

Powering Up: Seizing Australia's Hydrogen Opportunity by 2040

By 2040:

Australia's hydrogen industry will be a major source of jobs and economic growth.

GVA

Contributes around 1% of Australia's total GVA annually



Direct \$26 Bn of GVA

Indirect \$9-\$11 Bn of GVA in broader economy

JOBS

Total: **58,000-72,000 jobs** in 2040

Regions 53,000-66,000 jobs in regional areas

Multiplier 1 hydrogen job sustains 3 additional jobs in the broader economy



LOCAL MANUFACTURING

Onshoring a greater share of manufacturing could create an additional **11,500 jobs** and **\$1.45 Bn** in GVA annually.

Requires targeted investment, skills training, government support, and coordinated policy.



Fact Sheet

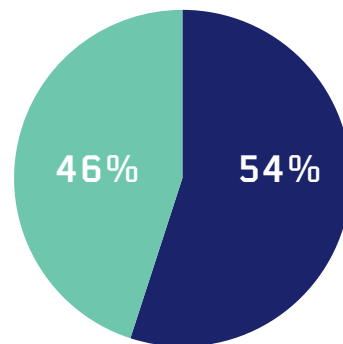
- *Powering Up* is a landmark economic study of the hydrogen supply chain needed to support Australia's future hydrogen economy by 2040.
- The study builds on modelling developed by Arup for the yet-to-be-released National Hydrogen Infrastructure Assessment (NHIA).
- It is the first study to comprehensively analyse Australia's supply chain opportunity from a national perspective.

Australian hydrogen demand could grow to almost 10-times current global production.

PRODUCTION

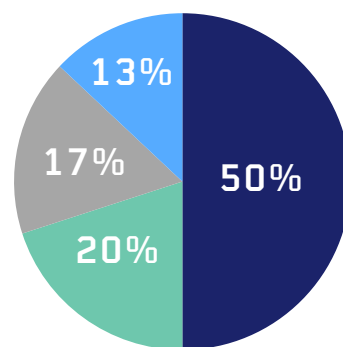
9.5 MMT

Australia's hydrogen production in 2040



UTILISATION

- Domestic use
- Export

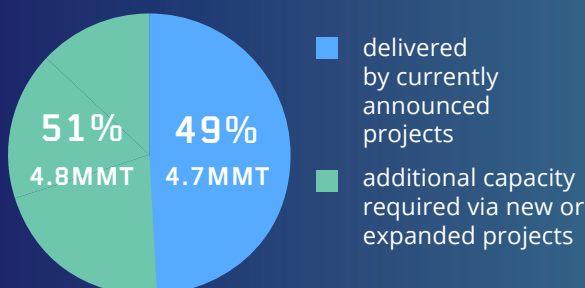


DOMESTIC DEMAND

- Automotive use
- Industrial use
- Residential and commercial use
- Other

Rapid deployment at scale is needed to deliver Australia's required production capacity.

PRODUCTION CAPACITY



ELECTROLYSER CAPACITY

51GW

a 50-fold increase on current global capacity

PRODUCTION FACILITIES

+500

operating electrolysis plants

36

hydrogen regions

Australia must attract a vast quantum of investment to produce hydrogen in the magnitudes envisioned between now and 2040, including:

**\$340–
\$420 Bn**

total investment required

**170,000–
200,000**

construction jobs (FTE)

**\$25–
\$30 Bn**

investment per annum
from 2025 to 2040

An eye-watering amount of infrastructure is required to power the hydrogen economy.

RENEWABLE ENERGY GENERATION REQUIRED



82 GW
of solar

+

=



76 GW
of onshore wind

Almost
5-times
Australia's current
solar and wind
capacity

INFRASTRUCTURE REQUIREMENTS



+246 million
solar panels



23,900 wind
turbine generators



12,800
control units



5,200 hydrogen storage
tanks (10t H₂ capacity)



+9,500 5MW
electrolysers



117 large-scale and 1,030
medium-scale compressors

TECHNOLOGY AND EXPERTISE REQUIRED



Local suppliers: Strong capability concentrated
in a few supply chain nodes

Most attractive opportunities:
Electrolysis, hydrogen storage, transport
and water treatment



Other potential opportunities: Fuel cell and
anaerobic digestion/gasification (although
higher level of uncertainty)

Technology challenges: Hydrogen storage
is a primary technology challenge, and low-
cost and large-scale hydrogen storage R&D
and technical investigations are needed



What could Australia's hydrogen supply
chain look like in 2040*?

PRODUCTION

95% of hydrogen production via electrolysis

DOMESTIC DISTRIBUTION

- > Large-scale: Via pipeline as compressed hydrogen gas
- > Smaller-scale: Road and rail transport

STORAGE

- > Longer-term: Salt caverns
- > Smaller-scale: Tanks and vessels

TRANSPORTATION

- > Export: 80% ammonia, 20% liquefied hydrogen
- > Domestic: Methylcyclohexane for transport and storage

Access
the full
report:



* configuration based
on the NHIA Central
Demand Scenario
and Arup's least-
cost modelling



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This report was prepared by Arup Australia.