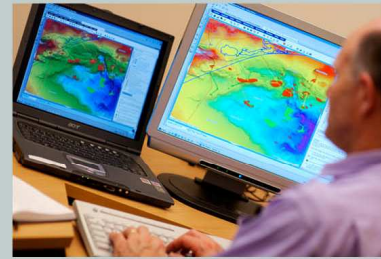


DEPARTMENT OF
PRIMARY INDUSTRIES

Putting the Carbon Back The Policy and Delivery strategy for Carbon Capture and Storage in Victoria



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The Thematics of CCS

Policy and strategy –why ?

Victoria and the world (of CCS)

Market based mechanisms

Legislation and regulatory framework

Technical standards and framework

Investment attraction and facilitation

Pre commercial technology support (ETIS)

Financial and commercial models

Measurement and Verification

Community interface (social licence to operate)

The Problem - 1

Australia

Population: 21 million

Annual emissions: 559 Mt CO₂-e



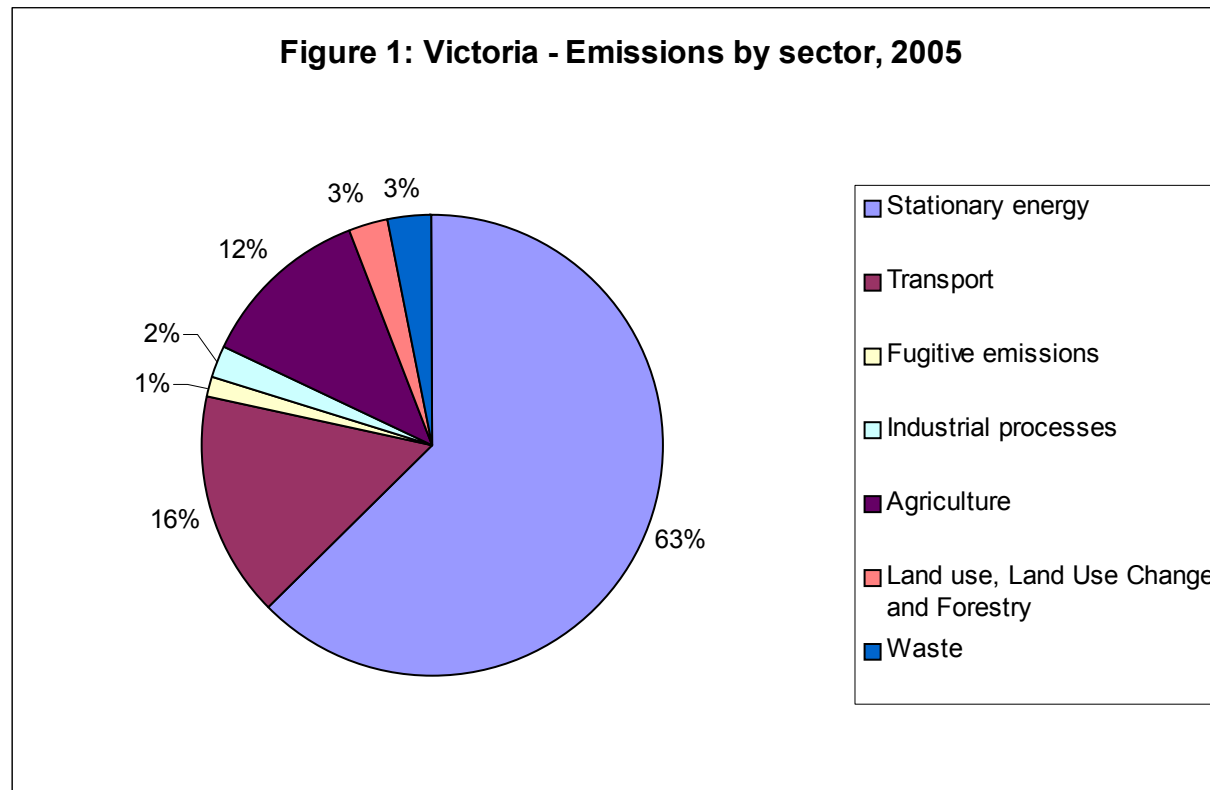
State of Victoria

Population: 5 million

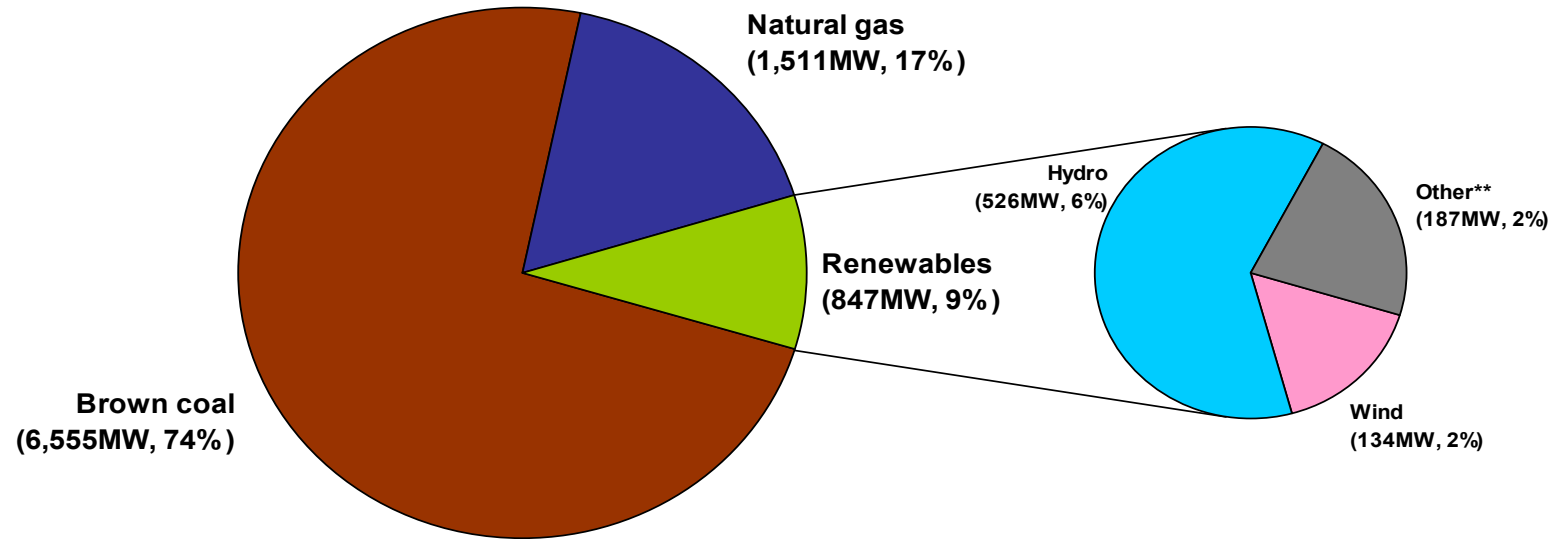
Annual emissions: 121.9 Mt CO₂-e or
21.8% Australia's annual emissions

The problem - 2

- Over 60% of Victoria's CO₂ emissions are from the stationary energy sector due to Victoria's reliance on brown coal for electricity generation



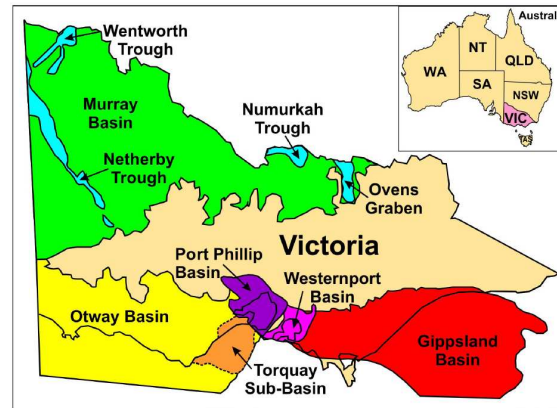
The problem - 3



- Victoria has significant reserves of:
 - Brown coal ~ 500 years (at current levels of usage)
 - Offshore natural gas ~ 25 years of known reserves

The problem - 4

- Victoria has world class CO₂ storage facilities – onshore and offshore, but primarily in the Gippsland Basin



Potential capacity – Gippsland Basin depleted reservoirs
2,000 MT (37.8 TCF)

Potential capacity – Gippsland Basin deep saline aquifers
33,300 MT (630 TCF) or 275 years of Victorian emissions

Policy context

- Victorian Government is committed to reducing greenhouse gas emissions from the production and use of its fossil fuel resources
 - Target to reduce greenhouse gas emissions by 60% by 60% from 2000 levels by 2050
- Carbon capture and geological storage (CCS) is part of a package of initiatives to reduce Victoria's CO₂ emissions
- CCS is important as it enables the ongoing use of Victoria's fossil fuel resources

Policy context cont...

- Victorian government developed a strategic policy framework for near zero emissions from Victoria's fossil fuels
 - Issues paper released August 2007
 - Position paper to be released shortly outlining comprehensive suite of policy measures to facilitate commercial deployment of CCS
- Development of Victorian regulatory framework for carbon storage foreshadowed in issues paper

Energy Technology Innovation Strategy – Phase 2

Fossil energy –large scale

\$110 m –both pre and post combustion capture
technology projects

\$5 m – further dynamic modelling – Victorian Storage
sites

\$12m – Clean Coal Victoria – pre competitive data on
Victorian Coal and storage

Renewables –large scale

\$72 –sustainable energy projects –
solar/wave/geothermal/energy storage

Commercial CCS projects

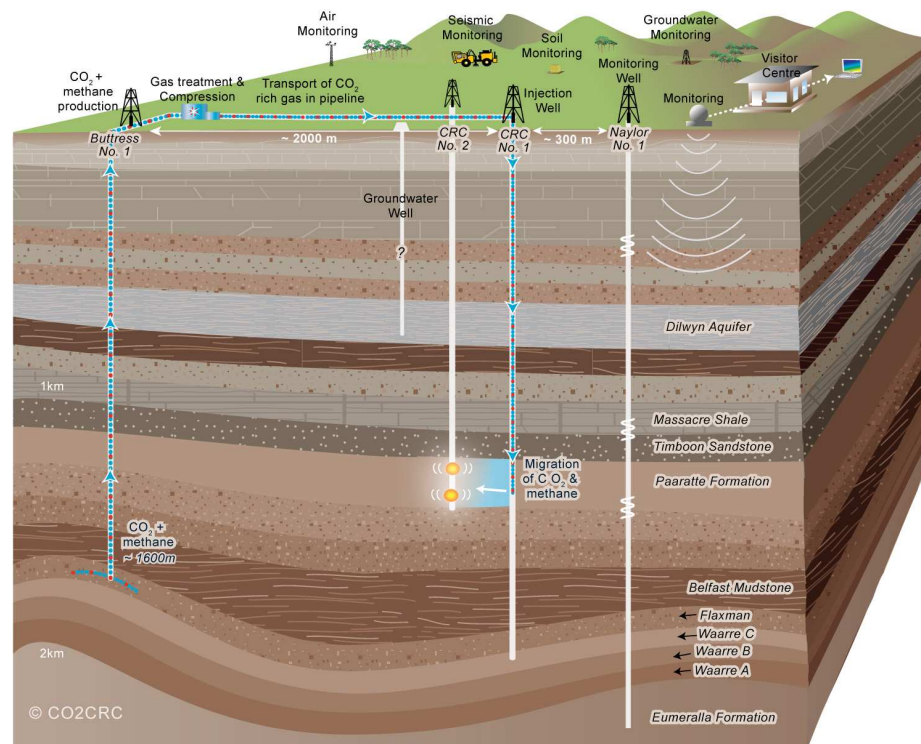
Monash Energy - \$10 b CTL w full CCS -2015

VCR Resources - \$20 b CTL - CCS/CSM -2015

Victorian Brown Coal Generators - ???

The CO2CRC Otway Project

- Australia's first demonstration of the injection and underground geological storage of CO₂ – commenced injection April 2008
- Also involves development and implementation of rigorous monitoring and verification regime
- Regulated under existing Victorian environment, petroleum and water law



Why have a legal framework for CCS?

- Economic incentives primary driver for investment
- Regulatory certainty also required for:
 - The community
 - Investors



- Storage can occur onshore or offshore in State or Australian waters:
 - Australian legislation is required for injection and storage in Australian waters >3 nautical miles
 - State legislation is required for injection and storage in State waters <3 nautical miles
 - State legislation is required for onshore injection and storage

Work to date

- Release of national guiding principles in 2005
 - *MCMPR Australian Regulatory Guiding Principles on Carbon Capture and Geological Storage*
- Australian Government released draft legislation to regulate offshore injection and storage of CO₂ through amendments to Australian offshore petroleum legislation – May 2008
- Other States also developing legislation to enable onshore injection and storage
- Ideally State legislation would follow Australian legislation – however due to commercial and environmental imperatives, Victorian Government developing onshore legislation in parallel with Australian legislation for offshore waters.
- Victoria's offshore legislation will follow Australian offshore legislation.
- In developing onshore CCS legislation Victoria is committed to ensuring regulatory consistency across jurisdictions



Work to date cont...

- Discussion Paper on a Victorian Regulatory Framework for the Long-Term Storage of Carbon Dioxide released - Jan 2008
- Development of proposed stand-alone legislation has been informed by:
 - submissions to the Discussion Paper
 - community consultation sessions
 - meetings with key stakeholders and Government departments

Key issues in developing legislation

- Property rights and access
- Managing competing rights and interests
- Managing long-term liabilities and monitoring and verification (M&V) requirements
- Managing public health and environmental risks

Property rights and access

- Modelled on tenure system for petroleum operations, includes:
 - exploration permit
 - retention lease
 - injection and monitoring licence

Competing right and interests

- Best interests test to be applied where proposed injection and storage operations pose a significant risk of contaminating or sterilising other resources (including water resources)

Managing long-term liabilities and M&V

- CCS operators to undertake post-injection monitoring and verification until:
 - Stored carbon dioxide behaving in a predictable manner, and
 - Risks associated with storage reduced to as low as reasonably practicable
- Licence then surrendered
- Responsibility for long-term M&V transfers to the State
- Costs associated with long-term M&V provided to the State over time

Managing public health & environmental risks

- IPCC estimates the risk of CO₂ from appropriately selected and managed storage reservoirs is likely to be very low with the risk reducing further over time
- Public health and environmental risks be managed through:
 - Need to satisfy Minister of specified environmental criteria
 - Referral of applications to relevant environmental agencies/ departments before any decision is made about injection operations
 - Post-injection M&V to be undertaken by operator until stored carbon dioxide behaving in predictable manner and risks reduced to as low as reasonably practicable
 - The requirement for an Environmental Effects Statement under the *Environment Effects Act 1978* where a proposed project is capable of having a significant adverse effect on the environment in either a regional or State context.

The Social Licence to Operate

Not be taken for granted

Requires communication and outreach

Link to climate change solutions

Everyone playing their part –increases in
power pricing

NGO's – WWF

Tim Flannery

Financing and Commercial models

Engaging with the sector

Debt and equity

Sovereign wealth funds (China)

Insurance sector

Making money from a national emissions trading scheme !

Hedge funds critical

ETIS –pre commercial technology support

Next steps

- Just do it
- now

Looking outwards – the world of CCS

CSLF

IEA/G8

Bilaterals – China, Clinton Foundation

