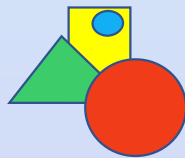


Nuclear in Australia



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FAILURE: Imminent and Avoidable

Triggers:

1) Lowering **GRID** Energy Density (AEMO)

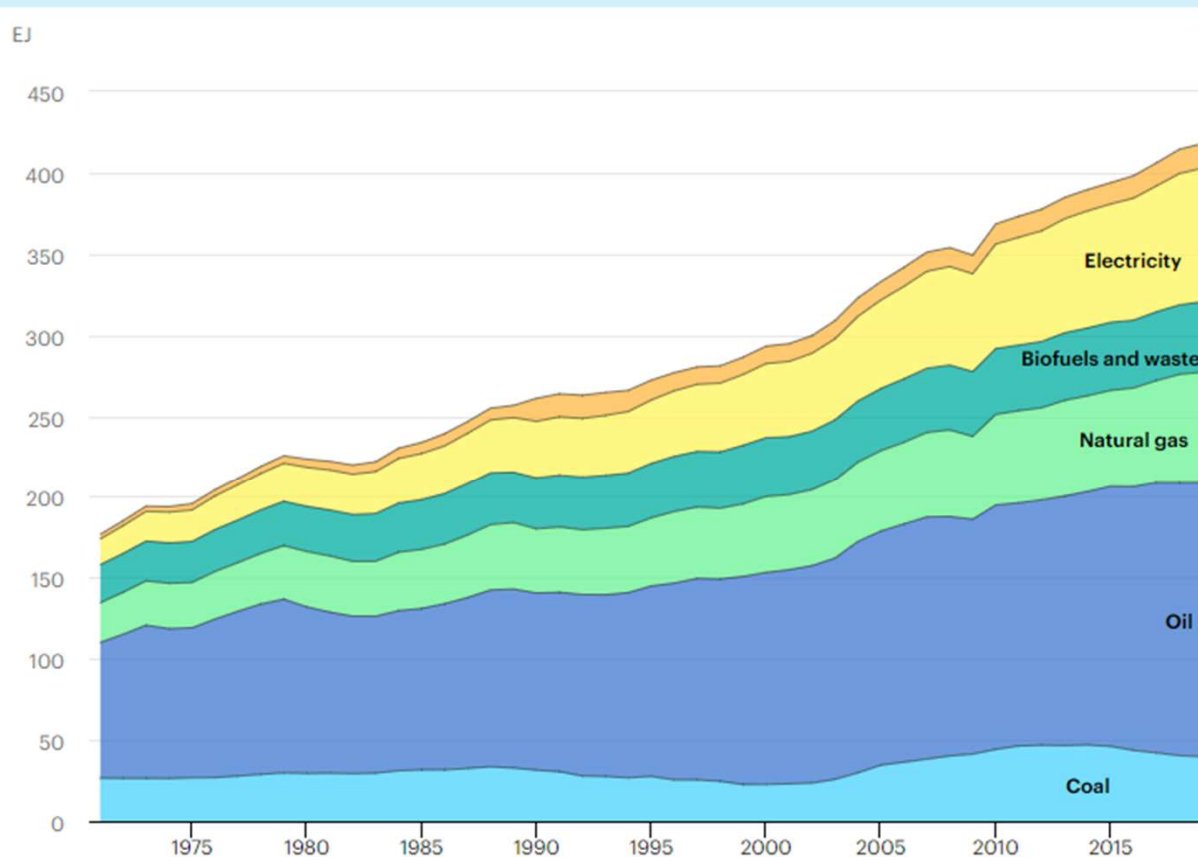
- Grid Transmission: A Highway NOT A School Bus Route
- Batteries are Buckets (not renewable, deep discharge – short life)

2) Societal Responsibility

- Solar – **not** available at night...
- Wind – **highly correlated** in South and Eastern Australia

Energy: World Final Consumption

(Key World Energy Statistics 2021, IEA, Paris)



The Challenge: Energy or Electricity?

To confuse electricity with energy:

1. Seriously underestimate the challenge
2. We need massive increases in **electrons**
3. Dilute sources distract

Energy including Electricity

Australia

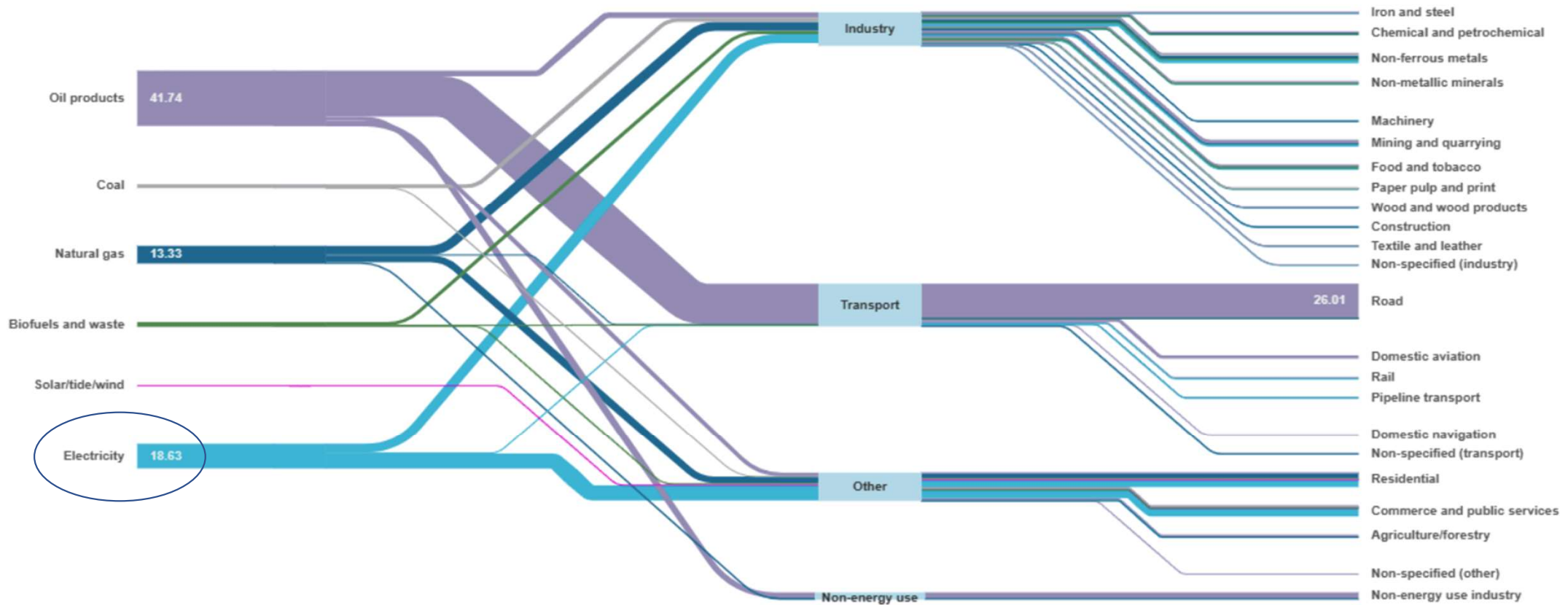
FINAL CONSUMPTION (2020)

Millions of tonnes of oil equivalent ▼

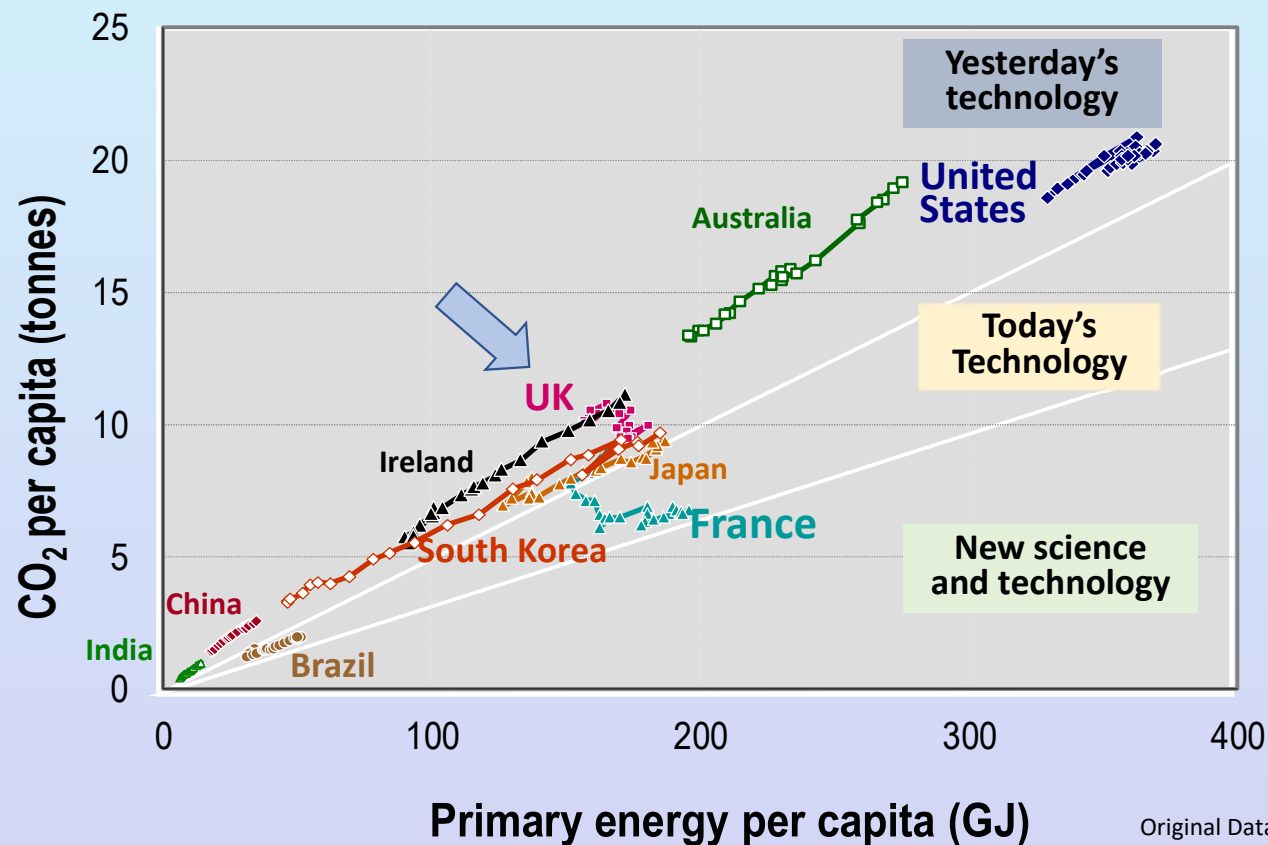
iea

Total final consumption
(80.65 Mtoe)

Consumption by sector



30-years: Countries CO₂ vs Primary Energy



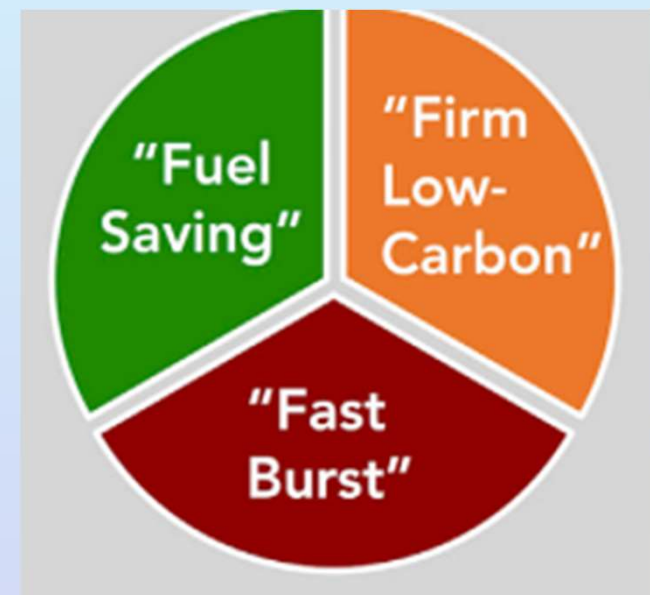
A New Paradigm: Beyond Baseload

Gencost 2022-23 Section 4.3.6

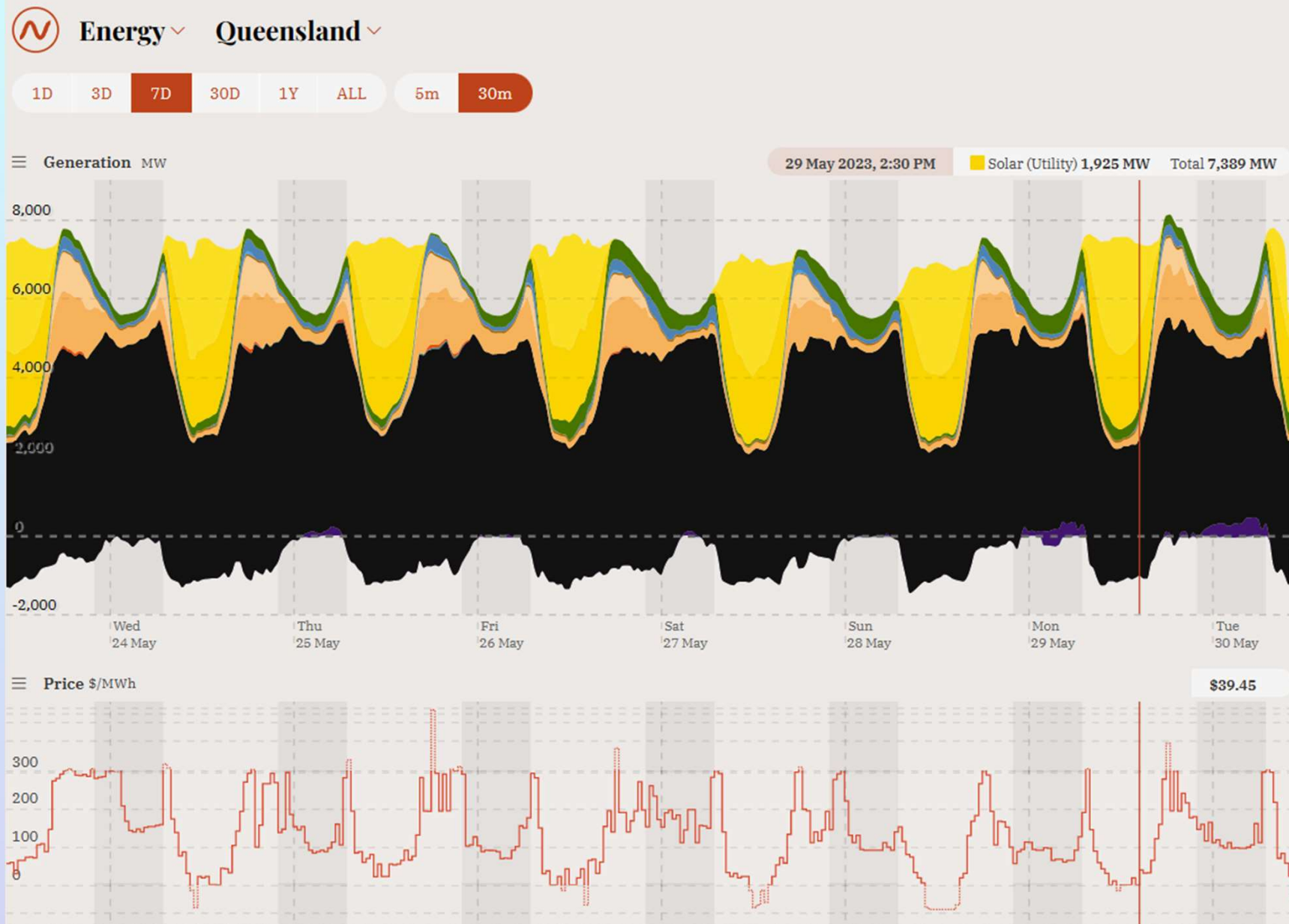
- “this result demonstrates that nuclear SMR can play a greater role.”

“...we note that offshore wind is as expensive as nuclear: Nuclear LCOE overlaps with offshore wind in the 2040s! This is a crucial finding. It is already known from North Sea experience that nuclear has a considerably better environmental footprint than offshore wind!”

A better way



A week in the life of the Queensland Grid





Energy

Queensland

Consumption

Generation

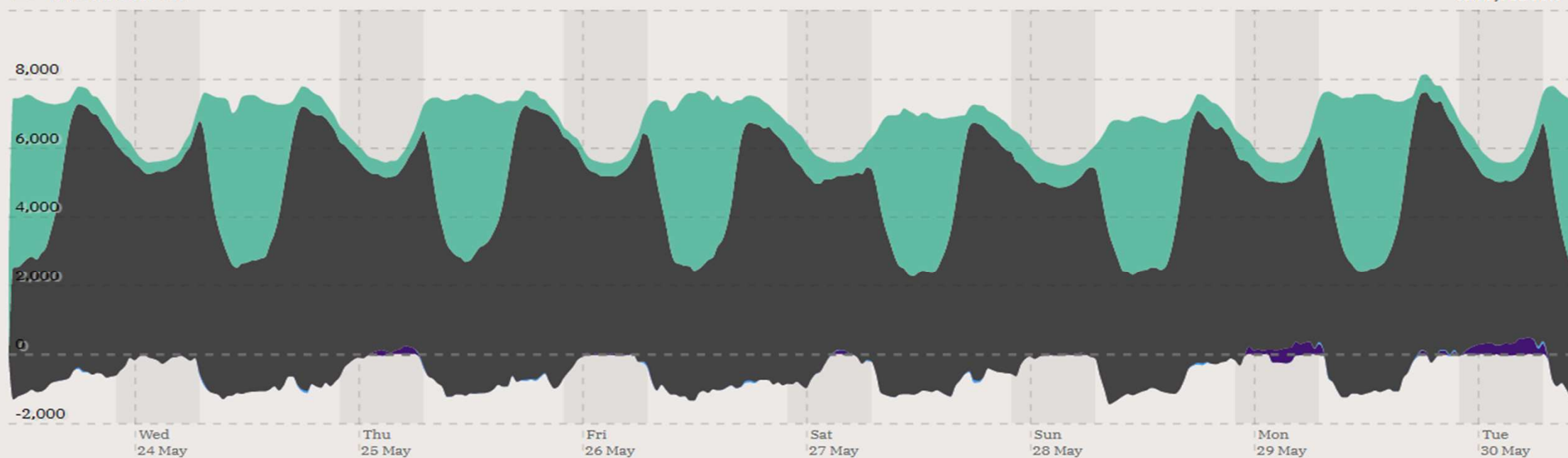
Export

1D 3D 7D 30D 1Y ALL

5m 30m

Generation MW

Av. 6,782 MW

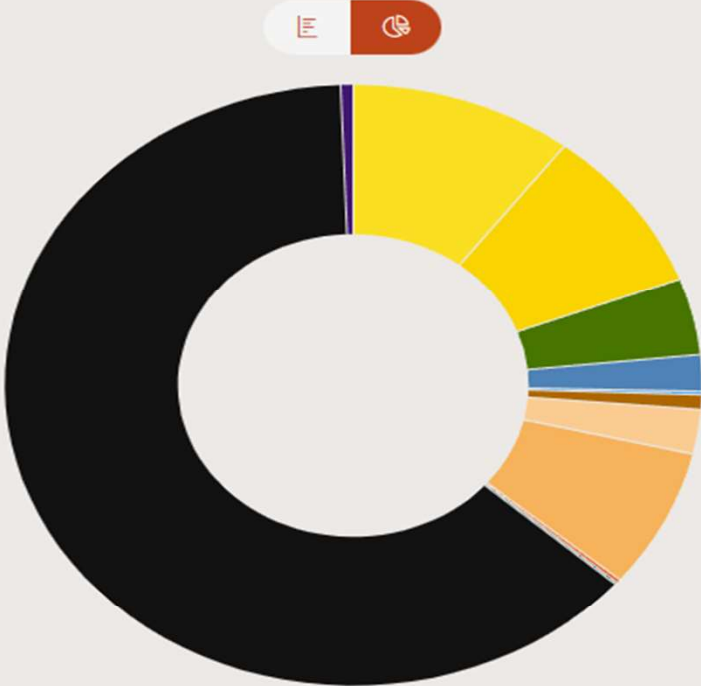


Price \$/MWh

Av. \$201.24



A week in the life of the Queensland Grid



Renewables Minimum
25.05.23: 10:30PM

3.7%

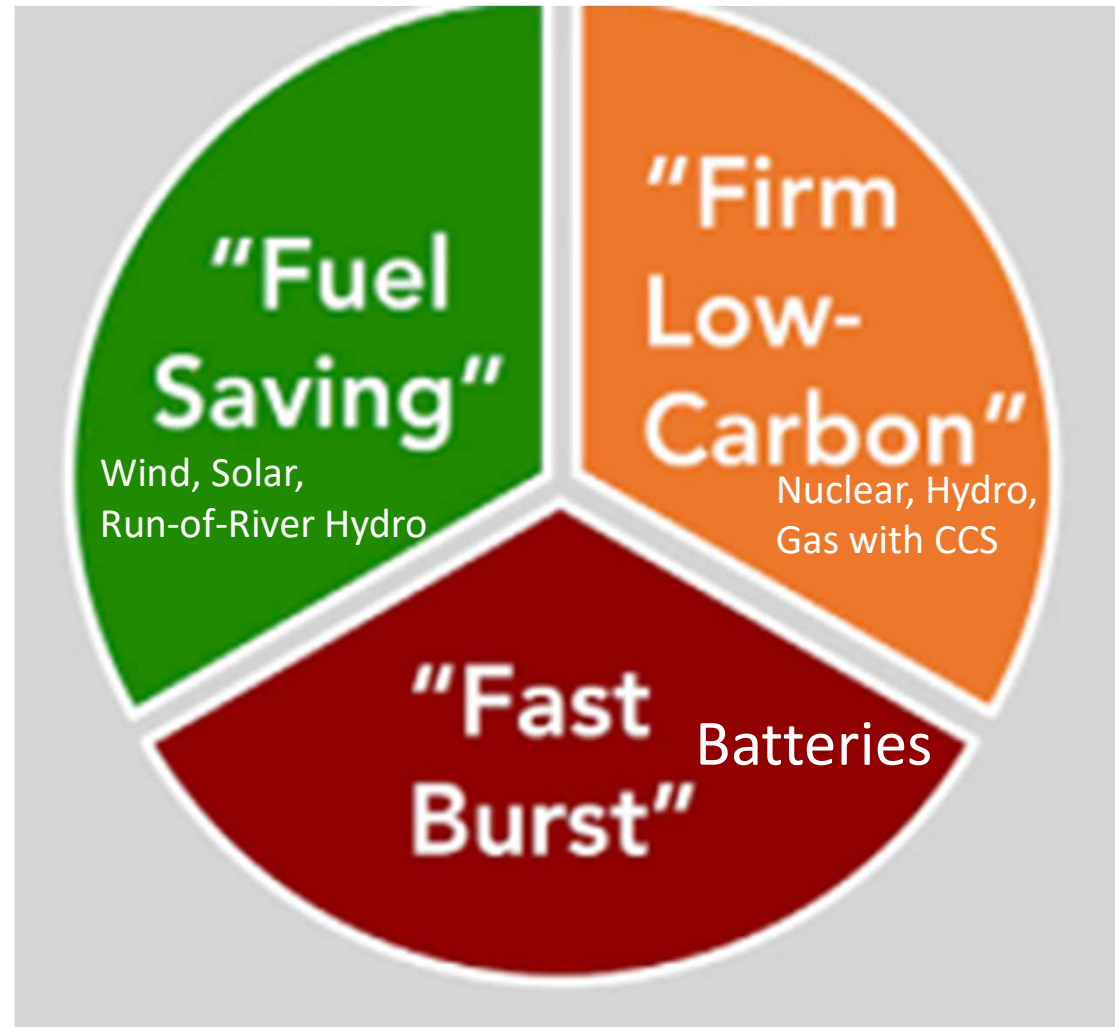
Price Maximum
25.05.23: 6:00 PM

\$12 195

STATS

23 May 2023, 10:30 AM – 30 May 2023, 11:00 AM AEST

	Min.	Max.
Demand MW	2,661 MW 23 May 2023, 10:30 AM	8,265 MW 30 May 2023, 11:00 AM
Renewables %	3.7% 25 May 2023, 10:30 PM	100.0% 23 May 2023, 10:30 AM
Price \$/MWh	-\$40.00 28 May 2023, 11:00 AM	\$12,195.00 25 May 2023, 6:00 PM
Temperature °C	8.5°C 30 May 2023, 6:30 AM	26.4°C 26 May 2023, 2:30 PM

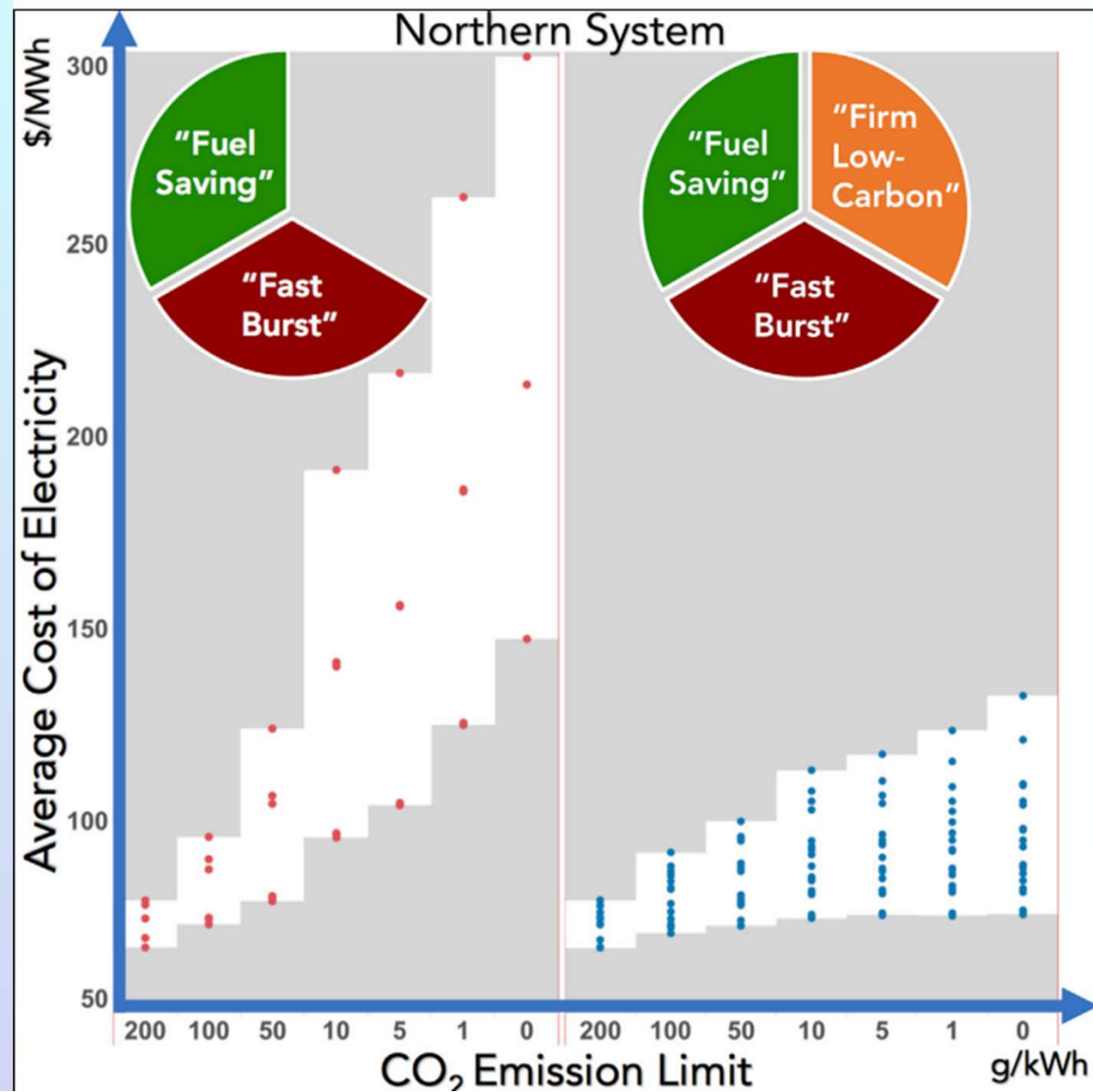


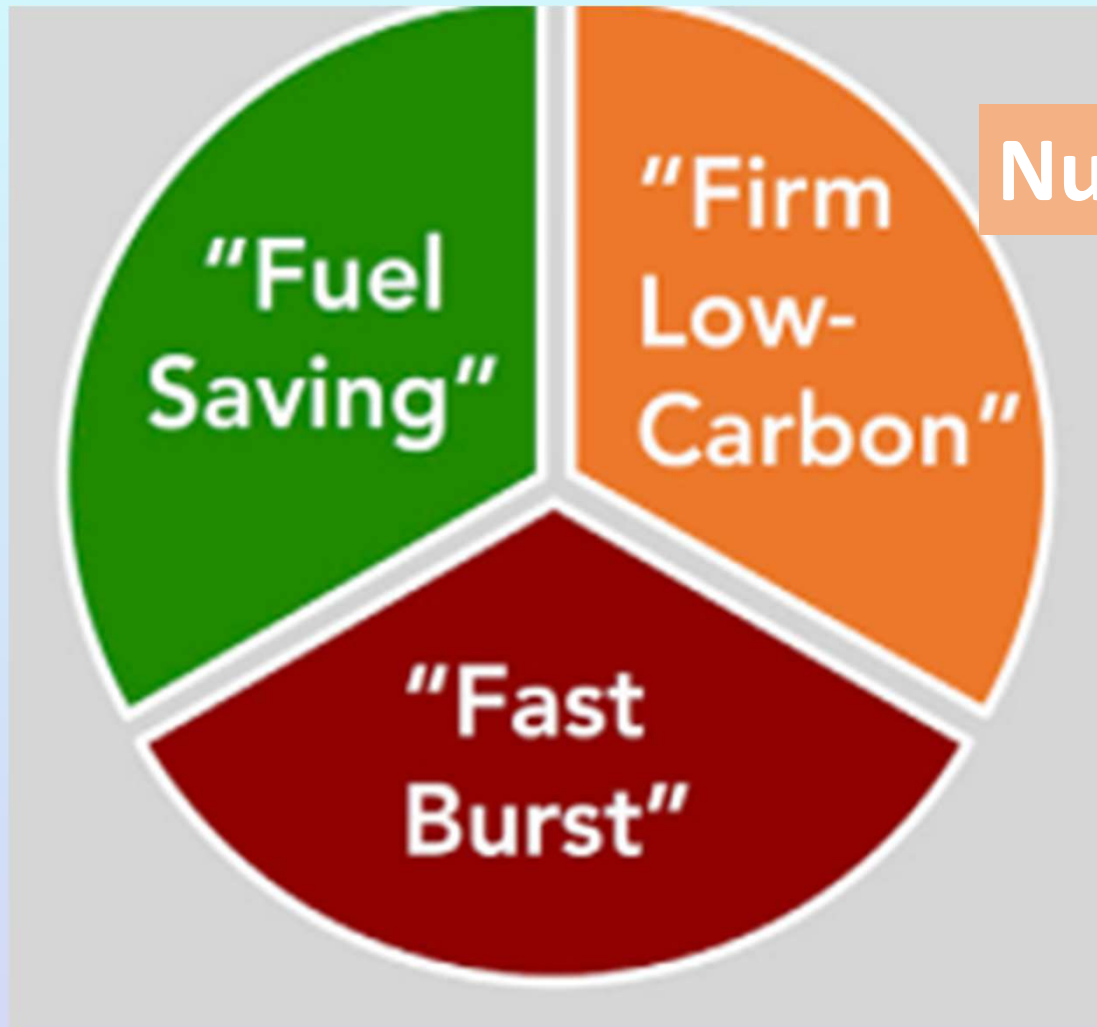
Scenario-Based Analysis

Vertical Axis: Cost (\$/MWh)

Horiz. Axis:

CO₂ High to Low (g/kWh)





Nuclear, Hydro, Gas + CCS

Batteries

AVOIDING FAILURE

Risk Framework: Frog in a Pot on a Stove – a slow crisis

Expand Electricity Options: More Of The Same Is Not Enough

Strategic Triggers:

- Lift the Bans on Nuclear

- Use Robust ENERGY Scenarios

Societal Responsibility

- Emergency Services

- Water

- Sewerage

- Energy

- “Highways” : Airways, Landways, Seaways, Data, Dollars

Food and Water

Adi Paterson 31 May 2023

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