

# Investor presentation – Pavo discovery

## 23 March 2022



Following the material Pavo oil discovery, which was separately announced today, Carnarvon Energy Limited (“Carnarvon”) (ASX:CVN) is pleased to provide the attached presentation that the company will use to brief investors.

Approved by:

A handwritten signature in black ink, appearing to read "Adrian Cook".

**Adrian Cook**  
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# Corporate Presentation

March 2022

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ASX listed energy company (ASX:CVN)  
Developing high quality assets in Western Australia

# Disclaimer

The resource estimates outlined in this presentation are based on and fairly represent information and supporting documentation prepared by Carnarvon's Chief Operating Officer, Mr Philip Huizenga, who is a full-time employee of the company. Mr Huizenga has over 25 years experience in petroleum exploration and engineering. Mr Huizenga holds a Bachelor Degree in Engineering, a Masters Degree in Petroleum Engineering and is a member of the society of Petroleum Engineers. Mr Huizenga is qualified in accordance with the ASX Listing Rules and has consented to the form and context in which this statement appears.

All contingent and prospective resources presented in this presentation are prepared as at 28 August 2017, 23 April 2018, 20 August 2018, 15 October 2018, 15 July 2019 and 17 September 2020 pursuant to the announcements released to the ASX on 28 August 2017, 23 April 2018, 20 August 2018, 15 October 2018, 15 July 2019 and 17 September 2020. The estimates of contingent and prospective resources included in this presentation have been prepared in accordance with the definitions and guidelines set forth in the SPE-PRMS. Carnarvon is not aware of any new information or data that materially affects the information included in this presentation, and that all material assumptions and technical parameters underpinning the estimates in this presentation continue to apply and have not materially changed. Deterministic and probabilistic methods have been used to prepare the estimates of contingent resources. These contingent resources have been aggregated by arithmetic summation and hence the aggregate 1C may be a very conservative estimate, and the 3C may be a very optimistic estimate, due to the portfolio effects of arithmetic summation.

There are numerous uncertainties inherent in estimating reserves and resources, and in projecting future production, development expenditures, operating expenses and cash flows. Oil and gas reserve engineering and resource assessment are subjective processes of estimating subsurface accumulations of oil and gas that cannot be measured in an exact way. These prospective resource estimates have an associated risk of discovery and risk of development. Further exploration and appraisal is required to determine the existence of a significant quantity of potentially moveable hydrocarbons.

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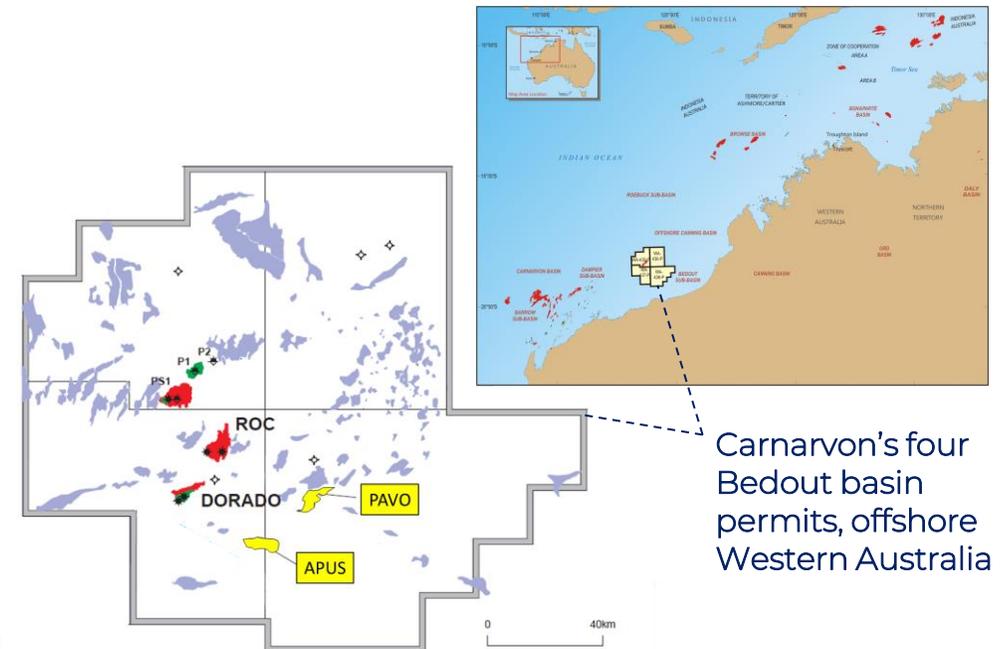
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## Carnarvon Energy – highly valuable energy projects in WA

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**Dorado oil development** - One of the few ASX listed companies with quality oil exposure, via the Dorado field in the Bedout basin in Western Australia
  
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**Bedout basin exploration** – With ~100 prospects in this basin, Carnarvon holds an enviable stake in a highly compelling growth region for oil and gas, with the **Pavo-1 oil discovery** recently reinforcing this position
  
- 
**Renewable fuel development** – Early investment into the production of renewable diesel demonstrates Carnarvon’s intention to generate value through the energy transition, while also lowering the emissions intensity across its asset portfolio





# **Dorado oil field development**

## **Dorado field overview (CVN 20%)**



Dorado was discovered in 2018 & appraised in 2019. Photo of the Noble Tom Prosser drilling rig used to drill the appraisal wells.

**Contingent resource of 162mmbbls**  
(gross 2C basis)

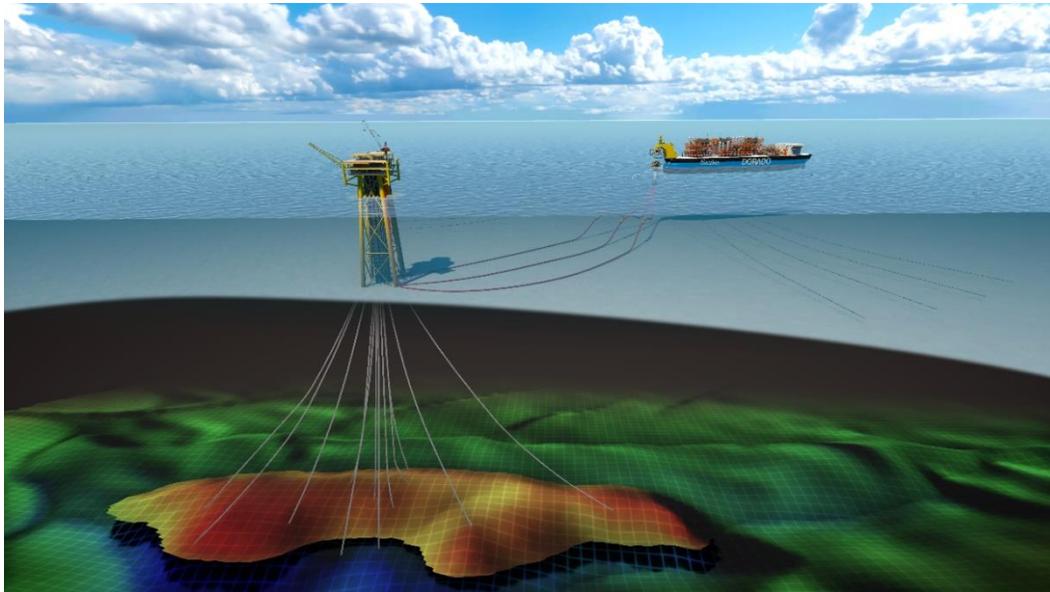
### **Phase 1 – oil production**

- Targeting an initial 75,000 to 100,000 bopd flow rate (gross) in early 2026

### **Phase 2 – gas and LPG production**

- In concept phase, with timing objectives to align with oil production decline

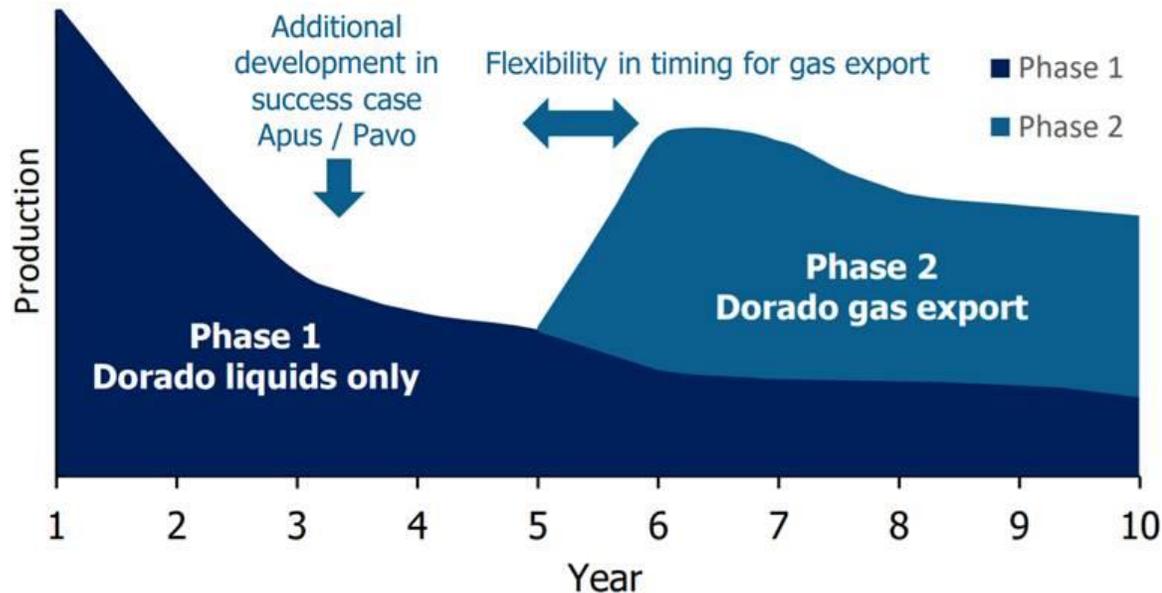
## **Dorado development phase 1 – FID ready by mid-2022**



The development plan includes multiple production and injection wells, a well head platform supplying an FPSO

- **Conceptual design complete** on subsurface, WHP and FPSO
- **FEED work advancing** to finalise capital cost and execution plan, along with required contracts
- Production License and Offshore Project Plan prepared for **regulatory approval**, Field Development Plan well advanced

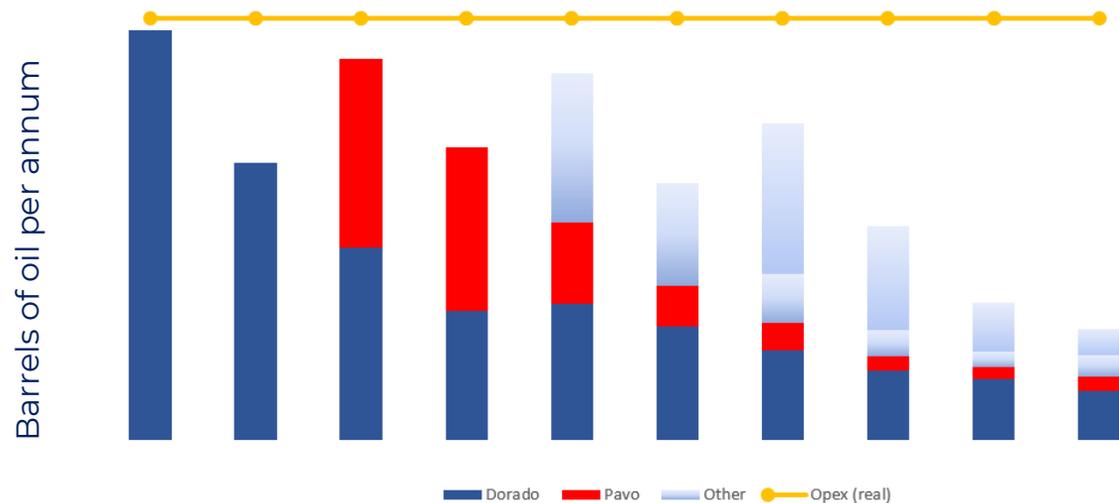
# Increasing opportunity to sequence oil & gas production



- **Pavo oil** discovery confirmed 23 March 2022
- **Apus-1** well is drilling in April 2022
- **Dorado gas** is to be reinjected for future production, timing is flexible
- **Roc gas** (discovered and appraised in 2016) has the potential to tie-into Dorado
- **Additional exploration and appraisal** potential near Dorado provides further opportunities

# Compelling value in producing additional oil in Dorado facilities

Illustration of the merits of tying back production from new fields into Dorado facilities with predominantly fixed operating costs



- Spreading operating costs over a larger resource pool maintains low operating costs per barrel
- Enhancing useful life and value of Dorado’s production facilities
- Compresses the time to tie in production by utilizing Dorado production facilities

# Dorado funding plans are advancing across multiple avenues

## Dorado's attraction for financiers

- Strong debt servicing capacity
  - Low operating cost per barrel
  - Material early free cash flows
- Australian jurisdiction
- Experienced operator

### Senior debt

- Technical DD commenced Sept 2021
- Commercial engagement commencing in Q2, 2022
- In discussion with >10 quality lenders

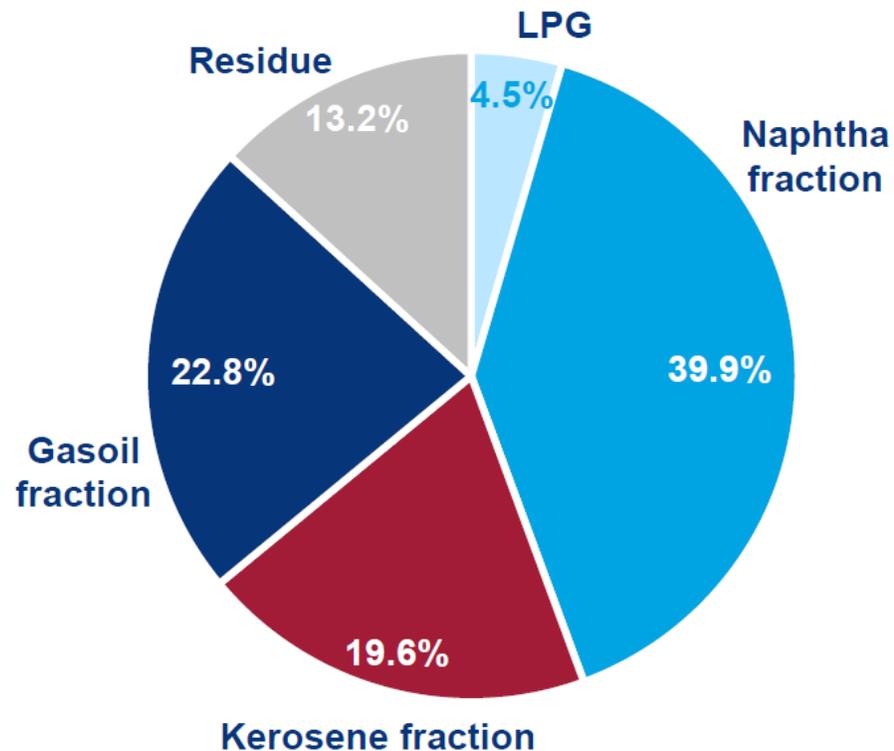
### Mezzanine finance

- Finance in addition to senior debt
- Junior debt, offtake prepayment and royalty funding
- In discussion with >5 providers

### Divestment

- Azure Capital engaged Jan 2022
- Process commencing in March 2022
- Reducing project equity lowers net capex and increases cash for funding

## **Dorado field contains a sought after light sweet crude**



(%s by volume)

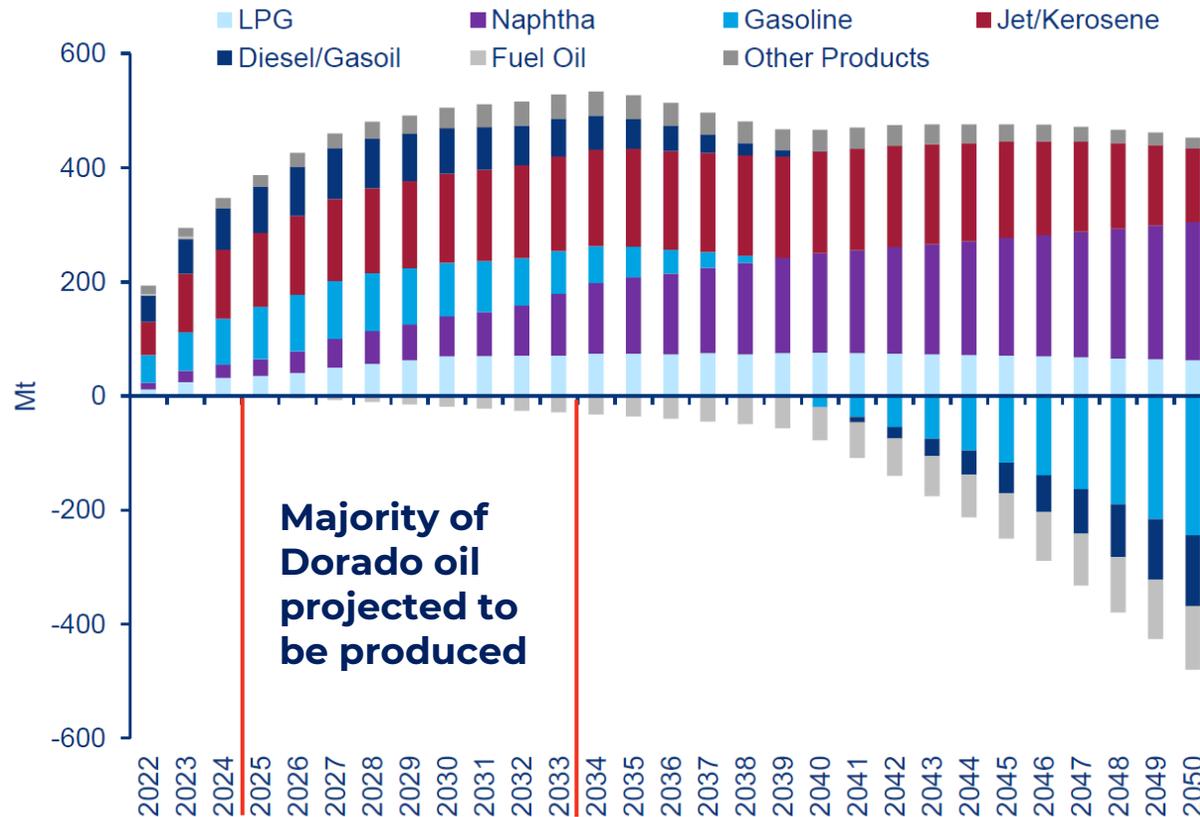
### **Examples of Dorado crude uses**

- Petrochemicals
- Jet & other transport fuels

### **Dorado crude is categorized as**

- Light / extra light (51° API)
- Sweet (defined by its low 189 ppm Sulphur content)

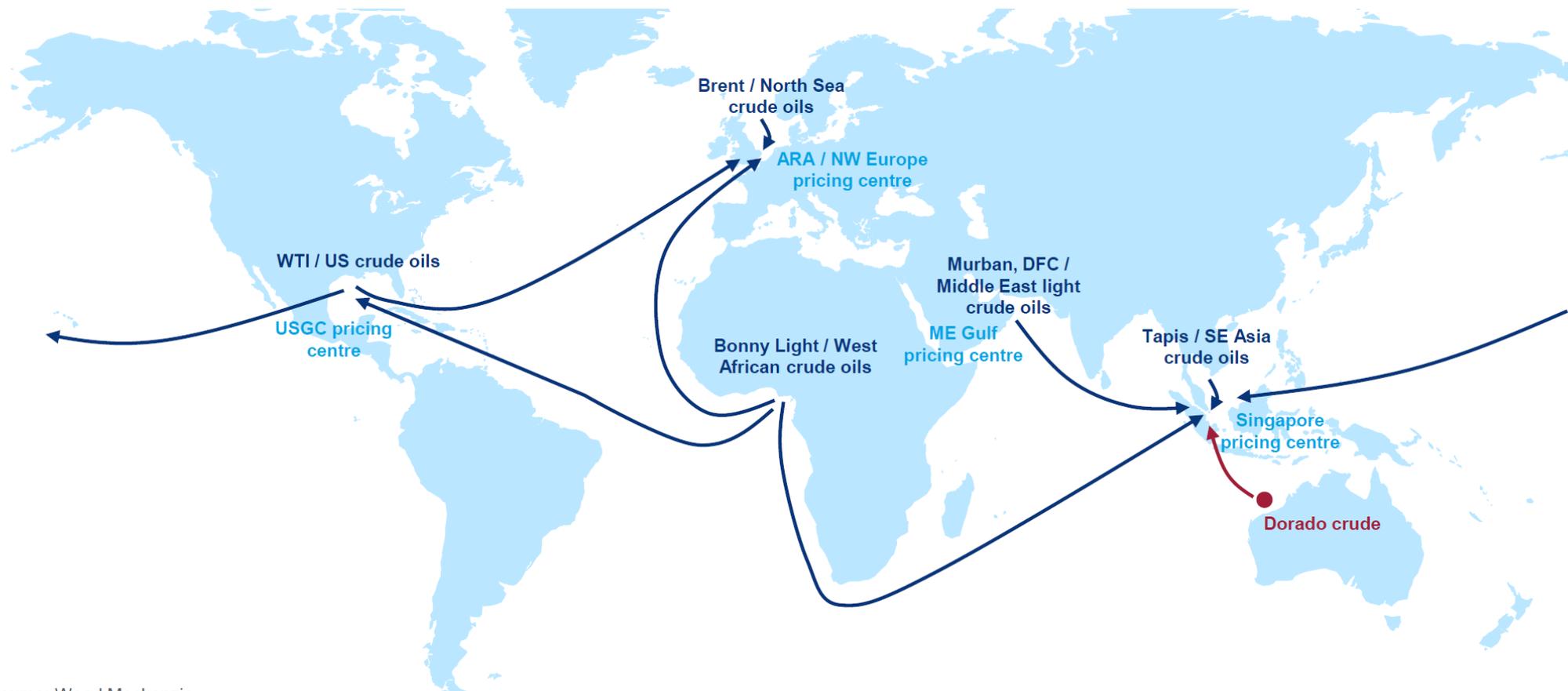
# Strong projected demand for light crude products like Dorado's



- Naphtha demand growth (petrochemical feedstock)
- Jet/kerosene demand growth
- Dorado crude refined products suited to growth areas
- Dorado production well timed into forecast growth profile

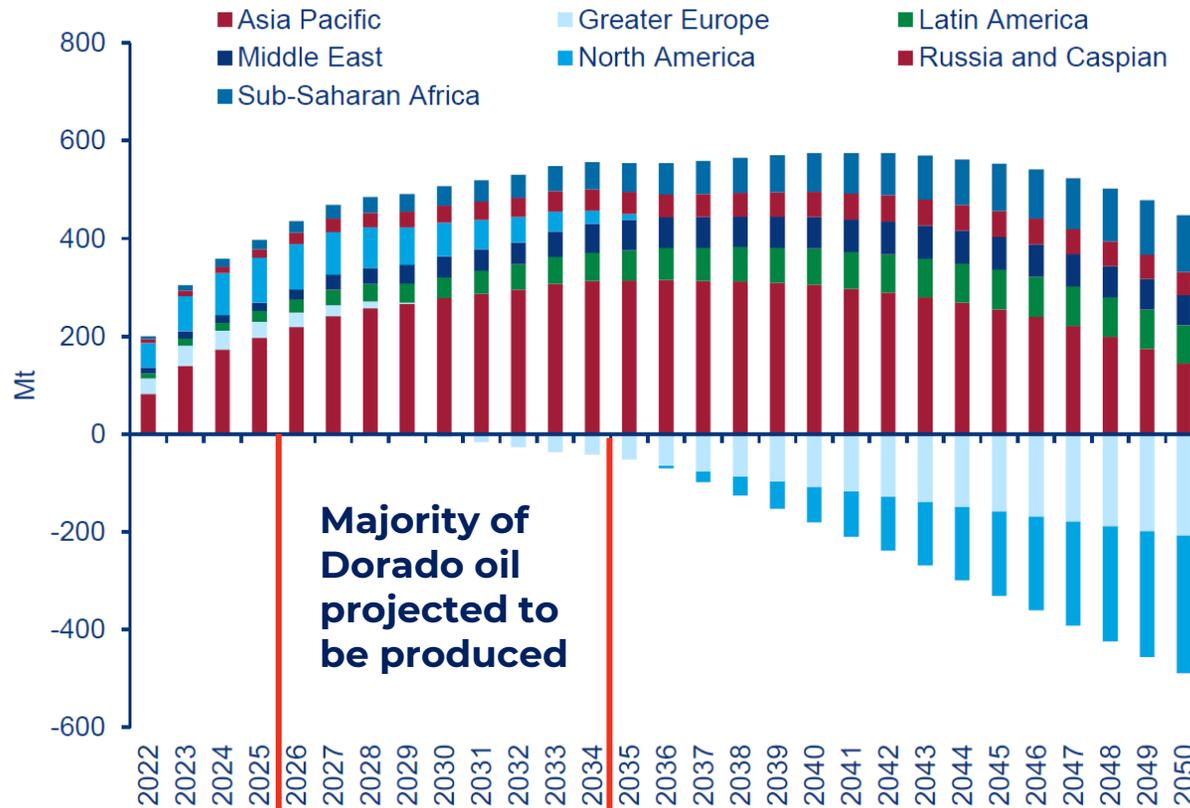
Source: Wood Mackenzie

# *Dorado positioned to support Asian demand growth*



Source: Wood Mackenzie

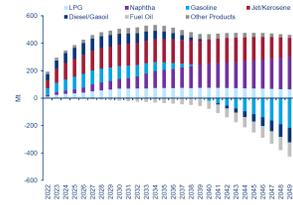
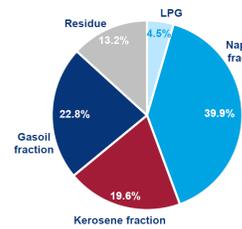
# Asian demand projections strong for light crudes like Dorado's



- Strong demand growth
- Driven from Asia Pacific
- Dorado production timing and location is ideal

Source: Wood Mackenzie

# Dorado refined products and demand forecasts are attractive

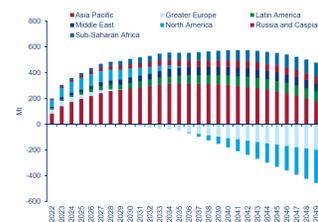


## Dorado refined products

- Naphtha for petrochemicals
- Jet and other transport fuels

## Dorado timing

- Demand growth projected in Dorado's main production window



## Dorado location

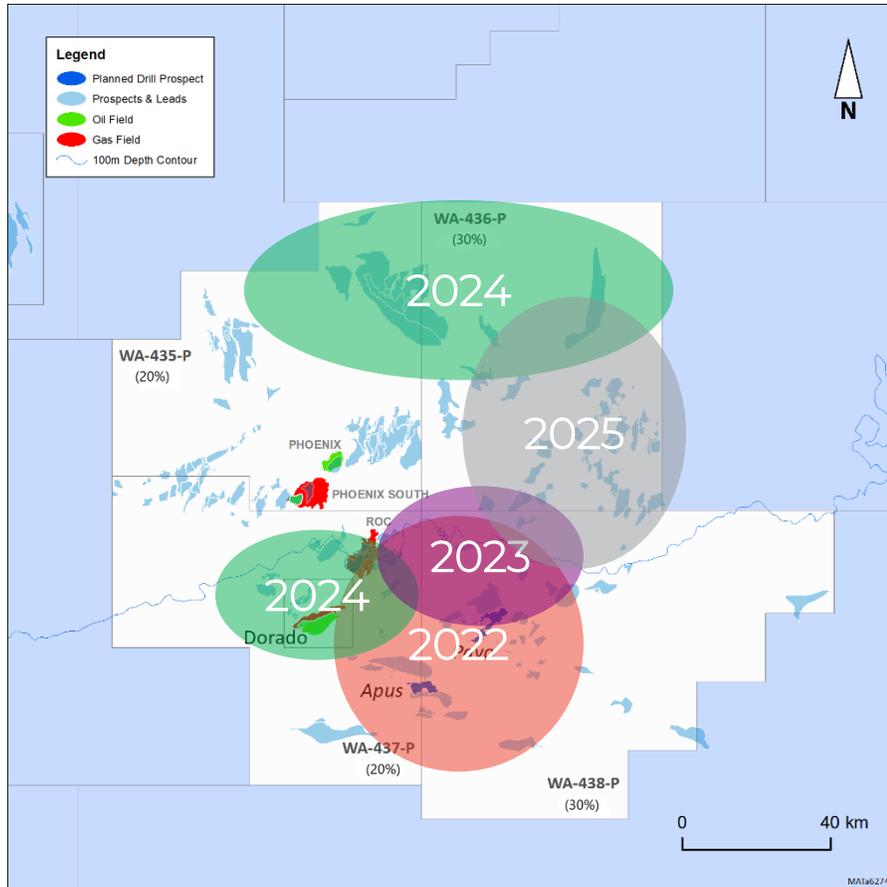
- Well located to supply growth projections in the Asian markets
- Fuel security benefits

Source: Wood Mackenzie



**Focused growth in the Bedout basin**

# 📍 Around 100 targets identified in the Bedout basin (CVN 20%-30%)



## Carnarvon’s objectives across the basin\*:

**2022** – Exploration drilling at Pavo and Apus

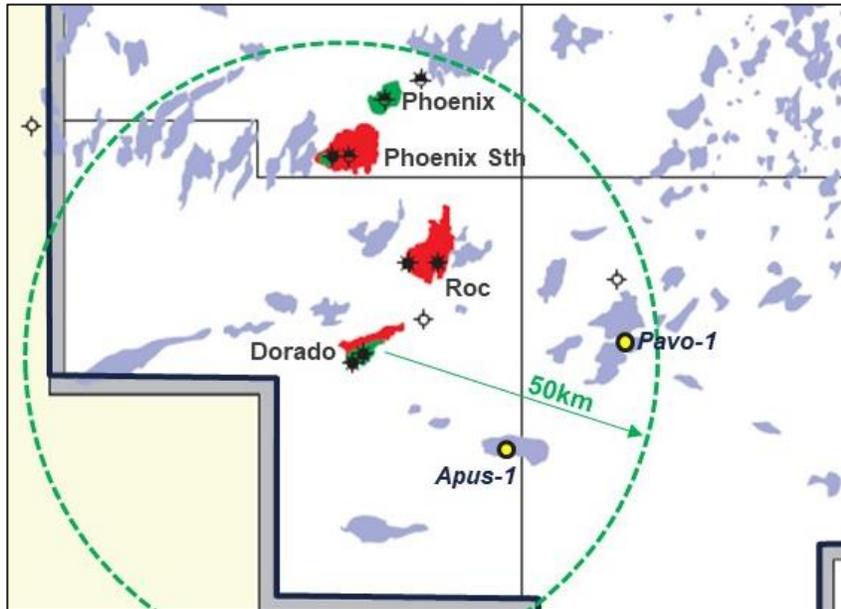
**2023** – Pavo appraisal drilling

**2024** – Dorado development drilling  
 Baxter appraisal drilling  
 Northern basin exploration drilling

**2025** – Eastern basin exploration on new 3D seismic data

\* Indicative drilling operations, demonstrating the extent of potential future activities which would be subject to joint venture and other approvals and availability of equipment.

## **Pavo-1 exploration well (CVN 30%)**



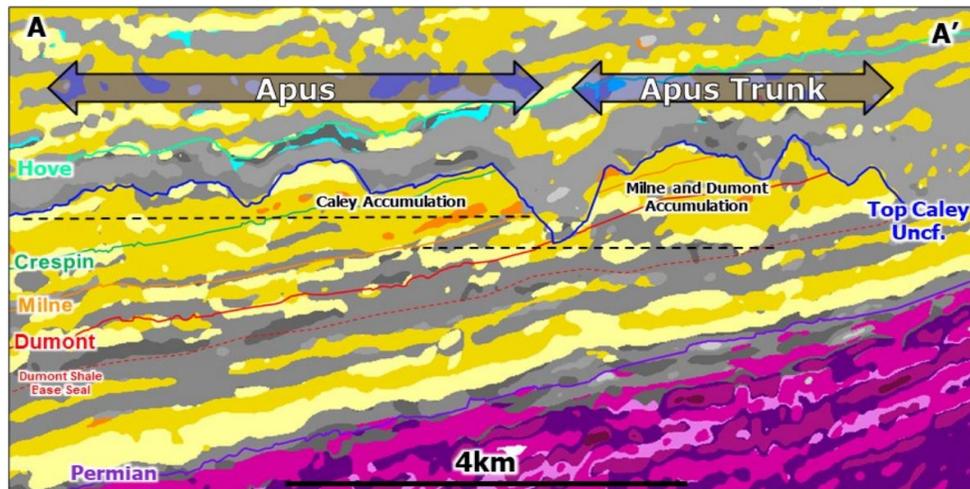
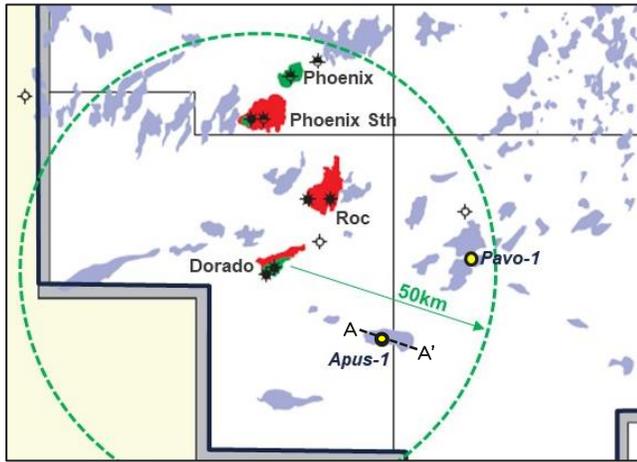
Map showing Dorado, Pavo and Apus locations.  
Green circle indicates area within 50km of proposed Dorado facility.

### **Location Highlights**

### **Material oil discovery**

- 46 km east of Dorado development
- ✓ 46 metres net pay
- ✓ Quality reservoir
- ✓ Light oil (52° API)
- ✓ Tie back to the proposed Dorado production facility attractive
- ✓ Unlocks suite of nearby prospects

# 📍 Apus-1 exploration well (CVN 20%-30%)



## To follow Pavo-1

**Location**

31 km southeast of Dorado

**Targets**

Caley & Milne Member sands

**Key Risks**

Charge & Top-seal

**Volumes\***

- ✓ **Liquids: 235 mmbbl; and**
- ✓ **Gas: 408 Bcf (gross, mean)**

**Risk**

- ✓ 23% Pg
- ✓ Pavo-1 result positive for key risks
- ✓ HRDZ's possible mitigations

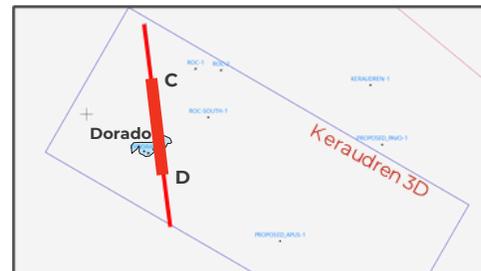
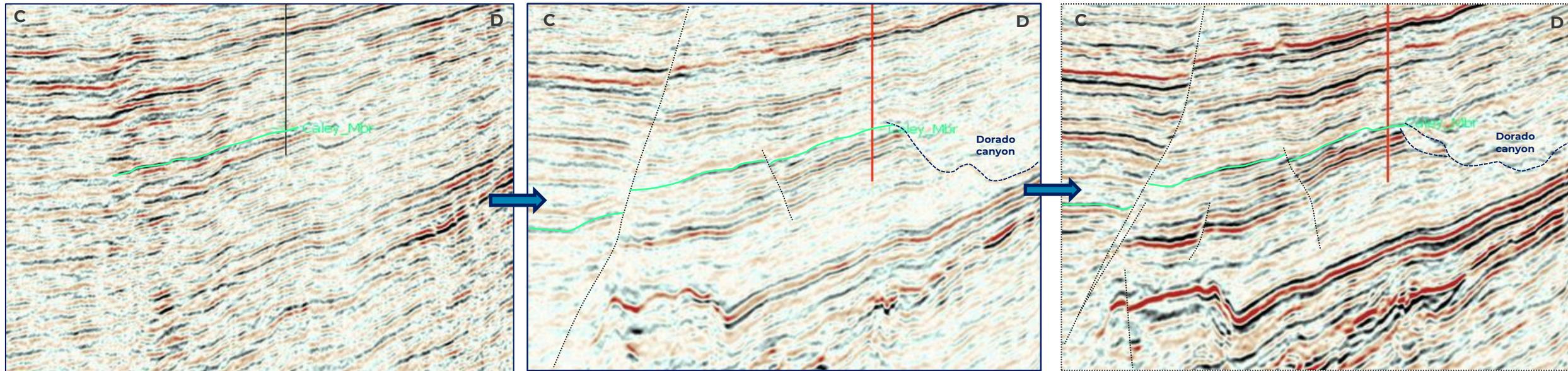
*\*Prospective Resources are the estimated quantities of petroleum that may potentially be recovered by the application of a future development project and may relate to undiscovered accumulations. These prospective resource estimates have an associated risk of discovery and risk of development. Further exploration and appraisal is required to determine the existence of a significant quantity of potentially moveable hydrocarbons.*

# Quality 3D seismic data are contributing to Bedout results

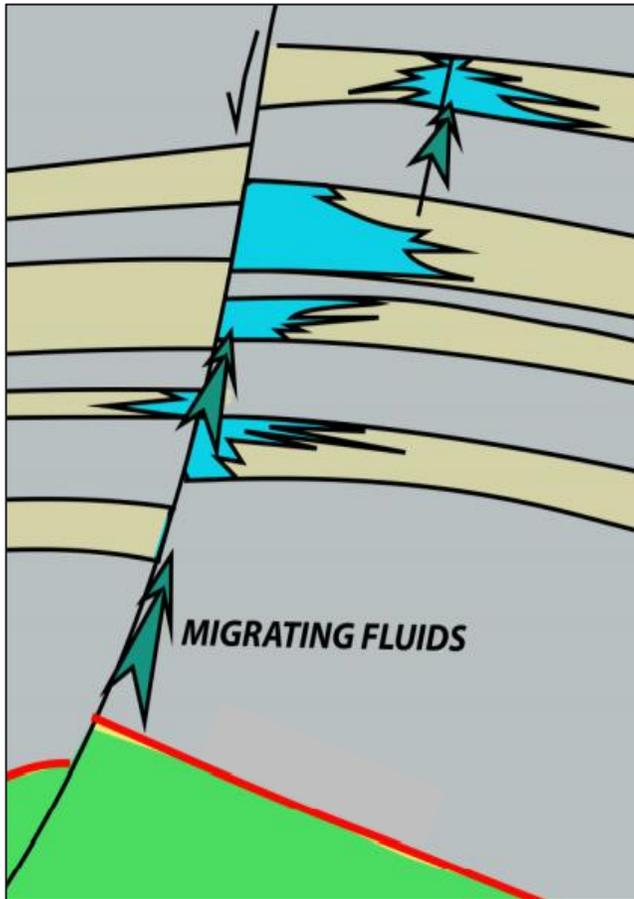
2D (1987)

3D (2019)

3D (2021)



# An exciting possibility for seismic data to de-risk future prospects

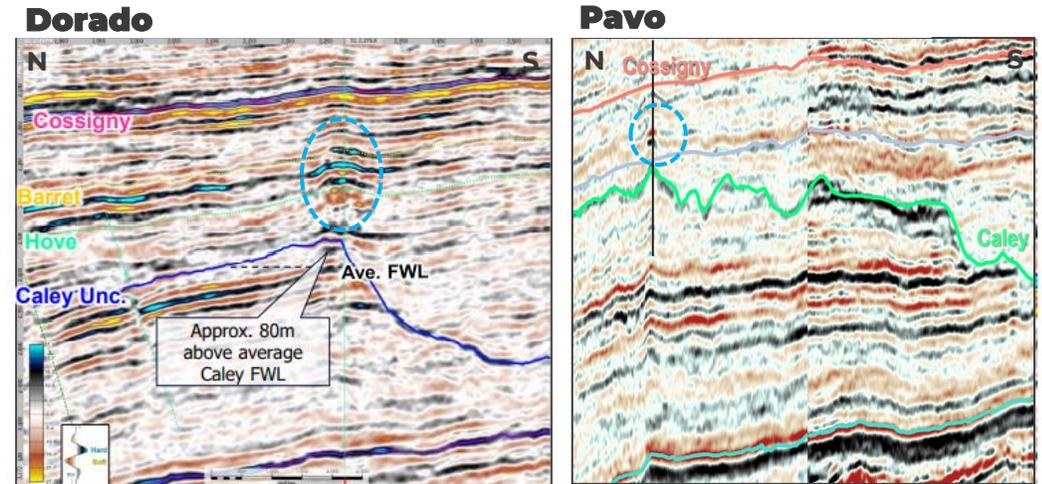


## Fluid Escape Features (FEF's)

Fluids that escape from a structure can create a seismic signature – often a sign that hydrocarbons are, or were, present

## An interpretation

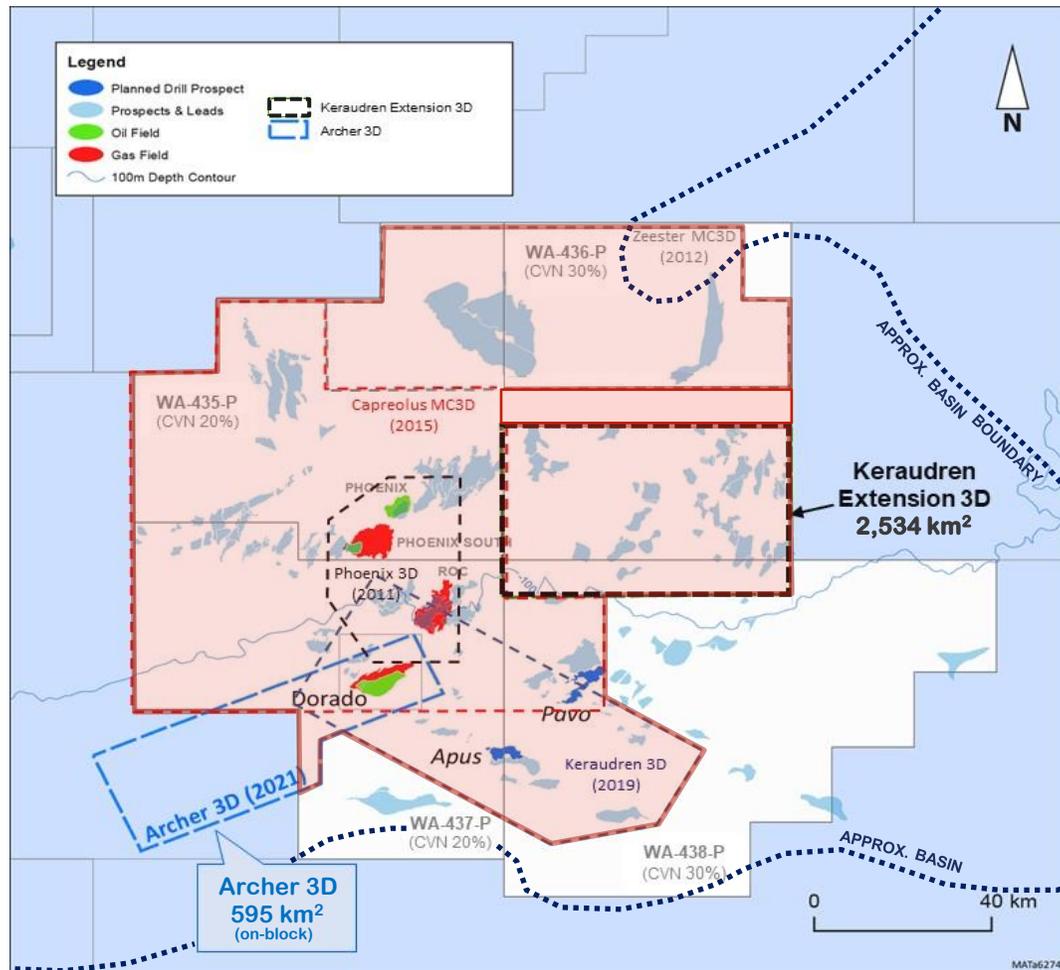
Positive indications of an 'over-supplied' petroleum system, with partial leakage of migrating hydrocarbons



## In the Bedout

- A FEF looks to have been intersected at Roc-2 in tight, cemented sandstones with good shows
- FEF like seismic signatures are present at Phoenix, Roc, Dorado and Pavo; but absent at the dry holes at Keraudren-1 & Roc South-1
- There are FEF like seismic signatures at Apus; and many other Bedout basin prospects

# Quality 3D seismic data now covers most of the Bedout basin



## Two new 2021 3D seismic surveys will mature and de-risk key leads and prospects

- Archer 3D, 595 km<sup>2</sup> – Dorado near-field prospects
- Keraudren Ext. 3D, 2,534km<sup>2</sup> – eastern lead complex

Processed data available early 2022

Permits now 68% covered by 3D seismic, imaging the most prospective basin area

Some residual areas may be covered in future seismic programs



# Renewable Fuel Development



# Carnarvon is committed to be part of the energy transition

**Net zero emissions by 2050**  
6 July 2021



**Highlights**

- Carnarvon commits to achieving net zero emissions by 2050, if not earlier
- All of Carnarvon's current existing emissions will be offset
- The immediate business focus remains on delivering value in Dorado and Buffalo projects
- In parallel the Company is developing a roadmap to achieve its net zero emissions objective

Carnarvon Petroleum Limited ("Carnarvon") (ASX:CVN) recognises that climate change is an important global challenge that requires action to transition to a lower carbon environment.

Carnarvon has an important role to play in this transition, which offers unique challenges and opportunities for the Company.

We are currently in the process of developing our roadmap to a lower carbon economy and expect that the direction we take will evolve over time utilising a variety of technologies.

As world population grows energy usage will rise. The challenge is to meet this demand in a manner that is within the UN Sustainable Development Scenario and achieves the Paris Agreement commitments.

Carnarvon recognises the challenges associated with reducing and offsetting emissions from oil and gas operations as well as the opportunities that the transition presents in alternative technologies and materials.

Carnarvon supports the commitments of the Paris Agreement and the need to reduce and offset greenhouse gas emissions.

We commit to achieving net zero emissions by 2050, if not earlier. Accordingly, Carnarvon has adopted a Climate Policy which is available on our website.

**Carnarvon Managing Director and CEO, Mr Adrian Cook, said:**

*"In our first step to achieving net zero emissions by 2050, Carnarvon will offset all its current Scope 1 and Scope 2 emissions, which at this time are derived from our head office.*

*With respect to our future assets such as Buffalo and Dorado, we are committed to working with our partners to reduce emissions from the proposed operations and will continue to develop our plans to offset emissions from these projects as they mature.*

*Carnarvon will also seek to diversify its portfolio over time into lower carbon intensive assets which provide appropriate returns to shareholders. However, in the near term, our short-term goal is to deliver our core projects safely and responsibly."*

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Net zero  
commitment

**2021  
SUSTAINABILITY  
REPORT**




Carnarvon Petroleum Limited  
ABN 60 002 688 851

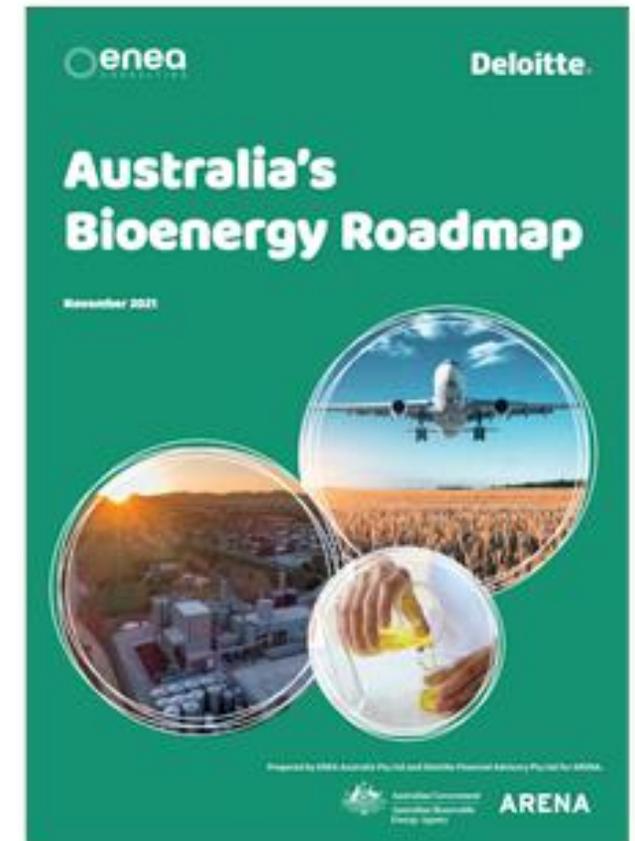
Sustainability  
reporting



Renewable diesel  
investment

## **Renewable diesel is a part of Australia's Bioenergy Roadmap**

- In November 2021, the Australian Federal Government released its roadmap to guide the growing bioenergy sector and its role in Australia's future energy mix
- Renewable diesel was identified by ARENA to play a role in lowering emissions in hard to abate sectors and tackle domestic fuel security
- Carnarvon and Frontier Impact Group's Renewable Diesel joint venture was established in July 2021 and recently launched as FutureEnergy Australia



## **About renewable diesel**

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Photo of renewable diesel

- Key benefits of the fuel vs. petroleum diesel:
  - Lower tailpipe emissions
    - including particulate matter, CO and NOx
  - Higher fuel efficiency, milage, power
  - Reduces engine wear
- Indicative lifecycle GHG emissions show fuel has the potential to be carbon neutral
- Meets European diesel standards, unlike biodiesel, and is compatible with existing diesel engines

## ***Carnarvon's first project is to be in the Narrogin Shire (WA)***

- Technip Energies is currently undertaking project FEED covering the technology and proposed site
- Rights to acquire a 64 ha site in the Narrogin Shire have been secured
- Significant inbound interest has been received from companies in the mining, construction and power generation sectors for the renewable diesel product
- Sustainably sourced feedstocks to be used, such as agricultural residues and ecological thinnings
- State and environment approvals documentation is being prepared
- Project progressing to FID in H2, 2022 with first production targeted for H2, 2023



Photo of Carnarvon staff at the Narrogin site

## ***Additional products associated with renewable diesel production***

**Biochar** - applications include:

- Carbon Soil Enhancer
- Water Reduction & filtration
- Metallurgical Charcoal
- Animal feed

Approx. 8,300 tons / annum projected production



**Wood vinegar** - applications include:

- Fertiliser
- Fungicide & soil disease inhibitor
- Insect repellent
- Health products for animals and humans

Approx. 6.5 million litres / annum projected production



**Appendix**  
**Supporting material**

# Bedout Basin Contingent Resources

Gross resources (100% basis)

	Oil and Condensate			Natural Gas			Barrels of Oil Equivalent <sup>1</sup>		
	MMbbl			BCF			MMboe		
	1C	2C	3C	1C	2C	3C	1C	2C	3C
Dorado	86	162	285	367	748	1358	176	344	614
Roc	12	20	35	205	332	580	48	78	137
Bedout Project Sub Total	98	182	320	572	1080	1938	224	422	751

Net Resource (CVN's shares)

	Oil and Condensate			Natural Gas			Barrels of Oil Equivalent <sup>1</sup>		
	MMbbl			BCF			MMboe		
	1C	2C	3C	1C	2C	3C	1C	2C	3C
Dorado	17	32	57	73	150	272	35	69	123
Roc	2	4	7	41	66	116	10	16	27
Bedout Project Sub Total	20	36	64	114	216	388	45	85	150

# Bedout Basin Selected Prospective Resources

## Prospective Resources (100% basis)

	Light Oil				Natural Gas				Barrels of Oil equivalent				Pg
	MMbbl				BCF				MMboe				%
	P90	P50	Mean	P10	P90	P50	Mean	P10	P90	P50	Mean	P10	
Pavo	Resource estimate to be revised following completion of the Pavo-1 well												
Apus	26	160	235	537	537	211	408	963	31	197	307	706	23%
Petrus	12	36	46	90	15	53	79	170	15	46	60	120	29%
Kepler	3	8	12	26	3	12	21	47	3	11	16	34	30%
<b>Bedout Project Total</b>	<b>41</b>	<b>205</b>	<b>293</b>	<b>653</b>	<b>48</b>	<b>276</b>	<b>509</b>	<b>1180</b>	<b>50</b>	<b>253</b>	<b>382</b>	<b>860</b>	

## Prospective Resources (Net to CVN basis)

	Light Oil				Natural Gas				Barrels of Oil equivalent				Pg
	MMbbl				BCF				MMboe				%
	P90	P50	Mean	P10	P90	P50	Mean	P10	P90	P50	Mean	P10	
Pavo	Resource estimate to be revised following completion of the Pavo-1 well												
Apus	7	40	59	134	7	53	102	241	8	49	77	177	23%
Petrus	2	7	9	18	3	11	16	34	3	9	12	24	29%
Kepler	1	2	2	5	1	2	4	9	1	2	3	6	30%
<b>Bedout Project Total</b>	<b>10</b>	<b>49</b>	<b>70</b>	<b>157</b>	<b>11.2</b>	<b>66</b>	<b>122</b>	<b>284</b>	<b>12</b>	<b>61</b>	<b>92</b>	<b>207</b>	

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# **Generating value through the energy transition – a contemporary approach that integrates conventional assets and renewables**

## **HEAD OFFICE**

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