May 1 2023

To Australian Energy Market Operator,

Thank you for the opportunity to make a submission for the ISP Methodology.

Beyond Zero Emissions (BZE) is an independent think tank creating solutions for a prosperous zero-emissions Australia. We strongly support AEMO's Integrated System Plan work as a key step to enabling electricity system planning to be delivered across the energy system. Indeed, we are highly supportive of a national approach to electricity system planning and modernisation as outlined in our recent briefing paper *National Supergrid - connecting all Australians to a zero-emissions future.*

Our **key recommendation** for AEMO's Methodology at this time relates to our work with Renewable Energy Industrial Precincts (REIPs). We would encourage inclusion of a REIP methodology (provision of common user infrastructure to clusters of manufactures in existing industrial heartlands) to model energy system priorities that enable industrial decarbonisation. Modelling should assume only scenarios that are 1.5 degrees aligned and include both domestic and export economic growth scenarios. We have expanded this idea in the following six pages, and would welcome the opportunity to discuss any of this information further.

Yours Sincerely,

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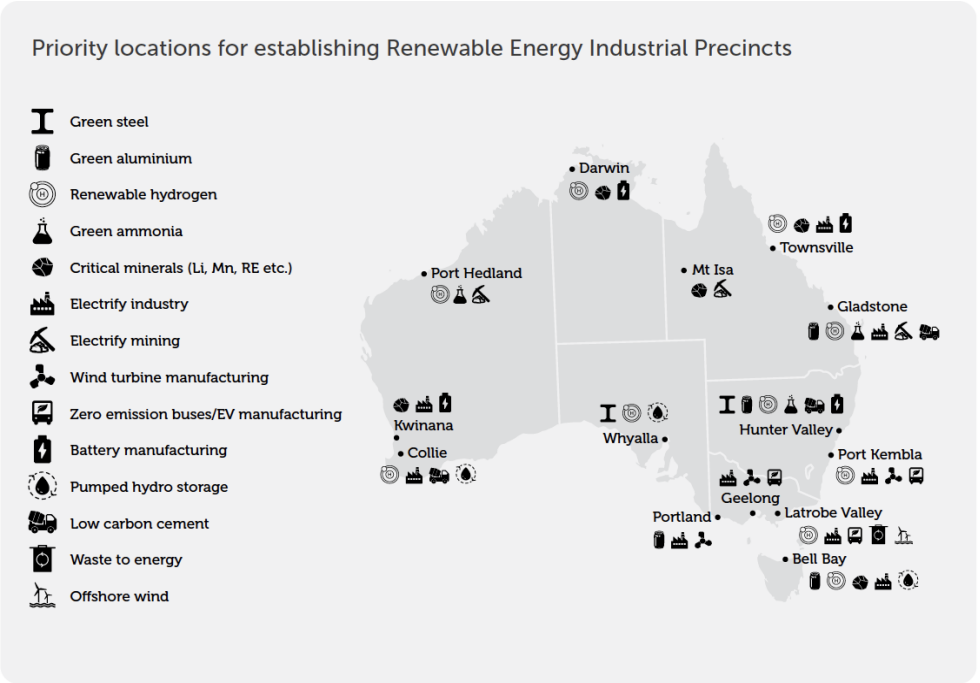
**BZE recommends AEMO integrate a Renewable Energy Industrial Precinct (REIP) methodology that models energy system priorities that enable industrial decarbonisation pathways for both domestic and green export scenarios. These scenarios should be 1.5 degrees aligned.**

## What is a REIP?

Renewable Energy Industrial Precincts (REIPs) are clusters of manufacturers that have efficient access to 100% renewable energy. These precincts are either located within Renewable Energy Zones or require connection to renewable energy generation through high-voltage transmission lines. They are designed to have access to clean heat, future renewable hydrogen, skills development and export infrastructure, including good transport links. BZE's research has found REIPs are the most efficient way to build out new infrastructure for industrial decarbonisation and economic growth.

Fourteen priority locations for REIPs are outlined below. The locations are all existing industrial heartlands with supporting infrastructure such as transport connections (port, rail and road), they are predominantly brownfield land and located where traditional skills in energy production, mining and or manufacturing are located.




Some of these regions have commenced their journey toward becoming Renewable Energy Industrial Precincts, with Gladstone, Townsville, the Hunter Valley and Port Kembla generating momentum through demonstrated industry and state government support. Tasmania has also made significant progress in decarbonising Bell Bay with the region now powered by net-100% renewable electricity and on its way to becoming Australia's first Renewable Energy Industrial Precinct. Greater infrastructure investment, including continued support for the production and use of renewable hydrogen and other zero-emissions heat solutions are required for this region to decarbonise the industrial ecosystem, including its logistics and supply chains.

To realise the full suite of economic and emission reduction potential these regions require scaled investment in common user infrastructure, access to skilled workers and electricity grid upgrades (see BZE's National Supergrid recommendations regarding grid upgrades) to consolidate and grow existing industry and private sector investment. Prioritisation of transmission and distribution upgrades in the ISP methodology acknowledges the significance that these regions play in

establishing clean manufacturing capability and the pivotal role this plays in ensuring that industry can compete in a rapidly decarbonising economy. In addition, the cluster based model of REIP provides an efficient means by which to deliver maximum value for money, both in terms of delivering large scale emission reductions and in maximising the productivity of each infrastructure project. These regions represent key areas where investment is likely to yield quick results due to existing clusters of industry and support for the REIP concept. BZEs forthcoming research investigates the scale of the benefits of prioritising investment to these regions (due for release in May 2023).

## 1.5 degrees scenarios for domestic and exports

REIPs are a 'yes and' approach to domestic and export decarbonisation. As recommended in BZE's submission to the IASR 2023, BZE strongly encourages AEMO to include 1.5 degree scenarios for both domestic and export scenarios.

Analysis by ACIL Allen found that for the Hunter and Gladstone, economic benefits can be profiled in both instances (see Figures 1 and 2 under 'Economic benefits'). Modelling domestic and exports scenarios separately will assist decision makers to better understand the transmission investments required to deliver domestic trade and export returns.

## Place-based approach to modelling industrial decarbonisation and green exports

The place-based approach for REIPs parallels the approach taken to develop and model REZs. We see that REZs will provide the supply of renewable energy, and REIPs will provide guaranteed industrial demand. By including REIP locations in AEMO modelling in the ISP, AEMO can take a robust approach to modelling domestic and export scenarios in a way that captures on the ground developments and future manufacturing opportunities where they are most likely to occur. The ISP modelling has the opportunity to bring forward key transmission and distribution works for industrial precincts as highlighted in BZE's National Supergrid report. The Australian economy has a once in a generation opportunity to capture a share of the rapidly emerging global green economy and this will be foregone if our industrial precincts are not prioritised for energy system upgrades.

AEMO already considers REZ development, and we believe that approaching REIPs in a similar way would be complementary. We note that the factors that generally affect the development of a REZ could also be applied to a REIP[1]:

- Energy targets, policies and scenarios
- Resource quality
- Existing transmission network capacity
- Demand correlation and correlation with other favourable REZs
- Cost of developing or augmenting the transmission network
- Proximity to the load centre
- Social licence for development of the generation, storage and associated network.

## Economic and emission reduction benefits

Clustering is a more efficient way to plan for renewable energy supply and infrastructure and deliver large scale emission reductions. For example, 76% of Safeguard Mechanism facilities are located in REIP locations.

[1] AEMO. 2022. Appendix 3. Renewable energy zones.

BZE and WWF-Australia commissioned ACIL Allen to model the economic and job benefits of repowering manufacturing with renewable energy in two prospective REIP locations, one in Gladstone and the Hunter Valley. This independent analysis showed that if the expected projects eventuate, there is the potential to transform the manufacturing base and support a total of 45,000 new ongoing jobs by 2032 and $13 billion in annual revenue by establishing Renewable Energy Industrial Precincts in these two regions alone.

Prioritising existing industrial locations in ISP planning will enable the regions and their high energy-intensive businesses such as aluminium and chemical production to ramp up their efforts to decarbonise their operations and accelerate the production of the clean technologies required to power the energy transition both nationally and globally.This will in turn secure investor confidence and investment in the build out of renewable energy.

**BZE** recommends **prioritising industrial regions in the ISP methodology to ensure that Australia's future economic prosperity and emission reduction scale can be facilitated by fast tracked** investment**.**

**Figure 1** Real economic output impacts in the Gladstone region by industries, 2022-2032

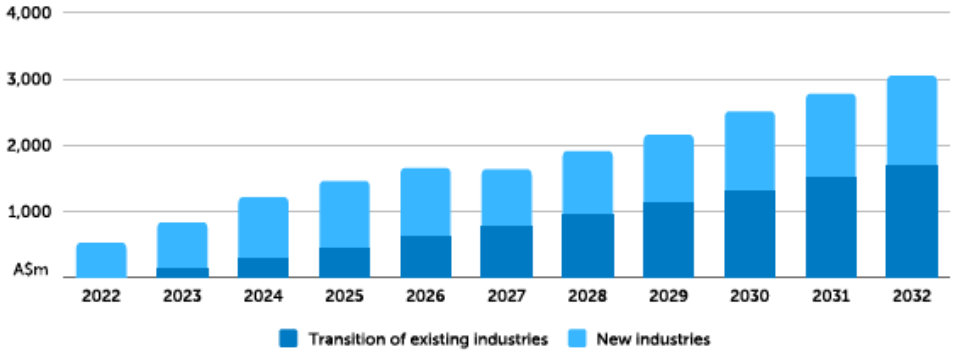
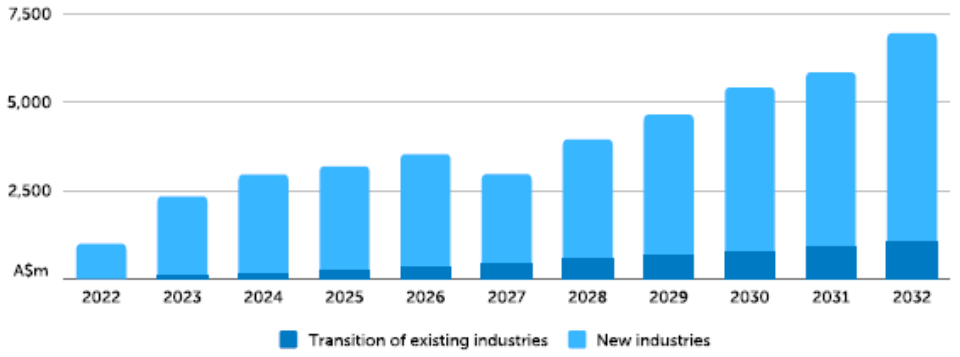



**Figure 2** Real economic output impacts in the Hunter Valley region by industries, 2022-2032




Note: All dollars are in 2020 prices.

Source: ACIL Allen modelling based on BZE data and assumptions.

## Infrastructure economies of scale

Beyond Zero Emissions is currently undertaking further analysis of REIPs. We are investigating cost efficiencies and emissions reduction opportunities delivered by clustering industry energy use and co-ordinating shared infrastructure, and how this may assist with decarbonising Australia's heavy industry and manufacturing regions. Early results suggest economic and emissions-reduction

benefits associated with clustering manufacturers and upgrading common user infrastructure at a lower cost than facility-by-facility upgrades (forthcoming release due in May 2023).

## Building the social licence for transmission infrastructure through REIPs

There is widespread community support for a return to Australian manufacturing, with 89% of Australians believing Australia should be manufacturing more products domestically following the COVID-19 pandemic.[2]

Each potential REIP location is home to existing energy-intensive businesses such as aluminium smelting, steel and other metals processing; emerging hydrogen production; chemicals production including pharmaceutical supply chains; recycling; and advanced manufacturing. For example:

Low-cost renewable energy infrastructure is required to upscale and decarbonise commodity and manufacturing operations. Providing access to this infrastructure and logistics will enable existing industries to upscale clean manufacturing and attract new enterprises to the precincts to share in infrastructure access and decarbonisation incentives. Some states including Queensland and New South Wales are moving toward REIP like initiatives, proving a clear need for AEMO to incorporate a REIP methodology to capitalise on the progress made by states and coordinate the efficient delivery of renewable energy to these regions (see Appendix A for detail on state based initiatives) . Modelling emerging REIPs with their full potential energy needs in the ISP such as Gladstone and Hunter as well as the other 12 identified REIP locations will assist state and federal governments, industry and communities to understand where priority infrastructure needs to go and how it best fits and operates with the other needs of the grid.

## Cross-department, cross-entity infrastructure transition for manufacturing

Based on work from the Climateworks Centre, BZE and WWF-Australia, there are four pillars that underpin the design, planning and establishment of Renewable Energy Industrial Precincts:.

1. Coordination and skills
2. Building enabling infrastructure
3. Decarbonising existing industry
4. Attracting new industries

We believe that the remit of AEMO is best aligned with Pillars 2 and 3, with significant expertise relating to modelling around building transmission (and other infrastructure) required to deliver energy to decarbonise existing industry. Key sub-pillars that also align with AEMO include:

- Under Pillar 2 - Building enabling infrastructure
    - Renewable electricity, transmission, network, storage/firming infrastructure
    - Green hydrogen infrastructure

- Under Pillar 3 - Decarbonising existing industry
    - Renewable electricity generation, storage and firming to support industrial decarbonisation

[2] Roy Morgan survey. September 2020.

There may be alignment with other pillars / sub-pillars in this work, but these focus areas frame where we see AEMO optimally positioned to contribute to the cross-department and cross-entity coordination. This activity is essential to efficiently and effectively decarbonise Australia's key manufacturing industrial heartlands and protect the jobs and community benefits they support. For reference a full list of REIP Pillars and Sub-Pillars is included at Attachment B.

## Appendix A: State-based energy infrastructure initiatives aligned to the REIP model

| Date | Jurisdiction | Announcement | Significance |
|---|---|---|---|
| Mar 2023 | NSW Govt (former) | Clean Manufacturing Precinct (CMP) bid team announced | Partner to develop roadmaps selected: Go2Clean. |
| Sep 2022 | QLD Govt | QLD 10 Year Energy Plan, Premier talked about "new internationally competitive manufacturing precincts" | The announcement including several components of a Gladstone REIP:<br>• Clean Energy Hubs (infrastructure)<br>• Gladstone grid reinforcement to support heavy industry to switch to renewables<br>• At least 25 GW new and existing renewable energy (BZE shows Gladstone needs 34 GW)<br>• ~1500 km of new high voltage backbone transmission<br>• $2.5bn boost to the Renewable Energy and Hydrogen Jobs Fund<br>• $500m for large-scale and community batteries<br>• Training hubs in Gladstone & Townsville supporting 570 workers each year |
| Feb 2022 | NSW Govt (former) | $550m in renewables, clean manufacturing and transmission infrastructure in Hunter | In response to the early closure of Eraring, the NSW Govt made this announcement complementary to its Clean Manufacturing Precinct policy in the Hunter. |
| Oct 2021 | SA Govt (former) | 7 major projects shortlisted for renewable hydrogen powered export hub. | The SA Government forecast "tens of billions" of dollars of investment by producing 1.5 million tonnes of green hydrogen each year and exporting hydrogen, ammonia and other green products. |
| Oct 2021 | QLD Govt | Rio Tinto, Orica and Alpha HPA sign on to the Govt's Statement of Cooperation | Statement of Cooperation between the industry stakeholders of Central QLD is to unlock more opportunities for Central Queenslanders as an industrial and advanced manufacturing powerhouse |
| Oct 2021 | QLD Govt | World's largest hydrogen equipment manufacturing facility | Funds now being committed to specific hydrogen projects. FFI will invest $1b on an electrolyser production factory in Gladstone — which, according to the QLD Government "is set to become Queensland's green energy manufacturing centre". |
| Aug 2021 | NSW Govt (former) | Clean Manufacturing Precincts (CMPs) | National leadership on industrial precincts being shown by the NSW Government, with CMP structure being designed, $108m committed to Hunter-based CMP and further private investment sought. |

## Appendix B: REIP Pillars and Sub-Pillar

1. **Coordination and Skills:**

- Convening key stakeholders for precinct co-design and ongoing industry coordination
- Strategic land use and infrastructure planning
- Skills and training
- Innovation/supply chain readiness
- International linkage funding

2. **Building enabling infrastructure:**

- Water infrastructure
- Renewable electricity, transmission, network, storage/firming infrastructure
- Renewable hydrogen infrastructure
- Port infrastructure, including required upgrades
- Transport

3. **Decarbonising existing industry:**

- Undertaking research and development to support decarbonisation
- Renewable electricity generation, storage and firming to support industrial decarbonisation
- Supporting renewable heat and feedstock supply, such as renewable hydrogen
- Providing grants and financing for heavy industry upgrades
- Ensuring efficient material and energy use and incorporating principles of a circular economy

4. **Attracting new industries:**

- Creating a strategy for attracting new businesses to REIPs
- Providing incentives for new businesses to set-up in REIPs and run on 100% renewable energy from the outset