

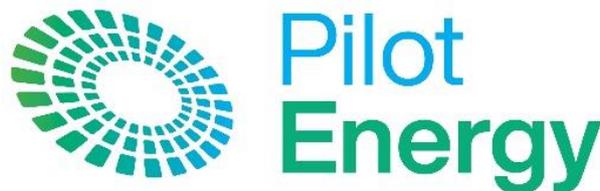
**Pilot Energy Limited**

ABN 86 115 229 984

1/85 Elizabeth Street Paddington, NSW 2021

E: [info@pilotenergy.com.au](mailto:info@pilotenergy.com.au)

[www.pilotenergy.com.au](http://www.pilotenergy.com.au)



**Announcement to ASX  
ASX: PGY**

16 September 2022

**AUSTRALIAN CARBON CAPTURE, UTILISATION & STORAGE  
CONFERENCE PRESENTATION**

Pilot Energy Limited (**ASX:PGY**) (**Pilot** or the **Company**) is pleased to advise that Mr Brad Lingo (Executive Chair) is presenting at the Australian Carbon Capture, Utilisation & Storage Conference in Melbourne today.

A copy of the presentation is attached to this announcement and the video referred to in the presentation can be found on the Company website.

**ENDS**

This announcement has been authorised for release to ASX by the Chairman, Brad Lingo and Managing Director, Tony Strasser.

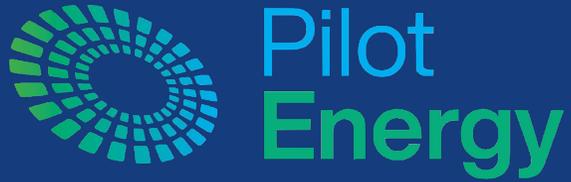
---

**Enquiries**

Cate Friedlander, Company Secretary, email: [cfriedlander@pilotenergy.com.au](mailto:cfriedlander@pilotenergy.com.au)

**About Pilot:** Pilot is currently a junior oil and gas exploration and production company that is pursuing the diversification and transition to the development of carbon management projects, hydrogen and integrated renewable energy by leveraging its existing oil and gas tenements and infrastructure to cornerstone these developments.

Pilot holds a 21.25% interest in the Cliff Head Oil field and Cliff Head Infrastructure, material working interests in WA-481-P and EP416/480 exploration permits, located offshore and onshore Western Australia, which form foundation assets for the potential development of clean energy projects in Western Australia.



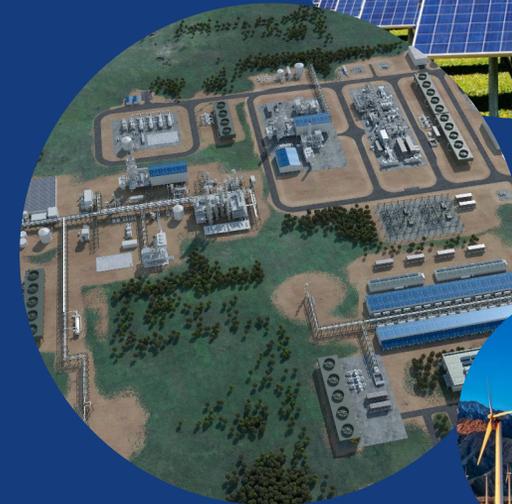
# Putting runs on the board

## The Cliff Head Carbon Capture & Storage Project

The Australian Carbon Capture, Utilisation & Storage  
Conference Presentation

16 September 2022

PILOT ENERGY LIMITED  
ASX:PGY



# Compliance statements



## Disclaimer

This investor presentation has been prepared by Pilot Energy Limited ABN 86 115 229 984 (Pilot or the Company). Any material used in this presentation is only an overview and summary of certain data selected by the management of Pilot. The presentation does not purport to contain all the information that a prospective investor may require in evaluating a possible investment in Pilot nor does it contain all the information which would be required in a disclosure document prepared in accordance with the requirements of the Corporations Act and should not be used in isolation as a basis to invest in Pilot. Recipients of this presentation must make their own independent investigations, consideration and evaluation of Pilot. Pilot recommends that potential investors consult their professional advisor/s as an investment in Pilot is considered to be speculative in nature.

This presentation contains “forward looking statements” concerning the financial condition, results of operations and business of Pilot. All statements other than statements of fact or aspirational statements, are or may be deemed to be “forward looking statements”. Often, but not always, forward looking statements can generally be identified by the use of forward looking words such as “may”, “will”, “expect”, “intend”, “plan”, “estimate”, “anticipate”, “continue”, “outlook”, and “guidance”, or other similar words & may include, without limitation, statements regarding plans, strategies and objectives of management, future or anticipated production or construction commencement dates and expected costs, resources or reserves, exploration results or production outputs.

## Assumptions and Forward Looking Statements

Forward looking statements are statements of future expectations that are based on management’s current expectations and assumptions, known and unknown risks and uncertainties that could cause the actual results, performance or events to differ materially from those expressed or implied in these statements. These risks include, but are not limited to price fluctuations, actual demand, currency fluctuations, drilling and production results, commercialisation reserve estimates, loss of market, industry competition, environmental risks, physical risks, legislative, fiscal and regulatory developments, economic and financial market conditions in various countries and regions, political risks, project delay or advancement, approvals and cost estimates.

Statements in this presentation are made only as of the date of this presentation unless otherwise stated & the information in this presentation remains subject to change without notice. Reliance should not be placed on information or opinions contained in this presentation. To the maximum extent permitted by law, Pilot disclaims any responsibility to inform any recipient of this presentation on any matter that subsequently comes to its notice which may affect any of the information contained in this document and presentation and undertakes no obligation to provide any additional or updated information whether as a result of new information, future events or results or otherwise.

No representation or warranty, express or implied, is made as to the fairness, accuracy, completeness or correctness of the information, opinions or conclusions contained in or derived from this presentation or any omission from this presentation or of any other written or oral information or opinions provided now or in the future to any person. To the maximum extent permitted by law, neither Pilot nor, any affiliates, related bodies corporate and their respective officers, directors, employees, advisors and agents (Relevant Parties), nor any other person, accepts any liability as to or in relation to the accuracy or completeness of the information, statements, opinions or matters (express or implied) arising out of, contained in or derived from this presentation or any omission from this presentation or of any other written or oral information or opinions provided now or in the future to any person.

## Competent Persons Statement

This announcement contains information on conventional petroleum and carbon storage resources which is based on and fairly represents information and supporting documentation reviewed by Dr Xingjin Wang, a Petroleum Engineer with over 30 years’ experience and a Master in Petroleum Engineering from the University of New South Wales and a PhD in applied Geology from the University of New South Wales. Dr Wang is an active member of the SPE and PESA and is qualified in accordance with ASX listing rule 5.1. He is a former Director of Pilot Energy Ltd and has consented to the inclusion of this information in the form and context to which it appears.

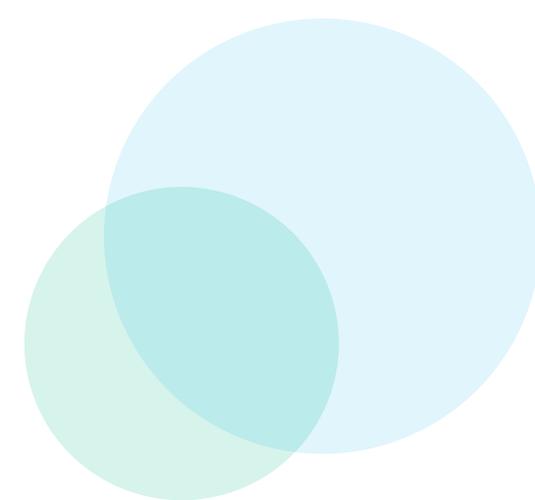
## Authorisation

This presentation has been authorized by the Chairman and Managing Director on behalf of the Board of Directors of Pilot Energy Limited

## Mid West WSP Feasibility Study Reporting Conditions

Pilot has agreed the following conditions with the ASX in relation to the Mid West WSP feasibility study:

1. The Company must continue to spend funds on its existing and proposed oil and gas projects.
2. The Company must disclose in each quarterly activities report until September 2022, the proportion of expenditure incurred in relation to exploration and evaluation on the oil and gas projects and the Mid West Wind and Solar Project.
3. The Company must disclose as separate line items in each quarterly activities report until September 2022, expenditure incurred in relation to exploration and evaluation on the oil and gas projects and the Mid West Wind and Solar Project.
4. Proceeding beyond the feasibility study stage of the Project (or incurring expenditure in excess of the budgeted feasibility expenditure in relation to the Project) constitutes a change in the nature and scale of the Company’s activities in terms of Listing Rule 11.1 and as such the Company will be required to comply with all of the requirements of Chapters 1 and 2 of the Listing Rules before it proceeds beyond the feasibility study or incurs expenditures in excess of the budgeted feasibility expenditure on the Project.



# Key messages



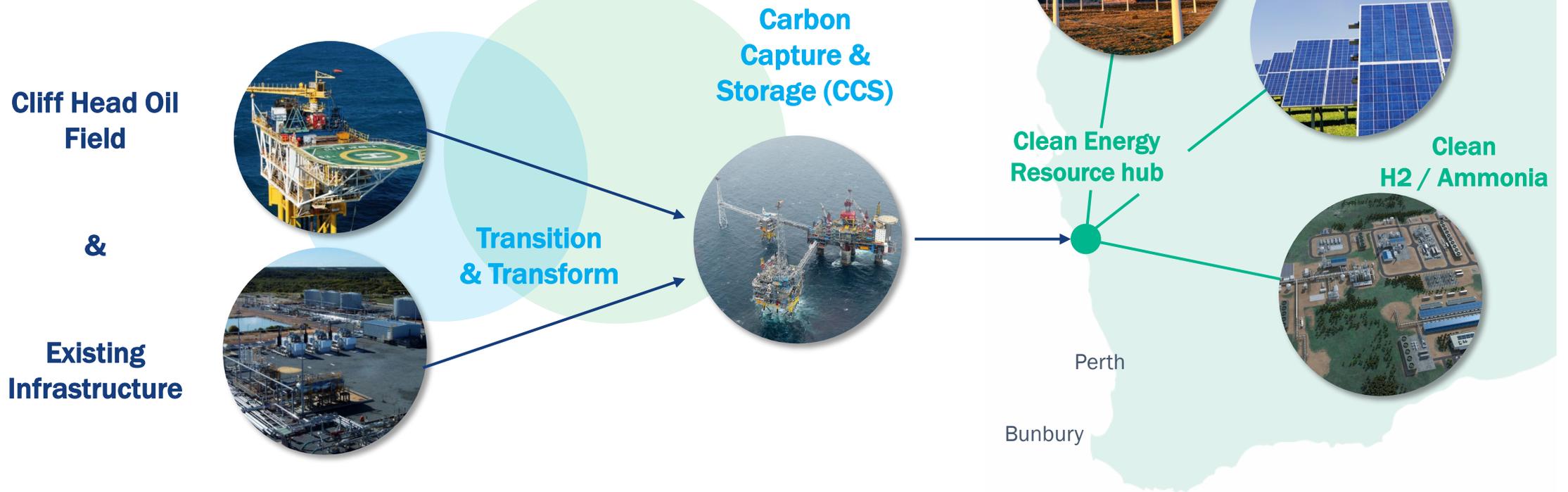
- Pilot is *focussed on transitioning* existing oil & gas operations into clean, low cost energy production & supply
- Carbon capture & storage (CCS) is *proven, safe and effective* means of permanent reduction in GHG emissions
- Cliff Head Oil Field is highly suitable for *low cost, low risk conversion* into significant CCS operation
- Cliff Head CCS aims to provide over a 1mmtpa of *permanent CO2 storage* continuing through 2050
- Offshore location provides opportunity for *direct CO2 injection/storage via LCO2 carriers*
- *CCS is key enabler* to delivering lowest cost clean Blue Hydrogen
- Blue Hydrogen is and will be *significantly cheaper than Green* for the foreseeable future
- Ability to provide CCS to Clean Hydrogen *ideal for producing Clean Ammonia-for-export* into APAC region
- Pilot's Mid West operations are *ideal location for integrated development* of CCS, Blue Hydrogen and Clean Ammonia
- Mid West Clean Energy Project aims to *produce lowest cost clean energy* from CCS through to Clean Ammonia

# Vision

Transform existing assets and infrastructure delivering an integrated cost competitive clean energy solution

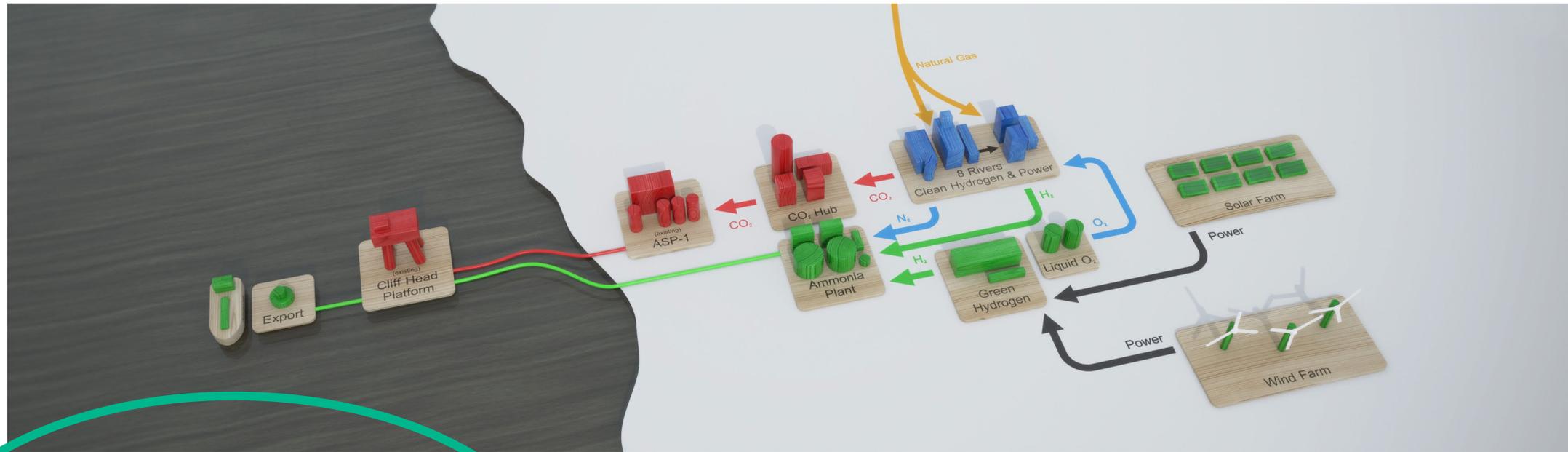
## Current Operations

## Integrated Clean Energy Portfolio



# Mid West Clean Energy Project

Staged development of blue hydrogen and ammonia production starting with CCS



## Stage 1 – Carbon Capture & Storage Timing: ~2025

- Conversion of Cliff Head Offshore oil field to CCS
- Permanent CO<sub>2</sub> storage in depleted offshore oil field
- Up to 1.1 million tpa CO<sub>2</sub> injection from 2025
- Targeting continuous CO<sub>2</sub> injection through 2050
- \$50 - 60 million net cash flow by 2029

## Stage 2 - Blue H2 Production Timing: 2025 - 2027

- Blue H2 Production facility utilizing Cliff Head CCS
- Initial Blue H2 production of ~43,000 tpa
- Expand Blue H2 production to 85,000 tpa
- Targeting H2 sales @ A\$5/kg at LCOH of ~A\$2/kg
- Revenue potential of ~ \$215 million

## Stage 3 H2 Expansion to Export Ammonia Timing: 2027 - 2030

- Integrate ~250MW renewables to produce ~18,000 tpa Green H2
- Combined Blue/Green H2 to feed Clean Ammonia plant
- Targeting Clean Ammonia-for export of ~345,000 tpa
- Revenue potential of ~ \$244 million
- Targeting Clean Ammonia LCOA of A\$400/tonne
- Expand Clean Ammonia production up to 1 million tpa

# Cliff Head CCS – Project Overview



## Key enabler of low cost clean hydrogen and ammonia production for the Mid West Clean Energy Project

- Cliff Head CCS Project is the first stage I of the Mid West Clean Energy Project
- Brownfield re-development utilizing existing Cliff Head Oil Field onshore/offshore facilities (owned by the Triangle Energy/Pilot Energy Joint venture)
- Ready end-of-life offshore reservoir in WA Mid West with Commonwealth regulatory pathway to CCS
- Minimal risk and capex requirements due to straight-forward adaptive re-use of existing plant, pipelines, wells, platform and reservoir
- Project to include onshore CO2 capture/aggregation and offshore CO2 injection facilities
- Proximity to ready accessible market with up to ~1.0 million tpa of easy-to-capture CO2 emissions sources
- Aims to provide over 1.0 million tpa of permanent CO2 storage continuing through 2050
- Focused on delivering an initial project LCoS of less than A\$20/tonne of CO2
- Foundation for future development of clean hydrogen and ammonia production
- Targeting first CO2 injection mid-2025/early 2026



# Why CCS?

## CCS essential to meeting GHG reduction targets and key enabler of lowest cost Clean Hydrogen and Ammonia

- **Proven** technology – 40 mmtpa now operating
- **Safe** – CO<sub>2</sub> has been safely and reliably transported since 1972 with zero fatalities over its 50-year history
- **Permanent** - CO<sub>2</sub> stored in appropriately selected and managed geological reservoirs is 99% likely to remain there for over 1,000 years
- **Commercial** – Used at an industrial scale use for over 50-years
- **Necessary** - IPCC found that it would be 138% more expensive to reach global climate goals without the deployment of CCS.
- **Key enabler** - of low cost Low Carbon Hydrogen & Ammonia – will accelerate build-out of hydrogen infrastructure required to reach net-zero
- **Essential for difficult industries** – CCS only option for decarbonising several non-energy sectors fundamental to modern society, such as cement, steel, chemical, and fertiliser production.



### MYTH

CCS is unproven.

### FACT

CCS technology has been in use for more than 50 years, and around 300 million tonnes of CO<sub>2</sub> have already been successfully captured and injected underground.

### MYTH

CCS is unsafe.

### FACT

The capture, transport, and storage of CO<sub>2</sub> is well regulated and empirically proven to be safe.

### MYTH

CCS is too expensive.

### FACT

The cost of CCS is quickly declining as the breadth of deployment increases and additional policy and financial incentives are made available.

### MYTH

CCS only prolongs the life of fossil fuel industries and delays the world from reaching global climate goals.

### FACT

CCS is a necessary tool for reducing the emissions of fossil fuels already in use and putting the world on a path to net-zero.

### MYTH

There is not enough space to safely store all the CO<sub>2</sub> captured by CCS projects.

### FACT

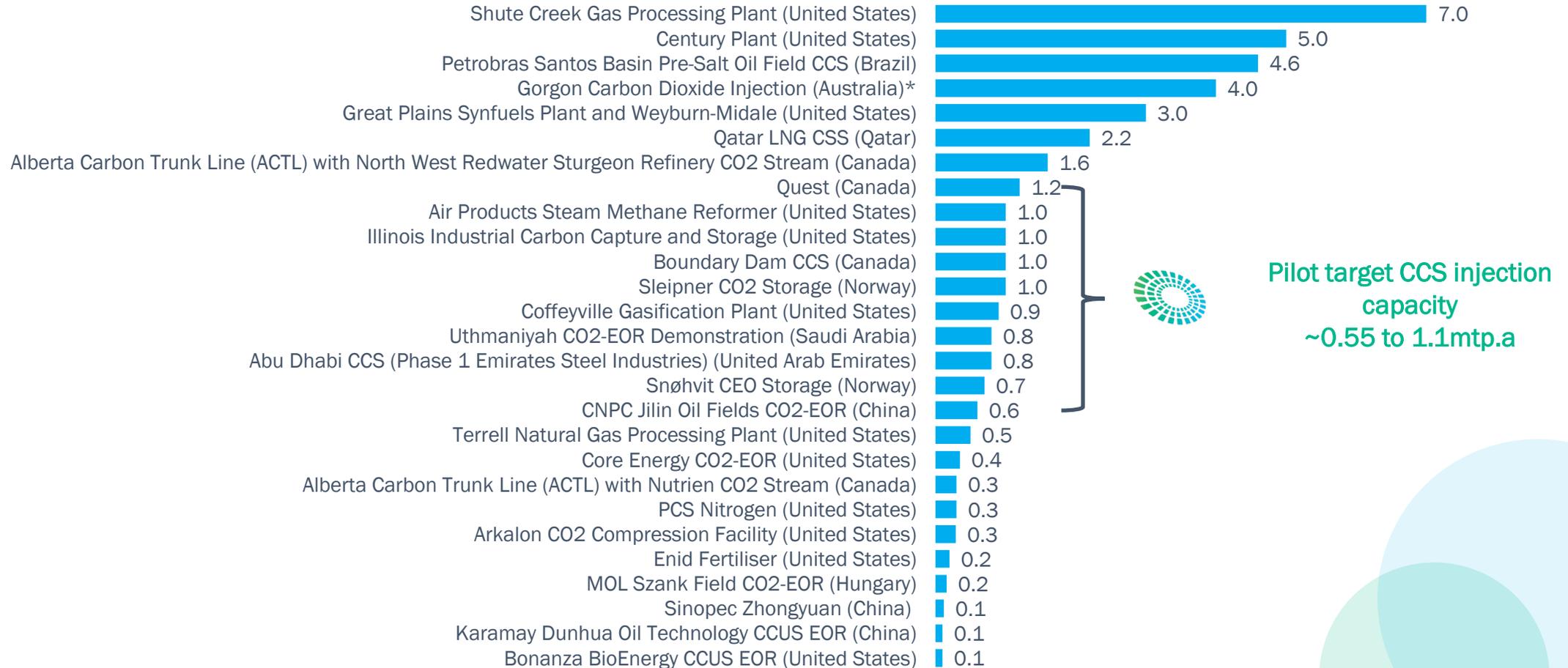
The world has more than enough capacity for CO<sub>2</sub>.

[MythBusters-Flyer\\_FINAL-5.pdf \(globalccsinstitute.com\)](#)

# Global CCS Facilities In Operation

## Cliff Head CCS is a Global Top 10 CO<sub>2</sub> Injection Capacity Project

### Carbon Dioxide Capture Capacity in million metric tons per year, 2021

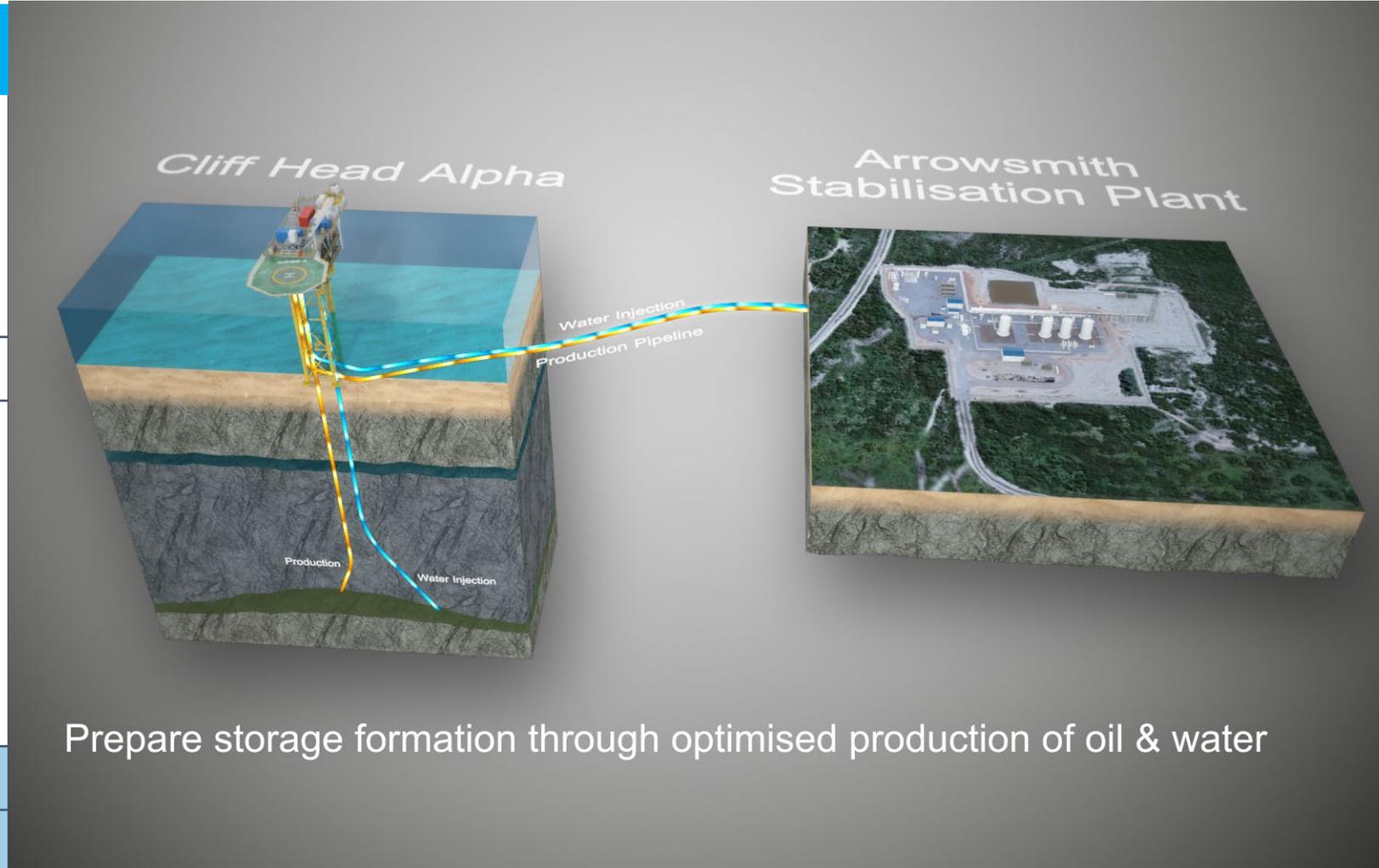


[www.statista.com/statistics/1108355/largest-carbon-capture-and-storage-projects-worldwide-capacity/](https://www.statista.com/statistics/1108355/largest-carbon-capture-and-storage-projects-worldwide-capacity/)

# Cliff Head CCS – Step 1 – Prepare the reservoir

Clear staged process to develop Cliff Head CCS

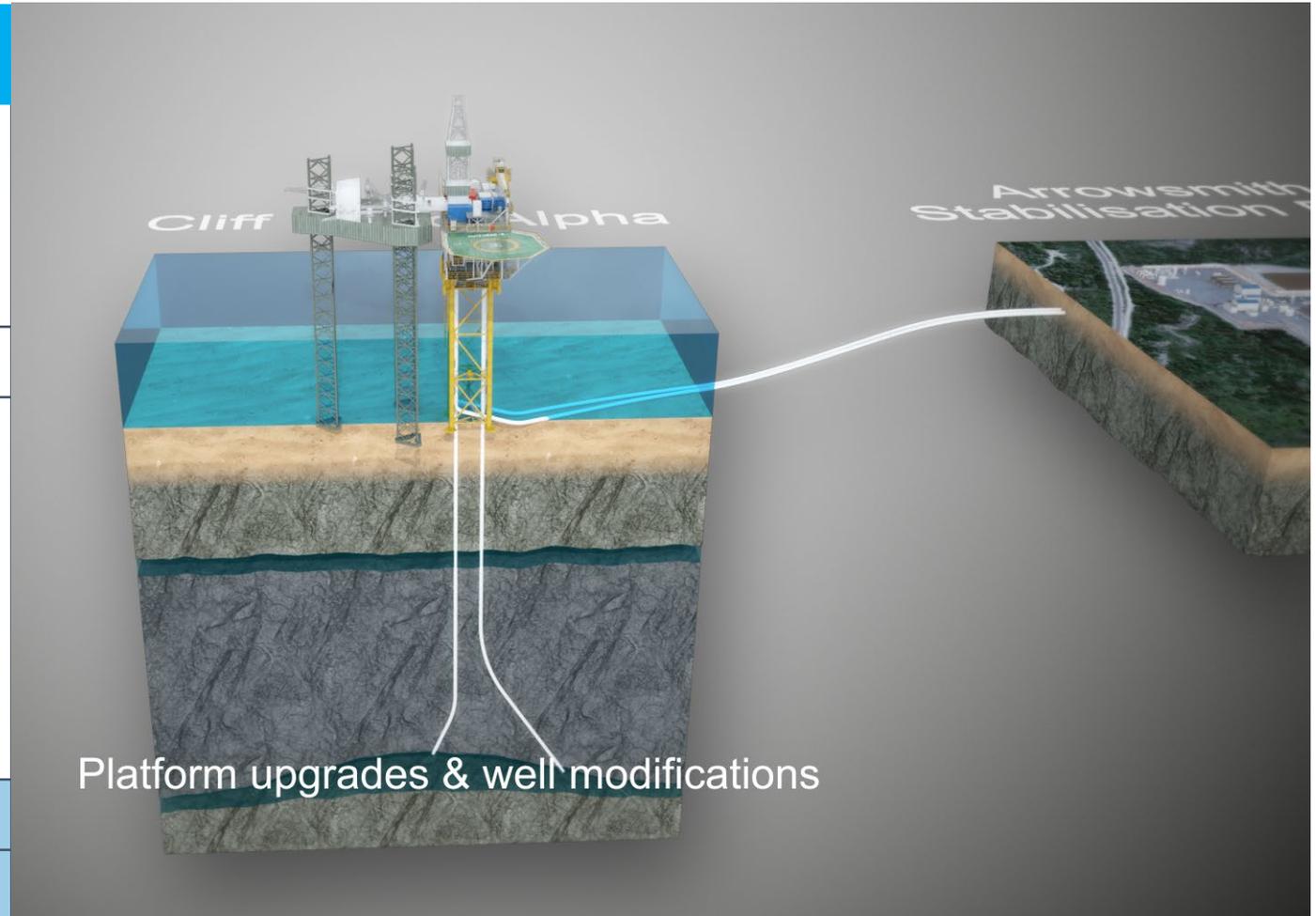
	Storage Reservoir Preparation
<b>Expected Outcomes</b>	Prepare reservoir for CO2 injection <ul style="list-style-type: none"> <li>• Creation of at least ~6 million tonnes of CO2 storage capacity within WA-31L</li> <li>• Continued oil production</li> </ul>
<b>Permitting</b>	Existing production license
<b>Indicative Work Activities</b>	<ul style="list-style-type: none"> <li>• Optimised fluids production</li> <li>• Additional oil/water separation units</li> <li>• Additional power to Cliff Head Platform</li> <li>• Re-commission onshore water disposal well</li> </ul>
<b>Timing</b>	CY Q1 2023
<b>Duration</b>	36-48 months



# Cliff Head CCS – Step 2 – Convert existing facilities

Clear staged process to develop Cliff Head CCS

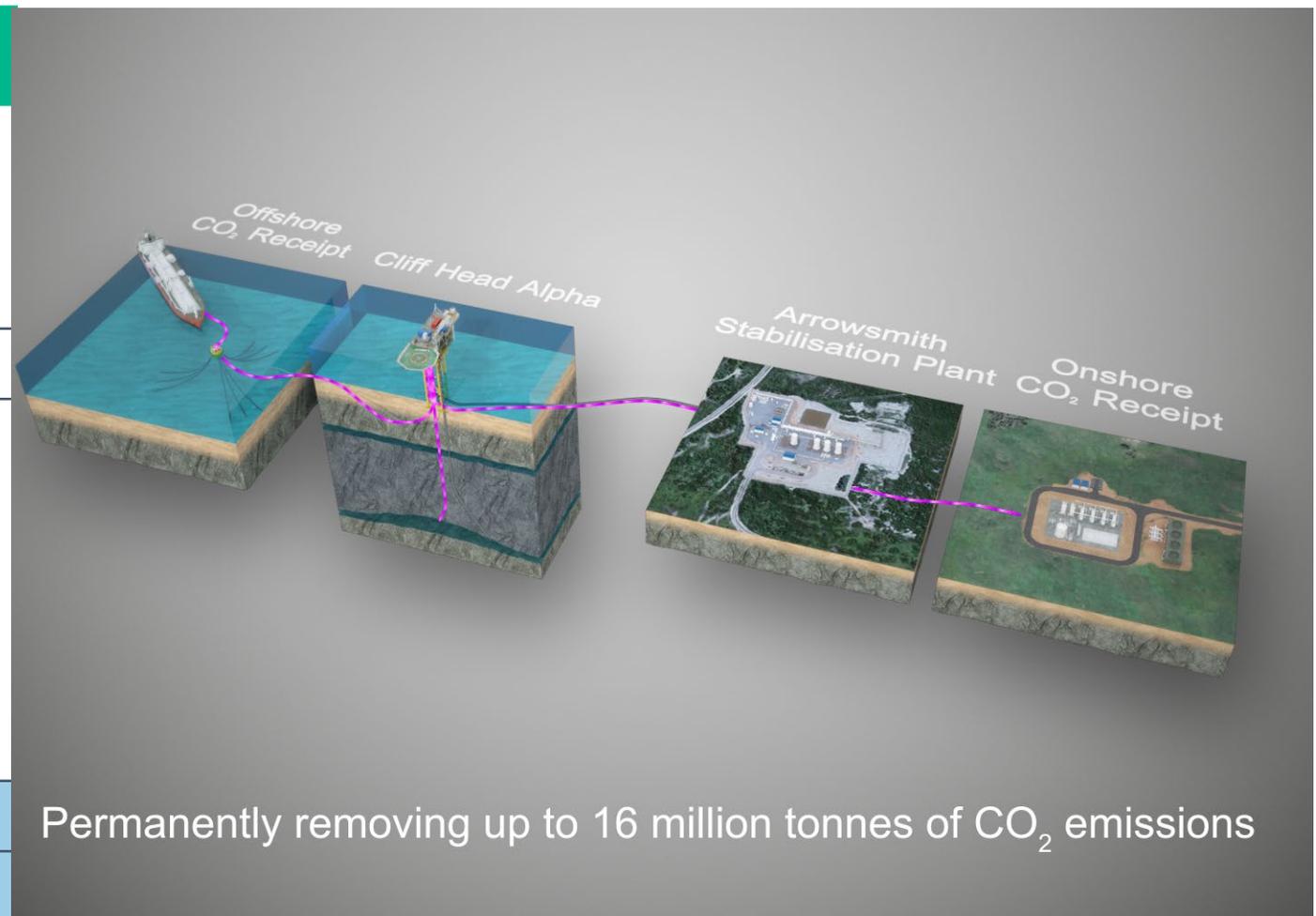
	Facility Conversion
<b>Expected Outcomes</b>	Conversion of all offshore and onshore facilities to commence CCS injection <ul style="list-style-type: none"> <li>• Prepare existing wells/infrastructure</li> <li>• Install onshore CO2 receiving facilities</li> </ul>
<b>Permitting</b>	GHG Declaration, CO2 injection license & FDP
<b>Indicative Work Activities</b>	<ul style="list-style-type: none"> <li>• Workover existing injection &amp; production wells</li> <li>• Externally reinforce existing pipelines for CO2 operation</li> <li>• Construct onshore CO2 receiving facilities</li> <li>• No further drilling required to accommodate 550,000 tpa injection rate and 6Mt of CO2 storage</li> </ul>
<b>Timing</b>	Late CY 2024-2025
<b>Duration</b>	6-12 months



# Cliff Head CCS – Step 3 – Commence CO2 injection

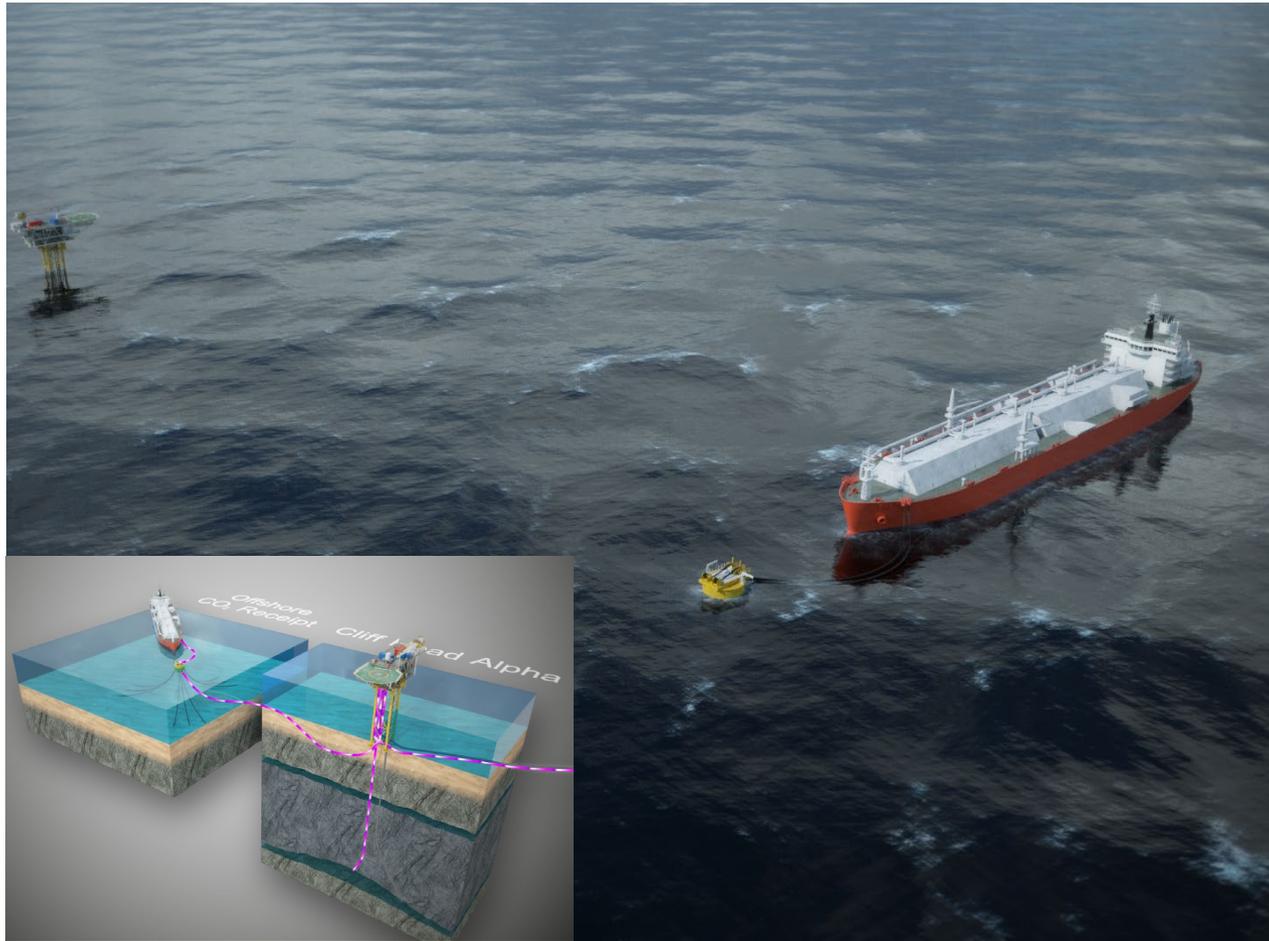
Clear staged process to develop Cliff Head CCS

	CO2 Injection Operations
<b>Expected Outcomes</b>	Continuous CCS operations <ul style="list-style-type: none"> <li>Commence supercritical CO2 injection at a rate of at least 550,000 tpa for at least 15-years</li> </ul>
<b>Permitting</b>	GHG Declaration, CO2 injection license & FDP
<b>Indicative Work Activities</b>	<ul style="list-style-type: none"> <li>Transport supercritical CO2 to CHA via existing onshore/offshore 10" pipelines</li> <li>Inject supercritical CO2 into reservoir through 5 existing wells</li> <li>Deepen two existing wells + drill 1 new well to increase storage capacity to up to 16Mt and injection rate to at least 1.1 mmtpa</li> </ul>
<b>Timing</b>	CY 2026
<b>Duration</b>	20+ years



# Direct offshore CO2 receipt

## Creating the opportunity for bi-directional LCO2 CCS storage to Clean Ammonia supply



- Existing platform, wells & storage reservoir make Cliff Head CCS ideal for direct offshore LCO2 receipt
- Targeting local industrial and international CO2 emitters seeking CCS solutions
- CO2 ship transport has been taking place for 35-years / First dedicated CO2 tanker launched in 1988
- Designs approved for new-build Very Large Carriers targeting LCO2 capacity of 60,000-70,000 m3\*
- Also planned dual-capability Ammonia/LCO2 carriers to support bi-directional trade means no “empty” trips
- Doubles the carbon reduction opportunity – supplying Low Carbon energy + Capture/Sequestration

### Unit cost of CO2 pipeline transport and shipping for different flow rates and distances\*\*



\* Density of LCO2 is ~1100 kg/m3 more than double the cargo density of LNG or LPG equating to 66-77 tonnes of LCO2 per cargo - IPCC Special Report on Carbon Capture and Storage 2005, page 190

\*\* CO2 Shipping CO2 – UK Cost Estimation Study Final Report for Business, Energy & Industrial Strategy Dept - 2018

# Cliff Head CCS Social Impact

0.5  
million  
tpa

Initial planned annual Cliff  
Head CCS CO<sub>2</sub>  
sequestration

35,000  
p.a.

Equivalent hectares of  
agroforestry planting per  
annum<sup>(1)</sup>

57  
million  
p.a.

Equivalent number  
of tree plantings per  
annum<sup>(2)</sup>

## Sources

1. Source: The FLR Carbon Storage Calculator applies data from the Global Removals Database developed by Winrock International under funding from the International Union for Conservation of Nature (IUCN), later published in Bernal et al. "Global Carbon Dioxide Removal Rates from Forest Landscape Restoration Activities." Carbon Balance and Management, vol. 13, no. 1, 2018, doi:10.1186/s13021-018-0110-8
2. Source: average 1,600 trees per hectare (NHS Forest)

# Stage II – Blue Hydrogen

## Cliff Head CCS will enable cost competitive industrial scale blue hydrogen production

### Blue hydrogen production with direct/integrated Cliff Head CCS

- Feasibility studies indicate production capacity of 43,000 tpa of blue hydrogen
- Avoid 445,000 tpa of CO2 emissions<sup>2</sup> through 98% of CO2 capture using established technologies

### Proven and well established, scalable technologies

- Blue hydrogen production has been in commercial operation since 1982
- 98% of current hydrogen production utilises steam reformation (SMR) technology<sup>3</sup> which has been in commercial use for over 100-years

### Cost competitive clean hydrogen

- Blue hydrogen expected to be the lowest-cost clean production option in majority of locations<sup>1</sup>
- A\$6.00/kg hydrogen is cost competitive with petrol/diesel for transport at A\$1.70/litre

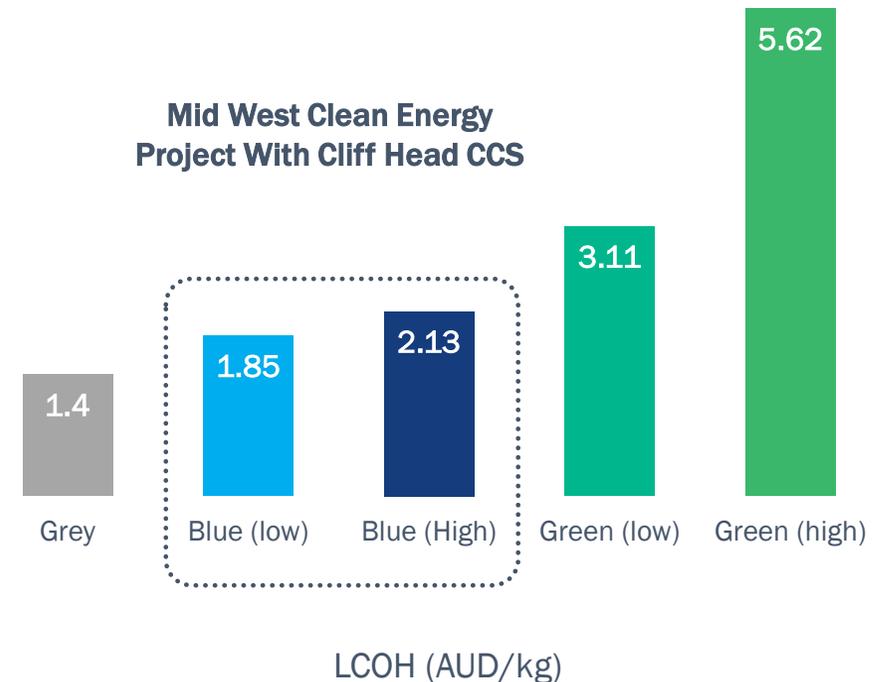
### Near-term delivery to facilitate clean hydrogen and ammonia production

- Facilitates, accelerates transition to green hydrogen using Mid West Renewables

#### Sources

1. Global CCS Institute Blue Hydrogen Report April 2021. Figure 6 (RHS of slide) taken from the same report.
2. CE Delft Feasibility Study into blue hydrogen July 2018 estimates that blue hydrogen production with 95% direct/integrated carbon capture and storage will produce 0.64/kg of CO2 process emissions per kg of hydrogen produced resulting in total annual CO2 process emissions of ~25.6 kTonnes of CO2
3. Global CCS Institute 2021.

Levelized cost of hydrogen (LCOH) in the range of A\$1.85 to A\$2.13 leveraging the Cliff Head CCS



Sources: SP Global, Cost, logistics offer "blue" hydrogen market advantages over "green" alternative 19 March 2020 and Pilot Feasibility Study ASX release 28 March 2022

# Stage III – Clean Ammonia Production



Ammonia from blue hydrogen is both a low cost and clean energy source and supply vector for hydrogen

## Clean ammonia emerging as a cost competitive LNG replacement

### Established market and supply chain

- Essential global commodity
- One of the most demanded industrial chemicals
- Well established, large-scale production and supply chain

### Excellent solution for transport and supply of hydrogen

- Excellent “vector” for transport/supply of H<sub>2</sub>
- Lowest cost form of hydrogen transport and supply
- Easily stored in simple, inexpensive pressure vessels
- Transportation and distribution simpler and cheaper than H<sub>2</sub> delivery

### Clean CO<sub>2</sub>-free energy source

- Proven CO<sub>2</sub>-free fuel
- Either blue or green H<sub>2</sub> can be used produce clean ammonia
- Can significantly reduce CO<sub>2</sub> emissions for power generation
- APAC power companies already seeking large clean ammonia supplies to displace coal

Levelized cost of ammonia (LCOA) in the range of A\$370 to A\$400 per tonne, leveraging CCS and renewables



# Mid West Clean Energy Project – bringing it all together



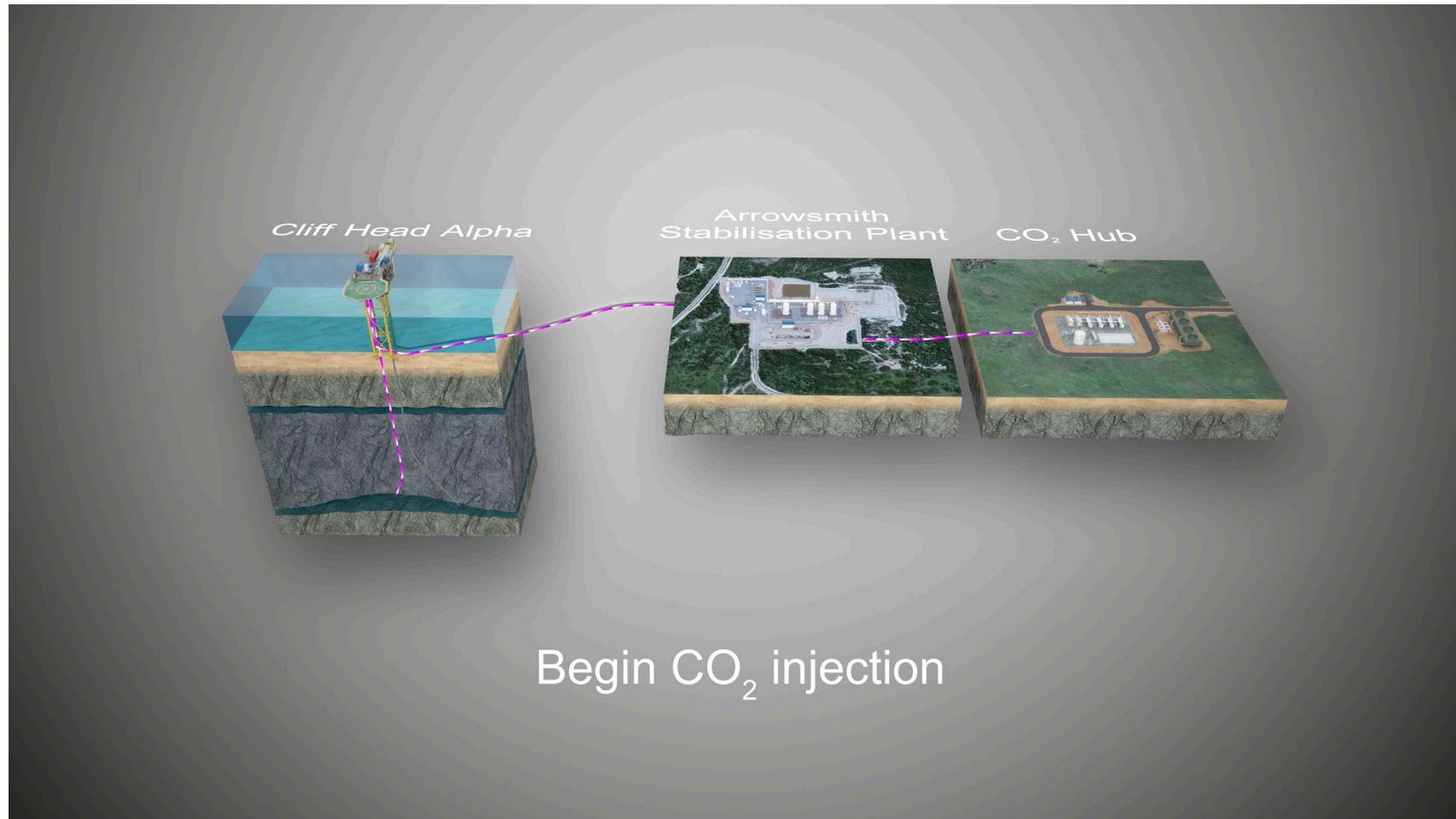
## Stage II Blue Hydrogen

- Hydrogen production integrated with Cliff Head CCS utilising 8 Rivers  $\text{eRH}_2$  technology
- Ability to accept  $\text{CO}_2$  rich raw gas with  $\geq 97\%$  direct carbon capture of  $\text{CO}_2$  already at pipeline pressure
- ~ 25–85 TJ/d natural gas demand identified
- Expected hydrogen production of 43,000–85,000 tpa

## Stage III Clean Ammonia

- Expansion of hydrogen production to 60,000–195,000 tpa
- Production of 345,000 – 1.1 million tpa of cost competitive clean ammonia for export
- Powered by 250–700 MW of integrated renewable energy generation

# Cliff Head CCS Project Video



## Key next steps

Over the next 12-months Pilot (as operator) together with JV Partner Triangle Energy will be focused on the activities to deliver the Cliff Head CCS Project



### Corporate

- Engagement with prospective project partners & customers
- Formulation of development funding plan



### Project implementation

- Permitting
- Site Acquisition
- Commercial Offtake
- FEED for CCS and Pre-FEED for Blue Hydrogen
- Begin prospective EPCM Contractor engagement



Next 12-months aimed at securing all necessary regulatory approvals, securing commercial off-take arrangements and completing a full bankable feasibility study and FEED to enable final investment decision (FID) for the Cliff Head CCS Project.

# Key messages



- Pilot is *focussed on transitioning* existing oil & gas operations into clean, low cost energy production & supply
- Carbon capture & storage (CCS) is *proven, safe and effective* means of permanent reduction in GHG emissions
- Cliff Head Oil Field is highly suitable for *low cost, low risk conversion* into significant CCS operation
- Cliff Head CCS aims to provide over a 1mmtpa of *permanent CO2 storage* continuing through 2050
- Offshore location provides opportunity for *direct CO2 injection/storage via LCO2 carriers*
- *CCS is key enabler* to delivering lowest cost clean Blue Hydrogen
- Blue Hydrogen is and will be *significantly cheaper than Green* for the foreseeable future
- Ability to provide CCS to Clean Hydrogen *ideal for producing Clean Ammonia-for-export* into APAC region
- Pilot's Mid West operations are *ideal location for integrated development* of CCS, Blue Hydrogen and Clean Ammonia
- Mid West Clean Energy Project aims to *produce lowest cost clean energy* from CCS through to Clean Ammonia

## Contact details

Pilot Energy Limited  
Level 1, 85 Elizabeth Street  
Paddington, NSW 2021

[www.pilotenergy.com.au](http://www.pilotenergy.com.au)



**Brad Lingo**  
Chairman  
[blingo@pilotenergy.com.au](mailto:blingo@pilotenergy.com.au)

**Tony Strasser**  
Managing Director  
[tstrasser@pilotenergy.com.au](mailto:tstrasser@pilotenergy.com.au)

**Nick Watson**  
Head of Renewables & Commercial  
[nwatson@pilotenergy.com.au](mailto:nwatson@pilotenergy.com.au)