



**SMART ENERGY COUNCIL**

# AUSTRALIA'S QUEST TO BECOME A **CLEAN ENERGY** **SUPERPOWER**

REvision2024



# Critical path to Net-zero

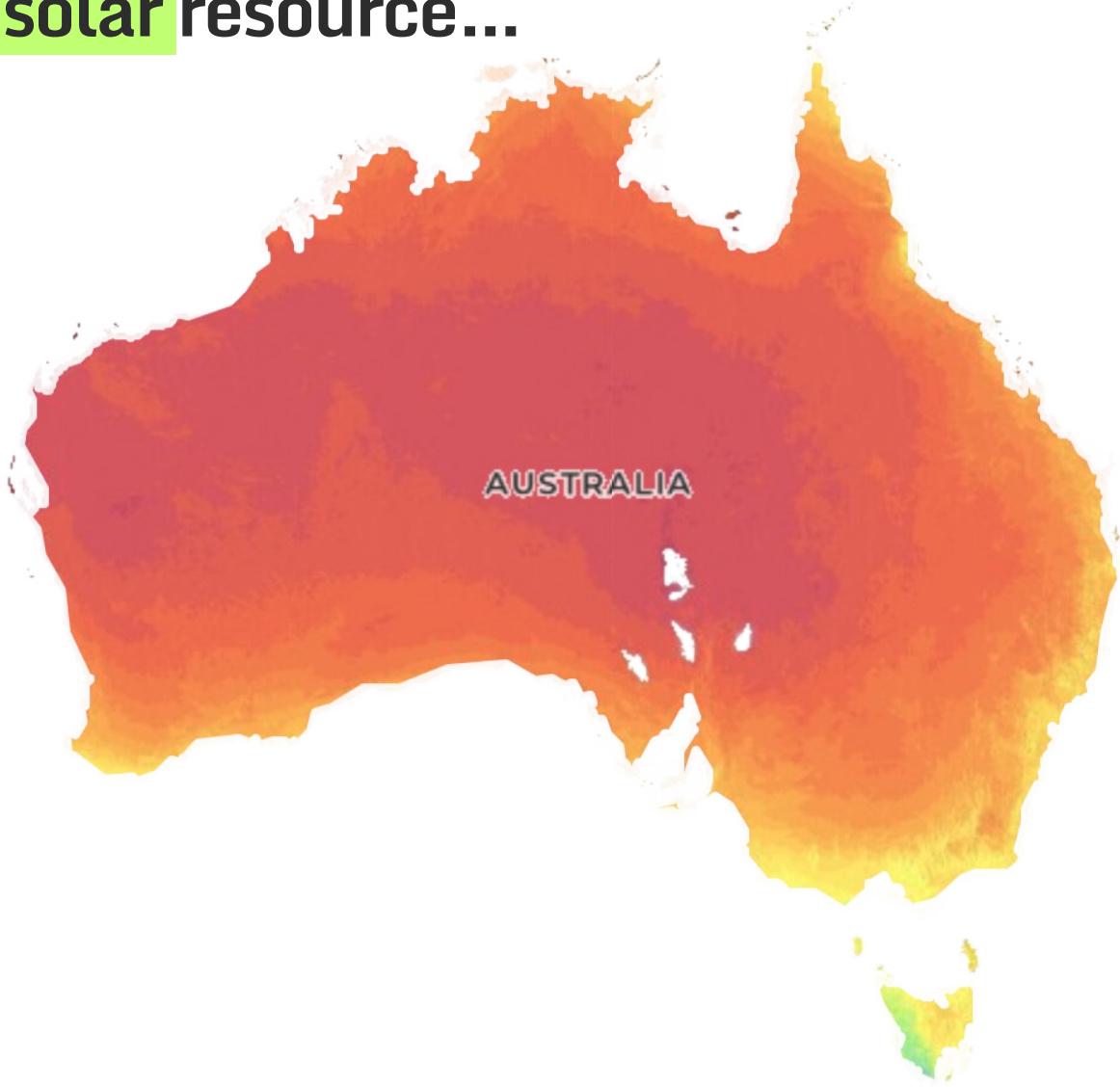
Replace  
fossil fuels /  
electrify  
everything



‘green’ electrons wherever possible

‘green’ molecules for the remainder

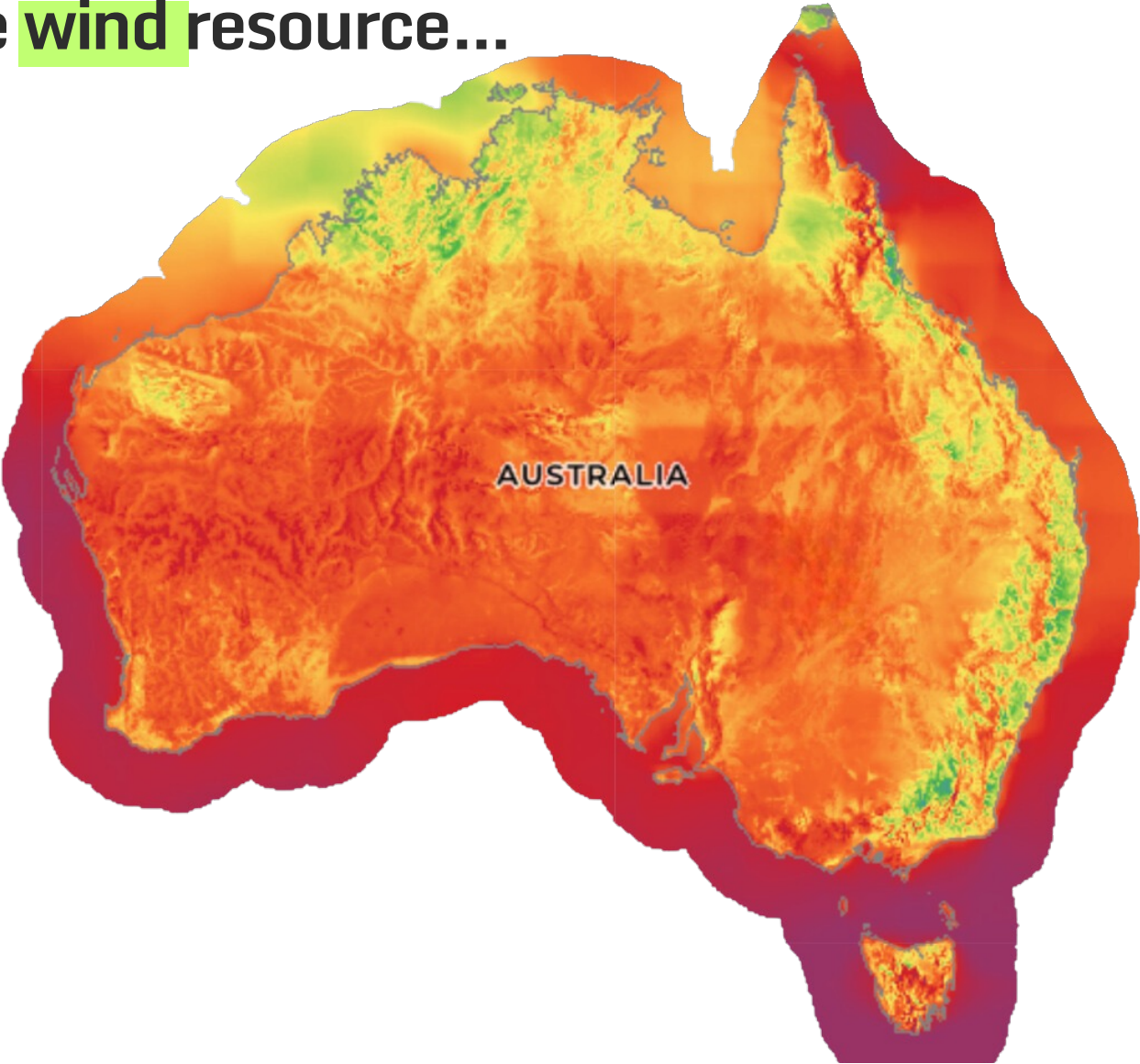
# Incredible solar resource...



Source  
globalsolaratlas.info



# Incredible **wind** resource...



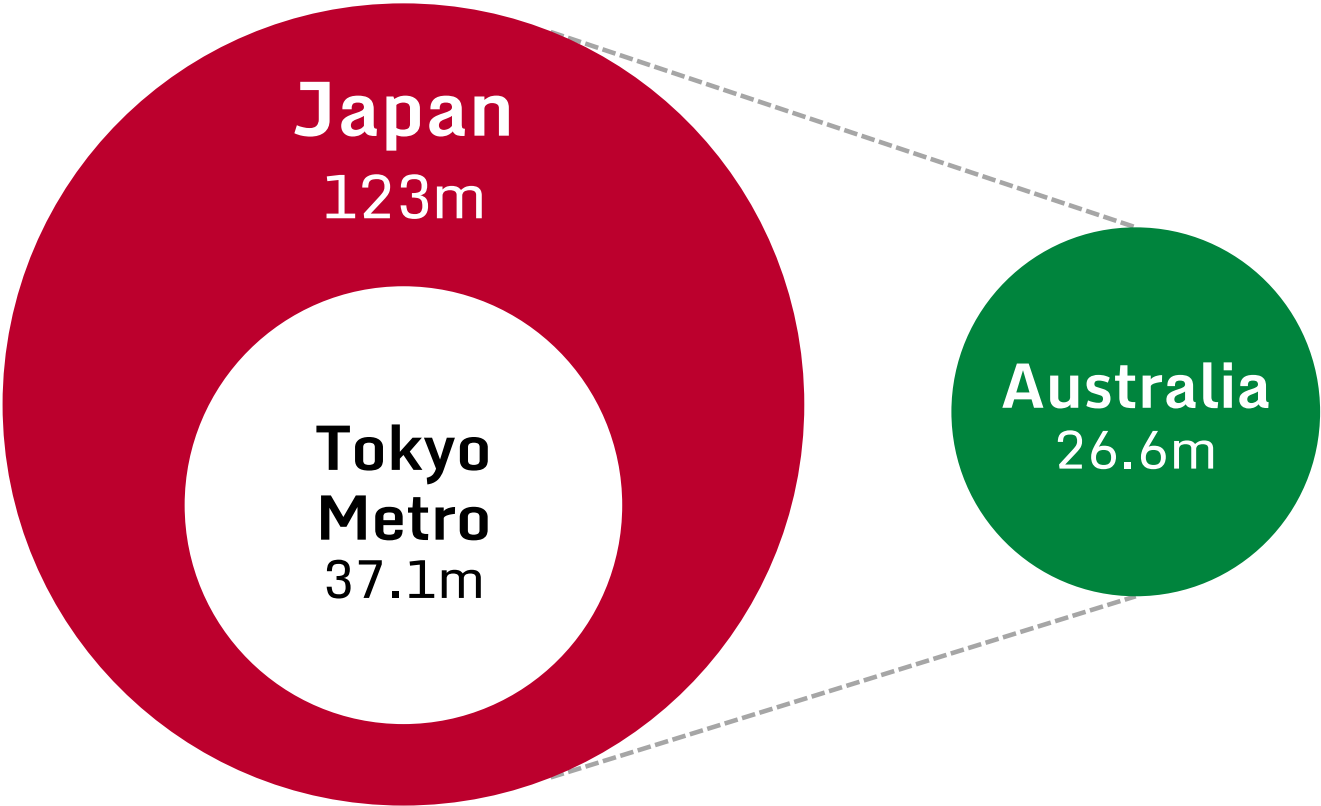
Source  
globalwindatlas.info



A **big** country...



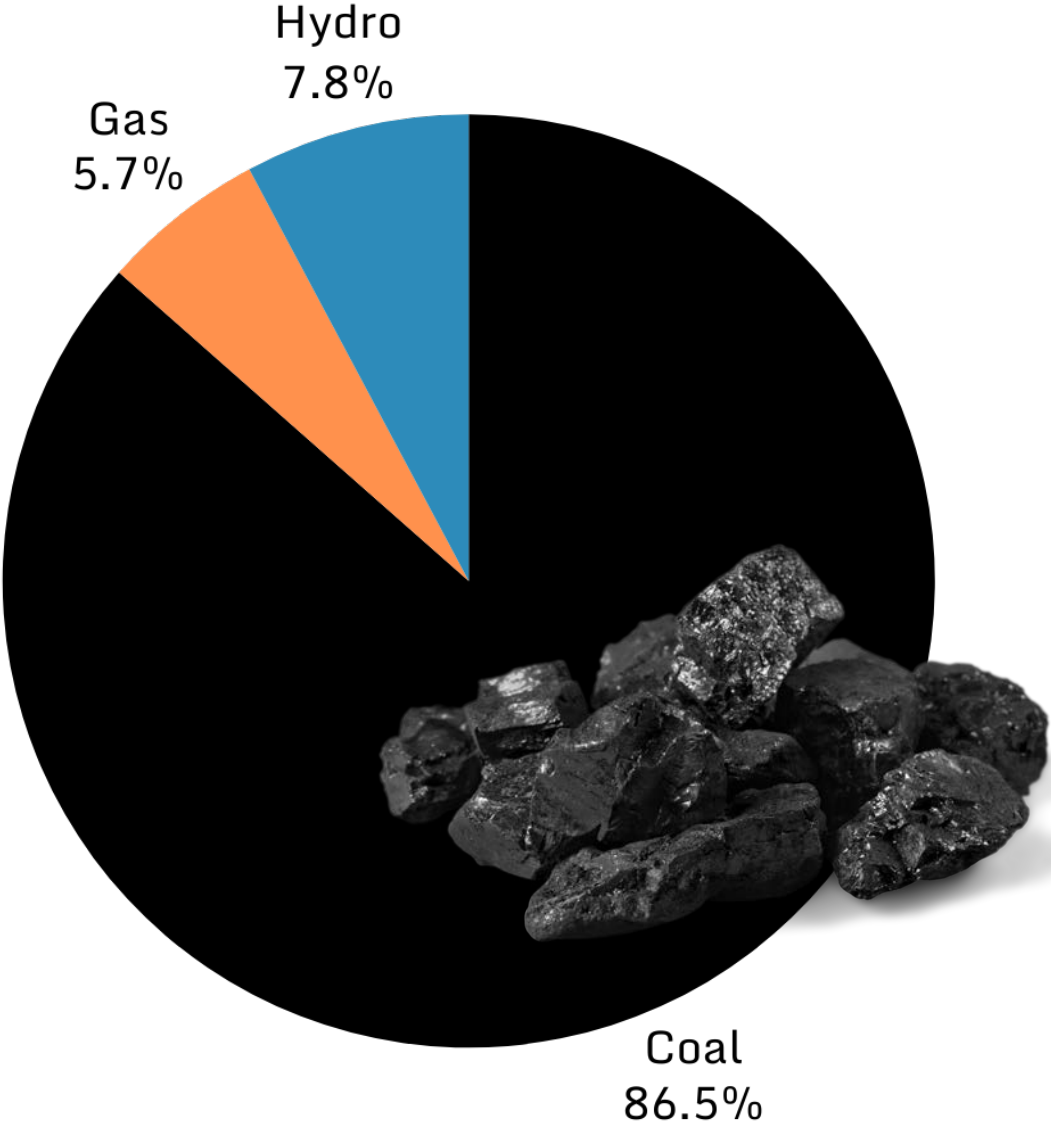
# A **small** population



Source  
The Superpower  
Institute  
OpenNEM



# Electricity in 2006



Source  
The Superpower  
Institute  
OpenNEM



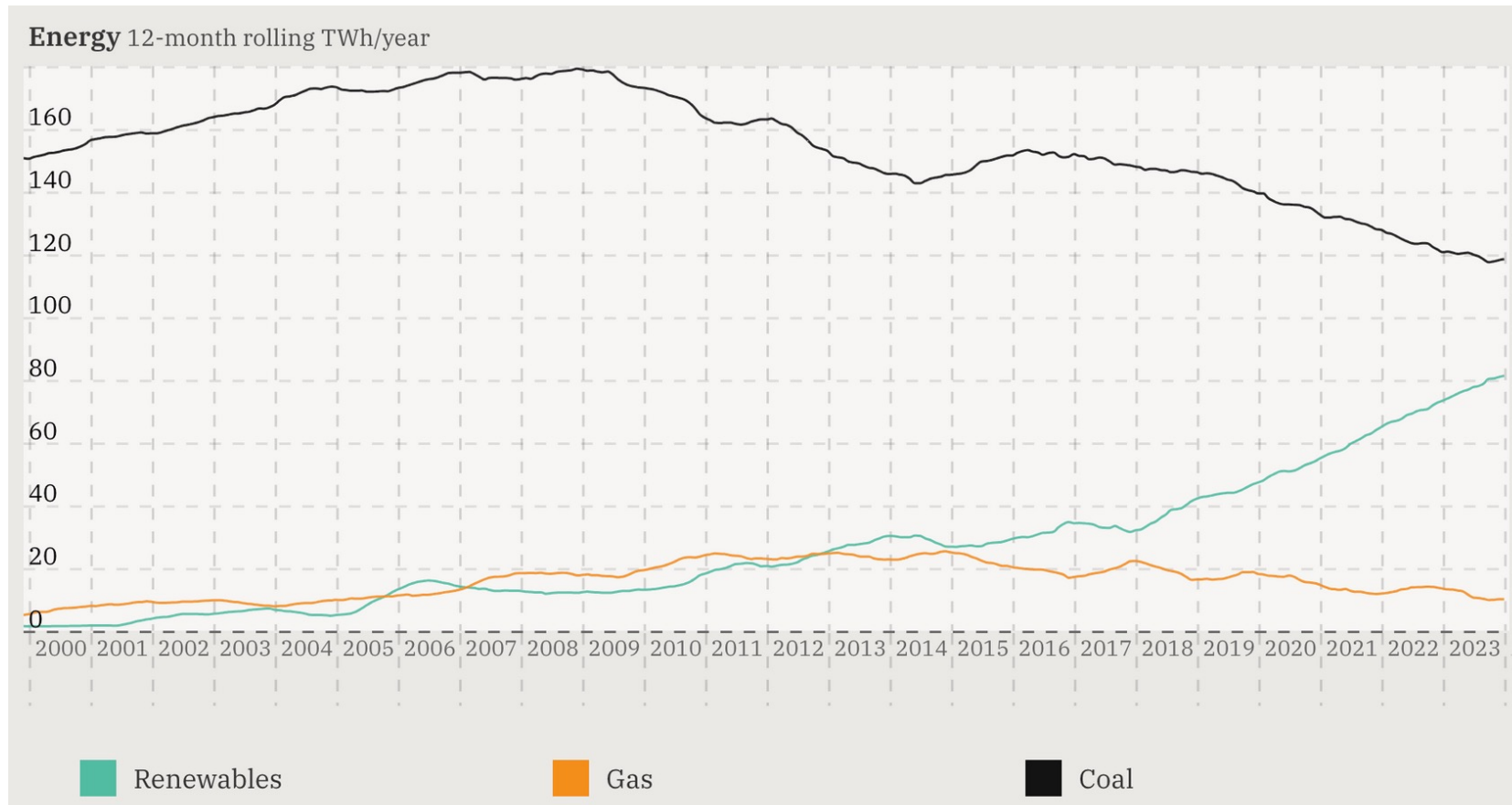
# Renewables sneaking up on coal

Crossover in ~2026?

Source

The Superpower  
Institute

OpenNEM





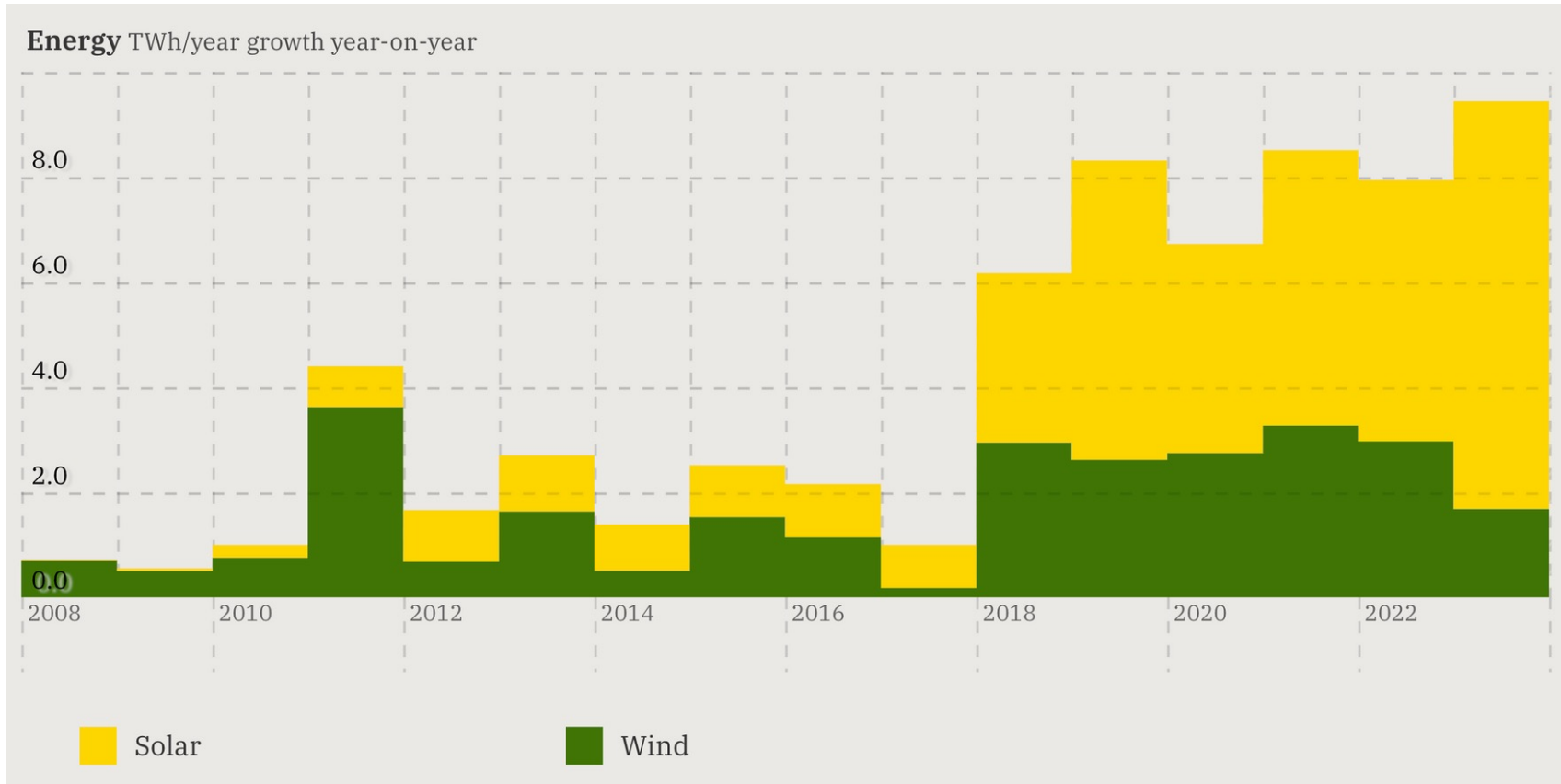
# Renewables growing

Wind and solar generation growing each year, and the growth is growing.

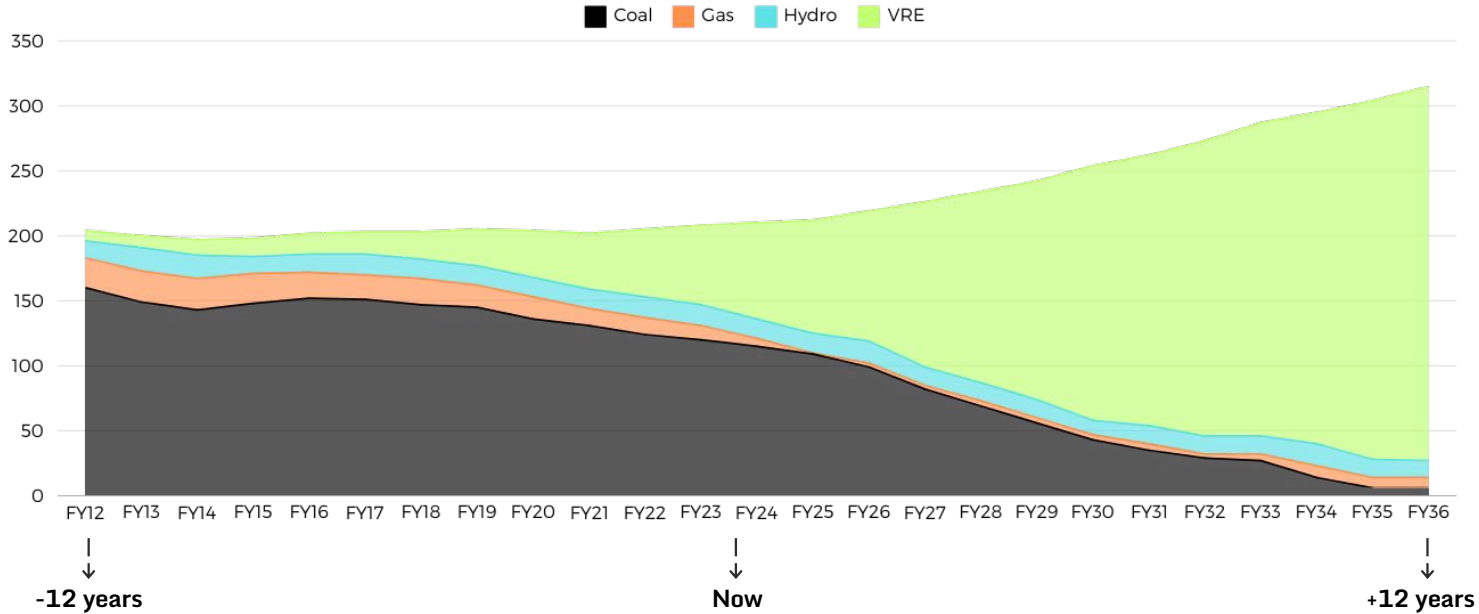
**Source**

The Superpower  
Institute

OpenNEM



# We're well on the way...



Renewables	10%	39%	95%
Coal power stations	27	15	1
Emissions	175 MtCO2	124 MtCO2	9 MtCO2

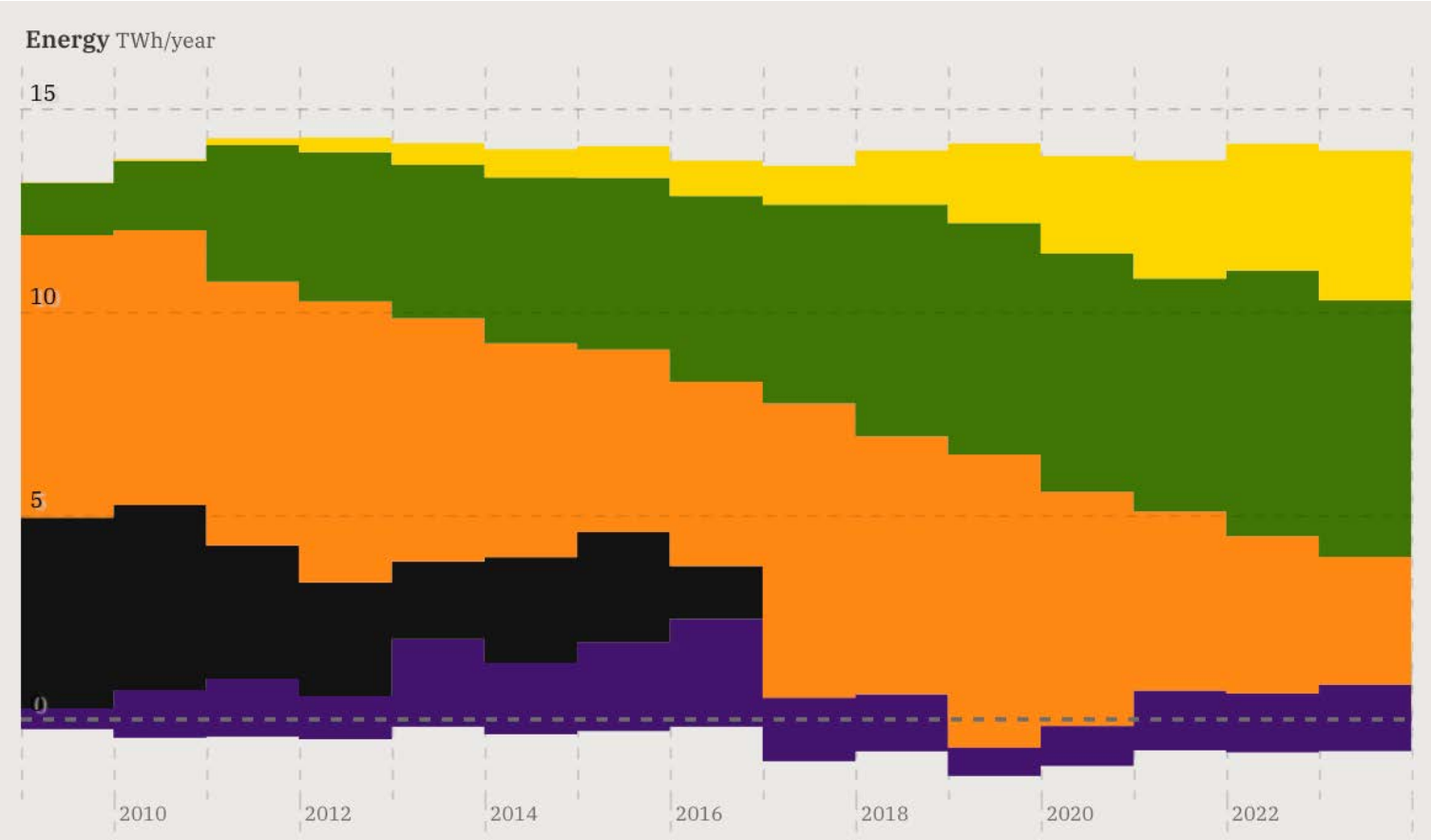
**Source**

AEMO  
2024 Draft  
Integrated  
System Plan



# South Australia – a leading light

Source  
The Superpower  
Institute  
OpenNEM



# SA grid emissions falling

South Australia falls from ~800 to ~228 kgCO<sub>2</sub>e/MWh in 15 years.



**Source**  
The Superpower  
Institute  
OpenNEM



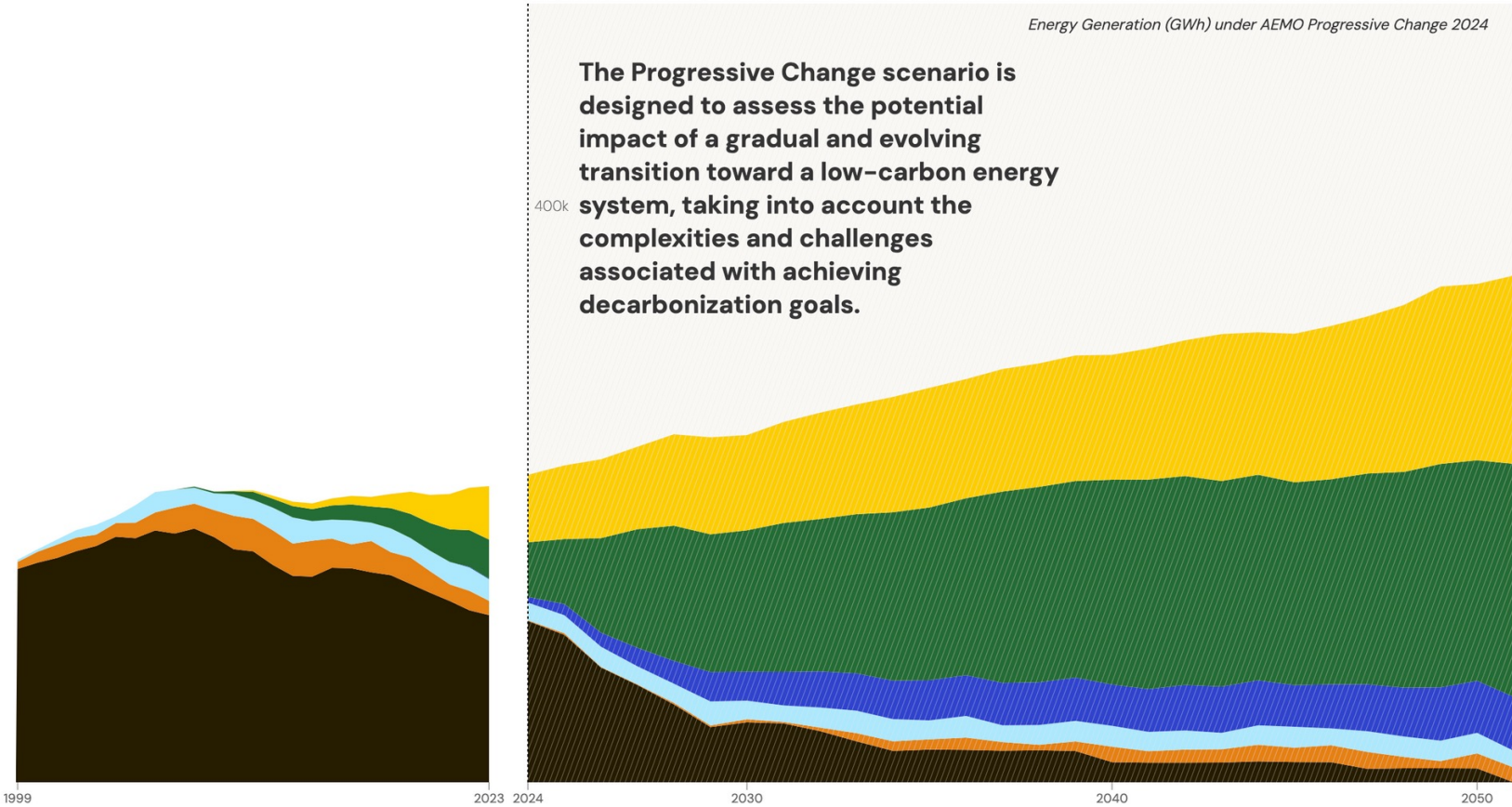
# SCENARIOS



# AEMO Integrated System Plan



# Progressive Change



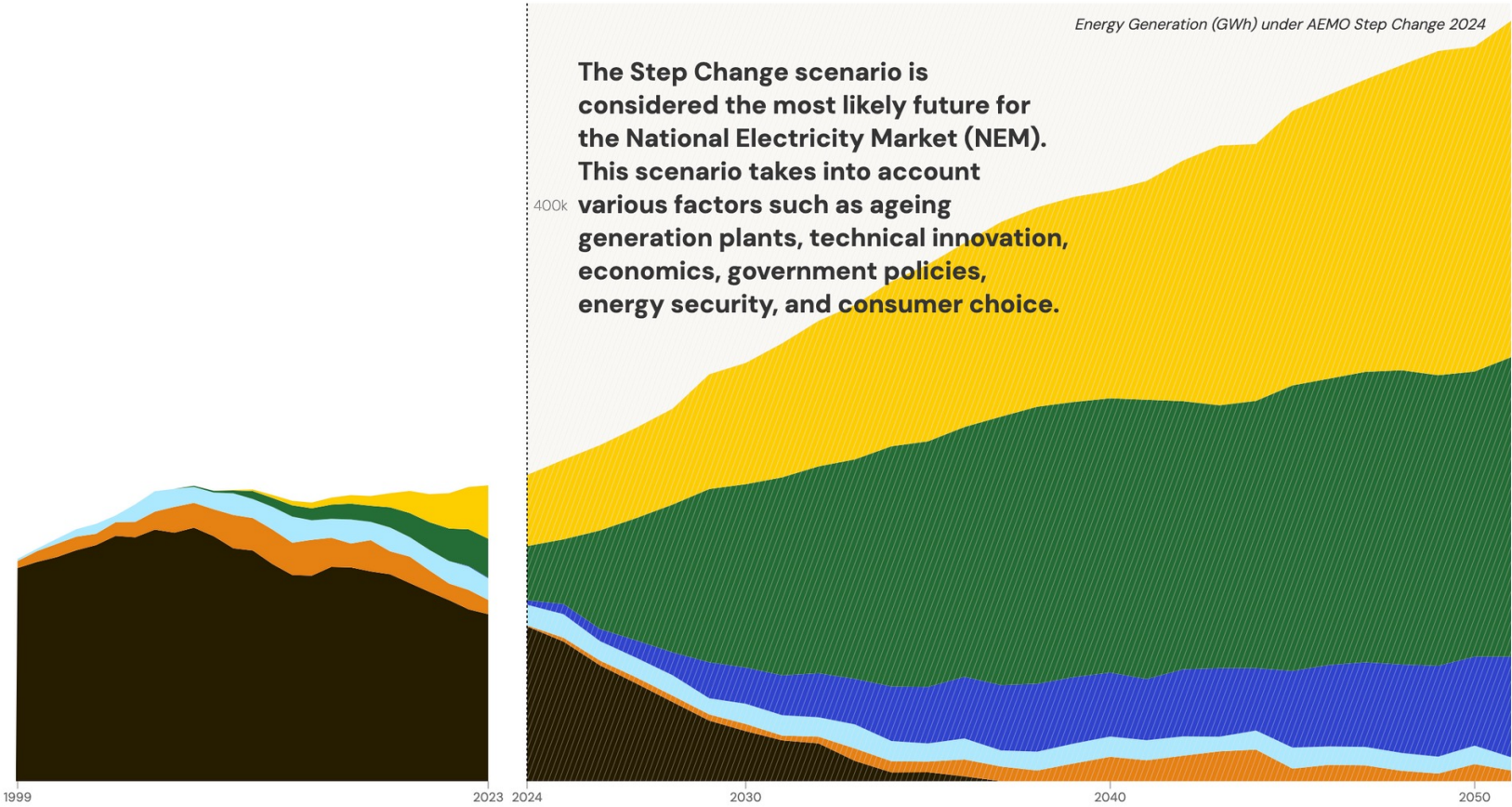
**Source**

AEMO 2024 Draft Integrated System Plan

via  
**The Superpower Institute**



# Step Change



**Source**

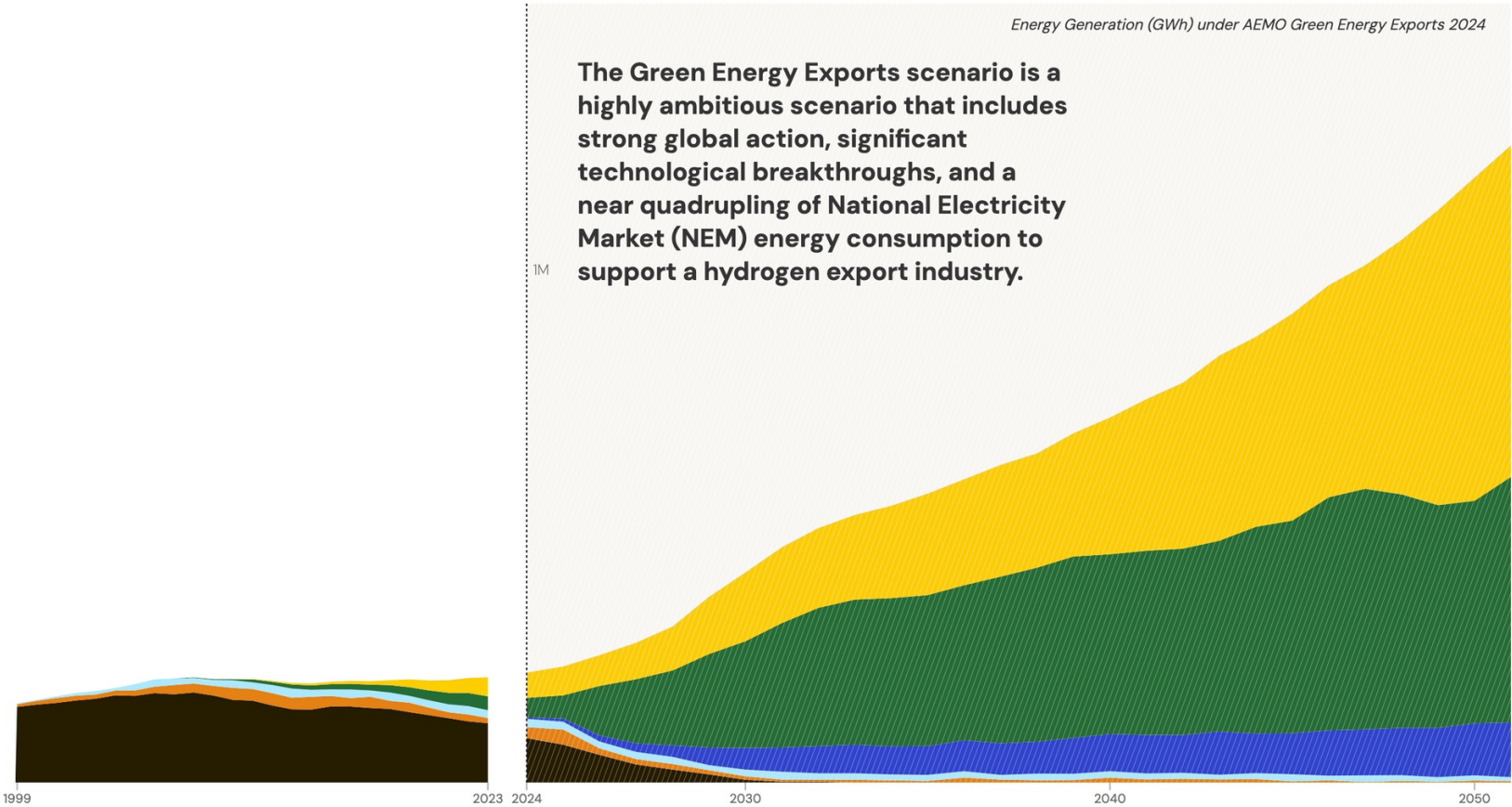
AEMO 2024 Draft Integrated System Plan

via  
**The Superpower Institute**





# Green Energy Exports



**Source**

AEMO 2024 Draft Integrated System Plan

via  
**The Superpower Institute**

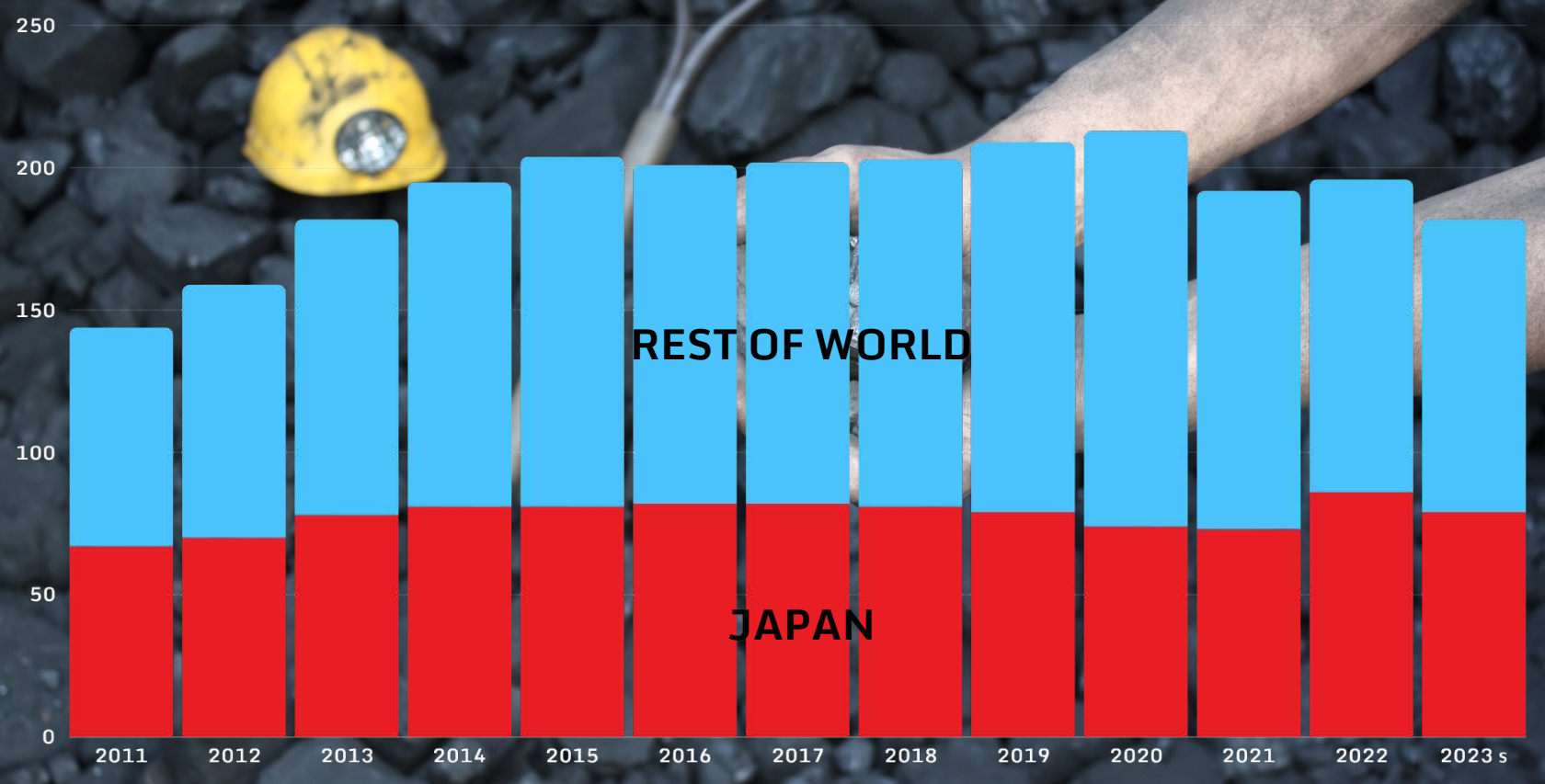


# SUPERPOWER



# Australian thermal coal exports

million tonnes

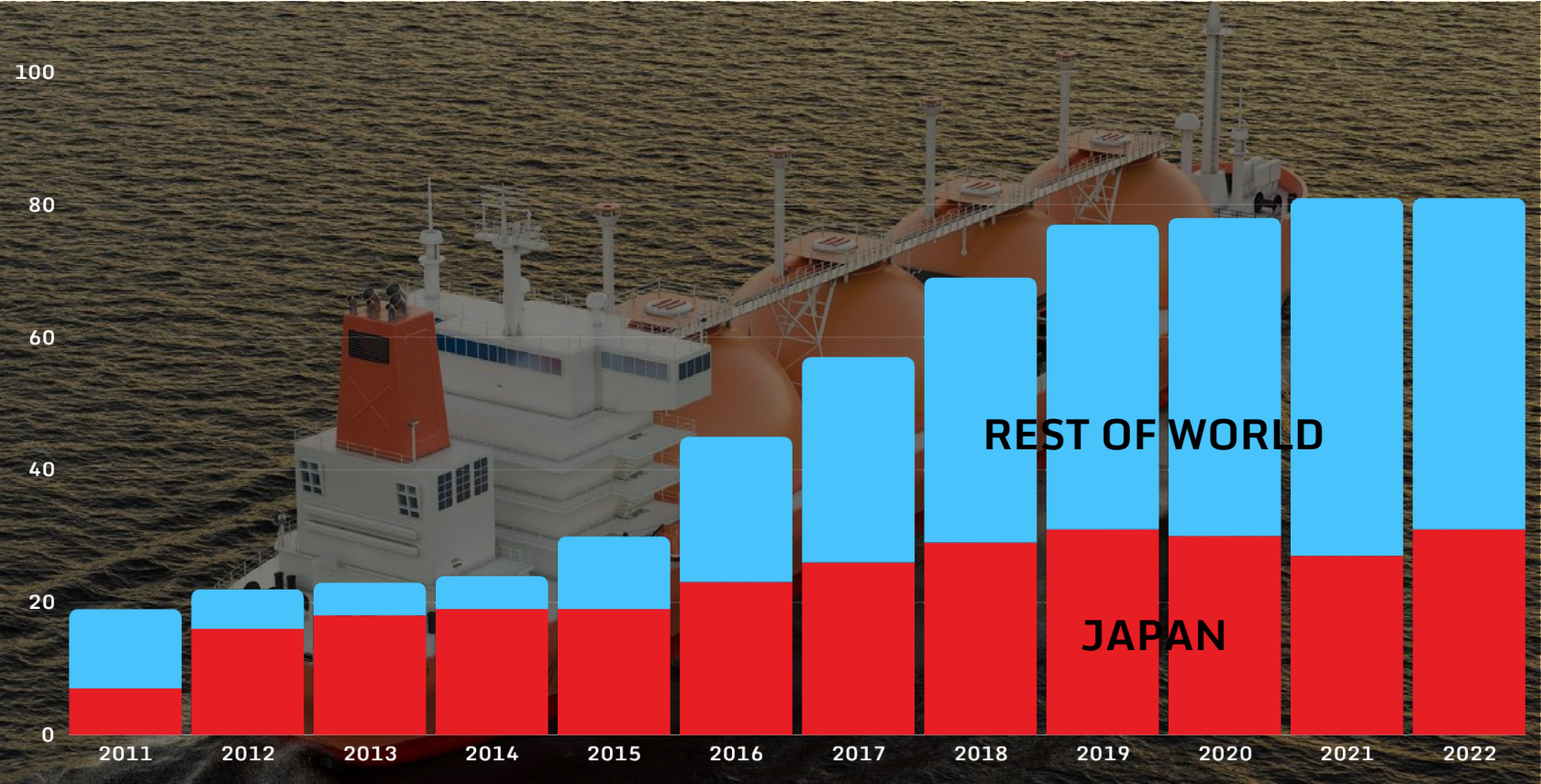


**Source**  
Office of the Chief  
Economist  
Resources and  
Energy Quarterly  
December 2023



# Australian LNG exports

million tonnes



**Source**

Office of the Chief Economist

Resources and Energy Quarterly

December 2023





Australia  
can directly  
remove over  
**8%**  
of global  
emissions.

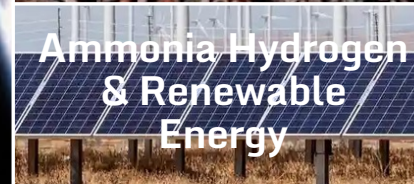
RESOURCE

REDUCTIONS



Iron Ore &  
Aluminium

3-4%



Ammonia Hydrogen  
& Renewable  
Energy



Energy Transition  
Minerals



Biomass for  
Industry & Land

Australia is the **only country** with **all critical** battery minerals.

29 <b>Cu</b> Copper 63.546	27 <b>Co</b> Cobalt 58.9332	66 <b>Dy</b> Dysprosium 162.50	6 <b>C</b> Carbon 12.011	28 <b>Ni</b> Nickel 58.6934
77 <b>Ir</b> Iridium 192.22	3 <b>Li</b> Lithium 6.941	25 <b>Mn</b> Manganese 54.938	60 <b>Nd</b> Neodymium 144.24	78 <b>Pt</b> Platinum 195.08

Australia is source of **80%** of Tesla's lithium and **40%** of its nickel and copper.

Australia is the world's

- #1 producer of lithium
- #3 producer of cobalt
- #4 producer of rare earths.

Australia produces large quantities of

- aluminium
- nickel
- copper ores.

Australia has the world's largest resources of wind and solar energy, needed to produce the 'green' commodities of the transition.

# Australian lithium exports

Spodumene kilotonnes



**Source**

Office of the Chief Economist

Resources and Energy Quarterly

December 2023



# Local lithium processing gets going

lithium hydroxide kilotonnes



## Source

Office of the Chief Economist

Resources and Energy Quarterly

December 2023





# Suncable



Source  
Suncable



# AREH: Green ammonia exports...

Source  
CWP Global

## 26 GW HYBRID GENERATION



10  
GW

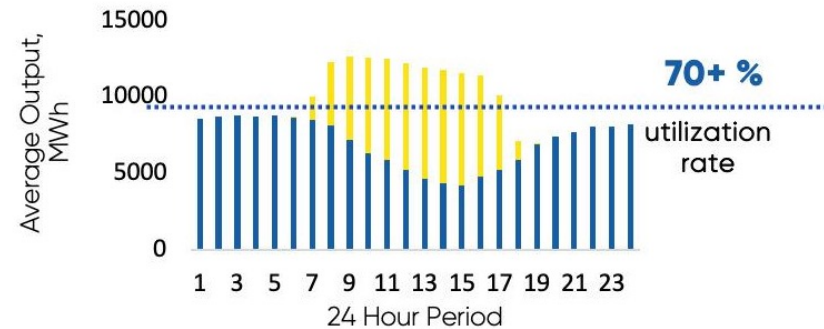
2,400  
kWh/m<sup>2</sup>/year



16  
GW

8.7  
m/s

## COMPLEMENTARY GENERATION PROFILES



The Asian  
Renewable  
Energy Hub  
Nyangumartamili  
wanga! pa janyja

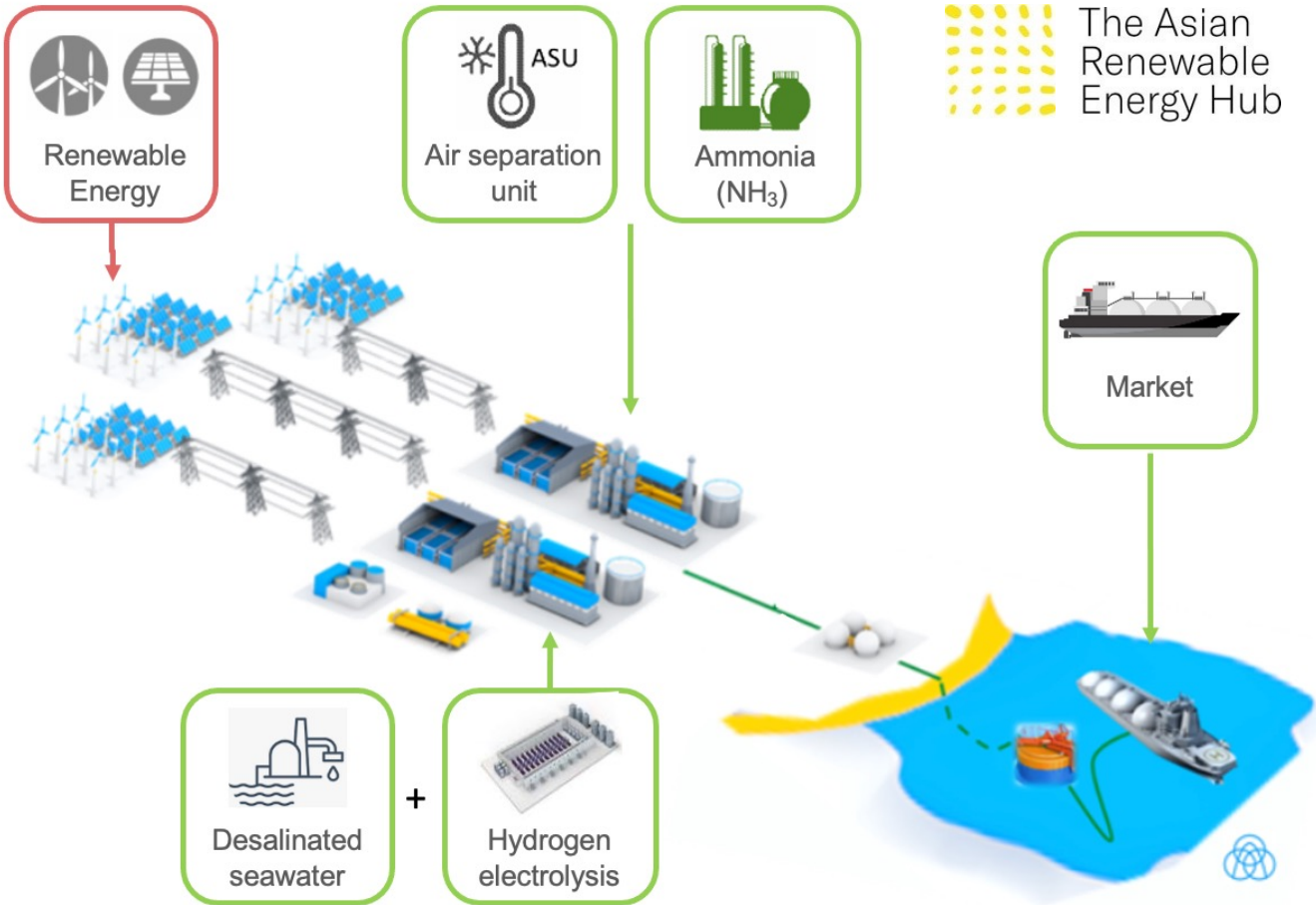
**PROJECT AREA**  
6,598 km<sup>2</sup>

- Mature project, started in 2015
- First 15 GW permit received in Oct-20 ([link](#))
- Major Project Status granted by Australian Government in Nov-20 ([link](#))
- 3 GW of inexpensive, carbon-free power to be made locally for domestic industry
- Ultra-cheap green hydrogen and green ammonia for export \$4b - \$5 b pa



# AREH: Green ammonia exports...

Source  
CWP Global



# Polysilicon proposal

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## Quinbrook announces green polysilicon manufacturing plant in North Queensland

Renewables investor Quinbrook Infrastructure Partners has announced plans to develop a green polysilicon manufacturing plant in North Queensland's Lansdown Eco-Industrial Precinct. Quinbrook has been conditionally allocated a 200-hectare at the site, and is looking for an operational partner to complete the vertical play.

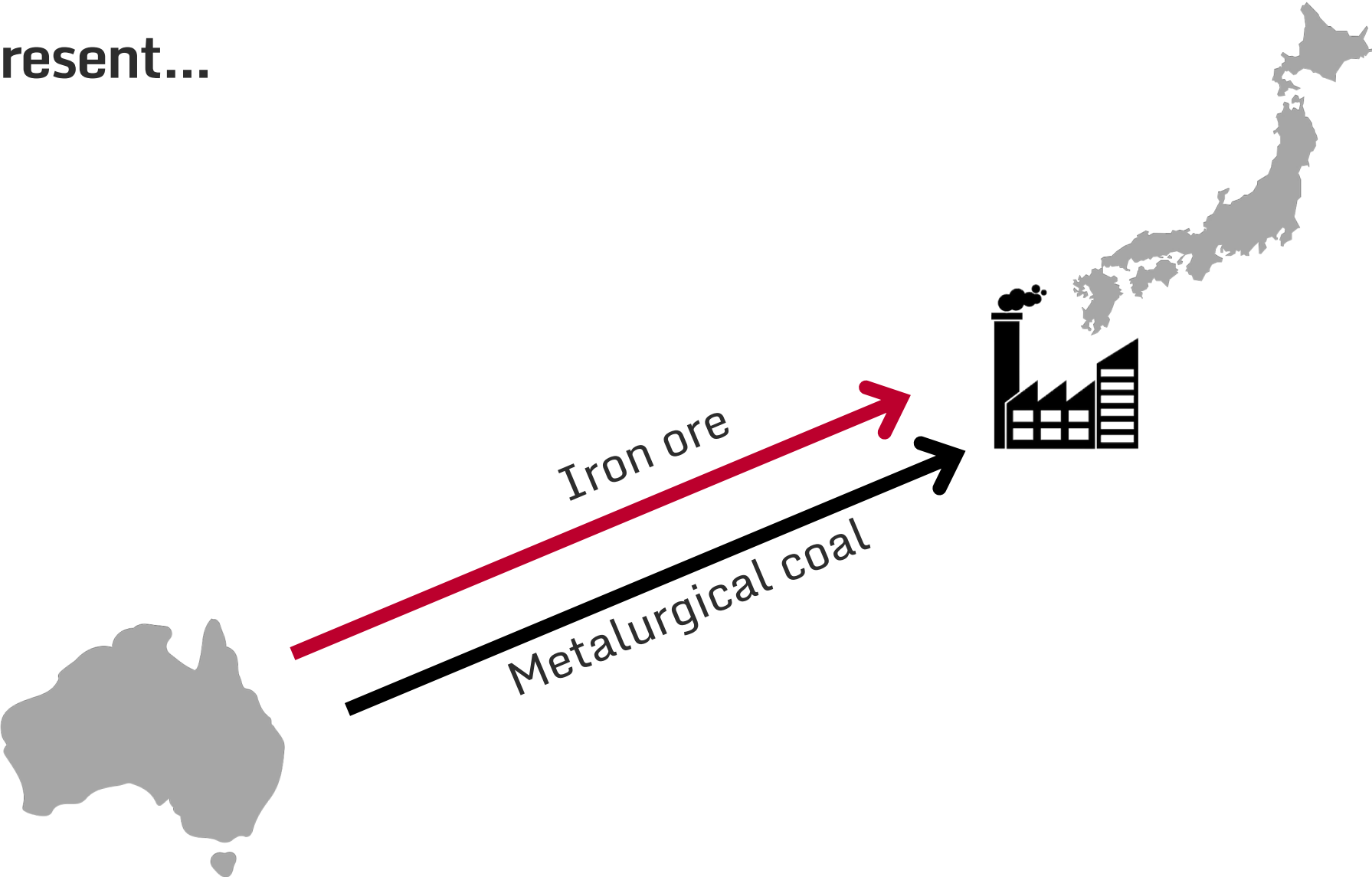
OCTOBER 31, 2023 **BELLA PEACOCK**



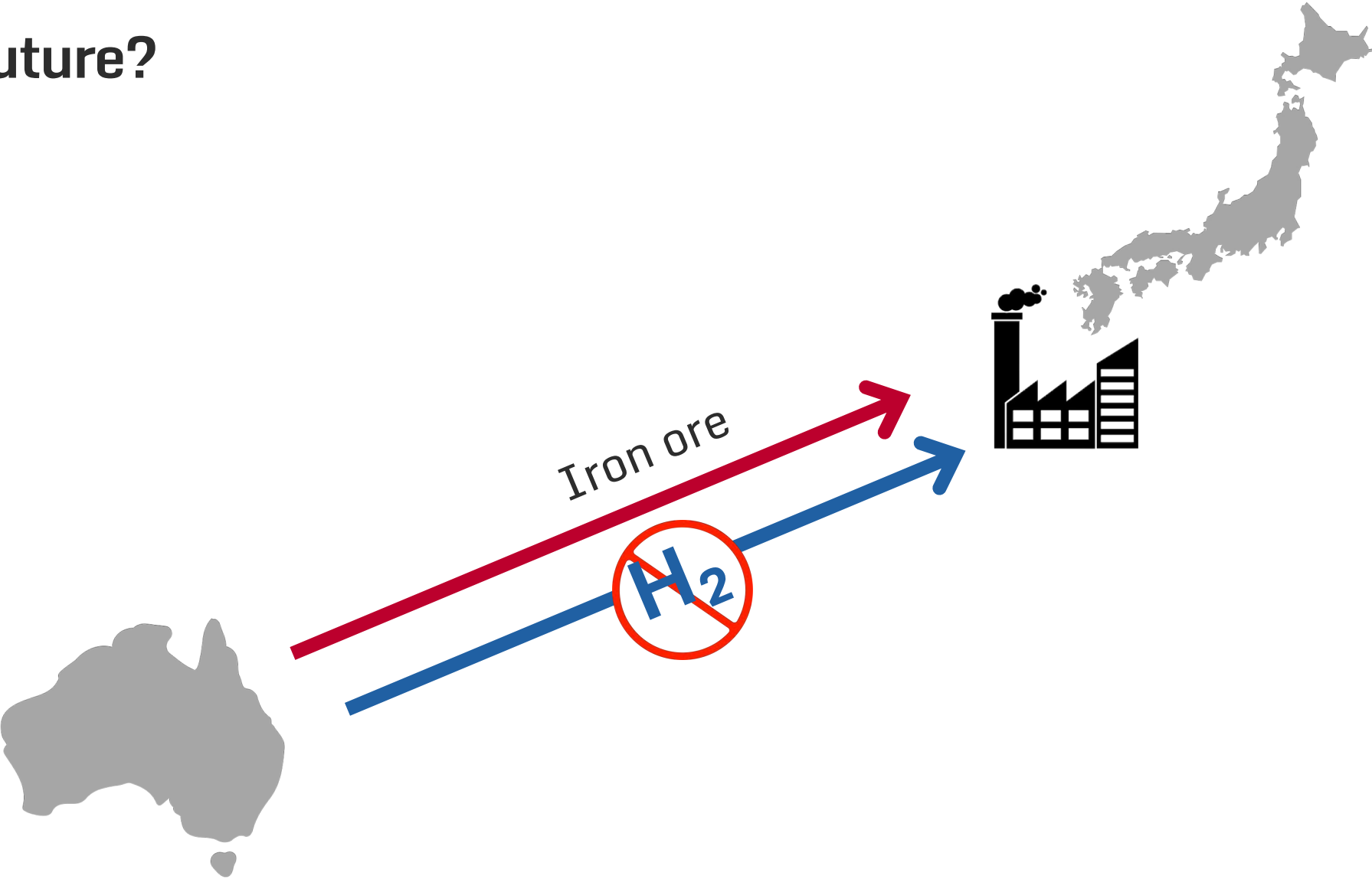
Artists impression of Lansdown Eco-Industrial Precinct  
*Image: Queensland government*



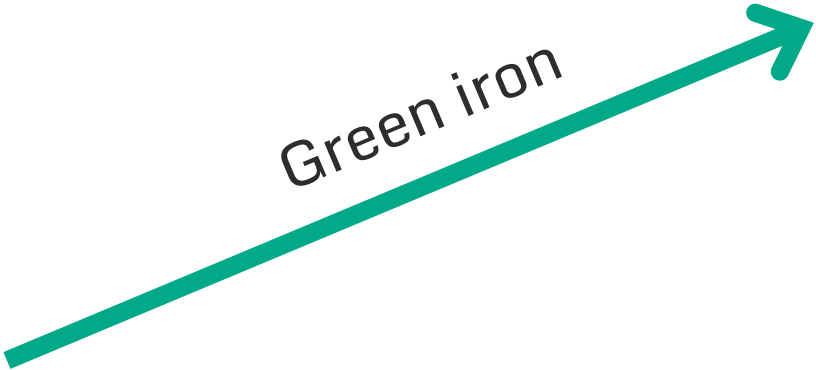
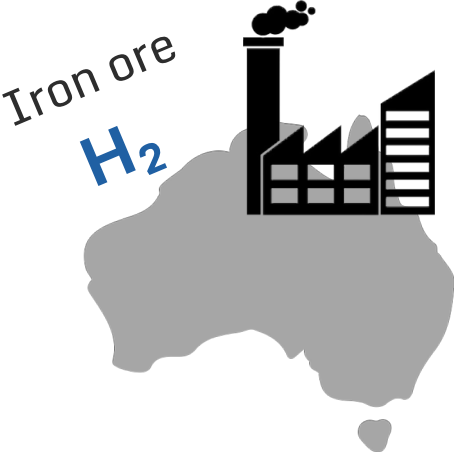
# The present...



# The future?



# The future!



Green iron

