



DEPARTMENT OF PRIMARY INDUSTRIES

Japanese-Victorian Collaboration on the Development of Low Emissions Coal Technologies in Victoria

Dr Richard Aldous
Deputy Secretary - Energy and Earth Resources

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PRIMARY INDUSTRIES**

Japan - Victoria

We have some common goals and shared opportunities to work together

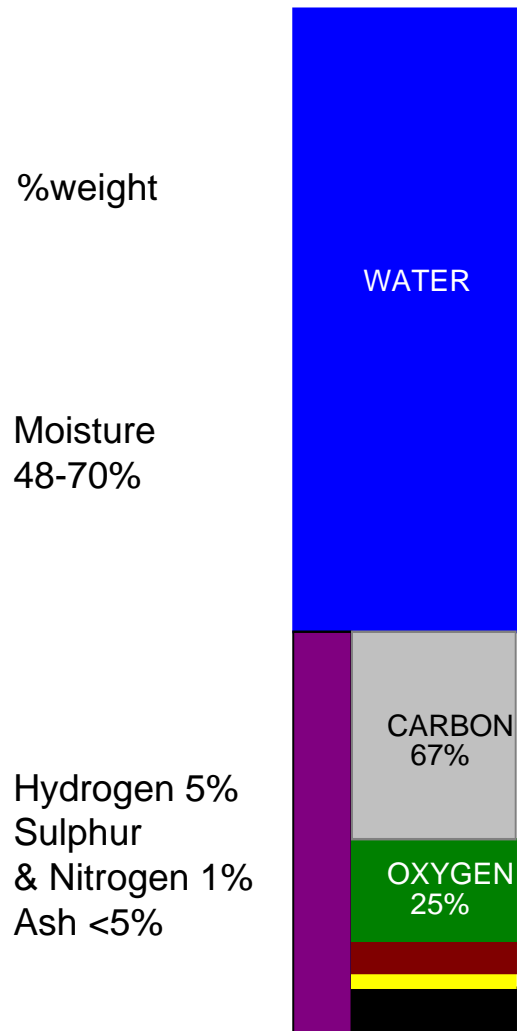
Japan

- Reduce CO₂ emissions by 25% by 2020, compared to 1990 levels (2010 Strategic Energy Plan)
- Needs low emission energy

Victoria

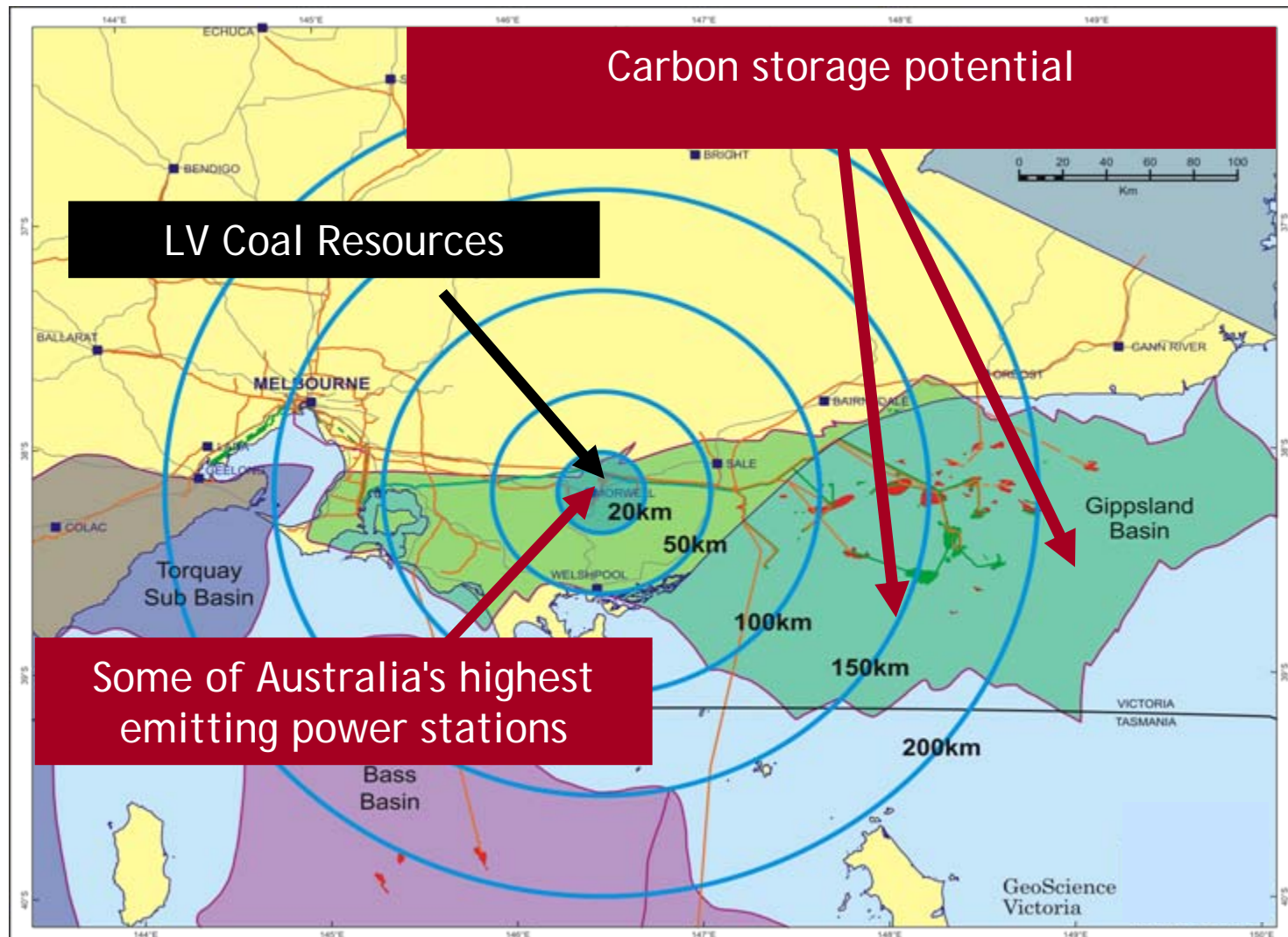
- Reduce CO₂ emissions by 20% by 2020, compared to 2000 levels
- May be able to provide low emission energy

Opportunities - Brown Coal

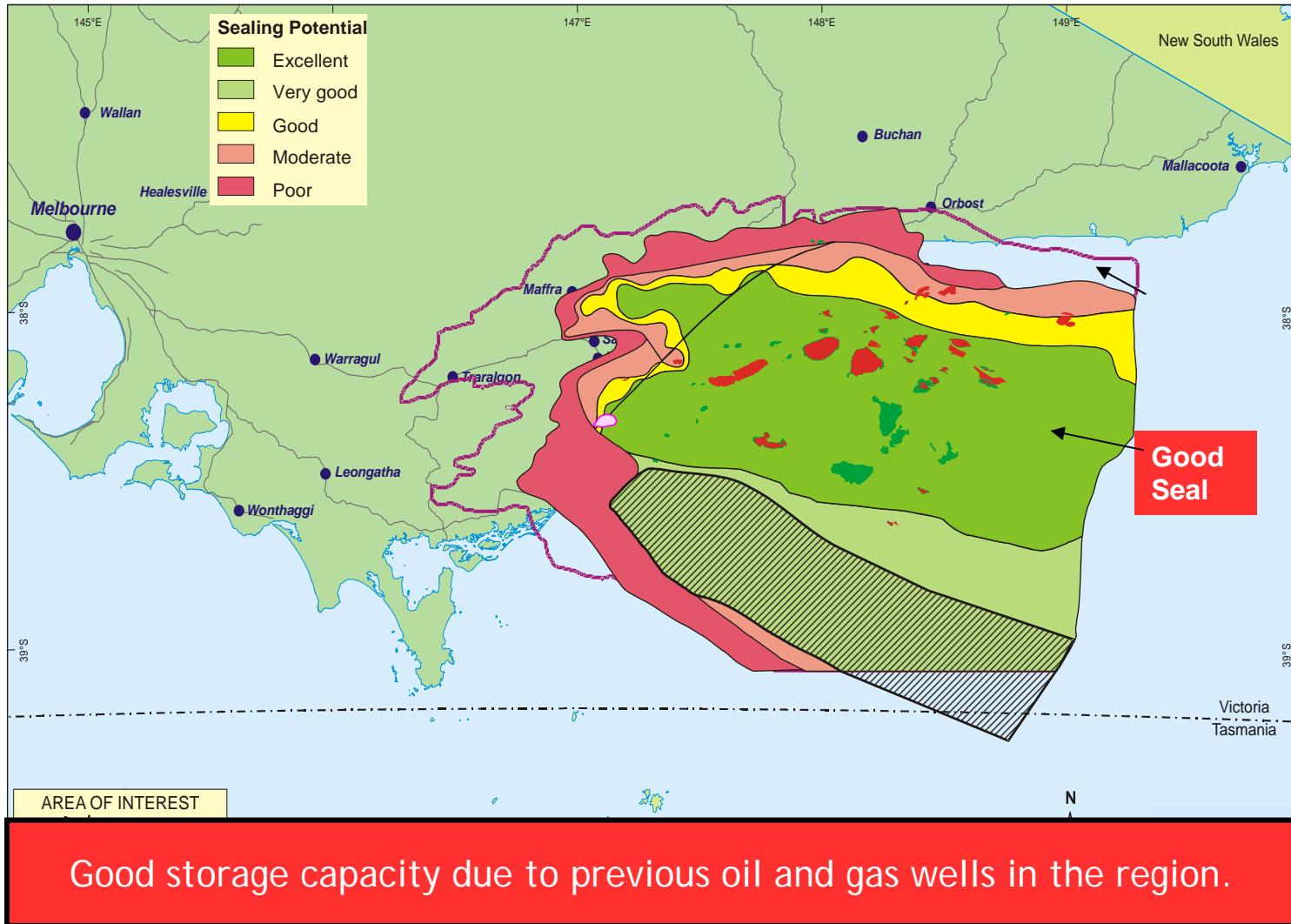


- Estimated brown coal resource 430 bt, with economic potential of over 33 bt
- 13 bt is currently unallocated.
- Low strip ratio makes very economical to mine (3-4 coal to 1 waste).
- Low contaminants (Sulphur/Nitrogen (<1%) and Ash <5%).
- High reactivity when dried and un-processed (suitability for CTX)
- **However, the high moisture content of Brown Coal increases CO₂ emissions intensity.**

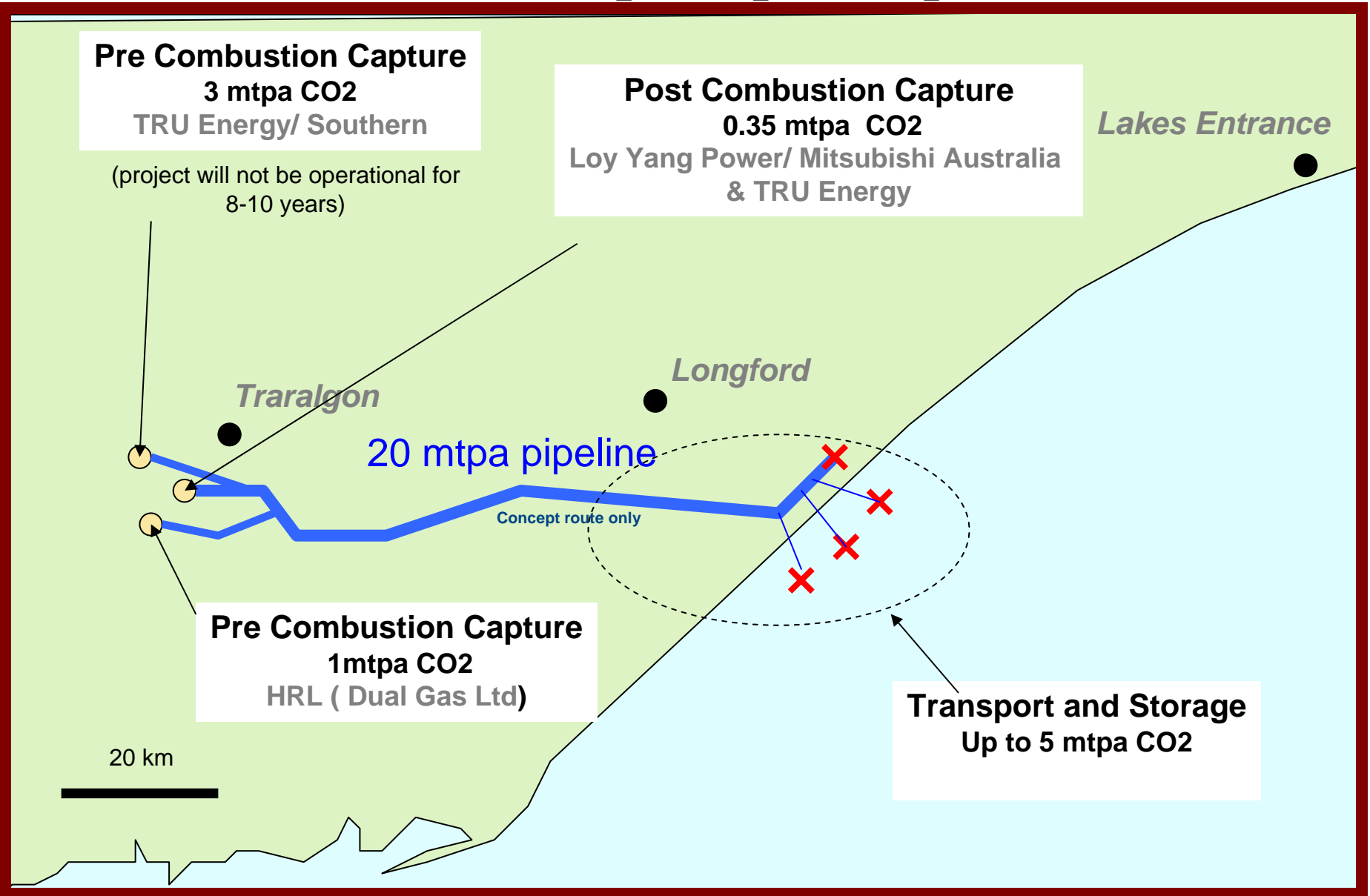
Victoria's CCS Potential



Victoria - geological storage capacity



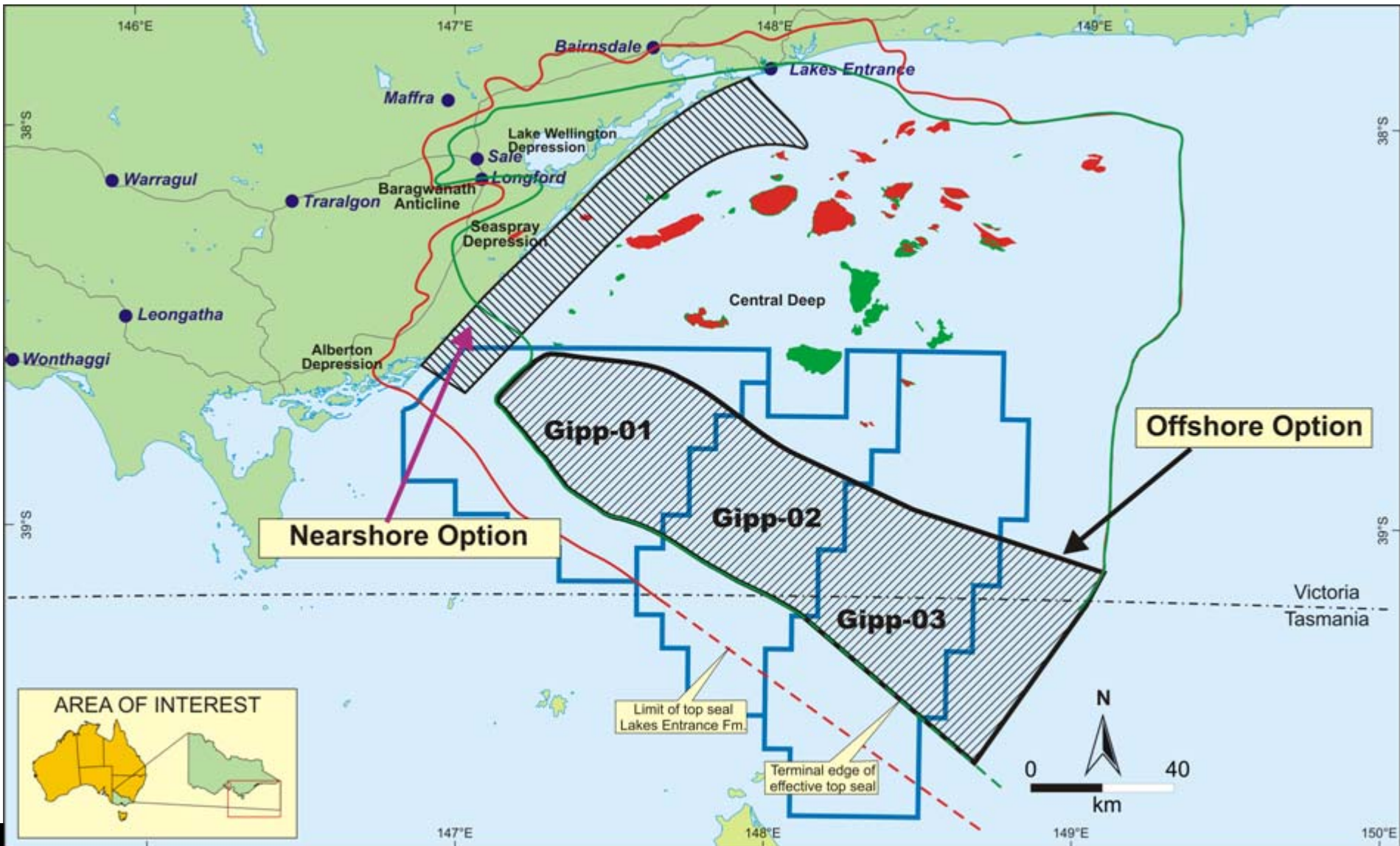
CarbonNet includes multiple capture options.



Geological Survey : defining specific sites

- Significant assessment required to define sites and test the suitability for injection and storage.
- Starting a detailed exploration program
- **Airborne gravity survey** = maps geological structure
- **soil gas study** = provides information on the containment potential
- **Siesmic** surveys and **drilling** to follow
- at the same time, we will be undertaking the first stage of what is intended to be a long term program of community engagement

Gippsland Basin storage options



Our Important Relationship with Japan

- Victoria (especially in the area of Brown Coal) has a long and successful relationship with Japan - Dates back to the 1980s
- Victoria has strong links with: Japanese Government Organisations, Companies and Research Organisations.
- Very importantly, Japan understands the benefits as well as the difficulties facing Victorian Brown Coal.
- MOU's with Japan:
 - KEPCo
 - JCOAL
 - NED
- Critical elements, drying, gasification, CO₂ capture

Current Japanese Projects in Victoria

Nippon Steel Engineering Corporation (NSEC)



- Pre-feasibility study for a demonstration plant utilising Nippon Steel's ECOPRO™ gasification technology with carbon capture.
- The target end-product from commercial project is Substitute Natural Gas (SNG).
- Capacity 200tpd (dry basis) of coal
- The proposed location is at the HRL facility in Tramway Road, Morwell.
- Pre feasibility work is partly funded by Victorian & Commonwealth Governments.

Current Japanese Projects...Contd.

Kawasaki Heavy Industries (KHI)



Kawasaki Heavy Industries, Ltd.

- Pre-feasibility Study looking at a "CO₂-Free" Hydrogen Supply Chain Development
- The project looks at H₂ production, transportation, storage and CO₂ capture and storage
- Project in collaboration with HRL Technology.
- Schedule of the project
 - Pilot scale demonstration by 2017
 - Large scale demonstration by 2025

Current Japanese Projects...Contd.

Mitsubishi Heavy Industries (MHI)



- Options for developing a “High Efficient Brown Coal Drying System” by recovering latent heat from evaporated steam.
- It will also look at combining Coal Drying with IGCC to improve power generation efficiency up to 50% (net HHV basis)
- Project partners are METI, University of Tokyo, JCOAL and MHI

Current Japanese Projects...Contd.

Kyushu Electric Power Company (KEPCO)



- MOU between Victoria and KEPCo to collaborate on developing technologies on the high level utilisation of Victorian brown coal
- \$750k each from both Victoria and KEPCo for R&D.
- Victorian projects are lead by Monash University. Expect to be completed by June 2013.

Victoria looks forward to working closely with Japanese companies researchers and agencies

- ✓ Engineering and technical capability
 - ✓ Research and development
 - ✓ Demonstration
 - ✓ Resource Utilisation

Working towards a low emission future with an abundant energy resource