firth – 43 discoveries in 11 potential clusters



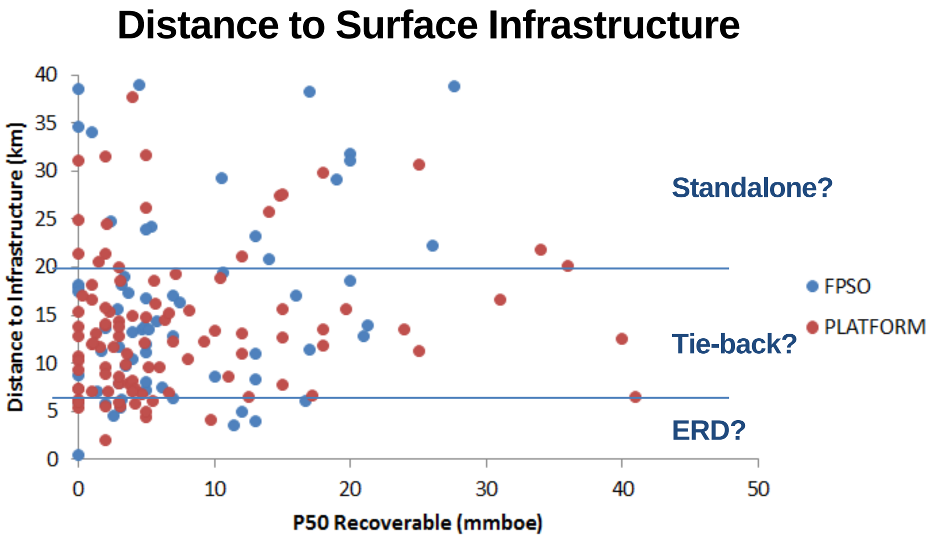
CNS – 64 discoveries in 18 potential clusters



Source – OGA

Significant "clustering" opportunities – Area development plans

Infrastructure access



~30 discoveries potentially suitable for **ERD** (0-5km)

~200 discoveries suitable for **tie-back** (<20km)

~120 discoveries would require **standalone** (cluster) developments

Incremental volumes can **extend life of host infrastructure**

Synergies with existing infrastructure

Licensing

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Alignment of license terms (e.g. expiry, timing of commitments) to induce synergies (exploration and development campaigns)

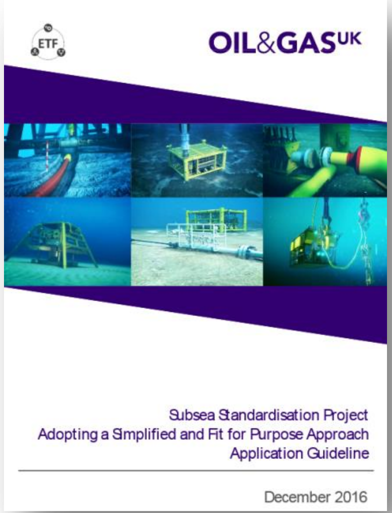
Licensing models (from “cooperation” to “unitisation”) to facilitate joint area development plans

Focus on **relinquished licenses** and mature-area prospectivity as part of the **30th licensing round.** Comprehensive **data packages** on 150 unlicensed discoveries to be published by the OGA

OGA working with license holders and potential new investors

Design and execution efficiencies

- **O&G UK Efficiency Task Force (ETF) initiative**
- **Quick wins**: cost savings of 15-28%



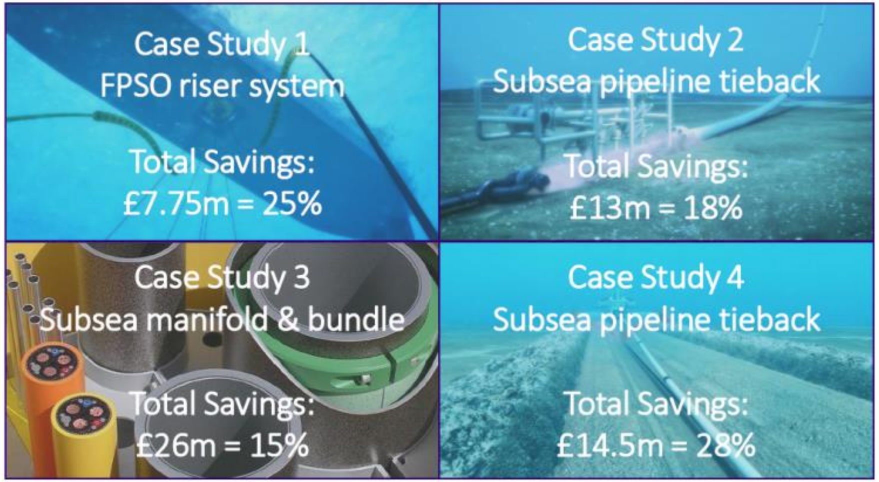


Image Courtesy of Oil & Gas UK

"Lean designs" using industry standards

Immature & new technologies

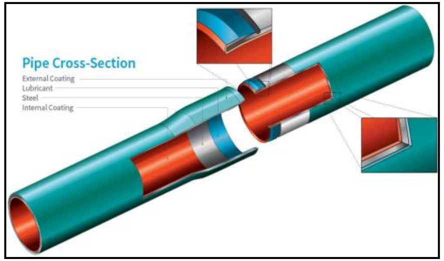
Efficient Tiebacks
Existing technologies available including:

- Mechanical hot taps
- Mechanically connected pipe
- Modular spooled pipe systems
- Composite pipe

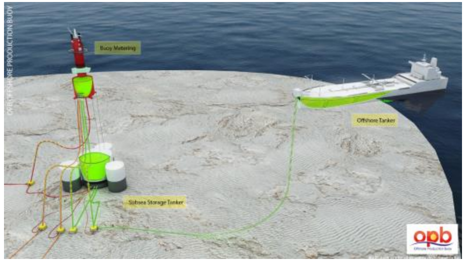
Stand Alone Systems
Key technologies identified:

- Unmanned Production Buoys
- Mini FPSO
- Subsea Storage
- Subsea Factory

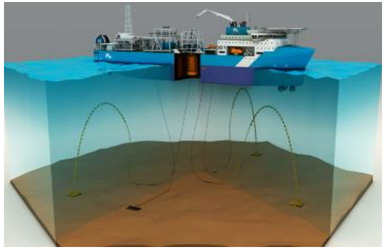

Spooled Pipe -Image Courtesy of Airborne Oil & Gas



Zap-Lok Mechanically connected pipe - Image Courtesy of Cortez Subsea



Unmanned Production Buoy - Image Courtesy of OPB


Small scale FPSO -Image Courtesy of Amplus Energy

Focus on technologies to further reduce costs and extend reach

OGA's focus

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Continue to **promote Cluster and Area studies** (E.g. in SNS, CNS, OMF)

Engage with operators to move area development forward

Leverage data for a successful **30th Licensing Round**

Close collaboration with OGTC to fast track technology enablers

Support the work of industry bodies (OGTC, NSRI, ITF, O&G UK) on efficiency and best practices

The OGA proactively promotes marginal field opportunities