



Oil & Gas
Authority

Polymer Enhanced Oil Recovery

EOR Task Group – Learnings from Industry



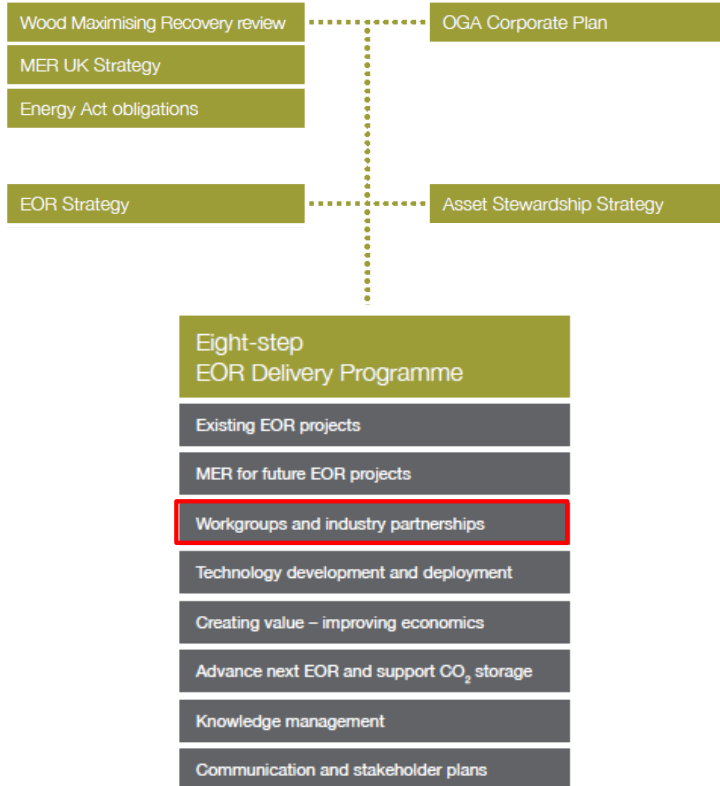
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OGA EOR Delivery Program



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OGA Corporate Plan

Delivering a strategy to facilitate sanctioning, by 2021, projects designed to deliver 250 million barrels of additional reserves

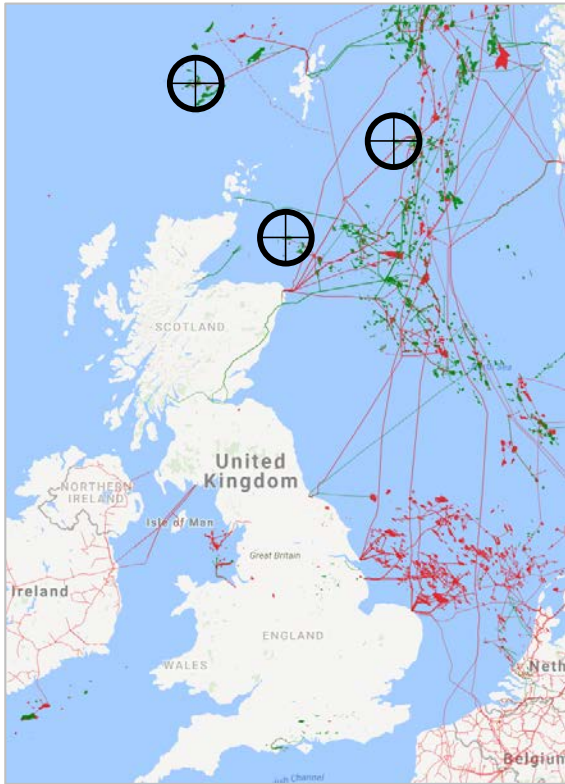
Call to Action

- 2016 – formation of a Joint Industry Task group, under Asset Stewardship Taskforce
- Comprised four operators; BP, Chevron, Shell & Statoil
- Compiled the key lessons learned from decades of experience to help inform other operators in the UK
- Summary of results to be published – 4Q17

Pertinent fields



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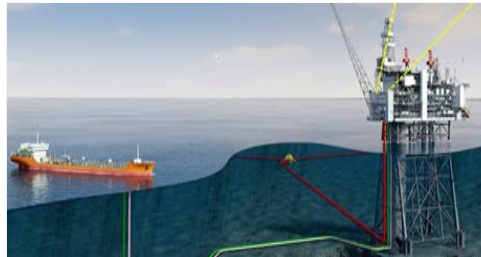
Captain

- Extending field life of mature asset
- Polymer facilities part of original FID in 90s
- Successful pilots
- Phased development



Q204

- Field re-development
- Provision for a potential future Polymer EOR scheme in design of the new FPSO



Mariner

- New development
- Screening shows that polymer EOR has good potential



What is the Potential from EOR?

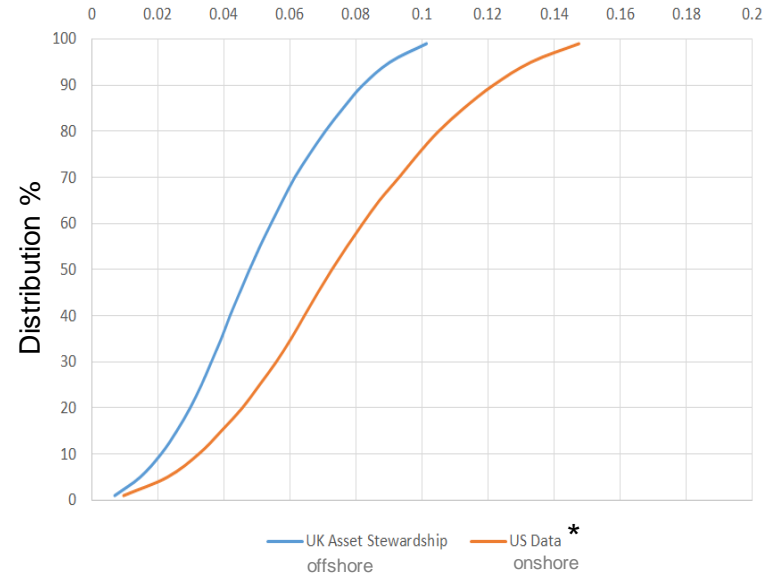
2016 Asset Stewardship Survey

	Number of Fields	Estimated STOIP (MMBO)	Waterflood Base Case (MMBO)	Polymer EOR (MMBO)	Waterflood % STOIP	EOR % STOIP
EOR	6	4,128	1,230	194	29.8	4.7

5% Size of the prize – Incremental recovery from polymer EOR projects

78% Of OGA EOR target identified in current projects

Incremental recovery factor from polymer EOR



* Summarised from published paper; SPE-174541 - Status of Polymer-Flooding Technology

Primary Lessons Learned



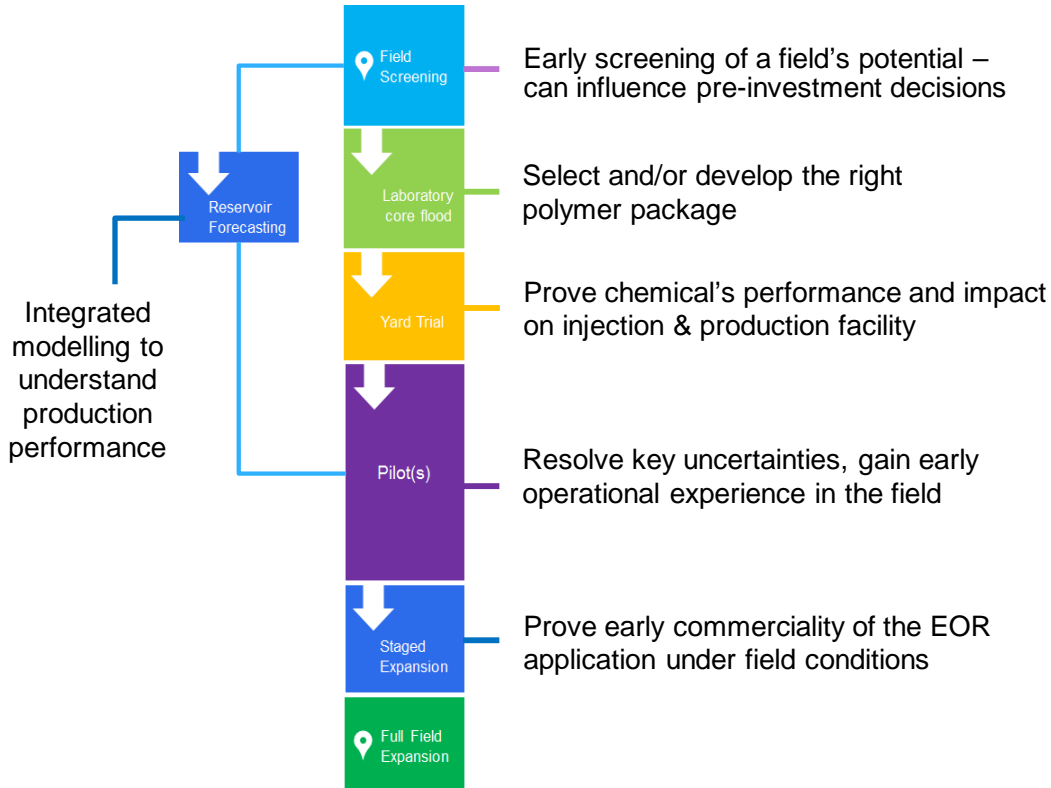
- Good business case for EOR if look long term – Late life incremental barrels can help lower \$/boe operating costs, improve cash margins and extend asset life.
- Utilize a roadmap, process based approach
- Duration of the Polymer EOR roadmap can be long
- Certain conditions that will make Polymer EOR difficult to execute
- Polymer EOR Testing and Standardisation – the supply chain has excellent competency in EOR, but opportunity to standardize
- Polymer injectivity must be sustainable long-term
- There are no short cuts – do not expect all uncertainties to be resolved in a single pilot.
- Consider impact on operations early
- Regulatory requirements on polymers need to be fully considered, to avoid surprises.

Tier 1 Learnings:

Observation	Lessons Learned
Subsea development	Shearing of polymer through subsea choke, reduces viscosity to a level where it can be rendered ineffective.
Well configuration & spacing	Retention time for the polymer within the reservoir – the wider the well spacing, the greater the lag time between injection & oil recovery.
Surface water discharge	Managing environmental risks.

Tier 2 – 37 learnings documents by category published in document

Roadmap to Polymer EOR



Aim is to help companies considering future Polymer EOR projects to move quickly up the learning curve and to understand the value these projects add to their assets.

An integrated, end to end approach is required for polymer EOR implementation