

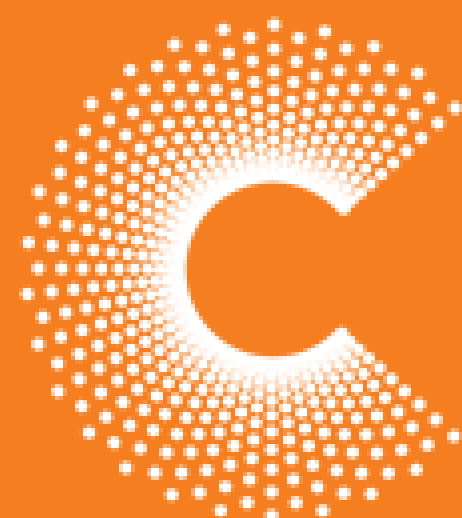
JOBS, SKILLS AND ECONOMIC OPPORTUNITIES FROM THE CLEAN ENERGY TRANSITION

Anna Freeman
DIRECTOR ENERGY GENERATION

31 October 2019



**THE CEC IS THE PEAK BODY FOR THE RENEWABLE
ENERGY INDUSTRY IN AUSTRALIA**



**CLEAN
ENERGY
COUNCIL**

750+
MEMBERS



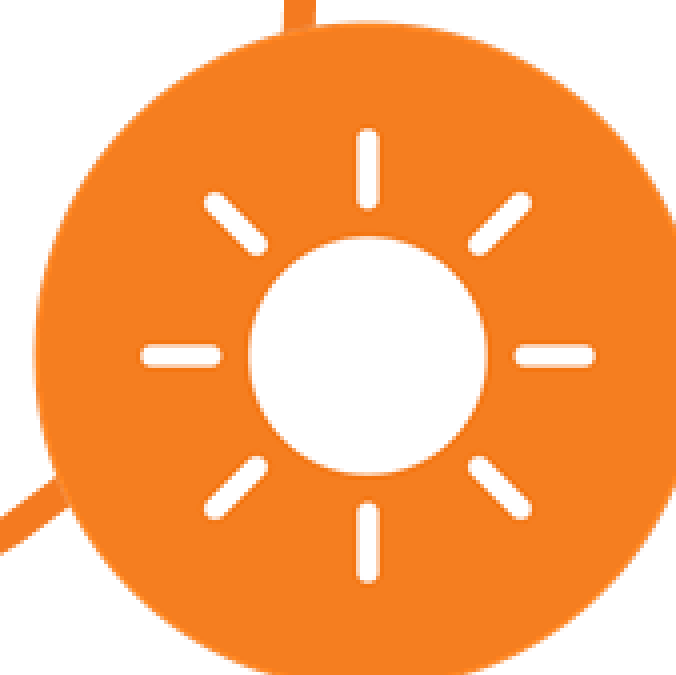
6400+
ACCREDITED
INSTALLERS



5000+
APPROVED
PRODUCTS



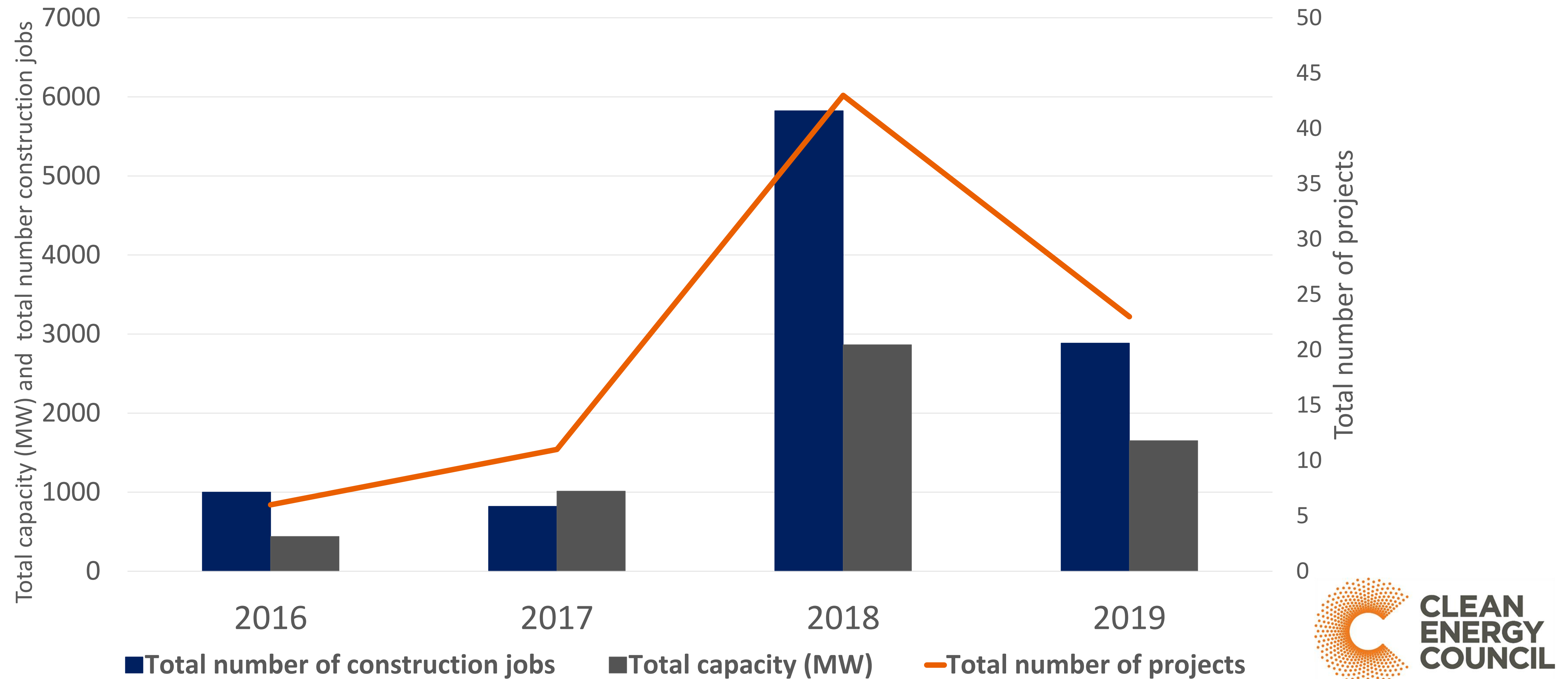
520+
APPROVED
SOLAR
RETAILERS





THE RENEWABLE ENERGY TARGET DELIVERED A JOBS BOOM

Commissioned renewable projects 2016-present



Includes projects >5 MW only

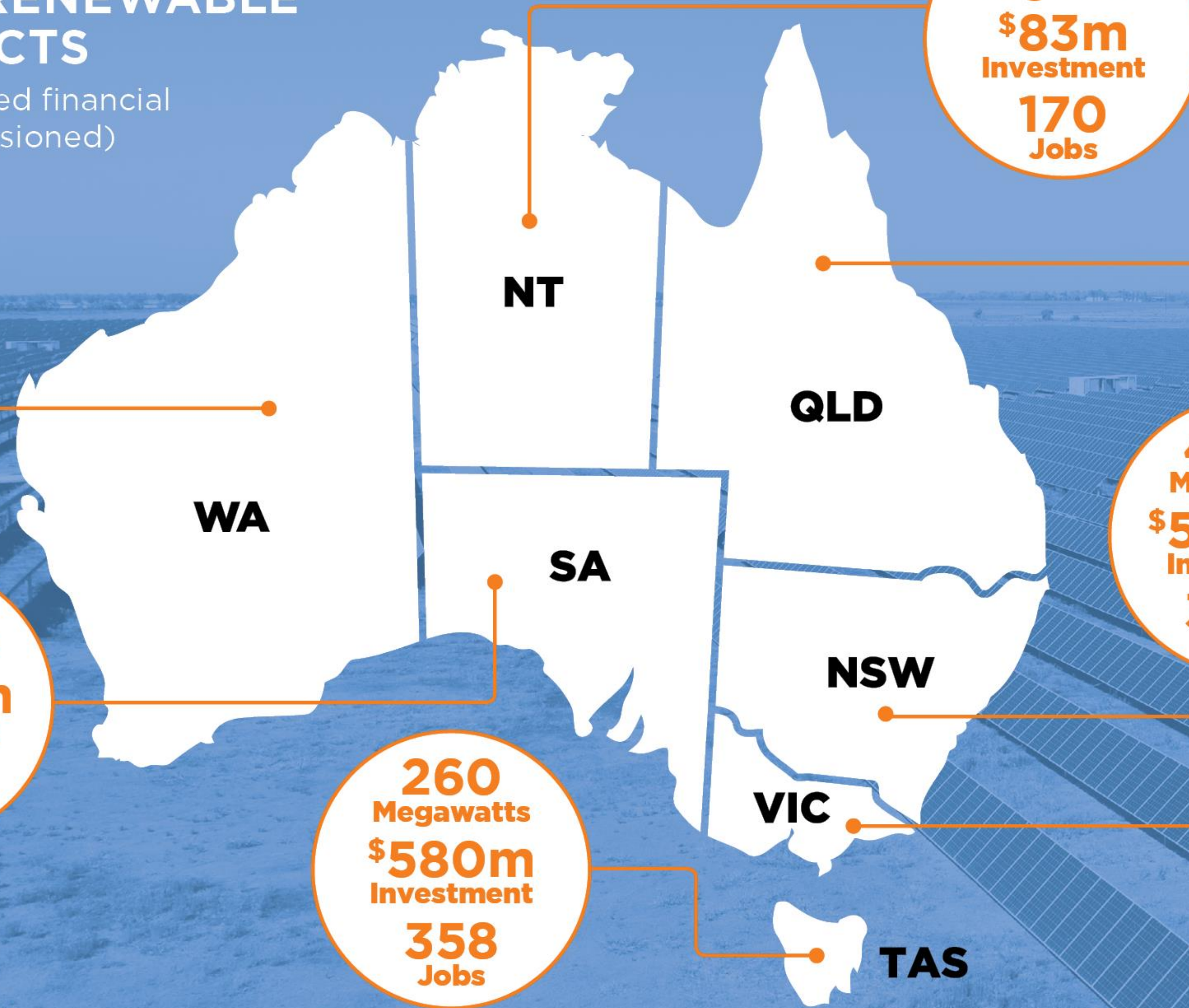
THE CONSTRUCTION BOOM FOR LARGE-SCALE RENEWABLE ENERGY PROJECTS

(Projects that have reached financial close and not yet commissioned)



904
Megawatts
\$3266m
Investment
2765
Jobs

2166
Megawatts
\$3269m
Investment
2460
Jobs



54
Megawatts
\$83m
Investment
170
Jobs

4616
Megawatts
\$9.6b
Investment
4206
Jobs

4282
Megawatts
\$5079m
Investment
3473
Jobs

3465
Megawatts
\$5784m
Investment
3224
Jobs

260
Megawatts
\$580m
Investment
358
Jobs

*As at 26 August 2019

Image: Griffith Solar Farm, New South Wales

TOTALS

15,747
Megawatts

\$27.7b
Investment

16,656
Jobs



Indirect jobs are estimated
to be much greater than
direct construction jobs

2.1 million
solar homes



What do we really
mean when we say
'renewable energy
jobs'?



“WHAT IS A RENEWABLE ENERGY JOB?”

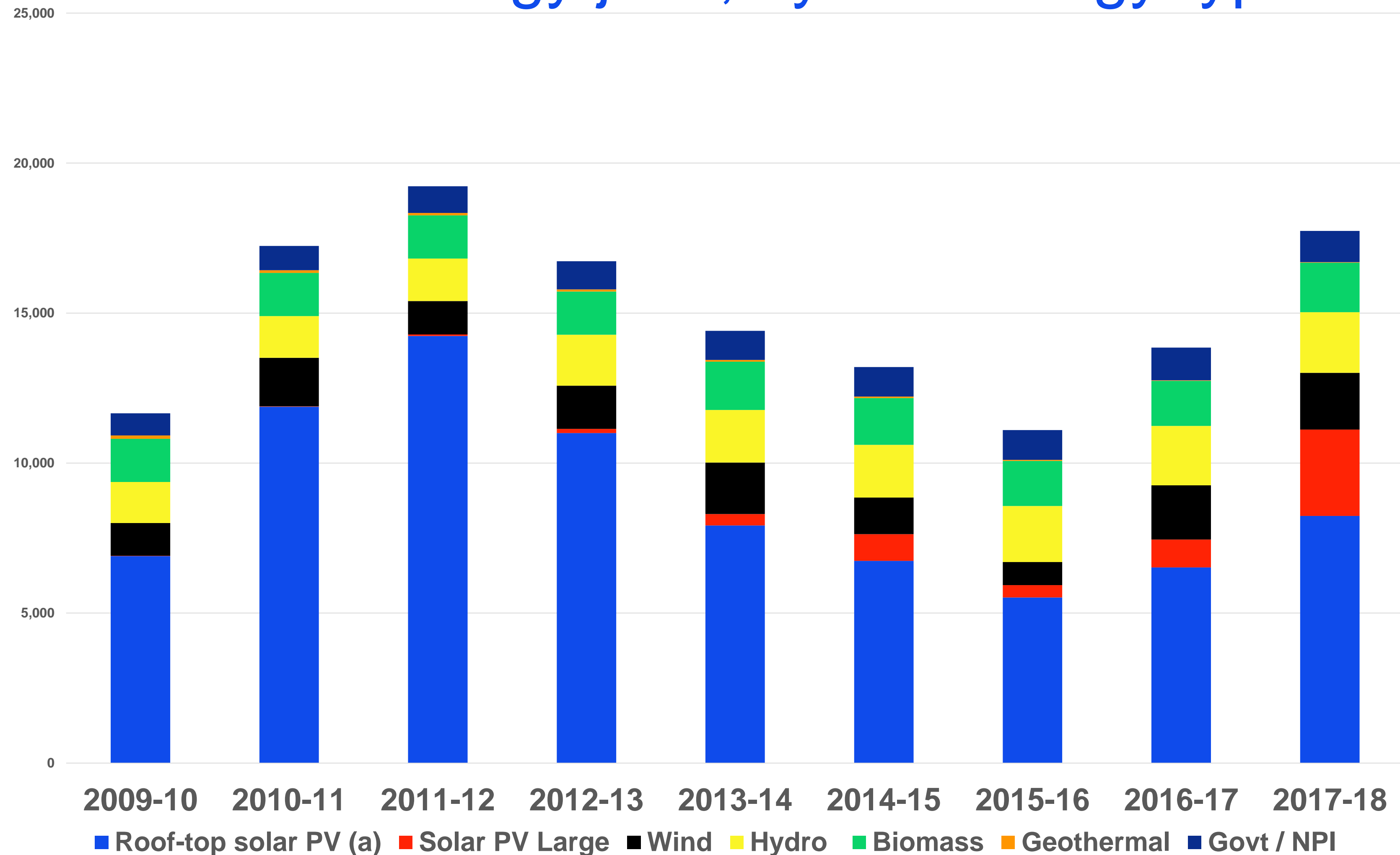
- **Mining for renewable energy technologies:** alumina, rare earths, lithium
- **Large-scale renewable project development:** Engineers, project managers, civil contractors, labourers, technicians, electricians, planning & environment managers
- **Rooftop solar:** Warehouses and assembly, sales, distribution, installers, maintenance
- **Clean hydrogen:** emerging industry
- **Manufacturing:** solar hot water, PV frames, batteries, steel & cement, wind towers, transformers, cabling
- **Professional services:** R&D, policy & regulation, commercial & legal, finance, engineering, consulting
- **Enabling technologies and start-ups:** software, online platforms, data analytics



People over-estimate the number of mining jobs ... and don't see renewable energy as creating 'real jobs'. They think of someone installing solar panels and ask 'what comes next'

- Rebecca Huntley

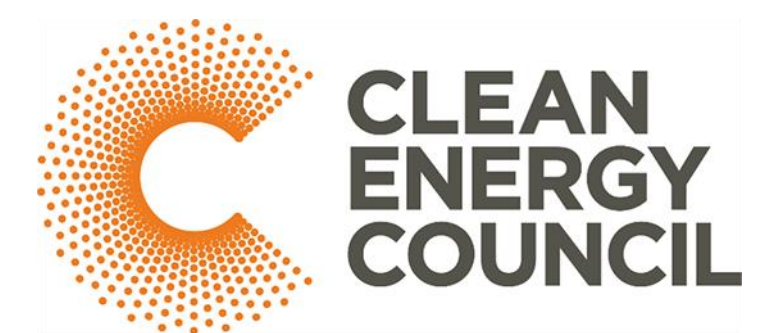
Renewable energy jobs, by technology type



- Renewable energy jobs not measured through surveys
- ~20,000 (ABS) – 30,000 (Green Energy Markets)
- Energy efficiency jobs 69,000 – 236,000 (Green Energy Markets)
- Large body of studies that find renewable energy is more labour-intensive than fossil-fuel industries

**Want more detail
about renewable
energy jobs?**

It's on its way...



THE CEC HAS COMMISSIONED THE FIRST NATIONWIDE SURVEY OF RENEWABLE ENERGY JOBS

Objectives:

Employment
factors &
Total jobs

Occupational
mix

Skill
shortages



Stage one

Large-solar
Large-wind
Distributed solar & Solar hot water
Battery storage
Hydro
Supply-chain

Stage two

Bio-energy
Professional service jobs
Renewable hydrogen
Electricity networks and retailing

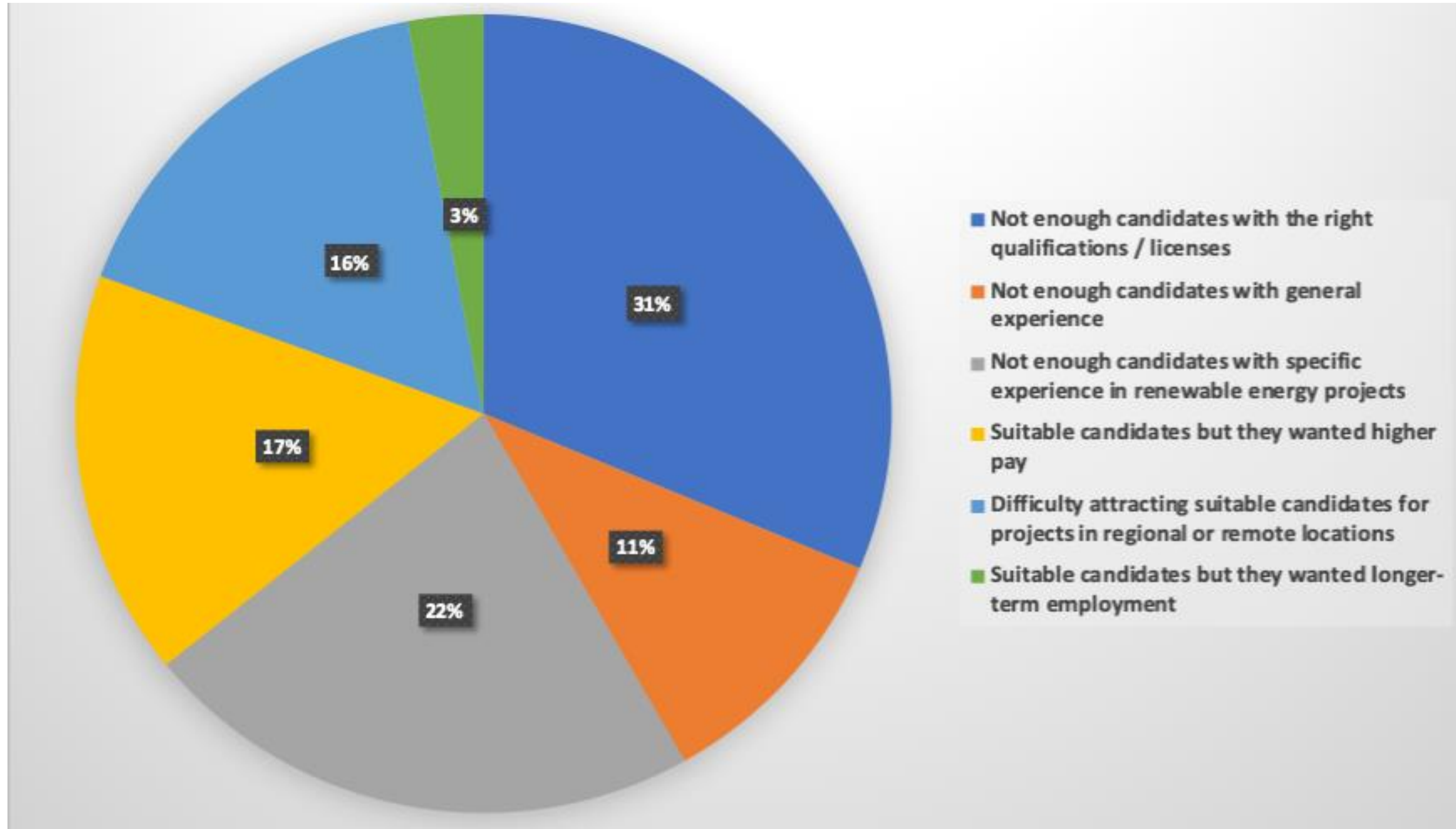
A TASTE OF PRELIMINARY FINDINGS IN DISTRIBUTED SOLAR

High recruitment difficulties were reported in these categories:

1. Electricians
2. Roofers
3. Site supervisors
4. PV designers
5. Electrical trade assistants
6. Sales & commercial managers



ELECTRICIANS - CAUSE OF RECRUITMENT DIFFICULTIES



**Maximising the
employment
benefits of
renewable energy
for the region**



CASE STUDY: TRANSFORMATIONAL EMPLOYMENT OPPORTUNITIES AT KARADOC SOLAR FARM



OF THE 200-STRONG SOLAR FARM WORKFORCE...

- 90 long-term unemployed people
- 12 people on community-based orders
- 14 people from culturally and linguistically diverse backgrounds
- 38 Aboriginal people
- 4 people with a disability.

In addition to these employment programs, 25 new electrical apprenticeships were created, and 9 of the apprentices were Aboriginal.



★ NEW: GUIDE TO BENEFIT SHARING FOR RENEWABLE ENERGY PROJECTS

Guidance and case studies on a range of models of benefit sharing:

- Local jobs, training and procurement
- Community funds
- Neighbourhood benefit schemes
- Community co-financing & investment

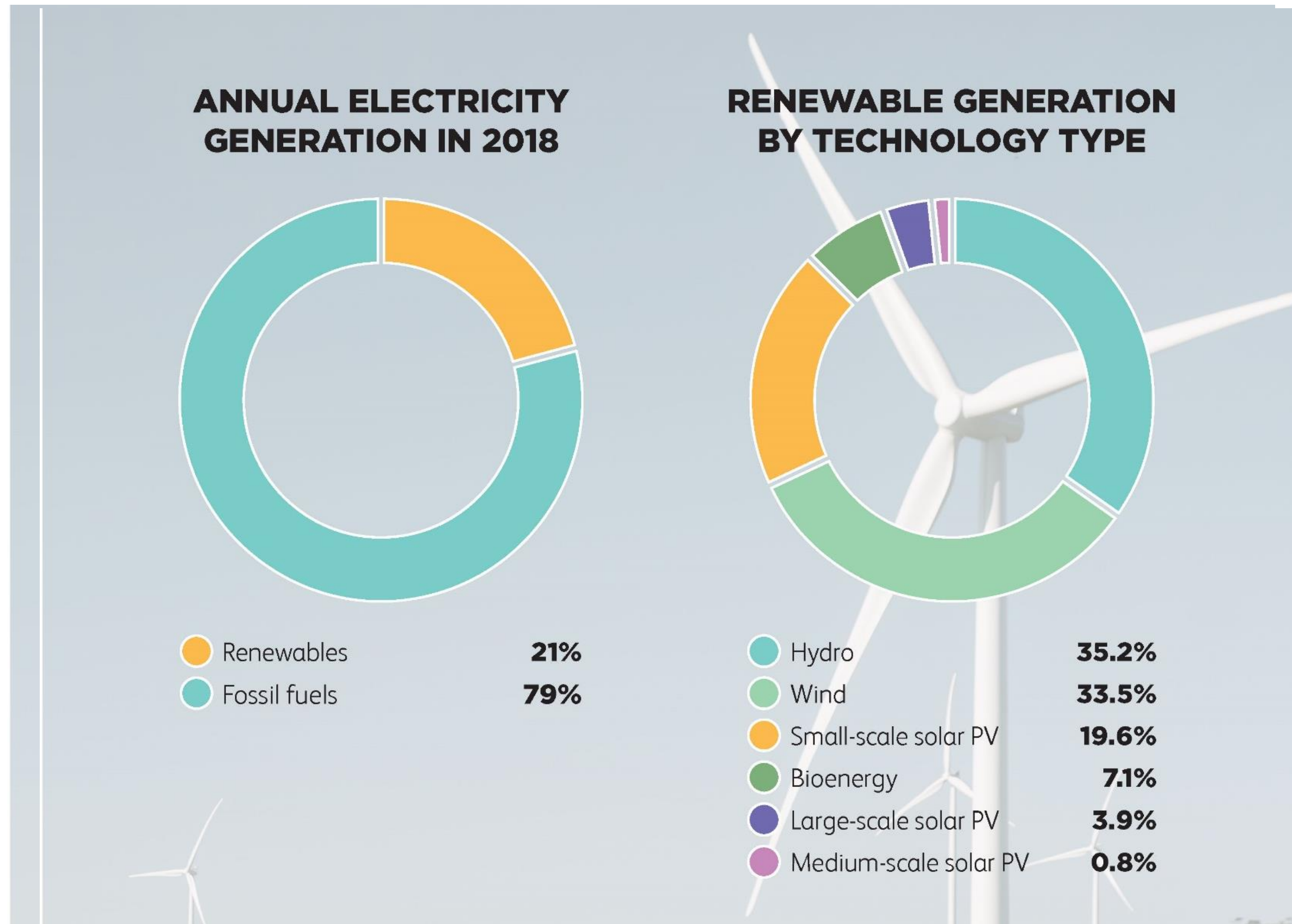
Visit cleanenergycouncil.org.au



We have only just
begun...



THE OPPORTUNITIES IN FRONT OF US REMAIN VERY LARGE



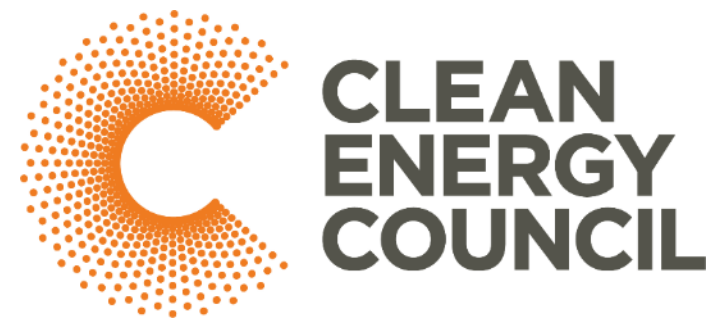
...AND WHY STOP THERE?

DARREN MILLER, CEO, AUSTRALIAN RENEWABLE ENERGY AGENCY



If we try to make of hydrogen the same kind of opportunity as we have now for LNG, we probably need **700GW** of wind and solar to produce that amount of hydrogen.

This idea of not having enough renewable energy will just be a weird concept that we had in the 2010s ... **200% renewables is too small**. It could be 6-7 times what we have in the national electricity market.



THANK YOU

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