

# CO<sub>2</sub> Capture & Storage in Victoria



**CCS Network**  
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Department of Primary Industries  
June 2009



# Thick seams of low cost brown coal at surface

**Victorian brown coal-**  
one of the world's great  
energy resources



**More energy than Australia's  
NW Shelf gas reserves**

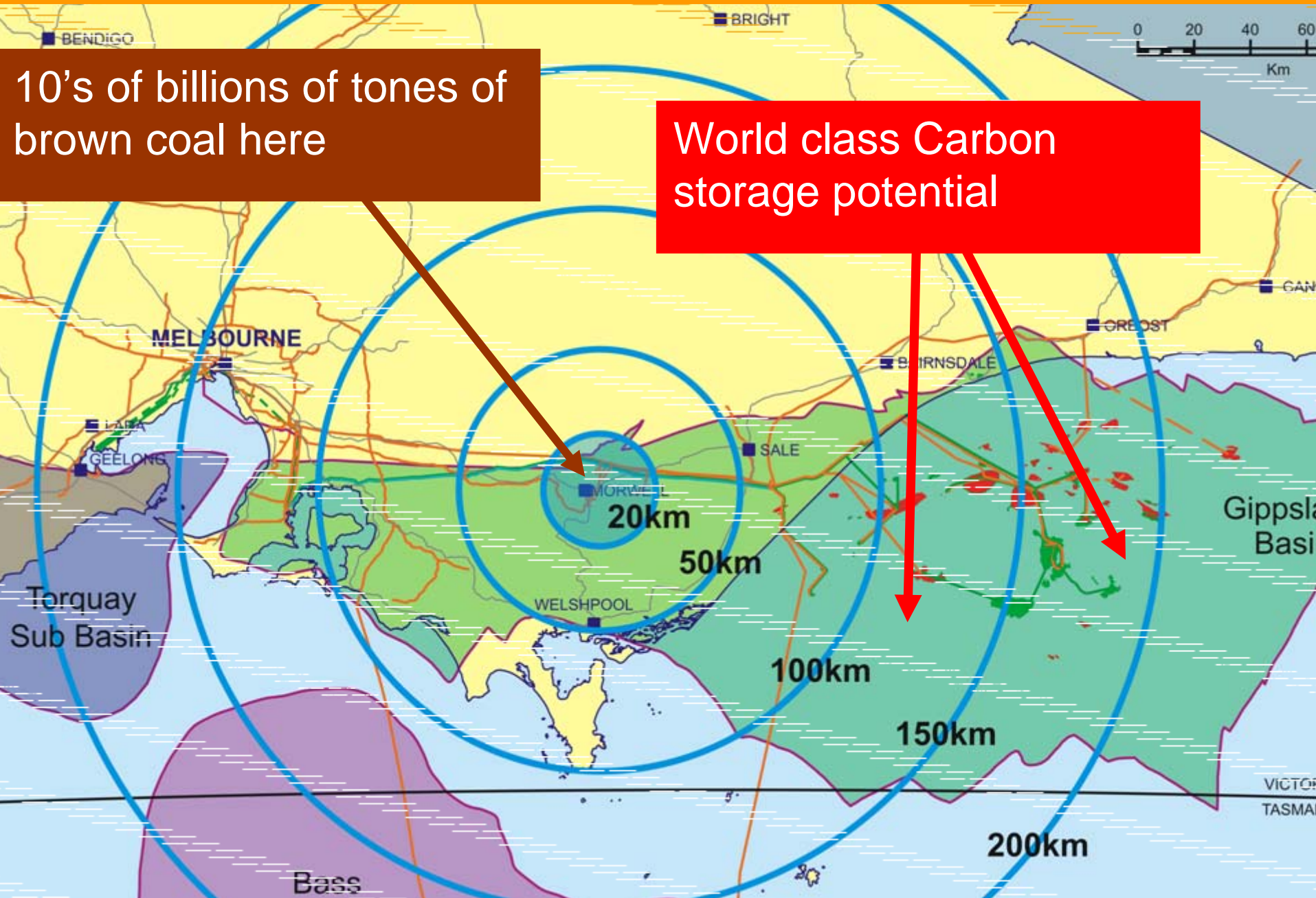




# World class CCS location next to large coal resources

10's of billions of tones of brown coal here

World class Carbon storage potential



# National Carbon Storage Task force Study

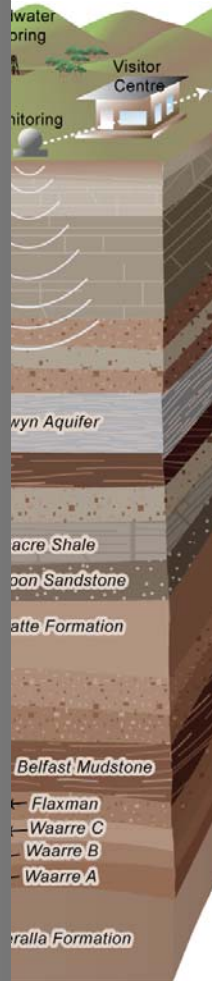
**National Study looking all over Australia at the opportunities to transport and store carbon dioxide:**

- Costs
- Capacity of storage sites
- Proximity to areas of major emissions

**Expected to find that:**

- Victoria has the lowest cost storage
- Very large storage capacity
- Low cost injectivity
- High potential to define secure storage locations
- Low cost transport - as close to coal and industry
- Good potential for a CCS network

**Final report expected in the next 2 months**



# Australian Government - CCS Flagships Program

## ***Victoria is strongly positioned***

- \$2 billion new money offered by the Australian Government to support 2-4 CCS projects over 9 years :
  - industrial scale integrated projects, and
  - network infrastructure
  - target: 2015 production
- Plus \$200 million for Education R&D infrastructure
- Australian Government to fund up to one third capital cost - implications
- States to nominate projects: applications close July/August 09; State Governments expected to match funding
- Short list announce late 2009 ; final announcement in mid-late 2010

the Victorian *CCS Foundation Network* concept

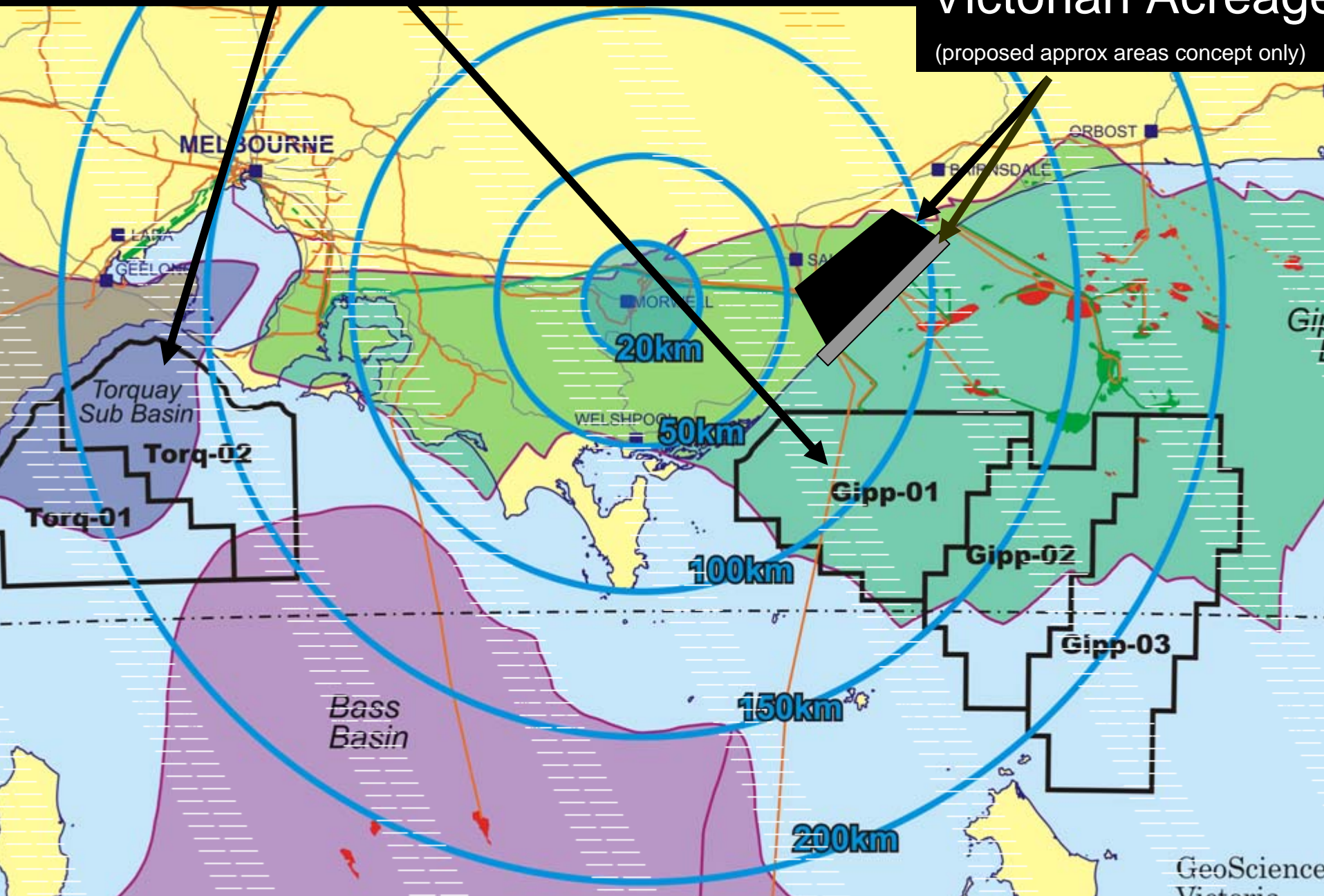
- CCS ‘backbone’ - common/multi user large scale infrastructure
- cluster of CO<sub>2</sub> generating point sources – generators & new coal industries
- stage-gated development
- supports commercial scale operation – up to 10-30 MT per year
- leverages existing initiatives and CW Govt. funding
- secures future for Victorian brown coal industry



# Current acreage releases

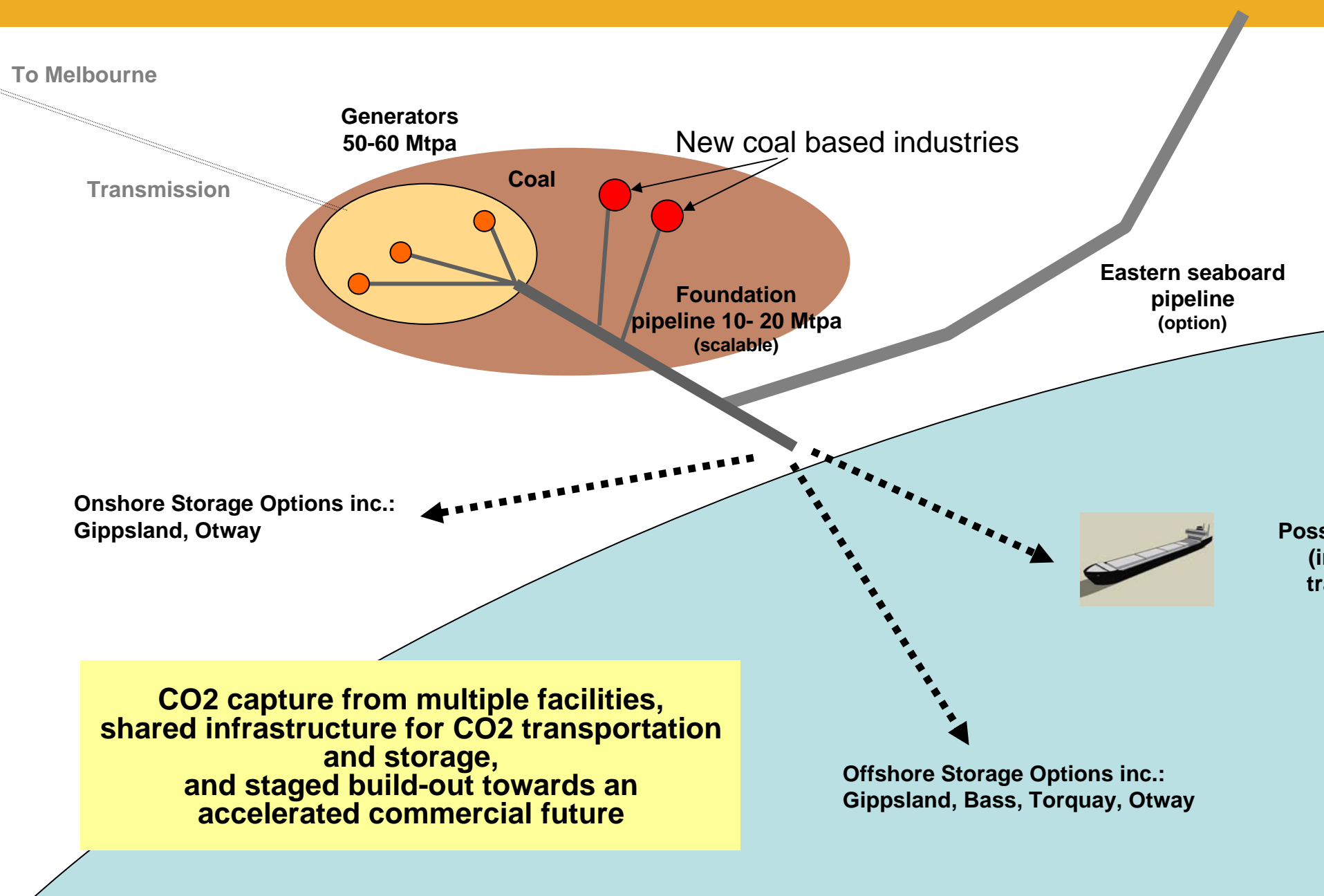
# Victorian Acreage

(proposed approx areas concept only)



# Vic CCS

# 10 - 20 MTPA CCS Hub



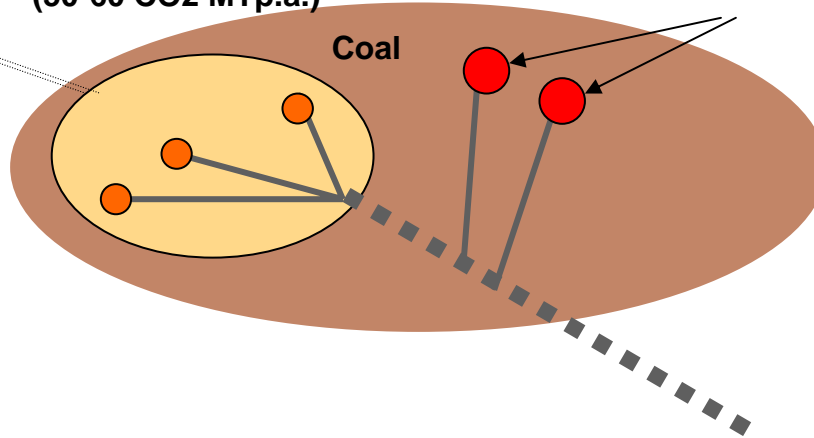


# Phase 1 Explore , choose ETIS projects, detailed feasibility studies

To Melbourne  
(transmission)

Generators  
(50-60 CO2 Mtp.a.)

New coal based industries



Explore onshore

Explore offshore

## Phase 1

Exploration

Develop options 1Mtpa to 10+ Mtpa

Plan and secure route

Financing and grant arrangements

# Phase 2 Finalize design, approvals , FEED and construct

To Melbourne  
(transmission)

Generators  
(50-60 CO2 Mtp.a.)

New coal based industries

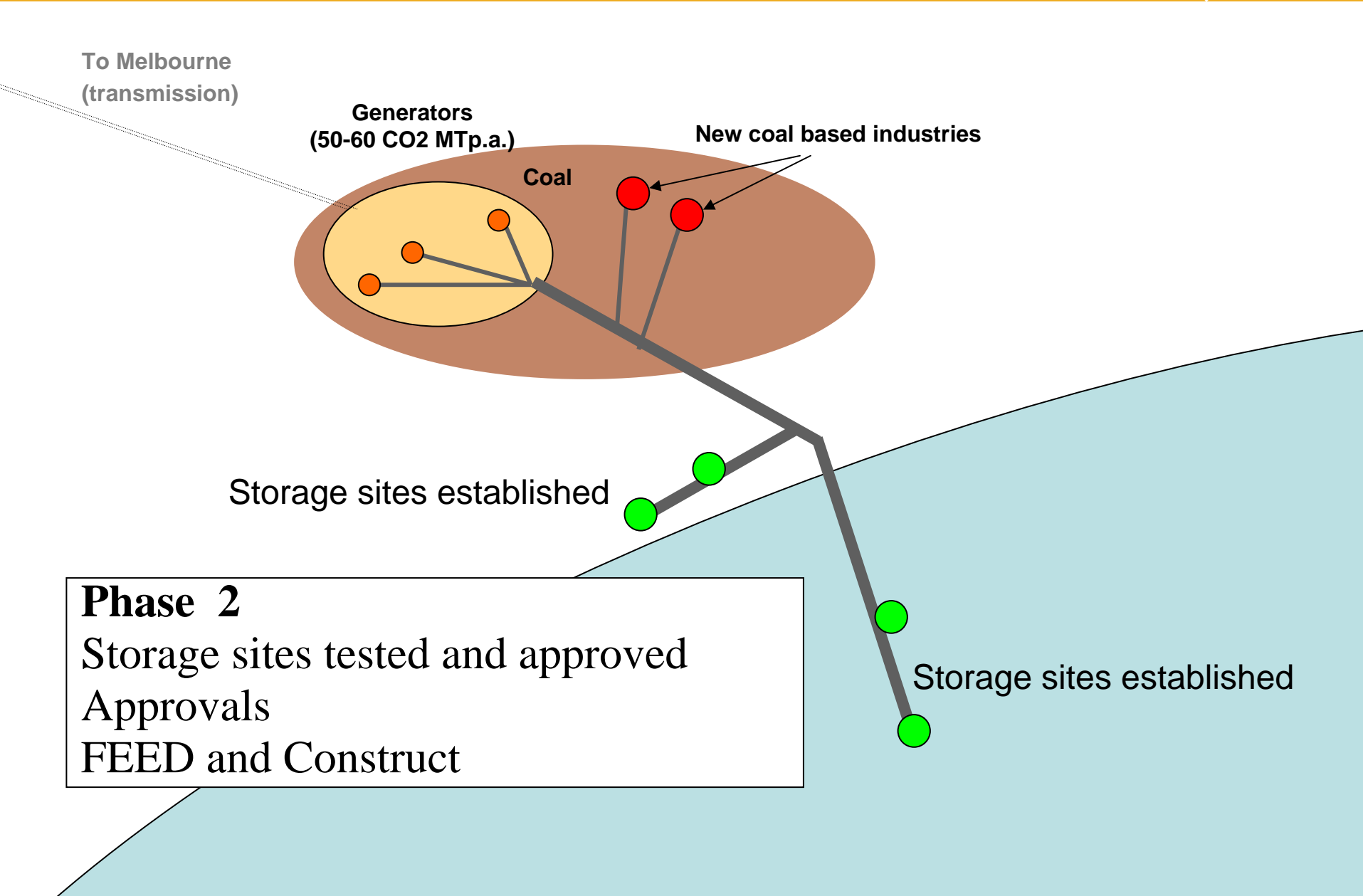
Coal

Storage sites established

Storage sites established

## Phase 2

Storage sites tested and approved  
Approvals  
FEED and Construct



# Case Study: Monash Energy



## Project Overview



12 x RWE



Dt x 10

~ 30 mtpa



## Process & Scale



0.6 x Geelong



~ 70,000 b/d



1 x Loy Yang Mine

CO<sub>2</sub>  
for storage



CCS ~ 15 mtpa



8 x Sleipner



# Victorian Carbon Storage Network

- The Victorian Government is committed to advancing CCS
- Preparing for exploration for storage sites
- Detailed technical and commercial modeling with a number of major companies underway
- ETIS bids being assembled
- Victorian Government will be submitting proposals for the Australian Government's CCS Flagships \$2 billion fund

# Clear, Supportive CCS Policy and Legislation

- Strategic Policy Framework for Near Zero Emissions from Latrobe Valley Brown Coal
- Australia's first onshore CCS legislation - passed in 2008
- To position Victoria as a leader in CCS
- Reduce greenhouse gas emissions
- Support new energy and energy related technologies

# Understanding the challenges and possibilities for the future of brown coal and CCS

**Scenario development:** the future for brown coal and CCS in Victoria to 2040 and beyond

- Broad stakeholder participation in “Shell Type” scenario planning workshops
- Insights, key challenges, opportunities and possibilities defined
- Product will be used by industry, government and communities to develop more robust strategies



# Victorian grants supporting development of CCS technologies to commercial deployment

## Energy Technology Innovation Strategy (ETIS):

- Driving pre-commercial technologies to market uptake where technical risk exists
- ETIS1: >\$180M, leveraged \$1.6B investment
- ETIS 2: \$110M available (closes Aug 2009), capture, storage or integrated
- Supports technologies that industry is seeking to invest in

## Research & Development:

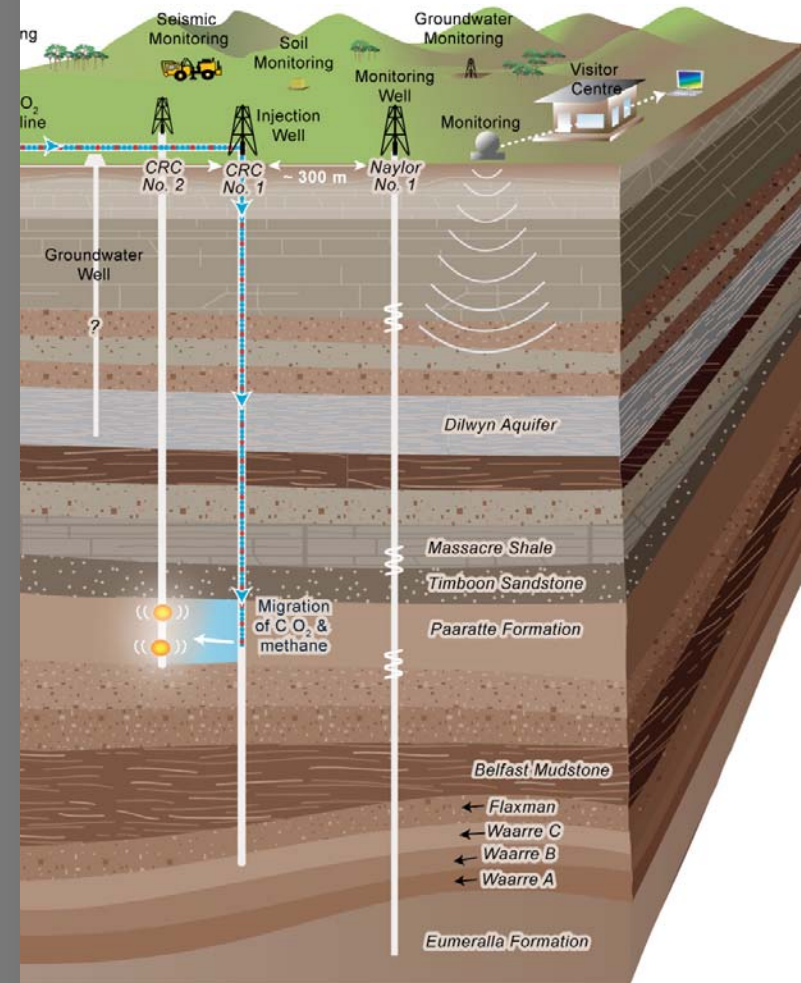
- \$12M for brown coal R&D; now planning for a new program

## Piloting

- Supporting Otway Basin CCS Trial – injection, storage, monitoring

# Otway Basin Pilot Project

- Australia's first demonstration of the injection and geological storage of CO<sub>2</sub>
- Development and implementation of monitoring and verification regime
- Up to 100,000 tonnes of gas will be injected



# Understanding & supporting storage opportunities

- GeoScience Victoria: undertaking detailed assessment of the Gippsland Basin
  - staged deliverables to 2012
  - results will be available as pre-competitive data
- Providing pre-competitive data to industry to support storage exploration & development
- Onshore acreage release when regulations in place later this year
- Assisting National Carbon Storage Taskforce that is currently assessing transport and storage potential networks nationally



# Large Scale Demonstrations needed

The Victorian government in proposing its CCS network, would like large CCS projects to move forward with

Welcome discussions with companies wishing to build a 400-500 MW power station or substantial other coal based industries with CCS

Victoria is one of the best places in the world to demonstrate these new technologies

- Lowest cost transport and storage in Australia
- Abundant low cost brown coal
- Low sovereign risk & skilled workforce

Questions?

