Getting to Net Zero emissions in Australia

Elements of a successful transition

Australian Climate Roundtable workshop
10 Sep 2020

Frank Jotzo
Centre for Climate and Energy Policy
Crawford School of Public Policy
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Themes towards net-zero

- Low-emissions objectives – international context
- Rapid technological change – allows cost-effective decarb
- Policies and markets – NEM reform, low-emissions policies
- Structural adjustment – esp in the regions
- COVID recovery – distractions and opportunities
- Renewables-based heavy industries – new exports?

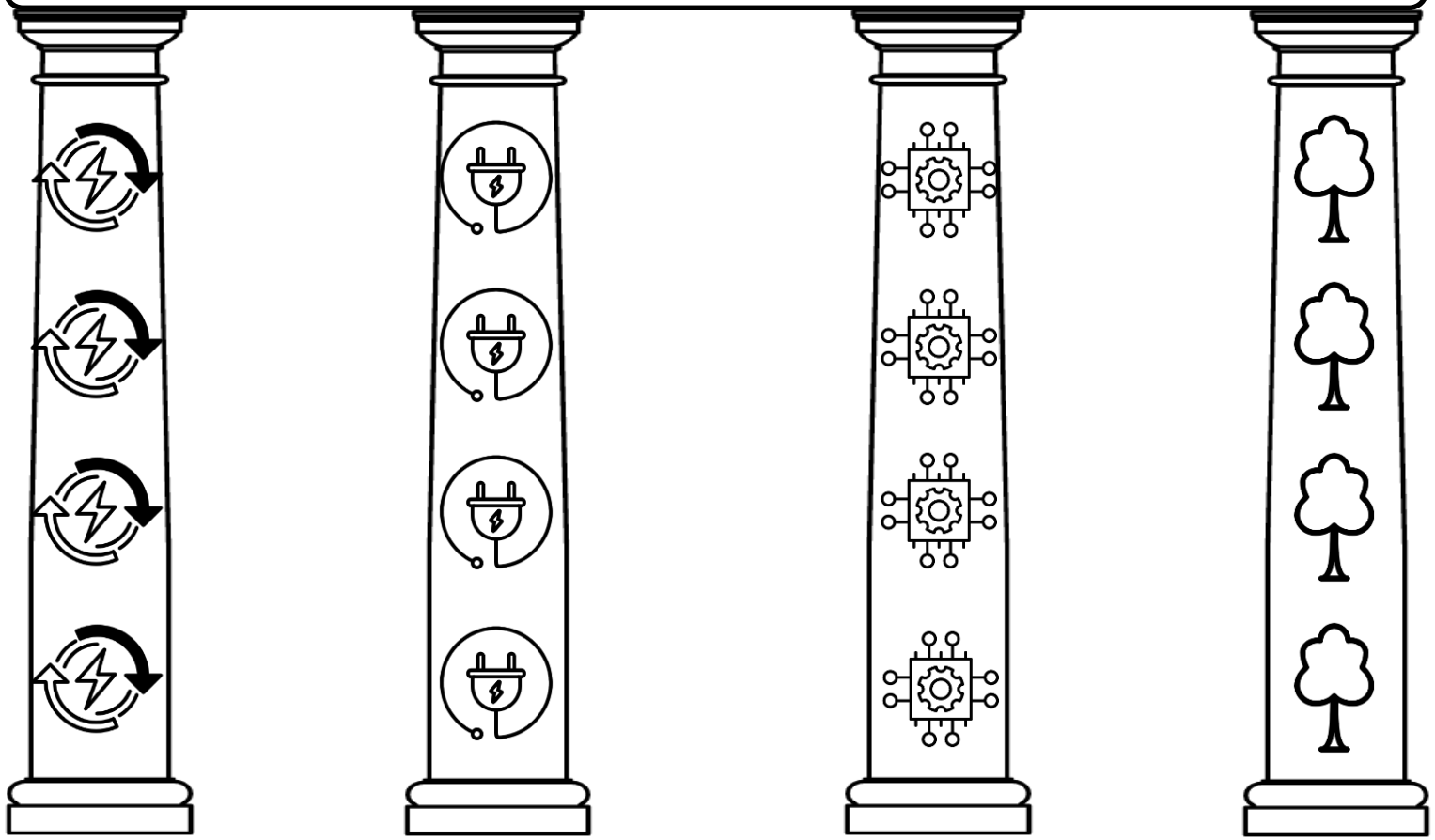
Paris <2d, Net Zero

- Premise widely accepted
- COP process will resume stronger in 2021
- UK, EU positioning clearly
- Biden's climate agenda
- Border carbon taxes

Rally the rest of the world to meet the threat of climate change. Climate change is a global challenge that requires decisive action from every country around the world. Joe Biden knows how to stand with America's allies, stand up to adversaries, and level with any world leader about what must be done. He will not only recommit the United States to the Paris Agreement on climate change – he will go much further than that. He will lead an effort to get every major country to ramp up the ambition of their domestic climate targets. He will make sure those commitments are transparent and enforceable, and stop countries from cheating by using America's economic leverage and power of example. He will fully integrate climate change into our foreign policy and national security strategies, as well as our approach to trade.

https://joebiden.com/climate-plan/#

Pillars of decarbonisation



Zero-emissions electricity

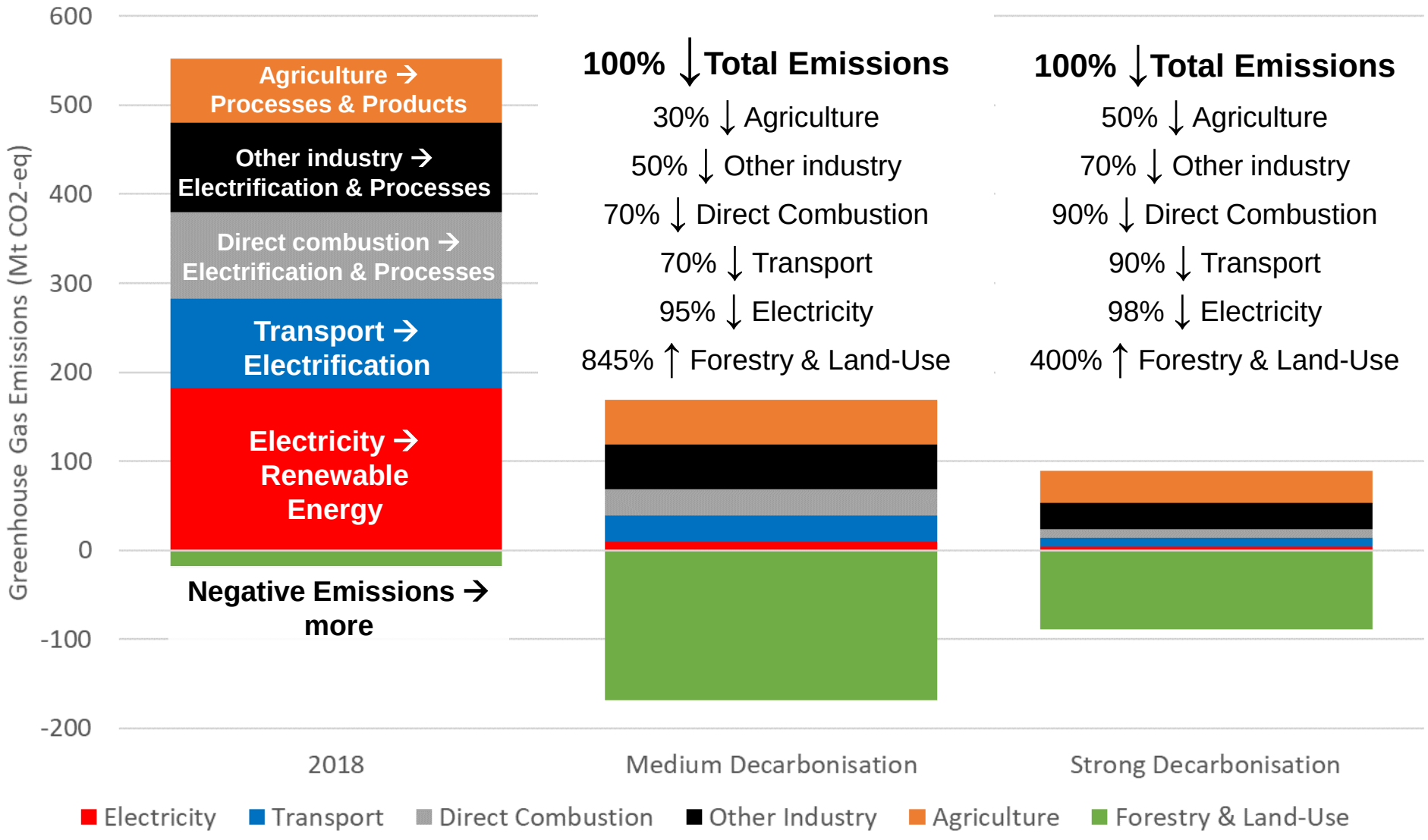
Electrification (transport, industry, buildings)

Processes & products (industry, agriculture)

Negative emissions (biological and technological)

+ energy efficiency, circular economy, consumption choices …

What net zero *might* look like, for Australia



Zero-emissions electricity supply is central

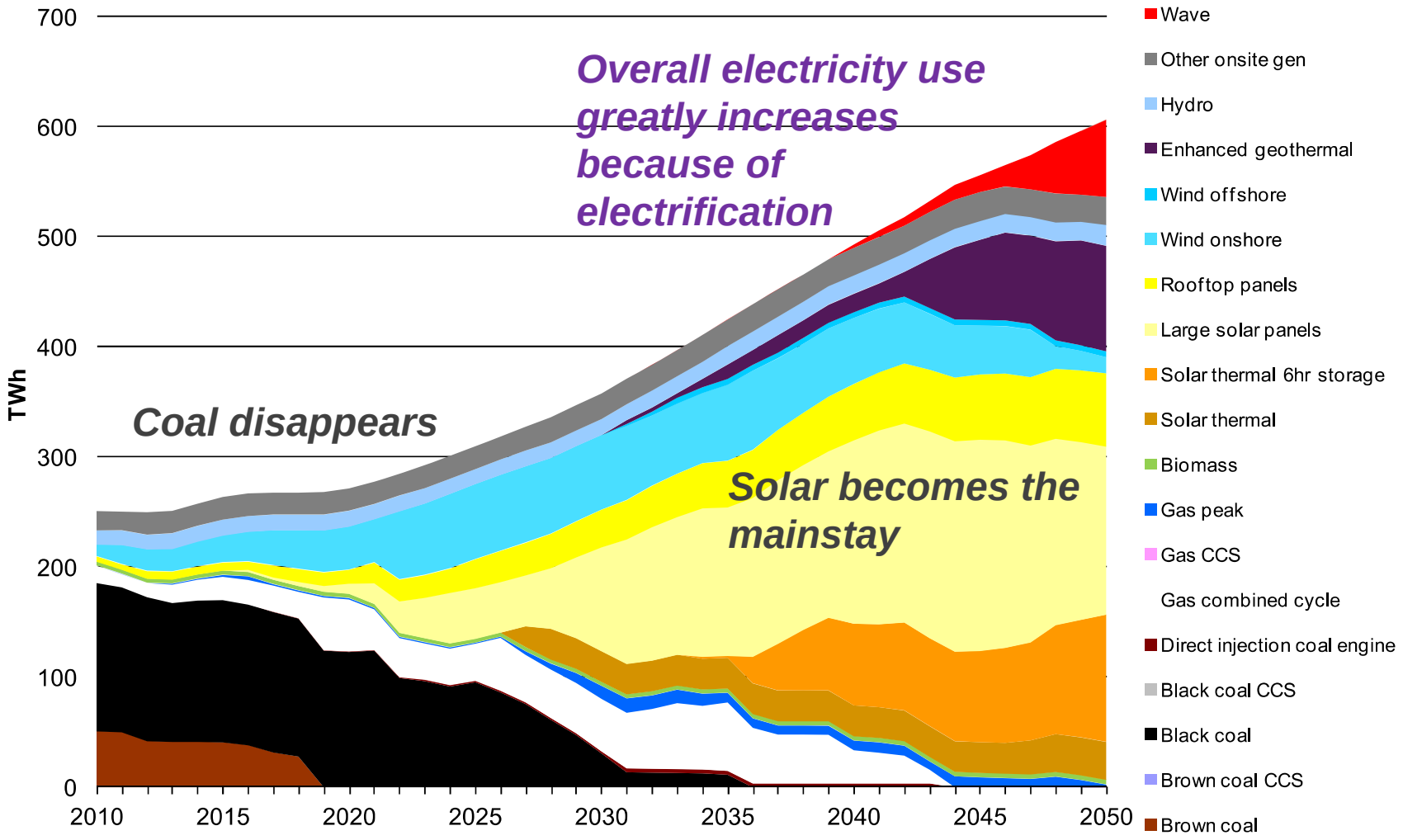
- ~1/3 of current emissions

“Electrify everything”

- Most of transport
- Much of industrial heat and motion
- Most energy use in buildings

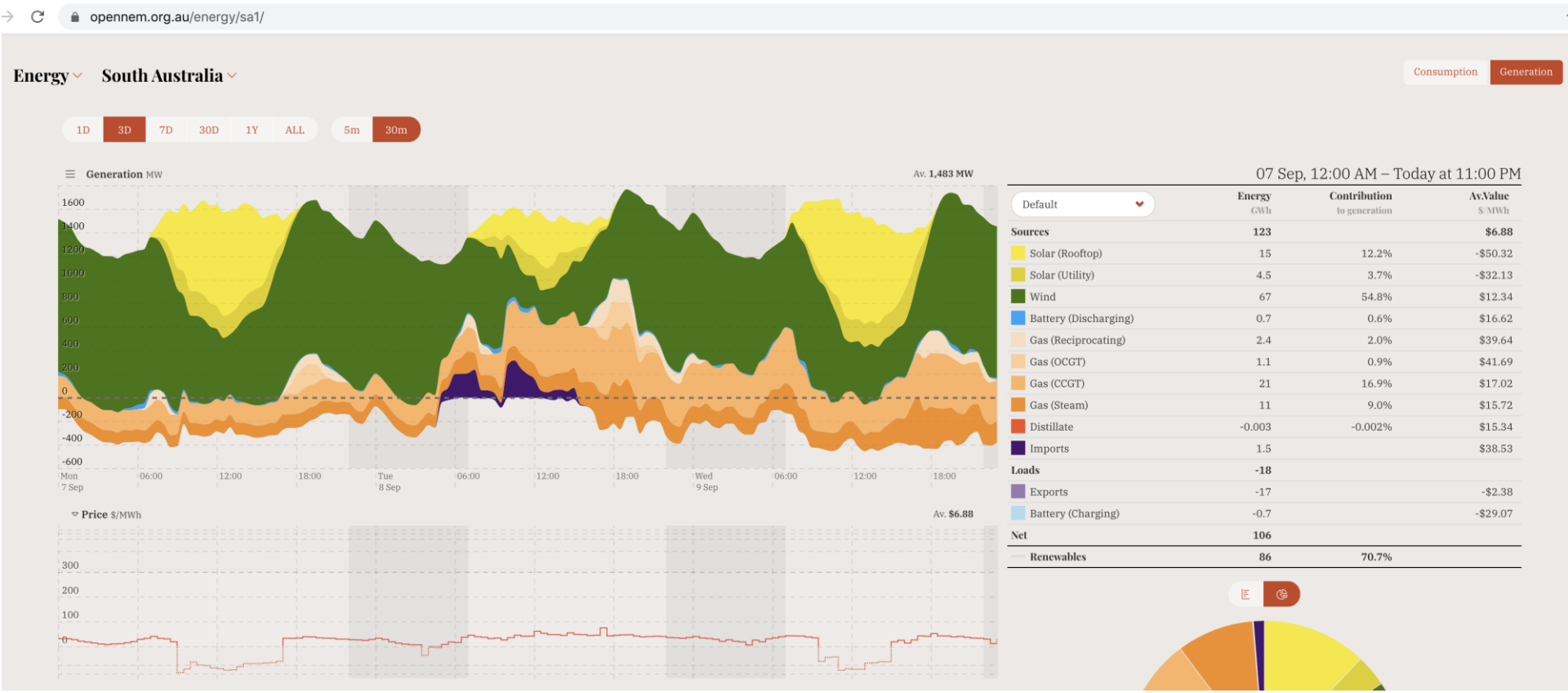
Decarbonising electricity: a scenario for Australia (old but still holds true)

Figure 2.10 – Projected national electricity generation by technology, *100 percent renewable grid*, 2010–2050



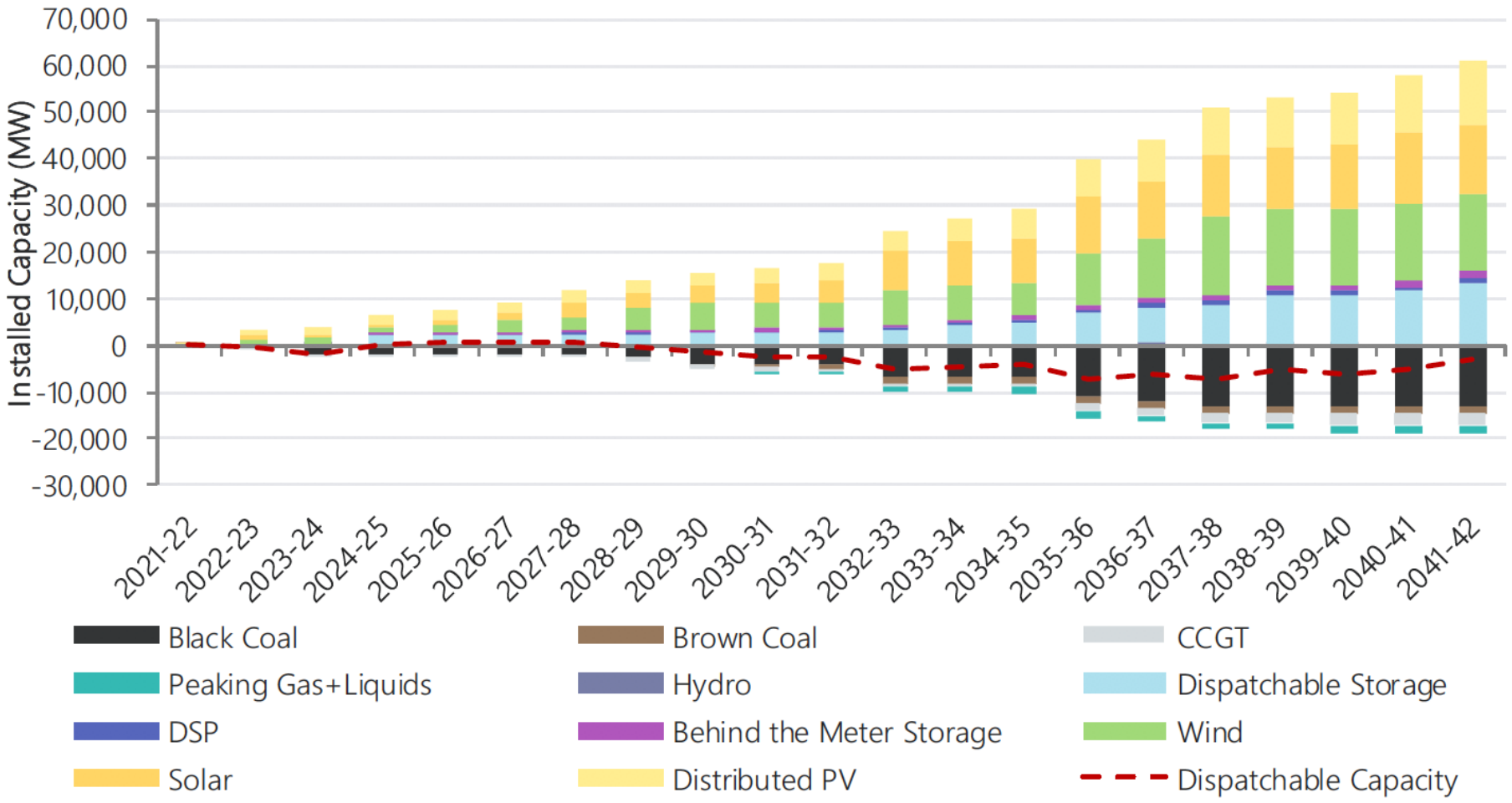
Source: CWA&ANU, CSIRO modelling, Australia Deep Decarbonisation Pathways report (2014)

SA power generation



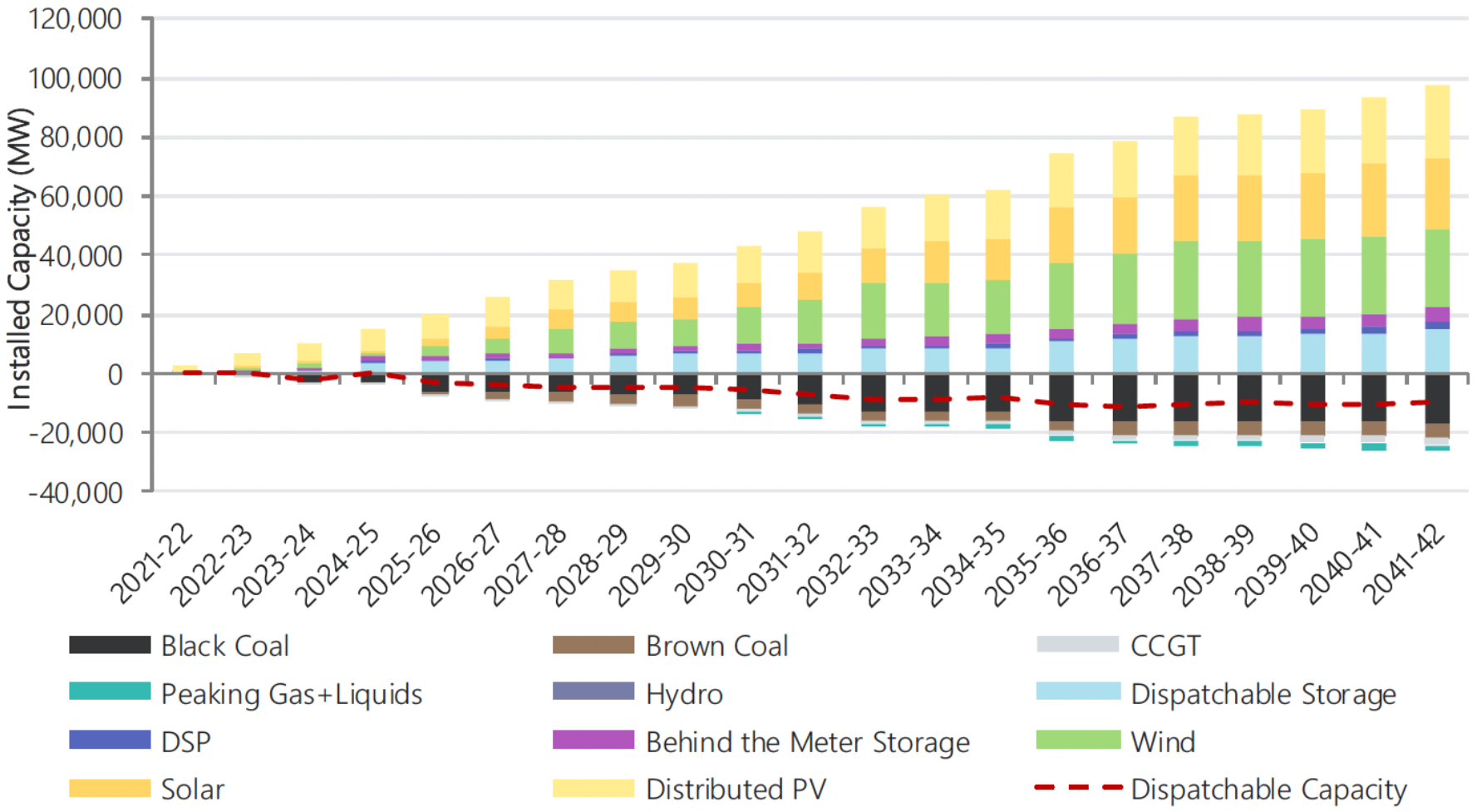
AEMO ISP: capacity additions/deletions, central sc

Figure 4 Forecast relative change in installed capacity to 2041-42, Central scenario



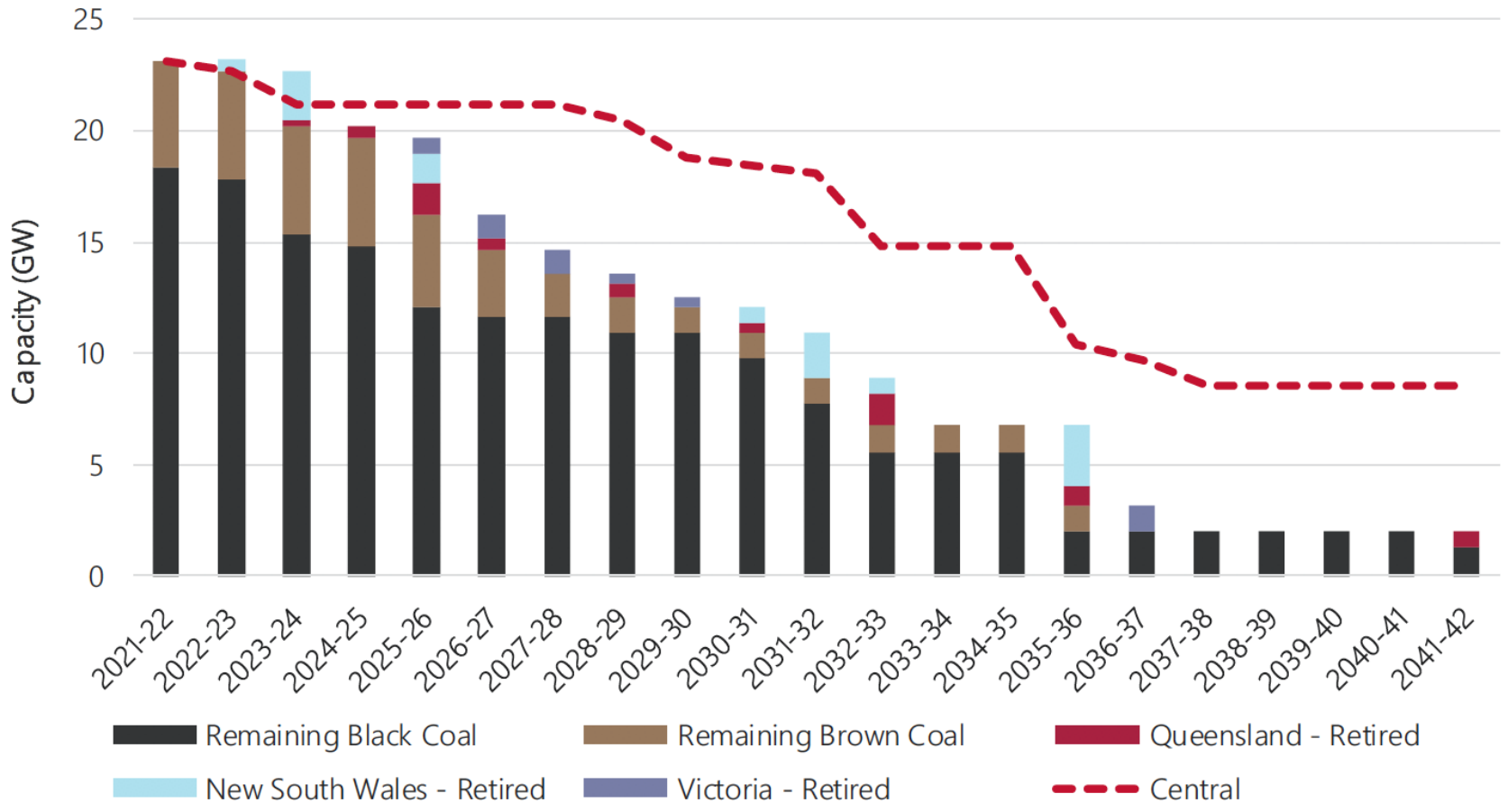
AEMO ISP: capacity additions/deletions, step change sc

Figure 56 Forecast relative change in installed capacity to 2041-42, Step Change scenario



AEMO ISP: coal capacity, step change sc

Figure 55 Forecast coal retirements to 2041-42, Step Change scenario



Electricity market reform

Predictable revenue for renewables

- Market was not designed for zero-marginal-cost generators

Transmission

- Speed, efficiency, cost-effectiveness

Storage

- Role of large centralized storage / Snowy2:
  part of the network infrastructure
  (rather than revenue maximizing generators)?
- Vehicle-to-grid

Demand response

- Fully rewarding flexibility in demand

Coal transition policy

Greater predictability of coal plant exit

- Replacement investment available in time
  … avoid supply crunch and “sawtooth” price patterns
- Prepare local transition
- ESB recognizes problem, canvasses options

➢ A time-bound coal exit plan, with a market mechanism?

Understand local transitions as corporate+society responsibility

- Planning and investment for regional economic futures
- Support for workers and communities

What policies? (simplistically)

Sector	Key policies	Plus
Electricity	Market and institutional reform	Coal exit, carbon price
Industry	Carbon price	Standards, R&D
Transport	Infrastructure	Pricing
Agriculture	Standards, R&D	Carbon price
Negative emissions	Carbon price / subsidies	R&D

Australian National University

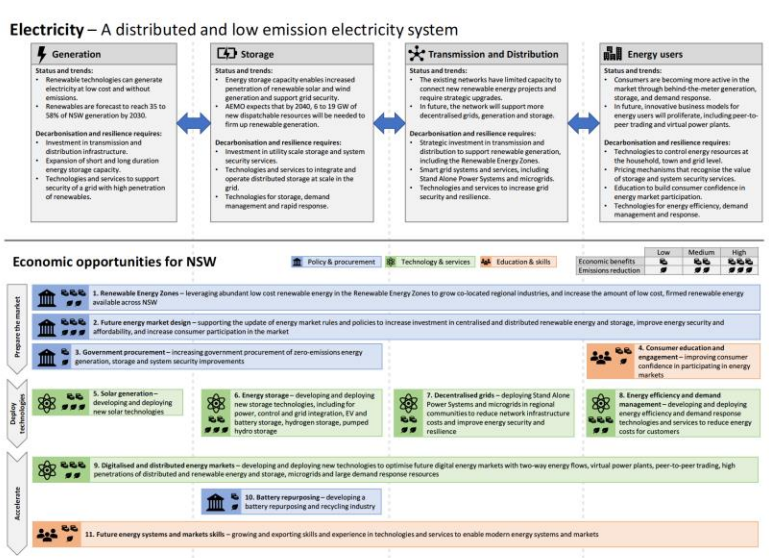
NSW GOVERNMENT | Chief Scientist & Engineer

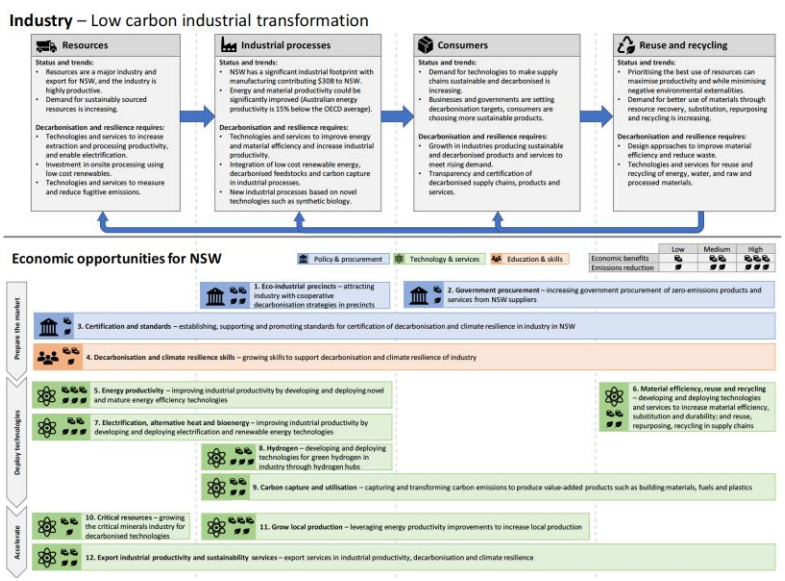
Business opportunities in decarbonization

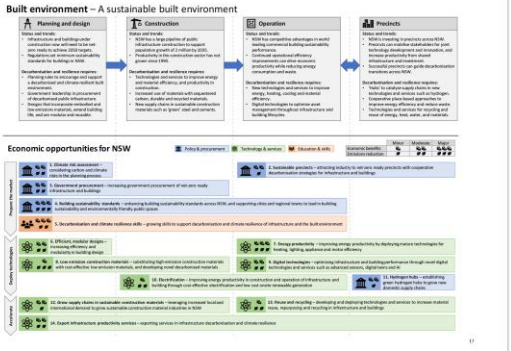
Opportunities for prosperity in a decarbonised and resilient NSW

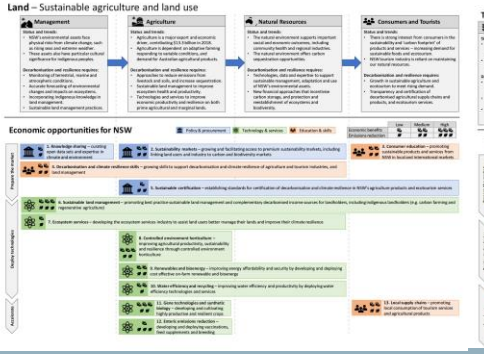
Decarbonisation Innovation Study

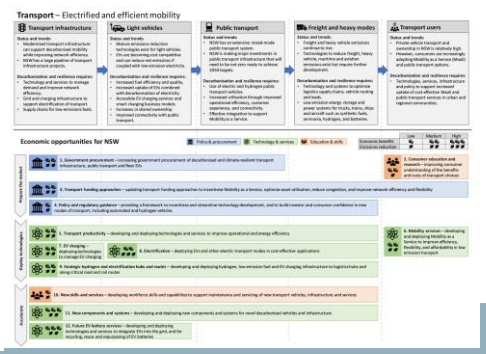
August 2020











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Fiscal stimulus for low-carbon compatible COVID-19 recovery: criteria for infrastructure investment

CCEP Working Paper 2005
June 2020

Frank Jotzo, Thomas Longden and Zeba Anjum
Crawford School of Public Policy, Australian National University

COVID recession recovery: criteria for sensible public investment

Employment	Economic activity and growth	Timeliness
Reduced implementation risk	Low carbon compatibility	Environmental benefits
Social benefits	Resilience	Governance

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COVID recession recovery: promising categories

Renewable energy supply

- REZs; along with expansion of transmission

Energy efficiency in buildings

- esp public housing, public buildings

Selected transport projects

- esp public/active transport ready to be built

Land management / ecological restoration

- esp in bushfire areas

Australian National University

Renewables-based export industries

Hydrogen

- Domestic uses first/foremost?

Ammonia

- Existing fertilizer market, future energy carrier market?
- Synthetic fuels eg incl aviation

Steel

- Potentially very large ‘green steel’ markets

Aluminium

- The simplest ‘green’ commodity

Australian National University
Crawford School of Public Policy
Centre for Climate & Energy Policy

Green hydrogen production costs in Australia: implications of renewable energy and electrolyser costs

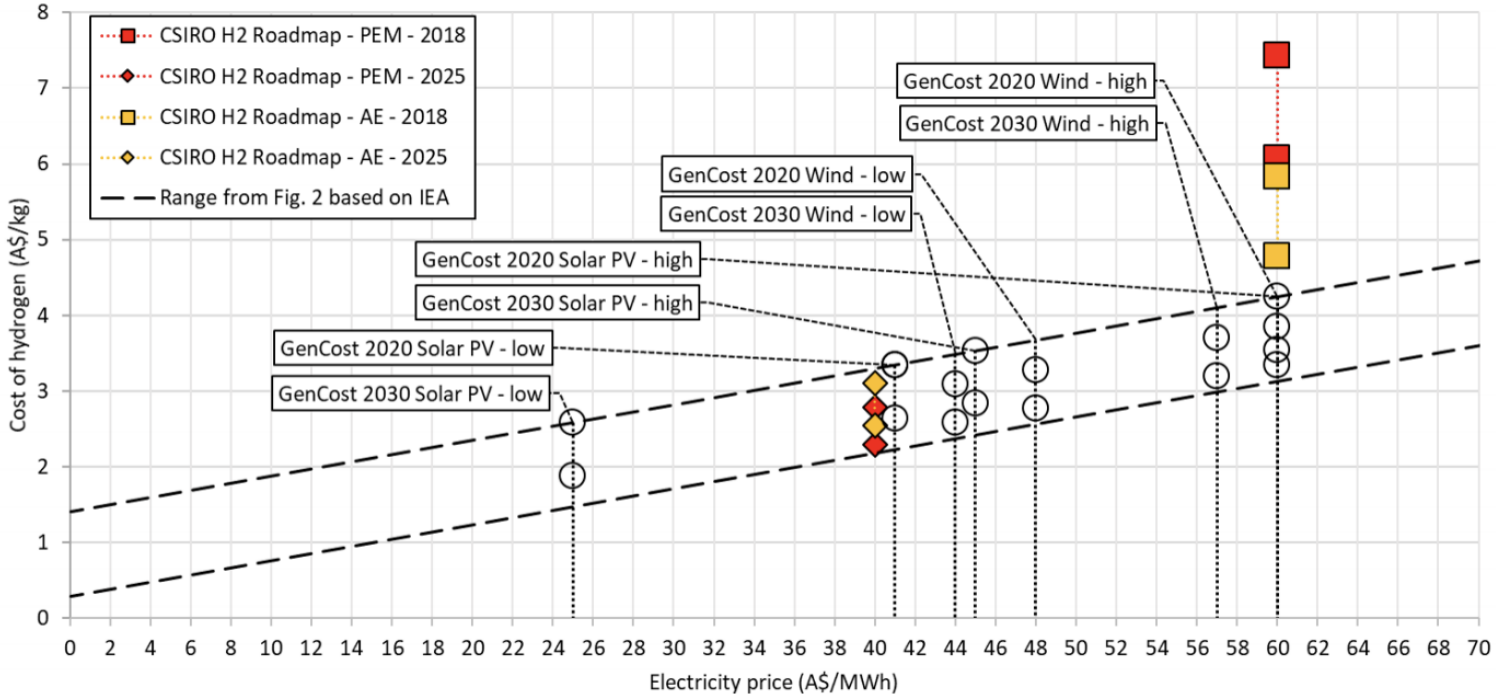
CCEP Working Paper 20-07
August 2020

Thomas Longden, Frank Jotzo, Mousami Prasad, Richard Andrews
Zero-Carbon Energy for the Asia-Pacific Grand Challenge (ZCEAP)
Crawford School of Public Policy, Australian National University

Hydrogen

Green hydrogen rapidly gaining cost advantage, avoid gas/coal lock-in – *beware outdated assumptions*

Figure 3 – Production cost of hydrogen – comparison of price points based on GenCost estimates in the IEA cost model and CSIRO Hydrogen Roadmap



Outlook 2020-21

- Technology statement
  - What will be ***done***, and how?
  - Gas debate a distraction?
- Long-term low-emissions strategy
  - Important not just as COP input, but to focus domestic thinking
- Recession response
  - Productive, low-carbon compatible public investment

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LATROBE VALLEY AUTHORITY

AUSTRALIAN CLIMATE ROUNDTABLE WORKSHOP

Energy transition in the Latrobe Valley

Insights from the Latrobe Valley Authority

10 September 2020

KAREN CAIN
Chief Executive Officer
Latrobe Valley Authority

Department of Jobs, Precincts and Regions, Victoria

Latrobe Valley and Gippsland

Regional context

Gross Regional Product
$9.1 billion

Population
272k

Size
41,556 km2

Major Industries

- Agriculture
- Energy
- Construction
- Healthcare
- Tourism
- Oil and gas
- Manufacturing

Transitioning our economy

History of coal fired power generation

The Latrobe Valley is home to brown coal reserves and has been one of the main sources of power generation in Victoria and south eastern Australia for more than 130 years.

- Privatisation of the State's power network in the mid 90s led to a decline in direct and indirect employment in the region.
- The downgrading of assets and decreased economic benefit to the community is due to upgrade costs and changes in the market.
- All remaining three power stations expected to close over the next 27 years

Transitioning our economy

History of coal fired power generation

In November 2016, Engie announced the closure of the Hazelwood Coal Fire Power Station and Mine by the end of March 2017.

It resulted in a loss of approximately **1000 jobs** with associated supply chain impacted.

Latrobe Valley Authority

Who are we?

- Established in November 2016 by the State Government to respond to the closure of the Hazelwood Power Station
- Our role, to work with and for workers, businesses and the community to transition to a strong future
- And lead the **transition and transformation** of the Latrobe Valley economy and community through response, recovery and long-term strategic work

Latrobe Valley Authority

Who are we?

We work with and for the people of the Latrobe Valley to:

- build on community strengths and capability for the future;
- lead collaboration and innovation;
- draw on and use the best ideas for what works, both locally and from outside the region; and
- support opportunity for all.

Evolving our approach

- We've moved from immediate response and filling gaps to work that will create long-term sustainable system-wide change
- We're creating the local conditions for collaboration, learning from others and testing new ideas for collective benefit

What have we achieved so far?

900 jobs supported by Economic Facilitation Fund (**$10m**)

$20 million for community funding supporting **232 projects**

1263 businesses receiving incentives under the Economic Growth Zone

Community

1,000 home energy upgrades

Business

20 Major events and a range of community development activities delivered

1,436 jobs supported by Back to Work (**$3m**)

$266m Support Package

Major sports infrastructure including upgrades and new facilities

76 businesses signed up to GROW Gippsland

350 participants in 13 Youth Space programs

Business support service providing **$1.9 million** for **195** early stage businesses

Workers

1,488 clients supported by Worker Transition Service

51 participants in Ladder Step-Up program

1,368 loans provided through Good Money on no or low-interest terms

1,040 businesses signed up to Gippsland Business Connect

90 workers transferred to other power stations

20 Industry partners and **18** schools involved in **Broadening Horizons**

200 candidates undertaking Micro-credentialing of enterprise skills

Construction of Hi-Tech Precinct Gippsland **nearing completion**

GROW People supporting inclusive employment

112 people engaged in the **Access New Industries Program**, customising training for entry to jobs in growth industries

Internationalising education

Immediate response

Worker Transition Service

Delivery model

WORKER TRANSITION SERVICE

Creating a plan

We work with you to plan for your future.

This may include

- Help with looking for a job
- Understanding your training needs
- Starting or growing your small business
- Getting your finances on track
- Personal and family support

Checking back in

Reconnecting to ensure your needs are being met

Delivery partners

- Gippsland Trades and Labour Council
- TAFE Gippsland Skills and Jobs Centre
- Employment providers
- Adult education providers

Supporting Workers

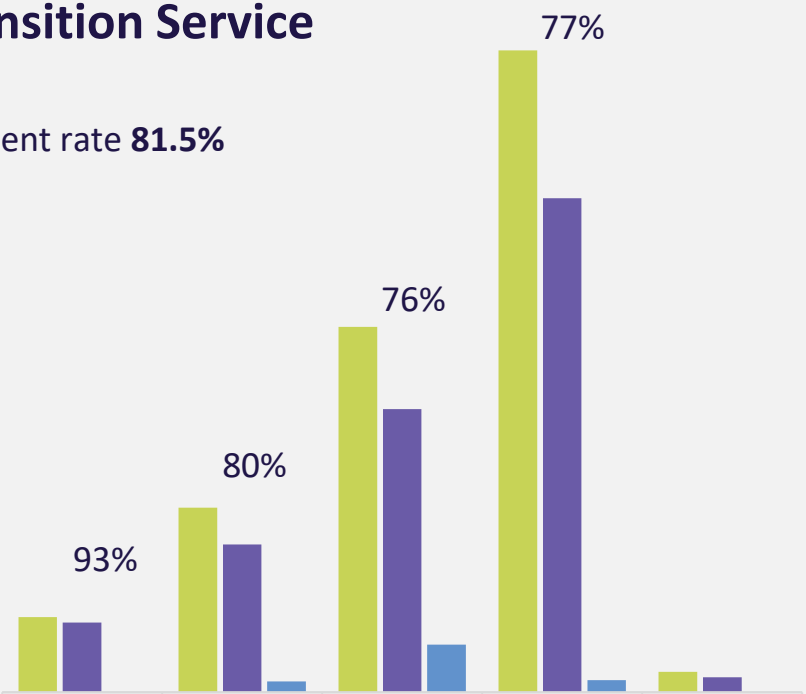
Delivery highlights

Worker Transition Service

Service highlights

Worker Transition Service clients

Overall employment rate **81.5%**



	ASH	Carter Holt Harvey	Engie	Hazelwood Contractor	GROW People
Registrations	55	135	267	469	15
Employed	51	108	207	361	11
Not looking for work	0	8	35	9	0

Strategic & sustainable growth

World's best practice

Smart Specialisation in Gippsland

The Smart Specialisation approach was pioneered by the European Union and has been applied and refined over two decades in more than 120 places at differing scales – from rural communities to whole cities and regions.

- The main focus of this work is to build on a region's unique assets and maximise opportunity for innovation.
- It is a platform to target investment – the EU has provided more than $77 billion in funding to support activities based on local strengths.

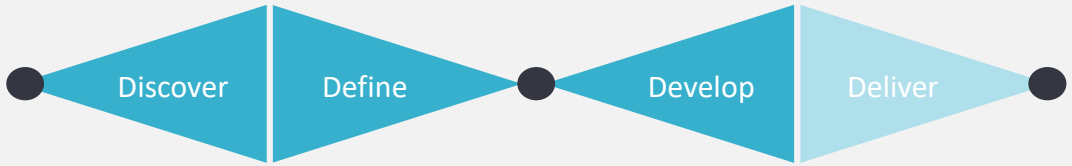
- Central to the approach is government, education, industry and the community working together to identify and develop local strengths and long-term growth strategies.
- Linking industry with government, community, education and research enables greater emphasis on collaboration and innovation and provides longer-term solutions.

New energy in Gippsland

Progress to date

The traditional centre of energy production in Victoria, Gippsland's extensive electricity infrastructure and transmission network are significant assets which provide opportunities for new renewable energy generation.

Engagement in the design process



164 people **discovering** opportunities

609 people **defining** opportunities

1220 people **developing** opportunities

Four themes have been identified as areas of potential competitive advantage:

Smart grids

Innovation opportunities

- Pre-feasibility study underway into on how Heyfield and Loch Sport might develop local grids
- Scan of the global market looking at smart grids and how we can learn from them

Bioenergy

Innovation opportunities

- Research underway to determine bioenergy potential in Gippsland.
- Bioenergy development framework being developed to support stakeholders navigate the planning and regulatory process

Geothermal

Innovation opportunities

- Research into uses for geothermal is underway to identify potential opportunities in Gippsland.
- 3D case study of the Gippsland Regional Aquatic Centre is being developed to highlight geothermal opportunities

Community energy

Innovation opportunities

- Pre-feasibility study underway on how Phillip Island might achieve its 100% Renewable by 2030 goal.
- Latrobe Valley Power Hub researching the potential of reusing mid-age solar PV panels and reduce solar panel e-waste.

Lessons learned

Latrobe Valley Authority

- Importance of community based team with resources, authority and flexibility backed by state
- Strong frameworks for operating that focus on what matters to people, collaboration and solutions
- Need for timely preparation, strong data and evidence base for informed collective decisions
- Being prepared for long term commitment and willingness to challenge status quo including the way government operates

LATROBE VALLEY AUTHORITY

Thank you.

Questions?

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