



## 2023-24 Pre-Budget Submission

Beyond Zero Emissions (BZE) is a non-partisan, not-for-profit think tank creating solutions for a prosperous zero-emissions Australia. We work with industry and government to develop and drive zero-emissions economic opportunities that deliver community benefits and long-term prosperity for Australia.

This submission to the 2023-24 Federal Budget includes two proposals. Both proposals draw on our research, engagement with industry stakeholders, government agencies, and other experts.

Australia has a wealth of renewable resources and is uniquely positioned to become a significant international player in green exports. Our *2021 Export Powerhouse* identified a \$333 billion green export opportunity for clean commodities and manufactured goods by 2050 (almost triple the value of 2019 fossil fuel exports).<sup>1</sup>

To realise this opportunity, we need to:

- Rapidly roll out renewable energy. This requires a **National Supergrid: connecting Australians to a zero-emissions future** (forthcoming release); and
- Repower and grow heavy industry and manufacturing with renewables, using a precinct approach, **Renewable Energy Industrial Precincts (REIPs)**.<sup>2</sup>

Our submission targets a fast, fair and sustainable transition to prepare Australia's economy and community to take a leading role in the global zero-emissions future.

The table below provides a summary of the proposals, the relevant department/s and the total funding commitment over the forward estimates.

These recommendations align with existing federal policy announcements, while making clear the importance of the scale and speed of action required to secure Australia's economic prosperity as the global economy transforms.

### Proposal Catalogue

No.	Proposal	Department/Agency	Funding
1	Renewable Energy Industrial Precincts	Department of Industry, Science and Resources	\$3.2 billion over four years
2	A National Supergrid	Department of Climate Change, Energy, the Environment and Water Department of Industry, Science and Resources	\$17.4 billion over four years

<sup>1</sup> Beyond Zero Emissions, 'Export Powerhouse: Australia's \$333 Billion Opportunity'.

<sup>2</sup> Beyond Zero Emissions, 'Gladstone Renewable Energy Industrial Precinct Briefing Paper'; Beyond Zero Emissions, 'Hunter Renewable Energy Industrial Precinct Briefing Paper'.

# Proposal 1: Coordination and support for a National Renewable Energy Industrial Precinct Program

**Department/Agency:** Department of Industry, Science and Resources

**Financial Implications:** \$3.2 billion over four years, \$6.3 billion over ten years

	2023-24	2024-25	2025-26	2026-27	Total
<b>Cost of proposal (\$m)</b>	<b>579</b>	<b>623</b>	<b>980</b>	<b>980</b>	<b>3,162</b>
Stream 1: Infrastructure and coordination funding (\$m)	390	370	570	570	1,900
Stream 2: Renewable manufacturing precinct upgrade funding (\$m)	189	253	410	410	1,262
Enabling funding included in Proposal 2: National Supergrid					
Grid infrastructure for REIPs* (\$m)	120	120	2,120	120	2,480

\*Budget allocation for Grid infrastructure for REIPs falls under Proposal 2: National Supergrid. It is included here to highlight the synergies between the two proposals.

## Outline of proposal

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 connected to renewable energy generation through high-voltage transmission lines. They also have access to clean heat, future renewable hydrogen, skills development and export infrastructure, including good transport links.

The businesses within these precincts demonstrate a commitment to decarbonising their operations and outputs and in doing so are eligible for dedicated government support. For example, concessional finance, co-funding, research and innovation grants, and access to subsidised training and skill development opportunities to enhance workforce participation and address skill shortages.

Beyond Zero Emissions recommends Australian Government investment in a national REIP program to:

- plan and co-fund the common infrastructure required to de-risk and incentivise industry and private sector investment in renewable energy infrastructure including generation, storage and distribution upgrades, and
- provide financial support to fast-track and incentivise operational and supply chain decarbonisation.

The proposal aims to establish a precinct in each state and one in the Northern Territory to capture the diversity of industrial and manufacturing opportunities available to Australia. A national program will ensure that each state and territory is supported to participate in the growth of the zero-emissions economy. A federally-coordinated national program will

ensure that each state and territory can efficiently capitalise on its own unique market opportunity.

This proposal outlines a 10-year REIP investment program of \$6.3 billion in total, \$3.2 billion of which is allocated in the current four-year budget period (2023-24 and 2026-27). This investment would be delivered in two streams:

Stream	Funding	Details
<b>Stream 1.</b> <b>\$1.95 billion</b> Coordination of planning, infrastructure and skill development pathways	\$140 million (first mover accelerator funding)	Accelerate planning and coordination of works in two REIP locations: <ul style="list-style-type: none"> <li>co-design roadmaps with state governments, industry and regional communities to match industry needs with renewable energy (\$20m);</li> <li>strategic land use and infrastructure planning to inform investment priorities for enabling infrastructure (\$80m); and</li> <li>identify skill gaps and fund skill development pathways (\$40m).</li> </ul>
	\$210 million	Plan and coordinate works in the remaining five REIP locations. Processes established in the acceleration of the first two locations should allow remaining locations to achieve cost efficiencies.
	\$1.6 billion	Upgrade infrastructure, including roads, rails, ports, water infrastructure, shared heating networks and renewable hydrogen pipelines. Note: spending on grid infrastructure for REIPs falls under Proposal 2: National Supergrid.
<b>Stream 2.</b> <b>\$1.3 billion</b> Renewable manufacturing precinct implementation	\$378 million	Grow and scale early movers, clean tech innovators and research and development to decarbonise existing industries.
	\$417 million	Provide capital for existing heavy industry to decarbonise. Additional capital to be accessed through private sector, state government initiatives and public finance.
	\$467 million	Provide incentives for new businesses to establish zero-emissions industries within REIPs.
Enabling funding included in Proposal 2: National Supergrid		
<b>\$2.6 billion</b> Grid infrastructure for REIPs	\$2 billion	Support transmission projects that deliver renewables to two industrial precincts.
	\$600 million	Support distribution upgrades to industrial clusters, enabling them to electrify and adopt modern, renewable-powered manufacturing processes.

A National REIP program can deliver the following **benefits**:

- Unlock private sector investment in renewable energy generation and storage by providing certainty around enabling infrastructure to de-risk these investments. Detailed modelling conducted by ACIL Allen in the Hunter and Gladstone regions showed that establishing REIPs and enabling industrial decarbonisation could attract \$35.8 billion of private investment and deliver \$13 billion in annual revenue by 2032.<sup>3</sup>
- Enable industry to decarbonise operations and supply chains and in doing so ensure they make a commensurate contribution to our national emissions-reduction target.
- Enable Australian manufacturers and commodity markets to produce green commodities and products. *Beyond Zero Emissions' Export Powerhouse* shows that these benefits can be significant for each region and can cumulatively deliver \$333 billion annual export revenue by 2050 by capitalising on the rapidly emerging international markets for clean commodities and clean manufactured goods.<sup>4</sup>
- Deliver skills pathways to enable workers to upskill and or re-skill for roles in new and emerging regional industries.
- Maintain existing jobs and create new ones, delivering job security for this generation and the next. Detailed modelling conducted by ACIL Allen in the Hunter and Gladstone regions show the potential for REIPs to create 34,000 and 11,000 jobs, respectively.<sup>5</sup>

## Rationale

Australia has the opportunity to position itself as a global leader in decarbonising industrial ecosystems and realigning its economy to achieve its ambition to become a renewable energy and export powerhouse. Our natural competitive advantage in the generation of renewable energy, along with our track record in leading scientific innovation provides ready capability to deliver on this ambition.

Industrial emissions comprise 47% of Australia's total emissions. Achieving Australia's net zero target requires rapid and coordinated investment to ensure industrial regions can deliver on their targets and take their place as the engine rooms of a zero-emissions future.

In 2021 Beyond Zero Emissions and Climateworks Centre co-hosted an investor roundtable on REIPs. Attendees were collectively responsible for \$2.7 trillion in assets under management. Investors identified three investable precinct components where finance can play a key role: renewable energy supply, the common infrastructure and the companies that are the end-users. New investments should focus on innovative de-risking financial tools to help pave the way and unlock investment at scale.<sup>6</sup> The focus on common user infrastructure being a barrier to unlocking private sector investment is a recurring theme in our industry and investor consultations.

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<sup>3</sup> [Renewable Energy Industrial Precincts: Economic Analysis Summary Report](#), Beyond Zero Emissions, July 2021

<sup>4</sup> [Export Powerhouse](#), Beyond Zero Emissions, September 2021

<sup>5</sup> ACIL Allen, 'Regional Economic Impact Analysis of Renewable Energy Industrial Precincts Central Queensland REIP'.

<sup>6</sup> Beyond Zero Emissions, 'Investor Roundtable - Event Summary'.

The Australian Government has a critical role to play in coordinating with state and local governments and industry to enable precinct-scale investment. In parallel with regulatory frameworks, this investment will provide certainty for private investors and support industry to decarbonise their operations and supply chains. The table below shows the potential contributions from each funding source and illustrates the potential for this program to catalyse \$37.8 billion in private investment, based on a proposed program design where the private sector contributes 60% of the cost towards establishing a REIP, leveraging \$6 of private investment for each dollar of federal funding.

Funding source	Total amount (over 10 years)
Australian Government (on budget)	\$6.3 billion
State and Territory governments (on budget)	\$3.15 billion
Public sector finance	\$15.75 billion
Private sector investment	\$37.8 billion

Leveraging private and public capital is supported by recent modelling by Powerlink and Ernst and Young for the Queensland Energy and Jobs Plan. The Infrastructure Blueprint from Powerlink anticipates \$62 billion of industry-wide capital investment through Government-owned Corporations and private investors, leveraged through \$4.5 billion funding from the Queensland Government, representing a 13-fold rate of co-investment for funds injected. For the whole of the economy, Ernst and Young modelled \$76 billion of private investment over 17 years, a 16-fold rate of co-investment for funds injected.

The global pandemic and the war in Ukraine have exposed significant weaknesses in global and national supply chains for energy, commodities, manufactured components and goods.

Australia has some of the best and most abundant renewable resources in the world, and this can give Australia's manufacturers a global edge. Capturing this natural competitive advantage can deliver sovereign, reliable, low-cost renewable power and:

- Buffer industry from price shocks associated with global geopolitical events;
- Increase our competitiveness on international markets; and
- Enable industry to meet rapidly expanding markets for clean commodities and manufactured goods.

Currently 50% of Australia's total commodity exports are fossil fuels in the form of thermal coal, metallurgical coal, crude oil and LNG.<sup>7</sup> However, Australia's top five export markets (China, Japan, South Korea, US and the EU) have all set net-zero targets and are implementing ambitious policy settings that will see demand for these exports decline, and demand for zero-emissions commodities and manufactured goods rise.

Hundreds of corporations have pledged to tackle emissions related to their supply chains. Global car makers, such as Toyota, Volkswagen, and Mercedes for example, have committed to carbon-neutral production and are already prioritising suppliers with low

<sup>7</sup> '2022 - Resources and Energy Quarterly December 2022.Pdf'.

emissions. Major Australian employers, like [Fortescue Metals](#) and [GFG Alliance](#), have also seen the opportunity and are actively decarbonising their enterprises to seize it.<sup>8</sup>

Australian manufacturers need support to prepare for these markets and be incentivised to retain and locate production in Australia rather than overseas if we are to secure our economic future. Other countries are providing such support, with the US Inflation Reduction Act the most recent example of large-scale government investment in home-grown renewable economies and production systems. The EU has also put in place an investment framework to assist its manufacturers to decarbonise through its Industrial Strategy, which forms an integral part of Europe's Green Deal, and the UK is subsidising zero-carbon industrial clusters.

A national REIPs program provides the mechanism through which the Federal Government can coordinate support to Australian industry. Investment now will ensure that Australia does not fall behind our major trading partners.

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.<sup>9</sup> A national REIP program will capitalise on the diverse range of opportunities that are available to the nation, while also building strong economic and social benefits for each state and the Northern Territory. Each potential REIP location (see the Implementation section of this submission) 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:

- **The Hunter** region in New South Wales has long been a powerhouse of Australian mining and energy exports. The region is well known for mining and manufacturing and the close relationship between industry, the University of Newcastle and the CSIRO has seen the region emerge as an energy innovation hotspot. The state government currently supports the region's decarbonisation potential and aspirations through the Clean Manufacturing Precinct roadmaps, and the Hunter Hydrogen Taskforce has developed a comprehensive green hydrogen roadmap for the region that incorporates a REIP and dovetails with the New South Wales hydrogen strategy.

Hunter-based companies such as Molycop, Infrabuild, Orica and Tomago Aluminium have all commenced decarbonisation journeys, providing demand for renewable energy and the momentum to drive rapid gains for a national REIP program.

- **Gladstone** in Queensland is one of Australia's industrial heartlands. Home to a deep water port, developed infrastructure, skilled workforce, research, skills and training facilities, the region has many of the components needed to facilitate the establishment of a REIP. Gladstone's alumina refineries and the Boyne Island aluminium smelter provide significant exports and jobs, with key stakeholder Rio Tinto committed to decarbonising their operations. Chemical manufacturer Orica

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<sup>8</sup> Andrew Forrest, 'Oil's Time up'; Parkinson, 'Gupta Flags 3,000MW New Renewables for Whyalla "Green Steel" Plans | RenewEconomy'.

<sup>9</sup> Roy Morgan survey. September 2020.

and Cement Australia are other key local industries, both with public intentions to decarbonise their operations. Gladstone is also a much-sought after cleantech investment location with Fortescue Future Industries developing electrolyzers, Alpha HPA producing high purity aluminium products, and Stanwell, H2U and others looking to set up green hydrogen production.

Coordinated investment in REIPs with state governments and local industry is a cornerstone principle of a national program. It ensures that Australia’s long term economic prosperity is grounded in equity and that as a society we support economic prosperity and high quality, secure jobs for this generation and the next, across all states and territories.

Low-cost renewable energy infrastructure is required to upscale and decarbonise commodity and manufacturing operations (electricity and heat). 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.

## Strategic Policy Alignment

The table below shows how the Renewable Energy Industrial Precinct program will complement existing federal policies and strategies related to climate change and energy, industry, employment, and regional development.

Federal policy/strategy	Aim	Alignment with Renewable Energy Industrial Precincts
Powering the Regions Fund	Support the decarbonisation of existing industries and creation of new clean energy industries and jobs. <sup>10</sup>	Many REIP locations are in regional areas, and developing a national program can deliver on the Fund’s priorities across: Decarbonising Existing Industries, Developing New Clean Energy Industries.
Safeguard Mechanism (SGM)	Require Australia’s largest greenhouse gas emitters to keep their net emissions below an emissions limit (a baseline). <sup>11</sup>	Of the Top 200 emitting SGM sites, 75% are in REIP locations making them highly viable for decarbonisation through sourcing shared renewable agreements.
Clean Energy Innovation Fund/CEFC Special Account	Invest in innovative businesses whose activities can lower Australia’s emissions. <sup>12</sup>	A precinct-approach to repowering industry with renewables can foster innovation, through lower costs for shared infrastructure, B2B marketing, and collaboration. REIP supporters include innovative businesses such as MGA Thermal, Molycop, and Alpha HPA.
New Energy	Support the development of	A national program of REIPs would require

<sup>10</sup> Australian Government Department of Climate Change, Energy, the Environment and Water, ‘Consultation Hub | Powering the Regions Fund - Climate Change’.

<sup>11</sup> Australian Government Department of Climate Change, Energy, the Environment and Water, ‘Safeguard Mechanism Reform’.

<sup>12</sup> ‘Clean Energy Innovation Fund - Clean Energy Finance Corporation’.

Federal policy/strategy	Aim	Alignment with Renewable Energy Industrial Precincts
Skills Program	fit-for-purpose training pathways for clean energy industry jobs. <sup>13</sup>	analysis of the skills and training needed as businesses located within REIPs will need new workers. This work can be included in Jobs and Skills Australia’s capacity study.
Northern Australia Infrastructure Facility (NAIF)	Provide financial assistance to the states and territories and other entities for the development of Northern Australia economic infrastructure. <sup>14</sup>	Five of the fourteen potential REIP locations are located within NAIF’s remit. Establishing REIPs in these locations can boost economic growth and deliver for Northern Australia.
National Reconstruction Fund	Provide finance for projects that diversify and transform Australia’s industry and economy, to secure Australia’s future prosperity and drive sustainable economic growth. <sup>15</sup>	REIPs will deliver the growth of the priority funding areas: Renewables and low emissions technologies, Transport, Value-add in resources.

The REIP program aligns with Renewable Energy Zones (REZs) as identified in the AEMO Integrated System Plan. REIPs will create industrial demand for renewable energy whereas REZs will provide supply. It is assumed the establishment of REZs occurs through programs such as Bilateral Agreements rather than this program, although they are complementary and transmission connecting Precincts to the nearest REZ is essential. New South Wales government’s Clean Manufacturing Precincts (CMP) locations, for example, are anticipated to lie within a broader precinct to facilitate access across the larger industrial ecosystem.

## Implementation

The REIP program proposes \$3.2 billion of on-budget spending from 2023-24 to 2026-27 and \$6.3 billion over ten years, to plan and deliver a national REIP program across seven industrial clusters (one in each state and the Northern Territory), in collaboration with state governments.<sup>16</sup>

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

A number of these regions have commenced their journey toward becoming Renewable Energy Industrial Precincts, with Gladstone, the Hunter Valley and Townsville generating momentum through demonstrated industry support. Yet they still require scaled investment in common user infrastructure, access to skilled workers and electricity grid upgrades (see

<sup>13</sup> Australian Government, ‘Skills and Training Program, October Budget’.

<sup>14</sup> ‘Northern Australia Infrastructure Facility | Department of Finance’.

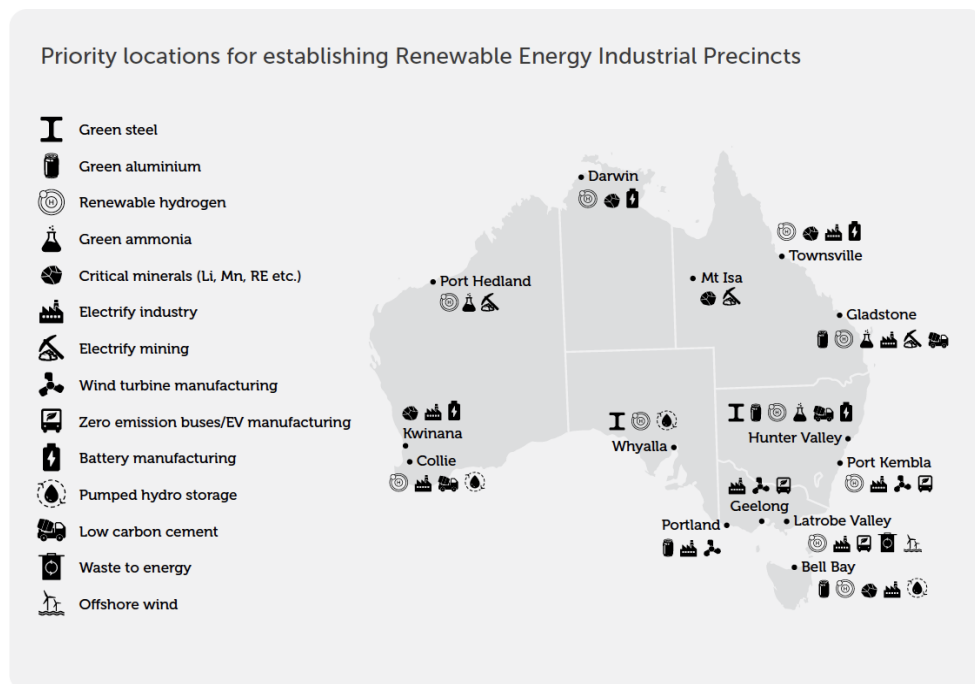
<sup>15</sup> Department of Industry, ‘National Reconstruction Fund’.

<sup>16</sup> Note the program could be expanded to support at least one precinct in each state.



Proposal 2: A National Supergrid (regarding grid upgrades) to consolidate and grow existing industry and private sector investment. These regions represent key areas where investment is likely to yield quick results due to existing industry support for the REIP concept.

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.



The REIP investment is proposed to be split into two funding streams.

### Stream 1: Planning, coordination and infrastructure – \$1.9 billion

This funding would be tendered for and matched by state and territory governments to support the delivery of strategic land use and infrastructure planning (including the development of decarbonisation plans) and coordination of precinct development in line with local social, economic and environmental needs. State governments could also access this funding to plan and implement critical infrastructure works, including:

- Transmission connections to new or planned renewable energy generation most likely through nearby Renewable Energy Zones;
- Hydrogen production and pipelines and a shared industrial heating network, where relevant;
- Water, waste and recycling;
- Connections to port, rail and road logistics;
- Skilled labour and training programs tailored to the needs of the precinct;
- Innovation programs including incubator, accelerator, and/or R&D processes to help fill industry ecosystem and supply chain gaps and establish new businesses.

The funding would be supported by programs that grow market demand for zero- and low-emissions products, and industry accelerator programs including, for example, Austrade to facilitate the engagement of Small to Medium Enterprises (SMEs) in export markets.

Additional support for critical transmission and distribution upgrades is outlined in Proposal 2: National Supergrid.

### **Stream 2: Renewable manufacturing precinct implementation – \$1.3 billion**

This funding, administered by the states in collaboration with the Federal Government would be tendered for by geographical clusters of manufacturing and industry players, backed by investors and research partners. The funding would be available to one precinct/industrial ecosystem cluster per participating state. Applicants would use the funds to progress commitments to reaching 100% renewable energy use. For example, this could cover:

- Upgrading processes and equipment to support existing manufacturers to transition to renewable electricity and renewable heat;
- Establishing new businesses and manufacturing processes, including but not limited to renewable hydrogen production, green steel, cleantech manufacture and material recycling facilities;
- Upscaling businesses and manufacturing operations that are already decarbonised or that have strong commitments and progress toward decarbonisation;
- Ensuring reliable power supply by establishing firming capacity such as storage and flexible demand programs and technologies;
- Procuring low-cost renewable energy supported by government underwriting, for example through contracts for difference.

The renewable manufacturing precinct implementation funding would be matched by state governments and the consortiums of companies applying. It could also be supported by additional financing through the Clean Energy Finance Corporation (CEFC), the Northern Australia Infrastructure Facility (NAIF) and state-based energy efficiency incentive programs.

### **Principles of Renewable Energy Industrial Precincts**

REIPs will be established according to sustainable principles. The overarching principle is that eligible participants use renewable energy. This means:

- New projects must use 100% renewable energy (electricity plus heat energy) at the outset;
- Existing businesses must commit to 100% renewable electricity within five years;
- Existing businesses must commit to 100% renewable energy (electricity plus heat) within 10 years.

REIPs should be developed in line with the United Nations' Sustainable Development Goals (SDG). Adhering to SDG principles and embedding them in the program design and assessment would set clear and globally-recognised parameters for REIPs and facilitate assessment of the benefits delivered by REIPs over time. Companies and investors value such parameters as they demonstrate adherence to global sustainable development expectations and allow measurable performance against investment and marketing priorities.

## **Governance**

We propose establishing a Renewable Energy Industrial Precincts Authority (REIPA) to coordinate the design of the REIP program. The proposed program design would be similar to the National Water Infrastructure Development Fund administered through the National Water Grid Authority, in that funding by the Commonwealth to state governments is coordinated to progress priority infrastructure projects. Funding for the new authority is estimated to be \$10 million per annum drawn from the Stream 1 allocation.

The funding could then be governed through the REIPA in partnership with the states and territory through a National Partnership Agreement with agreed program goals and funding arrangements. We recommend funding for implementation be administered by state governments and that the process have a competitive EOI stage, with funding made available to consortiums who pass this stage to develop their full tender.

We recommend that the REIP program work closely with the CEFC to help unlock low-cost finance for these precincts. A delivery model that leverages CEFC finance and government direct funding in a single process, similar to the ARENA Large Scale Solar Program, could be developed.

## **Skills and job pathways**

The planning and development stages for a REIP national program would involve understanding location-specific skills gaps and developing training pathways through apprenticeship programs, technical and tertiary institutions to meet the workforce needs. This may include reviewing existing regional facilities and pathways to ensure that workers in the regions are well placed to take advantage of upskilling opportunities and new careers.

Localised skill requirements may require more insight from local and regional governments, unions and existing training and educational institutions to ensure that programs are targeted to the needs of each region. There may be a need to construct purpose-built facilities to meet training and skill development needs. The proposed REIP program does not, however, include funding for these facilities.

# Proposal 2: A National Supergrid

**Department/Agency(s):** Department of Climate Change, Energy, the Environment and Water; Department of Industry, Science and Resources

## Financial Implications:

	2023-24	2024-25	2025-26	2026-27	Total
<b>Cost of proposal (\$m)</b>	<b>1,126</b>	<b>991</b>	<b>7,339</b>	<b>7,991</b>	<b>17,447</b>
Transmission (\$m)	0	100	3,452	6,165	9,717
Storage (\$m)	470	130	930	1,064	2,594
Distribution (\$m)	357	357	357	342	1,413
System security (\$m)	179	284	480	300	1,243
Grid infrastructure for REIPs (\$m)	120	120	2,120	120	2,480

Funding is allocated across the four-year program as follows: Transmission is based on AEMO 2022 ISP Hydrogen Superpower timings, with investment brought forward by one year; storage is based on a Hydrogen Superpower aligned timeframe; distribution funding is evenly distributed across the program; and technology and skills mature to deliver. System security is based on AEMO 2022 ISP Step Change annual spend but expedited to align with Hydrogen Superpower timing and speed.

## Outline of proposal

Beyond Zero Emissions proposes an accelerated investment in a 'National Supergrid' to facilitate the broadscale community and economic benefits that can be achieved through scaled and targeted upfront investment. This proposal outlines a five-year grid investment program that will build the foundations upon which Australia can transition to a prosperous and equitable zero-emissions economy and realise its ambition to become a renewable energy powerhouse.

The information contained in this proposal is based on forthcoming research titled **National Supergrid: connecting Australians to a zero-emissions future** – a Beyond Zero Emissions report due for publication in February 2023.

A National Supergrid can deliver the following **benefits**:

- Increase energy security by decoupling Australia's energy markets from volatile international fossil fuel markets. In 2022 the war in Ukraine caused spot prices on the National Electricity Market (NEM) to spike by over 200%.<sup>17</sup> In the Australian Capital Territory where energy is sourced from 100% renewables, energy prices increased by a comparatively modest 9%.<sup>18</sup>
- Ease cost of living pressures by enabling households to tap into modern, efficient, electric technologies such as heat pumps, electric vehicles (EVs), batteries and rooftop solar. Our analysis shows that an average Australian household can save between \$2,811 and \$4,021 annually on energy bills by electrifying their homes and

<sup>17</sup> Hannam, 'Island in the Energy Price Storm'.

<sup>18</sup> Independent Competition and Regulatory Commission, 'Retail Electricity Price Recalibration 2022–23: Standing Offer Prices for the Supply of Electricity to Small Customers'.

cars. A holistic consideration of the grid network including distribution will support households to electrify and reduce cost-of-living pressures. A recent report by the Climate Council similarly concluded that household bills would be reduced simply by switching gas appliances (including stovetops, heaters and hot water systems) to electric, with yearly bill savings ranging between \$500 and \$1,900.<sup>19</sup>

- Create sustainable economic growth and supply chain security through prioritising grid upgrades to industrial regions. Transmission and distribution upgrades along with investment in new energy storage technologies are required to enable industry to decarbonise. Low-cost, zero-emissions renewable energy will deliver lower operational costs, increasing Australian industry competitiveness on global markets and incentivising new renewable industries to locate within existing industrial and manufacturing regions.
- Deliver an equitable transition to all Australians, targeting urban, regional and remote communities.
- Lay the foundations to meet our emission reduction targets and become a renewable energy powerhouse, delivering the energy and commodities demanded by a global economy in transition to a zero-emissions future.

Just as past government investment in rail, roads and ports opened up new economic opportunities for Australia, the rapid deployment of a National Supergrid is a critical nation-building project. Building the right foundations for a zero-emissions economy will require the Federal Government to play a coordinating and supporting role to ensure investments are future-focused and supported by appropriate regulatory frameworks to ensure equity, social licence and environmental best practice.

Beyond the five years outlined in this proposal, government planning, coordination and support will still be crucial but with the right foundations, direct government intervention is expected to reduce as critical infrastructure comes online and private sector investment steps up to meet market demand. This approach allows pass-through costs to be deferred until wholesale energy prices reflect the lower cost of source energy, thus avoiding an increase in short term cost-of-living pressure. It is anticipated that the government will be able to sell the assets to infrastructure providers in the medium term to recoup funding for future projects.

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<sup>19</sup> Climate Council, 'Switch and Save: How Gas Is Costing Households'.

A National Supergrid program would see the Federal Government invest \$20 billion over the next five years. This investment would be delivered across four asset typologies to deliver holistic upgrades across all grid assets.

Infrastructure	Funding	Details
<b>Transmission</b> \$11.7 billion	\$8.7 billion	Support transmission projects identified in AEMO 2022 ISP Hydrogen Superpower to deliver in the next five years to 2027/28.
	\$2 billion	Support transmission projects that enable the delivery of renewables to two industrial precincts that deliver clean commodities and manufacturing.
	\$1 billion	Support transmission in the Pilbara (WA) to fast-track renewable energy sharing. Support the Electric Superhighway (NT) to deliver energy independence and opportunities to First Nations peoples.
<b>Storage</b> \$4.3 billion	\$3.6 billion	Support for 6 GW/50 GWh medium duration (8 hr) battery storage projects to unlock renewables and provide critical firming capacity.
	\$400 million	Support for local innovators to scale up next-gen energy storage technologies.
	\$300 million	Support the groundwork for pumped hydro assets, focusing on brownfield and off-river sites, as well as projects that support our industrial regions.
<b>Distribution</b> \$2.3 billion	\$335 million	Support collaborative establishment of a national distributed energy resources management system to optimise household solar, batteries and electric vehicles.
	\$175 million	Support distribution upgrades to enable electrification for communities.
	\$400 million	Support the rollout of stand-alone power systems and microgrids to remote and First Nations communities for improved energy independence.
	\$336 million	Support rural communities and farmers to decarbonise and connect mid-scale renewables (1-5 MW) to unlock new revenue streams.
	\$500 million	Support distribution upgrades to enable the electrification of community hubs, schools etc. to ease cost pressures and free up funding for service delivery.
	\$600 million	Support distribution upgrades to industrial clusters, helping them to electrify and adopt modern, renewable-powered manufacturing processes.
<b>System Security</b> \$1.7 billion	\$1.5 billion	Support the delivery of critical assets such as synchronous condensers.
	\$200 million	Support the accelerated rollout of advanced grid forming inverters.

## Strategic Policy Alignment

Beyond Zero Emissions proposes funding be drawn from announced funding allocations for grid infrastructure including Rewiring the Nation, the National Reconstruction Fund and Powering the Regions to fuel grid transformation at the speed and scale required to deliver the outlined economic and social benefits. The proposed National Supergrid program aligns with the following government policies.

Federal policy/strategy	Aim	Alignment with a National Supergrid
Rewiring the Nation	Provide finance to expand and modernise the electricity grid. <sup>20</sup>	Can directly support transmission upgrades.
Northern Australia Infrastructure Facility	Provide finance to infrastructure projects in Northern Australia.	Can support transmission upgrades in the Northern Territory.
Powering the Regions Fund	Support the decarbonisation of existing industries and creation of new clean energy industries and jobs. <sup>21</sup>	Can support transmission to enable Renewable Energy Industrial Precincts and distribution to enable industry decarbonisation.
New Energy Skills Program	Support the development of fit-for-purpose training pathways for clean energy industry jobs.	Supports the build out of the workforce required to implement the National Supergrid program of work.
National Reconstruction Fund	Provide finance for projects that diversify and transform Australia's industry and economy, to secure Australia's future prosperity and drive sustainable economic growth.	Supports the build out of capabilities required to deliver transmission to enable green steel/aluminium (Priority areas: Renewables and low emission technologies, Value-add in resource).
First Nations Clean Energy Strategy	The Energy Ministers' Communique includes a commitment to a co-designed and resourced First Nations Clean Energy Strategy to ensure First Nations peoples are central to the energy transformation. <sup>22</sup>	To help guide transmission developments and realise opportunities for First Nation communities.

<sup>20</sup> Australian Labor Party, 'Powering Australia'.

<sup>21</sup> Australian Government Department of Climate Change, Energy, the Environment and Water, 'Consultation Hub | Powering the Regions Fund - Climate Change'.

<sup>22</sup> First Nations Clean Energy Network, 'First Nations Clean Energy Network'.

## Rationale

Australia's future prosperity depends on a robust, renewable-powered electricity grid that reliably delivers low-cost, zero-emissions energy at scale. A National Supergrid delivers critical grid infrastructure and unlocks private investment into renewable generation, energy storage and new cleantech opportunities. Speed is the key if Australia is to deliver on its emission reduction targets and secure this future economic prosperity. There is an urgent need for Australia to expedite investment in the electricity grid to facilitate the rapid deployment of renewables and electric appliances. The Federal Government has a key role to play in coordinating with all stakeholders to articulate a roadmap that delivers investment confidence, fosters collaboration and leverages synergies at an accelerated pace. Federal coordination and prioritisation of funding can:

- Fast-track the connection of anchor tenants in each region to de-risk private sector investment in renewable generation and storage and bring forward large-scale emission reductions;
- Avoid curtailment where existing renewable generation exceeds network capability and therefore goes unused;
- Enable a diverse scale of industry decarbonisation commitments from the upgrade of heating and cooling systems to decarbonising operations and supply chains;
- Enable Australian industry to meet increasing domestic and global demand for cleantech and clean/green commodities (for example, in critical minerals, green steel/aluminium production and renewable hydrogen for domestic and export markets). Beyond Zero Emissions' [Export Powerhouse](#) research (2021) showed that these markets could be worth \$333 billion by 2050, triple the value of our 2019 fossil fuel exports.<sup>23</sup>

We have allocated \$2.6 billion specifically to invest in these industrial regions in recognition of their immense economic opportunities (See Proposal 1 above, Coordination and support for a National REIP program). This amount reflects the transmission and distribution needs of key existing anchor tenants, such as aluminium smelters and their surrounding supporting industrial clusters. It is sufficient to build the foundations of what is required, but is a fraction of what would be needed to realise the full potential of key industrial regions. For example, to activate the full suite of projects announced in Gladstone, we estimate the need for \$19 billion investment in transmission alone. As such, the \$2.6 billion investment is intended to indicate government commitment, driving investor confidence to leverage private sector capital up to six times the government contribution.<sup>24</sup>

This proposal would also improve energy equity for rural, remote and First Nations communities through investment in grid infrastructure and storage to reduce reliance on high-cost fuel. This improves energy access and sovereignty, and unlocks additional revenue streams, economic growth and job opportunities.

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<sup>23</sup> Beyond Zero Emissions, 'Export Powerhouse: Australia's \$333 Billion Opportunity'.

<sup>24</sup> NSW Government, 'Net Zero Industry and Innovation Investment Plan' (accessed 19/1/2023), <https://www.energy.nsw.gov.au/nsw-plans-and-progress/government-strategies-and-frameworks/net-zero-industry-and-innovation-investment-plan>



## Implementation

It is important that a national lens be maintained through the Federal Government, allocating resources and delivering projects that bring about the most efficient transition pathway for our grid. Coordination with states, bipartisanship and long-term thinking are vital to avoid service duplication and ensure that critical works and projects of national significance are prioritised. Delivery frameworks should ensure equity and leading practice in the delivery of outcomes, notably in relation to social licence and environmental and cultural heritage protection.

Beyond Zero Emissions proposes five steps to lay the National Supergrid's foundations:

1. **Invest a minimum of \$20 billion in grid infrastructure investment over the next five years** to help drive strong economic growth.
2. **Prioritise grid upgrades that promote rapid decarbonisation in regional industrial ecosystems** (REIPs, for example) in locations such as the Hunter and Gladstone to unlock private investment and grow zero-emissions industries.
3. **Adopt a holistic approach to upgrade all grid assets including transmission, energy storage, distribution, and system security.** The National Supergrid takes a holistic view of the grid, beyond 'poles and wires', to deliver reliable, robust and low-cost energy where and when needed.
4. **Embed social licence and community benefits as core principles so that all Australians can benefit from the transition to a zero-emissions economy and society.** The National Supergrid includes targeted investment in distribution and microgrids to ensure that no one gets left behind, including First Nations, regional and remote communities.
5. **Accelerate the move towards 85% renewables by 2028** by harnessing the capabilities of the National Supergrid. This will drive down emissions and shield businesses and households from volatile fossil fuel prices.

Government funding can be allocated via different mechanisms depending on the asset type, key customers and market conditions. It is anticipated that funding would be administered through existing programs. In general, we propose:

- The use of equity funding for large-scale transmission projects, allowing the government to delay the impact of network charges on electricity bills until **after** increased renewables have delivered lower wholesale prices. Once wholesale prices are able to offset the network charges, the government can sell off the assets to the relevant body to recoup costs.
- The use of concessional finance or underwriting for projects that are technically sound and vital for the grid but may not have a sufficient business case without short-term government finance, for example, medium to long duration energy storage projects or system security assets.
- The use of co-investment for projects that have a viable business case but will benefit from government contribution to fast-track implementation, ensure transparency and collaboration, deliver best practice around environmental management, or enable successful scaling of new innovations. Co-investment can ensure that Australia remains competitive for both domestic and international

investment. Projects could include pumped hydro, commercialisation of energy storage technologies and the orchestration of distributed energy resources (DER).

- The use of grant funding for projects that have a strong equity focus. For example, delivering grid, microgrid or standalone systems and benefits to rural, remote and First Nations communities and supporting the electrification of community centres, schools and other public spaces.

Full details of this spending allocation can be found in our forthcoming report release: *Beyond Zero Emissions (2023)*. 'National Supergrid: connecting Australians to a zero-emissions future'.

### Principles of National Supergrid

Best practice principles will ensure successful deployment of the National Supergrid. These reflect principles outlined in *Building Trust for Transmission* and include:<sup>25</sup>

- **Collaboration:** All stakeholders need to be engaged openly and transparently. This is critical to ensure an efficient delivery, avoiding unnecessary competition or project duplication.
- **Social licence:** Early community engagement and the consideration of community benefits, work and training opportunities, biodiversity and equitable access to infrastructure are critical to gaining and maintaining social licence.
- **First Nations free, prior and informed consent and economic opportunity:** Partnerships formed under free, prior and informed consent with First Nations peoples are vital in ensuring that new economic opportunities are inclusive.
- **Workforce transition and diverse participation:** The Supergrid is an opportunity to unlock a world-class grid infrastructure and renewables workforce with leading industry knowledge on how to deliver renewable infrastructure at scale.
- **Industrial capability in a zero-emissions economy:** The Supergrid brings low-cost firming renewable energy to industry, ensuring Australian industries stay internationally competitive while driving demand and off-take for new industrial production capacity.
- **Investment in Australian innovation:** World-leading clean technologies are being developed by local innovators. Proactive support now will see future benefits.
- **Emission reductions aligned with an IPCC 1.5°C scenario:** The Supergrid delivers the capability to achieve emission reductions faster, fairer and deeper than currently planned. It addresses emissions from the electricity sector, responsible for 36% of Australia's greenhouse gas emissions, and is a key enabler for decarbonisation in all other sectors.

Government commitment to and investment in a national Renewable Energy Industrial Precinct (REIP) program and a National Supergrid will build Australia's sovereign energy

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<sup>25</sup> Kate Healey, 'Building Trust for Transmission - Earning the Social Licence Needed to Plug in Australia's Renewable Energy Zones'.

capabilities. Our proposals set the scene for Australia to become a renewable energy powerhouse by building on our natural competitive advantage and strong industrial and energy heritage. They ensure that Australia and all Australians can reap the benefits of the world's growing green economy. Adopting the scale and speed of transformation detailed in the proposals will ensure that our economy is competitive and our community benefits from cost-effective, reliable renewable energy. These proposals will ensure that we protect existing jobs and create new ones, with a focus on our regions, and our future prosperity.

**For More Information:**

[Renewable Energy Industrial Precincts Briefing Paper](#) (including Hunter Valley Case Study), Beyond Zero Emissions & WWF-Australia, September 2020.

[Renewable Energy Industrial Precincts: Economic Analysis Summary Report](#), Beyond Zero Emissions, July 2021.

[Regional economic impact analysis of Renewable Energy Industrial Precincts: Central Queensland REIP](#), ACIL Allen, March 2021.

[Regional economic impact analysis of Renewable Energy Industrial Precincts: Hunter Valley REIP](#), ACIL Allen, March 2021.