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Inquiry into Energy Matters in Tasmania

Becoming the wheelhouse of renewable energy from all natural resources

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MEA commends Tasmania's success in achieving "100 per cent self-sufficiency in renewable electricity generation" [OBJ] and continued effort towards the "target of net zero emissions, or carbon negative, from 2030"[1]. And now with the State's "legislated …. Tasmanian Renewable Energy Target (TRET) …. to double [the] installed renewable generation capacity by 2040" there is abundant opportunity to enhance grid and overall National Energy Market (NEM) security while reducing household energy costs which is achievable through consumer energy resources (CER).

CER includes:

- Rooftop solar photovoltaic units (Solar PV)
- Battery storage
- Electric Vehicles (EV) batteries

These assets combined allow households to independently generate, store and control their energy, reducing reliance on the gird simultaneously decreasing energy costs. Furthermore, built environment CER infrastructure installation has minimal impact on cultural, heritage and ecological sites as they are installed within private household and business premises.

Despite Government's funding of EV charging infrastructure, consumer demand for charging facilities and energy supply could jeopardise the grid's stability as EV adoption increases. The obvious renewable energy solution is solar PV combined with bi-directional EV charging which enables consumers to charge their EVs within their private residence, reduce charging costs and store household energy for later utilisation. This needs to be coupled with Tariffs to incentivise CER behaviour that best supports grid demand.

MEA believes Solar PV is a powerful cost-saving and clean energy producing tool which is being significantly underutilised in Tasmania to achieve its targets. As a result, our response to the inquiry matters is from the position of CER advocacy.

The Parliament of Tasmania has appointed a Joint Select Committee to inquire into and report upon energy matters in Tasmania with the following Terms of Reference:-

a, challenges related to energy supply in Tasmania including:—

(i), Structure and operations of State-owned energy entities;

With the government aiming "to transition the Tasmanian Government fleet to 100 per cent electric vehicles by 2030"' in combination with the financial commitments to incentivise household uptake of EVs[2], we can expect to see a significant increase of EVs in coming years. More EVs means more energy demand as cars rely on energy to operate. Tasmania's energy supply chain is unprepared for these pressures exposing TasNetworks and Aurora Energy to significant public outcry if and when the grid fails. Furthermore multiple grid failures from over-demand will likely damage EV market growth as consumers lose faith in the ability to reliably charge their vehicles.

[1] Roger Jaensch, Minster for Environment and Climate Change, '*Tasmanian Greenhouse Gas Emissions Report 2022 released*' Tasmanian Government, [3 August 2022] <https://www.premier.tas.gov.au/site_resources_2015/additional_releases/tasmanian-greenhouse-gas-emissions-report-2022-released>

[2] (n1), < https://recfit.tas.gov.au/fact_sheets_and_reports/supporting_electric_vehicle_uptake>

(ii). energy requirements;

The NEM and grid remain exposed to supply capacity problems as population growth and increased EV adoption occurs. When coupled with Battery Energy Storage Systems (BESS), either home batteries or bi-directional EVs, Solar PV installations reduce these pressures as households requires less State produced energy and can support the grid's supply capacity exporting excess solar energy back to the grid when it is required.

(iii). expansion of State-owned renewable energy generation including associated community and economic benefits;

Tasmania's 'Battery of the Nation' project is preparing to expand existing hydropower systems and potentially create a new pumped hydro system.[3] The "combined cost of Marinus Link and Battery of the Nation could be about AU$7.1 billion, of which about half would be the cost of establishing a new pumped hydro capacity"[4]. Furthermore, as we discuss under b(ii) below, hydro-dams have significant ecological and environment impact. Alternatively, Solar PV infrastructure utilises pre-existing transmission lines and building rooftops making this a comparatively cheaper alternative and more environmentally considerate.

(iv). private energy generators;

It is vital that State-owned energy entities (SOEEs) respect *AER Ring Fencing Guideline Vers 3* in that works relating to private assets installation and maintenance are to be reserved for the private sector. SOEEs are to only be used as a "supplier of last resort" and to focus on public infrastructure projects only.

The energy consumer with rooftop PV either alone or in an aggregated service with others are in effect energy generators. MEA believe that this type of distributed consumer approach should be preferred over efforts from DNSPs and SOEEs to enter the market as "Gentailers" and their stated plan for DNSP installed and controlled Stand Alone Power Supplies (SAPS).

(v). energy generation, storage and transmission capacity; and

As discussed throughout this submission, Tasmania's current grid remains exposed to the following challenges:

- Grid supply issues
    - Excess consumer demand at certain times of the day and in certain locations – especially as population growth and EV adoption increases.
    - Grid failure through climate disasters and cyber-attacks.
- Insufficient focus on the micro-economic benefits available through renewable energy (i.e. solar PV and BESS reduces ongoing household and business energy costs).

(vi). energy security considerations.

Despite having 100 per cent renewable sourced energy, Tasmania is still subject to many of the traditional risks associated with grid supplied energy, including -

- Climate events (e.g. bushfires and cyclones).
- Cyber-attacks (e.g. Ukraine's grid shutdown).

Please, refer to b(vi) below on how CER provides a renewable alternative which protects the grid's security against these risks.

[3] (n1), 10.

[4] Colthorpe. A., *'Australian federal government funding for Tasmania 'Battery of the Nation' hydro scheme"*, Energy Storage News, [4 April 2022] < https://www.energy-storage.news/australian-federal-government-funding-for-tasmania-battery-of-the-nation-hydro-scheme/#:~:text=The%20utility%20has%20said%20the,establishing%20new%20pumped%20hydro%20capacity.>.

b. opportunities related to energy supply in Tasmania including:-

(i). Structure and operations of State-owned energy entities;

TasNetworks - CER provides TasNetworks the ability to reduce operating cost and increase supply capacity from household and business excess solar energy. TasNetworks should progressively upgrade transmission infrastructure to enable two-way energy supply and amend its operations to be maximise the benefits of utilising household and business solar and stored energy (i.e. extra source of TOU energy and reduced demand pressures).

Aurora Energy – this SOE can take the opportunity to provide competitive consumer price packages providing consumers with the 'power of choice' in utilisation of energy which should ultimately reduce energy costs. Amber Energy is a prime example, which allows customers to "earn wholesale [feed-in tariffs] for [their] exports"[5] and have real-time tracking of energy usage to ensure optimal and cheap energy utilisation throughout the day.[6]

(ii). energy requirements;

With only two per cent of Tasmania's renewable energy being sourced from solar PV[7], this is a significantly underutilised available renewable energy tool that offers unique benefits. The State receives sufficient levels of sunshine. We advocate that Tasmania implements ambitious private solar PV targets reinforced with meaningful policies and funding options.

Solar PV allows the Tasmanian Government to expand its renewable energy capacity through its built environment without significant environmental impact. Comparatively, hydroelectricity dams "can disrupt ecosystems and alter natural habitats … [and] can lead to the displacement of local populations and have adverse effects on fish migration and river flow"[8]. Alternatively, solar PVs are installed within private household and business premises' and utilise pre-existing transmission infrastructure for exporting back to the grid. This is a particularly important opportunity to note given Tasmania is considering a new pumped hydro-station in addition to expanding existing ones.[9] MEA advocate Tasmania initiate an ambitious household and business solar PV and BESS initiative as part of the Major Infrastructure Projects.

(iii). expansion of State-owned renewable energy generation including associated community and economic benefits;

Western Australia is currently undergoing initiation and testing of *Project Symphony* which is -

> "an exciting and innovative project in Western Australia (WA) where [CER] such as rooftop solar, batteries, and other major appliances, like air conditioning and pool pumps, will be orchestrated as a Virtual Power Plant (VPP) to participate in a future energy market, unlocking greater economic and environmental benefits for customers and the wider community."[10]

The purpose of Project Symphony is to "enable the aggregation and dispatch of electricity generated and stored by [CER] assets in a similar way to traditional power plant"[11]. This provides an example how Government can utilise CER to expand its State-owned renewable energy generation by building a de-centralised storage hub. This will enable the State to absorb excess household and business solar energy to:

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[5] 'I have a battery', Amber < https://www.amber.com.au/solar-and-battery>
[6] '*EARN THE REAL VALUE OF YOUR SOLAR EXPORTS*', Amber < https://www.amber.com.au/solar>
[7] (n1), 5.
[8] '*Hydropower vs Solar and Wind Energy Comparative Analysis of Renewable Sources*' [24 October 2023], < https://utilitiesone.com/hydropower-vs-solar-and-wind-energy-comparative-analysis-of-renewable-sources>
[9] (n1), 9.
[10] '*Project Symphony*', AEMO < https://aemo.com.au/en/initiatives/major-programs/wa-der-program/project-symphony>
[11] (n9).

a) Provide unimpeded energy for the community which can draw energy from a publicly controlled VPP battery; and
b) Send to the mainland, creating revenue for the Tasmanian taxpayer.

(iv). private energy generators;

For the below opportunities, please refer to c(i) for greater description.

- updating infrastructure to enable greater ease of two-way energy supply (currently designed as a one-way energy supply of supplier to household/business).
- Through greater use of Time of Use (ToU) Tariffs, when grid demand is high to incentivise more energy efficient consumer behaviour, the NEM can utilise the reservoir of excess over-supply of household/business generated solar energy.

(v). energy generation, storage and transmission capacity; and

For the below opportunities, please refer to c(i) below for greater description.

- Increasing stability of grid network as population and EV adoption increases. With CER, households and businesses will become less reliant on the grid despite general energy demand increasing.

(vi). energy security considerations.

CER provides opportunity to be resilient towards-

- climate events which disrupt energy connection (i.e. bushfires, cyclones). Households can independently source, store and utilise solar energy without the grid or transmission lines etc.

- Cyber attacks which are becoming increasingly risky as the world becomes more digitalised. Ukraine's 2015 grid cyber-attack, which shut off power to 80,000 customers, is just one example of this.[12]

c. the operation of the National Electricity market (NEM) including:-

(i). the current and future energy demand for participants;

CER will continue to change how the traditional NEM operates as households and businesses essentially become wholesalers in the energy supply chain. Infrastructure and policy upgrades are vital to ensure CER benefits can be fully realised by consumers and the economy.

Solar PV

As of July 2023, "more than 50,751 systems have been installed [in Tasmania] … [from] a population of 571,6000 … [which] works out to around 472 watts of small-scale solar energy capacity per Tasmanian"[13]. As this only accounts for 19% of full household and business capacity, there is vast opportunity to improve solar contribution to the States renewable energy resources. Independently sourced solar energy reduces grid demand pressures allowing for a more stabilised energy supply.

Two-Way Network Infrastructure

Pre-existing transmission infrastructure needs to be upgraded to reflect the changing energy supply chain, modifying from a one-way system to a two-way system, allowing consumers to not only receive energy but also transfer privately generated energy back to the grid.

Battery Energy Storage Systems (BESS)

It is widely accepted that we need to increase the NEM's energy storage capacity to enable reliable renewable energy operation. To achieve this, significant household and business

[12] '*Hackers behind Ukraine power cuts, says US report*', BBC News [26 February 2016] https://www.bbc.com/news/technology-35667989
[13] '*HOME SOLAR POWER IN TASMANIA*', Solarquotes < https://www.solarquotes.com.au/australia/solar-power-tas/>

implementation of BESS is required. These enable consumers to store self-generated energy (from Solar PVs) and either soak, be self-consumed during peak evening periods, or send excess BESS capacity back to the grid during peak demand times.

Rather than relying on large, centralised storage that needs long runs of HV transmission lines to transfer the energy to our cities and towns, many BESS located in private homes and businesses are installed throughout towns and cities on the existing built environment, utilising the existing distribution infrastructure. This removes the single points of failure, and increases network resilience, whilst at the same time incrementally and progressively increasing system storage capacity with each individual system installed.

Time of Use Tariffs (ToU)

With the cost saving opportunities Solar PV, HEMS and BESS collaboratively provide, there will be an expectation for Government to facilitate ToU policies which provide price signals to consumers when to store, utilise or send excess energy back to the grid. During peak demand, ToU tariffs would incentivise households to send excess energy back to the grid in returns for a rebate and simultaneously signal for consumers to utilise their store excess solar energy as opposed to utilising grid energy. This will result in sustainable economic growth and increased household disposable income.

Care must be taken that vulnerable cohorts of consumers such as pensioners, welfare recipients, and those on low incomes, are not negatively affected by a move towards ToU Tariffs.

Digital Smart Meters

Digital smart meters will become of greater use which provides consumers with the measurement infrastructure designed to promote choice and efficiency in the delivery of energy to the end point consumer. Unlike traditional meters, smart meters allow for real time measurement and control of energy use.

Electric Vehicle (EV) Bi-Directional Charging

With the widely anticipated uptake of EVs, more energy will be required to maintain charging demands. Home rooftop Solar PV is a key solution to reducing the excessive demands EVs would place on the grid. EVs provide the ability for households to soak excess PV supplied energy and have the possibility of being dispatched during times of need as EVs typically have a battery of around 70KW adding up to seven times the capacity of a static home battery in addition to being a clean productive transport option.

Demand for bi-directional EV charge will likely become the way of the future, allowing consumers to not only charge their vehicles but also becoming a dispatchable reservoir of power during periods of undersupply. Currently DNSPs are seeing EVs as primarily a threat to the grid, but if policy and regulation caught up to the rapid uptake of EVs they would become an invaluable asset to the grid.

We can expect to see increased network stability through EV infrastructure installations amongst households and businesses when utilised in concert with HEMS for residential buildings and Building Management Systems (BMS) for commercial buildings.

(ii). costs, benefits, opportunities and risks associated with the renewable energy transition; and

Please refer to our answer under c(i). We have listed a summary of our response below.

Costs (of CER)

- Installing CER equipment can be costly however these costs will be significantly off-set through reduced power bills.
- Below is a list of groups who may initially struggle to participate and benefit from CER:
    - Tenants – relying on landlords to bear cost of installation without any benefit.
        - Solution: tax incentives for landlords who install CER.
    - Low Income Households – upfront cost of installation unaffordable.
        - Solution: government rebates to assist with installation costs.
    - Multi-Unit Complexes – Body Corporates may deny motions to install solar PV, EV charging, and batteries.
        - Solution: government policy mandating such motions must be accepted.

Benefits (of CER)

- Greater household control over power utilisation, allowing consumers to become suppliers in the energy chain.
- Increased stability of the grid despite population growth and increased uptake of EVs.

Opportunities (of CER)

- Tasmania can develop long-term sustainable economic growth through household and business solar PVs as consumer energy costs are reduced, leading to increased household disposable income, and therefore improved macro-economy.
- EV bi-directional charging will help alleviate EV charging facility pressures and reduce household energy costs. It would also increase the distributed dispatchable storage capacity in the grid as a whole, ultimately helping reduce electricity prices for consumers that do not have PV or BESS.
- There is a private market of licenced electrical contractor ready to be at the forefront of CER installation and maintenance. This will continue to contribute towards the job and economic growth Tasmania is expecting with its current pipeline of renewable energy projects.

(iii). Tasmania's past and future participation

Tasmania has made a significantly positive contribution towards clean energy generation and is to be congratulated in its efforts to double this output by 2040.

However, Tasmania should take advantage of its 2040 target to positively impact the micro economy. As described throughout this submission, hydroelectricity has achieved clean energy, but has not improved grid capacity, NEM stability or energy costs. We recommend Tasmania aggressively develop its solar PV market to benefit households, businesses and the wider Tasmanian economy.

d. Marinus Link Pty Ltd and associated energy power developments (Battery of the Nation and North West Transmission Development) including:-

(i). Likely beneficiaries;

The NEM and Tasmanian taxpayers

(ii). Funding arrangements, including the potential for private sector contribution;

Beyond MEA's Expertise.

(iii). Impact on Tasmanians' energy bills and concessional pricing arrangements; and

As discussed under a(iii) installation of solar PV infrastructure is cheaper and better for the environment than that of hydro-electricity infrastructure. Consequently hydro-dam works proposed under the 'Battery of the Nation' project, we can expect operating and capital costs to

be absorbed by consumer energy prices. Alternatively, if the Tasmanian Government instead integrates solar PV installations (and necessary network connections) into its major infrastructure projects, we can expect consumer energy prices to decrease as considerably less infrastructure costs will be incurred.

Furthermore, unlike hydro-energy and wind energy, CER allows consumers to independently generate, store and utilise renewable energy. When used in concert with ToU tariffs, consumers can save money as they store energy to utilise during peak demand hours when prices are high or alternatively sell back to the grid and receive a financial rebate in return. The current renewable energy operations within Tasmania does not provide consumers with these opportunities as the NEM still operates in the same traditional one-way retailer-to-consumer operating chain.

(iv). Alternative options and associated costs and/or benefits to Tasmania including costs and cost of a 'do nothing approach'.

Throughout this report we have discussed the benefits of prioritising CER growth within Tasmania's renewable energy industry. Pease refer to all previous answers throughout this report for the costs, benefits and opportunities that CER can achieve.

Conclusion

Through a combination of solar PV, BESS, HEMS and ToU tariffs, households and businesses are empowered to independently produce distributed clean energy, simultaneously reducing power bills which increases consumer disposable income leading to long-term economic growth.

Tasmania has achieved exemplary renewable energy independence through its abundant natural resources but has severely underutilised the potential of solar PV and its unique micro-economic benefits for households and businesses. We advocate that government policy should focus on increasing household and business CER through financial rebates, ToU tariffs and upgrading transmission infrastructure to enable two-way import and export of household generated energy.

With population and EV adoption anticipated to increase in the coming years, it is vital Tasmania take advantage of the opportunity to stabilise the grid's integrity and provide consumers the best opportunity to save electricity. Under hydro-energy, the grid remains exposed to climate disasters and cyber-attacks; issues which solar PV provides natural protection.

Unlike hydro-energy, the infrastructure required for solar PV is cheaper and better for the environment as it merely requires building rooftops and utilising pre-existing transmission infrastructure (in addition to new transmission lines where currently non-existent (e.g. new residential areas)).

Tasmania is well positioned to champion renewable energy through all natural resources with a skilled electrical industry available to make this happen; it is up to Government to implement actionable policies. There is further opportunity for Tasmania to demonstrate to the remaining Australian private and Government entities how to profitably incorporate CER into daily operations by updating infrastructure to a two-way network and providing customer retail packages that allow customers to maximise their CER benefits.

There are vast benefits and opportunities to be potentially derived which benefit the households, businesses and the wider Tasmanian community. The State's goal to double renewable energy by 2040 makes this the prime time to invest into CER solar PV technology, becoming the national powerhouse of renewable energy from 100% natural resources.