**Submission No 134**

# INQUIRY INTO IMPACT OF RENEWABLE ENERGY ZONES (REZ) ON RURAL AND REGIONAL COMMUNITIES AND INDUSTRIES IN NEW SOUTH WALES

**Organisation:** Wild Rivers Engineering

**Date Received:** 31 January 2025

**To**: Portfolio Committee No. 4 - Regional NSW

## Re: Inquiry into the impact of Renewable Energy Zones (REZ) on rural and regional communities and industries in New South Wales

# 1 Introduction

Wild Rivers Engineering is a small business that is based within the New England Renewable Energy Zone (NE REZ). We welcome the opportunity to respond to this inquiry.

It is exceptionally rare that a series of mega-projects will be relied upon by government policy before their cumulative impacts are understood. It presents a high risk to the community as various consultants and government employees feel obligated to achieve policy goals to the detriment of the impacted communities.

Wild Rivers Engineering elected not to respond to the EnergyCo tender to provide its core constructability services for this reason. The density of the proposed development, as well as its geographic spread, is simply breath taking.

In the course of our business, we have tried to understand what the stated 8GW Network Capacity of NE REZ could look like for our region. While EnergyCo have responded to our inquiries, they have refused to publish the additional information or update our community. Despite repeated requests, they have also elected to not advertise the existence of this Inquiry in project updates and community letterbox drops.

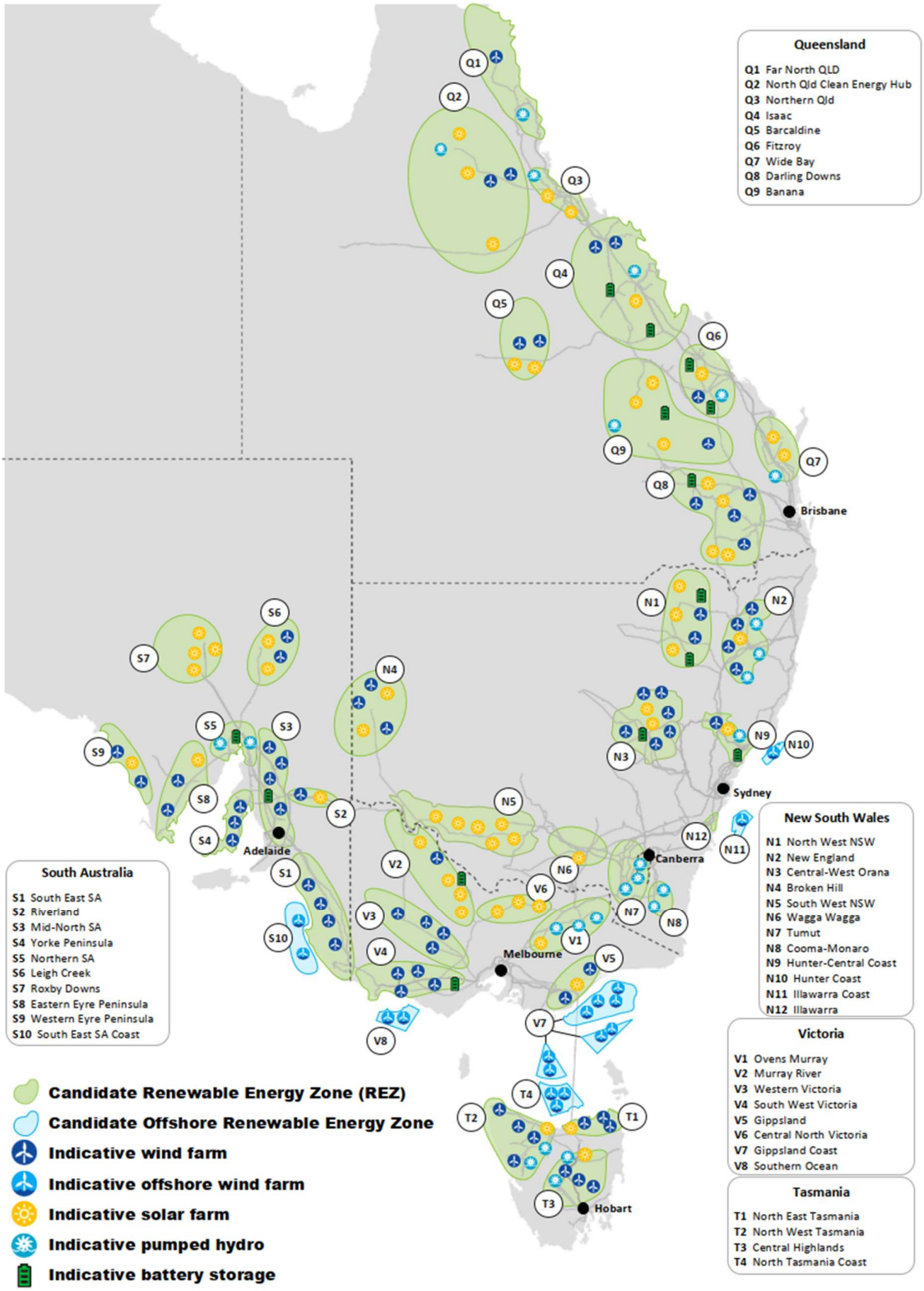
Our community has been misled, and robbed of the opportunity to understand the severity of the REZ impacts in time to respond to this inquiry. It is possible that other respondents, including public authorities, are also making their submissions on the basis of misinformation.

This is particularly disturbing given decommissioning bonds are not being required for such impactful projects, despite costs being expected to exceed land value. In the event of a bankruptcy, there may not be funds available to remove infrastructure that may only have a design life of 20-25 years, and the quantum of installed infrastructure may continue to increase in a potentially perpetual cycle.

It has also been noticed that development standards do not currently address land use conflicts such as the proximity of large-scale batteries to residential land. No zoning considerations appear to have been made to date.

Visual impact assessment methods do not respect the reality the inland environment or values of rural communities. Beautiful open landscapes are deemed to be low value and therefore permitted to be more heavily impacted for example, and a tree that shields a visual impact from one specific standpoint is assumed to remain despite droughts and storms. It is laughable to think someone will not move to a different vantage point within their home.

**Figure 1 2024 REZ candidates**



## 2 Anticipated Scale

Figure 1 of AEMO ISP Appendix A3 shows the impacts of REZ extend from Tasmania to the tropics and have the potential to fundamentally change both the NSW and Australian landscape for generations to come. It is without a doubt the biggest environmental change since the commencement of farming.

The NE REZ, while only a small part of the overall REZ network, appears to be designed to support circa **17.2 GW** of Generation across the geographic REZ.

This is substantially different in meaning to the advertised figure of 8GW of additional network capacity.

This figure is reached by calculating the Generation required to support the New REZ Network Capacity, or what the new transmission lines are being designed to accommodate (~13.3GW), and then adding the generation projects that are being fed into the existing network (~3.9GW).

Even once these figures have been clarified, they still have little meaning to the community trying to understand impact. The community is not aware that AEMO are modelling the NE REZ to become the largest power plant in NSW by 2035.

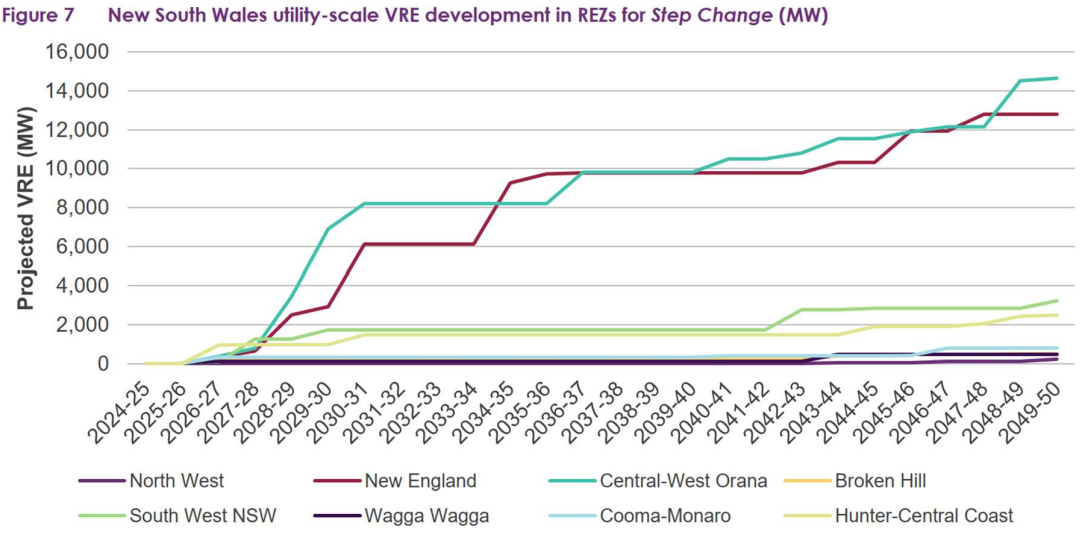


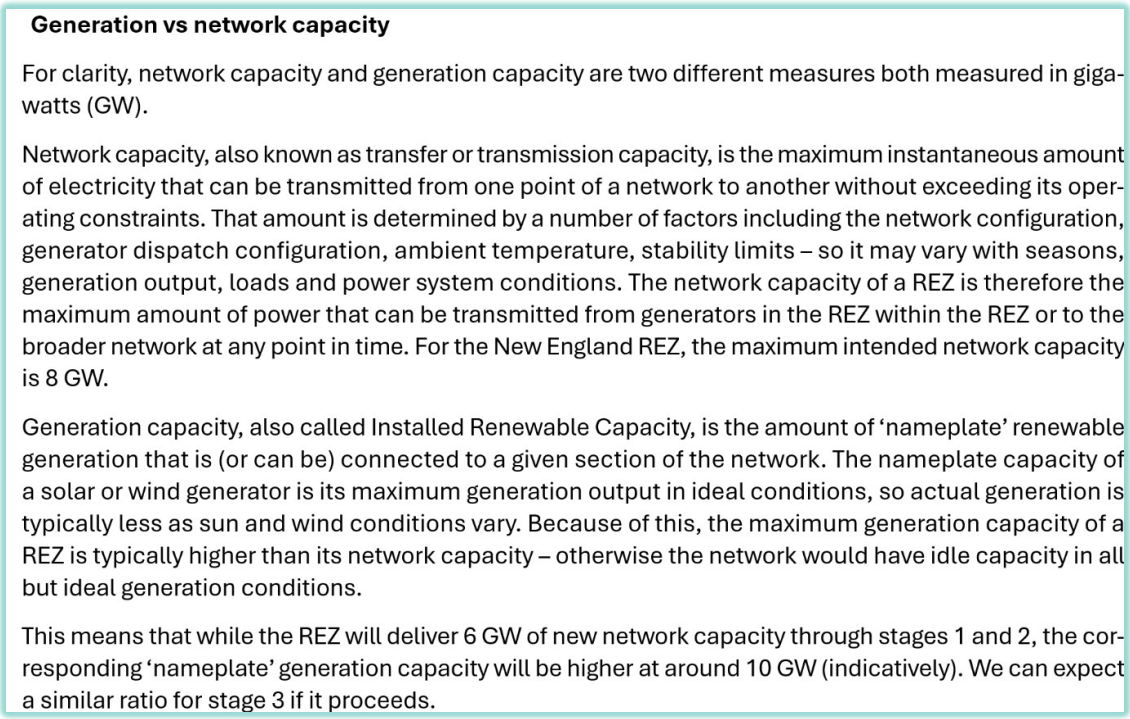

*Figure 1 - Extract ISP Appendix, A3 - Renewable Energy Zones, June 2024*

What would it feel like to live amongst 17.2GW of renewable energy projects? As this far exceeds anything that has been constructed anywhere in Australia, it is impossible for even proponents of renewables to comprehend.

Reference projects such as White Rock Wind Farm (Stage 1), a massive local development, has a capacity of only 0.175GW and will provide ~1% of the calculated 17.2GW.

## 2.1 New REZ Network

EnergyCo have advised a staged 8GW increase of Network Capacity on the NE REZ Network may result in ~13.3GW of generation projects, with 10GW (indicatively) required to support 6GW Network increase in stages 1 and 2 and another 3.3GW generation for Stage 3. Refer EnergyCo advice in Figure 2 below.



**Generation vs network capacity**

For clarity, network capacity and generation capacity are two different measures both measured in gigawatts (GW).

Network capacity, also known as transfer or transmission capacity, is the maximum instantaneous amount of electricity that can be transmitted from one point of a network to another without exceeding its operating constraints. That amount is determined by a number of factors including the network configuration, generator dispatch configuration, ambient temperature, stability limits – so it may vary with seasons, generation output, loads and power system conditions. The network capacity of a REZ is therefore the maximum amount of power that can be transmitted from generators in the REZ within the REZ or to the broader network at any point in time. For the New England REZ, the maximum intended network capacity is 8 GW.

Generation capacity, also called Installed Renewable Capacity, is the amount of 'nameplate' renewable generation that is (or can be) connected to a given section of the network. The nameplate capacity of a solar or wind generator is its maximum generation output in ideal conditions, so actual generation is typically less as sun and wind conditions vary. Because of this, the maximum generation capacity of a REZ is typically higher than its network capacity – otherwise the network would have idle capacity in all but ideal generation conditions.

This means that while the REZ will deliver 6 GW of new network capacity through stages 1 and 2, the corresponding 'nameplate' generation capacity will be higher at around 10 GW (indicatively). We can expect a similar ratio for stage 3 if it proceeds.

*Figure 2 - EnergyCo clarification received via email 15 November 2024*

Only ~3GW out of ~13.3GW of generation projects intended to be supported by the new REZ network are visible to the public on the NSW Planning Portal, however. Refer Figure 3 below. While it is reasonable to accept that the information is not yet available, it is not reasonable to present the planning portal as a means for the public to understand the intended scale of development when >75% of new REZ projects are not yet shown.

Potential REZ transmission network connection

| ID | Location | Proponent | Status | Capacity Wind (MW) | Capacity Solar (MW) | Combined |
|---|---|---|---|---|---|---|
| 1 | Yarrowyck | Origin | Investigation Area | ? | 0 | |
| 2 | Northern Tablelands | Origin | Investigation Area | ? | 0 | |
| 3 | Boorolong | Squadron Energy | Investigation Area | 400 | 0 | |
| 4 | Uralla Energy Park | Someva Renewables | Investigation Area | ? | ? | |
| 5 | Hillview | Ace Power | In Planning | 300 | 300 | |
| 6 | Deeargee | ACEN Australia | In Planning | 0 | 320 | |
| 7 | Salisbury | Origin | Investigation Area | 0 | 450 | |
| 8 | Bendemeer | Metis Energy | Investigation Area | 360 | 0 | |
| 9 | Ruby Hills | Origin | Investigation Area | 870 | 0 | |
| | Unallocated | | | | | |
| | | | Total MW | 1930 | 1070 | 3000 |

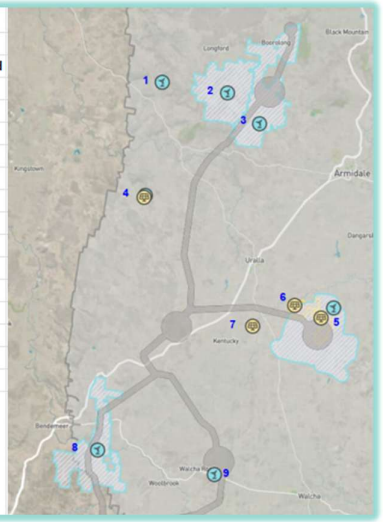



*Figure 3 - Projects shown on the NSW Planning Portal with Potential REZ Transmission Network Connection*

## 2.2 Existing Network

Approximately 3.9GW of additional renewable generation projects are shown to be either operational, approved or in planning on the existing network, refer to Figure 4 below.

Existing transmission network connection

| ID | Location | Proponent | Status | Capacity Wind (MW) | Capacity Solar (MW) | Combined |
|---|---|---|---|---|---|---|
| 1 | Saphire Wind | CWP Renewables | Operational | 485 | 0 | |
| 2 | Sundowner | CWP Renewables | In Planning | 0 | 360 | |
| 3 | Glen Innes Wind | Nexif Energy | Approved | 66 | 0 | |
| 4 | Tuttles Lane | NSW Community Renewables (Glen | Approved | ? | 5 | |
| 5 | White Rock 2 | Goldwind Australia | Approved | 202 | 0 | |
| 6 | White Rock 1 | Goldwind Australia | Operational | 175 | 0 | |
| 7 | Rangoon | Meridian Energy | In Planning | 130 | 0 | |
| 8 | Guyra Solar | NSW Community Renewables (Guyr | Under construction | 0 | 5 | |
| 9 | Tilbuster Solar | Enerpac | Approved | 0 | 150 | |
| 10 | UNE Solar | University of New England | Operational | 0 | ? | |
| 11 | Olive Grove Solar | Olive Grove Solar Farm | Approved | 0 | 29.9 | |
| 12 | Metz Solar | FRV | Operational | 0 | 100 | |
| 13 | Stringybark Solar | Stringybark Solar Farm Pty Ltd | Approved | 0 | 29.9 | |
| 14 | Oxley Solar | Oxley Solar Development | In Planning | 0 | 215 | |
| 15 | Armidale Solar | ITP Development Pty Ltd | Approved | 0 | 5 | |
| 16a | New England Solar Stage 1 | UPC/AC Renewables | Operational | 0 | 720 | |
| 16b | New England Solar Stage 2 | UPC/AC Renewables | Under construction | 0 | | |
| 17 | Thunderbolt community solar | Medam Holdings Pty Ltd | Approved | 0 | 4.95 | |
| 18 | Thunderbolt Wind Farm | Neoen Australia | Approved | 192 | 0 | |
| 19 | Bendemeer Solar | Metis Energy | In planning | 0 | 257 | |
| 20 | Winterbourne | Vestas Energy | In planning | 737.8 | 0 | |
| | | Total | Total MW | 1987.8 | 1881.75 | 3869.55 |

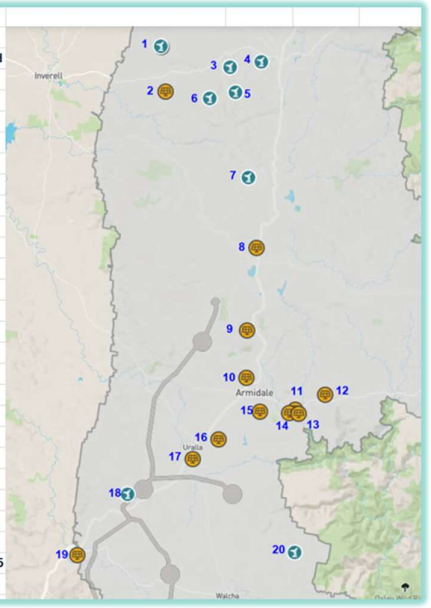



*Figure 4 - Projects shown on the NSW Planning Portal to be constructed with existing transmission network connection*

EnergyCo have advised that projects on the existing network will not need to apply for network access rights, and are therefore considered to be in addition to the 13.3GW that will be supported by the new REZ network.

With this in mind, the following scale of generation within NE REZ has been compiled. Refer to Figure 5.

| Stage | Increases Network Capacity (GW) | Proposed Generation (GW) | Cumulative Generation (GW) |
|---|---|---|---|
| Existing Network | Unknown | 3.9 | **3.9** |
| Stage 1 | 2.4 | 4 | **7.9** |
| Stage 2 | 3.6 | 6 | **13.9** |
| Stage 3 | 2 | 3.3 | **17.2** |
| **Total** | **8** | **17.2** | |
| **AEMO "Step Change" Requirement for NE** | **6.3** | **14** | |
| **Surplus / Redundancy** | **Possibly 4.1** | **3.2** | |

*Figure 5 - Conversion of Network Capacity increases to cumulative generation requirements (indicative)*

This is more than double what the general public could reasonably be expecting within the REZ. The Roadmap only considers 12GW generation for the entire State of NSW by 2030.

This also does not seem to fit within the objectives of the EII Act for the "geographic area" to provide a certain network capacity, rather than a new network to provide a certain network capacity. It appears that the NE REZ is being deliberately increased in size without either a supporting change in legislation or community consultation.

## 2.3 Visualising Impact

The community has not been alerted to the modelling completed by AEMO in Appendix 3 of the ISP, which provides a projected split between the scale of wind and solar generation for each REZ.

Such information could be used now to produce indicative but official fly-through models that could be accessed by the community. EnergyCo are relying on the incomplete NSW Planning Portal to communicate cumulative impact, despite less than 25% of anticipated projects being shown. This is misleading, because the portal does not make it clear that only a fraction of developments are shown.

Rainforest Reserves Australia has published several examples of such a fly-through of wind farms online, and it is reasonable to expect this level of indicative clarity be certified or otherwise recreated by an independent verifier.

This information also indicates the NE REZ Network may be oversized, as it shows a requirement of ~14GW generation, not 17.2GW.

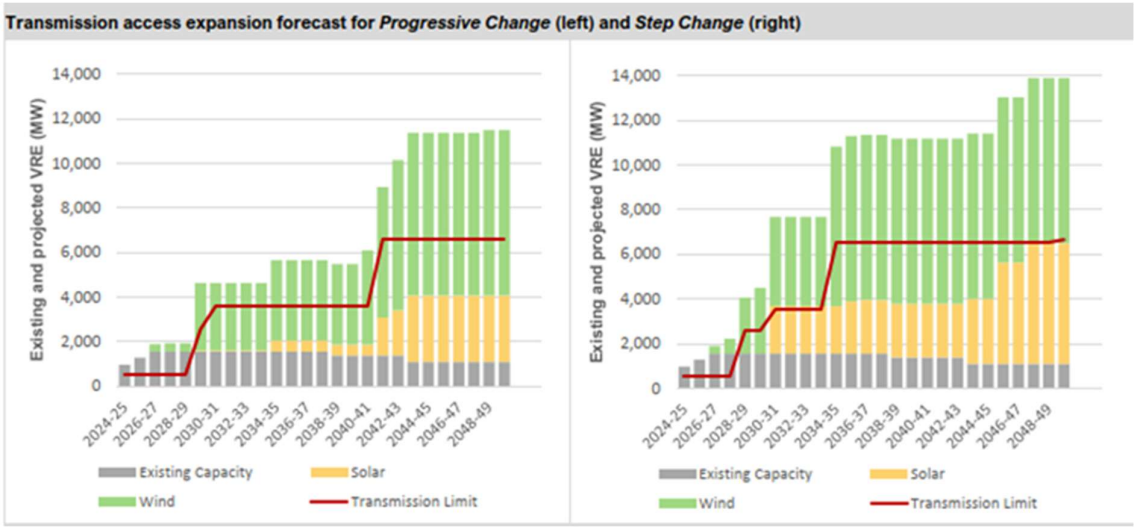



*Figure 6 - Extract ISP Appendix, A3 - Renewable Energy Zones, June 2024*

The extent of required solar developments is also expected to be insufficiently understood and should be modelled in detail. Extrapolating the energy density of the Sundowner Solar Farm across the anticipated 5320MW of solar projects in NE REZ indicates the projects may occupy ~419km$^2$ of otherwise agricultural land. Similarly, the region may be required to host between 1525-2656 wind turbines over 2951-9488km$^2$. Despite the simplicity of the exercise, no attempt has been made by EnergyCo to communicate these figures.

| | | | |
|---|---|---|---|
| **Reference Solar Project (used for extrapolation)** | **Sundowner Solar Farm** | | |
| | **Capacity (MW)** | 360 | **Density (MW/ha)** |
| | **Development footprint (ha)** | 651 | 0.553 |
| | **Development Area (ha)** | 2097 | 0.172 |

| | | | |
|---|---|---|---|
| **Reference Wind Project 1 (used for lower bound extrapolation)** | **Winterbourne Wind Farm (118 x 6.2MW turbines, 210m high to tip)** | | |
| | **Capacity (MW)** | 737.8 | **Density (MW/ha)** |
| | **Development footprint (ha)** | 697 | 1.059 |
| | **Development Area (ha)** | 21844 | 0.034 |

| | | | |
|---|---|---|---|
| **Reference Wind Project 2 (used for upper bound extrapolation)** | **White Rock Wind Farm (48 x ~3.3MW turbines, 200m high to tip)** | | |
| | **Capacity (MW)** | 158.4 | **Density (MW/ha)** |
| | **Development footprint (ha)** | 160 | 0.990 |
| | **Development Area (ha)** | 15078 | 0.011 |

| | **Development** | **Generation (MW)** | **Extrapolated Development Area (ha)** | **Number of Turbines** | **Extrapolated Development footprint (ha)** |
|---|---|---|---|---|---|
| **N2 - New England** | Extrapolated REZ (40% Solar) | 5320 | 30989 | | 9620 |
| | Existing network (Solar projects) | 1881 | 10957 | | 3401 |
| | Extrapolated REZ (60% Wind) | 7980 | 236263 - 759611 | 1287 - 2418 | 7538 - 8060 |
| | Existing network (Wind projects) | 1988 | 58858 - 189236 | 238 | 1878 - 2008 |
| | **Total** | **17169** | | | |
| | | | 419km2 solar plus 1525 - 2656 turbines over 2951 - 9488km2 | 1525 - 2656 | 130km2 solar plus 1525 - 2656 turbines over 94 - 101km2 |

*Figure 7 - Indicative extrapolation energy densities and development requirements in NE REZ*

To extend the exercise across NSW, 1171km$^2$ of solar farms and 3444-6262 turbines would be required. The impact then extends to Tasmania in the south and the tropics in the north. Again, and quite outrageously, this has not been communicated with the general public.

| | Development | Generation (MW) | Extrapolated Development Area (ha) | Number of Turbines | Extrapolated Development footprint (ha) |
|---|---|---|---|---|---|
| **Combined NSW "Step Change"** | Extrapolated REZ Solar | 18220 | 106131.5 | | 32948 |
| | Existing network Solar | 1881 | 10957 | | 3401 |
| | Extrapolated REZ Wind | 19880 | 588585 - 1892365 | 3206 - 6024 | 18780 - 20080 |
| | Existing network Wind | 1988 | 58858 - 189236 | 238 | 1878 - 2008 |
| | **Total** | **41969** | | | |
| | | | 1171km2 solar plus 3444 - 6262 turbines over 6474 - 20816km2 | 3444 - 6262 | 363km2 solar plus 3444 - 6262 turbines over 207 - 221km2 |

*Figure 8 - Indicative extrapolation of development requirements in wider NSW*

Nationwide impacts and Statewide impacts should therefore be shown alongside Regional impacts in community updates as the scale of development is not something that can be easily escaped by simply going for a drive.

## 2.4 Decommissioning Bonds

The importance of decommissioning bonds is highlighted by recent cost guidance published on the EnergyCo website.

As can be seen in figure 9 below, the cost of decommissioning solar developments has been modelled as $59,751/ha, without changing any of the pre-populated variables. This substantially exceeds land value in New England REZ.

| SOLAR FARM DECOMMISSION OUTPUTS | | | | |
|---|---|---|---|---|
| DESCRIPTION | UNIT | AMOUNT | COMMENT | This Section is for Summary of the OUTPUT of decommissioning. It allows for commenting by user on the outcomes |
| Total Cost Exc Recovery | $ | 53,477,645.60 | | Output of the Total Decommissioning Cost without consideration to the credits that may be achieved through resource recovery |
| Recovery of Material | $ | 16,211,375.25 | | Subject to the YES/NO Variable by the user, this provides the approximate credit that is calculated based on the resource recovery options selected |
| Total Cost After Recovery | $ | 37,266,270.35 | | Output of the Total Decommissioning Cost with consideration to the credits that may be achieved through resource recovery (if applicable) |
| ost Per Development Ha Exc Recover | $/ha | 59,751.56 | | Output for cost per development hectare excluding recovery credits |
| Cost Per hectare Inc Recovery | $/ha | 41,638.29 | | Output for cost per hectare including recovery |
| Cost Per Panel Exc Recovery | $/panel | 74.79 | | Output for cost per panel excluding recovery |
| Cost Per Panel Inc Recovery | $/panel | 52.12 | | Output for cost per hectare including recovery |

*Figure 9 - Extract, solar-energy-decommissioning-calculator excel spreadsheet, EnergyCo*

Likewise, wind turbines have been modelled to have a decommissioning cost of $1.396M each, refer figure 10.

It is important to consider that while turbine footings may be designed with a 50 year design life, the towers and turbines typically only have a design life of 25 years due to fatigue. The practicalities of retrofitting new towers to a 25 year old footing may require the footing to also be replaced every 25 years as design codes and requirements change.

| WIND TURBINE DECOMMISSION OUTPUTS | | | |
|---|---|---|---|
| DESCRIPTION | UNIT | AMOUNT | COMMENT |
| Total Cost Exc Recovery | $ | ############ | |
| Recovery of Material | $ | ############ | |
| Total Cost After Recovery | $ | ############ | |
| Cost Per MW Exc Recovery | $/MW | 387,920.99 | |
| Cost Per MW Inc Recovery | $/MW | 314,465.30 | |
| Cost Per Turbine Exc Recovery | $/turbine | 1,396,515.58 | |
| Cost Per Turbine Inc Recovery | $/turbine | 1,132,075.07 | |

*Figure 10 - Extract, wind-energy-decommissioning-calculator excel spreadsheet, EnergyCo*

The only reason to not require a bond to be lodged would be to artificially improve the commercial viability of a project and shift risk away from developers and onto landholders or the State. It is important that these costs are accounted for up-front as they will eventually need to be paid by either the landholder or the consumer.

## 2.5 Visual guidelines

Visual impact assessment methods do not respect the reality the inland environment or values of rural communities. Beautiful open landscapes are deemed to be low value and therefore permitted to be more heavily impacted for example, and a tree that shields a visual impact from one specific standpoint is assumed to remain in full foliage despite droughts and storms. It is laughable to think someone will not move to a different vantage point within their home where turbines are not obscured by an individual tree.

## 2.6 Batteries and zoning

The absence of development controls around proximity of batteries to residential developments in particular is of great concern. The recent fire at the Vistra Energy lithium battery plant in Moss Landing, Texas, USA on 18 January 2025 “generated huge flames and significant amounts of smoke” for example and consultants are currently lodging applications that only consider fires breaking out within single battery cells. As State Significant Infrastructure Projects, Councils are currently powerless to act.

# 3 Summary of Recommendations

| | |
|---|---|
| 1 | Communicate indicative Generation expectations to the community, not Transmission conversions. |
| 2 | Communicate indicative development extents, for example the number of turbines and solar panels that will be hosted by their community. |
| 3 | Publish an interactive visual model of potential projects to communicate the scale of development required to provide the legislated network capacity increases. |
| 4 | Revisit the increase in network capacity to be provided by NE REZ, and potentially other REZ networks, as it appears to be providing more capacity than is legislated. This is increasing already substantial impacts. |
| 5 | Include Nationwide impacts and Statewide impacts alongside Regional impacts in community updates. |
| 6 | Legislate a requirement for prospective generators to lodge a bond with the State for the full future decommissioning cost of projects |
| 7 | Develop development guidelines and zoning approach to regulate the proximity of battery storage systems to residential land |
| 8 | Consider reducing the size of NE REZ due to the disprop |