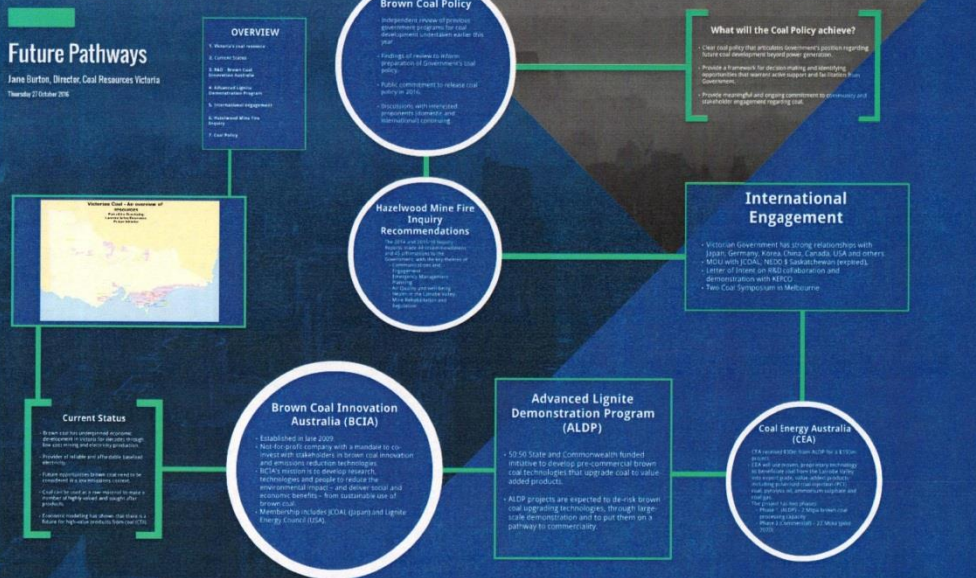


# Brown Coal

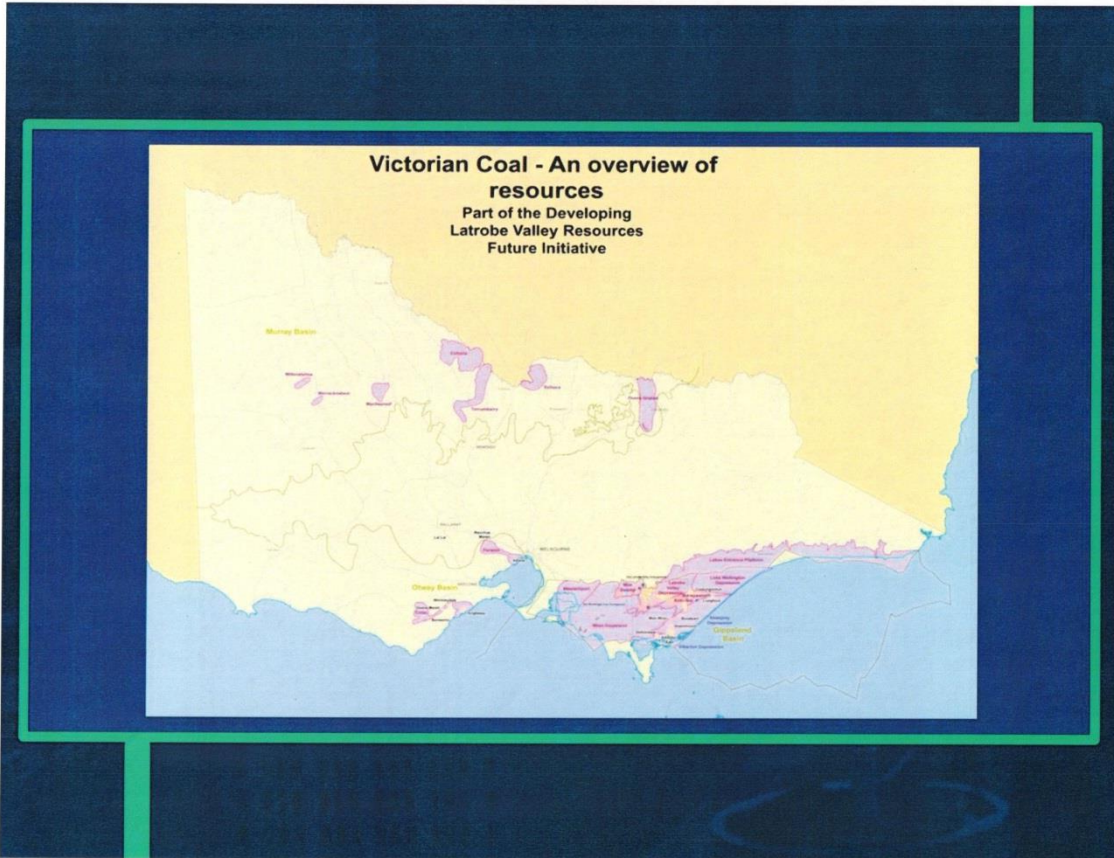
## Future Pathways

Jane Burton, Director, Coal Resources Victoria  
Thursday 21 October 2016



# OVERVIEW

1. Victoria's coal resource
2. Current Status
3. R&D - Brown Coal Innovation Australia
4. Advanced Lignite Demonstration Program
5. International engagement
6. Hazelwood Mine Fire Inquiry
7. Coal Policy



- ## Current Status
- Brown coal has underpinned economic development in Victoria for decades through low cost mining and electricity production.
  - Provider of reliable and affordable baseload electricity.
  - Future opportunities brown coal need to be considered in a low emissions context.
  - Coal can be used as a raw material to make a number of highly valued and sought after products.
  - Economic modelling has shown that there is a future for high-value products from coal (CTX).

## **Brown Coal Innovation Australia (BCIA)**

- Established in late 2009.
- Not-for-profit company with a mandate to co-invest with stakeholders in brown coal innovation and emissions reduction technologies.
- BCIA's mission is to develop research, technologies and people to reduce the environmental impact – and deliver social and economic benefits – from sustainable use of brown coal.
- Membership includes JCOAL (Japan) and Lignite Energy Council (USA).

## **Advanced Lignite Demonstration Program (ALDP)**

- 50:50 State and Commonwealth funded initiative to develop pre-commercial brown coal technologies that upgrade coal to value-added products.
- ALDP projects are expected to de-risk brown coal upgrading technologies, through large-scale demonstration and to put them on a pathway to commerciality.

## Coal Energy Australia (CEA)

- CEA received \$30m from ALDP for a \$193m project.
- CEA will use proven, proprietary technology to beneficiate coal from the Latrobe Valley into export grade, value-added products including pulverised coal injection (PCI) coal, pyrolysis oil, ammonium sulphate and coal gas.
- The project has two phases:
  - Phase 1 (ALDP) – 2 Mtpa brown coal processing capacity
  - Phase 2 (Commercial) – 22 Mtpa (post 2020)

## International Engagement

- Victorian Government has strong relationships with Japan, Germany, Korea, China, Canada, USA and others
- MOU with JCOAL, NEDO & Saskatchewan (expired),
- Letter of Intent on R&D collaboration and demonstration with KEPCO
- Two Coal Symposium in Melbourne

## Hazelwood Mine Fire Inquiry Recommendations

The 2014 and 2015/16 Inquiry Reports made 44 recommendations and 45 affirmations to the Government, with the key themes of:

- Communications and Engagement
- Emergency Management Planning
- Air Quality and well-being
- Health in the Latrobe Valley
- Mine Rehabilitation and Regulation

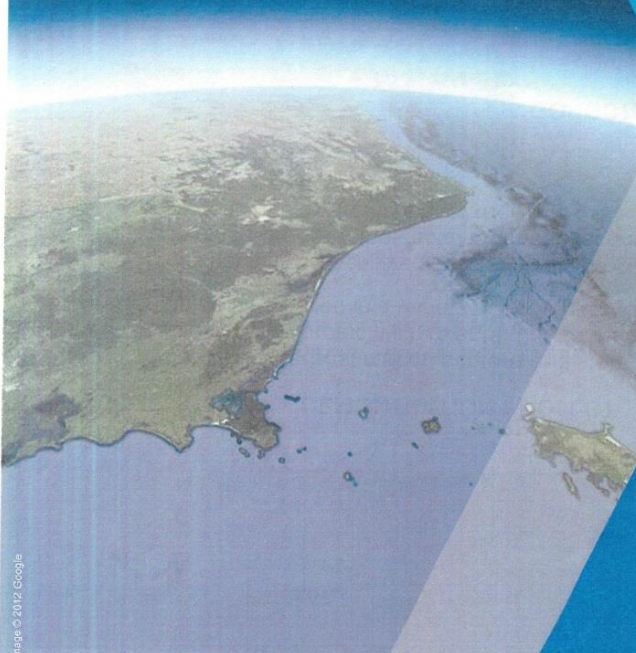
## Brown Coal Policy

- Independent review of previous government programs for coal development undertaken earlier this year.
- Findings of review to inform preparation of Government's coal policy.
- Public commitment to release coal policy in 2016.
- Discussions with interested proponents (domestic and international) continuing.

## What will the Coal Policy achieve?

- Clear coal policy that articulates Government's position regarding future coal development beyond power generation.
- Provide a framework for decision making and identifying opportunities that warrant active support and facilitation from Government.
- Provide meaningful and ongoing commitment to community and stakeholder engagement regarding coal.

# The CarbonNet Project



The CarbonNet Project  
Overview and Update  
October 2016



Image © 2012, Google

## CCS- IN AUSTRALIA

### CO2CRC OTWAY DEMONSTRATION PROJECT

- Is the worlds largest carbon capture and storage demonstration project with over 80,000 tonnes of CO<sub>2</sub> injected and stored in a variety of geological formations;
- The most comprehensive, internationally renowned, monitoring program that tests advanced technologies and techniques with the aim of reducing cost.



© CO2CRC

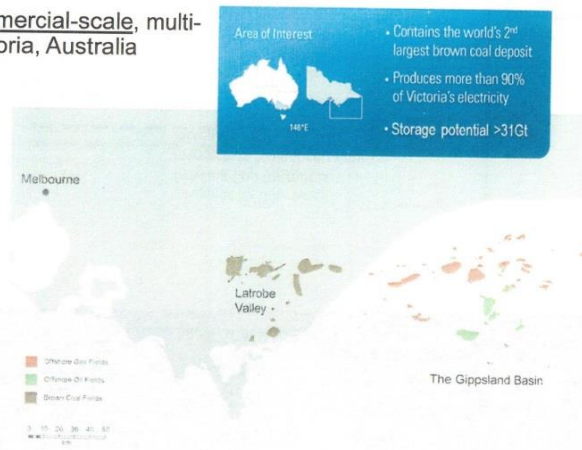


### GORGON LNG PROJECT

- Liquefied Natural Gas project currently being commissioned;
- 3.4 - 4 million tonnes per annum of CO<sub>2</sub> injected and stored in a deep saline formation;
- The worlds largest dedicated geological storage.

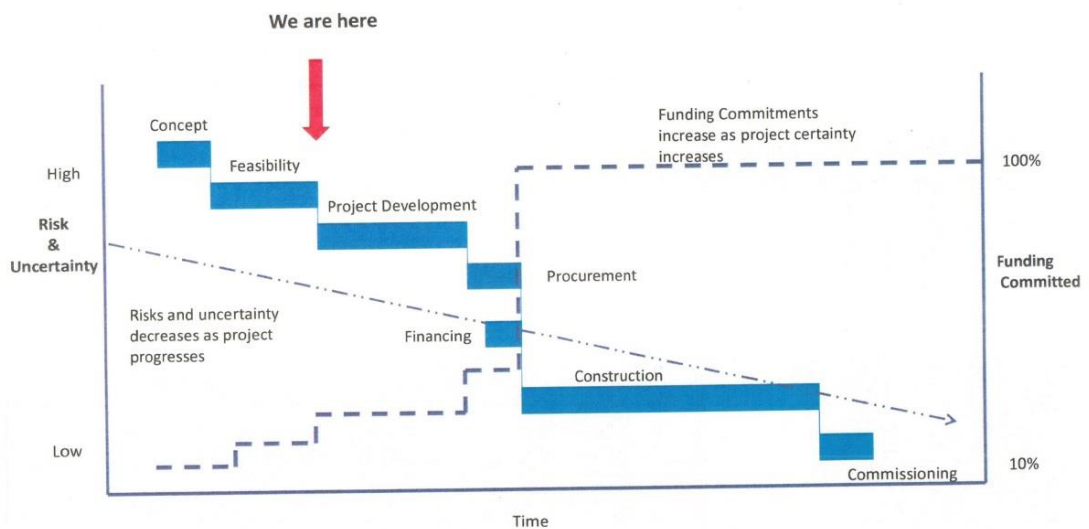
# THE CARBONNET PROJECT

- 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, also supported by GCCSI
- Governments have made significant research investment to support CarbonNet as well
- CO2CRC is CarbonNet's lead research organisation
- Working collaboratively with industry to secure customers and investors in a **CCS service**



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# A GATED APPROACH

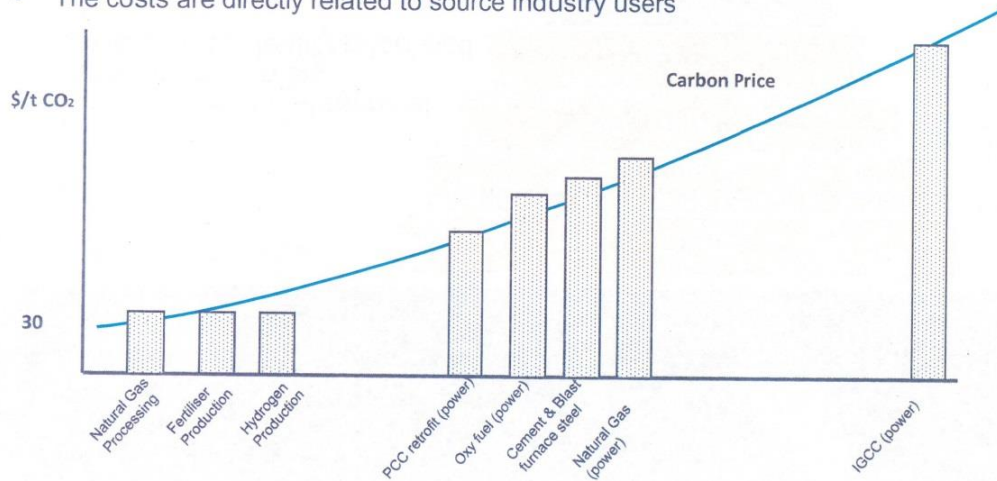


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## COMMERCIAL VIABILITY

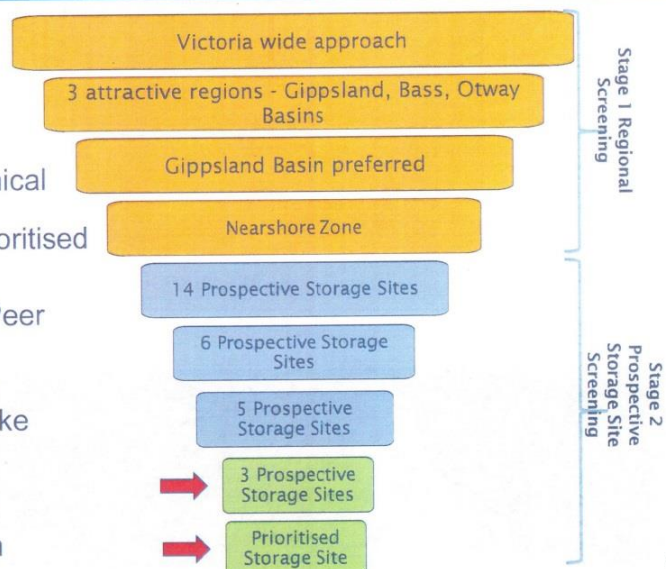
- CCS is not a homogenous product
- The costs are directly related to source industry users



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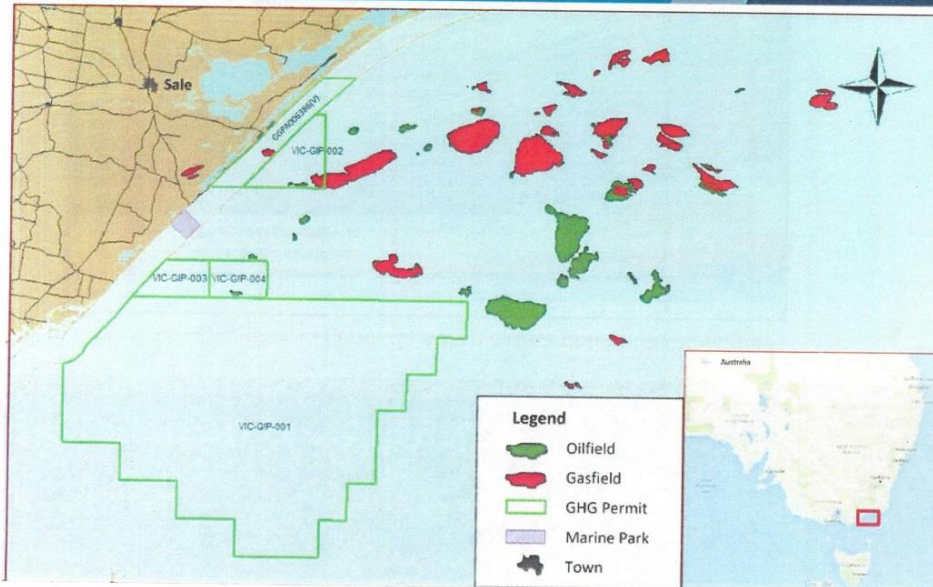
## STORAGE CERTAINTY - A MAJOR FOCUS

- Two-stage process
  - regional
  - site specific
- Technical and non-technical assessment - criteria developed to identify prioritised storage sites
- Independent Scientific Peer Reviews
- Independent assurance certification by Det Norske Veritas:
- Statement of Feasibility
- Certificate of Verification



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# ENVIRONMENTAL & REGULATORY ASPECTS

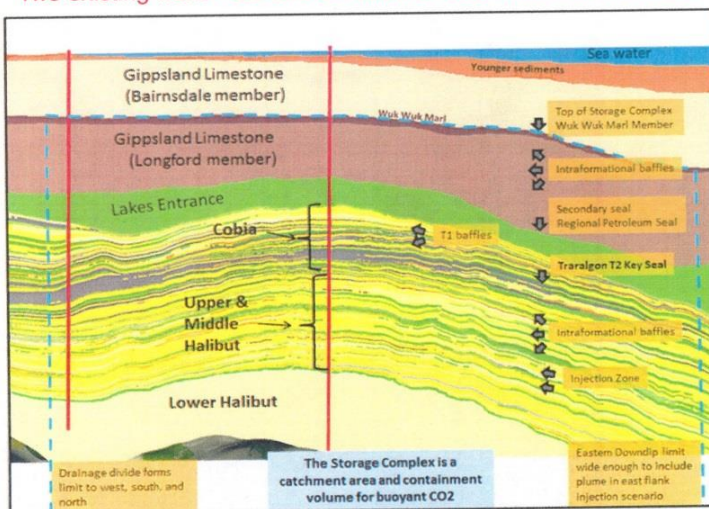


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# PRIORITISED STORAGE SITE

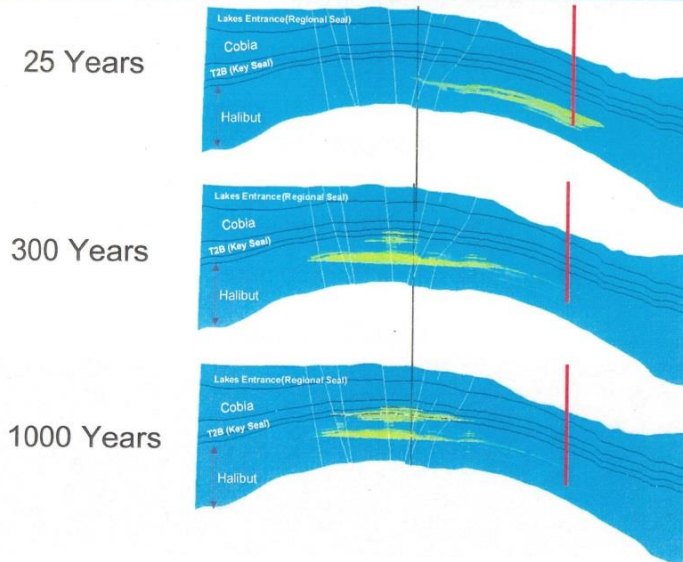
Two existing wells + 2D and 3D seismic data define the structure

*125 wellsoff*



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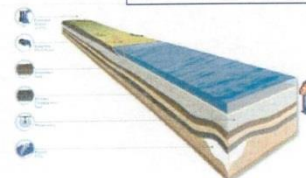
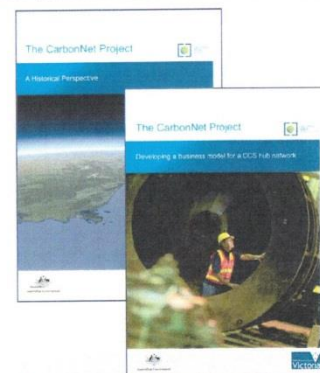
## MODELLING OF INJECTION SCENARIOS



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## PUBLIC PERCEPTION

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



## GIPNET - ENVIRONMENTAL BASELINE TECHNOLOGY VALIDATION

### Microseismic

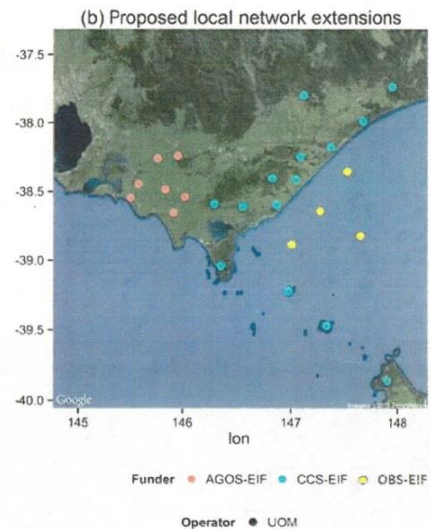
- validate monitoring protocols in 'noisy' nearshore environment

### Marine MMV

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

### Atmospheric MMV

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



## WHERE TO FROM HERE - CARBONNET

### Feasibility Stage key outcomes (2012-2016):

- Secure full access to portfolio of prioritised storage sites
- Prepare Application for Declaration for prioritised storage site
- Finalise a business case for next stage outlining:
  - a vision of what a CCS network in Gippsland and its estimated costs
  - what is the level of commitment from industry
  - what next steps government should take

### Project Development Stage (2017-2020):

- Storage Site Appraisal and GipNet environmental baseline validation
- Progressing industry collaboration – investment facilitation activities
- Transitioning CarbonNet to the private sector around 2020