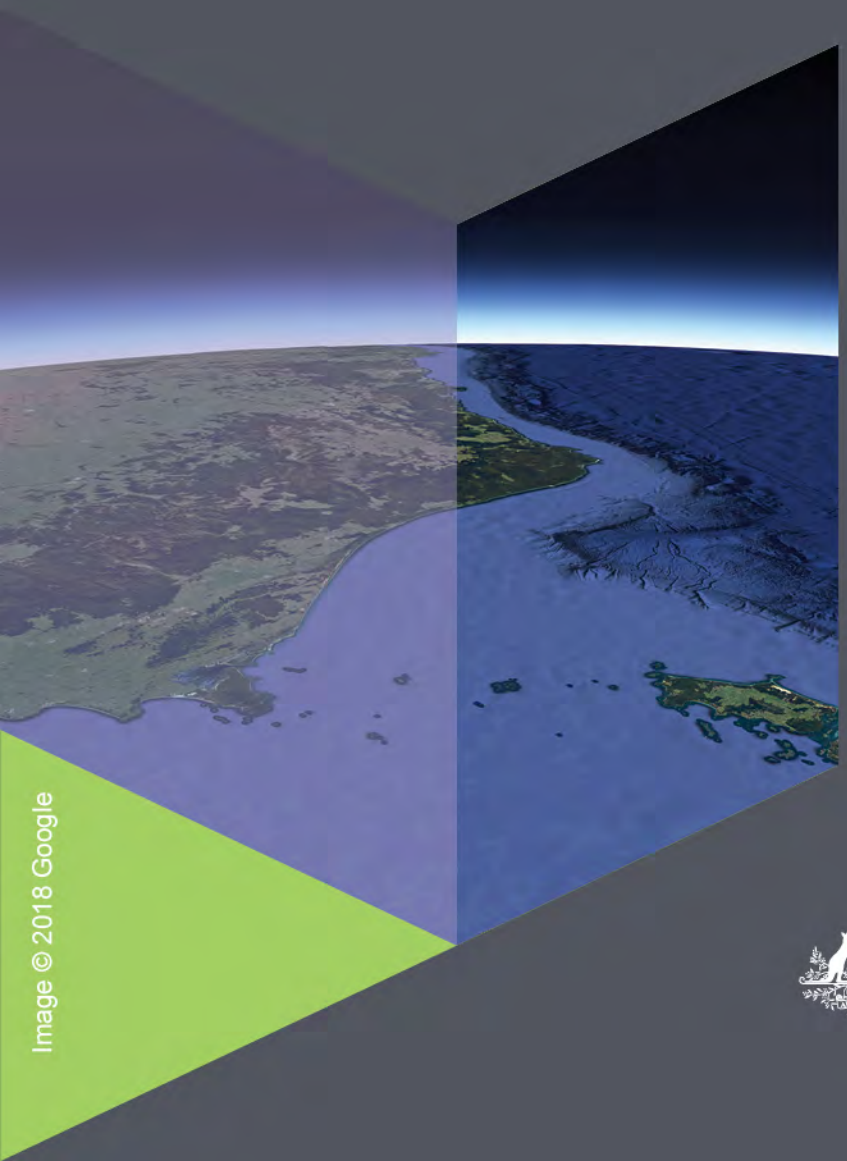


CarbonNet Project

Update for Carbon Sequestration Leadership Forum

October 2018

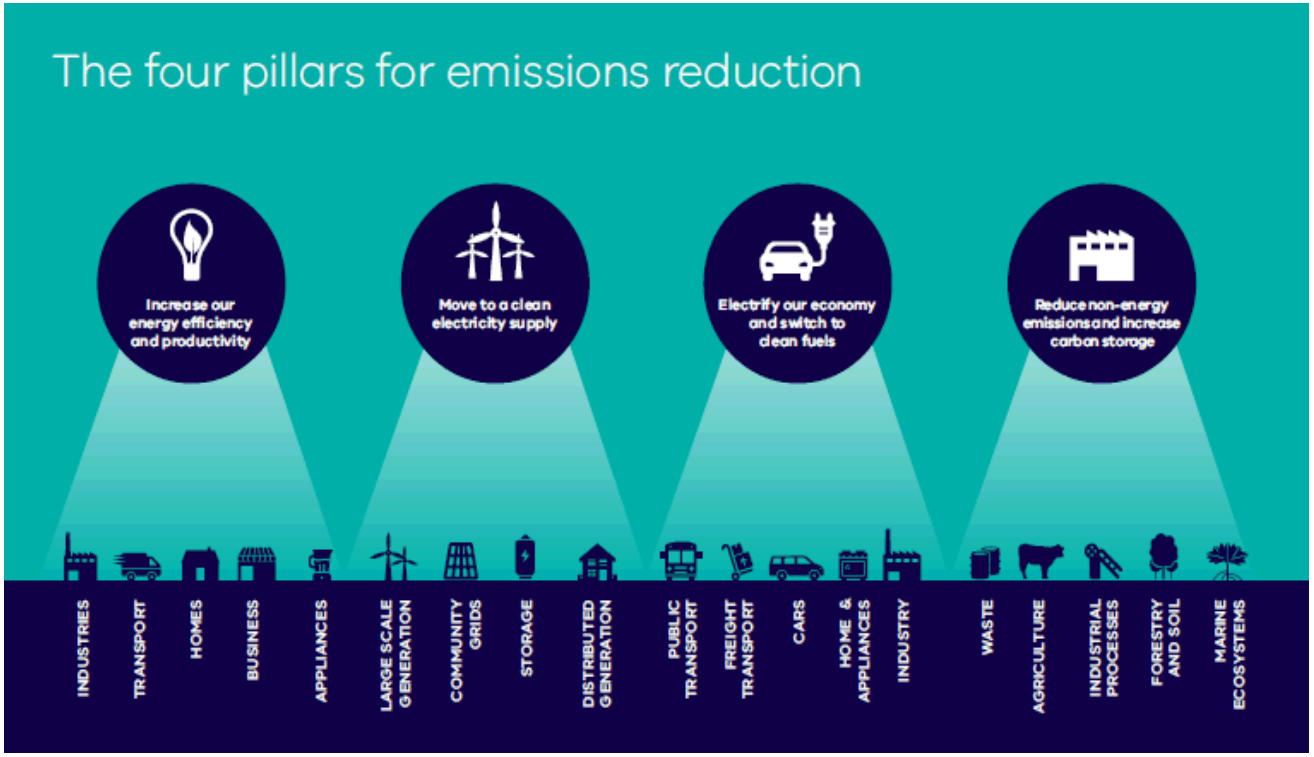
Australian Government
Department of Industry, Innovation and Science

VICTORIA State Government
Economic Development, Jobs, Transport and Resources

The CarbonNet Project

- Investigating the feasibility for a commercial-scale, multi-user CCS network in Gippsland, Victoria, Australia
- Jointly funded by the Australian and Victorian Governments to 2020
- Significant research investment to support CarbonNet e.g., ANLEC R&D
- CO2CRC is CarbonNet's lead research organisation e,g., Commonwealth EIF assets
- Knowledge sharing via GCCSI
- Working collaboratively with industry to secure customers and investors in a **CCS service**

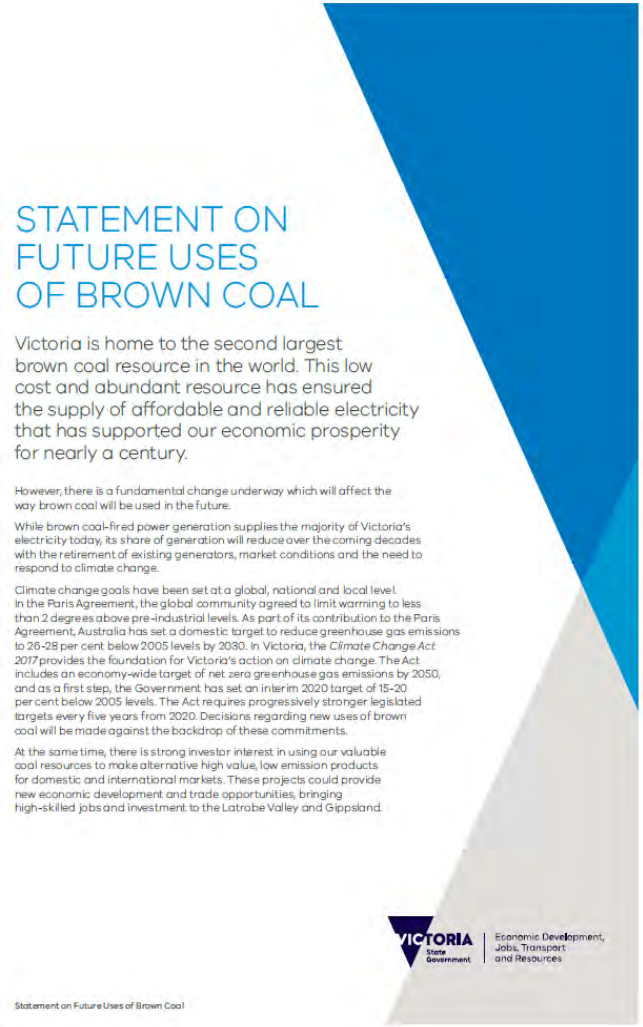
Victorian Government
Climate Change Commitment 2017



"carbon capture and storage (CCS) technology could support emissions reduction action across multiple pillars including from industrial processes such as gas processing, refineries and chemical manufacturing."

Victorian Government – Coal Policy Statement July 2017

- Consistent with Climate Change Act and net zero emissions by 2050
- Sets initial emission intensity at 0.45 t CO2e/MWh.
- Acknowledges strong interest in new industries – for low emission, high value products for domestic and international markets eg hydrogen and fertilisers
- Identifies opportunities for new projects to mitigate emissions with CCS or offsets
- Commits to completing the CarbonNet project



STATEMENT ON FUTURE USES OF BROWN COAL

Victoria is home to the second largest brown coal resource in the world. This low cost and abundant resource has ensured the supply of affordable and reliable electricity that has supported our economic prosperity for nearly a century.

However, there is a fundamental change underway which will affect the way brown coal will be used in the future.

While brown coal-fired power generation supplies the majority of Victoria's electricity today, its share of generation will reduce over the coming decades with the retirement of existing generators, market conditions and the need to respond to climate change.

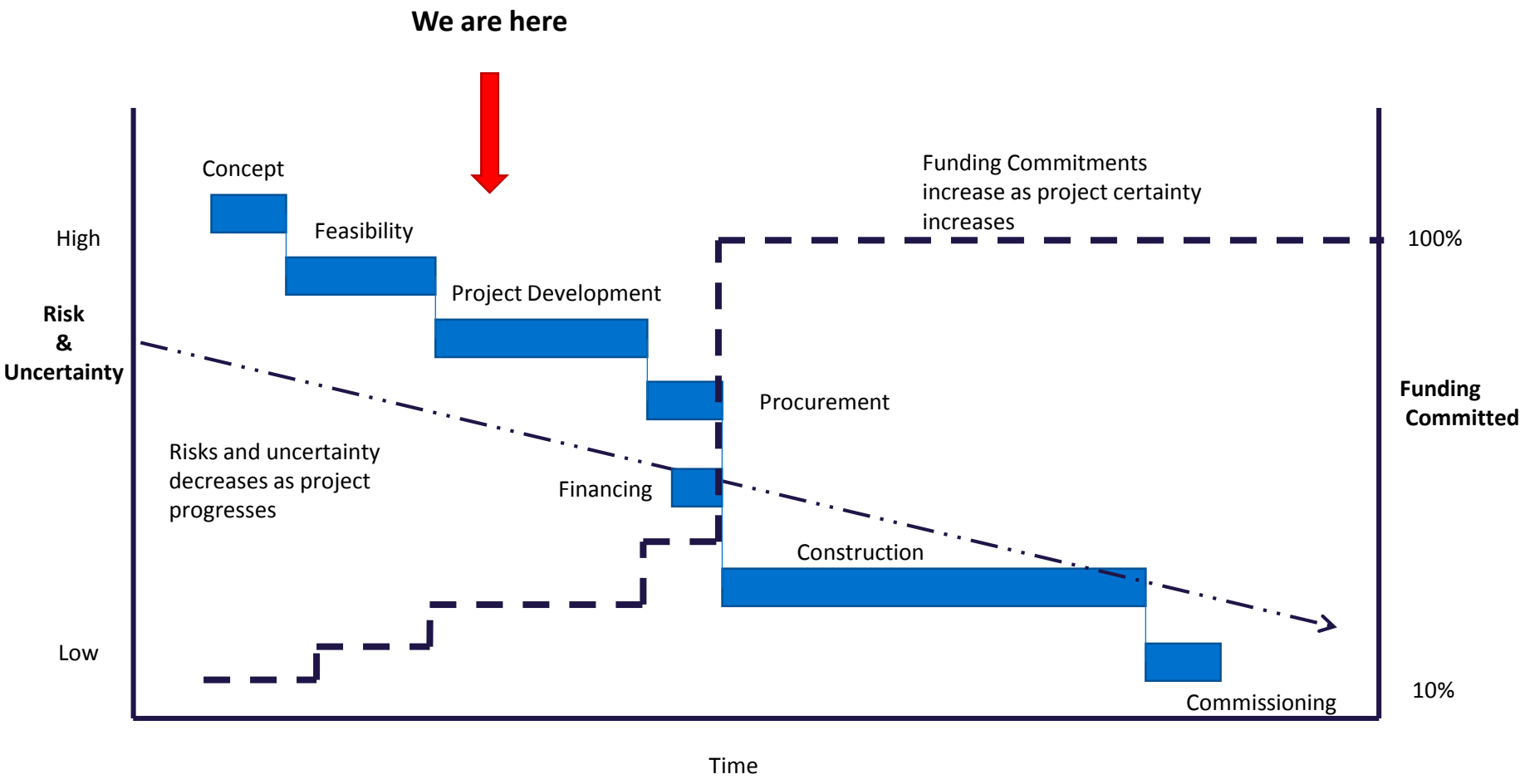
Climate change goals have been set at a global, national and local level. In the Paris Agreement, the global community agreed to limit warming to less than 2 degrees above pre-industrial levels. As part of its contribution to the Paris Agreement, Australia has set a domestic target to reduce greenhouse gas emissions to 26-28 per cent below 2005 levels by 2030. In Victoria, the *Climate Change Act 2017* provides the foundation for Victoria's action on climate change. The Act includes an economy-wide target of net zero greenhouse gas emissions by 2050, and as a first step, the Government has set an interim 2020 target of 15-20 per cent below 2005 levels. The Act requires progressively stronger legislated targets every five years from 2020. Decisions regarding new uses of brown coal will be made against the backdrop of these commitments.

At the same time, there is strong investor interest in using our valuable coal resources to make alternative high value, low emission products for domestic and international markets. These projects could provide new economic development and trade opportunities, bringing high-skilled jobs and investment to the Latrobe Valley and Gippsland.

VICTORIA State Government | Economic Development, Jobs, Transport and Resources

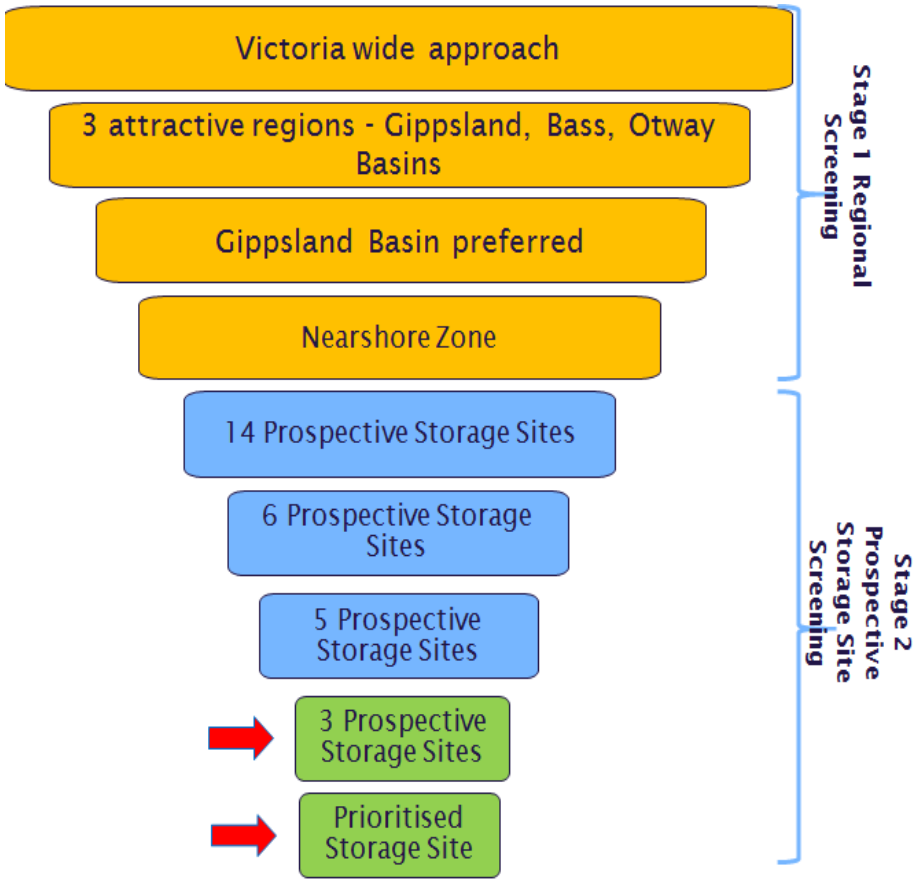
Statement on Future Uses of Brown Coal

CarbonNet Business Case - Approved to progress to Stage 3

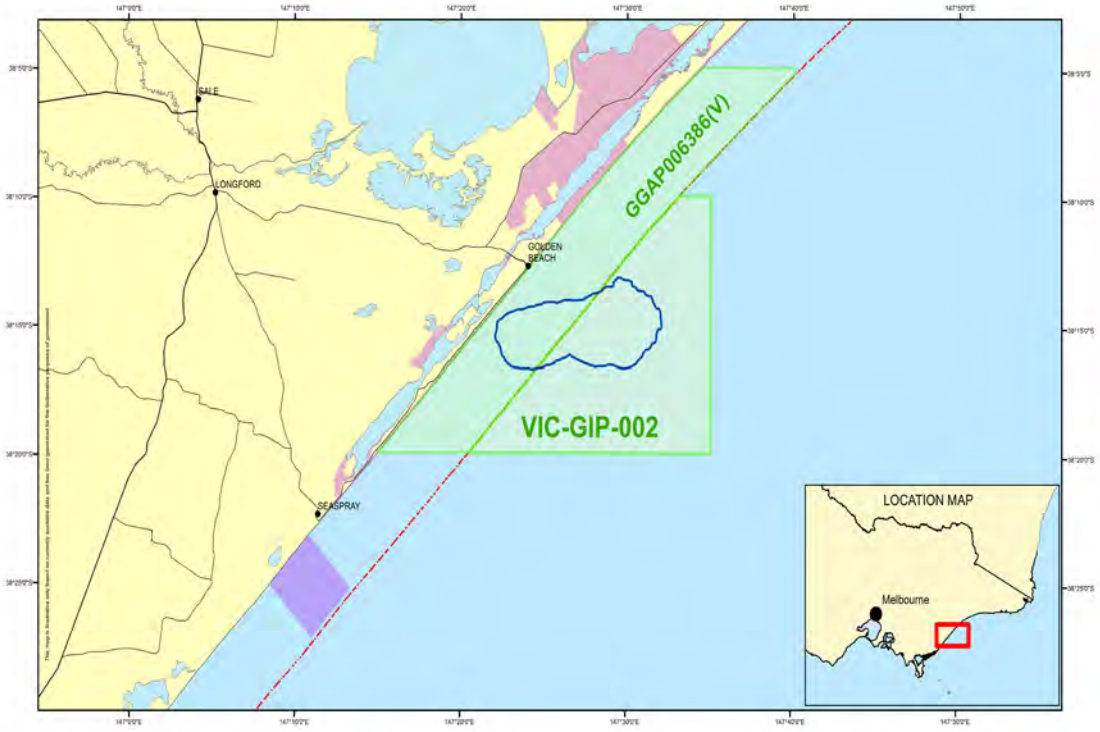


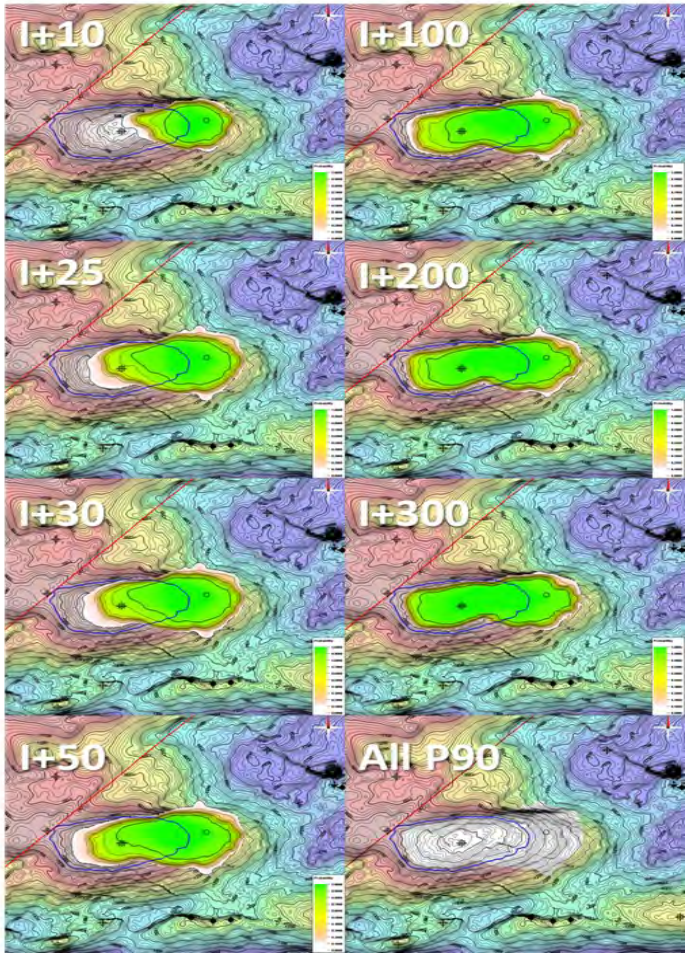
Outcomes of Stage 2 – Feasibility and Commercial Definition

- Geological storage site selection independently certified: portfolio of three sites including a prioritised site
- Secured of five greenhouse gas assessment permits: legal access
- Feasibility studies across full CCS chain: capture, transport and storage
- Environmental risk assessment: including air and groundwater potential impacts
- Risk-adjusted whole of life costings for CO2 transport and storage: service fee
- Regulatory framework review: regulatory fix plan being implemented
- Market soundings with industry: understanding preconditions for investors



CarbonNet's Prioritised Storage Site - Pelican

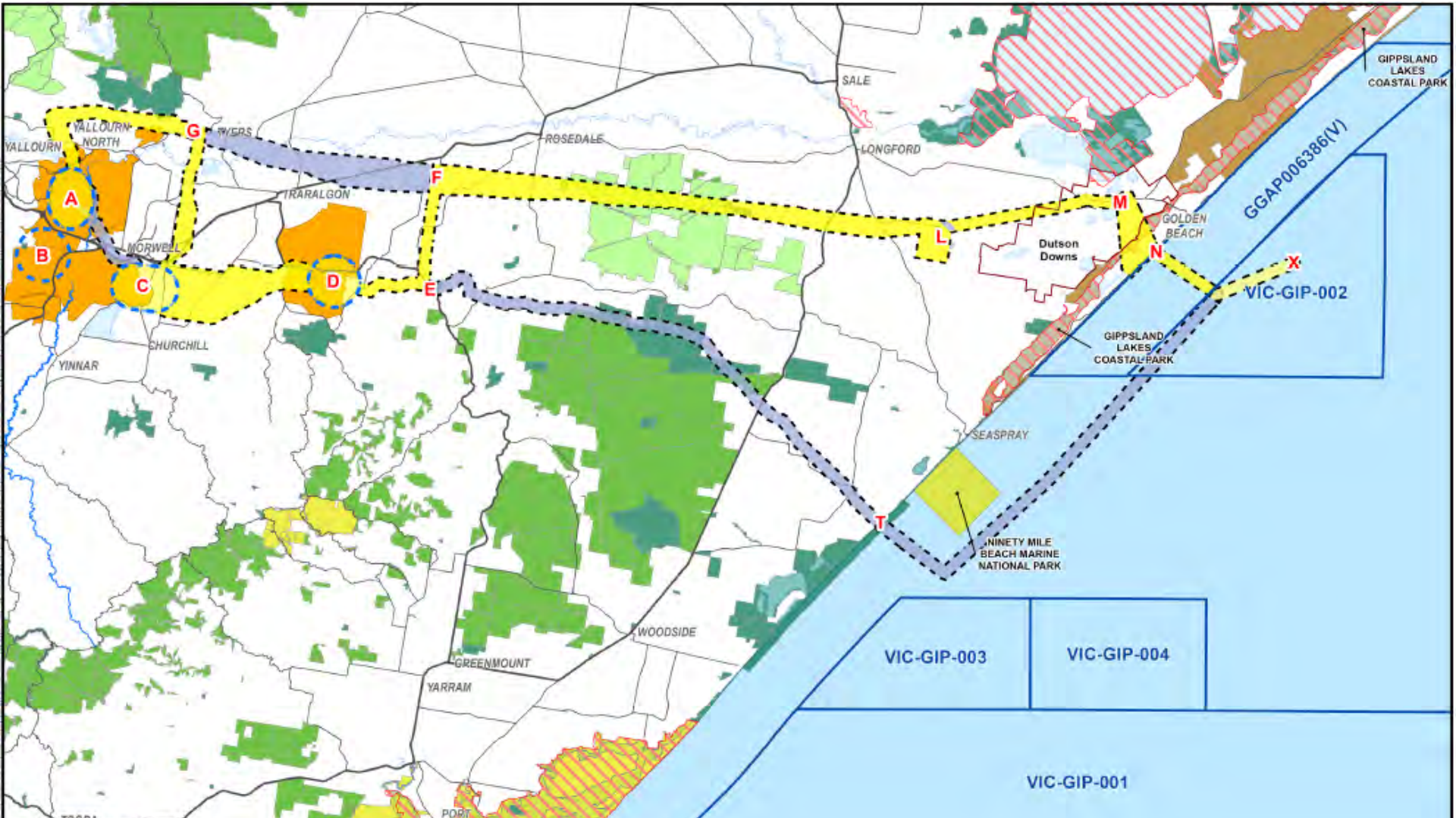




Extensive modelling of injection scenarios:

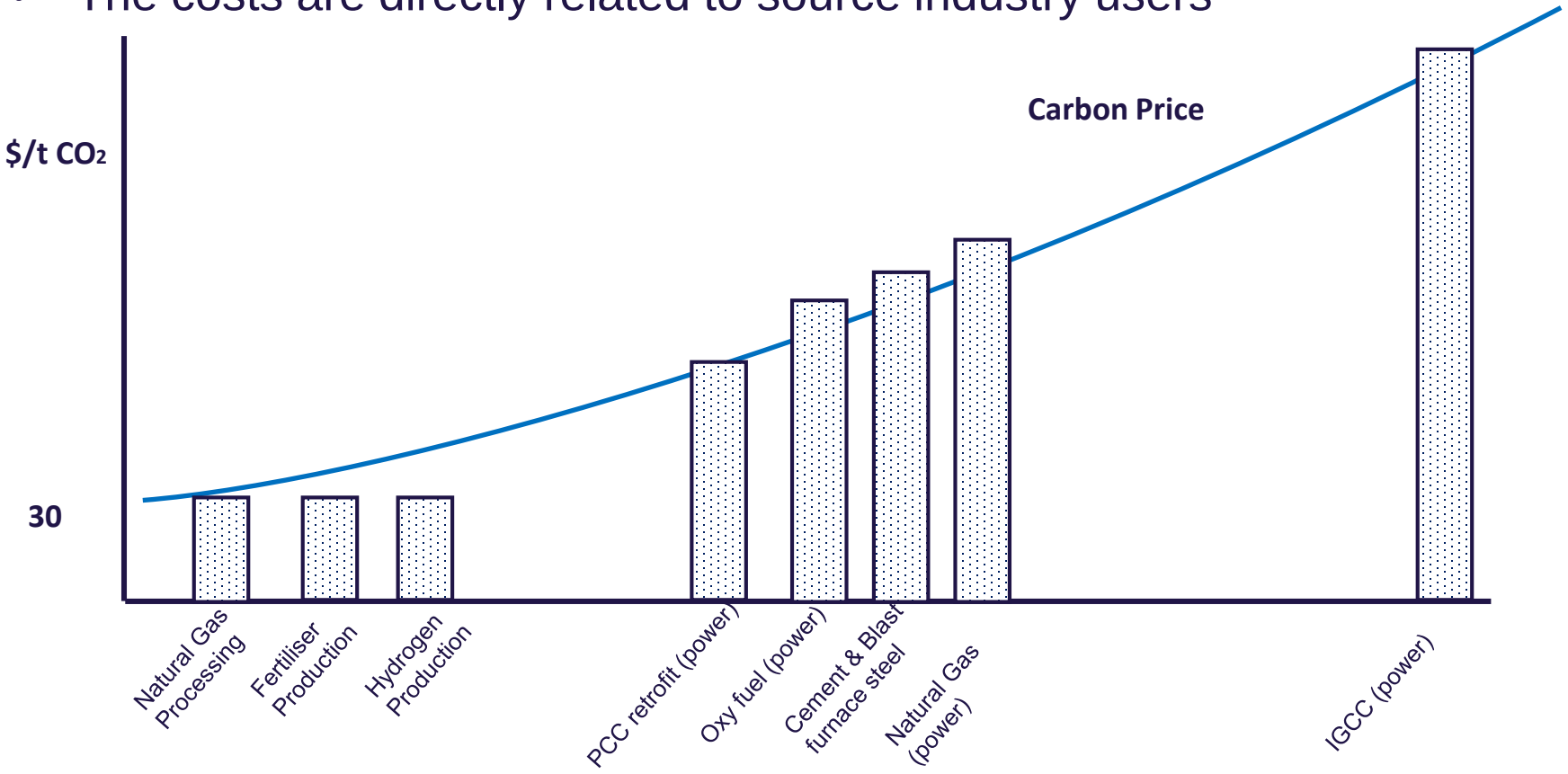
- accounting for uncertainties & sensitivity
- capacity 125MT @ P90
- prepared draft Declaration of Storage

CCS Network – Feasibility Study Options



Risk-Adjusted Costings

- CCS is not a homogenous product
- The costs are directly related to source industry users



Opportunities enabled by CCS: Hydrogen

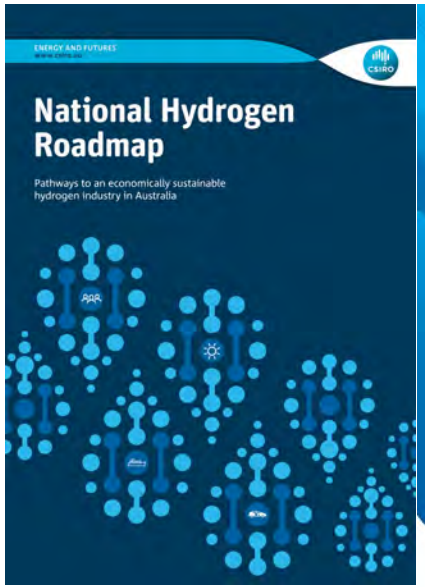
METI
Ministry of Economy, Trade and Industry

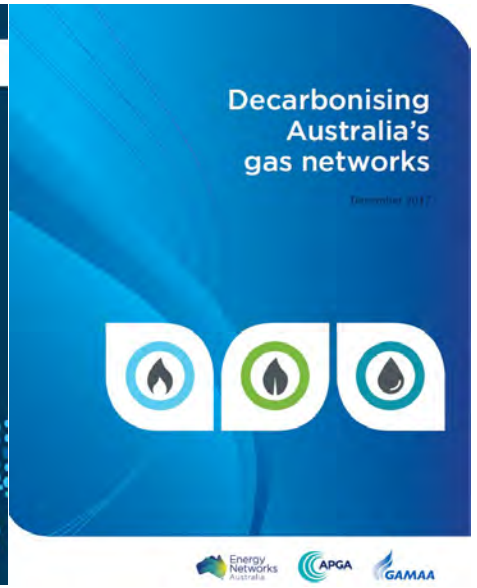
HESC

Japanese Government has adopted a Hydrogen Society and Basic Hydrogen Strategy and supporting the KHI led HESC project project, along with Victorian and Australian Governments.

CSIRO Hydrogen Roadmap illustrates opportunities for Australia, and in particular Victoria through HESC.

Growing interest by domestic industry.





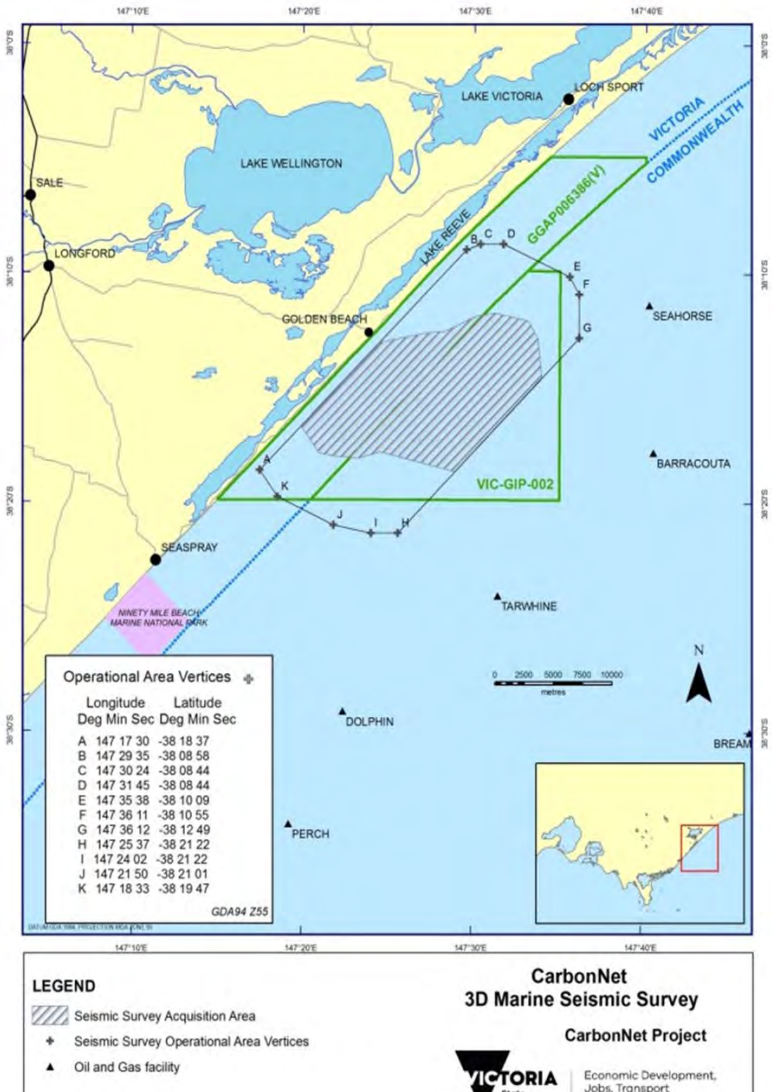
CarbonNet Stage 3 - Next steps

- CarbonNet storage site appraisal activities:
  - marine seismic survey- completed Feb 2018
  - offshore appraisal well- schedule for late 2019
- Stakeholder and community engagement:
  - raising awareness and confidence in CCS
- GipNet (EIF) validating environmental monitoring technologies:
  - onshore and offshore
- Commercialisation Pathway
  - Declaration of Storage
  - Injection Licence
  - Investment Facilitation in step with HESC
  - Ready project for transition to private sector around 2020/21

Pelican Storage Site Appraisal

Marine Seismic Survey

- Stakeholder engagement during 2017 - extensive
- Regulatory permitting- Environment Plan approved
- Completed in Feb 2018
- Environmental monitoring ongoing
- Data analysis scheduled to be completed by end of 2018



Pelican Storage Site
Offshore Appraisal Well

Offshore Appraisal Well

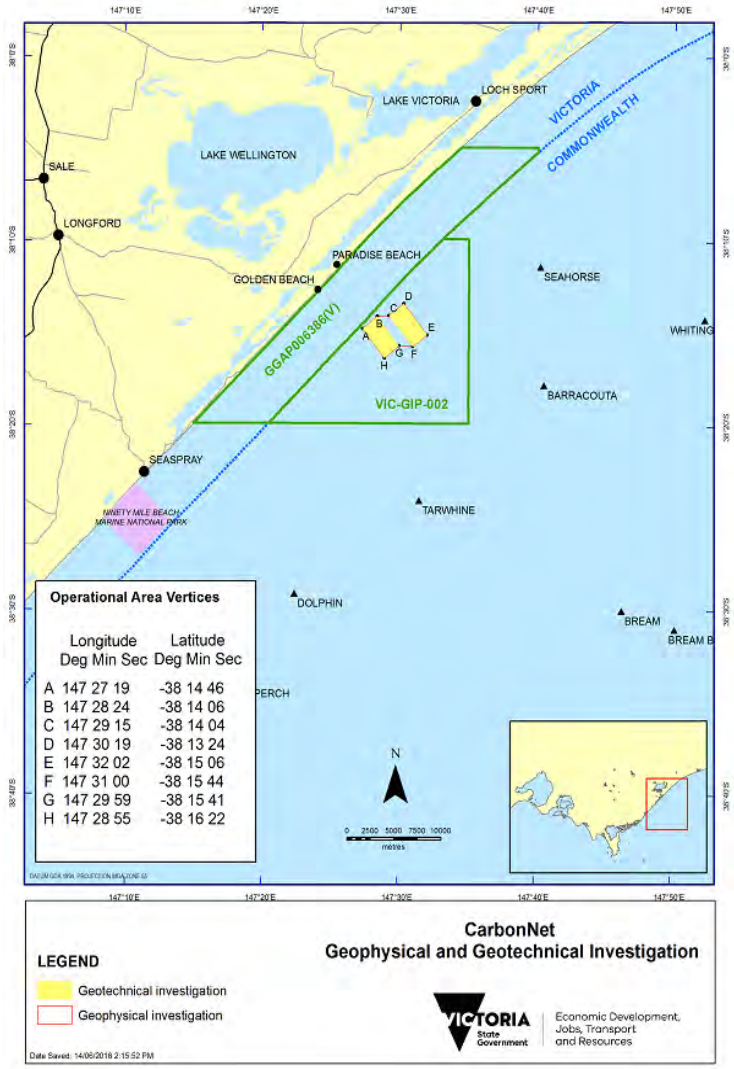
- to collect rock samples for testing
- approx. 8 km offshore
- Commonwealth waters
- consultation recommenced in July

Two phases of activity

- Geotechnical and Geophysical investigations (late 2018/early 2019)
- Drilling Appraisal Well (late 2019)

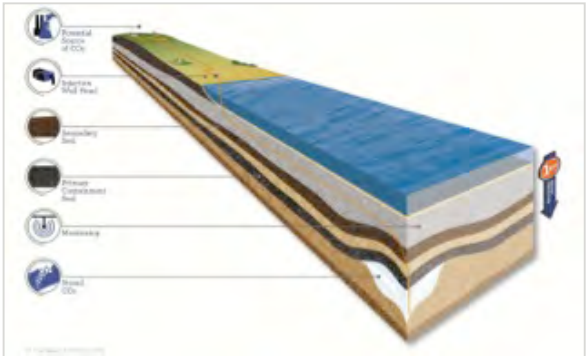
Environmental and Regulatory approvals

- For each phase of activities
- Informed by stakeholder consultation
- Informed by risk assessments



Stakeholder Engagement
Community Confidence in CCS

- Public perception critical
  - Understanding local issues and interests
  - Building community confidence in CCS
- Access to information
  - Fact sheets
  - Presentations
- GCCSI / CarbonNet partnership:
  - Publication of 9 Knowledge Share Reports
  - Technical Papers in peer reviewed journals
- CO2CRC / CSIRO / UoM partnership:
  - GipNet environmental baseline validation



GipNet – Environmental Monitoring Technology Validation

Microseismic (ANLEC R&D 7-0284)

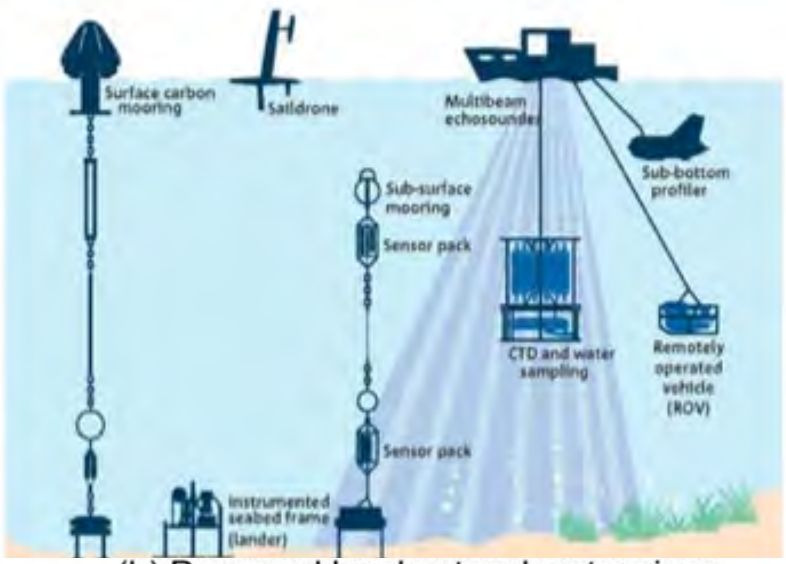
- validate monitoring protocols in ‘noisy’ nearshore environment

Marine MMV (ANLEC R&D 7-0305)

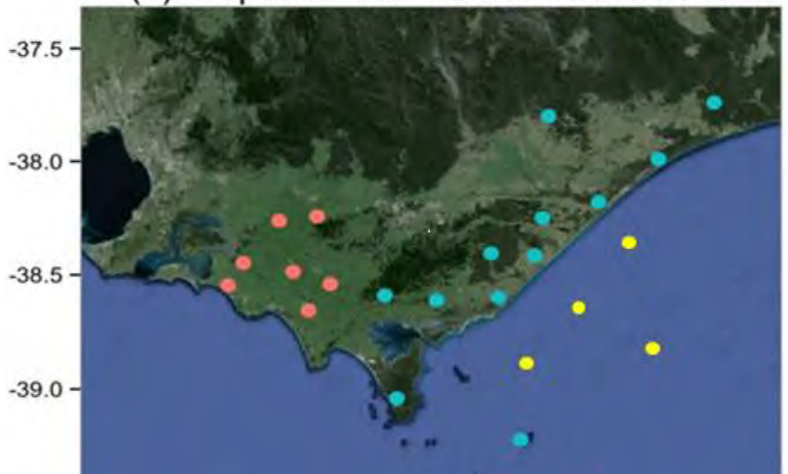
- builds on precursor ANLEC scoping study (7-0314-0230)
- Validate monitoring methods in shallow waters, including autonomous vehicles

Atmospheric MMV (ANLEC R&D 7-0304)

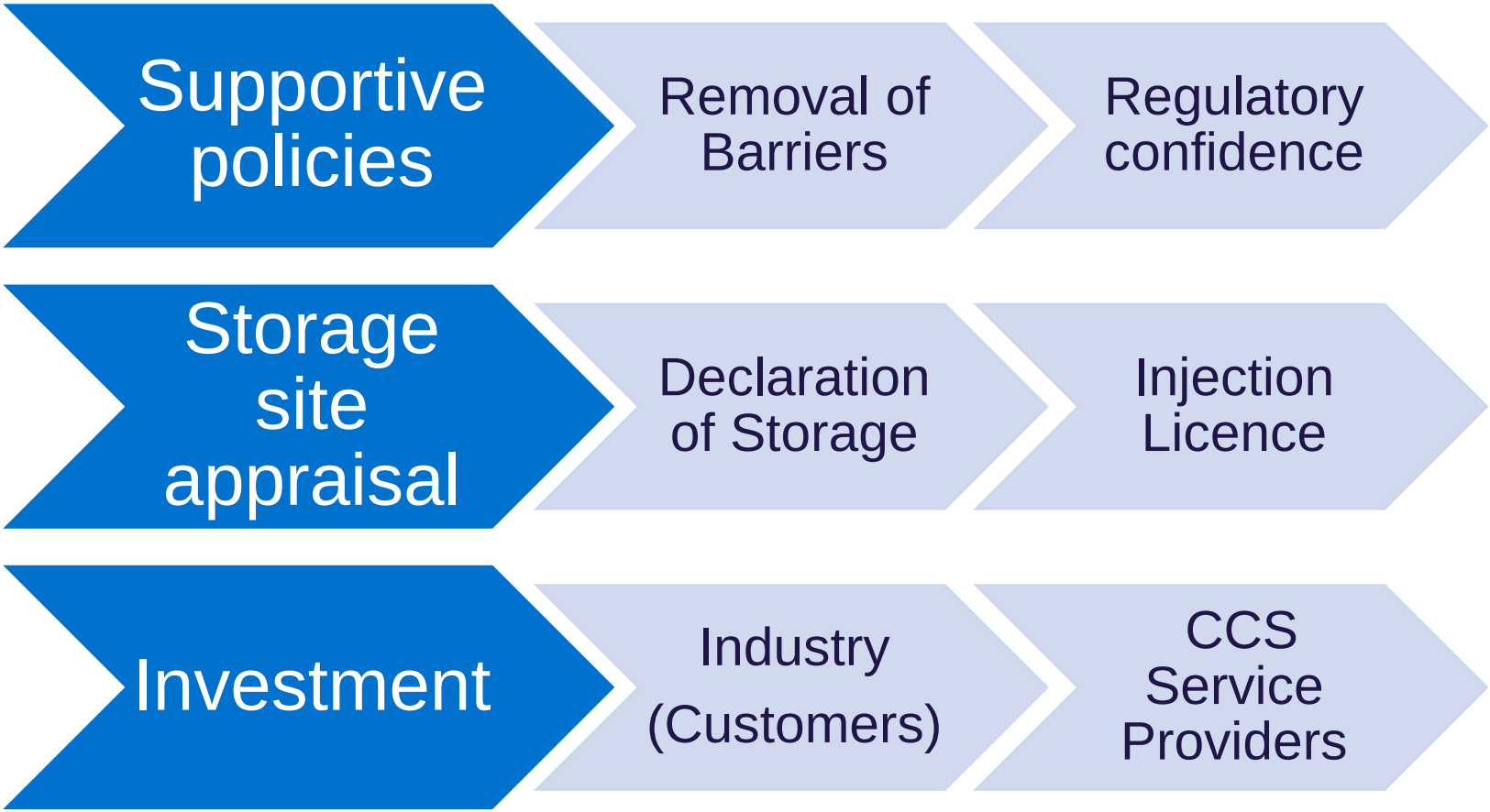
- Applies proven open path technology but across the onshore and offshore environment over longer distances



(b) Proposed local network extensions



Commercialisation Pathway



Get In Touch

Contact CarbonNet:

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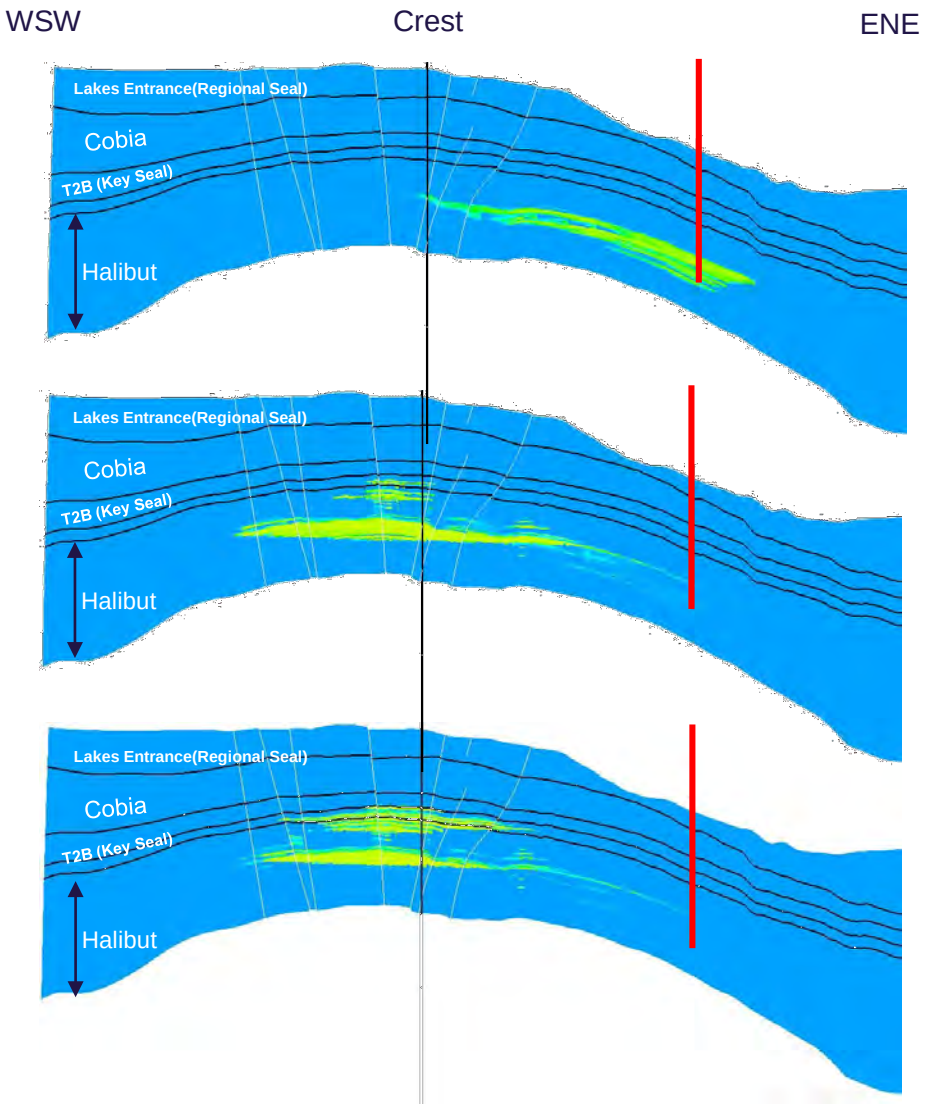
E: carbonnet.info@ecodev.vic.gov.au
P: 136 186

Modelling of Injection Scenarios



Prioritised Storage Site – Pelican

Two existing wells + 2D and 3D seismic data define the structure