

# CarbonNet Project: A hub for climate change action and economic growth

## PRESENTERS:

STEVE MARSHALL, OPERATIONS DIRECTOR, CarbonNet

NICK HOFFMAN, GEOSCIENCE ADVISOR, CarbonNet

AMANDA HARDING, STAKEHOLDER ENGAGEMENT & COMMUNICATIONS MANAGER, CarbonNet

ALEX ZAPANTIS, GENERAL MANAGER, GLOBAL CCS INSTITUTE

## MODERATED BY:

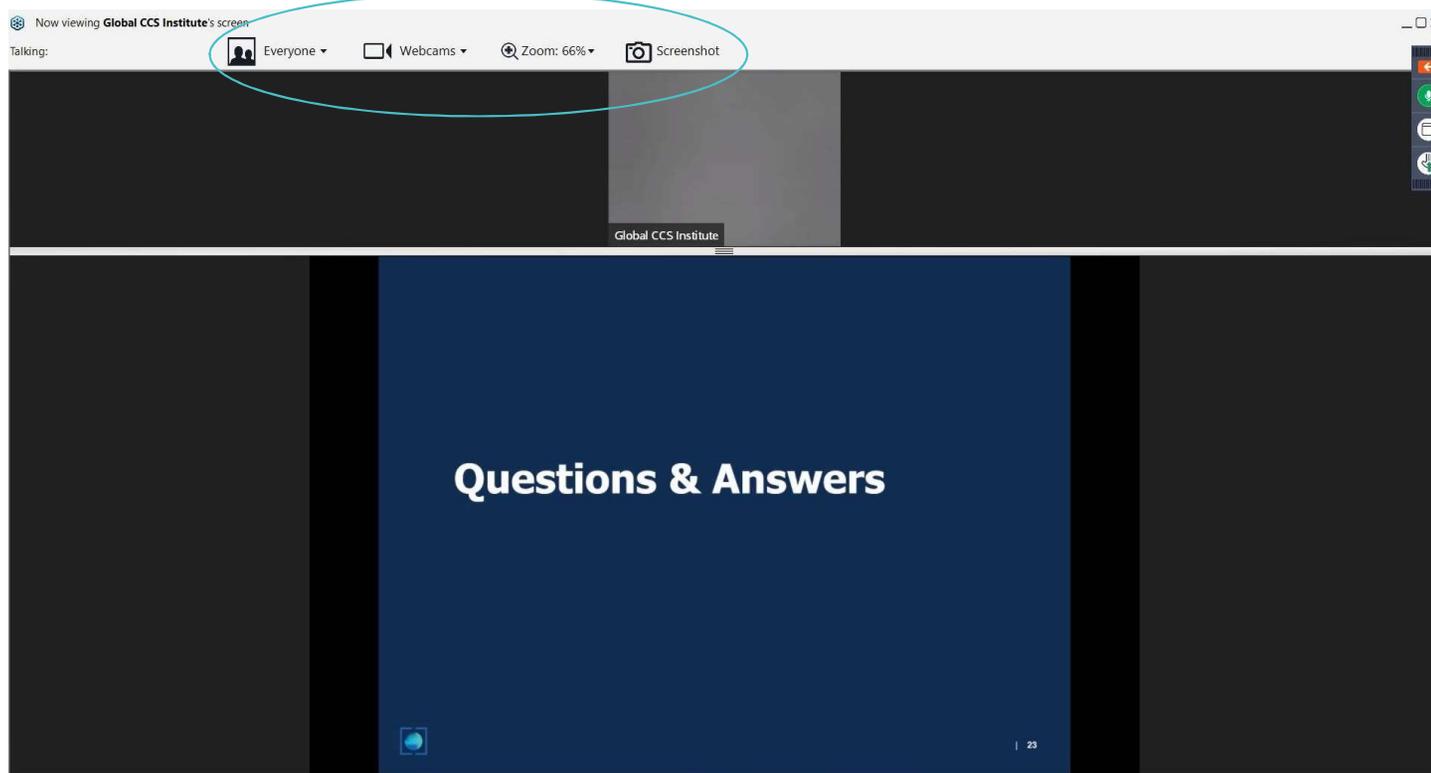
LUCY TEMPLE-SMITH, SENIOR ADVISOR, GLOBAL CCS INSTITUTE



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# ADJUSTING THE VIEW

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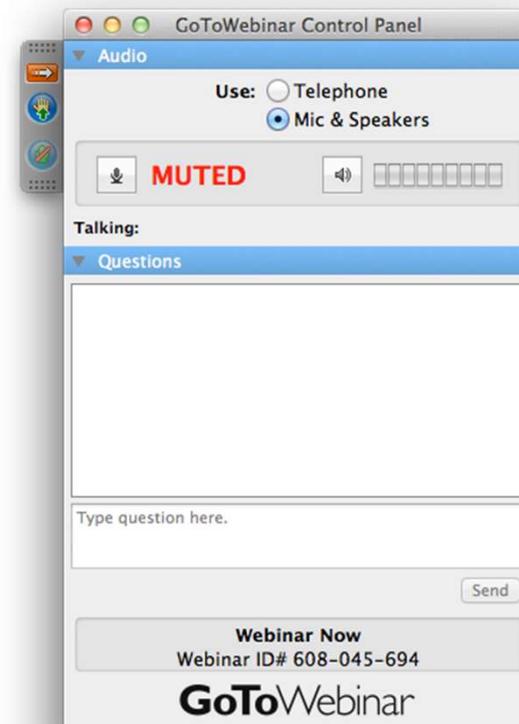
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# QUESTIONS

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- We will collect questions during the presentation.
- Moderator will pose these question to the presenters after the presentation.
- Please submit your questions directly into the GoToWebinar control panel.

Twitter: @GlobalCCS #CCSTalks



# PRESENTERS

## STEVE MARSHALL

Operations Director, CarbonNet

## NICK HOFFMAN

GeoSequestration Advisor, Carbonnet

## AMANDA HARDING

Stakeholder Engagement & Communications Manager, CarbonNet

## ALEX ZAPANTIS

General Manager - Commercial, Global CCS Institute

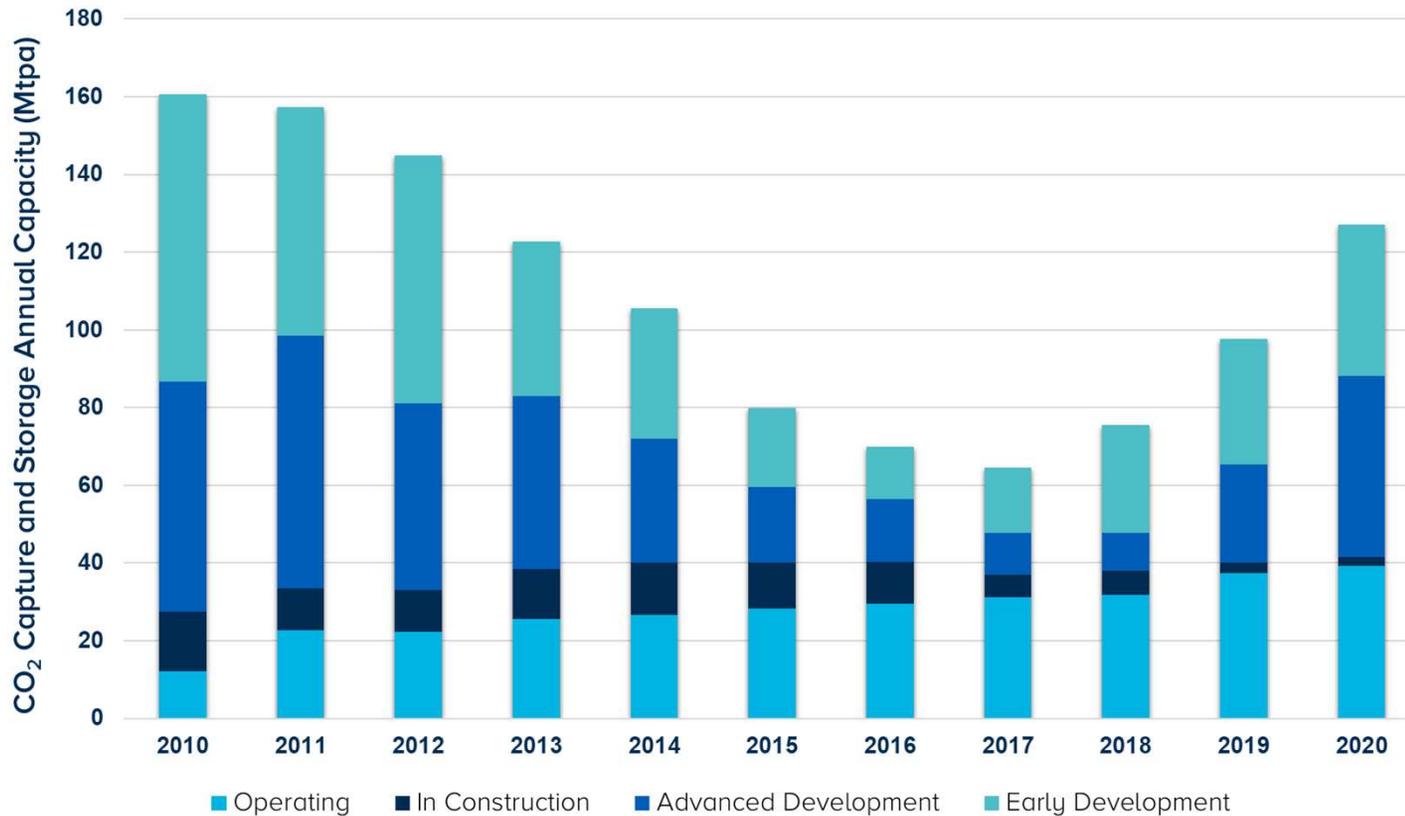


## SECTION 1

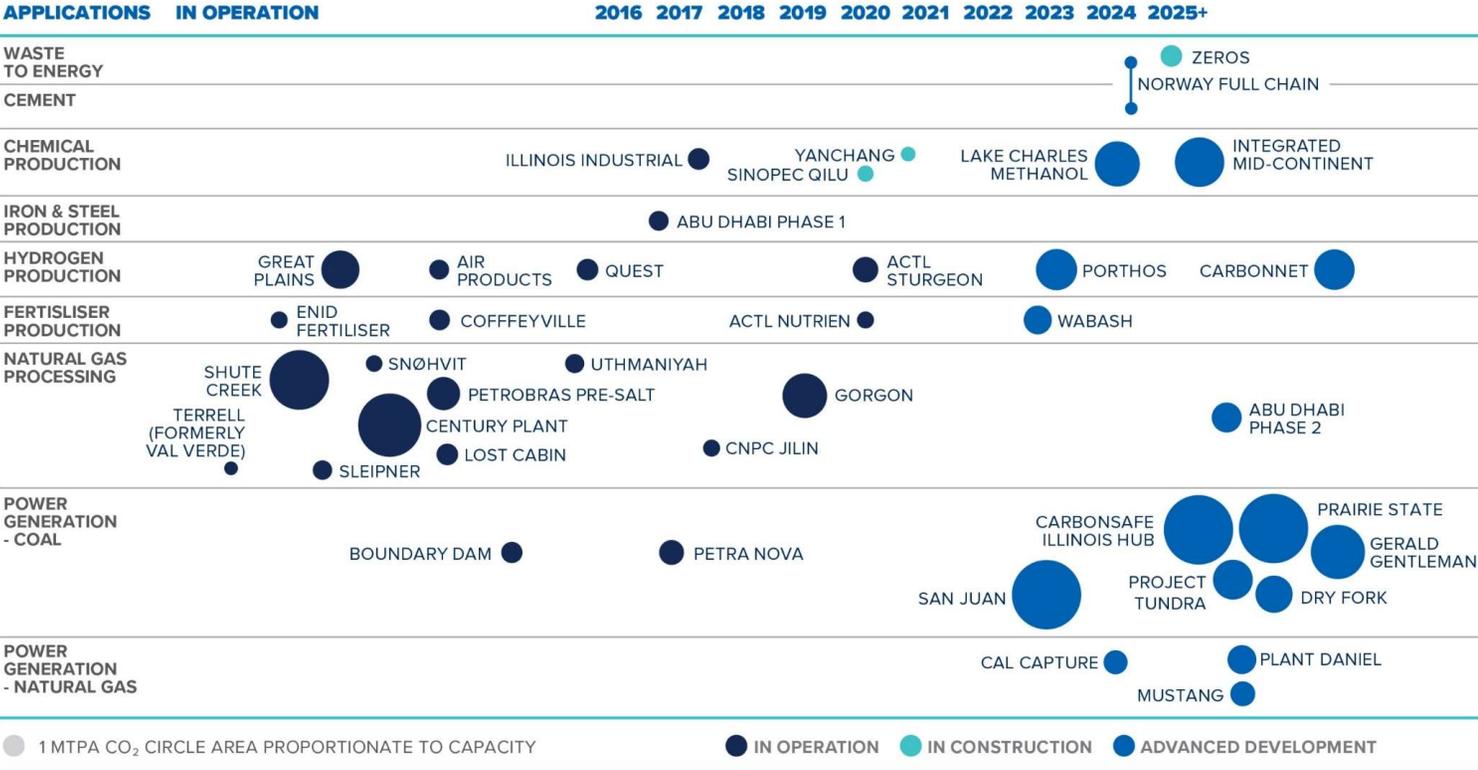
# CCS Introduction



# CCS AROUND THE WORLD



# CCS AROUND THE WORLD



Source: Global CCS Institute

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# THE VALUE OF CCS

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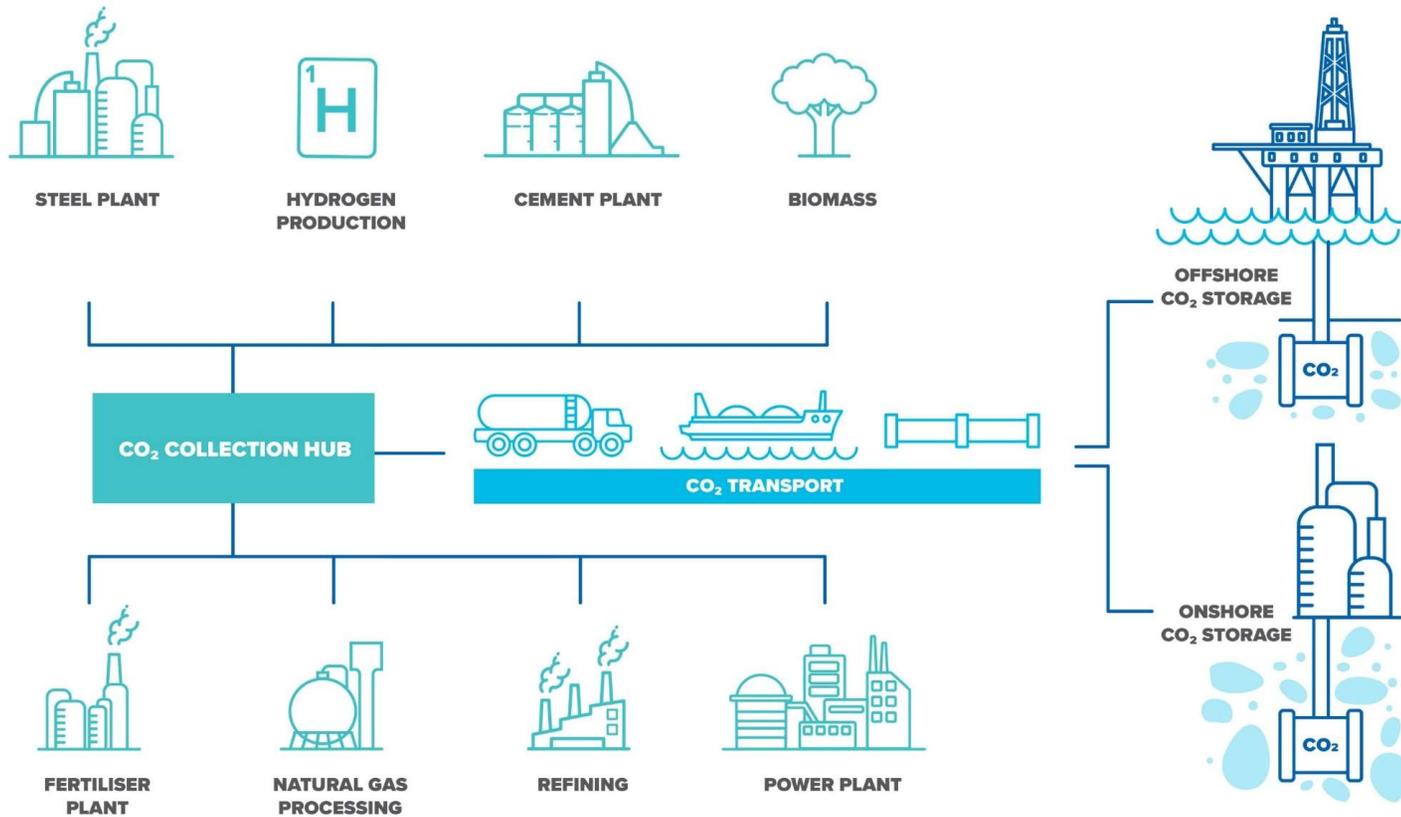
## CCS IS AN ESSENTIAL CLIMATE MITIGATION TOOL

- Achieves deep decarbonisation in industry
- Provides low-carbon dispatchable power
- Enables the production of low-carbon hydrogen at scale
- Delivers negative emissions

## CCS IS A DRIVER OF GROWTH AND EMPLOYMENT

- Creates and supports jobs
- Supports economic growth through new net-zero industries
- Extends the lifetime of infrastructure and defers decommissioning costs
- Facilitates a just transition

# NEXT WAVE OF CCS: HUBS AND CLUSTERS



Source: Global CCS Institute

# CCS HUB & CLUSTERS - 2019

**INDUSTRY SECTOR**

- COAL FIRED POWER
- NATURAL GAS POWER
- NATURAL GAS PROCESSING
- FERTILISER PRODUCTION
- HYDROGEN PRODUCTION
- IRON AND STEEL PRODUCTION
- CHEMICAL & PETROCHEMICAL PRODUCTION
- CEMENT PRODUCTION
- WASTE INCINERATION
- ETHANOL PRODUCTION
- BIOMASS POWER

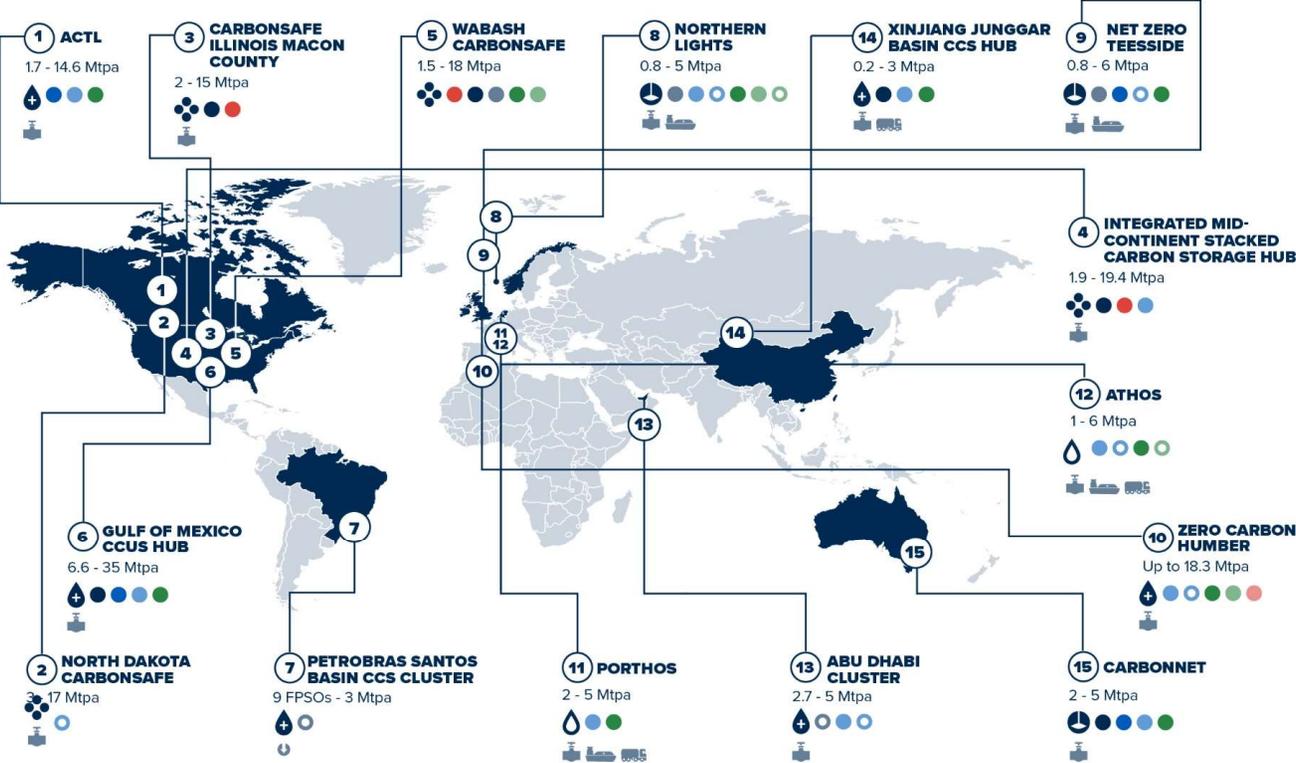
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**STORAGE TYPE**

- DEEP SALINE FORMATIONS
- ENHANCED OIL RECOVERY
- DEPLETED OIL AND GAS RESERVOIRS
- VARIOUS OPTIONS CONSIDERED

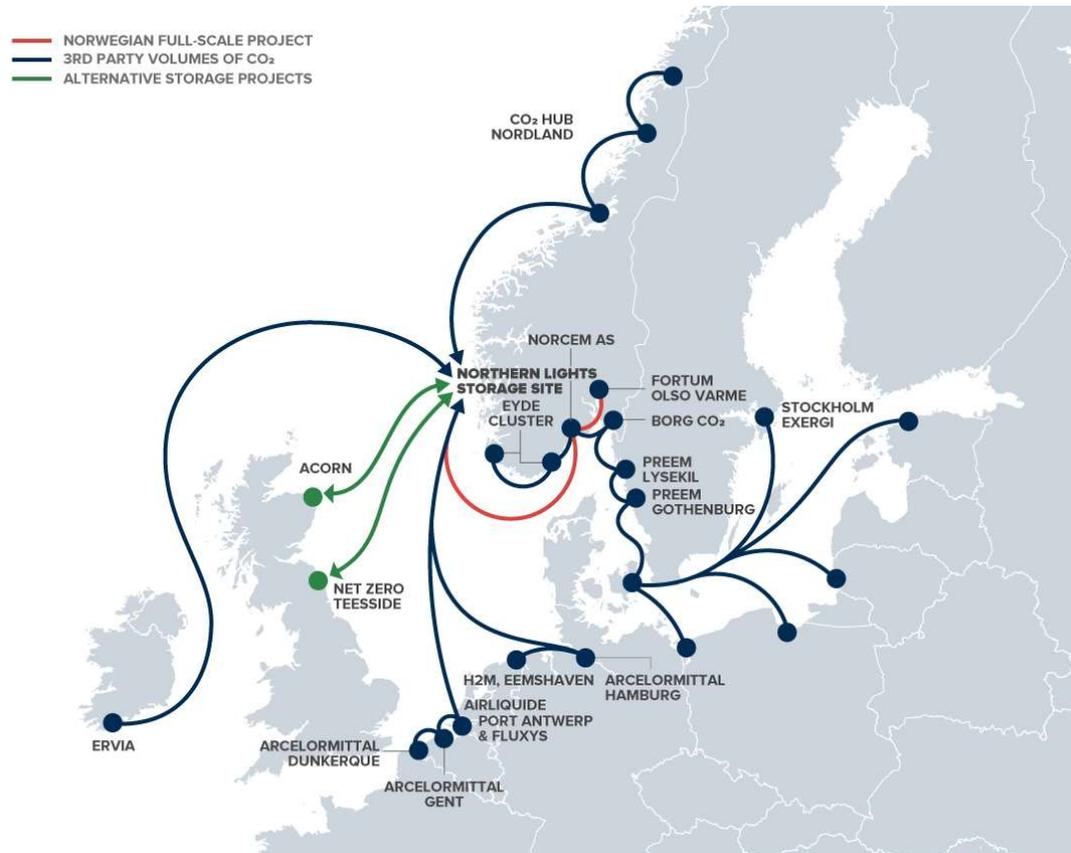
**DELIVERY**

- PIPELINE
- SHIP
- ROAD
- DIRECT INJECTION



Source: Global CCS Institute

# EXAMPLE: NORTHERN LIGHTS



# EXAMPLE: ZERO CARBON HUMBER

## WHAT A ZERO CARBON CLUSTER COULD LOOK LIKE IN THE HUMBER REGION

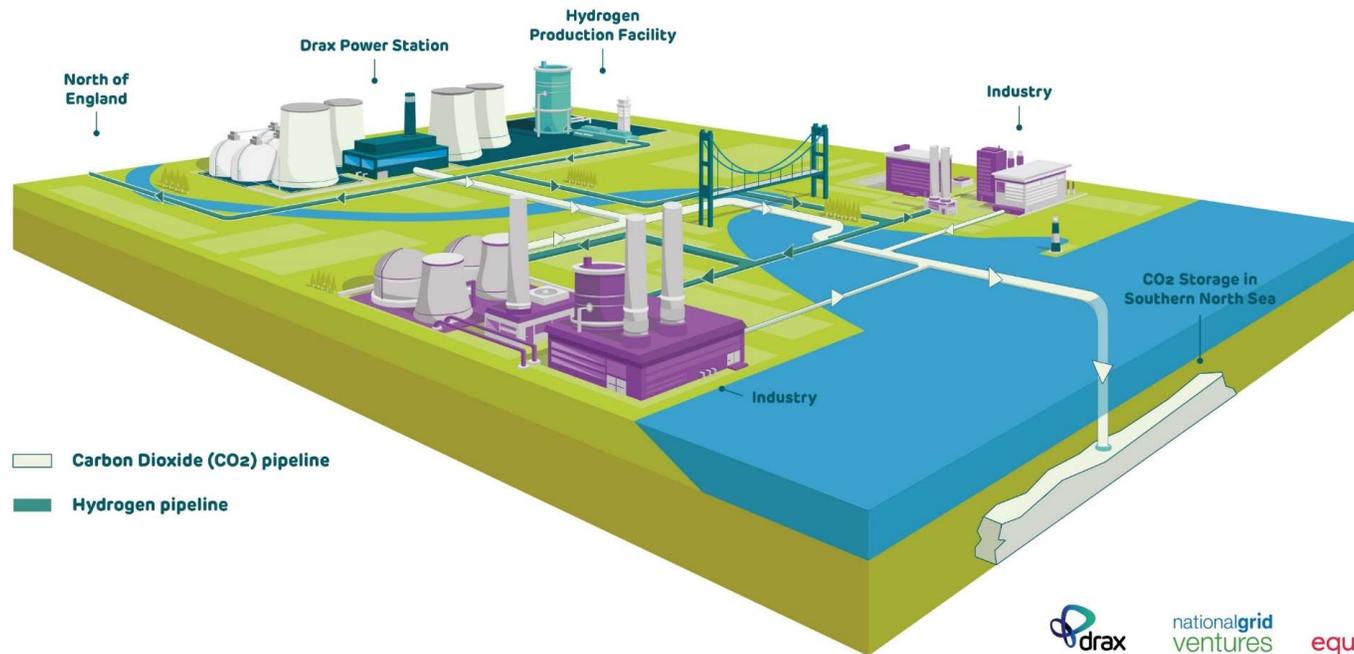




Image © 2018 Google



# CarbonNet Project

## **GCCSI Talks: 23 July 2020** **The CarbonNet Project – A hub for climate change action and economic growth**

Steve Marshall - Operations Director

Dr. Nick Hoffman - Geosequestration Advisor

Amanda Harding – Stakeholder Engagement & Comm's Manager



Australian Government  
Department of Industry, Science,  
Energy and Resources

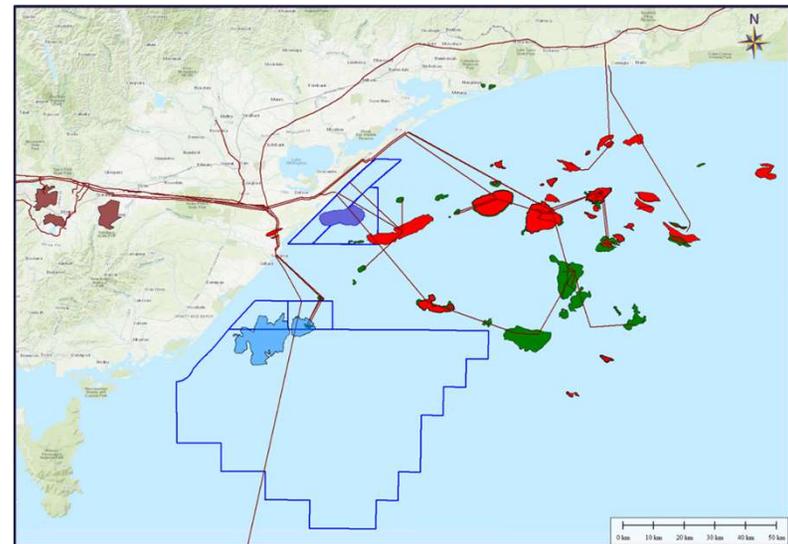


Jobs,  
Precincts  
and Regions

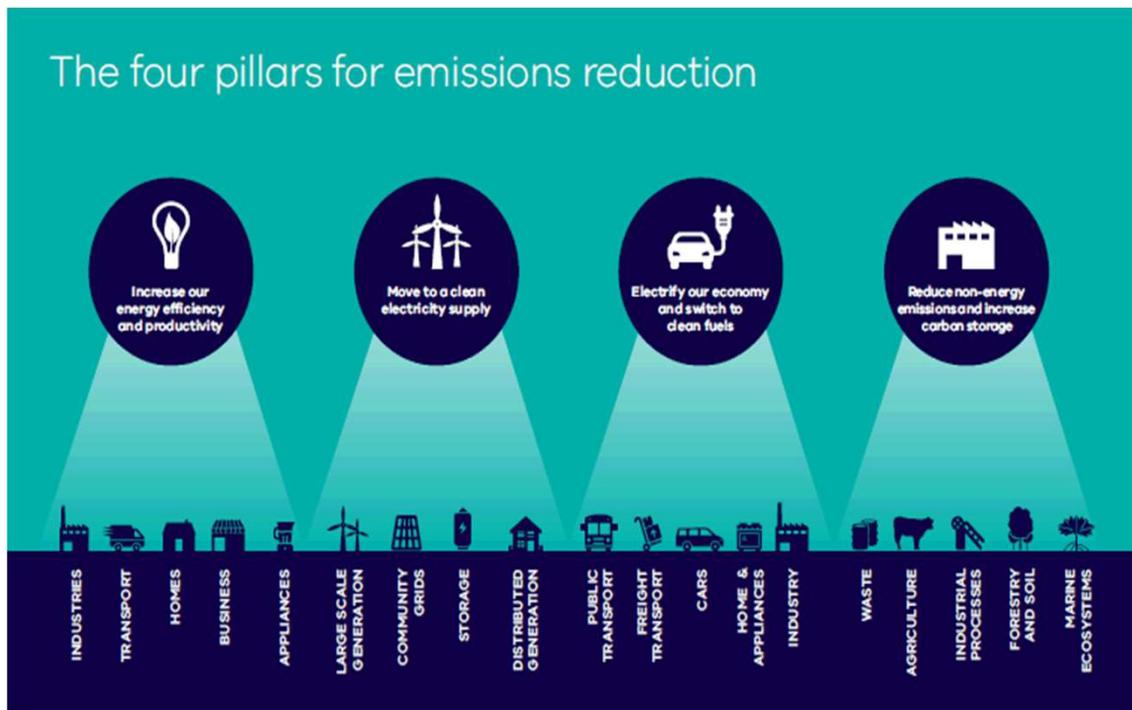
## CarbonNet: Enabling a low-emissions future

The CarbonNet project is working towards establishing a commercial-scale, multi-user Carbon Capture and Storage (CCS) network in Gippsland.

The project is jointly funded by the Victorian and Commonwealth Governments.

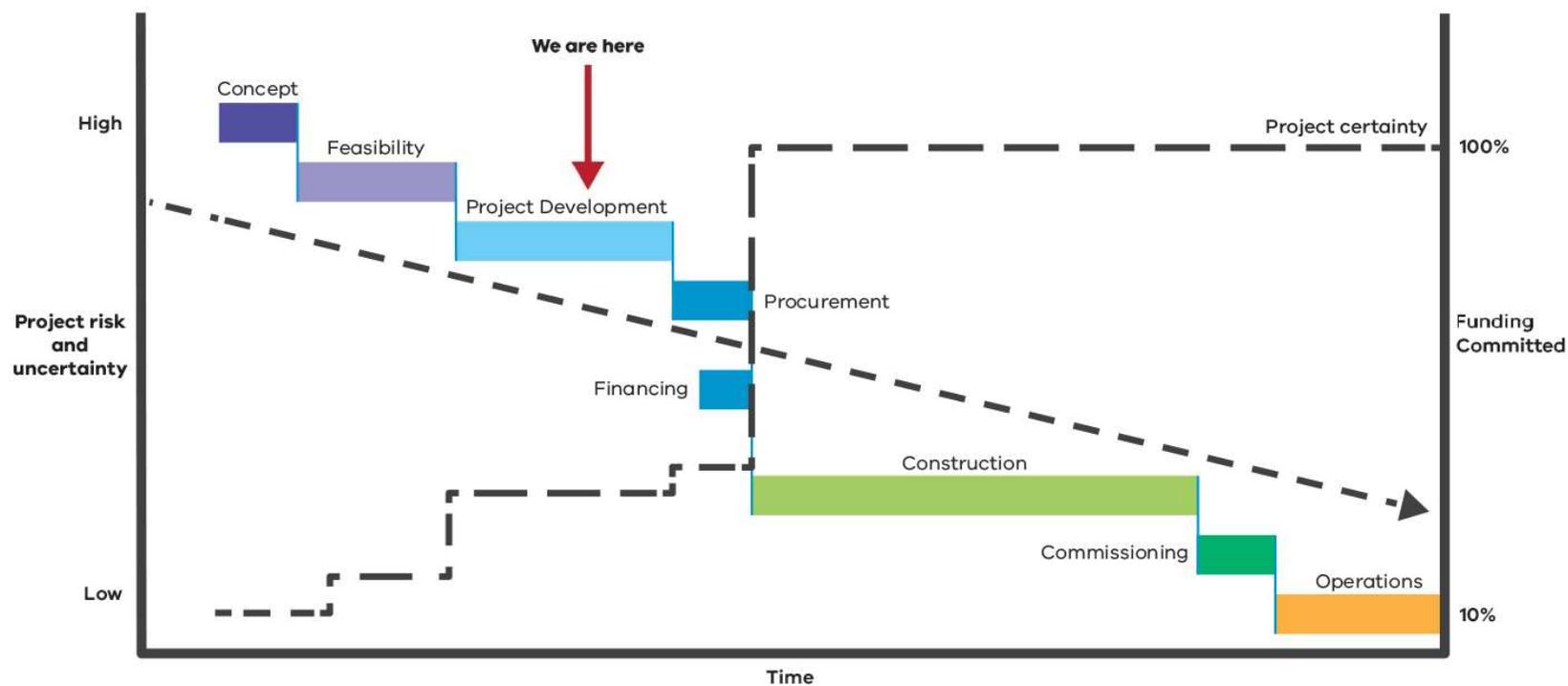


# Victorian Government - Climate Change Commitment 2017

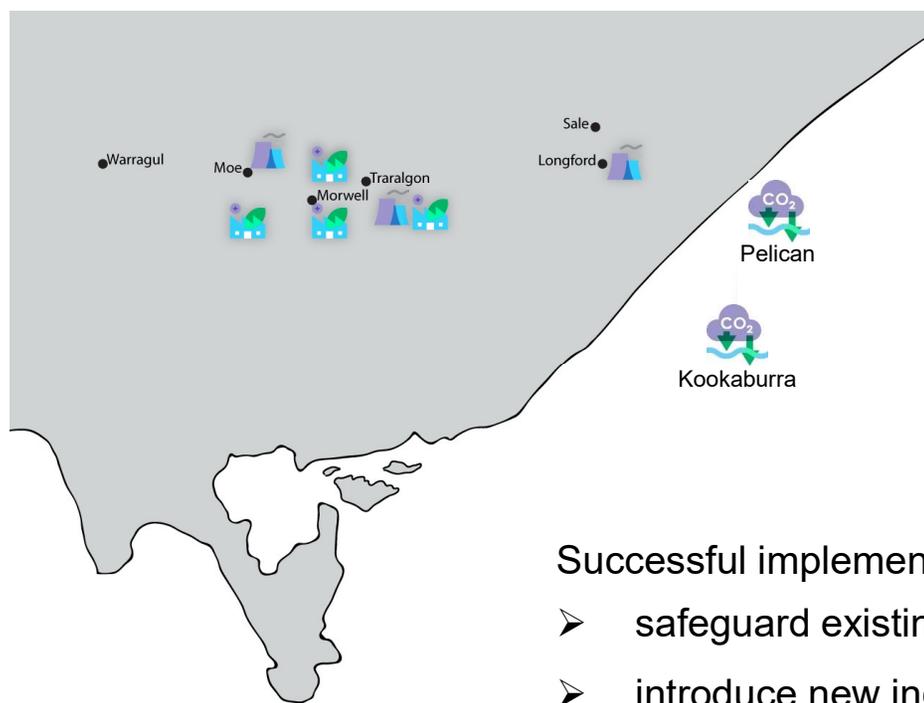


CarbonNet and CCS are an essential component of the Victorian Government's long-term target of net zero emissions by 2050.

# Project Progression



# The future vision – Gippsland Low Emissions Network



## Existing industry:

- Fossil Fuel Power Generation
- Natural Gas Processing
- Paper production



## Emerging industry:

- Hydrogen production
- Fertilizer production
- Direct Air Capture
- BioEnergy + CCS



Successful implementation of this project will;

- safeguard existing jobs
- introduce new industries such as hydrogen, fertiliser and bioenergy
- capitalise on existing skill set of local workforce
- new employment opportunities in regional Victoria





## Pelican Appraisal Well: Gular-1

- First offshore appraisal well dedicated to CCS in Australia
- Well drilled in Dec 2019/ Jan 2020, on the Pelican structure
- Drilled to 1423m TVDSS, into the storage reservoir
- Operations regulated by NOPTA & NOPSEMA
- Extensive Formation Evaluation Program
- Well Plugged & Abandoned, to reduce long term liabilities
- Significant stakeholder engagement activities during before and during operations
- Results to date are positive and aligned with field expectations for Pelican to take >5Million tonnes CO2 per year

## Appraisal – More than operations



Conducting appraisal activities is so much more than the physical operations.

Being a first of a kind, presented many challenges and opportunities;

- Community engagement
- Industrial relations
- Testing existing regulatory regimes
- Media & Social Media



## Regulatory achievements

CarbonNet has been a first of a kind:

- evaluated its three short-listed storage sites and gained legal access to them
- amendment to Offshore Petroleum & Greenhouse Gas Storage Acts
- certification of the site selection process by the international risk agency DNV-GL
- successfully completed appraisal operations meeting all regulatory requirements



## Unlocking policy

Around the world we are seeing a significant shift in government policy, placing CCS firmly at the centre of their Net-Zero ambitions

In Australia, 2019 / 2020 has seen a fundamental shift in Government led policy and legislation in support of Carbon Capture & Storage.

Key moves in Australia;

- 1) Commonwealth OPGGS Act
- 2) Victorian OPGGS Act
- 3) Victorian Brown Coal Statement
- 4) Victorian NetZERO Industry Sector Pledges
- 5) The King Review
  - Clean Energy Finance Corporation
  - Australian Carbon Credit Units
- 6) Commonwealth & State Hydrogen Strategies
- 7) Commonwealth Technology Investment Roadmap



Image © 2018 Google



# CarbonNet Project

Part 2 – Pelican site geoscience in support of  
safe storage

Dr Nick Hoffman

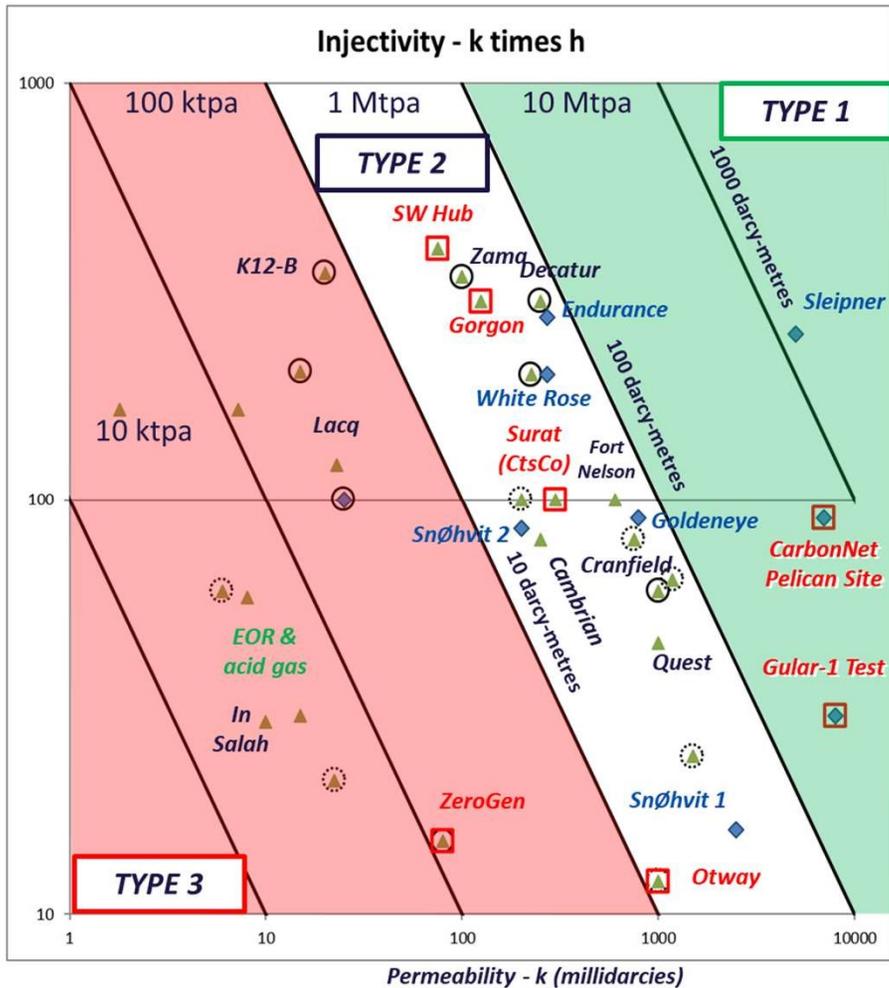


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# Injectivity- world projects - why the Gippsland Basin?



## World-Class basin, public data

- World-class oil and gas basin with excellent reservoirs
- Proven by >1,500 exploration and development wells.
- Basic data on all of these is open-file.

## Source-sink matching

- There are large stationary sources of CO<sub>2</sub> nearby.

## Injectivity – the route to project success

- Injectivity is reservoir thickness (*h*) times permeability (*k*).
- Other factors (e.g. aquifer quality) can reduce long-term performance
- Good initial injectivity is crucial to success.

## Pelican Site:

- Gular-1 well injection test covered a 30m interval.
- Future development may use three wells, each with 30m interval

## Type 1 Reservoirs

Ideal for low-cost projects, both on- and offshore

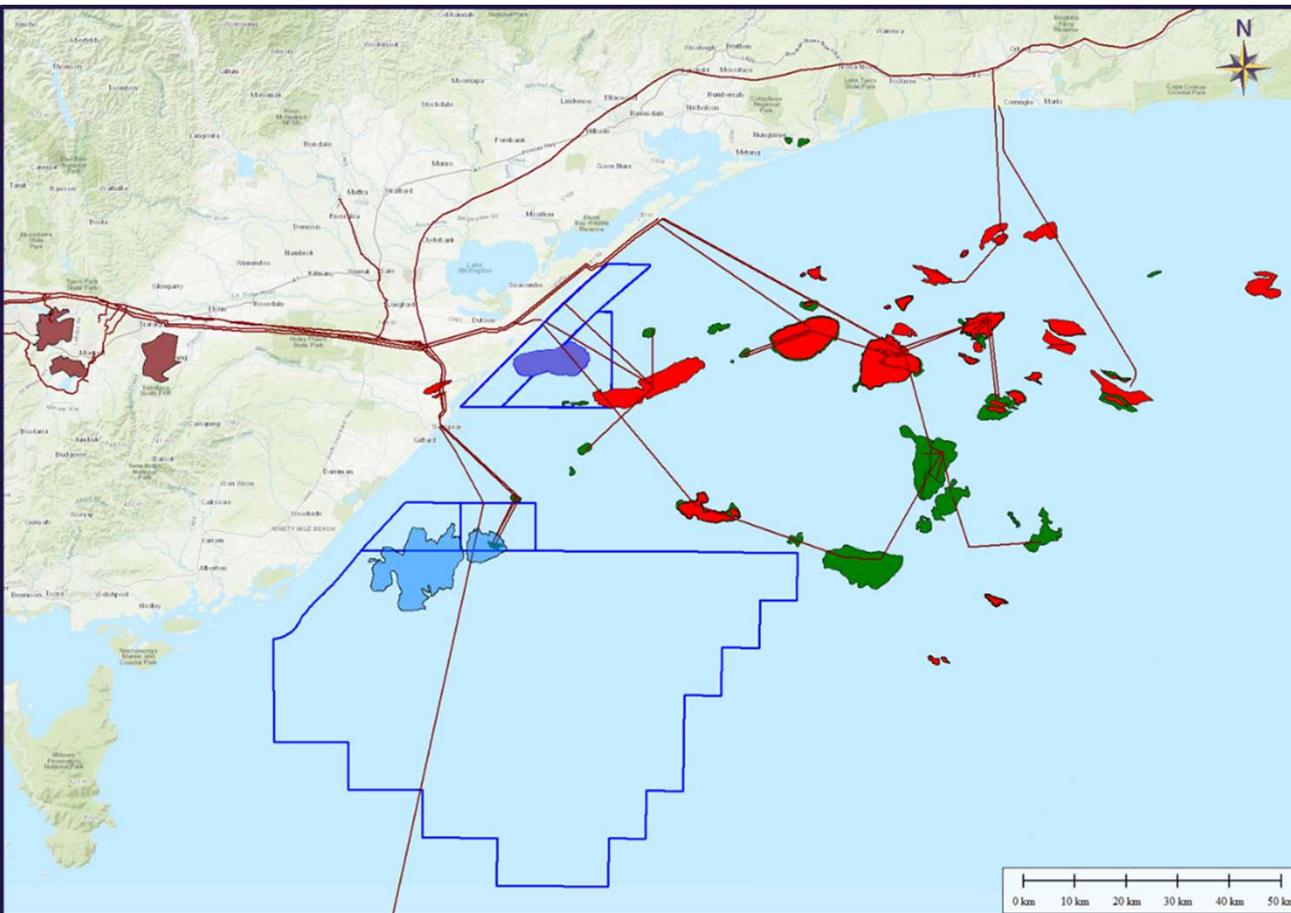
## Type 2 Reservoirs

Good for onshore injection, less suitable offshore

## Type 3 Reservoirs

Only suitable for small research/pilot projects onshore

# CarbonNet offshore GHG Permits and potential storage sites

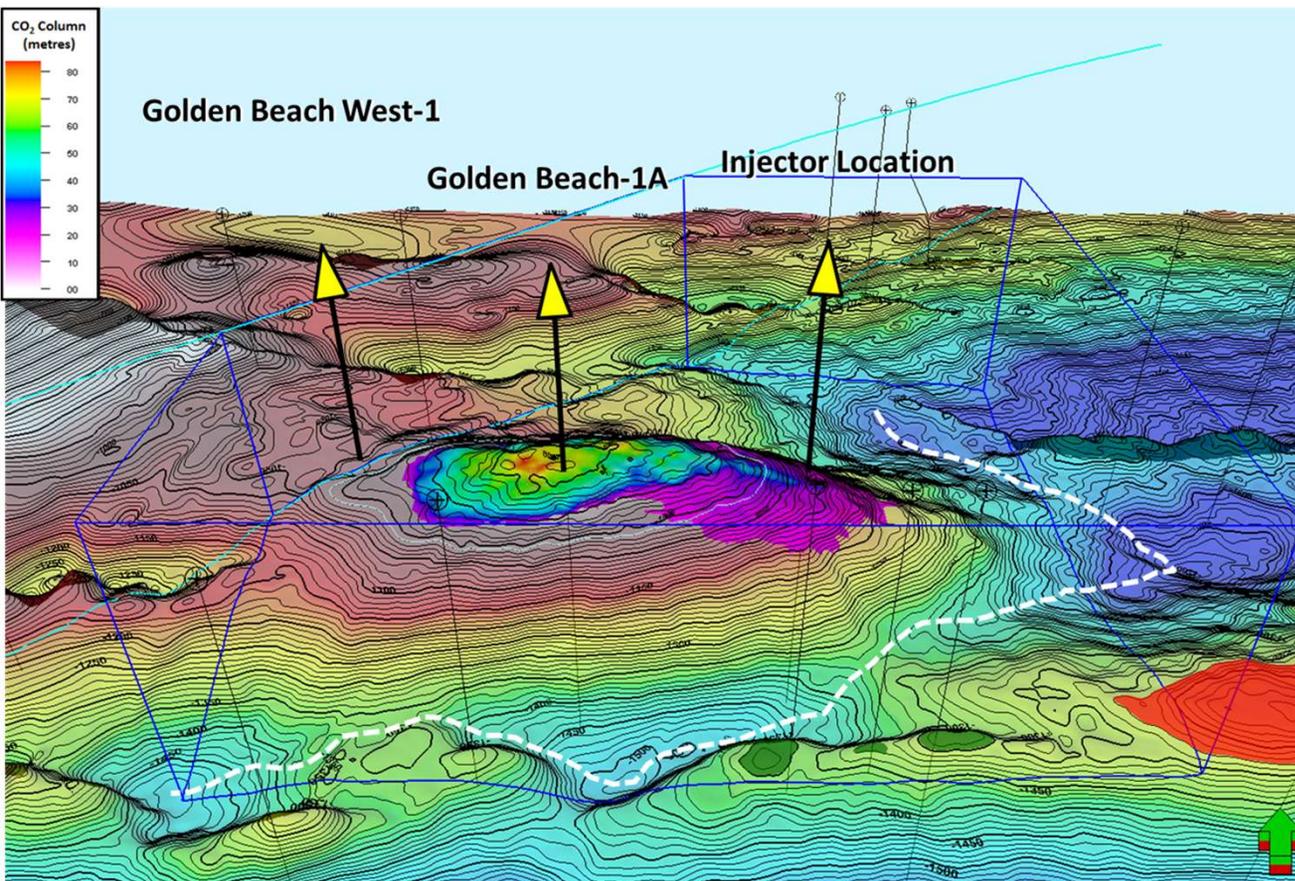


CarbonNet operates five offshore GHG assessment permits in Australian state and commonwealth waters offshore Victoria

Three potential storage sites have been evaluated.

Work is progressing for a “*Declaration of Identified Storage Formation*” for at least two of these sites

# Pelican – prioritised storage site



Pelican site is a large structural anticline with substantial capacity:

**Society of Petroleum Engineers CO<sub>2</sub> Storage Resources Management System:**

1C (P90) 125 Mt  
2C (P50) 250 Mt  
3C (P10) 500 Mt

- Site now fully characterised and appraised
- New high-resolution marine 3D seismic survey
- Appraisal well Gular-1
- Ongoing evaluation to optimise the development plan



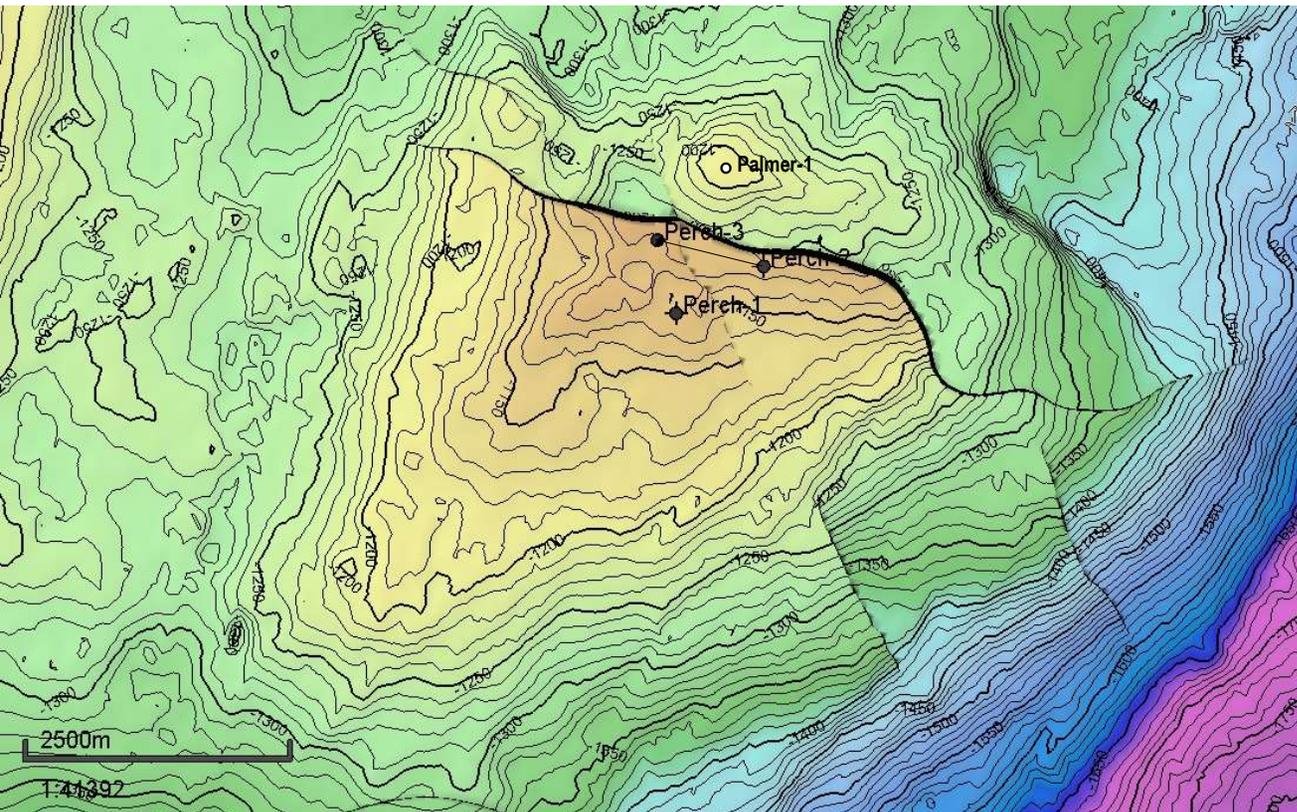
## Gular-1 Appraisal Well Outcomes

### Gular-1 well summary:

- Location optimised, using 2018 3D seismic survey
- TD 1423m TVDSS, into the storage reservoir
- Stratigraphy as predicted
- Depth forecast accurate ( $\pm 15\text{m}$ )
- 89m core recovered (seal and reservoir)
- Extensive wireline logging program
- 24-hour water injection test up-to 10,000bpd
- Seals present
- Reservoirs better than predicted (multi-darcy)
- Use high spec alloys in well construction and plugged with CO<sub>2</sub> resistant cement

Image Credits: CarbonNet/Robert Garvey

# Kookaburra – the next available storage site



Kookaburra is a large structural anticline with substantial capacity:

**Society of Petroleum Engineers CO<sub>2</sub> Storage Resources Management System:**

Currently under evaluation.

1C (P90) is likely to be around 125 Mt

- A depleted small oilfield due for abandonment in the next few years.
- Fully characterised with existing marine 3D seismic data and five exploration and development wells that will be abandoned.
- CO<sub>2</sub> storage development plan will be based on existing well and seismic data, and the field production history.

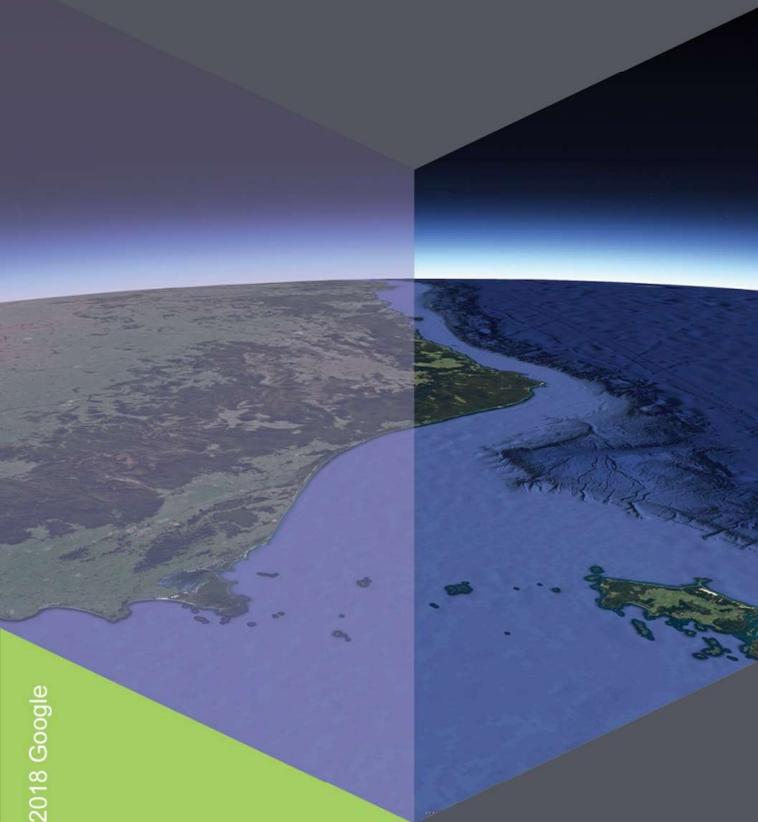


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# CarbonNet Project

Part 3 – Stakeholder Engagement &  
Communications

Amanda Harding



Australian Government  
Department of Industry, Science,  
Energy and Resources



Jobs,  
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and Regions

## Stakeholder Engagement and Communications



CarbonNet aims to:

- ➔ Build community awareness and confidence in CCS
- ➔ Work towards establishing a social licence for the CarbonNet project
- ➔ Achieve broad advocacy for the CarbonNet project

## Our Stakeholders

- Gippsland Community
  - Shoreline Community
  - Latrobe Valley
- Regulators and Government
- Victorians
- Australians
- Scientific and Academic Community



## Stakeholder activities

- Community Sentiment Survey
- Community Information Sessions
- Community Reference Group
- Education Program
- Events and Conferences
- Media and Social Media
- Knowledge Sharing
- Working with project partners, e.g. HESC





A huge 150-metre-tall rig off the Victorian coast is drilling for rock to help combat climate change. The CarbonNet Project is exploring whether emissions could be commercially stored inside sandstone buried deep on the ocean floor. | [@SimoLove](#) [@JaclynSymes](#) [@VicGovDJPR](#)

## Media & Community Engagement





## CarbonNet next steps

- Continuing technical development and regulatory permitting of the Pelican site and our other sites
- Expand collaboration with industry and government on legislation and policy updates
- Stakeholder engagement and education
- Continue technical & commercial discussions with industry
- Furthering collaboration and partner with industry on developing a low emissions future industrial hub in Victoria

## Stay informed

Subscribe to our e-newsletter:

[www.resources.vic.gov.au/carbonnet](http://www.resources.vic.gov.au/carbonnet)

CarbonNet are keen to hear from all interested parties in furthering the commercial development of the project

Please contact us via;

[steve.marshall@ecodev.vic.gov.au](mailto:steve.marshall@ecodev.vic.gov.au)

**THANK YOU**

Thanks to our valued partners



# Questions & Answers



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# FURTHER INFORMATION

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- **Global Status of CCS Report** [globalccsinstitute.com/resources/global-status-report/](https://globalccsinstitute.com/resources/global-status-report/)
- **CO2RE CCS Database** [co2re.co](https://co2re.co)
- **Thought Leadership Report: Value of CCS**, download from [globalccsinstitute.com/resources/publications-reports-research/](https://globalccsinstitute.com/resources/publications-reports-research/)
- **Further information on the CarbonNet Project** can be found at <https://earthresources.vic.gov.au/projects/carbonnet-project>
- **CCS Talks Webinars, Global CCS Institute Audio Visual Library** [globalccsinstitute.com/resources/audio-and-visual-library/](https://globalccsinstitute.com/resources/audio-and-visual-library/)

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