

# 6TH ROUNDTABLE FOR STUDYING ENERGY SITUATIONS

## ENERGY SECURITY FOR JAPAN – A ROLE FOR VICTORIA

Ministry of Economy, Trade and Industry (METI), Tokyo

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Victorian State Government

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Economic Development,  
Jobs, Transport  
and Resources



# VICTORIAN GOVERNMENT CLIMATE CHANGE COMMITMENT 2017

## The four pillars for emissions reduction



Increase our energy efficiency and productivity



Move to a clean electricity supply



Electrify our economy and switch to clean fuels



Reduce non-energy emissions and increase carbon storage



Decrease the amount of energy required to run our homes and fuel our economy and produce more using less energy.

Increase electricity generation from zero emission sources and eliminate dependence on fossil fuels.

Shift from fossil fuel energy for activities such as transport and heating to the use of electricity and switch from gas, petrol, diesel and other fossil fuels to clean energy.

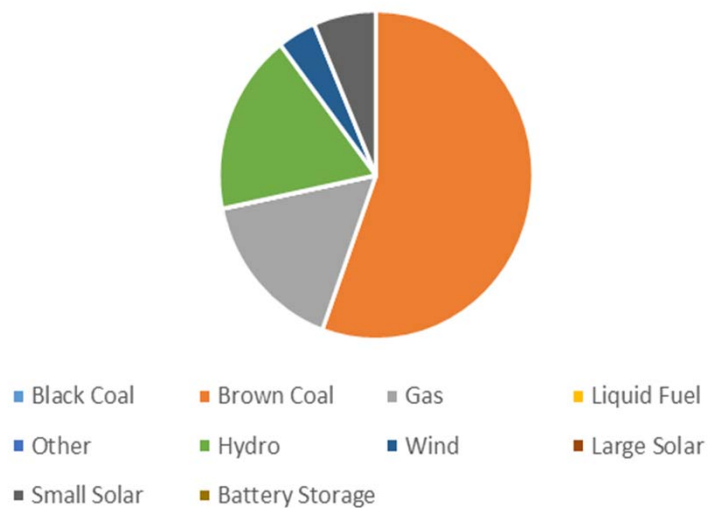
Change industrial processes and increase carbon storage in our natural environment.

"CCS technology could support emissions reduction action across multiple pillars including from industrial processes such as gas processing, refineries and chemical manufacturing."

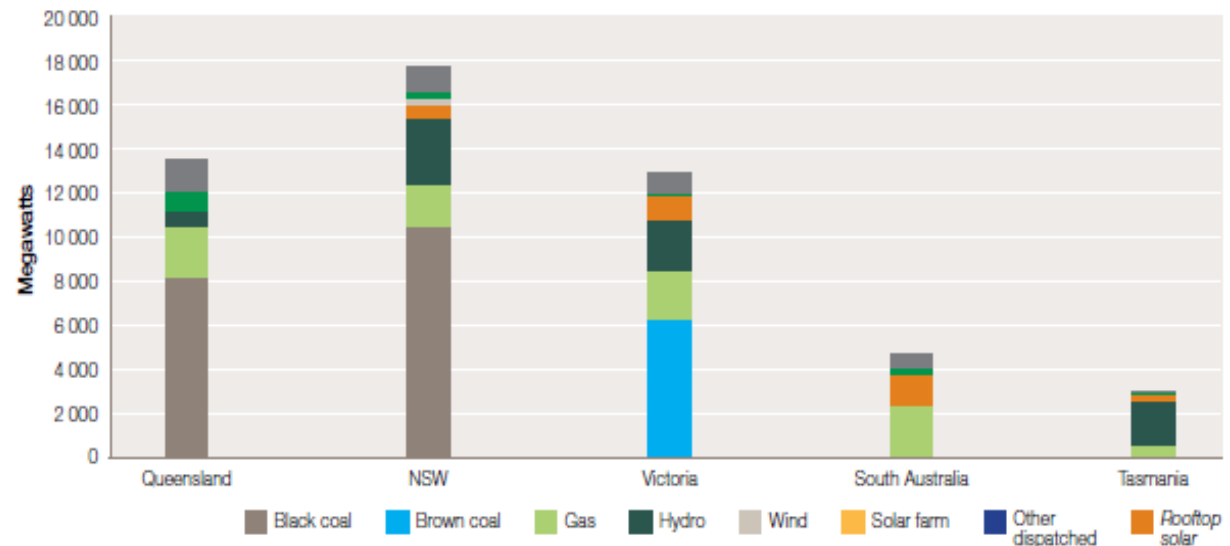
## CAPACITY AND GENERATION BY FUEL SOURCE

- Brown coal's significant share of Victorian generation is decreasing
- First closure of large coal generator was 2017 (next forecast in 2020's)

Victoria's Energy Mix



Generation capacity in the NEM, by region and fuel source, 1 January 2017

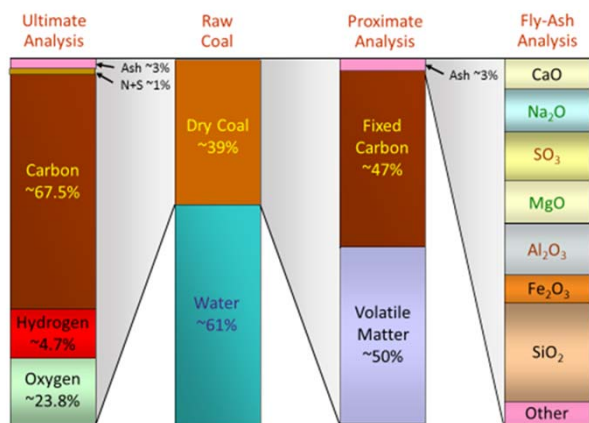


Note (figures 1.7 and 1.8): Rooftop solar generation is not traded through the NEM. Electricity generated from this source acts to reduce the demand for grid supplied electricity.

Sources (figures 1.7 and 1.8): AEMO; AER.

Source : <http://reneweconomy.com.au/nem-watch/>  
accessed 6 February 2018

# ABUNDANT BROWN COAL AND STORAGE RESOURCES



- 2nd largest resource in the world
- Low in impurities
- Reactive
- Close to world class CO<sub>2</sub> storage site



## VICTORIAN GOVERNMENT – COAL POLICY STATEMENT JULY 2017

- Framework for approving new coal projects
  - Consistent with *Climate Change Act 2017* and net zero emissions by 2050
- Sets initial emissions intensity at 0.45 t CO<sub>2</sub>e/MWh
- Acknowledges strong interest in low emission - high value products for domestic and international markets
  - Eg: hydrogen and fertilisers
- New projects must mitigate emissions with CCS or offsets
  - Commits to completing CarbonNet
- Independent Expert Advisory Panel will review project proposals for compliance and viability
- See <http://earthresources.vic.gov.au/earth-resources/victorias-earth-resources/coal/policy-reviews/statement-on-future-uses-of-brown-coal>

### STATEMENT ON FUTURE USES OF BROWN COAL

Victoria is home to the second largest brown coal resource in the world. This low cost and abundant resource has ensured the supply of affordable and reliable electricity that has supported our economic prosperity for nearly a century.

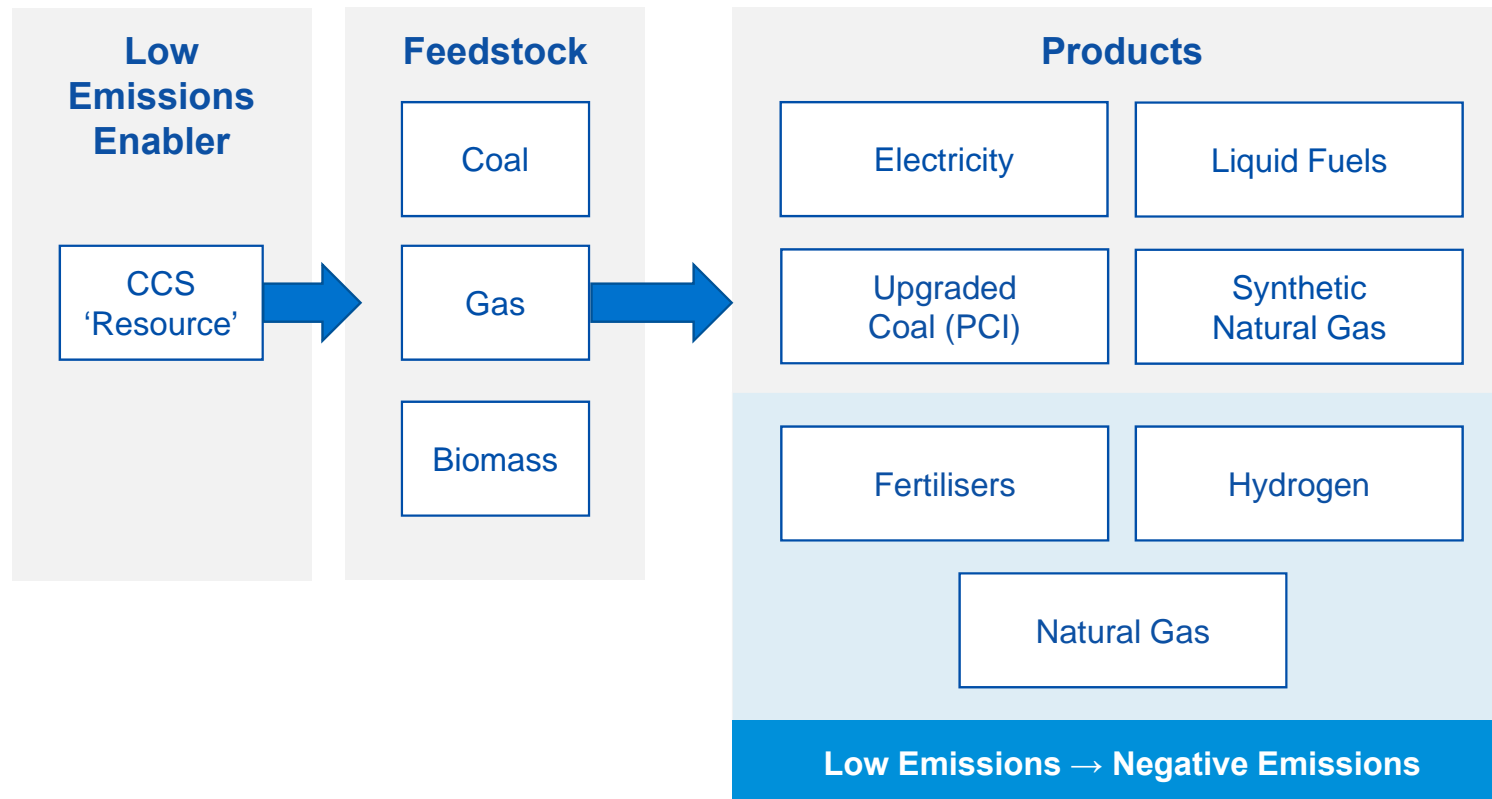
However, there is a fundamental change underway which will affect the way brown coal will be used in the future.

While brown coal-fired power generation supplies the majority of Victoria's electricity today, its share of generation will reduce over the coming decades with the retirement of existing generators, market conditions and the need to respond to climate change.

Climate change goals have been set at a global, national and local level. In the Paris Agreement, the global community agreed to limit warming to less than 2 degrees above pre-industrial levels. As part of its contribution to the Paris Agreement, Australia has set a domestic target to reduce greenhouse gas emissions to 26-28 per cent below 2005 levels by 2030. In Victoria, the *Climate Change Act 2017* provides the foundation for Victoria's action on climate change. The Act includes an economy-wide target of net zero greenhouse gas emissions by 2050, and as a first step, the Government has set an interim 2020 target of 15-20 per cent below 2005 levels. The Act requires progressively stronger legislated targets every five years from 2020. Decisions regarding new uses of brown coal will be made against the backdrop of these commitments.

At the same time, there is strong investor interest in using our valuable coal resources to make alternative high value, low emission products for domestic and international markets. These projects could provide new economic development and trade opportunities, bringing high-skilled jobs and investment to the Latrobe Valley and Gippsland.

## CCS: ENABLES LOW EMISSION USES OF BROWN COAL



## RECOGNITION OF THE BENEFITS OF CCS

- Intergovernmental Panel on Climate Change (2015)
  - AR5 report re-emphasised the need for CCS to address climate change
  - 138% more expensive without CCS to meet COP21
- Global Carbon Capture and Storage Institute (2016)
  - 2016 Global status report: 21 large-scale projects operational by end 2017
  - call to policy makers to address barriers and accelerate deployment
- CSIRO (2015)
  - National Outlook to 2050: CCS important opportunity for Australia
- ClimateWorks (2014)
  - Pathways to Deep Decarbonisation in 2050: CCS and renewables important
- Commonwealth Energy White Paper (2015)
  - includes focus on CCS storage capacity
  - acknowledges opportunities for brown coal and hydrogen, with CCS



## CCS IN AUSTRALIA

### OTWAY DEMONSTRATION PROJECT (CO2CRC, Victoria)

- Established in 2008
- World's largest CCS demonstration (80,000 tonnes of CO<sub>2</sub> injected and stored)
- Comprehensive, internationally renowned, monitoring program that tests advanced technologies and techniques to reduce cost
- Community engagement from the outset



Source: CO2CRC

### GORGON LNG PROJECT (WA)

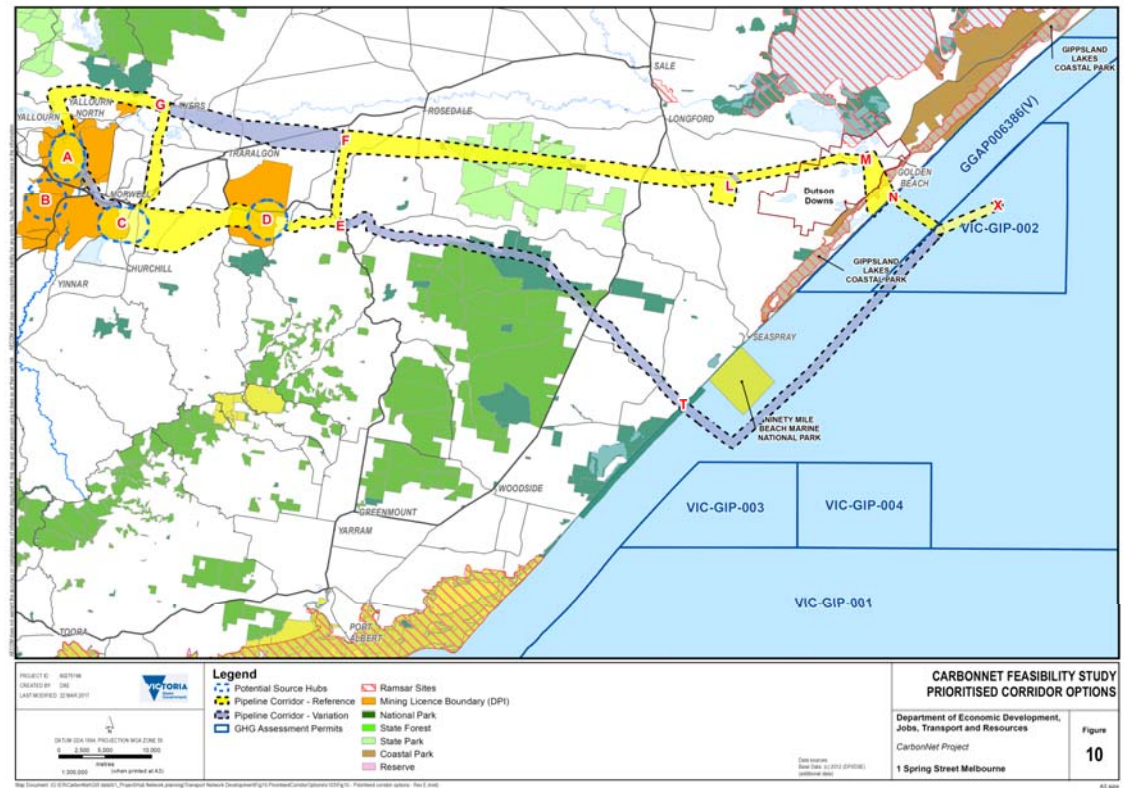
- Currently being commissioned
- 3.4 - 4 million tonnes per year of CO<sub>2</sub> injected and stored in a deep saline formation
- World's largest dedicated geological storage



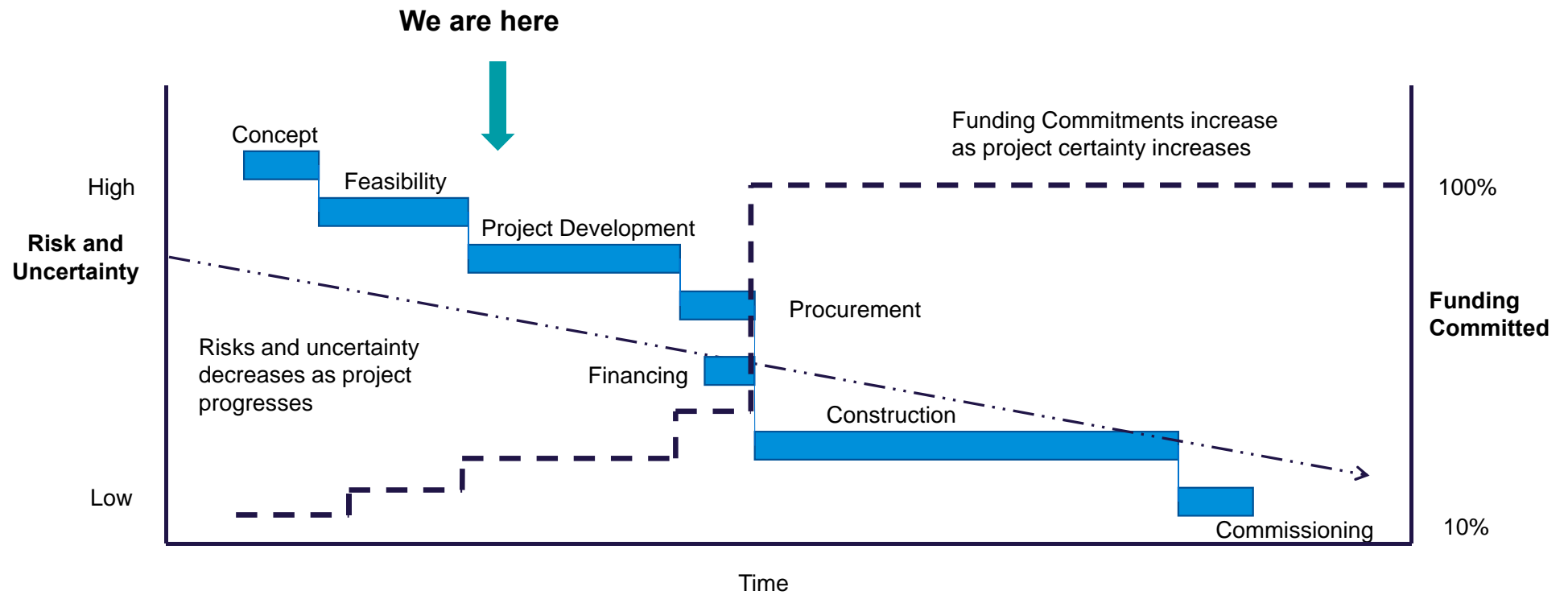


# CARBONNET PROJECT

- Developing a large-scale, multi-user CCS network in Gippsland region
  - Near-shore injection for offshore storage
- Jointly funded by the Australian and Victorian Governments to 2020
  - \$A150m for feasibility and development
- CarbonNet's Pelican storage site has 125 million tonnes at P90
- Significant research investment
- Knowledge sharing via Global Carbon Capture and Storage Institute
- Collaboration with industry to secure customers and investors



# CARBONNET STATUS



## COMMUNITY SUPPORT IS CRITICAL



### **Community Education**

Improved understanding of new low emissions coal opportunities, including the role of CCS

### **Access to information**

Engagement – strategic and accessible factsheets, presentations and web content

# HYDROGEN AS A DOMESTIC ENERGY SOURCE

Growing recognition in Australia of the future importance of hydrogen

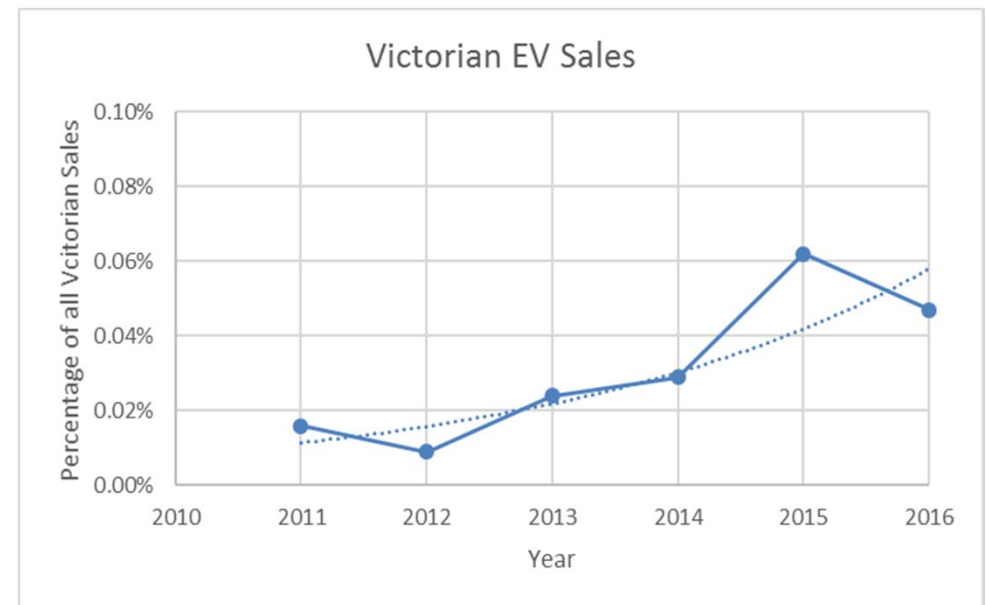


## POTENTIAL DOMESTIC USES

- Growth in renewable power will need gas-fired generation, batteries and pumped hydro to balance the grid
- As renewables share grows and emission caps tighten, hydrogen should become more important
  - A growing renewable surplus could become a large second source
- Hydrogen may also be a key source of industrial heat in place of fossil fuels
- There is a growing focus on reducing vehicle emissions
  - Hydrogen may become an important transport fuel, complementing battery-electric vehicles
- Hydrogen exports would provide Victoria and Australia with a key option for domestic energy security

## ELECTRIC AND HFC VEHICLES

- Electric vehicles are less than one per cent of light vehicles sales in Victoria, due to:
  - limited model choice (only two brands)
  - lack of charging infrastructure
  - perceived low vehicle range
  - high purchase price
- Battery electric vehicles projected to increase in the next decade, assuming:
  - costs equal conventional vehicle prices
  - more models are available
- Less clear when hydrogen fuel cell vehicles could enter the local market
  - may displace larger, long-distance vehicles (trucks, trains, buses)





## SUMMARY

- The world has begun a major transformation to reduce carbon emissions while providing secure and affordable energy
- Victoria's brown coal resources will move from producing electricity with high emissions to other products with low emissions
- Victoria's large coal and carbon storage resources combined with Japanese technology could contribute to energy security in both countries
- The Hydrogen Energy Supply Chain project builds on a mature and trusting relationship

# QUESTIONS



Economic Development,  
Jobs, Transport  
and Resources