GREEN RECRUITMENT COMPANY

Australian Market Report 2018

Welcome

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Welcome to our Australian Market Report.

This report is a brief survey of the renewable energy market in Australia and focuses on;

- The Pipeline of Energy Projects,
- A Brief Overview of Government Policy
- The Key Developers
- EV
- Energy Storage
- Staffing Conditions

If you have any questions regarding this report, or would be interested in any other research please get in contact:

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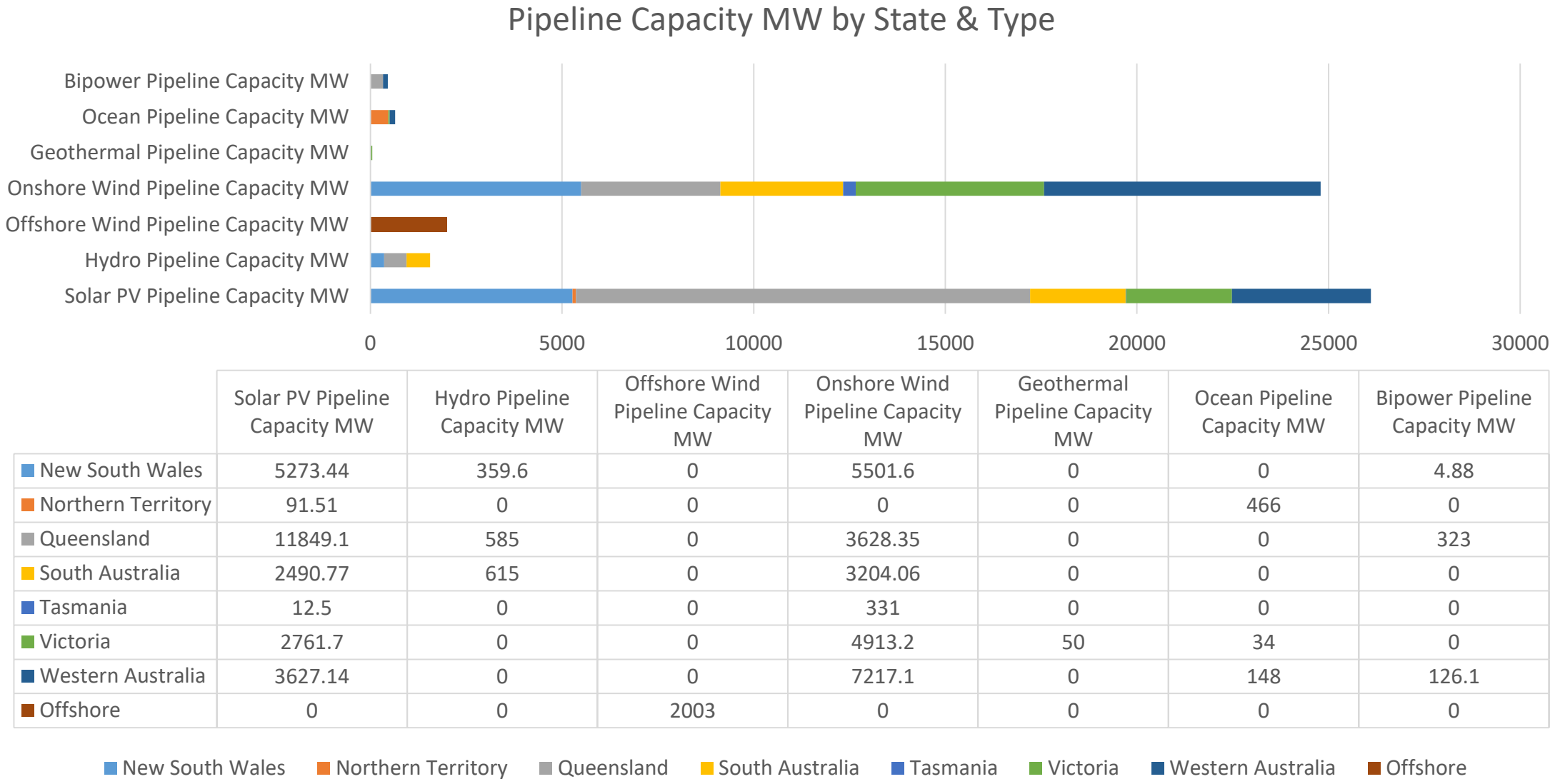

	Solar PV Pipeline Capacity MW	Hydro Pipeline Capacity MW	Offshore Wind Pipeline Capacity MW	Onshore Wind Pipeline Capacity MW	Geothermal Pipeline Capacity MW	Ocean Pipeline Capacity MW	Bipower Pipeline Capacity MW
New South Wales	5273.44	359.6	0	5501.6	0	0	4.88
Northern Territory	91.51	0	0	0	0	466	0
Queensland	11849.1	585	0	3628.35	0	0	323
South Australia	2490.77	615	0	3204.06	0	0	0
Tasmania	12.5	0	0	331	0	0	0
Victoria	2761.7	0	0	4913.2	50	34	0
Western Australia	3627.14	0	0	7217.1	0	148	126.1
Offshore	0	0	2003	0	0	0	0

Pipeline Capacity (MW) by State/Type

Policy Overview

Government and State.

Government Policy

Australia has the benefit of having a vast unused renewable energy potential and strong public support for the renewable energy to be the nations' primary energy source. The Climate Institute's national Climate of the Nation survey published in 2017 saw Australians recognise the impact of climate change and 96% supporting renewable energy.

At national level the main policy vehicle has been the Renewable Energy Target (RET) scheme. The scheme was launched in 2009 with a target of 23.5% of power share coming from renewable energy.

At national level the government is pro- renewables and has in its dealings with the different states encouraged them to engage with private investors.

However would be suppliers need to exercise a degree of caution. RET is not universally respected in political circles and there have been several attempts to modify the policy. A weakness of Government Policy is that RET doesn't guarantee connection to the grid and it has little impact on state governments or their planning policies.

State Policy

The different states of Australia have varying policies to renewable energy. The states approaches are summarised on the next page of this presentation.

The principal mechanism of the states is the Feed In Tariff – some have historic schemes no longer active, others have tiered tariffs which support users dependent on when they joined a scheme.

The FiTs have garnered some criticism for increasing electrical supply costs and the way in which states have been unpredictable in withdrawing schemes. This can cause a boom/bust cycle for Solar PV.

Across National and State level, it is possible to identify the direction of travel i.e. that renewable energy is a priority for Australia. The challenge is that Australia has largely taken a trial and error approach toward implementing renewable energy, this can create uncertainty at a local level as well as concerns around costs for schemes. It is a good place to do business but a thorough risk assessment of projects based on energy type, state and national policy should always be undertaken.

Quick Reference for Policy/Financial Incentives by State

Southern Australia	New South Wales	Victoria	Queensland
Feed in Tariffs for Solar between $.0.16-$0.40 per kWh. State has a strong focus on energy integration to the grid and on energy storage with two recent tenders.	Abolished Feed in Tariffs and there is no mandatory rate. The state regulatory body publishes benchmark rates for utilities firms to use.	The state has a wide range of FiTs in place – most of which are time-variable. The state is proactive with several schemes around energy efficiency, auctions and farmer support in operation	Feed in Tariff for Solar is $0.34 per kWh. Currently mid-process on the Renewables 400 auction scheme for a range of renewable energy projects
Western Australia	**ACT**	**Tasmania**	**Northern Territory**
Current FiT scheme is suspended	There is a pre-existing FiT in place but new users will be managed through voluntary rates. The state has aggressive targets for renewables and is also supporting home battery storage projects	Tasmania has two tiers of FiTs. The schemes are focused on both residential consumers and small businesses.	The Northern Territory has a low level of renewable energy in its energy mix (4%). The state has adopted a FiT and has agreed in principle to adopt reverse auctions to encourage private investment.

Solar

NW Interconnected Power
3000MW in Pipeline Capacity

Sun Edison LLC
2000MW in Pipeline Capacity

Vena Energy
1120MW in Pipeline Capacity

Photon Energy Australia
1051MW in Pipeline Capacity

CleanGen Projects
980MW in Pipeline Capacity

Wind (Onshore)

NW Interconnected Power
6000MW in Pipeline Capacity

AGL Energy
1411MW in Pipeline Capacity

Global Power Generation Australia
1372MW in Pipeline Capacity

Windlab
1342MW in Pipeline Capacity

Epuron
1145MW in Pipeline Capacity

Hydro

Snowy Hydro Limited
330MW in Pipeline Capacity

Tilt Renewables
300MW in Pipeline Capcity

Zhejiang Fuchunjiang Hydropower Equipment
250MW in Pipeline Capacity

Wind (Offshore)

Offshore Energy
2000MW in Pipeline Capacity

Other

North Queensland Bio Energy Corporation
260MW in Pipeline Capacity (Biopower)

Tidal Energy Australia
48MW in Pipeline Capacity (Ocean)

Key Developers By Pipeline Capacity

EV Market & Energy Storage

Brief Overview

Electric Vehicles

There is significant optimism surrounding the Australian EV Market. A report published in May this year by Energeia on behalf of ARENA and CEFC suggested that 20% of new vehicle sales by 2030 will be EVs. They project that they will account 49% of vehicle sales by 2040.

The principal drivers of this optimism rests on a number of assumptions:

- That vehicle charging will continually improve its efficiency with an ability to charge cars in 5 minutes at public charging points.
- That providers of infrastructure for existing cars are prepared to provide the same services for EVs i.e. that petrol stations become charging stations.
- That the cost of EVs continues to fall.

The report has made several recommendations on how the above is achieved and extensive benchmarking of Norway's best practice has been done.

The overall view is that Australia could in the long run prove to be a great market for EVs. However in the short term it is important to see that this a hypothetical position based on the need for further product development in EVs and serious investment in charging capabilities.

Energy Storage

At present the Australian Energy Storage market is under developed. This is a consequence of the national Renewable Energy Target (RET) this prioritise renewable energy projects e.g. Wind & Solar developments but left integration to the grid and storage as local decisions with near inevitable results.

ACT is the leading state focused on home storage, grid connectivity and energy storage. Others are likely to follow their lead, with NSW, Queensland and Victoria seen as the best growth markets. The market is expected to grow by 30% up to 2023.

Australia is dominated by electro-chemical solutions to energy storage and reductions in Lithium-Ion storage costs will help drive new projects through affordability.

The key players in the current market are: Enphase Energy Inc, GCL System Integration Technology Co. Ltd, Hoppecke Batterien GmbH & Co. KG, LG Chem Ltd., Magellan Powertronics Pty Ltd, Redflow Limited, Smart Storage Pty Ltd, Sonnen GmbH, Tesla Inc and VSUN Energy Pty Ltd.

Staffing Your Projects

Immigration, Local Conditions & Other Topics.

Staffing

The most recent data from the Australian Bureau of Statistics suggested that renewable energy roles increased by a third in the last year. This is placing pressure on the labour market and increasing the need for ex-pat hires especially in Wind/Solar roles.

When hiring ex-pats there are different criteria for different categories of visas and the criteria are established to meet Australia's national interests and needs. The Government sets the number of people who can enter under the programme on an annual basis.

There are three entry routes: Skills, Family & Special Eligibility. Most ex-pat hires will be from the skill category. For more information on the scheme check the following resources:

- https://www.homeaffairs.gov.au/about/corporate/information/fact-sheets/26state
- https://www.homeaffairs.gov.au/about/corporate/information/fact-sheets/27business

Local Conditions

The Climate Council of Australia have identified the following about the renewable job market in Australia:

- New South Wales (NSW) and Queensland will have the largest net growth in jobs, around 11,000 and 6,000 respectively.
- Victoria will see a net gain of around 4,000 jobs by 2030
- South Australia and NSW will experience the largest per capita jobs growth.
- Most states will see half of all new jobs created in rooftop solar photovoltaics (PV): rooftop solar PV jobs are generally accessible, being located in areas where people already live and work.
- Utility scale renewable power in regional and remote Australia may well offer opportunities to increase employment in those regions.

Long Term View

Australia has ambitious targets for renewable energy with 50% generation from renewables by 2030. Australia's coal fired power stations have a low employment footprint and there will be little effort made to convert these workers into the renewable sector. Instead there will be a need to develop local talent for the sector – which will double in size.

The major skills gaps exist at the construction phase of projects and firms will need to have programmes in place to train and develop talent in this area. A point of uncertainty exists as to how the country will approach a skills shortage. Australia has been benchmarking Germany's state intervention approach to renewable skill sets and also USA's market led approach. Depending on which approach wins out, employers may find that they may have to make significant training and development costs.

Where will the jobs be in 2030?

Tasmania

- Tasmania will account for 4% of all jobs
- 24% will be in Solar
- 18% in Wind
- 58% in Hydro

Western Australia

- Western Australia will account for 7% of all jobs
- 57% will be in Solar
- 18% in Wind

Southern Australia

- Southern Australia will account for 10% of all jobs
- 47% will be in Solar
- 38% will be in Wind

Victoria

- Victoria will account for 20% of all jobs.
- 47% will be in Solar
- 15% will be in Wind

Queensland

- Queensland will account for 25% of all jobs
- 58% will be in Solar
- 12% will be in Wind
- 27% will be in Thermal

New South Wales

- New South Wales will account for 34% of all jobs.
- 49% will be in Solar
- 29% will be in Wind

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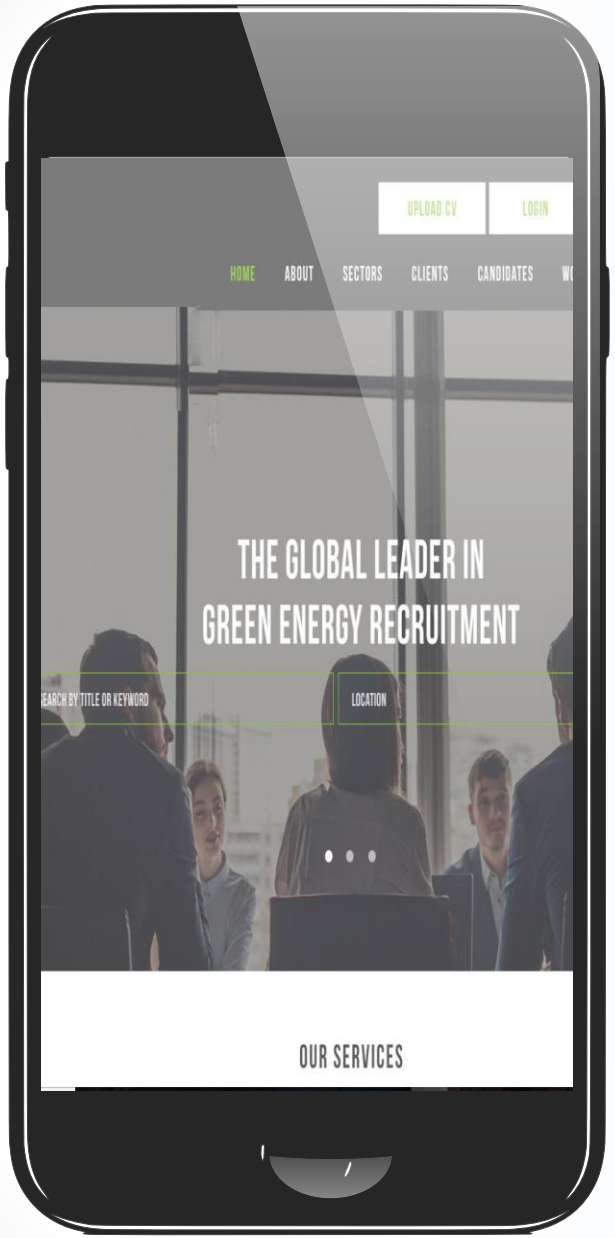

Thank you for taking the time to read our Australian Market Report. We regularly create reports on the Green Energy space so if you're interested in seeing other reports or want to discuss our services then please get in touch:

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