Country Assessment Report

Country/Region name: Australia

Generation and Demand:

Australia's electricity supply system is divided into four main, grid-connected markets. The National Electricity Market (NEM) connects the 5 states of South Australia, Victoria, New South Wales (including ACT), Queensland and Tasmania, while the Wholesale Electricity Market (WEM) manages the South West Interconnected System (SWIS) in southern Western Australia. In 2017, these two major markets provided 85% and 13% of Australia's electricity consumption, respectively [1]. Two smaller, isolated power networks, the North West Interconnected System (NWIS) and Northern Territory Electricity Network (NTEN) serve remote communities, mining operations and the NT capital of Darwin (Figure 1).

The WEM (SWIS) has been operating since 2006 and comprises over 7,800km of transmission lines, supporting some 18 terawatt-hours of annual electricity generation from around 5,800MW of installed capacity. Almost all of the renewable energy generation connected to the SWIS falls under Australia's existing Renewable Energy Target (RET) schemes and, in terms of generation eligible for potential I-REC issuance, just two landfill gas renewable generators are connected to the SWIS, while the Ord River Hydro Plant and Ten Mile Lagoon Wind Farm service remote communities and mining operations around Kununurra, Wyndham and Esperence (in WA).

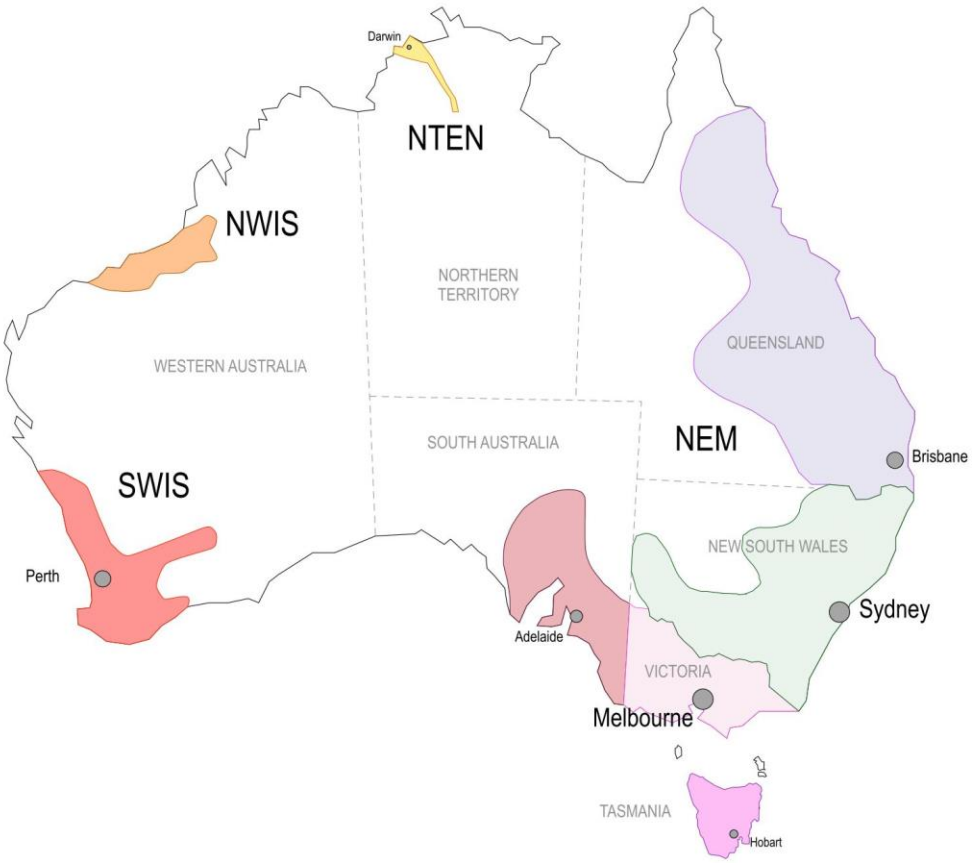

Figure 1: Australia's four electricity supply networks are the NEM, SWIS (WEM), NWIS and NTEN.

Australia's National Electricity Market (NEM) is the largest continuous electricity grid in the world, comprising over 40,000 km of high voltage transmission lines and spanning over 5,000km, end to end. The NEM commenced operation as a wholesale spot market for electricity in 1998 and supplied 204TWh to customers in 2019-2020 [2]. There are over 400 registered participants in the NEM, including electricity generators, transmission network service providers, distribution network service providers, and electricity retailers. The NEM supplies approximately 10 million customers [3] and around A$13 billion was traded through the spot market in 2019-20.

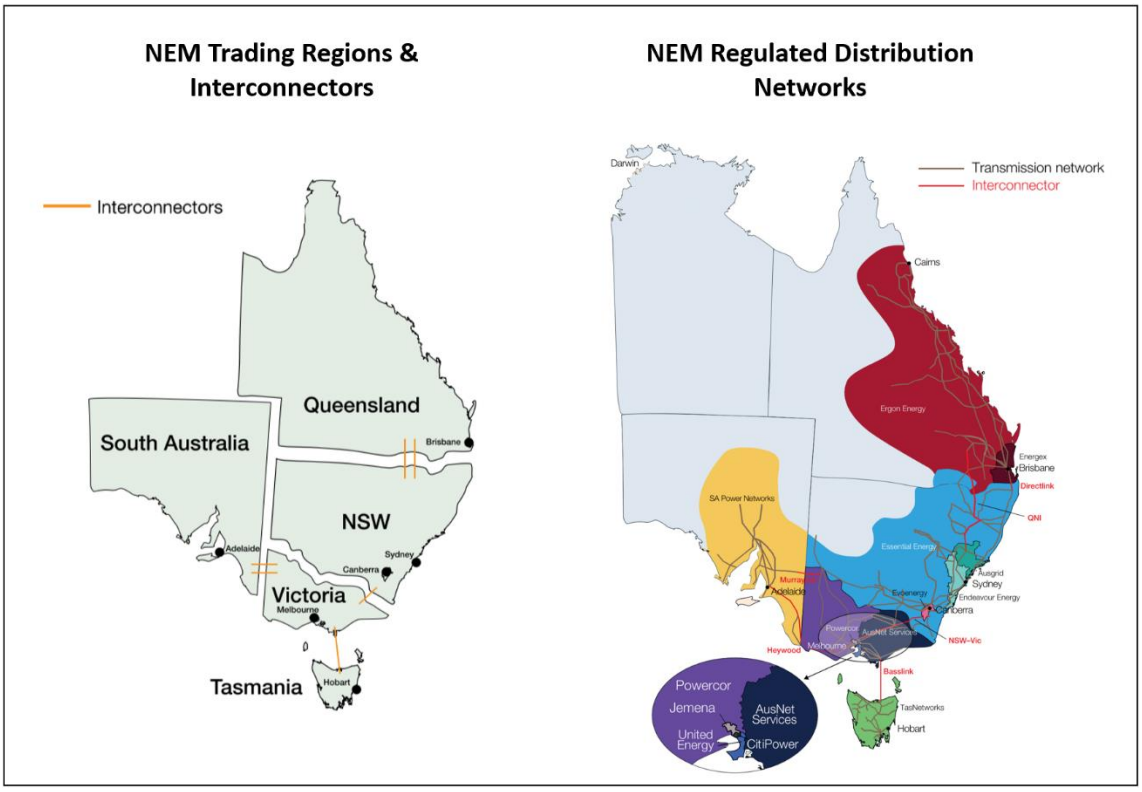

Figure 2: Australian National Energy Market (NEM) Trading regions, HV interconnectors and distribution management zones (figure adapted from AER State of the Energy Market 2020 report).

The NEM comprises five trading regions (Figure 2, left) and each region has a unique generation mix, owing to its available natural resources (Figure 3). Each region has its own sub-market and spot price and several high-voltage interconnectors allow import-export between regions and facilitate security and flexibility across the grid.

The NEM is managed by the Australian Energy Market Operator (AEMO), who are responsible for supply and demand forecasts, generator dispatch, frequency control, pricing, reporting and a host of other responsibilities according to the National and Western Australian electricity & gas laws. AEMO also manages several domestic gas markets.

The wholesale electricity price is set via the marginal cost generator in the availability bid stack at 5-minute intervals. Six consecutive intervals are averaged to produce the 30min power price, per region. In 2021, the 30min pricing interval will reduce to 5mins. The NEM has a diverse generation mix in terms of installed capacity (Figure 4), however, it is still dominated by coal-fired generation, representing approximately 67% of actual generation in 2020 (Table 1).

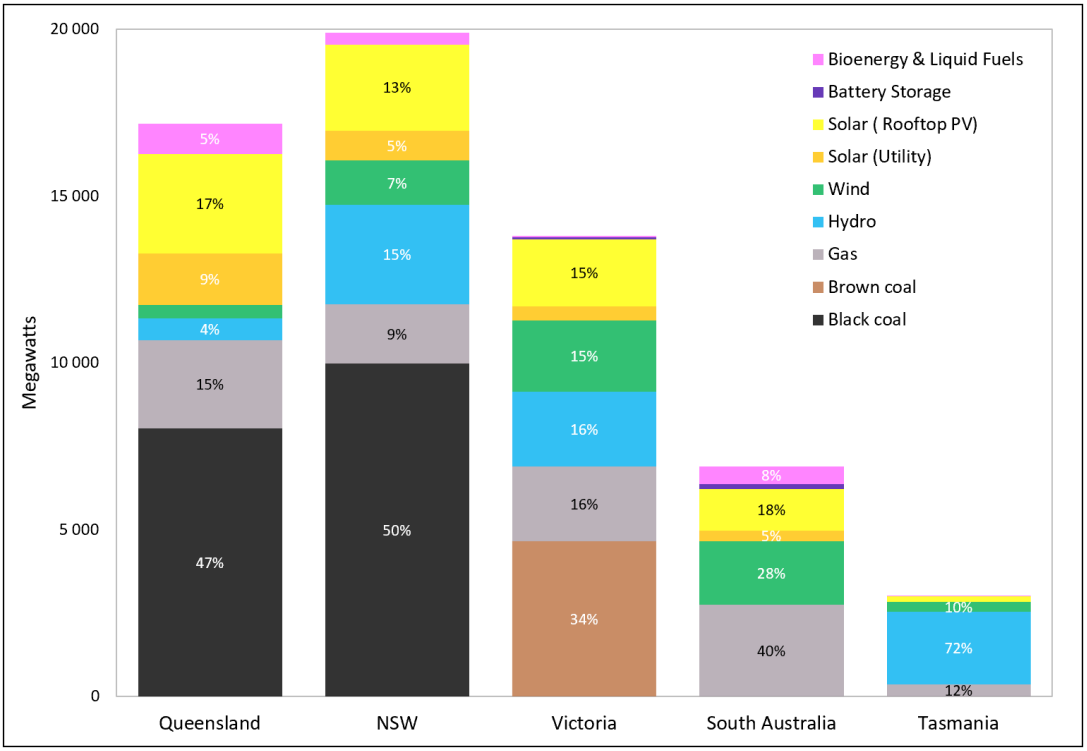

Figure 3: Generation capacity (MW) by trading region and fuel type (%) (Source: AER)

A diverse renewable generation base exists in Australia, comprising wind, large-scale solar, rooftop solar, hydroelectric, biomass (predominantly bagasse) and waste gas (landfill, sewer). The total installed generation capacity (at 1st January 2020) was 60,824MW [4] across an evenly-distributed renewable and baseload generation mix, as shown in Figure 4, below**:**

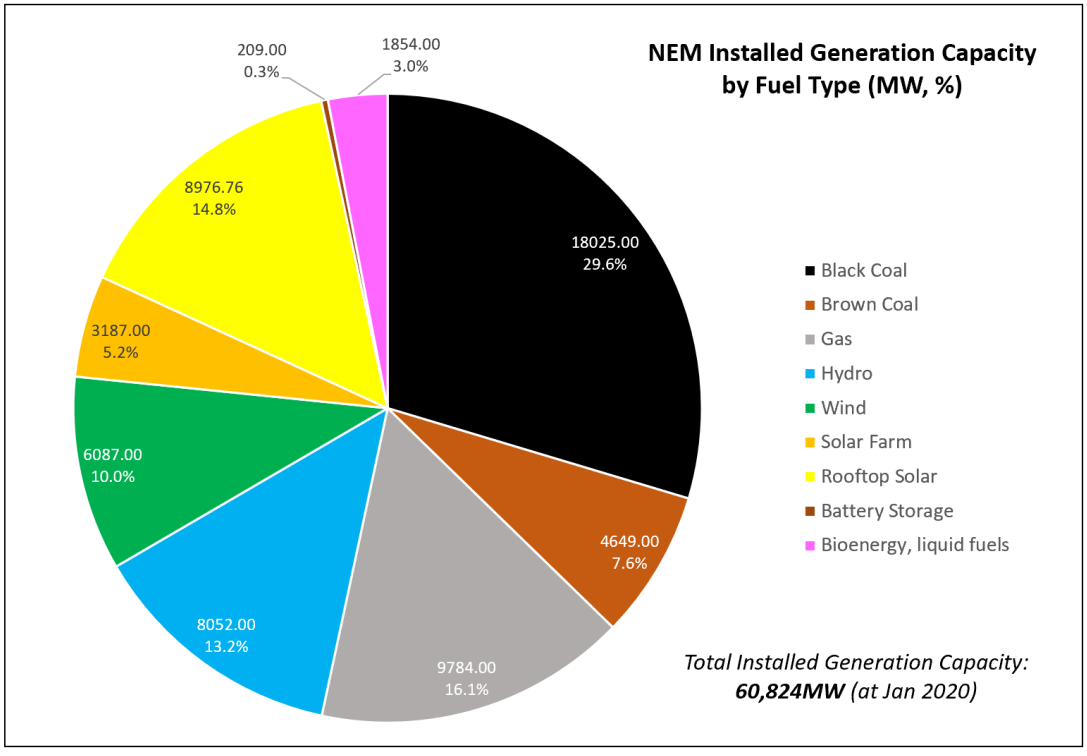

Figure 4: Installed electricity generation in the NEM. Source: AER.

NEM Generation (8 Aug 2019 - 7 Aug 2020)			
	Fuel Type	**GWh**	**%**
	Black Coal	102,004	50.0%
	Brown Coal	33,908	16.6%
	Gas (& Distillates)	17,499	8.6%
	Wind	17,969	8.8%
	Solar (Rooftop)	12,022	5.9%
	Solar (Utility)	5,896	2.9%
	Hydro	14,462	7.1%
	Bioenergy	181	0.09%
	Battery (net discharge)	22	0.01%
	Total Generation	**203,941**	
	Renewable Contribution	**50,530**	**24.8%**

Table 1: Total NEM generation from 8th August 2019 to 7th August 2020 by fuel type (Source: AEMO, via openNEM.org.au)

Electrical interconnection and import/export:

High voltage interconnectors link the five trading regions in the NEM (Figure 2), allowing import & export of power as determined by market forces and infrastructure needs (e.g. plant outage, maintenance). This improves the reliability and security of the system and facilitates efficient markets and generator dispatch.

South Australia has traditionally been a net importer, due to higher-cost gas generation, however rapid growth in wind and rooftop solar has recently made it an exporter to Victoria. Historically, Victoria's brown-coal fired capacity saw it exporting low-cost power to other regions, however recent plant closures have made it a net importer. Queensland is a net electricity exporter, due to excess coal-fired generation capacity. NSW relies predominantly on more expensive black coal generation, so is a net importer. Tasmania is historically an exporter of hydro power, and depends on rainfall, Victorian spot prices and interconnector availability. In the past 10 years, growth in wind generation has displaced Tasmania's gas.

Figure 5 shows the level of inter-regional trade as a percentage of demand. This indicates that the NEM is a well-connected and efficient market (except for instances where interconnectors have outages).

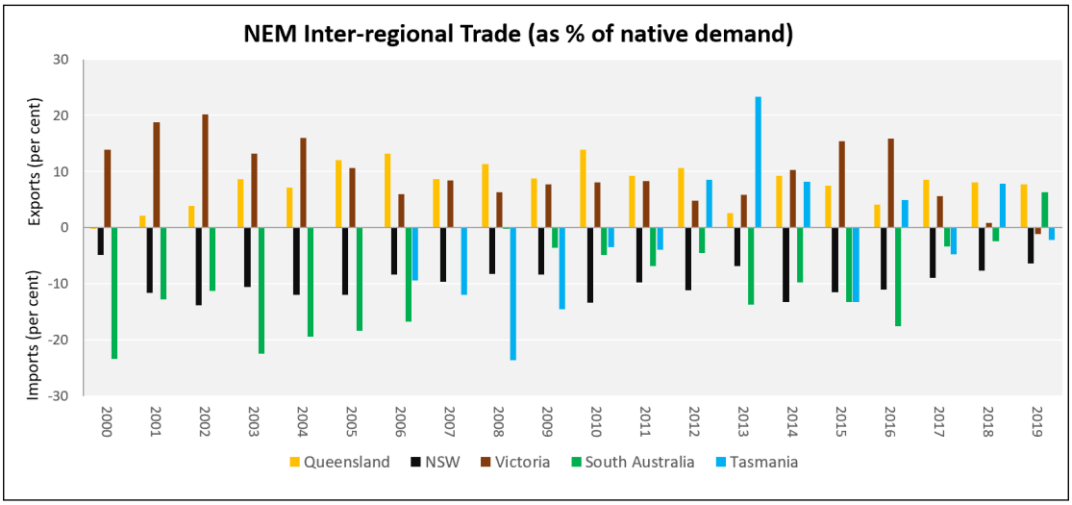

Figure 5: Inter-regional electricity trade as a percentage of demand. (Source, AER)

Historical support or development of renewables in the country/region:

The Renewable Energy Target (RET) was originally introduced in 2001 by the Australian Federal Government as the Mandatory Renewable Energy Target. Its aim was to source an additional 2% (9,500GWh) of Australia's generation from renewable sources by 2010. At the beginning of 2001, Australia's energy mix was heavily dominated by fossil fuel generation (83.3% coal, 8.6% gas & oil) with renewables, comprising almost entirely hydro, making up less than 8% [5].

In 2009, the RET was reviewed to target 20% renewable contribution (41,000 GWh).

In January 2011, the RET was divided into two sub-schemes, according to plant capacity (100kW threshold). Both schemes utilize renewable energy certificates and aim to achieve the same goal, which is to drive investment in, and development of renewable energy projects and deliver on the RET mandate.

1. Category 1: The large-scale Renewable Energy Target (LRET) is designed to deliver the majority of the RET. It creates a financial incentive (via energy certificate creation & sale) to develop renewable energy power stations such as solar farms, wind farms and hydropower.
2. Category 2: The complementary small-scale Renewable Energy Scheme (SRES) is designed for individual consumers and small businesses to participate in the energy transition by installing solar panels, solar hot water heaters and other eligible renewable energy generating systems.

In 2015, the Australian Parliament passed the Renewable Energy (Electricity) Amendment Bill 2015, which, among other things, reduced the RET from 41,000GWh to 33,000GWh by 2020. A link to the legislation and amendments is included in the relevent section of this report.

Since its introduction in 2001, the Renewable Energy Target has increased the number of installations of small-scale renewable energy systems, and successfully stimulated investment in renewable energy power stations. As a result, Australia's energy mix has evolved dramatically, with accelerated retirement of coal-fired generation and rapid growth in renewable generation, primarily wind and solar.

At the time of introduction of the RET, renewables contributed around 8% to total generation. Recent data from the Australian Electricity Market Operator (AEMO) for the period August 2019 to August 2020 (*Table 1, source: openNEM.org.au*) indicates that 24.8% was renewables and that Australia is on track to meet its stated goal of generating 33,000GWh from new renewable energy by 2020 under the scheme.

Electricity market structure:

The NEM comprises electricity generators, the HV transmission network, several regional distribution networks, electricity retailers and consumers. In 2000, the Australian Government privatised its transmission network and leased its distribution network.

Transmission networks transport electricity at high voltages from generators to major load centres, where electricity enters the 13 distribution networks that distribute electricity to residential homes and commercial & industrial properties. The transmission network is managed separately per sector by ElectraNet (SA), AusNet Services (Vic), TransGrid (NSW), Powerlink (QLD) and TasNetworks (TAS).

The electricity distributors are responsible for transporting and delivering electricity to customers, but not for selling it. Electricity retailers purchase electricity in the wholesale market, and network services from network service providers, and sell them to customers.

Consumers in Queensland, NSW and Victoria are serviced by multiple distribution networks, each of which operates and maintains its network within a defined geographic region. Consumers in South Australia, Tasmania and the ACT have a single distribution network operating within each region. These are: SA Power Networks (SA), Energex, Ergon (QLD), Ausgrid, Endeavour Energy, Essential Energy (NSW),

Evoenergy (ACT), AusNet Services, Jemena, Powercor, United Energy, Citipower (Vic) and TasNetworks (TAS). Distribution network regional extents are indicated on the right of Figure 2.

Vertical integration is the favoured business structure for large electricity retailers in the NEM. Vertical integration allows generators and retailers to better manage price risk in the wholesale market, reducing their need to participate in hedging markets. Three retailers - AGL Energy, Origin Energy and EnergyAustralia - supply 63% of small retail electricity customers in the NEM and have 46% market share in generation capacity. Second tier retailers - Red Energy and Lumo Energy (Snowy Hydro), Simply Energy (Engie) and Alinta - also own major generation assets. These vertically-integrated businesses account for 17% of small residential customers across the NEM, and 18% of generation capacity. When combined, these seven retailers own over 90% of generation capacity in South Australia, Victoria and NSW.

Around 200 registered generators sell electricity into the NEM spot market. Private entities own most of the generation capacity in South Australia, Victoria and NSW, while Government-owned entities own or control the majority of capacity in Queensland and Tasmania. A few large participants control a significant proportion of generation in each NEM region, as shown in Figures 6 & 7, below.

In South Australia, AGL Energy is the dominant generator, with 45% of capacity. Other significant generators are Engie (23%), Origin Energy (15%) and EnergyAustralia (6%). In Victoria, AGL Energy (32%) and EnergyAustralia (26%) control the majority of capacity. The Australian Government-owned Snowy Hydro (23%) is next largest. In NSW, AGL Energy (30%) and Origin Energy (26%) are the leading plant owners since privatisation in 2015. Snowy Hydro (22%), EnergyAustralia (12%) and Sunset Power (9%) are other major generators. In Queensland, state-owned corporations Stanwell and C S Energy control 56% of generation capacity. A third state-owned corporation, CleanCo, was created to increase wholesale market competition and support growth in the state's renewable energy industry. It controls 8% of the state's capacity, including all hydropower. The largest private operators are InterGen (10% of capacity) and Origin Energy (9%). In Tasmania, the state-owned Hydro Tasmania owns all generation capacity across hydro, wind and gas.

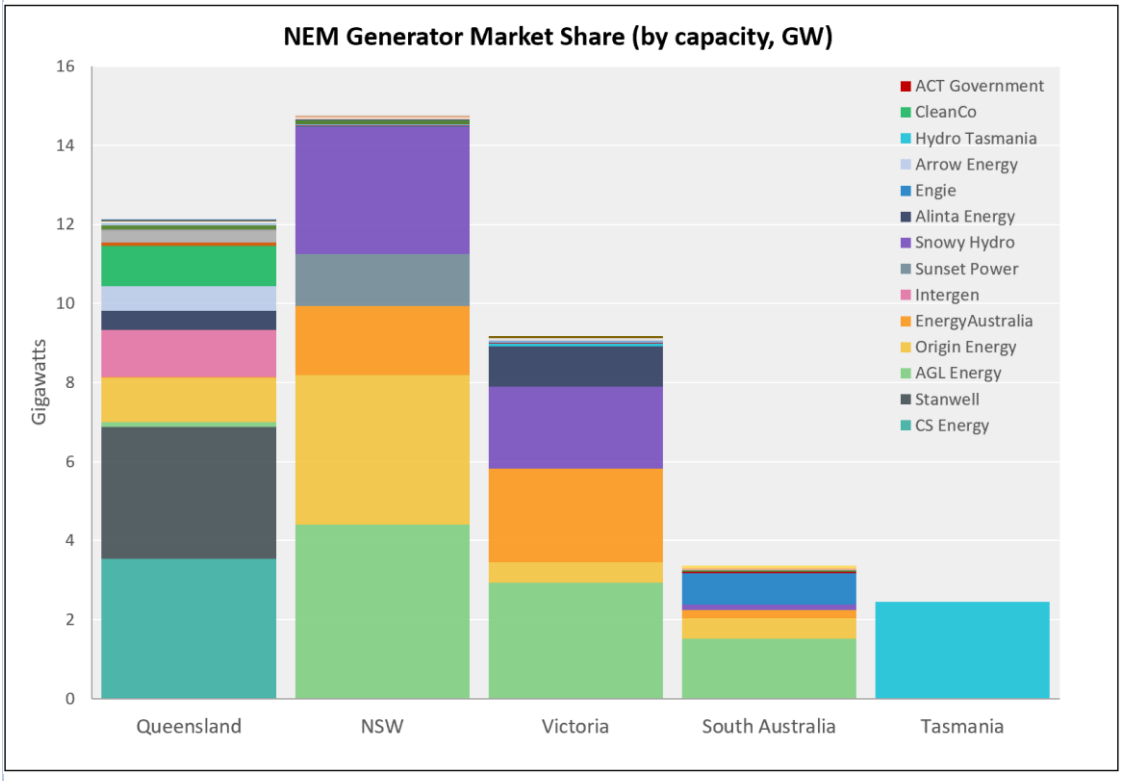

Figure 6: NEM generator market share by region and installed capacity (GW). Source: AER

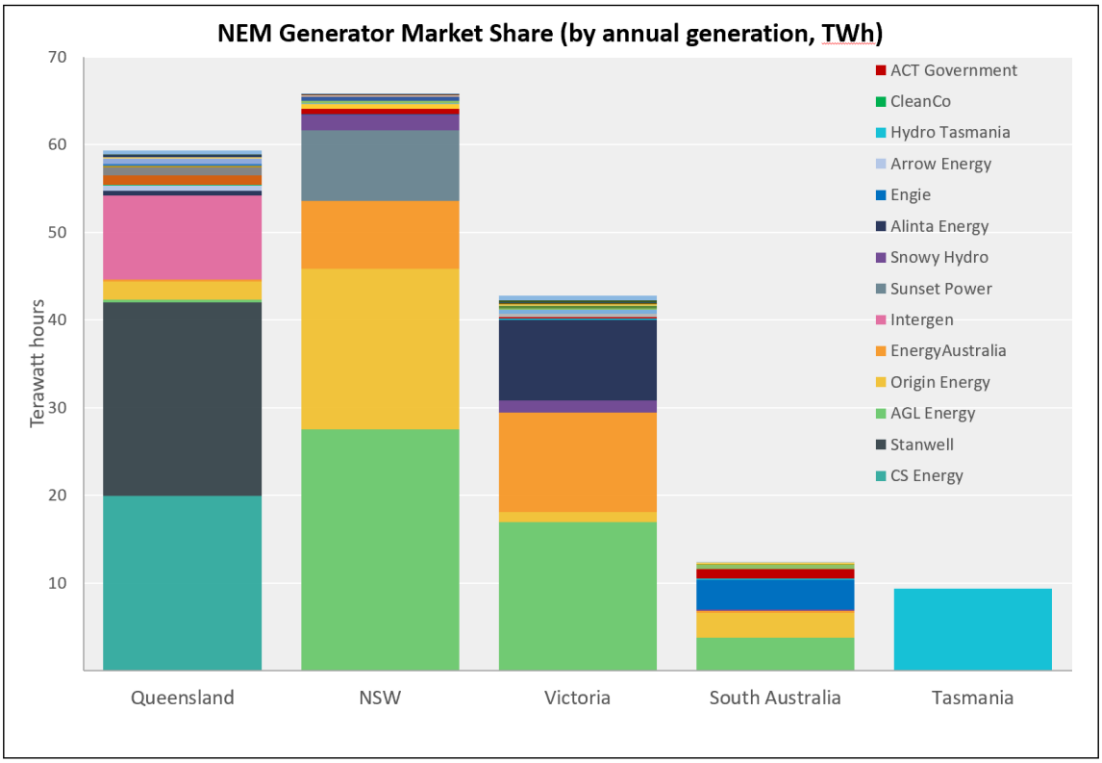

Figure 7: NEM generator market share by region and annual generation (TWh). Source: AER

Description of renewables support mechanism:

The Australian Federal Government introduced the RET to support renewable energy development and ensure that at least 33,000GWh of Australia's electricity comes from renewable sources by 2020. The scheme is split into two parts and includes:

1. The Large-scale Renewable Energy Target (LRET): creates large-scale generation certificates (LGCs)
2. The Small-scale Renewable Energy Scheme (SRES): creates small-scale technology certificates (STCs)

The RET provides a framework for the interaction of industry, business and individuals, including:

1. Sellers: Renewable Energy developers that receive LGCs and STCs for their renewable energy generation;

2. Buyers: Industry groups known as liable entities, who are required by legislation to acquire and surrender LGCs and STCs to meet compliance obligations under the RET scheme.

Certain qualified industry groups that produce emissions-intensive trade-exposed products (e.g. smelting, glass manufacture, fertilizer production) may apply for exemptions from the RET.

The LRET is designed to accelerate the development of renewable energy power stations (>100kW) through commercial incentives. These incentives are administered by creating a market for LGCs. Accredited power stations are able to create an LGC for each megawatt-hour (MWh) of generation, which can then be sold to liable entities (electricity retailers) that must purchase a certain amount to meet their compliance obligations. Liable entities are required to buy LGCs from the market and surrender them to the Clean Energy Regulator (CER) on an annual basis. The number of LGCs required to be submitted by liable entities is set each year through the renewable power percentage. In 2020, the RPP for LGCs is 19.31%. Accreditation of power stations and creation of LGCs continues under the LRET until 2030.

LGCs can also be sold to companies and individuals looking to voluntarily offset their energy use and emissions, however the relatively high price of certificates means that they are primarily used for compliance purposes under the RET scheme.

The SRES creates a financial incentive for individuals and small businesses to install eligible small-scale renewable energy systems such as solar panel systems and solar water heaters. It does this through the creation of STCs, which liable entities are legally obliged to buy and surrender to the CER each quarter.

STCs are provided after installation and cover the expected power generation of the system from the installation year (post-2017) until 2030, when the scheme ends. Typically, these STCs are marketed by installers as a subsidy and purchasers assign the right to create their certificates to an agent in return for a lower up-front price. The number of small-scale technology certificates required to be submitted by electricity retailers is set each year by the small-scale technology percentage, which in 2020 is 24.40%

All LGCs and STCs must first be created in the REC Registry before they can be bought, sold, traded or surrendered. The REC Registry is an online system managed by the Clean Energy Regulator that handles the creation, registration, transfer and surrender of LGCs and STCs, tracks their ownership and status and provides access to the STC clearing house.

https://www.rec-registry.gov.au/rec-registry/app/home

Responsible government department: (include key contacts)

The Clean Energy Regulator (CER) administers the Renewable Energy Target's large-scale and small-scale Renewable Energy Schemes. The CER also administers the REC Registry, where LGCs and STCs are created, transferred, and surrendered.

Existing/Planned energy legislation: (is there a CPO)

This is elaborated in the sections above.

Environmental legislation for RE:

Renewable Energy (Electricity) Regulations 2001

Renewable Energy (Electricity) Act 2000

Renewable Energy (Electricity) Amendment Bill 2015.

National Greenhouse and Energy Reporting Act 2007 *(NGER Act)*

Other Existing/Planned energy certificate systems: (purpose, extent)

GreenPower –
Green Power is a label-based scheme that is facilitated by the Federal Government. The scheme allows consumers to voluntarily surrender Green Power accredited LGCs for different portions of their energy usage above the mandatory levels required under RET compliance. Greenpower is most commonly offered as part of the product mix of Electricity Retailers.

STCs are not eligible for use under the Green Power Scheme.

Not all LGCs are eligible for use within the Greenpower scheme, the following fuels/technologies are not acceptable.

1) Utilisation of any materials (including wastes, primary or secondary) derived from forests other than sustainably harvested plantation forests. Plantation-derived wastes must not be sourced from plantations that clear, or have cleared after 1990, existing old growth or native forests.

2) Generators that involve the incineration of industrial, commercial or municipal solid wastes.

3) Hydro-electric projects, which require new dam construction that results in large-scale flooding of ecosystems.

4) Hydro-electric projects, which involve major diversion of rivers and do not adequately allow for environmental flows.

Other energy certificate schemes
Additional state-level energy efficiency schemes also exist (and include tradeable certificates) but do not fall under the RET scheme. They are focused on energy savings and carbon abatement, rather than generation attribution. None of the below certificates relate to any of the baseline generators or RET generators, and thus there is no risk of double counting with any future Australian I-RECs.

ESC's
Energy Savings Certificates's (ESC's) are issued under NSW's Energy Savings Scheme (ESS), which incentivises investment in energy-saving projects. ESC's represent 1 MWh of energy saved through the installation, improvement or replacement of energy saving equipment.

VEEC's
Victorian Energy Efficiency Certificates (VEECs) are electronic certificates created under the program when certain energy efficiency activities are undertaken in residential or non-residential premises. Each certificate represents one tonne of greenhouse gas emissions reduction (tCO_2-e).

ACCU's
An Australian Carbon Credit Unit (ACCU) represents one tonne of carbon dioxide equivalent (tCO_2-e) avoided or stored through emmissions reduction or carbon sequestration by an eligible activity.

Initial Implementation I-RECs – Below Baseline Generation

In order to be eligible to create LGCs under the RET, accredited generators must be in operation after 1st January, 1997. When the Renewable Energy Target was introduced in 2001, existing RE power generators – primarily hydroelectric and bioenergy – were assigned a baseline (measured in MWh) by the Clean Energy Regulator. This is generally equal to the plants average generation over the 1994-1996 period. Only generation above this baseline is eligible for creating LGCs under the RET. Thus, the MWh's below each plant's baseline are free to be assigned to another tracking instrument such as I-RECs.

There are currently 1,643 accredited renewable generators, generating approximately 50.5TWh in the NEM. Of these, the majority have baselines of zero and are eligible to create LGCs for their full generation under the current RET scheme. However, there are 95 baseline generators, totalling up to 16.4TWh of annual generation that are not eligible for LGC's. It is this portion of non-RET renewable generation that is the target of this I-REC application.

The legislation allows for certain situations whereby a baseline generator may apply to have its baseline reset. Generally, this is due to significant plant upgrades, repairs or changes in environmental flows (hydro). After engaging with a 'baseline' asset owner, the authors can confirm that this process was recently achieved after repairing and upgrading a small hydro dam that had been offline for several years due to flood damage. Once approved, baseline reviews are updated in the REC Registry by the CER.

By using baseline information from the CER and liaising directly with asset owners on the amount of generation, we can ensure that no MWh of generation eligible under the RET is double-counted in the proposed I-REC scheme. For example: a RE project may have been assigned a baseline of 100 MWh by the CER. If that project generates 150 MWh in a given year, then it can create LGCs for generation above

baseline (i.e. 150 – 100 = 50 MWh). The producer gets LGCs for 50 MWh, leaving the remaining 100 MWh below the baseline that can secure I-RECs.

Extent of engagement with government:

The authors have engaged with the Clean Energy Regulator to understand the baselines of generators and ensure that the generation that is proposed for I-RECs is not covered by RET schemes in any way.

To date, the authors have not yet raised the proposition of introducing the I-REC standard for baseline renewable generators with the CER or any other Government body.

Response from Government in relation to attribute tracking systems:

A detailed overview of the communication with the CER can be found in Annex 1.

Demand-side market potential or strategic nature of market development:

Expected demand will be from domestic and international companies operating in Australia. The Australian domestic market comprises many materials and energy-intensive industries that are eager to report on their use of renewables, and seeking an efficient, affordable way to track the origin of their electricity. Australian I-RECs would allow existing and aspiring RE100 companies to report green energy procurement in Australia. Currently, these companies can only use the compliance LGCs and STCs in Australia, which thereby, interferes with the existing compliance market and could distort the intended policy target by increasing the cost of compliance for the liable companies and thereby, their consumers.

Further, a compliance market is driven by its key policy targets and thus, its own economics, and as such, consumers who would like to use them for attribute tracking may be currently priced out of the market. Hence, such compliance markets can be considered similar to tax, injection rights and other benefits that several countries employ to achieve it's RE generation targets and thus, may not be considered as an efficient system to track the consumer's RE consumption.

As a policy tool, Renewable Energy (Electricity) Act 2000 section 23B(2) states that creation of STCs may employ a multiplier to the actual electricity generated and section 23B(4) makes it clear that "For the purposes of this Act, a certificate created in accordance with the regulations as mentioned in subsection (2) has a value of 1 MWh (even though the certificate does not actually represent 1 MWh)." These multipliers may achieve the desired policy targets but, may not suited for voluntary electricity tracking requirements. We have a similar scheme in the forms of ROCs in UK which employs such multipliers, but is exclusively used as a compliance scheme, complimented by the voluntary REGO scheme developed to enable a consumer's consumption claims. Similarly, we propose to have an I-REC scheme in Australia to enable consumer choice but, unlike in the UK, will have no overlap between the compliance and voluntary certificate schemes.

A further key benefit of introducing an I-REC system is that it allows consumers access to around 16.4TWh of hydroelectric and bioenergy generation not covered under the current RET scheme.

Moreover, the I-REC system is a long-term solution as, unlike the current Australian schemes, it does not end in 2030, thereby providing a more sustainable solution for attribute tracking.

Analysis of political disruptions or market risks:

With the LGC market forecasted to be oversupplied by 2022/2023 and forward prices suggesting a sub AUD$10/LGC price by 2023 the introduction of I-REC into the Australia market is well timed to take advantage of a likely increase in demand associated with lower pricing.

Analysis of regulatory risks including linkages with carbon markets and support systems:

Current environmental reporting in energy:

Under existing RET schemes, liable entities are required to report their LGC and STC certificate surrender on an annual basis. All liable entities that make acquisitions of electricity in a year must lodge an energy acquisition statement, which is completed in the REC registry and submitted by 14th February each year for the previous calendar year. The reporting includes information such as the amount of liable electricity acquired (in MWh), the network in which it took place and any exemptions. If liable entities do not surrender the required number of certificates, they must complete a large-scale generation shortfall statement or small-scale technology shortfall statement. If a liable entity fully meets its certificate liability, the shortfall statement is zero.

The National Greenhouse and Energy Reporting (NGER) scheme is a system for reporting company information on greenhouse gas emissions, energy production, energy consumption and other information specified under NGER legislation. It is also managed by the Clean Energy Regulator, which is required to publish annually, the greenhouse gas emissions and net energy consumption for registered corporations, as well as their GreenPower purchases, renewable energy certificates and carbon offset data. The CER also reports voluntary purchases of GreenPower and certificate surrender, although this is not a requirement under the NGER Act. Importantly, the data published under the National Greenhouse and Energy Reporting scheme for GreenPower represents a portion of voluntary surrender across the market, and does not capture any compliance-related transactions required under the RET schemes.

Mechanisms in place to support the reliable verification and issuance of I-RECs:

The Mechanism for verification of I-RECs in the Australia market will be broken into two categories;

- Generation volume that has created LGCs under the RET mechanism
- All other generation whose volume will be verified through Australian Energy Market Operator (AEMO) data

The RET and subsequent LGC creation mechanisms are operated on an opt in basis for eligible generators. This means that for generators to access the subsidy associated with the sale of LGCs they must choose to register their facility and create/sell LGCs. This freedom of choose allows the generator and eventual buyer of the LGCs to surrender them for purposes outside the RET, i.e voluntary surrender. It also means a generator could choose not to register their facility under the RET at all. This could occur in circumstance where the LGC price was below that of another accreditation mechanism for which the facility was eligible . The market experienced this event when the Victorian Government introduced a state based renewable energy target (VRET) and due to supply shortages VRECs traded at a premium to LGCs. This resulted in generators who were eligible for both schemes choosing to create VRECs instead of LGCs.

Renewable generators who are eligible under the RET and who are accredited and produce LGCs under the RET, can still choose to create I-RECs so long as they subsequently voluntarily surrender the corresponding LGC associated with the MWh used to create the I-REC. The Australian LGC registry has existing functionality to enable voluntary surrender. As an additional verification step it could be required that generators looking to create I-RECs would need to voluntarily surrender through a designated I-REC registry account, as is commonly done with the Green Power scheme.

For all other generators who aren't eligible or registered under the RET, generations volumes used to verify volumes for I-REC creation will be sourced through the publicly available data from the Australian Energy Market Operator's (AEMO) NEMWeb service (https://www.aemo.com.au/energy-systems/electricity/national-electricity-market-nem/data-nem/market-data-nemweb)

Local organizations of importance and their opinion on local I-REC market development:

Initial engagement with a large baseline generator was met with positive feedback and a request for further information on process and logistics to assist building their internal business case and expedite board approvals to participate in any future I-REC scheme.

More detailed conversations were held with

- [redacted] (Edify Energy)
- [redacted] (Origin Energy)
- [redacted] (UPC/AC Renewables Australia)
- [redacted] (Snowy Hydro)

[redacted] sees merit in introducing I-RECs in Australia, especially if the I-REC Standard cooperates with CER. This would limit errors in the convergence between I-RECs and other schemes and issues such as double sales. Another reason for introducing I-RECs is that the value of LGCs is dropping which means that generators will be looking for alternative ways to certify their generation. Besides, the LRET is ending in 2030, and having I-RECs already in place would provide continuity of a scheme in the country. [redacted] also mentioned that international players might have more interest in the Australian Market if there is a scheme that is adherent to international best practices (I-RECs or even LGCs being adherent).

[redacted] suggested targeting additive renewable generation rather than all generation as this would be in adherence to current local legislation. However, the secretariat and the local consultant believe that [redacted] is aware of the fact that EACs are normally eligible for all generation and that the focus on additive sources would just be his preference looking at the activities of Edify Energy.

[redacted] sees I-RECs being issued to all generation as a huge benefit as this would broaden the options for end-users who are cognizant of where their electricity is coming from. This group of end-users is rapidly growing according to [redacted]. The voluntary surrendering of LGCs as a requirement to create I-RECs is seen as very important to avoid double sales

[redacted]
The comments of [redacted] were seen as less relevant as they were mainly aimed at comparing I-RECs with offsets and about requirements in carbon markets rather than related to EACs directly. As a result it may be wise to consider workshops and webinars in 2021 to educate the public and stakeholders as to the work of certificate systems in electricity markets.

[redacted] also sees a growing demand for renewables from end-users as more and more companies are looking to procure more LGCs than the minimum required. Expanding the options for end-users by issuing below baseline generation would therefore be beneficial as long as various schemes would interact correctly. [redacted] highlighted that he wants only 'true renewables' to be used for 100% renewable claims in Australia and hence not the offshore efficiency schemes that use gas below the average emission factor.

In general all local stakeholder did not see any legal or regulatory issues associated with the introduction of the I-REC Standard in Australia to the contrary all saw it as supplemental and were supportive.

Any other relevant information:

References and Data Sources:

1. Palmer, G. 2017. An input-output based net-energy assessment of an electricity supply industry, Energy, 141 (2017) 1504-1516

2. openNEM Market data interactive portal
https://opennem.org.au/energy/nem

3. AEMO NEM Fact Sheet
https://www.aemo.com.au/-/media/Files/Electricity/NEM/National-Electricity-Market-Fact-Sheet.pdf

4. AER State of the Energy Market Report 2020
https://www.aer.gov.au/publications/state-of-the-energy-market-reports/state-of-the-energy-market-2020

5. Australian Energy Statistics Table of Electricity generation by Fuel Type
https://www.energy.gov.au/publications/australian-energy-statistics-table-o-electricity-generation-fuel-type-2018-19-and-2019

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Contributors	
Preparation Date	4th November 2020

Annex 1 - Contact with the Clean Energy Regulator (CER)

March, 2021

The secretariat calls with several individuals of the CER and the authors of the Australia country report including on call in March 2021.

Following the call, we received the contact details of the person within the Department of Industry, Science, Energy and Resources; the department responsible for setting policy. The email sent to them is copied below

Dear [redacted], [redacted] and the rest of the CER team,

First I want to thank you for the conversation last Thursday. It was helpful to get your feedback on our plan to promptly allow for the issuance of I-RECs as part of below baseline capacity generation.

I would like to ask you, once again, to provide your feedback on how you would like to see us proceed from here; as we mentioned on the call, this is all voluntary and it is beyond the scope of the current regulatory framework, thus you can be assured that there is no double counting of an environment attribute with an LGC. And as such, we do not see any barriers for the implementation.

However, you mentioned the desire to speak with the Policy Team about this prior to our facilitation. I propose we follow a 2-step approach. Step one: in the short-term, we proceed with voluntary I-RECs issuance for below baseline generation only. Step two: in parallel, we engage with the Policy Team on longer term integration including various topics such as voluntary I-RECs on the back of surrendered LGCs from wind/solar/hydro over baseline generation and CER or another promoted entity becoming the local Issuer for I-RECs in Australia, etc.

The additional potential revenue for renewables producers is a time-sensitive matter, therefore the faster we can provide clarity, the faster deals can be closed, and renewables producers supported with these additional revenue streams. Furthermore, we see international corporates wanting to voluntarily buy Australian (originated) RECs, but because a potentially perceived lack of access or adherence to third-party compliance rules they end up using sub-optimal solutions. If the short-term I-REC solution is available, many corporates would be willing to switch from these less than ideal solutions to buying I-RECs from below baseline generation in Australia to follow best practice and generate additional revenue for Australian producers.

The ability for the national authorities to appoint their own Issuer for I-RECs is, of course, always available but we understand that this is a step too far for the first discussions. As such, please let us know if you have any concerns related to the issuance of I-RECs for below baseline capacity, on a voluntary basis, based upon the principles listed above.

Thank you for your time and consideration, I look forward to staying in touch.

Kind regards,

[redacted]

April 2021

Following the email above, there was another meeting with the CER in April, 2021.

Dear [redacted] and others,

Thank you for the call on Wednesday. As a follow-up, I'd like to include an updated country authorization report for your review. In this report, you will be able to more clearly understand our intentions for the short-term, primarily, as quoted from the report:

> *In order to be eligible to create LGCs under the RET, accredited generators must be in operation after 1st January, 1997. When the Renewable Energy Target was introduced in 2001, existing RE power generators – primarily hydroelectric and bioenergy – were assigned a baseline (measured in MWh) by the Clean Energy Regulator. This is generally equal to the plants average generation over the 1994-1996 period. Only generation above this baseline is eligible for creating LGCs under the RET. Thus, the MWh's below each plant's baseline are free to be assigned to another tracking instrument such as I-RECs.*
>
> *There are currently 1,643 accredited renewable generators, generating approximately 50.5TWh in the NEM. Of these, the majority have baselines of zero and are eligible to create LGCs for their full generation under the current RET scheme. However, there are 95 baseline generators, totalling up to 16.4TWh of annual generation that are not eligible for LGC's. It is this portion of non-RET renewable generation that is the target of this I-REC application.*
>
> *The legislation allows for certain situations whereby a baseline generator may apply to have its baseline reset. Generally, this is due to significant plant upgrades, repairs or changes in environmental flows (hydro). After engaging with a 'baseline' asset owner, the authors can confirm that this process was recently achieved after repairing and upgrading a small hydro dam that had been offline for several years due to flood damage. Once approved, baseline reviews are updated in the REC Registry by the CER.*
>
> *By using baseline information from the CER and liaising directly with asset owners on the amount of generation, we can ensure that no MWh of generation eligible under the RET is double-counted in the proposed I-REC scheme. For example: a RE project may have been assigned a baseline of 100 MWh by the CER. If that project generates 150 MWh in a given year, then it can create LGCs for generation above baseline (i.e. 150 – 100 = 50 MWh). The producer gets LGCs for 50 MWh, leaving the remaining 100 MWh below the baseline that can secure I-RECs.*

It is our intention to move forward with the tracking of below baseline technologies and issuing I-RECs in a short timeframe. As this is an entirely voluntary market, we are just looking to ensure that there are no unforeseen clashing or unwarranted interactions with existing requirements or legislation. As future changes in legislation are, of course, always possible and, pending at least 6-12 months of notifications, we can easily inform the market of any potential adjustments.

I just want to clarify, as I did on our call, that our goal with this work is to facilitate the clarification of renewables procurement *within* Australia. The International in our name, the International REC Standard, refers to the international standardization of the markets, not the underlying Products they create. These certificates will be used by corporate companies, across Australia, as a verification of the origin of their electricity in adherence with international Standards and best practices.

Thank you for your time. Please let me know if you have any additional questions, comments, or concerns. I look forward to hearing from you.

Kind regards,
[redacted]

June 2021

In June 2021, the secretariat of the I-REC Standard Foundation was made aware of an Australian Government survey regarding the development of a certification scheme for Hydrogen in Australia. The report can be found here.

The report was primarily about hydrogen, but also for discussions related to below-baseline certification. The report acknowledged the need for a certification mechanism for below baseline generation noting that without it, it wouldn't be possible to prove the production of 'green' hydrogen using electrolysis. In particular, the following sections (in *italics* below) moved the secretariat to write the email which can be found in below. You can see below their reference, which also triggered the focus of the secretariat, saying, "There has also been non-governmental organization interest in creating below baseline renewable electricity certificates in Australia ahead of an Australian Government scheme." More details from the report can be seen below.

From the Hydrogen GO survey from the CER:

The need for a new system
P.23

> *"In order to verify and track emissions associated with hydrogen production, the scheme needs to be able to verify whether renewable electricity was consumed. At present, production of renewable electricity can be demonstrated if the electricity received Large-scale Generation Certificates (LGCs) under the LRET. However, this cannot be used to verify below baseline renewable electricity and will not be available for any renewable electricity produced after 2030. Therefore, alongside the Hydrogen Guarantee of Origin, a new renewable GO certificate is proposed that could be used to track and verify below-baseline renewable electricity and renewable generation post-2030 when LGCs cannot be created under the LRET. This scheme is outlined in detail in chapter 3.5."*

The objective of the new system
P.33 (chapter 3.5)

> *"Like LGCs, renewable GO certificates could represent 1 MWh of eligible renewable generation, and could be traded between renewable electricity generators and other entities in private commercial arrangements, or sold openly in a spot market. A renewable GO certificate could be voluntarily surrendered using the Renewable Electricity Certificate (REC) Registry which is administered by the Clean Energy Regulator. Other eligibility conditions could be similar to LGCs as set out in the REE Act and Regulations, except the requirement to be above baseline.*
>
> *The long-term objective of this option would be to have a single renewable GO certificate mechanism to verify all eligible renewable generation. However, a transitional arrangement would be that until 2030, LGCs would continue to be used to verify above-baseline renewable generation, while renewable GO certificates could only be created for below-baseline generation or generation ineligible under the LRET.*
> *After 2030 when no LGCs can be created and no liability under the LRET applies, the transitional arrangement would end and renewable GO certificates would be exclusively used for verifying all renewable energy generation.*
>
> *This option would provide an enduring mechanism for tracking all renewable generation and ensuring no double counting under the market based method. Under the market based method, surrender of renewable GO certificates, like LGCs, would be assigned a zero emissions factor."*

International Standardization (Text in Bold is in the report but made Bold by the secretariat)
Continuation of P.33

> *"Surrender of renewable energy certificates is emerging internationally as the primary approach to verifying and tracking renewable electricity inputs into hydrogen production, for example under the industry-led CertifHy scheme. Additionally, under the CertifHy scheme, no distinction is made between above and below baseline renewable electricity. Other countries such as the European Union and the USA have Guarantee of Origin schemes that cover all renewable generation.* ***Therefore, without a mechanism to recognise below baseline renewable electricity, domestic hydrogen producers would be at a competitive disadvantage compared to those operating under international schemes.***
>
> *Outside of industry, the Tasmanian Government has advocated for a mechanism to track below baseline renewable electricity to provide a basis for the lowest cost renewable electricity as an input to hydrogen production.* ***There has also been non-governmental organisation interest in creating below baseline renewable electricity certificates in Australia ahead of an Australian Government scheme."***

Dear [redacted],

I am responding on [redacted]'s behalf ([redacted] in CC). Thank you for sending us the report, 'A Hydrogen Guarantee of Origin scheme for Australia,' and providing us the opportunity to respond during the consultation.
[redacted]. As we have shared your survey, they will respond to it in more detail through the official paths.

The main reason for contacting you is with regards to the to-be-developed electricity REC scheme in Australia that will cover below baseline generation. But before delving into that,
[redacted]

Australian REC scheme for below baseline generation
As noted several times in the report, Australian market players need an electricity REC scheme for below baseline generation and as a substitute for the LGC scheme after 2030. We have already shared our wishes, as the I-REC Standard Foundation, to enter the Australian electricity REC market for exactly those reasons. And this report identifies such challenges that emphasise the relevance for implementing a REC scheme that is adherent to the I-REC Standard Foundation rules and regulations.

International acceptance and harmonization
Paragraph 3.4 on page 28 mentions that the *"implementation of the market-based method may differ between countries as each country has their own mechanisms to account for renewable electricity claims, however a key principle is a requirement that renewable energy claims cannot be double counted"*.

Avoiding differences between mechanisms in various countries is the core reason for the existence of the I-REC Standard. The I-REC(E) scheme, the name for the electricity REC scheme adhering to our rules and principles, has already been implemented in 43 countries around the world including China, Taiwan, India, Singapore, and Japan.

[redacted]

Industry-led versus government-led scheme

[redacted]

Next steps

We firmly believe the introduction of I-REC(E) would be beneficial in Australia and this report reinforces that belief, particularly with the mention of interest for non-governmental organizations to implement a REC scheme in Australia on page 33 of the report. At the same time, as a voluntary international NGO, we recognize that providing explicit permission will be challenging, and as a result, and in discussion with our governance board, we have decided to implement the scheme for below baseline generation as of September 1, 2021. Our default Issuer, GCC, will take care of the Issuance but we have the control to request them to leave and put in place any organization you may want to appoint for this role. In the case this is against the explicit desire of the national authorities, we anticipate responses before that time. In addition, as we are working to collaborate and support national policy, we will keep close eye on the national regulations and ensure any future changes in the Australian national system for tracking below-baseline technologies are closely evaluated.

Thank you for this opportunity to respond to your report. We hope to have you consider us a partner in the future developments for below-baseline tracking, as well as other attribute tracking needs in the country.

[redacted]

Thank you again for your time and consideration to our response. We look forward to hearing from you.

Best regards,
[redacted]

Response

Hi [redacted]

Thank you for your feedback on the hydrogen guarantee of origin discussion paper.

I encourage you to submit a formal submission on the renewable certification elements of the consultation paper. However, if you would prefer we treat your email as a formal submission, then please consider the Privacy Collection Statement and let me know https://consult.industry.gov.au/climate-change/hydrogen-guarantee-of-origin-scheme-discussion/consultation/intro/

As outlined on the cover of the discussion paper, the intention is to facilitate consultation and the issues canvassed have not been endorsed by the Australian Government. However, we anticipate that the submissions received as part of the consultation process will inform the Government's position, including with regards to certification of renewable energy.

The establishment of a hydrogen Guarantee of Origin (GO) certification scheme is a priority under Australia's National Hydrogen Strategy (https://www.minister.industry.gov.au/ministers/taylor/media-releases/promoting-australian-hydrogen-through-certification-scheme). As outlined in the discussion paper, a key part of delivering this scheme will be a mechanism to track and verify renewable energy inputs.

Regards

[redacted]