

The CarbonNet Project

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Background

The CarbonNet Project in Australia is investigating the potential for establishing a world class, large-scale, multi-user carbon capture and storage (CCS) network. The network could integrate multiple carbon dioxide (CO₂) capture projects in the State of Victoria's Latrobe Valley, transporting CO₂ via a common-use pipeline and injecting it deep into offshore underground storage sites in Victoria's Gippsland region.

The CarbonNet Project was established in 2009 by the Australian and Victorian Governments as part of a suite of solutions that have the potential to reduce CO₂ emissions.

The CarbonNet Project seeks to:

- Design scalable infrastructure to underpin growth and deployment of a CCS network

- Identify and demonstrate the capacity and integrity of CO₂ storage in the Gippsland Basin
- Attract private sector funding and participation in the foundation project
- Enable Government's role in The CarbonNet Project and the CCS industry to evolve.

The CarbonNet Project aims to initially capture, transport and store 1–5 million tonnes of CO₂ per annum, with the potential to increase capacity significantly over time.

The establishment of a successful CCS network would support the development of new industries in Victoria. Positioning Victoria as a hub for CCS provides a substantial opportunity for new jobs and to boost skills.

The CarbonNet Project: CCS flagship status

In February 2012, the Australian Government selected The CarbonNet Project as one of only two CCS flagship projects under its Clean Energy Initiative and, with the State of Victoria, awarded the project a further \$100 million in joint funding to undertake feasibility. The Global CCS Institute is also providing \$2.3 million in support to be used to develop a business model and commercial structure – that can be supported by industry – for The CarbonNet Project.

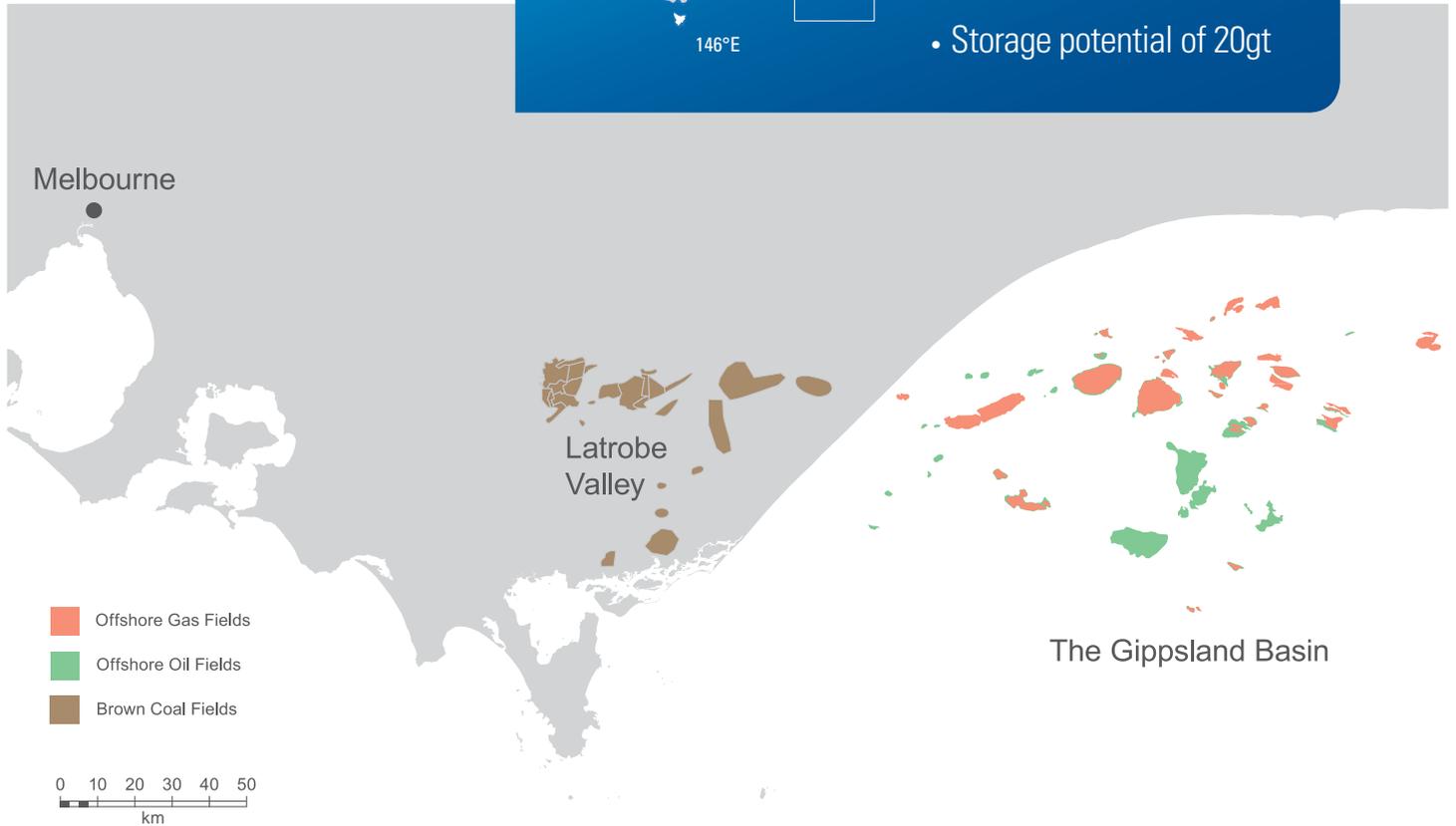
The State of Victoria – which manages The CarbonNet Project via the Victorian Department of Primary Industries – is working with the Australian Government, industry and other organisations such as the Commonwealth Scientific and Industrial Research Organisation (CSIRO), the Cooperative Research Centre for Greenhouse Gas Technologies (CO₂CRC) and Australian National Low Emissions Coal Research & Development (ANLEC R&D) to fully investigate CCS potential in Victoria.

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Area of Interest



- Contains the world's 2nd largest brown coal deposit
- Produces more than 90% of Victoria's electricity
- Storage potential of 20gt



The Gippsland Basin is considered to contain the highest quality and largest capacity reservoirs out of 25 major basins across Australia.

Why Victoria?

Victoria's Latrobe Valley (the Valley) – which is situated within the Gippsland region – contains the second largest deposit of brown coal (lignite) in the world. Currently, as a result of accessibility to this brown coal resource, 90 per cent of Victoria's electricity is generated from ageing and emissions-intensive coal-fired power stations.

Brown coal has growing industrial processing and mining potential because of its abundance and low cost extraction. However, solutions must be found to reconcile its high moisture content with a clean energy future.

Carbon capture technologies have the potential to provide a sustainable and long term solution for dealing with emissions arising from the use of this brown coal and other fossil fuel resources.

The offshore Gippsland Basin is located adjacent to Victoria's brown coal reserve and carbon-emitting power stations and is ideally suited for geological carbon storage. The Gippsland Basin is considered to contain the highest quality and largest capacity reservoirs out of 25 major basins across Australia.¹ Research to date shows that the geology deep below the sea bed in the Gippsland Basin is well suited to long term CO₂ storage within rock formations. These geological formations have stored oil and gas securely for millions of years. Research also indicates future storage potential for over 20 gigatonnes (gt) of CO₂ in structural and stratigraphic sites²; this represents hundreds of years of storage for Latrobe Valley's CO₂ output.³

Where are we now?

The CarbonNet Project is currently at feasibility stage. The focus is on addressing the project's key challenges, which are not dissimilar to those experienced by CCS projects globally:

- **Storage certainty:** The CarbonNet Project is conducting a comprehensive evaluation of potential storage sites. The site selection process involves Australian and international experts and aims to determine viable locations for the safe, long term and secure storage of CO₂
- **Technical integration:** Potential carbon capture plants and technologies are being investigated for the establishment of an economically viable network to capture, transport and store CO₂
- **Regulatory requirements:** The regulatory challenge is focused on ensuring the regulatory framework is effective and the local and wider community has confidence in its integrity
- **Developing a business model:** CCS must be economically viable and attract private sector participants and investment
- **Stakeholder engagement:** Ongoing engagement of the local community and other stakeholders will continue throughout the project's lifecycle.

Current focus on storage

The CarbonNet Project benefits from geological data acquired and made public by the oil and gas industry, which has operated in the region for decades. The CarbonNet Project team analysed high resolution details of the subsurface geological strata from 2D and 3D acoustic imaging data, together with rock core material and information from over 50 existing wells within the immediate project area. Over 1,500 wells support this data on a regional basis.

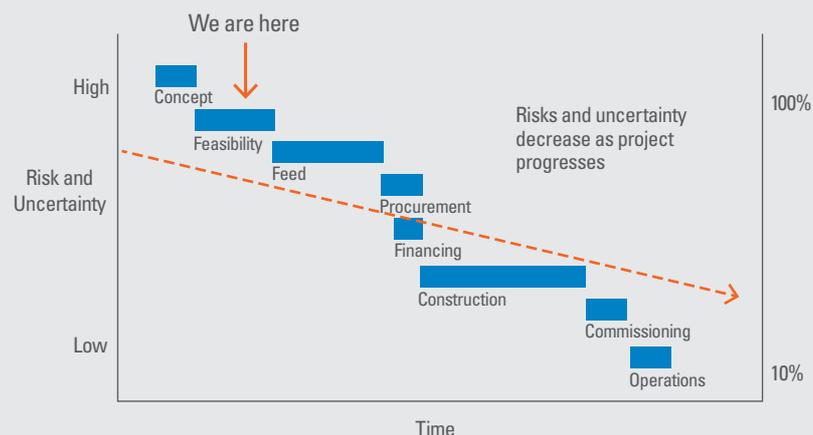
Three dimensional models of the Gippsland Basin have allowed geologists and reservoir engineers to analyse potential storage sites and predict the behaviour of CO₂ throughout the storage process including injection, migration and stabilisation. Prospective storage sites have been evaluated and short-listed in a process similar to that employed by the oil and gas industry, with a focus on safe and secure storage.

¹Source: National Carbon Taskforce, September 2009

²Source: Root et al, 2005; CO2CRC Rpt 05-0108 upscaled for all fields, 2005; CO2CRC Rpt 109-1586, 2009; RISC, 2009; CSIRO Green Michael and Paterson upscaled for 5000sq km, 2010; The CarbonNet Project, 2012

³Source: The CarbonNet Project, 2012

CarbonNet – Stage Gates



What next?

Over the next two years, The CarbonNet Project will evaluate short-listed potential storage sites, followed by the drilling of data appraisal wells, with the aim of selecting high grade site(s) for detailed mapping. This will determine viable locations for the safe, long term storage of CO₂.

Investigation into suitable potential carbon capture plants and technology will continue along with assessment of transport corridors to the selected injection site.

Defining the commercial structure and underlying principles to attract private sector investment is a primary focus during this stage of the project. Various business models, between government and the private sector, including options for a variety of commercial combinations of capture, transport and storage arrangements, are being examined.

Community and stakeholder engagement is also a strong focus. The project has a broad range of stakeholders that includes landholders, the local community, industry groups, community groups, environmental organisations and the global CCS community.

With the help of its partners, which includes the Commonwealth, the Global CCS Institute, the Clinton Climate Initiative and industry, The CarbonNet Project will develop the emerging industry of CCS in Australia.

If proved viable, The CarbonNet Project would play a significant role in national and international efforts to reduce CO₂ emissions.

Project Team Structure

The project team structure is aligned with the five key challenges that all CCS projects face: storage certainty; technology integration; regulations; the business model and public acceptance.



For more information on CCS and CarbonNet, including regular updates on the project's progress, please visit our website or email us:

www.dpi.vic.gov.au/carbonnet

CarbonNet.Info@dpi.vic.gov.au/carbonnet

If you would like to receive this information/publication in an accessible format (such as large print or audio) please email customer.service@dpi.vic.gov.au.

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