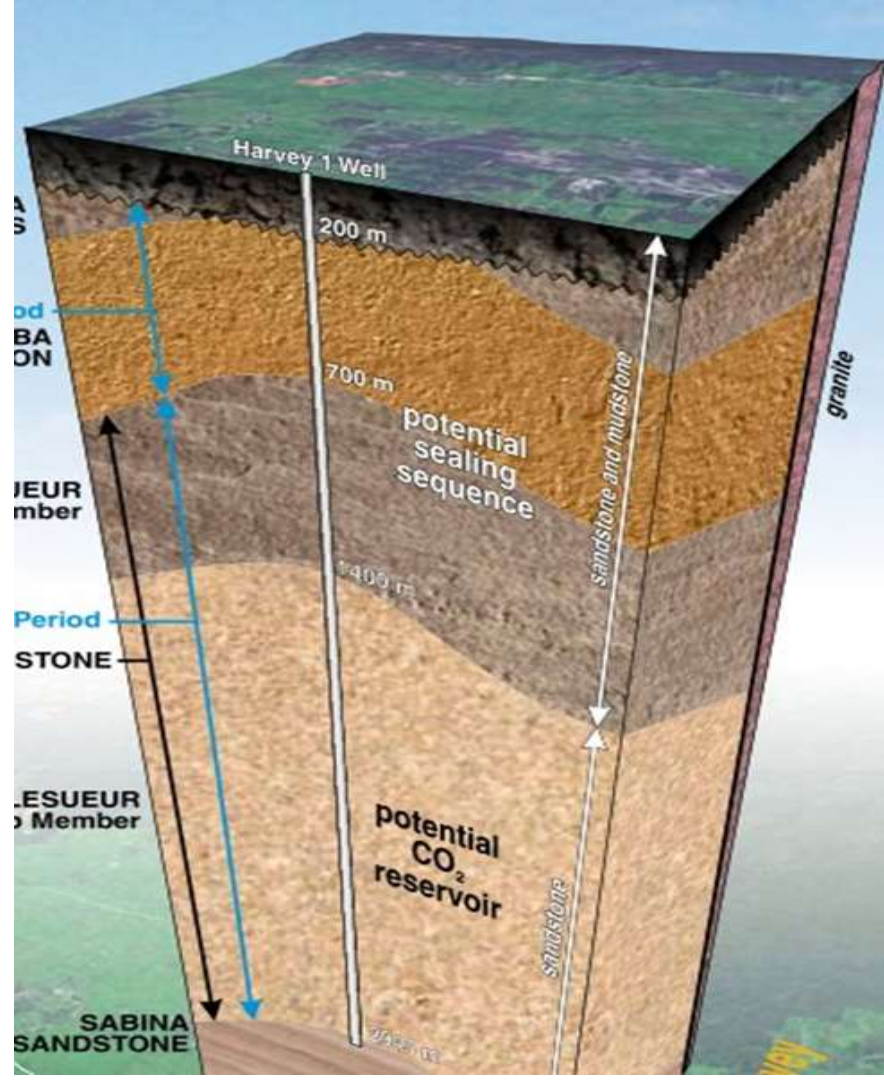




# CCUS in Australia

UK CCS Research Centre  
Autumn conference  
Paul Feron | 8 September 2021

Australia's National Science Agency





# Australia's stake in CCUS

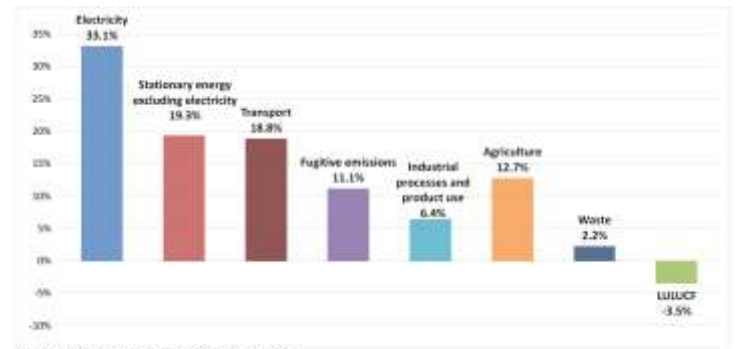
	Export volume (Mt)	Export value (B\$)	CO <sub>2</sub> -emissions (Mt)
Metallurgical coal	177	35	425
Thermal coal	213	21	485
Natural gas	79	48	217
Total	-	104	1127



(2019/20)

Reconciling the value of energy exports with the need for CO<sub>2</sub>-emission reductions

Also, Australian electricity generation still has large dependency on coal (60% in 2018)

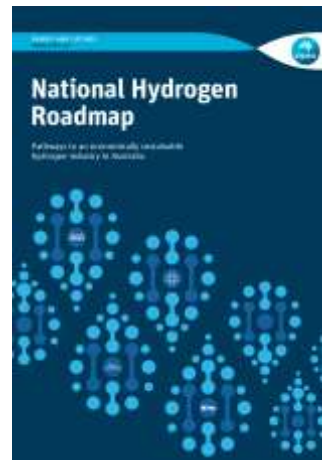


Source: Department of the Environment and Energy



# Australian energy policy framework development

- Technology investment roadmap
- Hydrogen roadmap/strategy
- Role of gas
- Ongoing support to CCUS from:
  - ANLEC R&D
  - Geoscience Australia
  - CO2CRC
  - NERA
  - ARC

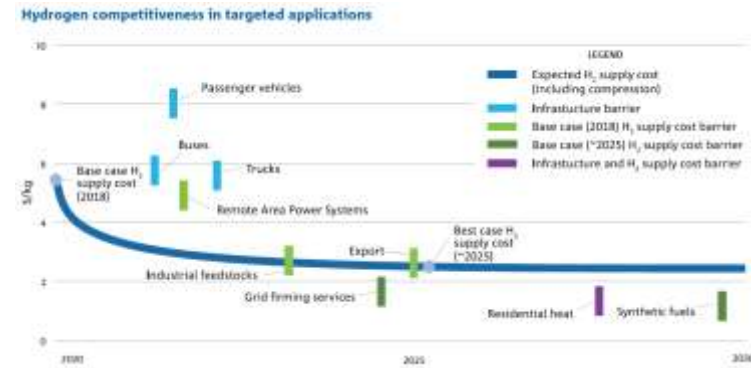




# Low Emissions Technology Statement (2020)

## 5 priority low emissions technologies:

- Clean hydrogen (< \$2/kg H<sub>2</sub>)
- Energy storage (<\$100/MWh)
- Low carbon materials (steel <\$900/t; aluminium <\$2700/t)
- Carbon capture and storage (<\$20/t CO<sub>2</sub>)
- Soil carbon (<\$3/ha/y)



Abatement potential

Australia's comparative advantage

Scale of economic benefit

Technology readiness

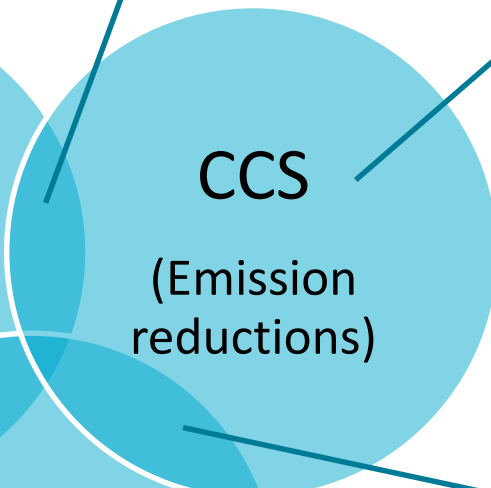
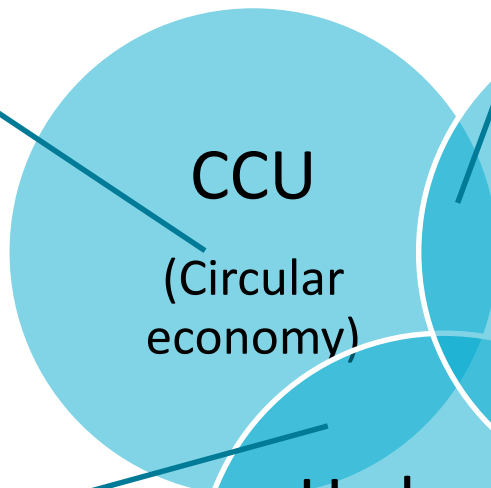


# CSIRO CO<sub>2</sub> utilisation roadmap - 2021

EOR, EGR, ECBM

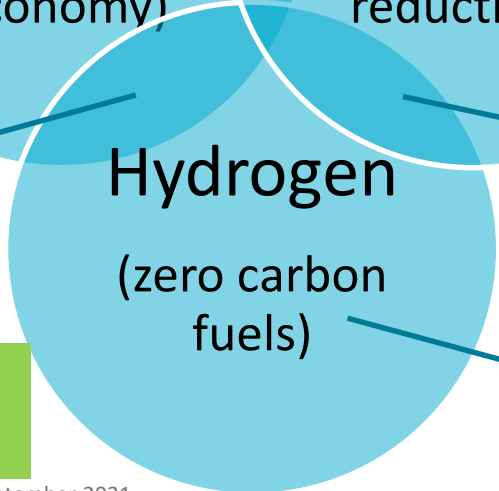
CO<sub>2</sub> capture and storage in aquifers

CO<sub>2</sub> capture and conversion to minerals, concrete, aggregates, bio-products



# ANLEC R&D CCS Roadmap for Australia - 2017

Renewable gas  
E-fuels  
Chemicals  
Plastics



Blue hydrogen

# CSIRO National Hydrogen roadmap - 2018

Green steel  
Transport fuel  
Heating



# Carbon Dioxide Storage Projects in Australia

*High CO<sub>2</sub>-content gas fields*

*CO<sub>2</sub> from natural gas/hydrogen*

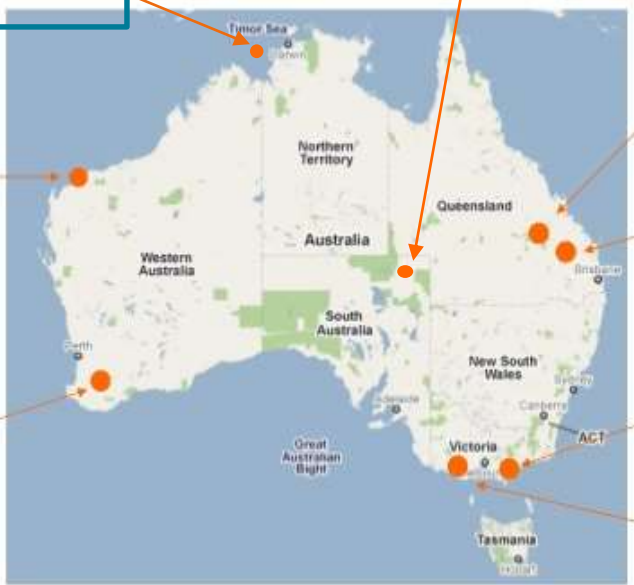
Northern Australia  
CO<sub>2</sub> Store

Moomba

*Largest commercial CCS project*

Gorgon LNG Project

South West Hub Project  
*CCS Flagship*



*Largest oxyfuel technology demonstrator*

Callide Oxyfuel Project

*Full CCS chain demonstration*

Surat Basin CCS Project

*Enabled by Hydrogen Energy Supply Chain project*

CarbonNet Project  
*CCS Flagship*

*Unconventional geology for CO<sub>2</sub>-storage*

*Otway international test centre CO<sub>2</sub>-storage*

CO2CRC Otway Project





# CO<sub>2</sub>-utilisation Roadmap



## Direct use



## Mineral carbonation



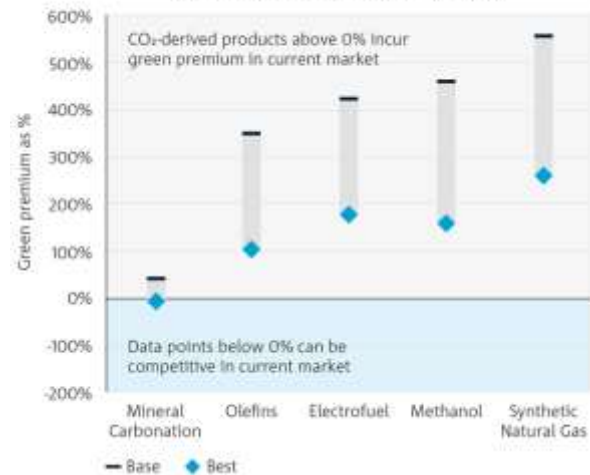
## Chemicals and fuels



## Biological conversion



Green premium (or additional cost) of products synthesised from CO<sub>2</sub> compared to current market prices





# CCUS Development fund (\$50M)

- Santos – Geological storage from natural gas (\$15M)
- Mineral Carbonation – CO<sub>2</sub> into manufacturing and construction materials (\$14.6M)
- EDL – CO<sub>2</sub> capture from landfill and use in cement carbonation curing (\$9M)
- CTSCo – Viability of CO<sub>2</sub>-capture and storage from coal-fired power station in Queensland (\$5M)
- Corporate Carbon – First demonstration of DAC and geological storage (\$4M)
- Boral Limited – pilot scale CO<sub>2</sub> capture to improve quality of recycled concrete, masonry and steel slag (\$2.4M)





# Further actions

- \$565.8 M funding for international low emission technology partnership initiatives by co-funding research and demonstration projects
  - Germany, Singapore, UK, Japan
- Carbon capture and storage method for the Emissions Reduction Fund (consultation closed)



# Thank you

**CSIRO Energy**

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Sustainable Carbon Technologies

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