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# Australasia Petroleum Exploration (& Appraisal) Year in Review 2022

SEAPEX Conference 2023

Adam Craig

Principal Advisor - Geoscience



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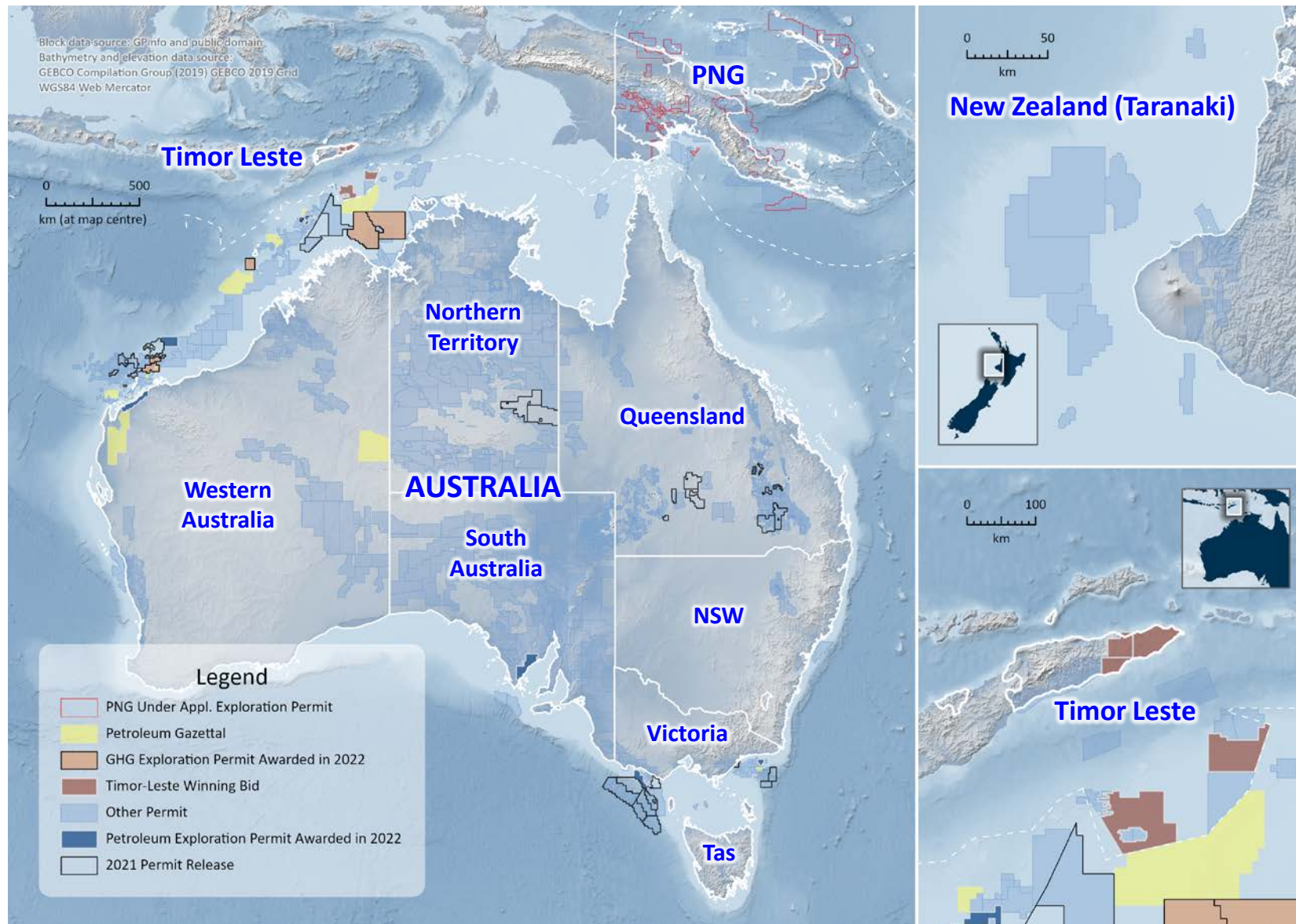
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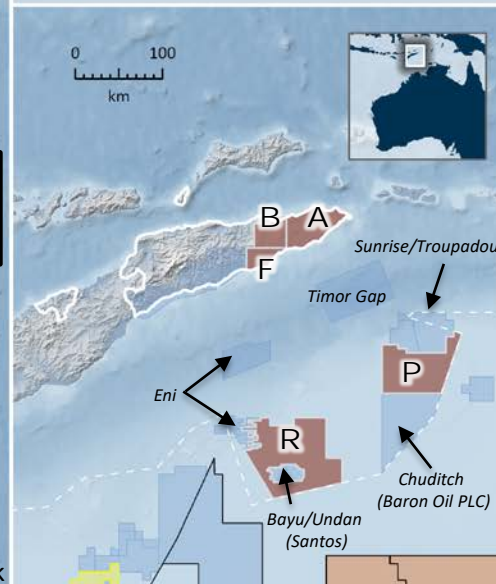
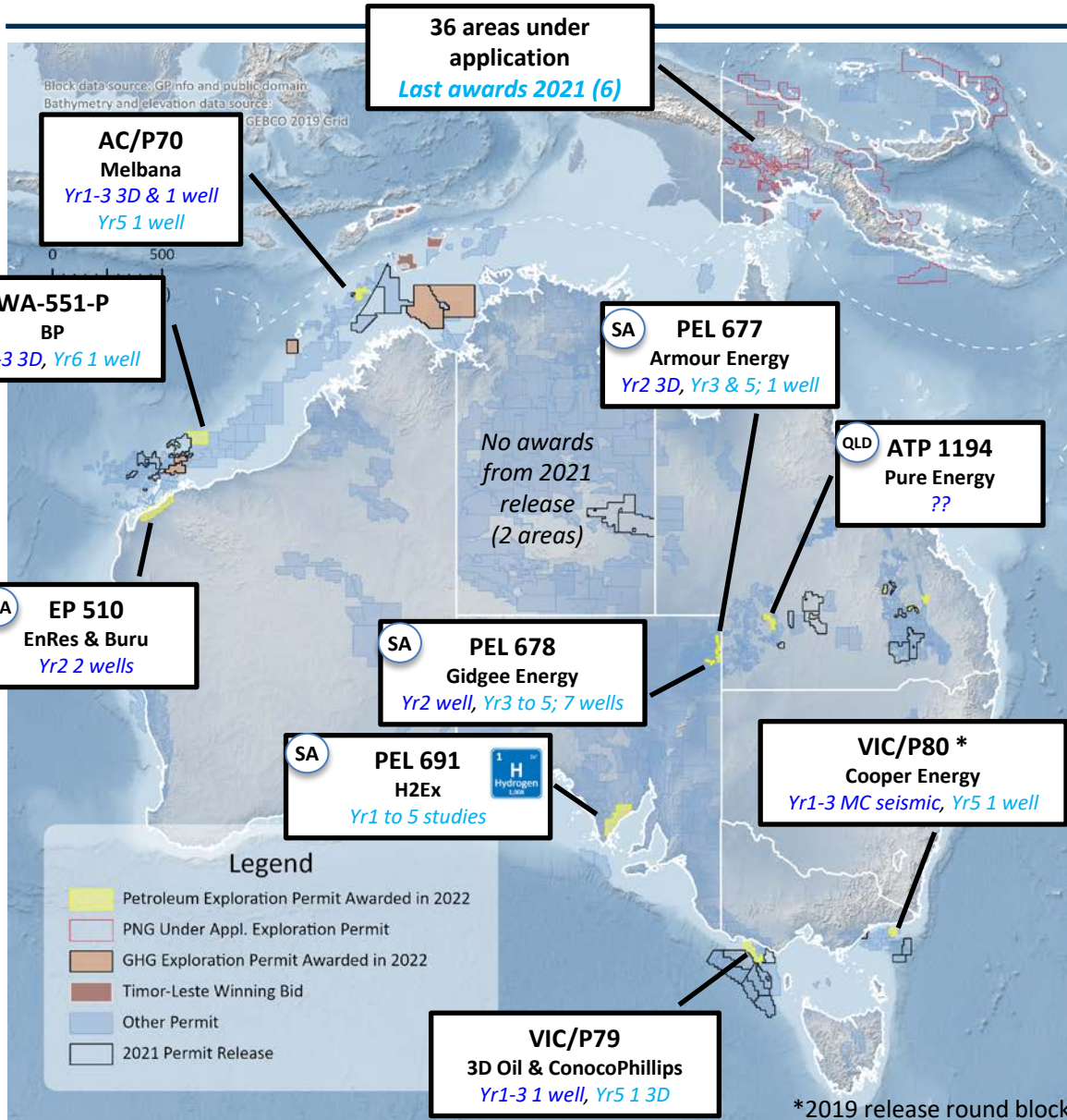
- Summary of exploration acreage releases & permits awarded
- Summary of exploration transactions & farmins
- Summary of exploration & appraisal activity
- Key exploration & appraisal well summaries
- Exploration wells planned 2023+
- Summary, key take-aways & acknowledgements

# Australasia 2022 Exploration Year in Review





# Australasia 2022 Petroleum Exploration Permit Awards



## Australian Federal Offshore Petroleum Exploration Permits

- 4 awards
- 3 from 2020 round & 1 from 2019 round
- No awards for 2021 round (closed 3 March 2022)

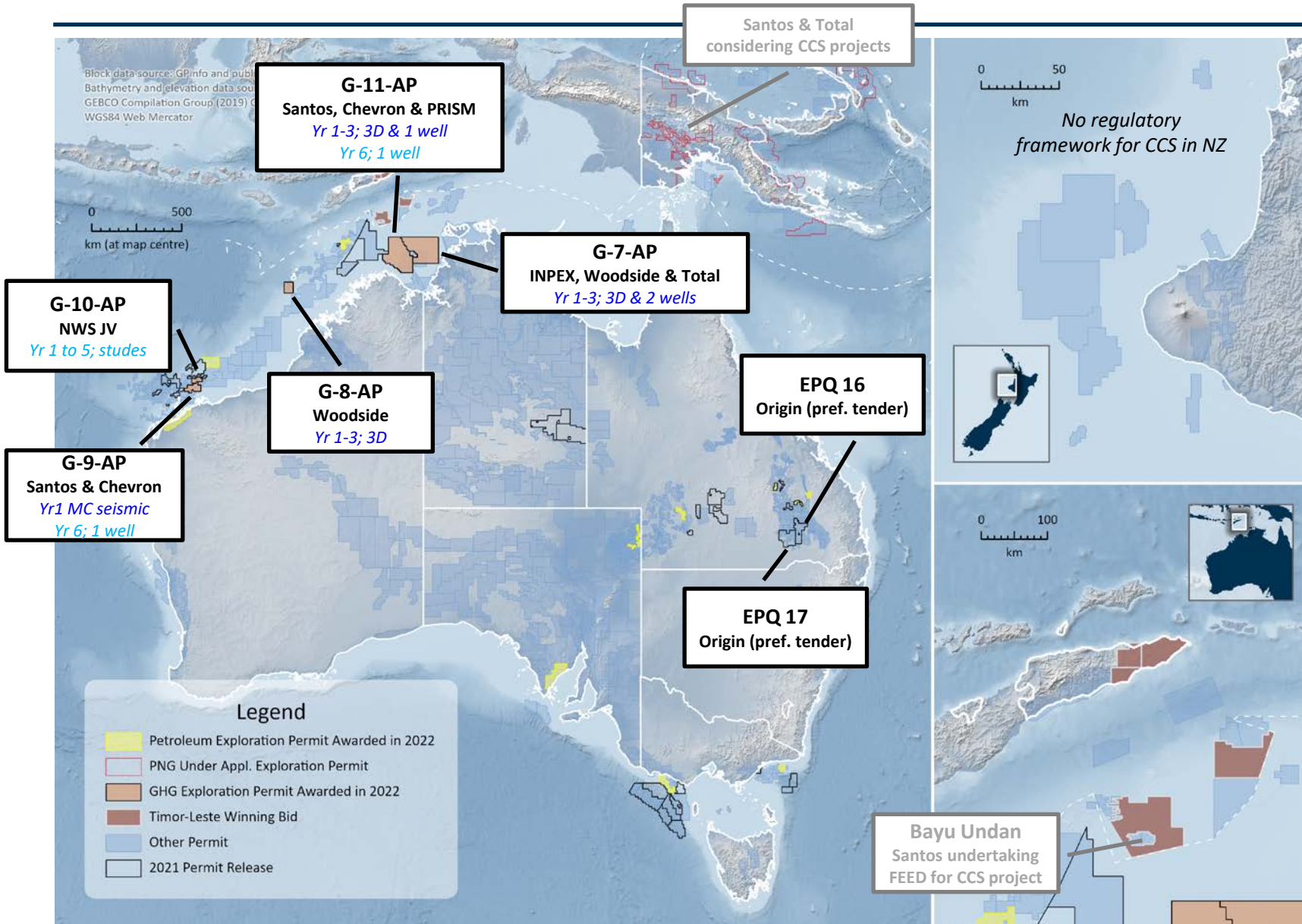
## State Jurisdiction Petroleum Exploration Permits

- WA 1 permit
- SA 3 permits
- QLD 5 permits (4 being CSG permits)

## Timor Leste

- ANPM announced winning block bids for 2019-2022 licensing round in April 2022
- Subject to negotiation of PSC
- Expected that contracts to be finalised in Feb 2023
- Block A – Timor Gap E. P.
- Block B – Esperanca Timor Oan Lda
- Block F – HTS Exploration
- Block P – Eni Aust.
- Block R – Santos

# Australasia 2022 GHG Assessment Permit Awards



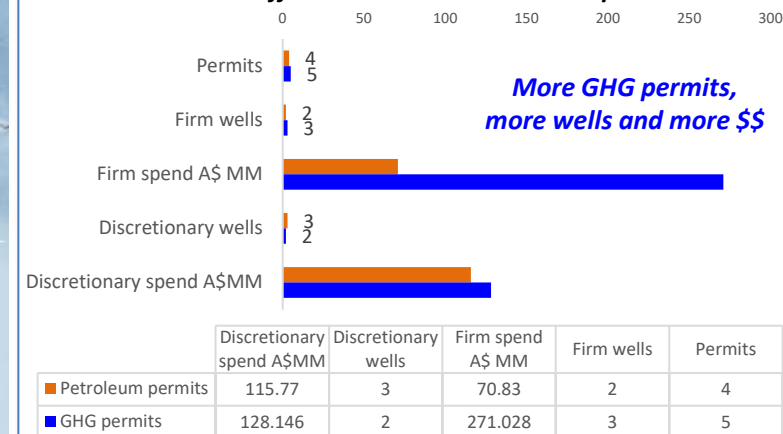
## Australian Federal Offshore Greenhouse Gas Storage Acreage Awards

- 5 permit awards (from 5 release areas)

## State Jurisdiction GHG Exploration Permits

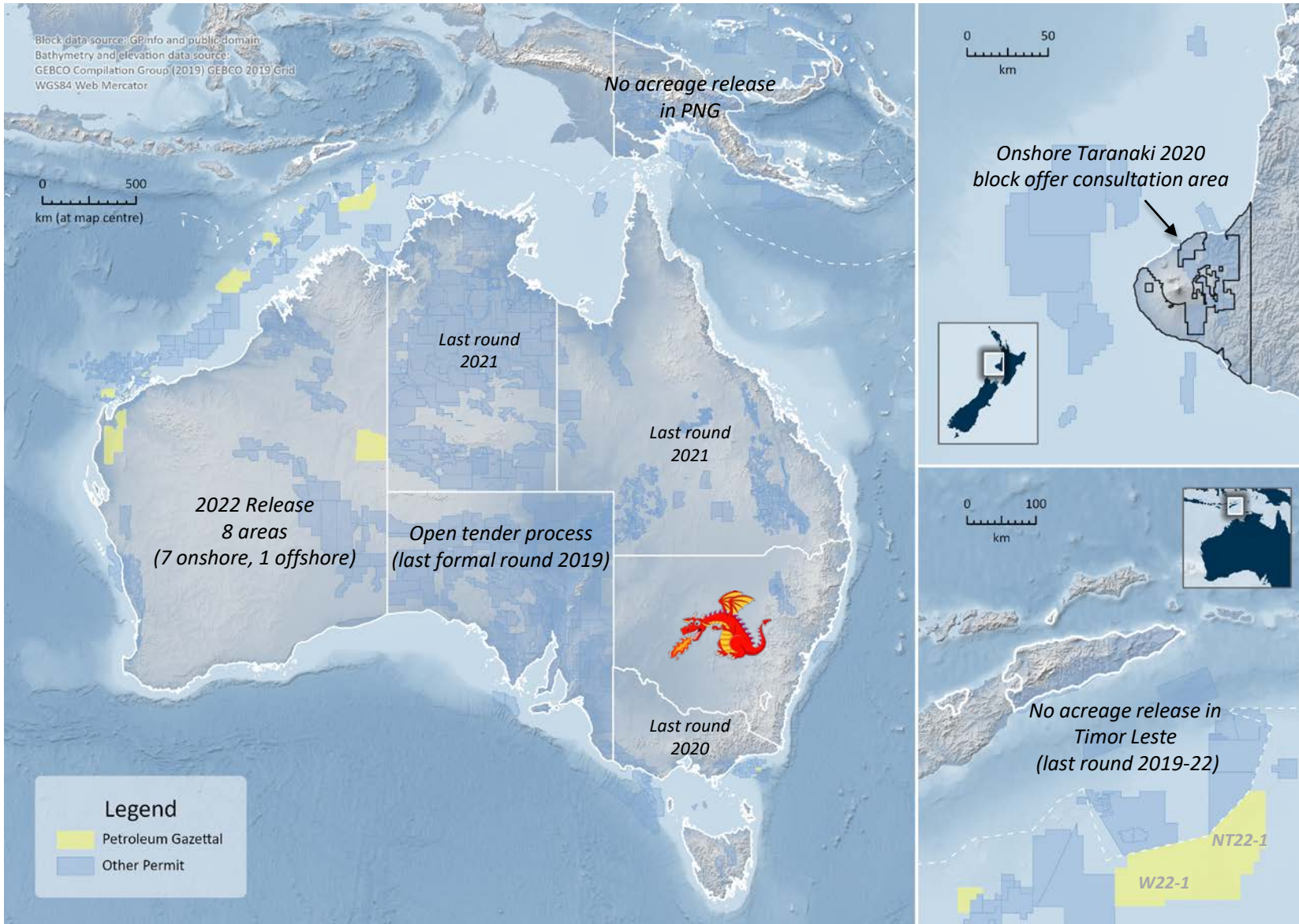
- SA; 1 permit awarded, GSEL 759 (3D Oil, over Caroline-1 well)
- SA; 13 areas with 'preferred tender' status under consideration, and subject to native title negotiation
- QLD; 2 permits 'preferred tender' status from 2021 release round, and subject to native title negotiation

## Aust. Federal Offshore GHG vs Petroleum Exp Awards





# Australasia 2022 Acreage Releases



## Australian Federal Offshore Petroleum Release Round

- 10 areas (21 in 2021 & 42 in 2020)
- Release delayed to due to Federal election (August instead of June)
- Bids due 2 March 2023

## Western Australia Petroleum Release Round

- 7 onshore areas, 1 offshore area (territorial waters)
- Released March and closed June 2022
- 7 bids received
- 'Preferred bidder' announced on 4 areas (subject to native title negotiation)

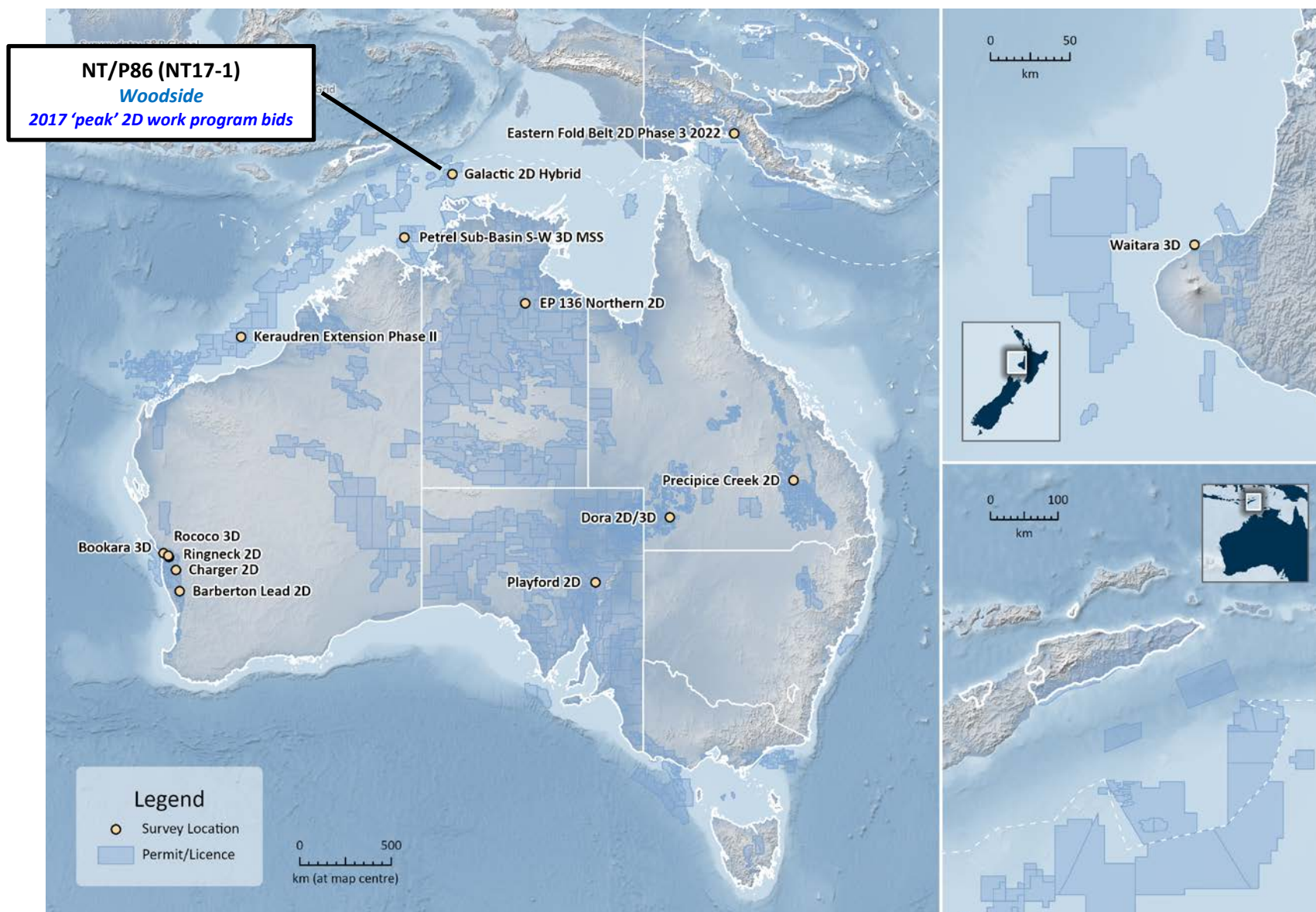
## New Zealand

- 2020 block offer area remains open for iwi and hapu consultation.
- Govt deferred decision to offer blocks in Dec 2022
- Ban on new offshore exploration permits since 2018
- Last onshore Taranaki round in 2019

## Australian Federal Offshore Greenhouse Gas Storage Acreage Release

- Nominations for areas closed July 2022 but.....
- Release round was not announced in December as expected

# Seismic Surveys Acquired 2022

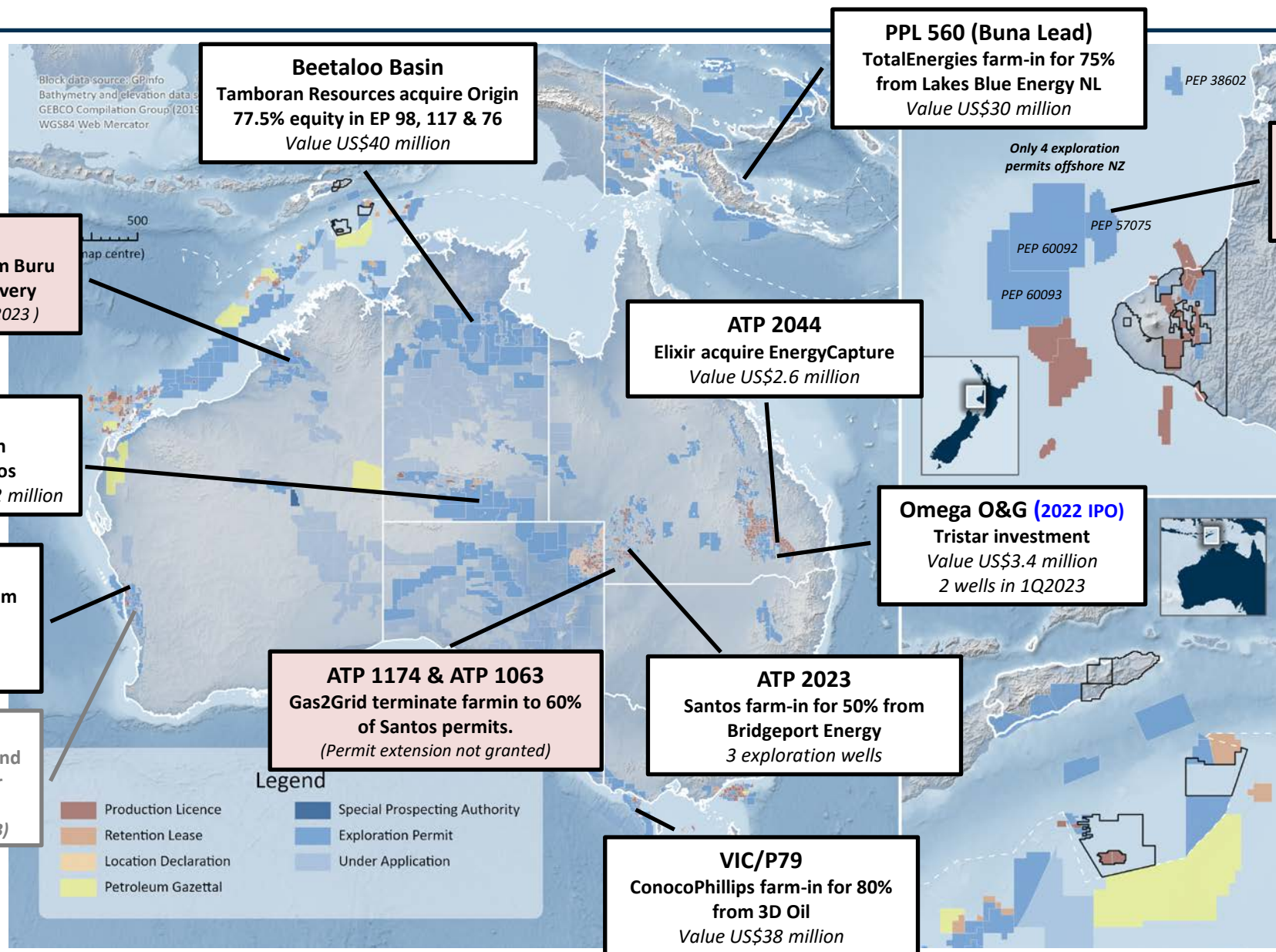


Australian Seismic	2022	2021	% Change
<b>Total 2D (km)</b>	<b>4,819</b>	<b>1,460</b>	
2D onshore	707	1,460	48% ↓
2D offshore	4,112	0	100% ↑
<b>Total 3D (km2)</b>	<b>2,384</b>	<b>7,060</b>	
3D onshore	727	280	260% ↑
3D offshore	1,657	6,780	24% ↓

- Only offshore 2D acquired in the Woodside operated NT/P86 exploration permit (2017 release, 2019 award), Timor Sea.
- Santos acquired Keraudren 3D extension Phase II in Bedout Sub-basin (Dorado hub area)
- Significant 2D & 3D acquisition in the Perth Basin**
- Transition zone Waitara 3D acquisition in NZ by Greymouth Petroleum
- Eastern fold belt Phase 3 in PNG (?? Km)



# Exploration Deals 2022

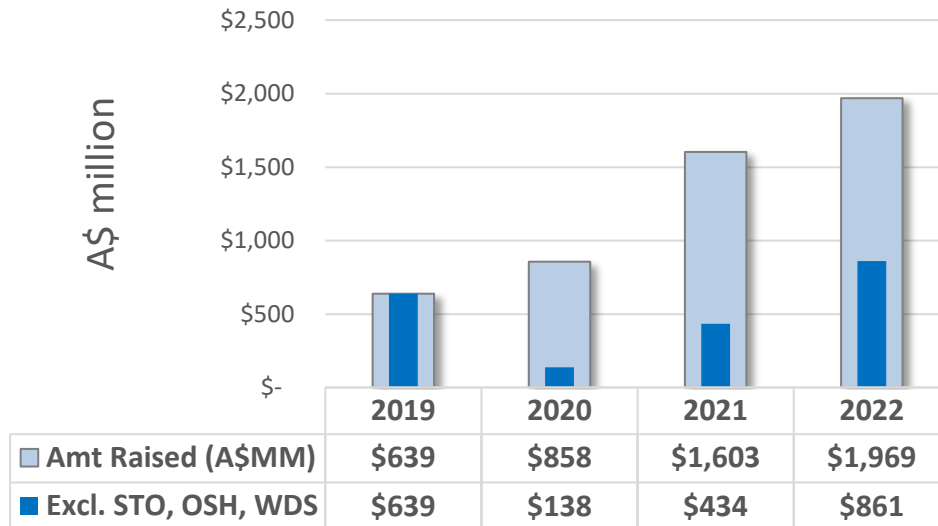


# IPO's and Capital Raisings (ASX listed)



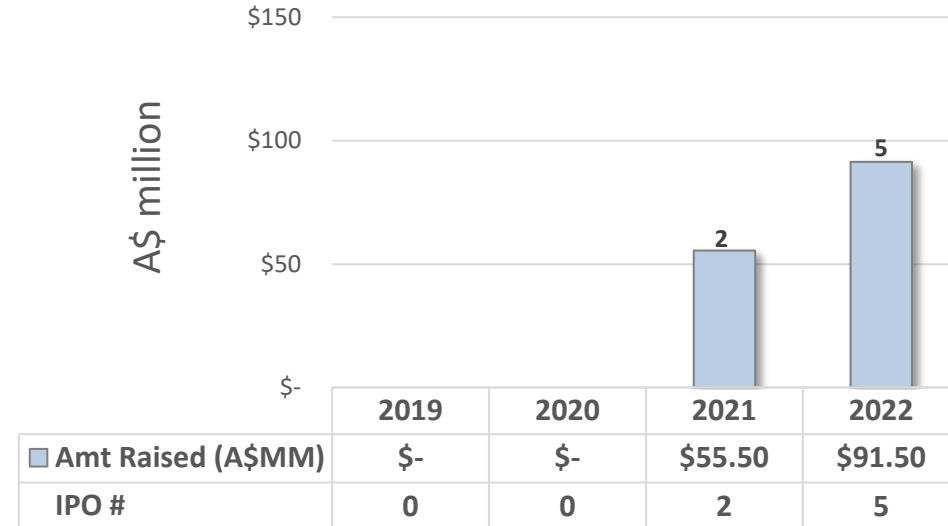
## Litmus tests for the health of the O&G exploration industry .....

IPO's, Capital Raises and Rights Issues



- Oil & gas companies on the Australian stock exchange ("ASX")
- Excluding large caps (Woodside, Santos, Oil Search, Origin) the ASX is dominated by exploration companies with assets and activities worldwide
- Capital raised on equities market is increasing since 2019/20**

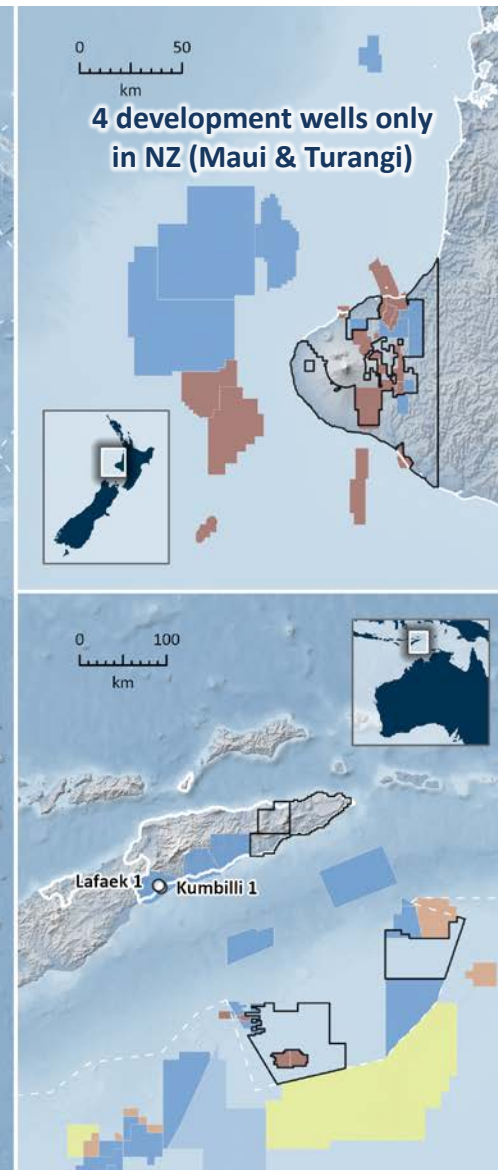
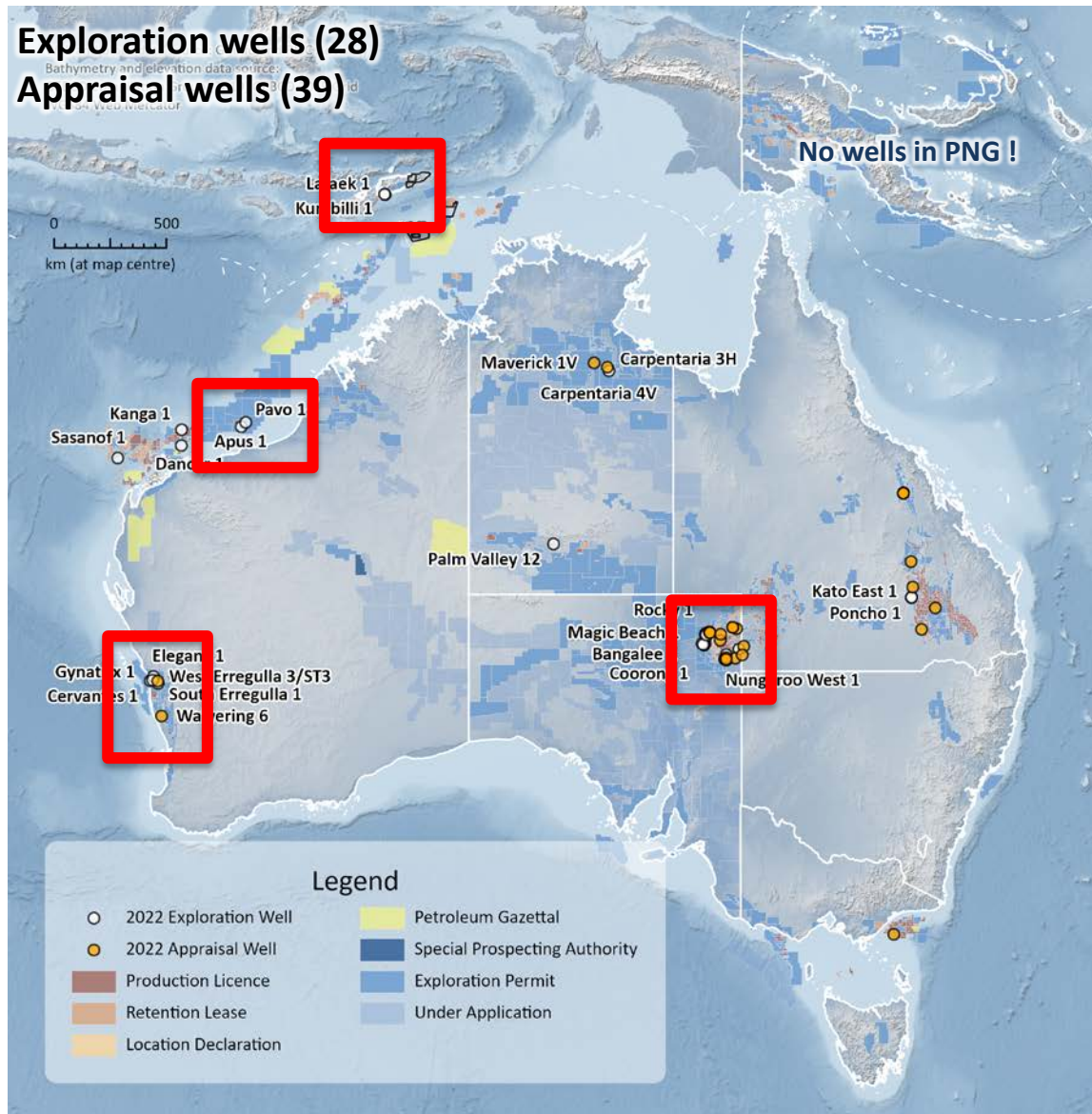
IPO's



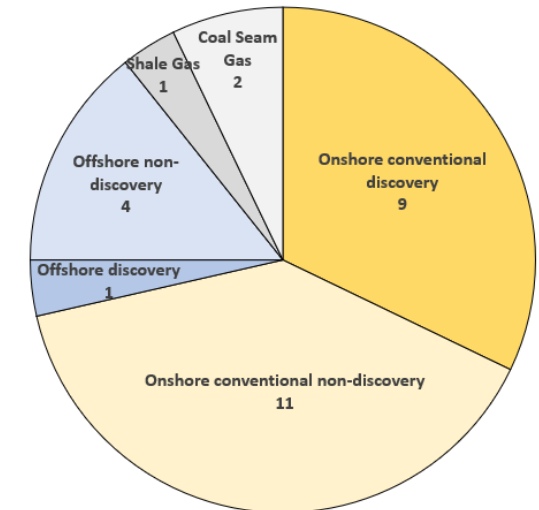
- Oil & gas company initial public offerings ("IPO") on the ASX have increased
- IPO's typically exploration focussed companies
- In 2022 Finder Energy, Noble Helium, Top End Energy, Omega O&G and Conrad Asia Energy floated on the ASX
- IPO's are an indicator of the investment health and investor appetite for oil & gas equities (and their returns)**



# Exploration & Appraisal Wells 2022

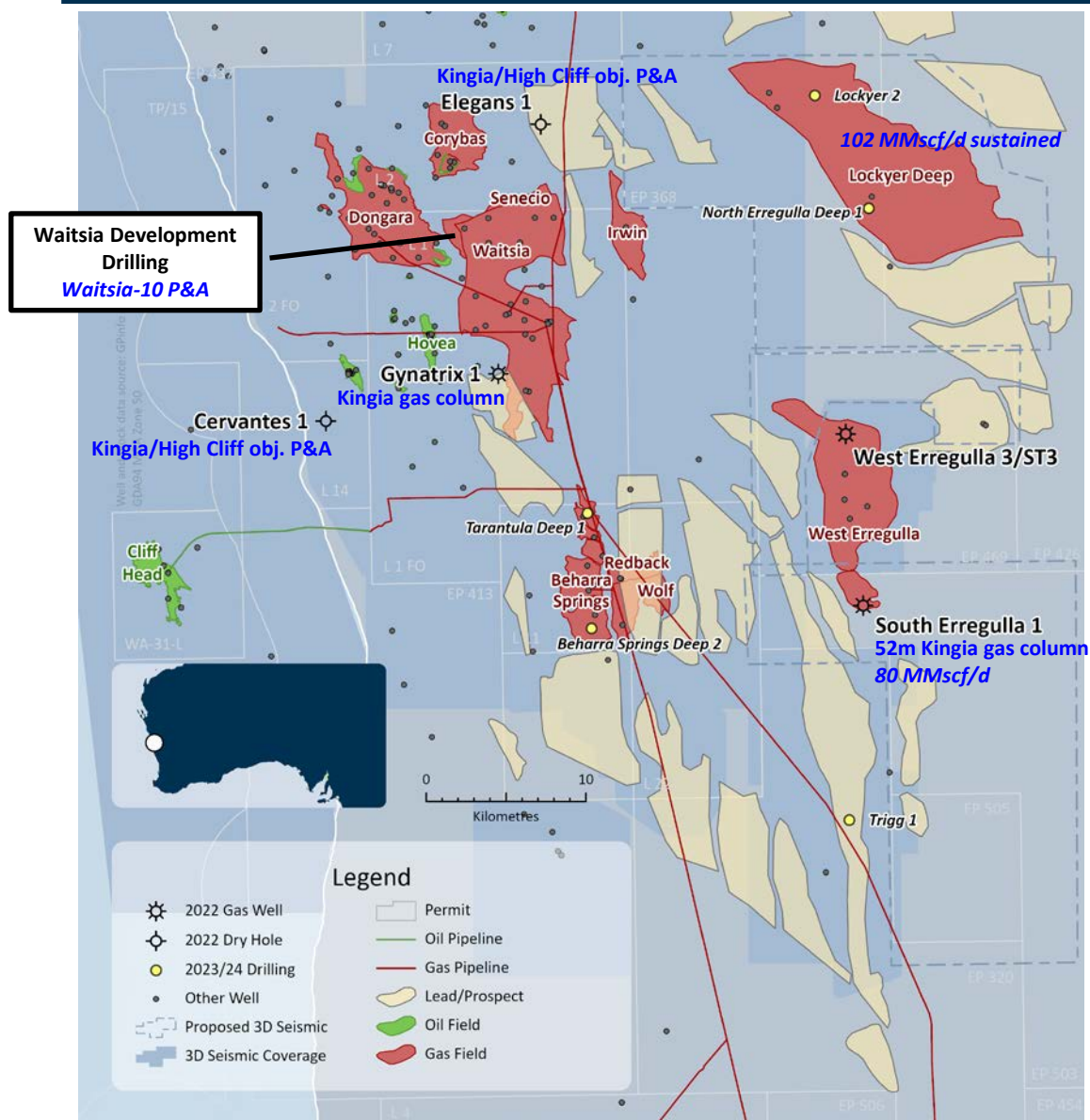


## Exploration wells (n= 28)



- No exploration or appraisal wells in PNG or NZ
- Offshore exploration wells = 5
- Offshore discoveries = 1 (Pavo-1)
- Onshore exploration wells = 23
- Onshore conventional discoveries = 9
  - Australia = 8
  - Timor Lestè = 1 (Kumbilli-1)

# Exploration Hotspot – North Perth Basin



## Exploration Drilling:

- RCMA, Vintage & Metgasco drilled the **Cervantes-1** well which was P&A'd as a dry-hole.
- Strike Energy drilled the **South Erregulla-1** exploration well in EP 503 (gas discovery).
  - Wagina sandstone 16m net. Ave porosity 14%
  - Kingia Sandstone 52m gross gas column, 14m net. Ave porosity 13% 80 MMscf/d on test.
- Mitsui / Beach Energy Joint Venture drilled the **Elegans-1** and **Gynatrix-1** wells as part of the Waitsia development drilling campaign<sup>1</sup>.
  - Elegans-1 was P&A'd as a dry-hole (17% gPOS pre-drill)
  - Gynatrix-1 intersected 6m net gas pay in Kingia Sst objective (24% gPOS pre-drill)

## Appraisal Drilling:

- Strike Energy operated EP 469 JV completed drilling the **West Erregulla-3ST3** well. 60 m gross gas column in Kingia. Tested at 90 MMscf/d

## Future Drilling:

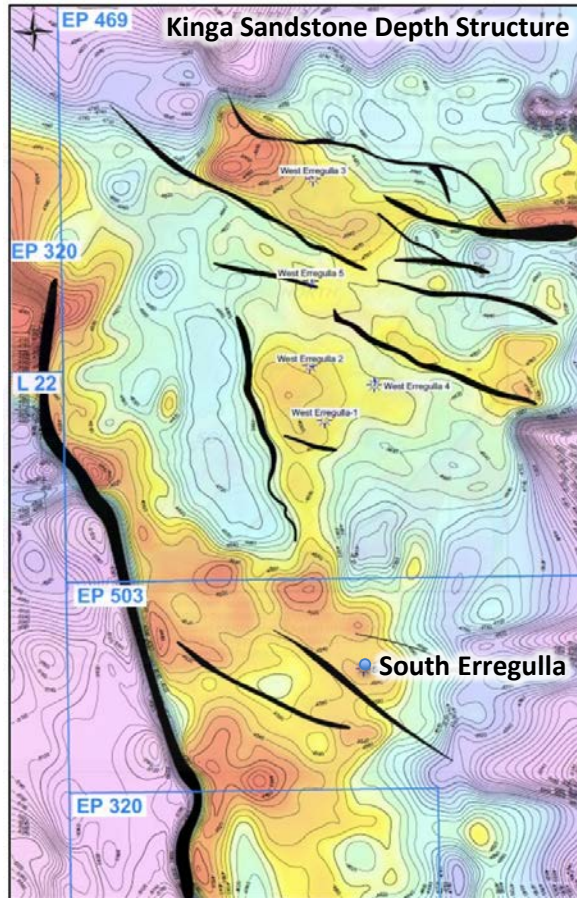
- Beach to drill Trigg-1 exploration well
- Beach to drill Beharra Springs Deep-2 appraisal well and Tarantula Deep-1 exploration well
- Energy Resources (MinRes) & Norwest Energy JV to drill 2 exploration/appraisal wells on the 2021 Lockyer Deep gas discovery

For more details on the Permian exploration play, check out Ian Cockerill's and Andrew Farley's Session 11 presentations Thursday.

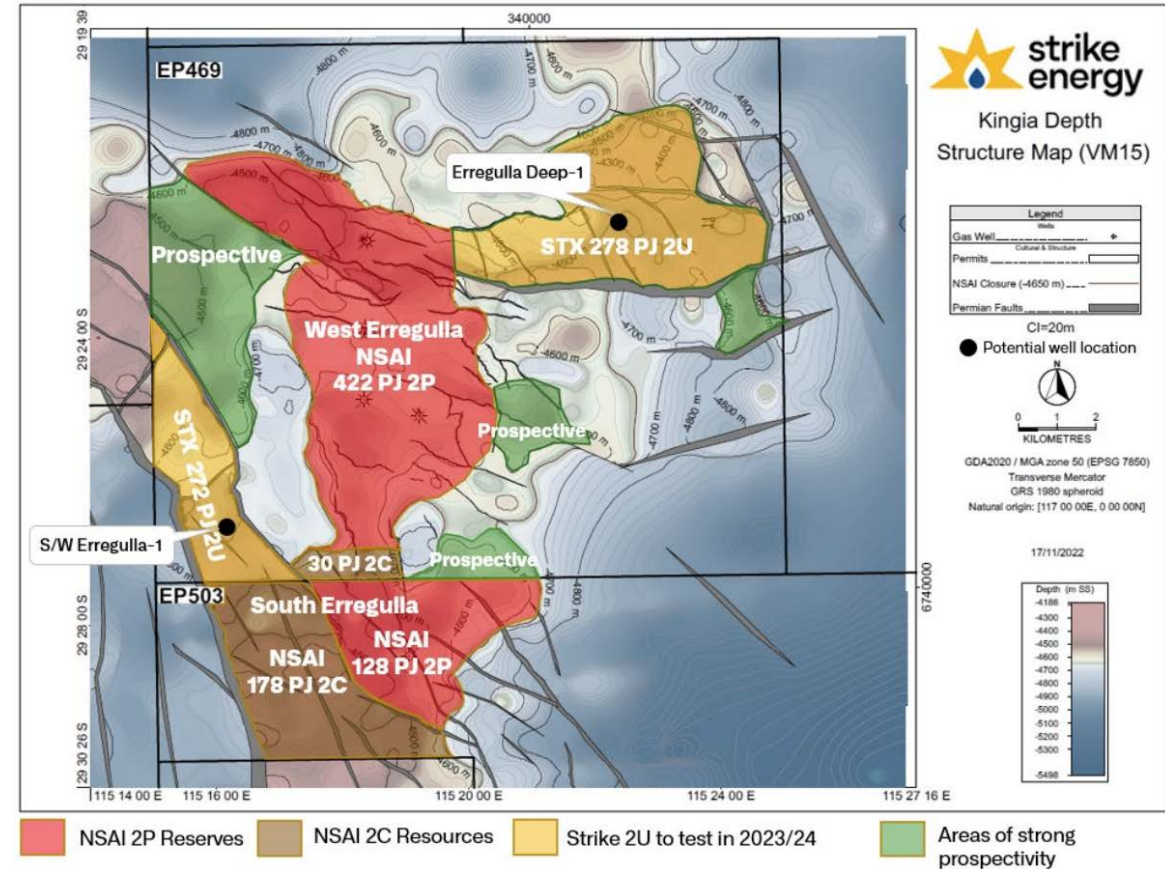
<sup>1</sup> Beach Energy FY23 2<sup>nd</sup> Qtr report released 31 Jan 2023



# South Erregulla-1



Source: Strike ASX announcement 10 January 2022



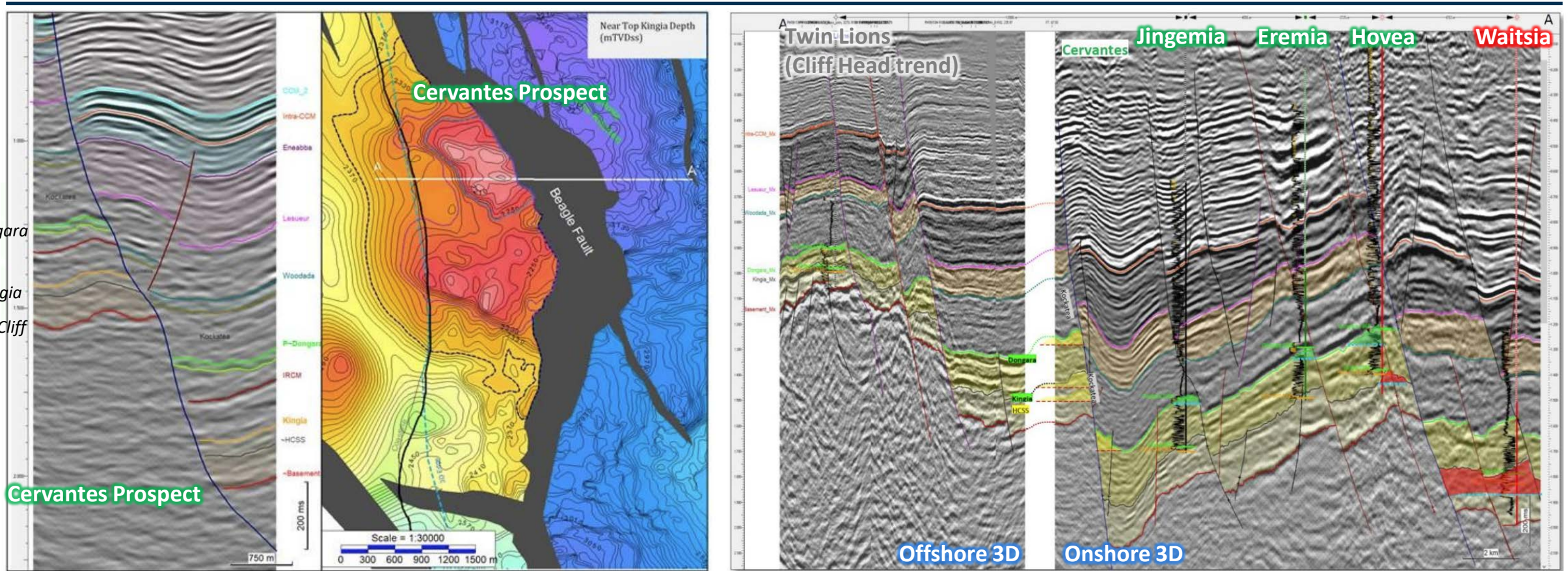
\*resource polygons are for visualisation purposes only and well locations are preliminary and subject to additional analysis and joint venture processes

Source: Strike ASX announcement 16 Dec 2022

- South Erregulla-1 drilled January – March in EP503 by Strike Energy 100%
- 16 m net gas pay in Wagina Sandstone with porosity up to 14% (average 9%)
- 52 m gross and 14 m net gas pay in Kingia Sandstone with porosity up to 20% (average 13%) – tested at 80 MMscf/d



# Cervantes-1

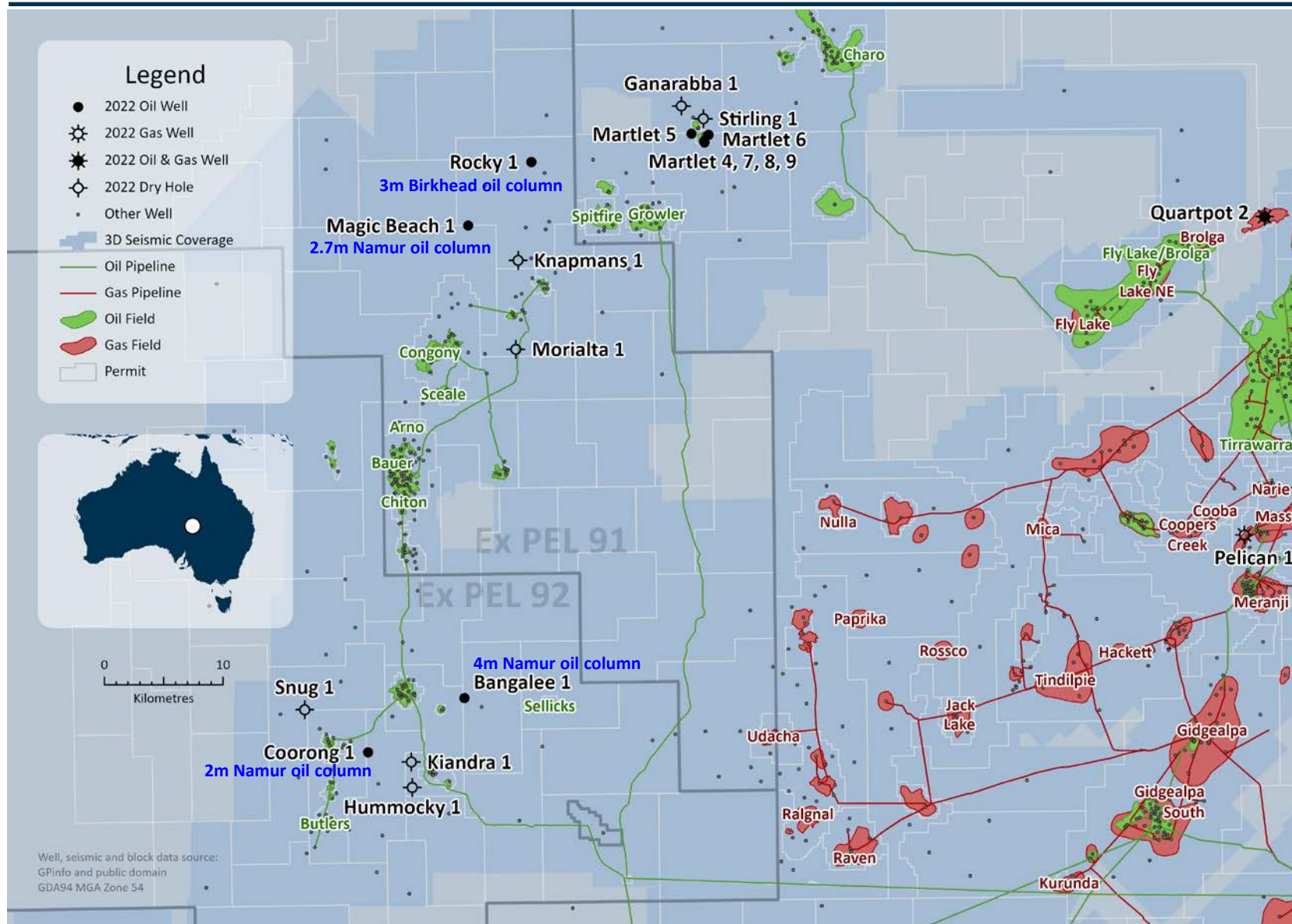


Source: Vintage Energy ASX announcements

- **Pre-drill estimate of 15.3 MMbbl Prospective Resources (2U) and 28% gPOS**
- Target Permian Kingia and High Cliff sandstones in a faulted 3-way structural trap
- Cervantes-1 drilled March – April in L14 (Jingemina production license) by RCMA - Vintage Energy & Metgasco farming in
- TD of 2,520 m
- **Well failure attributed to poor access to oil charge**



# Exploration Hotspot – Cooper Basin Western Flank



## Exploration Drilling:

- Beach Energy drilled 13 exploration wells in the Cooper-Eromanga basin (12 Operated wells)
- 11 exploration wells on the 'Western Flank'
- 4 successes (Bangalee-1, Coorong-1, Magic Beach-1 & Rocky-1)
- No material exploration on the Western Flank for 5-years
- Exploration success attributed to PSDM (re)processing of 3D seismic
- 'Western Flank' Namur and Birkhead plays have been extended north-west

## Appraisal Drilling:

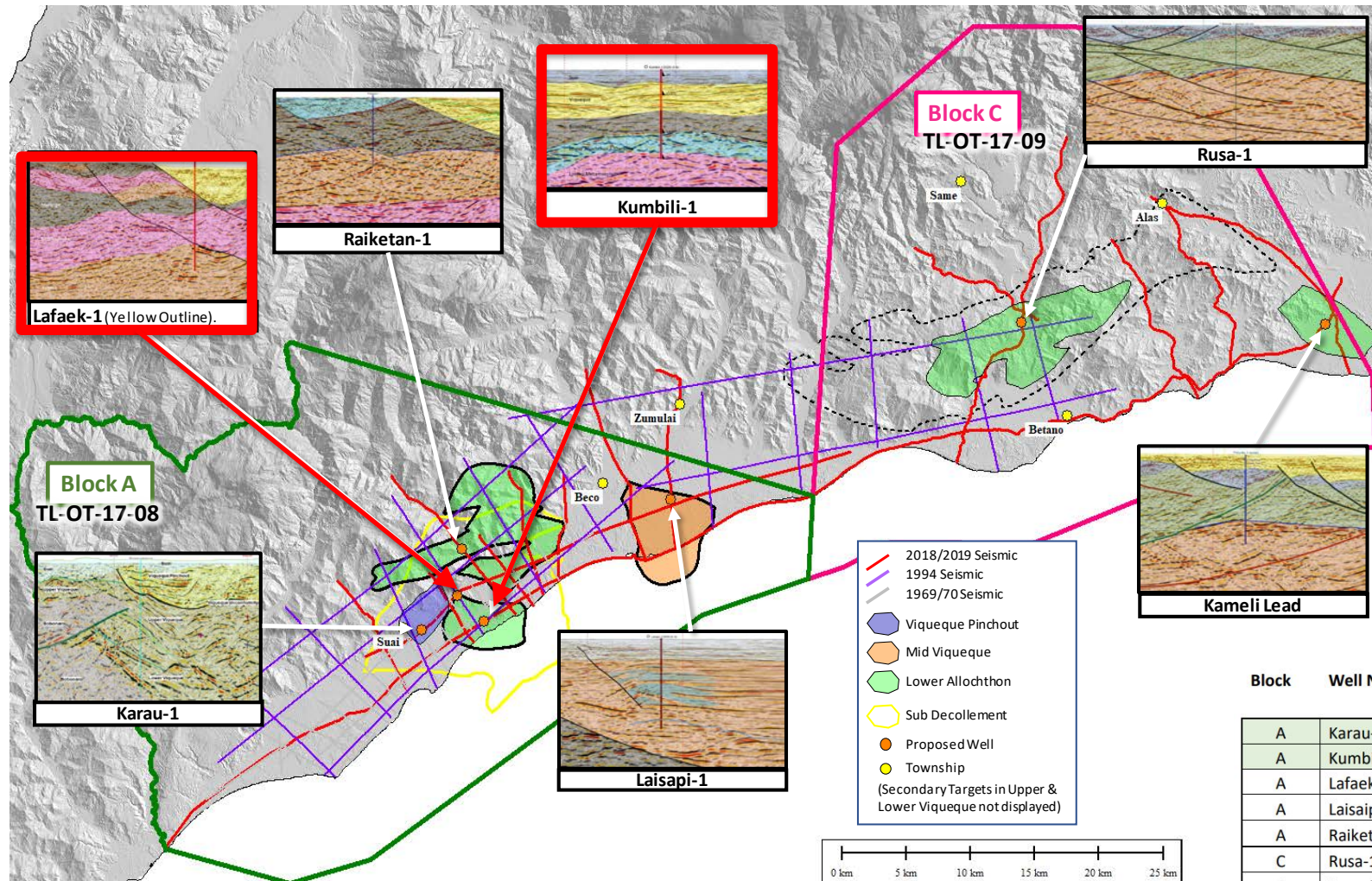
- Beach Energy drilled Martlet-3 to 9 during 2022
- All wells successful

## Future Drilling:

- 2023/24 exploration drilling planned



# Exploration Hotspot - Timor Leste (Kumbilli-1 & Lafaek-1)

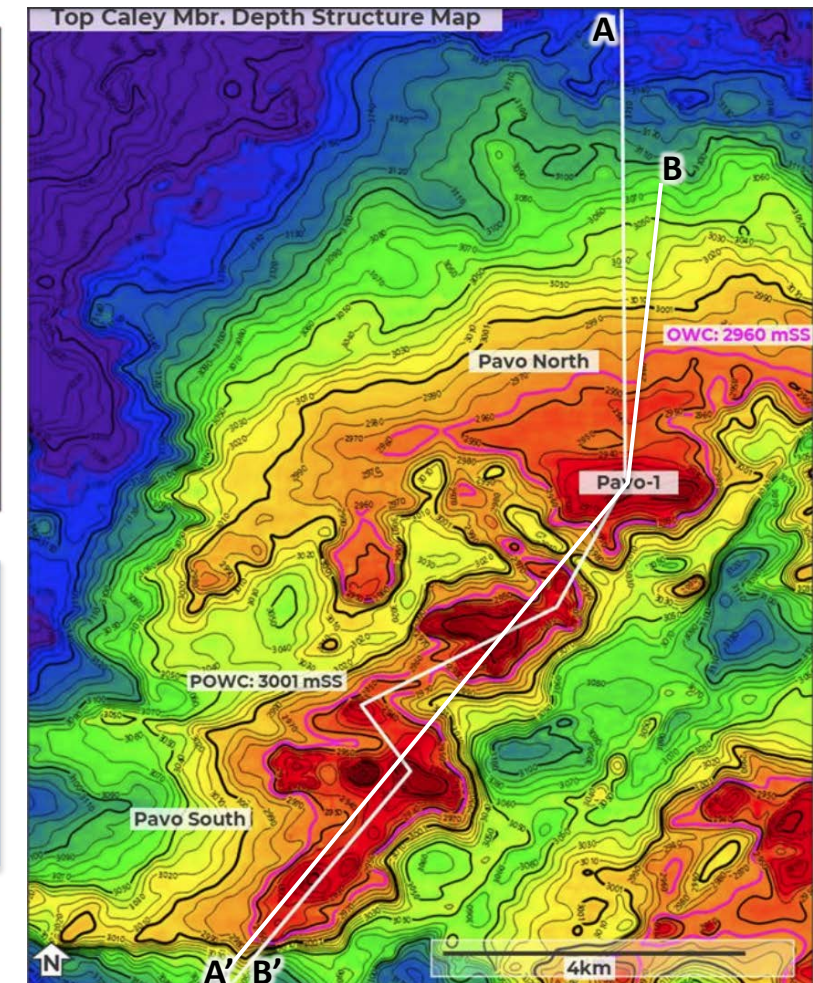
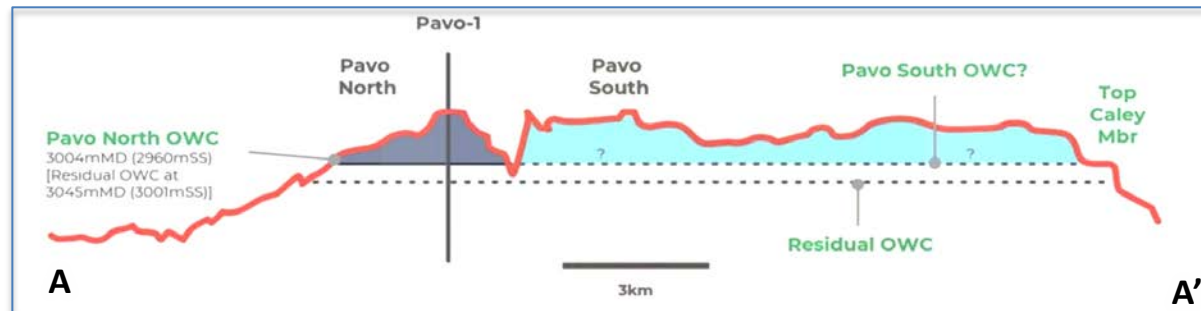
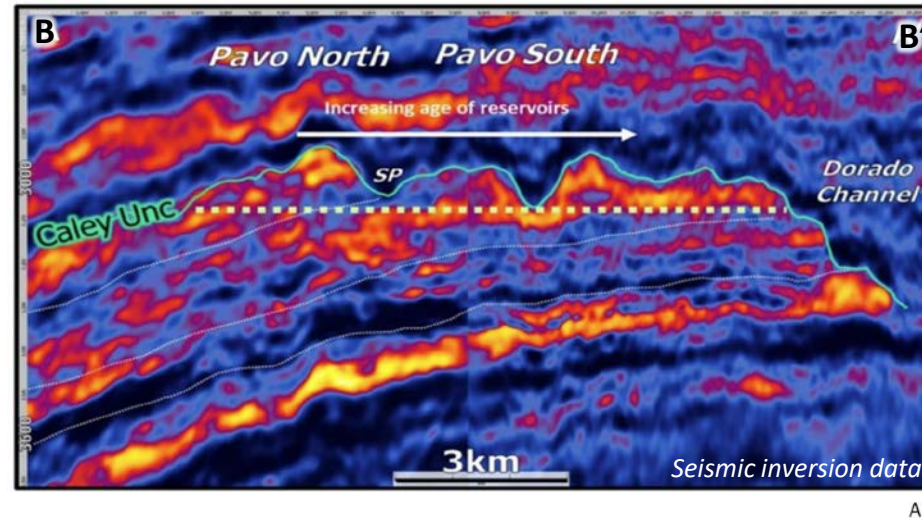
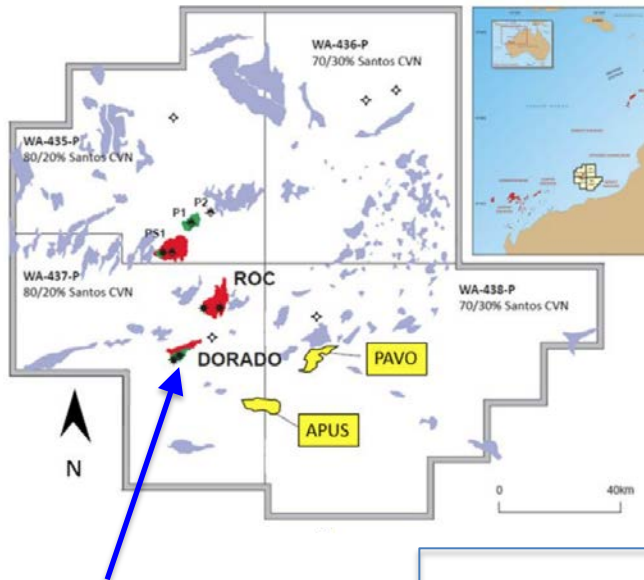


- TL-OT-17-08 Timor Resources (Op) and Timor GAP Joint Venture
- Karau-1 drilled late 2021
  - Oil recovered on MDT
- **Kumbilli-1** drilled December 2021 – March 2022
  - TD of 1,670 m in Triassic
  - Oil recovered on MDT in fractured Triassic limestones primary objective
- **Lafaek-1** currently drilling

Block	Well Name	Prospects	Recoverable Oil mmbbls			
			P90	P50	P10	Pmean
A	Karau-1	Viqueque	15	39	50	97
A	Kumbilli-1	Lower Allochthon	10	35	121	55
A	Lafaek-1	Sub Decollement	32	195	504	244
A	Laisapi-1	Viqueque Carbonate	11	42	98	50
A	Raiketan-1	Lower Allochthon	7	27	110	48
C	Rusa-1	Lower Allochthon	25	113	512	217
C	Kameli-1	Lower Allochthon	13	69	379	154
Recoverable Oil (MMstb)			<b>113</b>	<b>520</b>	<b>1774</b>	<b>802</b>



# Exploration Hotspot - Bedout Sub-basin (Apus-1 & Pavo-1)



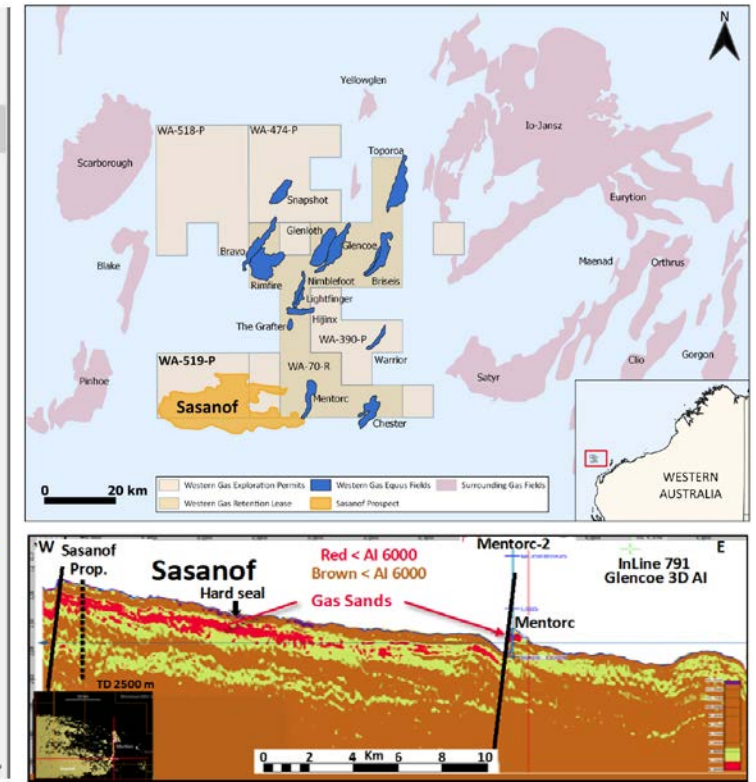
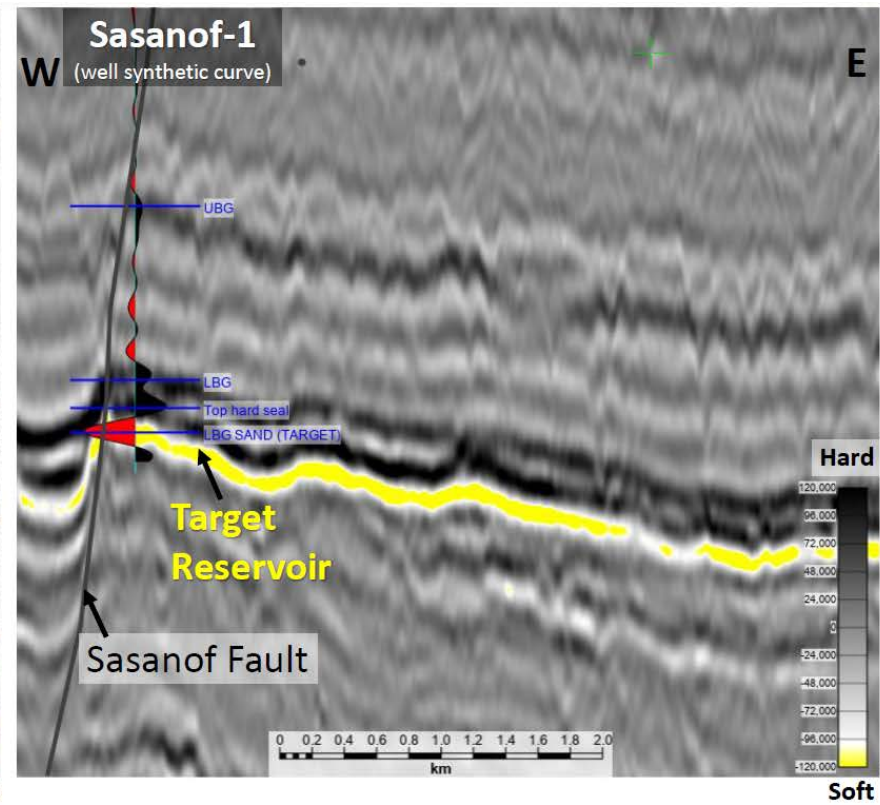
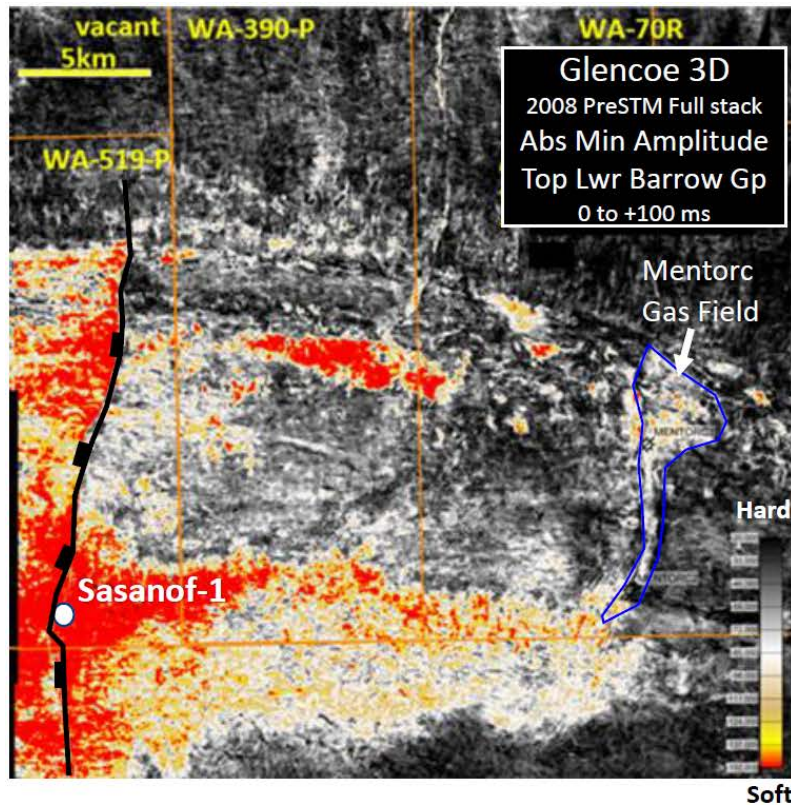
Sources: Carnarvon Energy ASX releases

2018 Dorado-1 oil discovery  
(~150 MMbbls)

- **Pavo-1** drilled February – April in WA-438-P in 88 m water depth by Santos and Carnarvon Energy JV to a TD of 4,235 m by the jackup Noble Tom Prosser
- **60 m gross oil column** in Triassic Caley Formation sandstones, **net pay of 46 m**
- 52° API oil with low GOR
- **2C Resources of 43 MMbbl**
- Pavo South Prospective Resource estimate 66 MMbbl (mean) and 51% gPOS
- **Apus-1** drilled during April (WA-437-P) in 80 m water depth to a TD of 2,900 m – P&A as dry-hole (access to charge main reason for failure)



# Sasanof-1

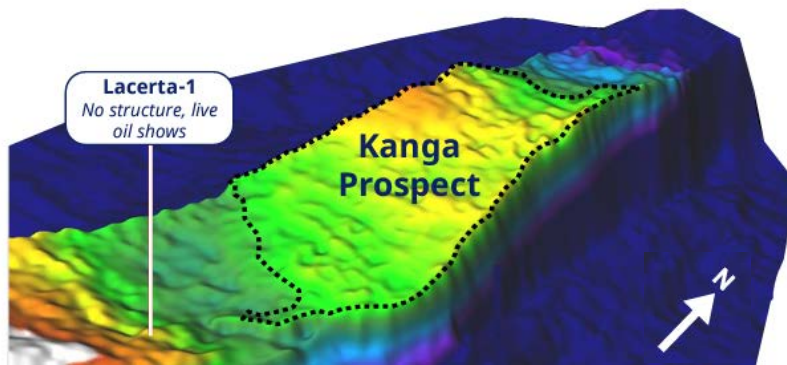
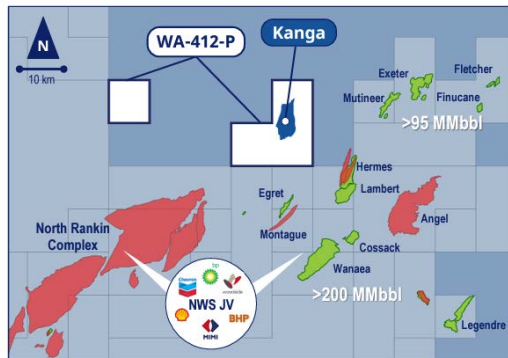


Source: Western Gas

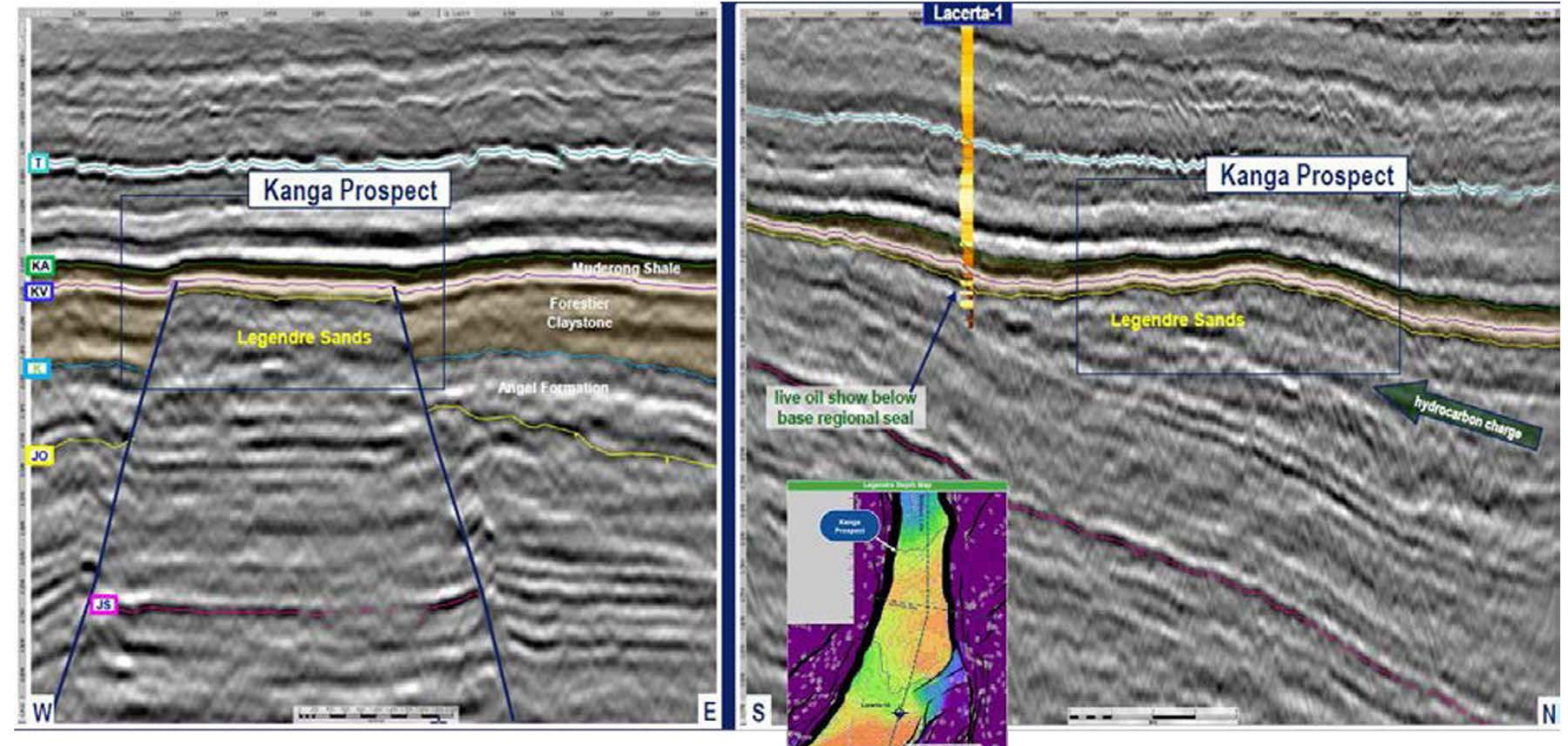
- **Sasanof Prospect pre-drill estimate of 7.2 Tcf Prospective Resources (2U) and 32% gPOS**
- Target Upper Barrow Group sandstones in a combination (structural/stratigraphic) trap
- Sasanof-1 drilled May – June in WA-519-P by Western Gas (Prominence Energy & Global Oil & Gas farming in)
- 1,070 m water depth and to a TD of 2,390 m
- Well failure attributed to lateral seal failure and/or limited gas charge



# Kanga-1



Source: Finder Energy Investor Presentation

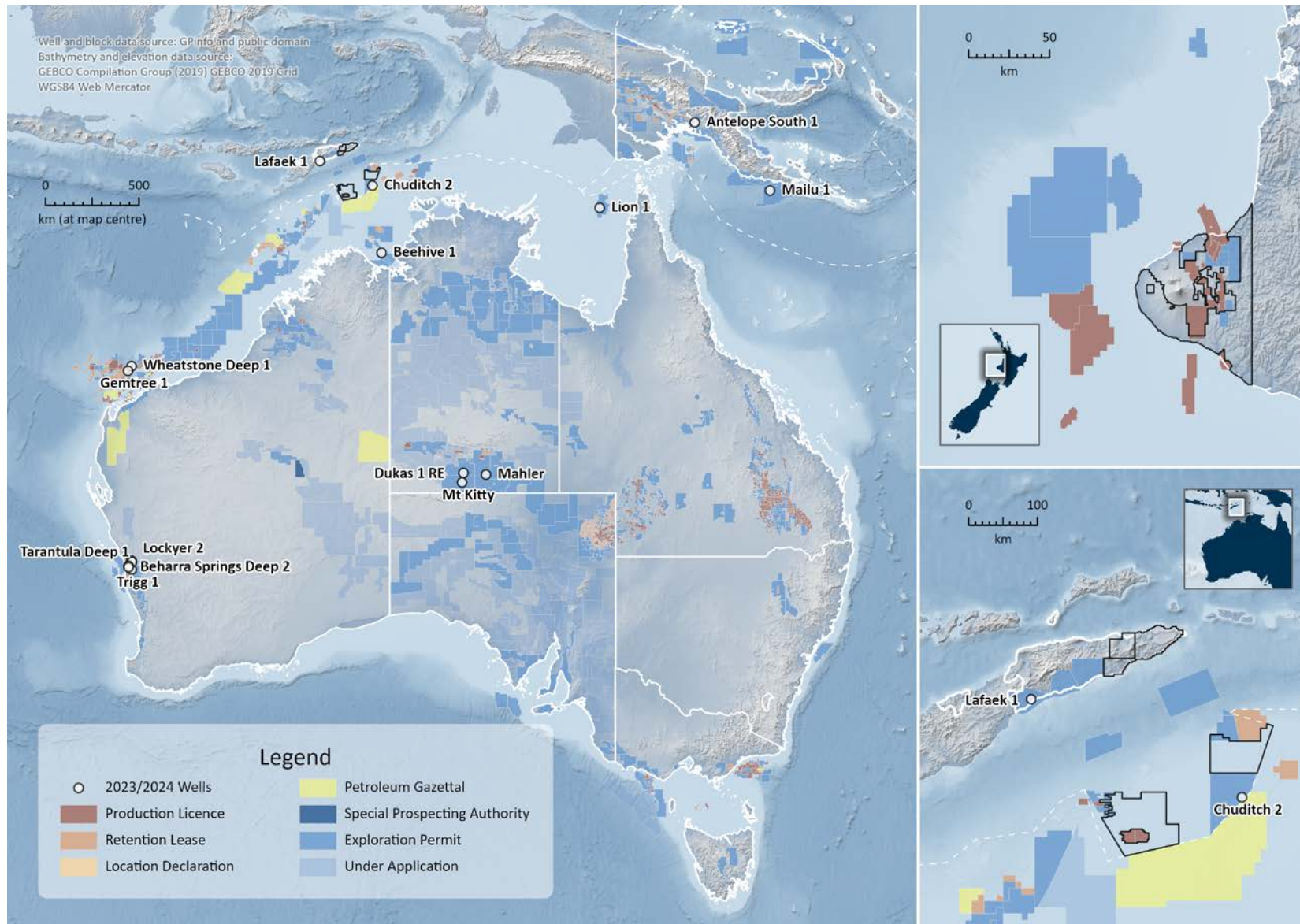


Source: Finder Energy Prospectus

- **Kanga Prospect pre-drill estimate of 170 MMbbl Prospective Resources (2U) and 36% gPOS**
- Target Jurassic Legendre Formation sandstones in a combination (structural/stratigraphic) trap - depth conversion play
- Kanga-1 drilled May – June in WA-412-P by Finder Energy (SapuraOMV farming in)
- *“Kanga-1 was drilled to test the hydrocarbon potential of Middle to Upper Jurassic sandstones within a horst block, fault-dependent closure below the ‘Valanginian Unconformity’ at the northern extension of the Rankin Trend. The well was drilled to a total depth of 3,400 metres however did not intersect any hydrocarbons. **Well failure has been attributed to no trap being present due to an increase in thickness of the Forestier Claystone shales than was interpreted pre-drill.**” (SapuraOMV)*



# Exploration & Appraisal Wells planned for 2023+



- **Lafaek-1** currently drilling
- **Wheatstone Deep-1** (Chevron Op) and **Gemtree-1** (Woodside Op) exploration tiebacks to Wheatstone LNG project
- **Trigg-1, Tarantula Deep-1 & Beharra Springs Deep-2** (Beach Energy) in the North Perth Basin
- **Beehive-1** (EOG Resources) in WA-488-P, Bonaparte Gulf targeting 416 MMboe 2U Prospective Resources
- Total to drill the long-delayed wells **Antelope South-1** (~1-2 Tcf Prospective Resources) and ultra deep water **Mailu-1** oil prospect.
- Re-entry of the suspended **Dukas-1** and **Mt Kitty-2 & Mahler-1** are planned to test sub-salt prospects with multi-TCF potential (hydrocarbons, He and H<sub>2</sub>)
- **Lion-1** is a well commitment in Q/23P in the Gulf of Carpentaria. Subject to farmout and likely to be delayed.
- **Chudditch** appraisal drilling (SundaGas)

- 28 exploration wells across the region, with 5 offshore and 21 onshore Australia and 2 onshore Timor Leste .
- 1 offshore discovery and 8 onshore conventional petroleum discoveries (Aust.) and 1 onshore discovery Timor Leste.
- No exploration wells in NZ or PNG.

## Key take-aways

- Exploration activity (wells and spend) in Australia decreased from 2021.
- Petroleum exploration is very much focussed on the onshore basins.
- Little or no petroleum exploration activity in NZ and PNG
- 36 areas under application in PNG awaiting ratification
- Bedout Sub-basin yields another sizeable oil discovery (Pavo)
- Exploration 'hot-spots' are Onshore North Perth Basin, Cooper – Eromanga Basin and onshore Timor Leste.
- The Cooper – Eromanga continues to yield exploration discoveries.
- GHG assessment permits are attracting larger work program commitment than petroleum exploration titles.
- Capital raisings and IPO's are increasing – an indicator of exploration industry health
- The return of the 2:1 farmin promote ?
- **2023+ should witness an increase in exploration activity with a number of planned wells, firm wells in new permit awards and companies having access to capital**



- Simon Barber (RISC)
- Craig Gumley (Consultant)
- Will Barker & Phil Woods (Western Gas)
- Sam Algar & Carrie Trembath (Beach Energy)
- Matthew Quinn (IHS)
- Rhys Simpson (EurozHartleys)
- Peter Cameron (Australian Oil & Gas Research)
  
- Data compiled from Gpinfo, GlobalData and public sources



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## Perth

Level 2  
1138 Hay Street  
WEST PERTH WA 6005  
P. +61 8 9420 6660  
E. [admin@riscadvisory.com](mailto:admin@riscadvisory.com)

## Brisbane

Level 10  
95 North Quay  
BRISBANE QLD 4000  
P. +61 7 3025 3397  
E. [admin@riscadvisory.com](mailto:admin@riscadvisory.com)

## London

Office 204  
20 St Dunstan's Hill  
LONDON UK EC3R 8HL  
P. +44 (0)203 795 2900  
E. [admin@riscadvisory.com](mailto:admin@riscadvisory.com)

## South East Asia

Jakarta  
Indonesia  
P. +61 8 9420 6660  
E. [admin@riscadvisory.com](mailto:admin@riscadvisory.com)