

UNLOCKING MER AT A SUB-BASIN LEVEL THROUGH INDUSTRY COLLABORATION

OUTER MORAY FIRTH SPECIAL INTEREST GROUP

Presenting: Colin Percival – The Parkmead Group

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and P Taylor



PETEX 2018

28th November 2018

Olympia, London

TALK FORMAT

INTRODUCTION

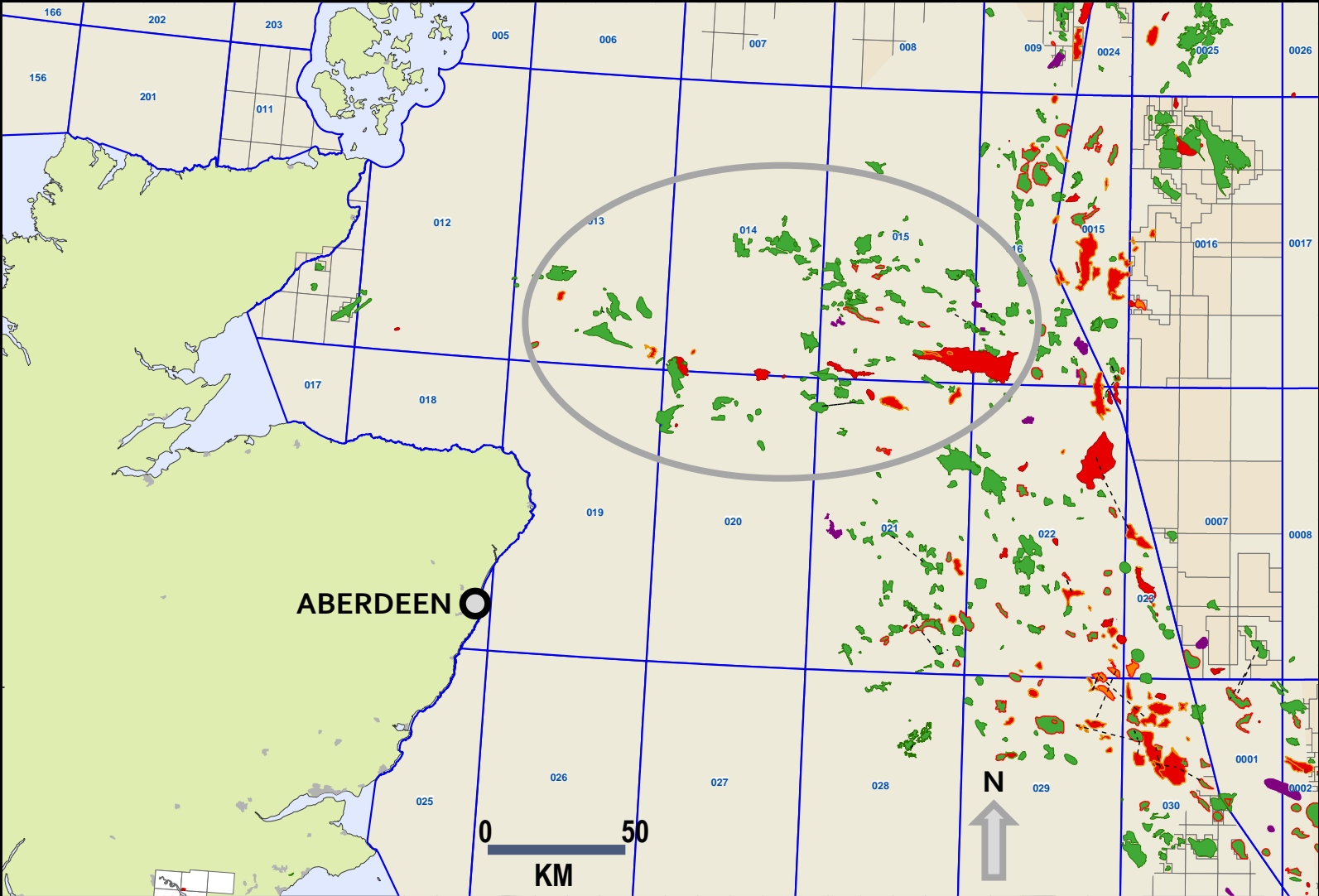
- LOCATION
- AREA PLANS

PHASE 1 DEFINING THE SIZE OF THE PRIZE

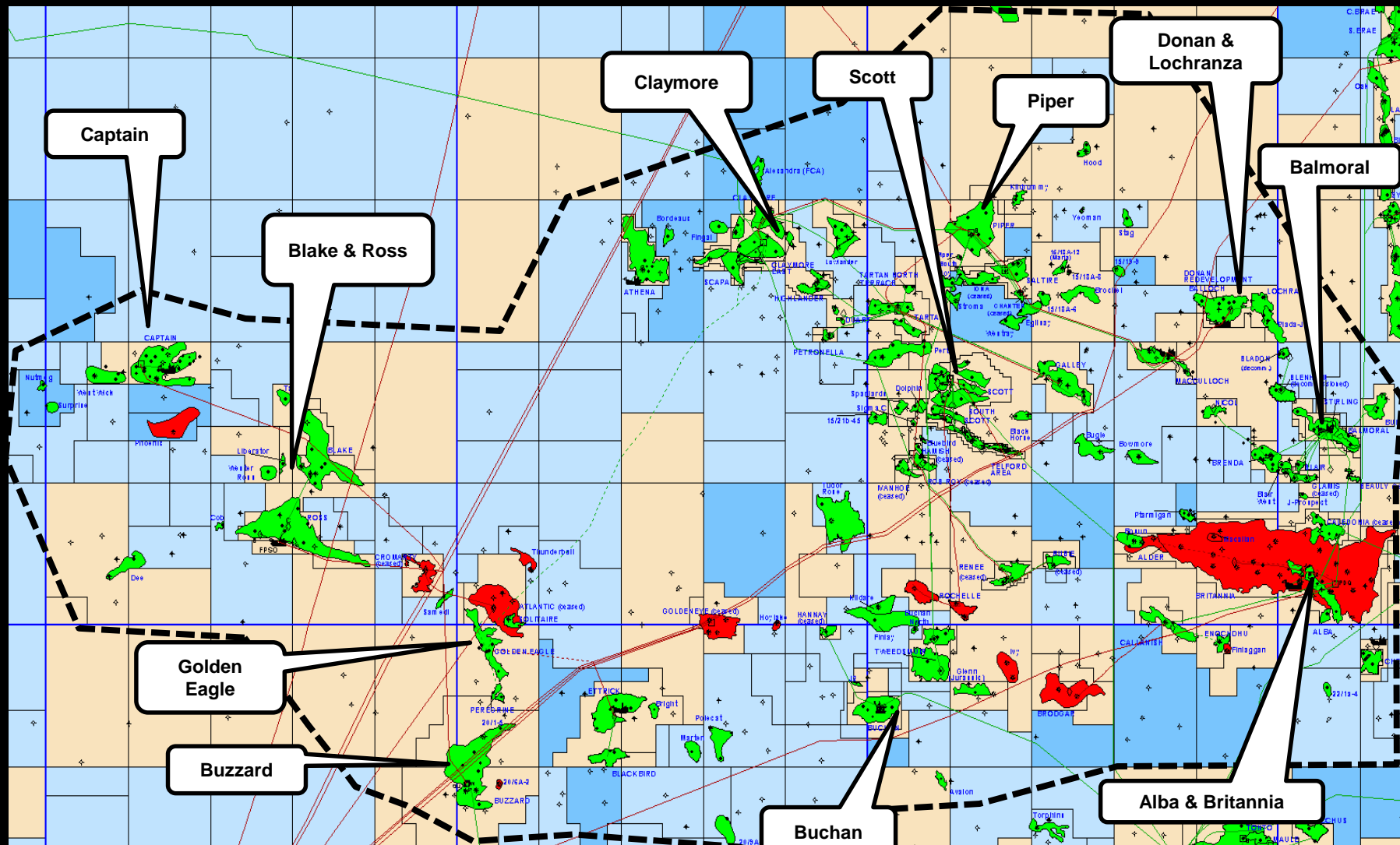
PHASE 2 ACCESSING THE PRIZE

SUMMARY AND CONCLUSIONS

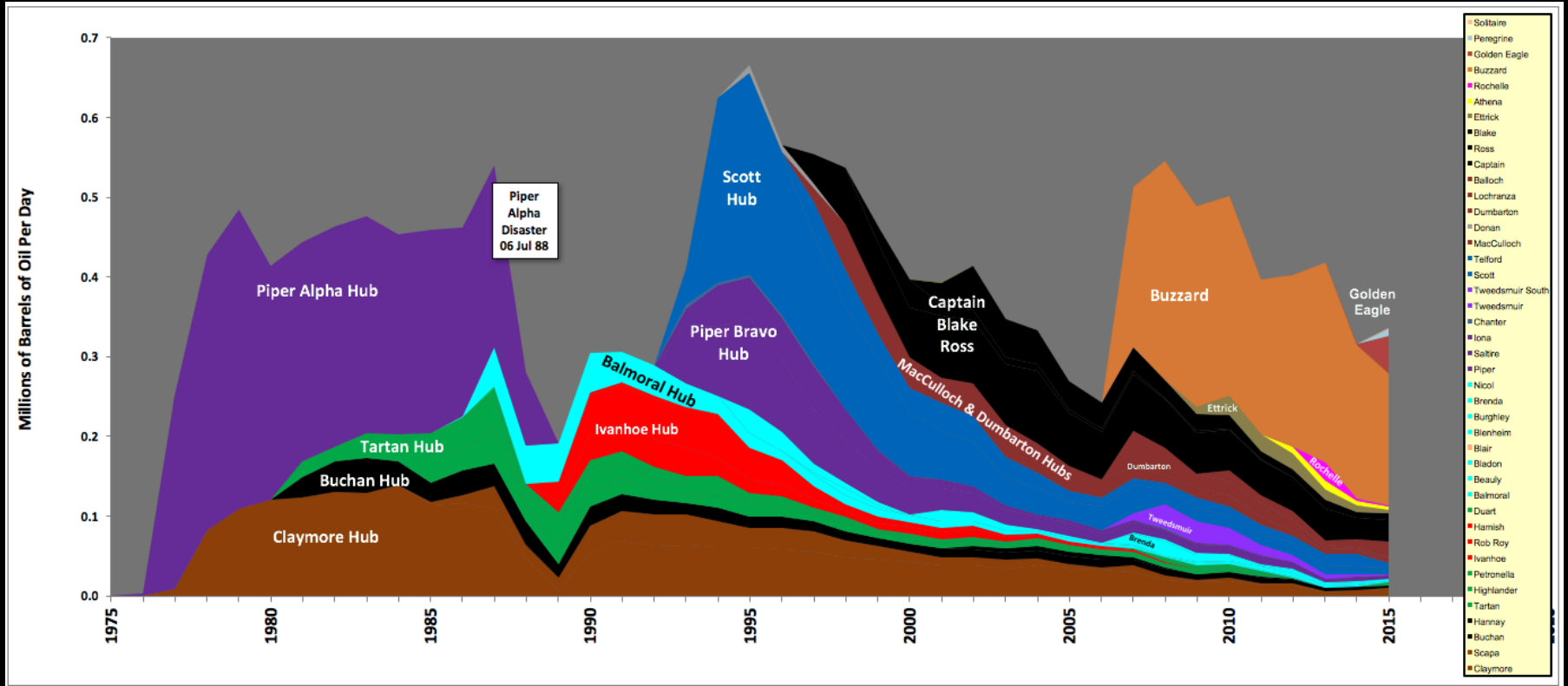
OUTER MORAY FIRTH LOCATION MAP



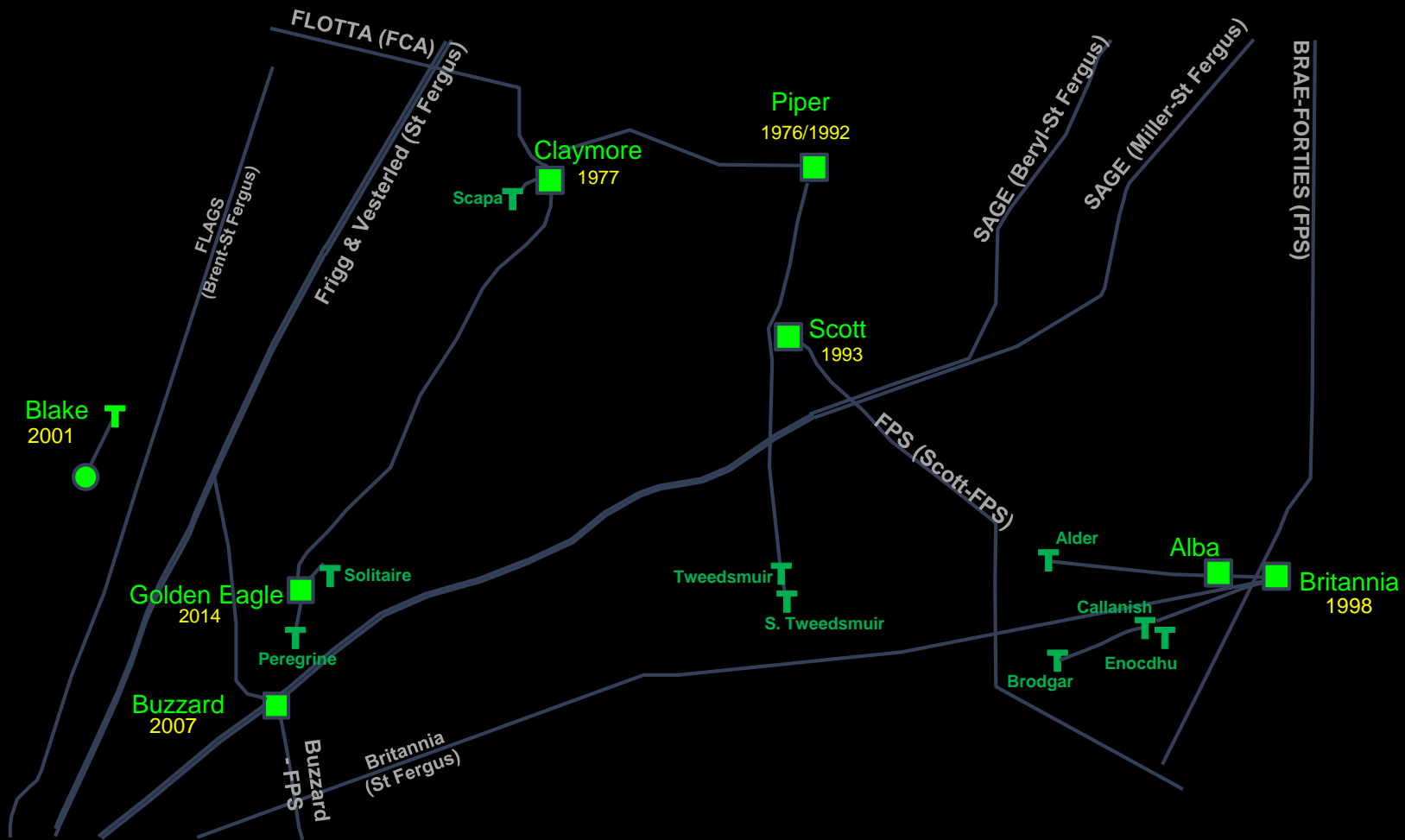
OUTER MORAY FIRTH AREA – AREA OF INTEREST






PRODUCTION HISTORY – CAN WE DELIVER THE NEXT PRODUCTION PEAK



INFRASTRUCTURE – 2025 DO NOTHING PROJECTION– YET TO BE CONFIRMED



	Fixed Platforms	(3 - 40 years old)
	FPSO (FPV)	(6 - 20 years old)
	Subsea Tieback	

Based on Woodmac mid 2016;
prior to Efficiency Task Force

WHAT IS AN AREA PLAN?

- A plan to maximize economic recovery – value not barrels
- A holistic, common view of opportunities and infrastructure
- Requires shared, validated and detailed view of opportunities

CREATING THE OMF MER AREA PLAN

- Phase 1 – Understand the Size of the Prize – Exploration, Development, Reactivation & Sustaining
- Phase 2 – A plan for accessing the Prize

PHASE 1 – DEFINING THE SIZE OF THE PRIZE

Exploration Workgroup decided that existing data sources were not up to the job of being the “shared data repository” required.

New database created from wide range of sources:

- Relinquishment reports;
- Publically available reports and papers (CPR, 10K, Annual Reports, Company websites etc.)
- OGA Open Government Licence publications;
- User non-commercial contributions (SIG & non-SIG members)

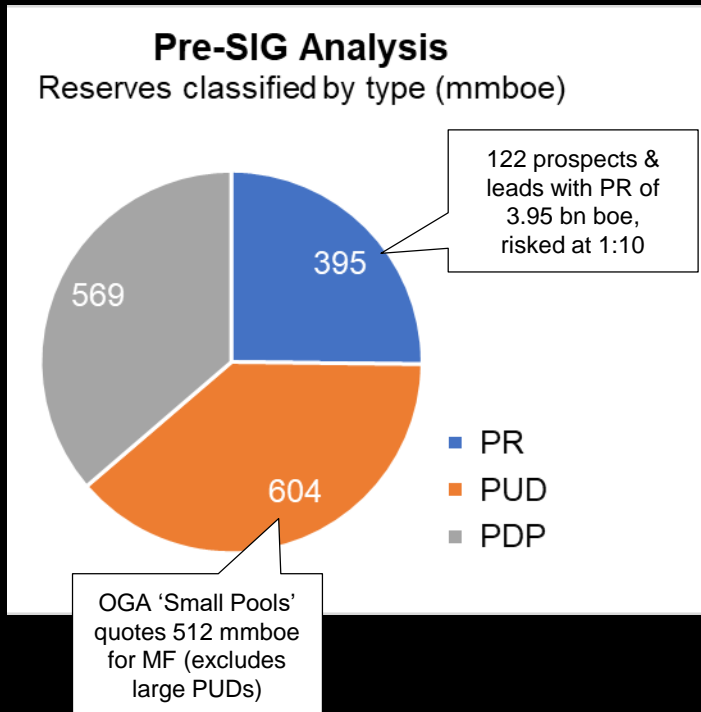
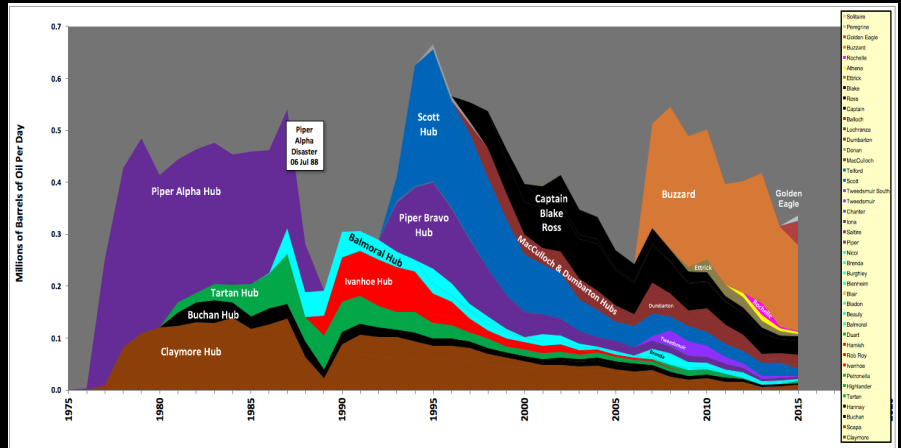
Processed to create structured database – fields, unsanctioned discoveries, prospects & leads – with audit trail.

Now known as TROVE and available across all UKCS basins and beyond.

PHASE 1 - THE OUTER MORAY FIRTH PRIZE

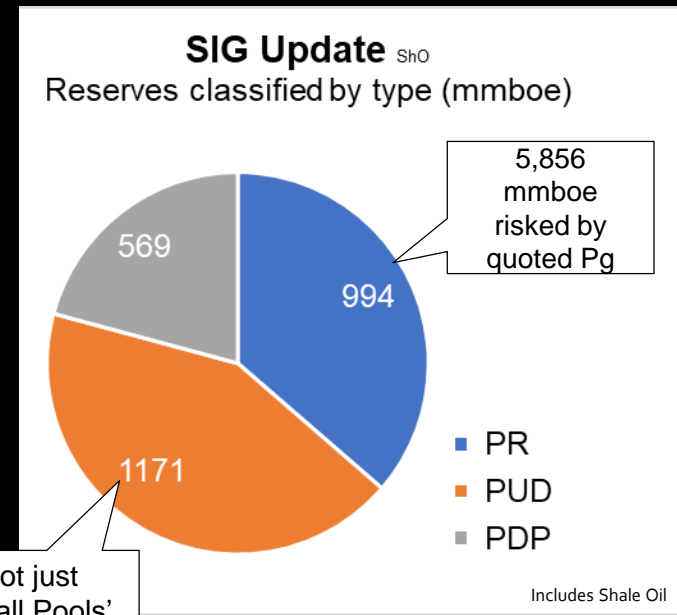
What the data was telling us:

- Basin already had delivered three peaks.
- Published data said it had potential.



Total 1,568 MMBOE

- The SIG study has quantified & increased the size of the prize.



Total 2,734 MMBOE

PHASE 1 - HAS DATA COLLABORATION DELIVERED ANY BENEFIT?

Pre-Area Plan

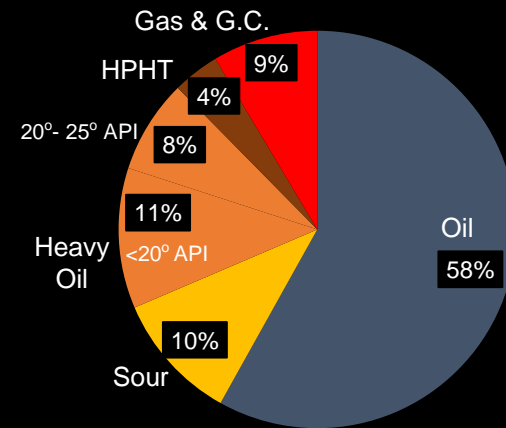
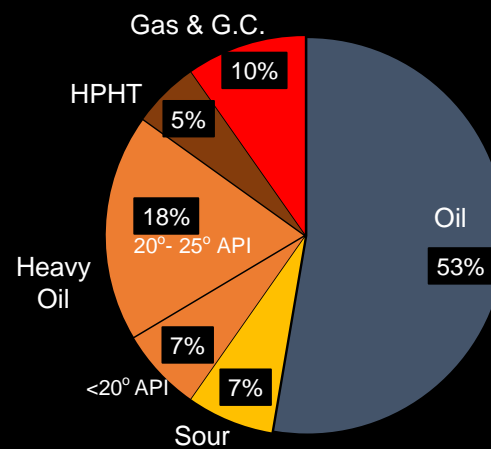
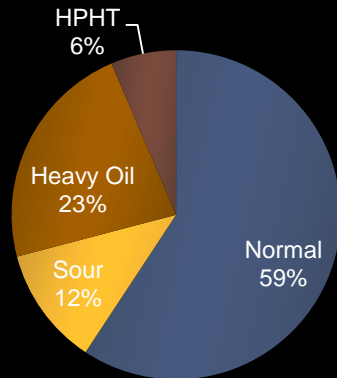
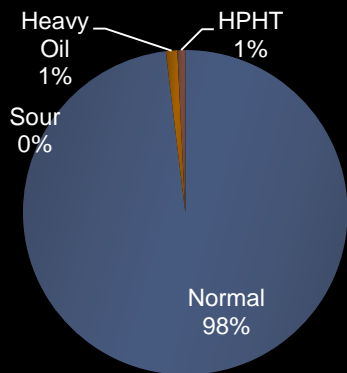
Area Plan Case

Prospective Resource

Contingent Resource

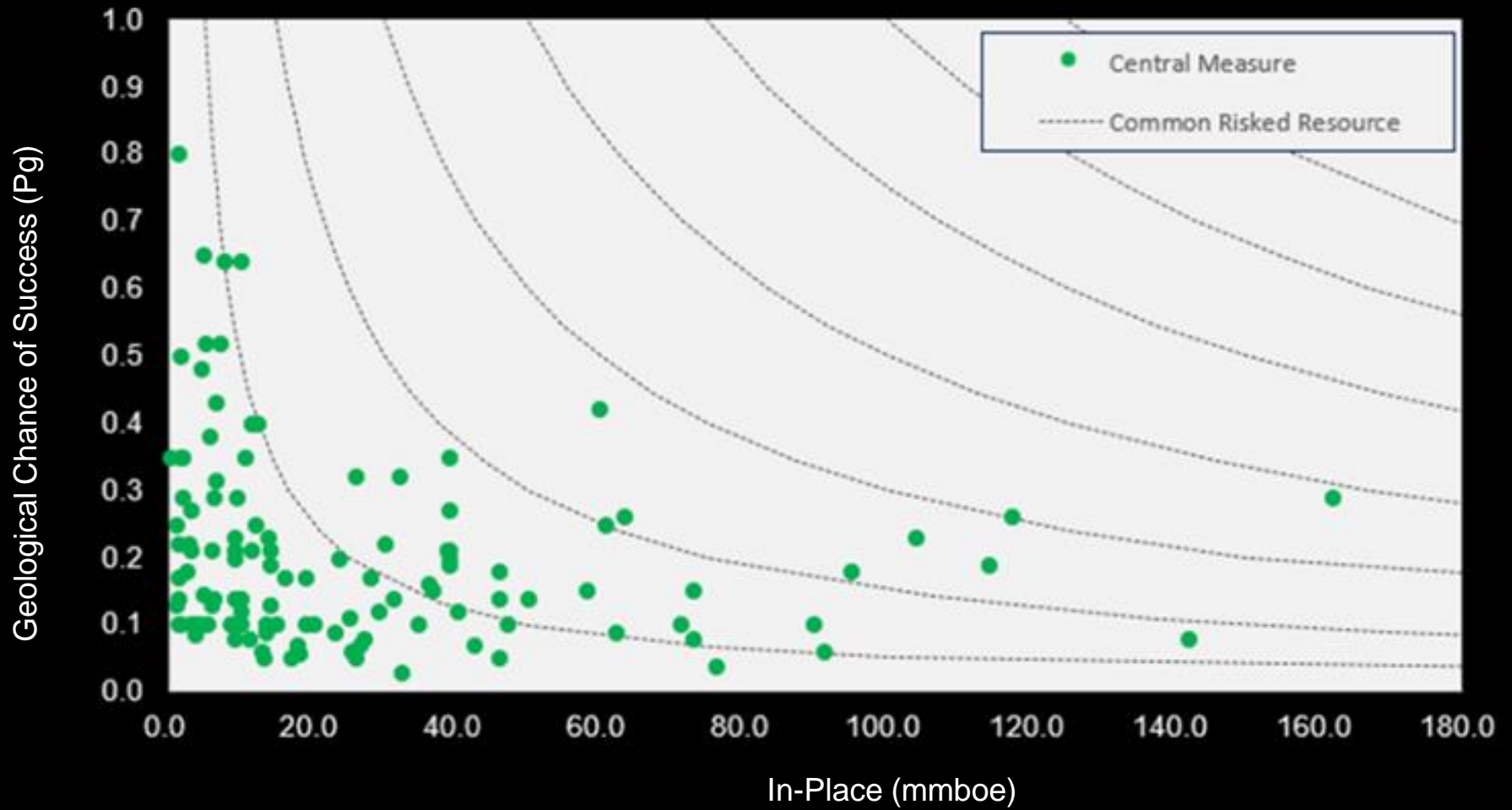
Prospective Resource

Contingent Resource



More detailed and consistent dataset

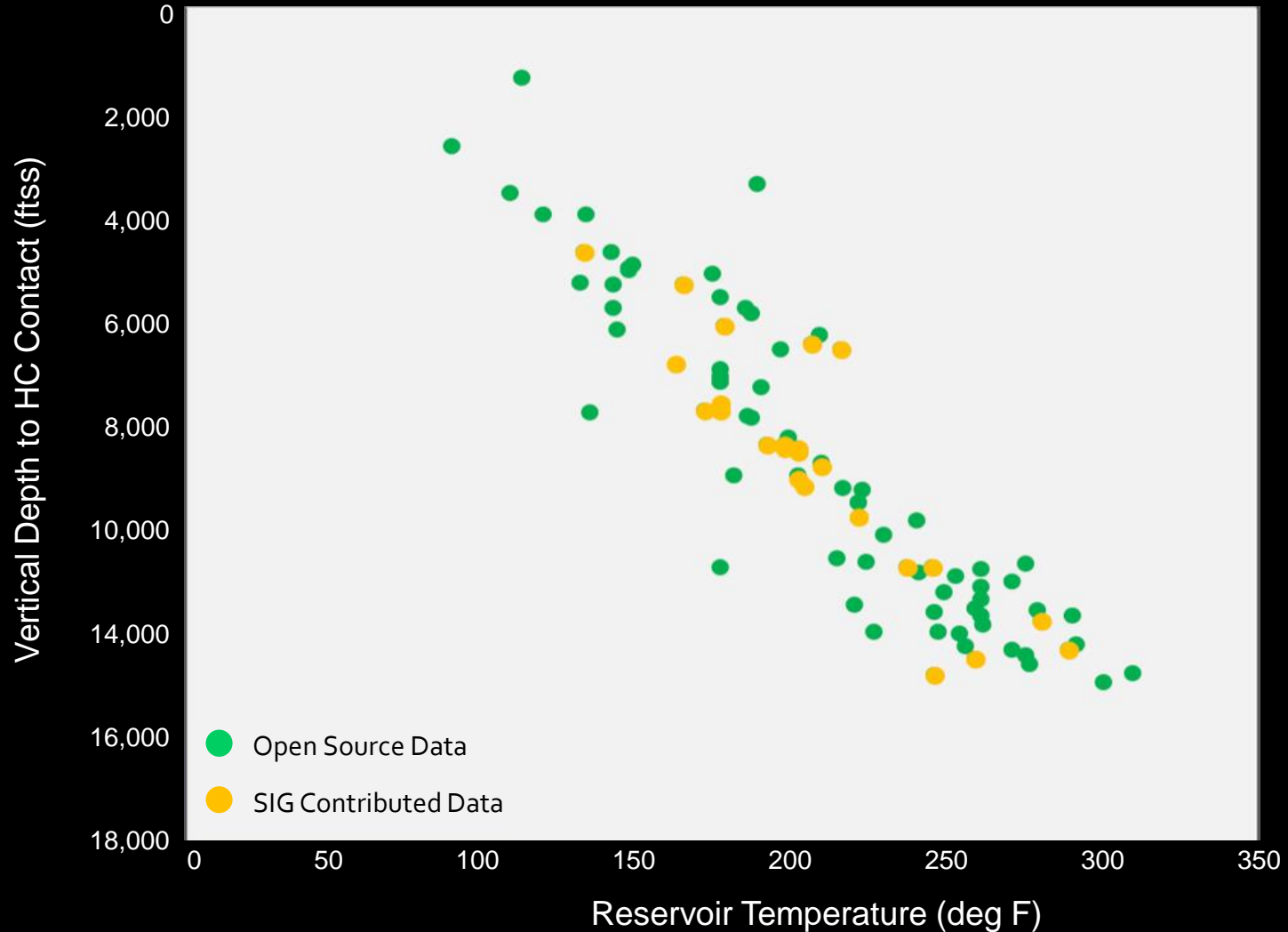
PHASE 1 – HYDROCARBONS IN PLACE VS. COS



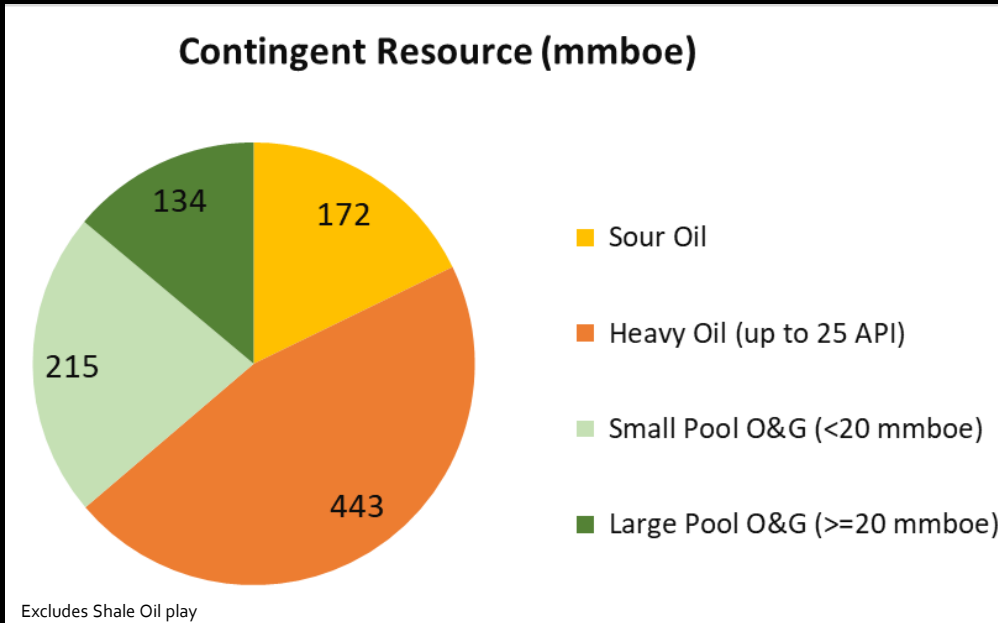
PHASE 1 - DATA INSIGHTS

The power of data collaboration.

Reservoir Temperature versus Depth



PHASE 1 - OUTER MORAY FIRTH CONTINGENT RESOURCE



TOTAL RESOURCE ~1.0 BILLION BOE

UNDEVELOPED DUE TO SIZE, FLUID TYPE, RESERVOIR QUALITY – LIKELY TO REMAIN SO IF TREATED ON AN INDIVIDUAL POOL BASIS – COLLECTIVE SOLUTIONS REQUIRED

Detail of individual pools held in Trove Database

Themes:

- Sour
- Heavy
- Small

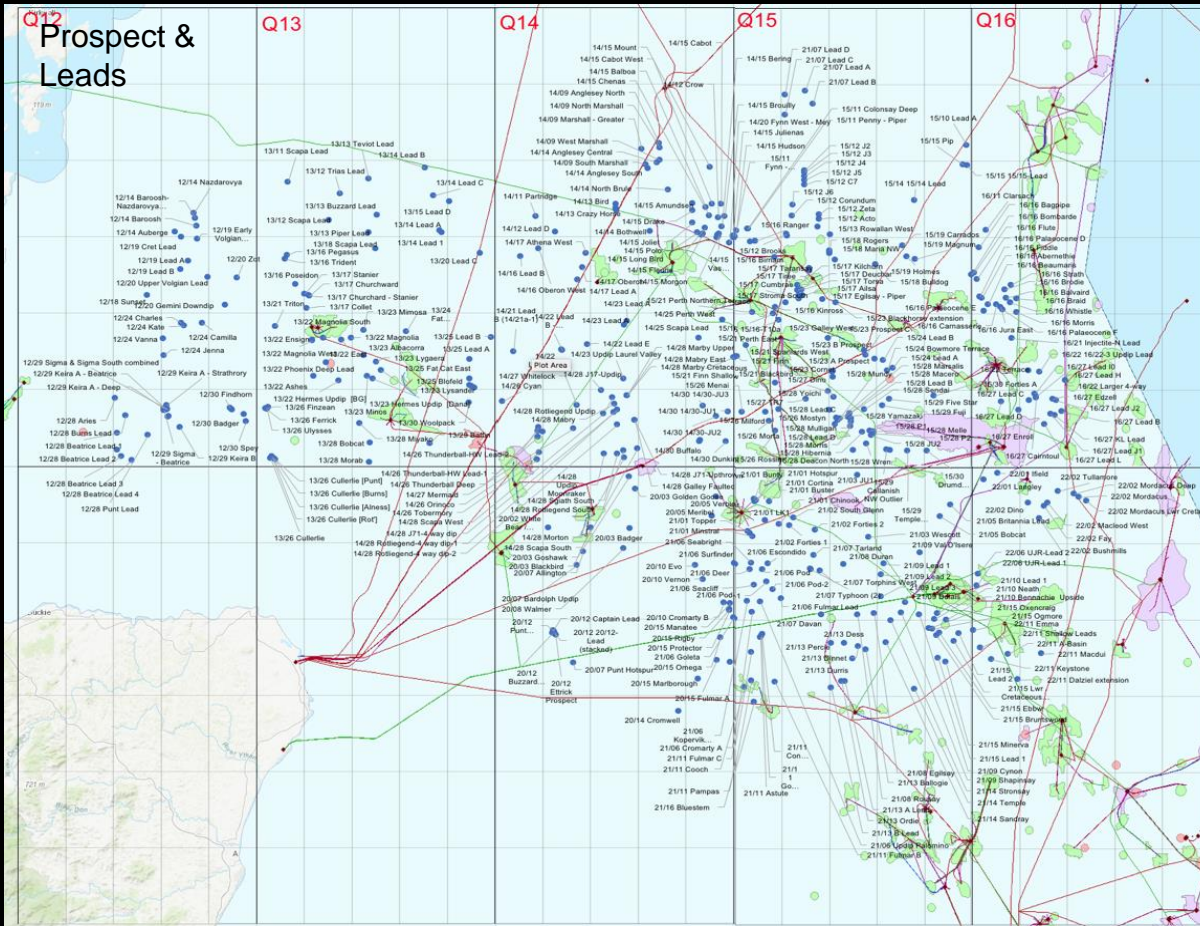
Heavy and Sour Crudes

- New Facility / major modification of existing facility

Small Pools

- Potential tiebacks – portfolio for tieback of the future
- Stranded
 - Shared Facility
 - FPSO – high deliverability
 - SPAR / Buoy – low deliverability

PHASE 1 - WHAT DOES THE OUTER MORAY FIRTH HAVE TO OFFER?

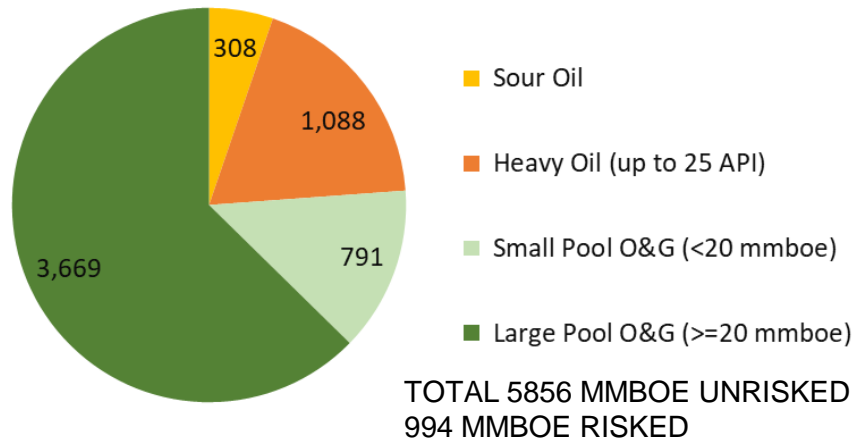


Prospects	No
Valid Prospects & Leads	298
Downgraded Leads	77
Total	375
Total with duplicate evaluations & stacked	438

Prospective Resource	
No with Prospective Resource	208
Sum of P50 PR (mmboe)	5,856
Sum of risked P50 PR (mmboe)	994
Average Pg Tertiary / Sub-Tertiary	0.2 0.28 / 0.17

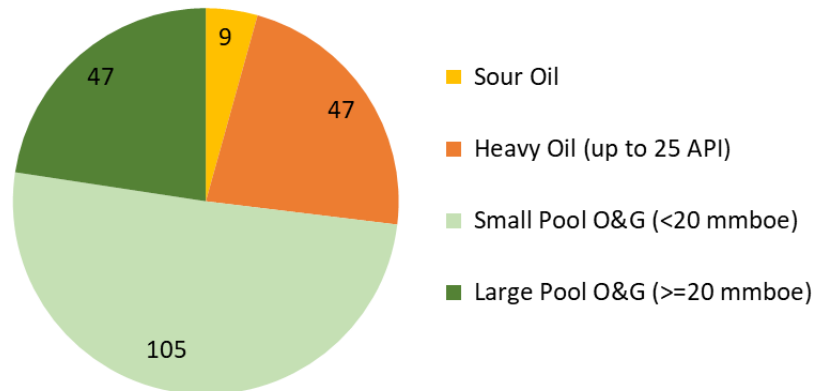
PHASE 1 - PROSPECTIVE RESOURCE

Prospective Resource (mmboe)



STRATIGRAPHIC TRAPS DOMINATE

Number of Prospects & Leads

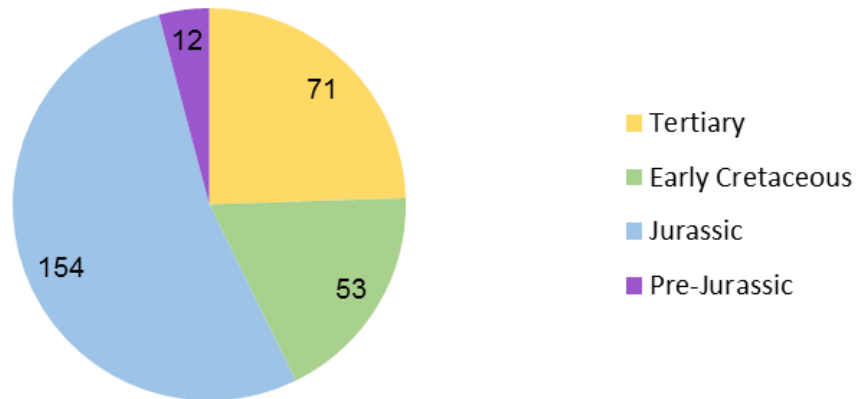


STRUCTURAL TRAPS DOMINATE

Excludes P&L without PR (83)

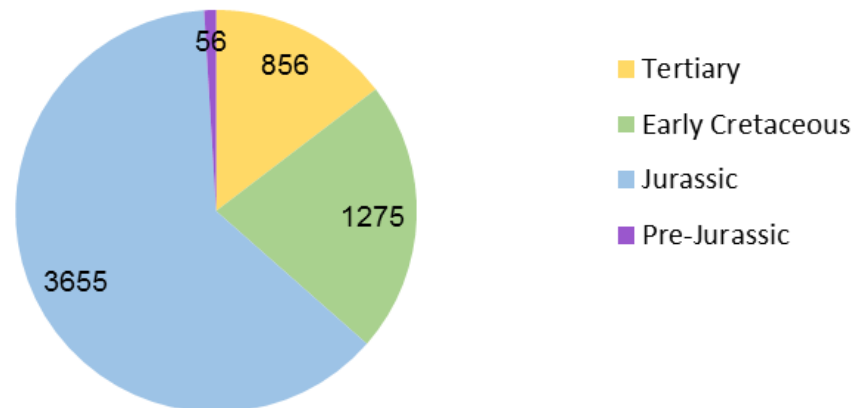
STRATIGRAPHIC BREAKDOWN OF PROSPECTS AND LEADS

Prospects & Leads: Number



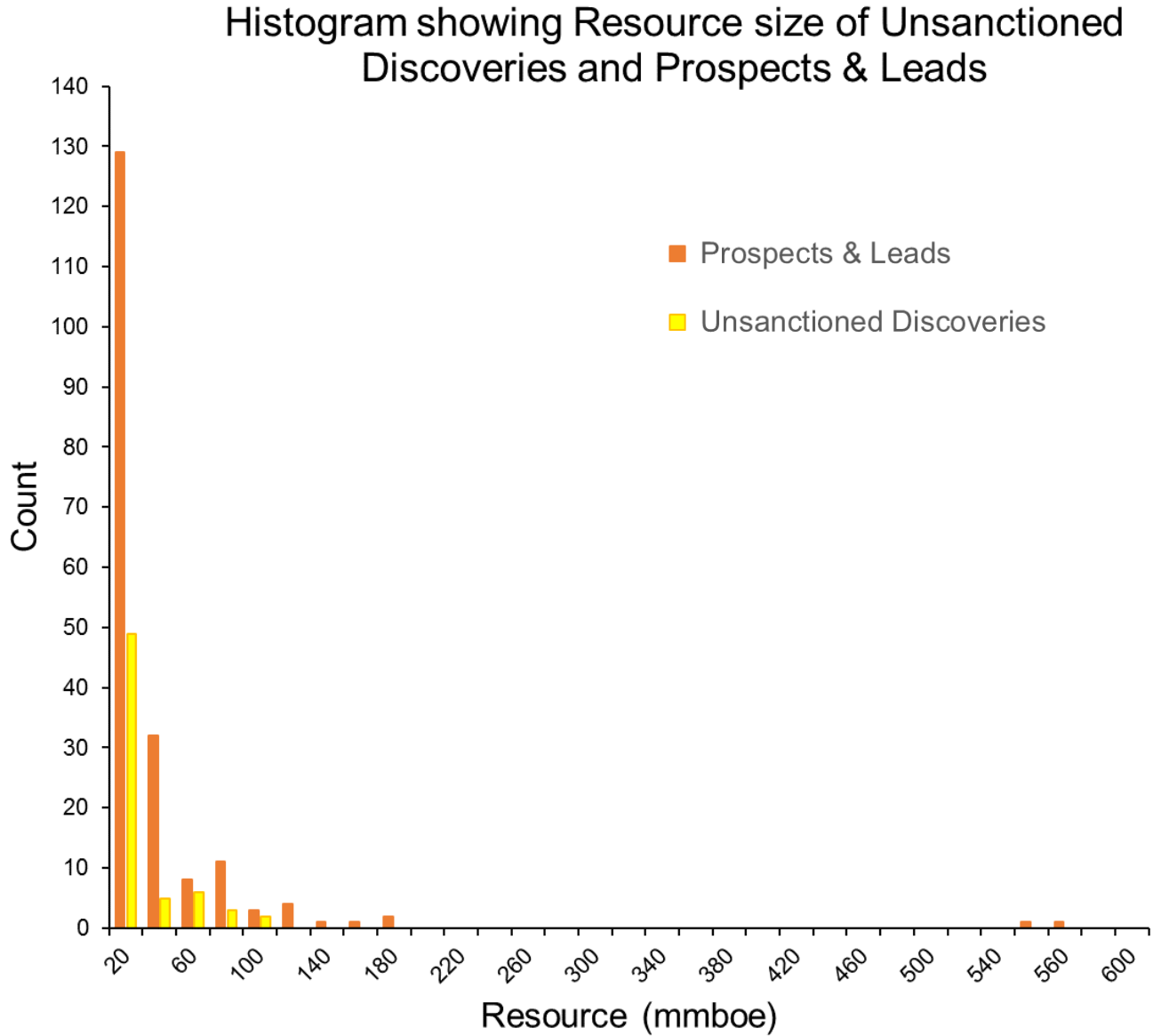
8 P&L not assigned to stratigraphic units

Prospects & Leads: Prospective Resource (mmboe)

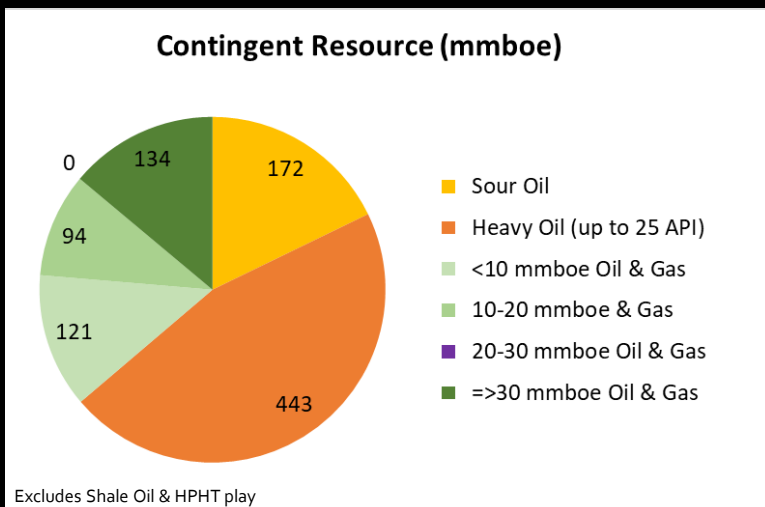
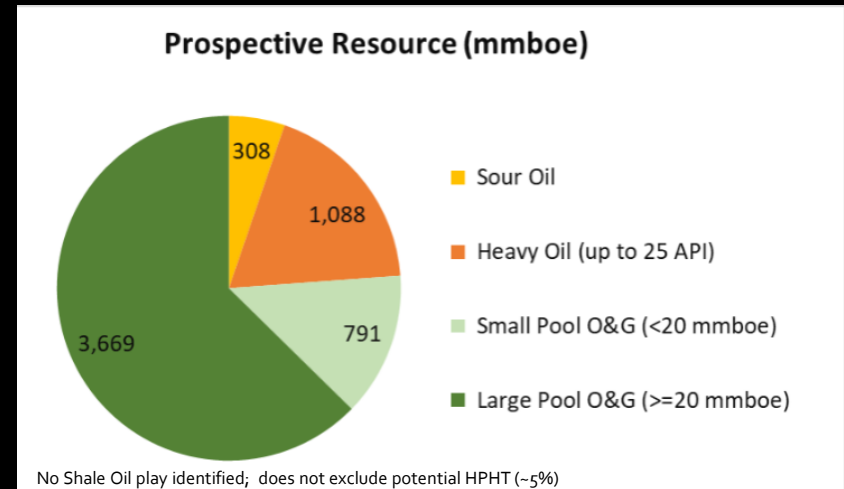
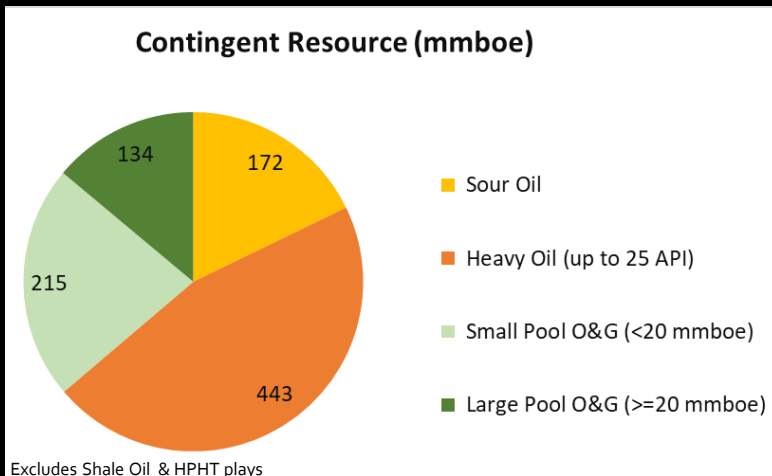


8 P&L not assigned to stratigraphic units

PHASE 1 - PROSPECTIVE AND CONTINGENT RESOURCES



PHASE 1 - CONTINGENT AND PROSPECTIVE RESOURCES



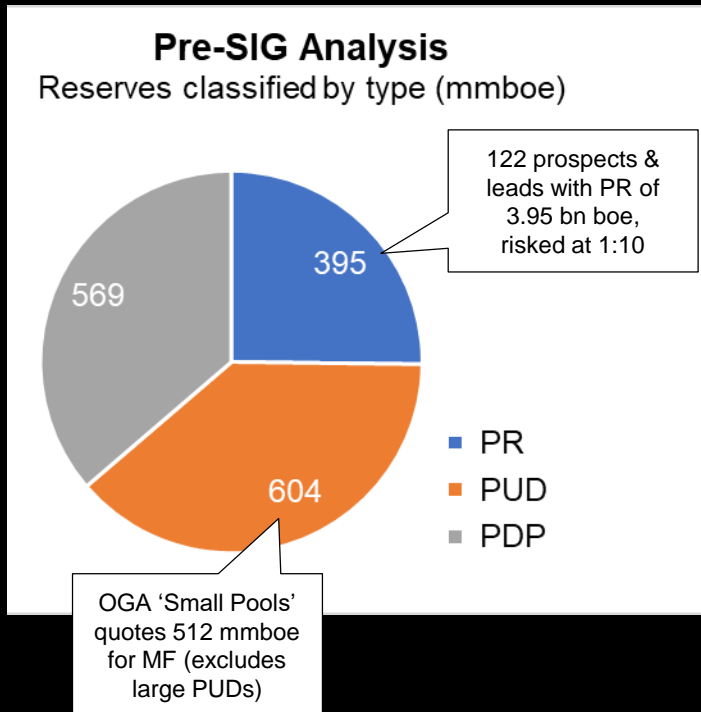
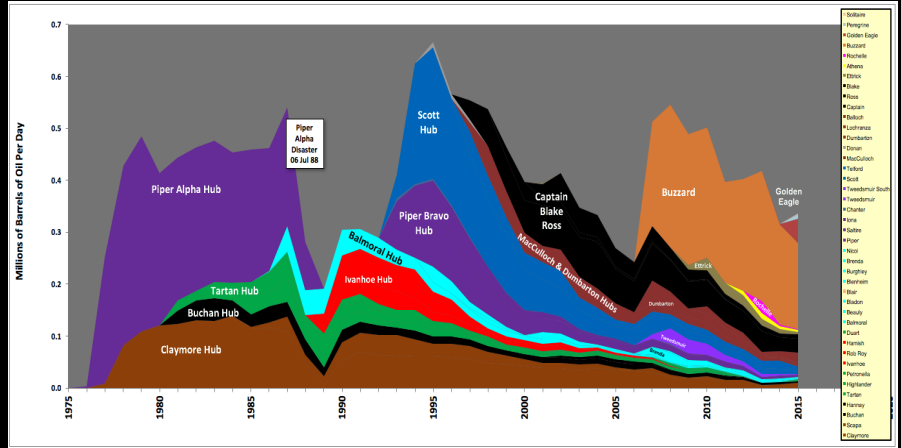
- ~1 billion boe risked
- Average COS = 20%
- Structural traps dominate
- Largest volumes in stratigraphic traps
- Most stratigraphic traps found by drilling smaller structural features that turn out to be larger

- ~1 billion boe of which ca. 85% requires a new solution/way of working

PHASE 1 - THE OUTER MORAY FIRTH PRIZE

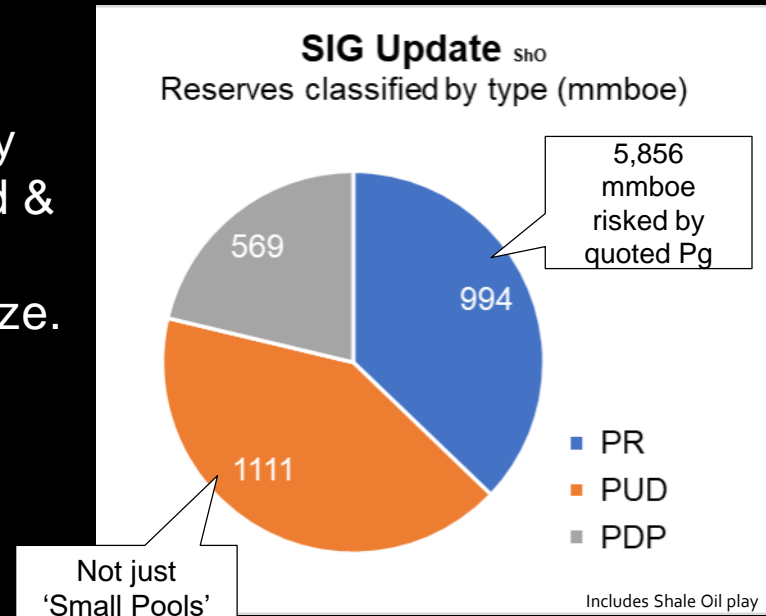
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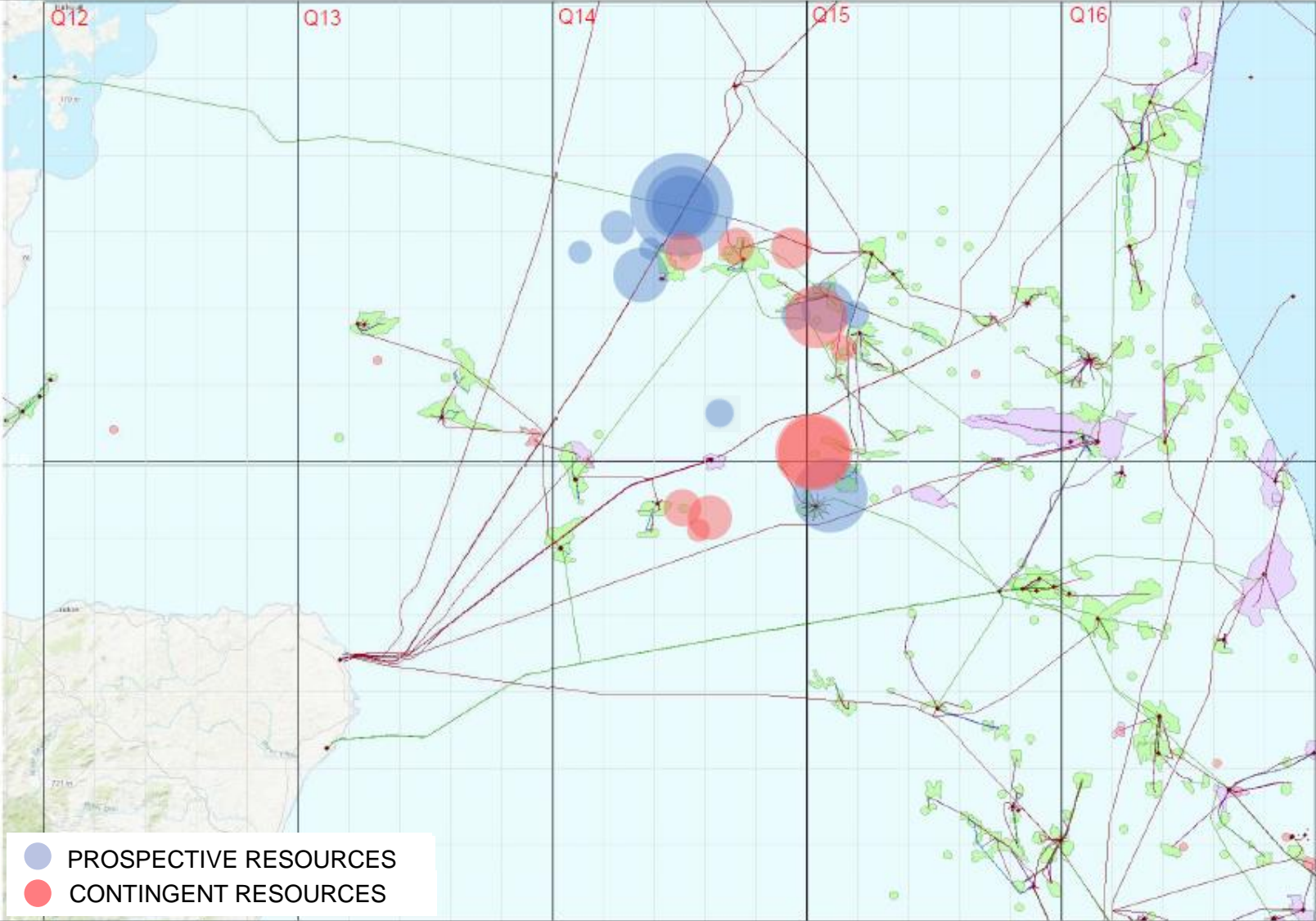
PHASE II AREA PLAN: SCOPE OF WORK - THEME MATRIX

		Themes		
		Small Pools	Sour Oil	Heavy Oil
Enabling SOWs	● Exploitation	<ul style="list-style-type: none"> ● Further refinement of each theme's Prize ● Accelerate Opportunity Delivery if blockers removed 		
	● Cost Elements (Investability)	<ul style="list-style-type: none"> ● Cost base ● Investment risk management 		
	○ Technology/OGTC	<ul style="list-style-type: none"> ● Recovery Factor Improvement ● New production facilities ● Safe operations 		
	○ Infrastructure Criticality	<ul style="list-style-type: none"> ● Importance of satellites to hosts ● Identification of "stranded" hotspots 		

● SOW or Theme document

○ No documentation

SOUR OIL – CONTINGENT AND PROSPECTIVE RESOURCES



PHASE 2

FOCUS ON KEY THEMES TO DELIVER CONTINGENT RESOURCE PRIZE

- HEAVY
- SOUR
- SMALL

WORK TO BE UNDERTAKEN UNDER JIP AGREEMENT

DELIVERY OF CONTINGENT RESOURCES WILL RESULT IN PULL THROUGH OF PROSPECTIVE RESOURCE PRIZE

- E.G. MAKING SMALL POOLS WORK WILL ENCOURAGE COMPANIES TO DRILL SMALL PROSPECTS

CONCLUSIONS

- OMF HAS A SIGNIFICANT PRIZE OF CA. 2 BILLION BOE – SUFFICIENT FOR A FOURTH OIL PRODUCTION PEAK
- ACCESSING THE CONTINGENT RESOURCE (1.0 BILLION BOE) IS KEY TO DELIVERING THIS PRIZE. MOST OF VOLUME IS IN:
 - SOUR – NEEDS NEW INFRASTRUCTURE
 - HEAVY – NEEDS NEW INFRASTRUCTURE
 - SMALL – NEEDS NEW COMMERCIAL MODEL
- PROSPECTIVE RESOURCE (1.0 BILLION BOE) DOMINATED BY SMALL FEATURES
 - SMALL PROSPECTS WILL ONLY GET DRILLED IF WE CAN MAKE SMALL POOLS ECONOMIC.
 - UPSIDE IS MAINLY IN STRATIGRAPHIC TRAPS – TYPICALLY FOUND BY DRILLING SMALLER LOWER RISK PROSPECTS THAT TURN OUT TO BE LARGER.
 - SOUR OR HEAVY OIL PROSPECTS WILL ONLY GET DRILLED ONCE CLEAR ROUTE TO MONETIZATION EXISTS FOR EXISTING DISCOVERIES
- COLLECTIVE VIEW REQUIRED TO DELIVER THIS PRIZE = NEW COMMERCIAL MODELS FOCUSED ON THE OUTCOME (VALUE) RATHER THAN AN INPUT (COST).
- KEY TO OMF AND NORTH SEA FUTURE IS BECOMING A SMALL/COLLECTIVE PROJECT BASIN