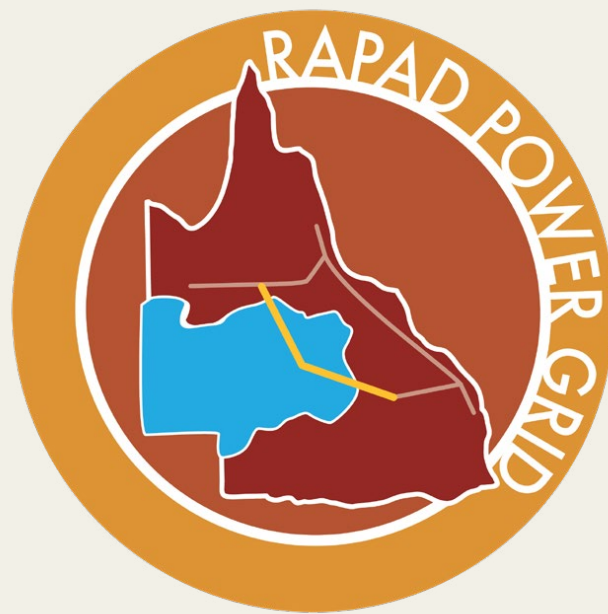


*A unique  
community-led partnership*

*employing  
world leading HVDC and  
battery storage technology*

*creating capacity needed to  
power Queensland's clean  
industrial superpower*



*The largest and most technically-advanced  
power system development in Australia*

# RAPAD Power Grid: Powering the Clean Energy Superpower

## Community led

RAPAD Power Grid was initiated through a unique collaboration between the Central Western Queensland **Remote Area Planning and Development Board (RAPAD)**, **Barcaldine Regional Council** and **VisIR Pty Ltd**. RAPAD represents seven local government areas that span almost 25% of Queensland including the Barcaldine region which is home to the emerging Barcaldine Renewable Energy Zone (**BREZ**). Queensland firm **VisIR** founded and developed the \$5 billion CopperString 2032 transmission network that will extend approximately 1,000 km across Northern Queensland which is being delivered by the Queensland Government.

## Collaborative partnership agreement

RAPAD and BRC approached VisIR to help drive development of major clean energy infrastructure capitalising on the vast open plains in Central Western Queensland (**CWQ**). This collaboration led to the decision to implement world leading power system technology that ensures Queensland can realise it's potential as a Green Energy Superpower. A Memorandum of Understanding (**MOU**) between the three parties was signed in October 2023, to develop major High Voltage Direct Current (**HVDC**) transmission, renewable generation, and battery storage infrastructure in the CWQ region.

The RAPAD region is strategically located between the industrial and energy hub of Gladstone and the critical mineral and renewable energy corridor between Townsville and Mount Isa in the North West Minerals Province (**NWMP**) and utilises this strategic arc from Hughenden to Barcaldine and on to Gladstone.

## Powering a green industrial superpower

RAPAD Power Grid catapults Queensland and eastern Australia's strategic infrastructure planning to truly align with the ambition to become a green industrial superpower. This world-leading infrastructure will build upon the Queensland Government's transformational Queensland Energy and Jobs Plan (**QEJP**), advancing initiatives to decarbonise our existing power system while facilitating major industrial growth.

A global transition to Net Zero status is expected to dramatically reduce Australia's exports unless significant green industrial development occurs to fill this economic void; this is a key risk and opportunity for Australia. AEMO forecasts renewable supply will need to reach over 1,000,000 GWh in 2054 under a Green Energy Exports scenario, more than 5 times the electricity generated in the National Electricity Market (**NEM**) today, and in Queensland this requirement increases to 9 times the electricity generated today.<sup>1</sup> RAPAD Power Grid dramatically increases the confidence for green industrial investors that the NEM power system can supply their renewable energy requirements, particularly for key green industrial hubs in Gladstone and Townsville.

*“Global decarbonisation efforts are having a profoundly transformative effect on the way the world engages in trade and investment. The growing global demand for green energy and green-alternatives to traditionally emissions-intensive exports presents immense opportunities for Australia to be a leading destination for trade and investment in the future global green economy and to establish itself as a ‘green energy superpower’.”*

– Inquiry by the Joint Standing Committee on Trade and Investment Growth into Australia's transition to a green energy superpower.<sup>2</sup>

Aerial view of Mitchell Grass Downs in the RAPAD region, October 2023

## Nature positive; ideal biodiversity for energy infrastructure development

RAPAD Power Grid will facilitate the utilisation of ideal land for large scale solar and battery, removed from the environmentally sensitive and biodiverse regions toward the east coast and the food bowls along the foothills of the Great Dividing Range. It will employ the vast open plains of CWQ, with excellent biodiversity characteristics for transmission and renewable generation infrastructure in relation to terrestrial ecosystems biodiversity and conservation status, wildlife corridors, threatened fauna and agricultural classification. RAPAD Power Grid has a clear and efficient path to be true nature positive energy infrastructure.

## World-leading technology and innovation

RAPAD Power Grid will be the largest and most technically advanced transmission network in Australia; integrated with solar and battery storage, and major wind energy provinces around Hughenden (in the Flinders shire) and the Banana shire. Advanced power system technology will be important to managing flexibility and scale required for electricity to supply green industrial production and a zero-emissions electricity generation sector. HVDC electricity transmission technology enables granular control and technical performance characteristics not possible for conventional AC technology, and can enhance electricity supply security by integrating all forms of generation technology more seamlessly.

## Game Changing Infrastructure



Community-led transmission; lowest biodiversity and nature impact



HVDC transfer capacity of 45,000 GWh p.a. (current Queensland consumption is circa 50,000 GWh p.a.)



8,250 GWh p.a. solar generation utilising less than 0.066% of the RAPAD region, with no tree clearing required



Helps meet the 5x more power required in 2054 for Green Export Superpower future

- 1 AEMO Draft 2024 ISP forecast, Electricity Annual Consumption (NEM), Green Energy Exports Scenario.
- 2 Australia's trade and investment opportunities in a global green economy, Commonwealth of Australia, Joint Standing Committee on Trade and Investment Growth, October 2023.



## RAPAD Statement

The Central Western Queensland Remote Area Planning and Development (RAPAD) Board is the glue that binds the collective effort of local government representatives and drives regionally focused progress in Central West Queensland. We take a regional approach while recognising the individuality of each local member local government, and, have a proven thirty-one-year history of partnering with state, federal and private stakeholders to bridge the gaps between opportunity, action, and growth.

Our region has a long history of being an important supplier and exporter of goods to our state, nation, and globally. For much of the twentieth century our state and national economy rode off our 'sheep's back'. It is on the back of this long history in the supply of economic benefit we feel we once again have the opportunity to offer Queensland the prospect of true competitive advantage, this time not riding the 'sheep's back', but in the supply and transmission of 24/7 low-cost renewable power from those same vast open plains.

RAPAD congratulates the Queensland Government on the delivery of its groundbreaking *Energy and Jobs Plan*. It is an integral step in defining a path to decarbonisation of the existing power system, however it does not, in our view, set out how to supply the immense increases in power required to deliver the full potential this transition means for Queensland, especially the industrial powerhouses of Gladstone and Townsville. The *'Queensland New-industry development strategy — A strategy for new industry in a decarbonising global economy'*, identifies in its modelling the state's hydrogen industry could be \$19 billion larger in 2040, creating 4,350 direct additional jobs, however it cautions such success requires significant additional renewable energy and transmission.

RAPAD Power Grid opportunity is not only seeking development from the net zero transition, but how this infrastructure will harness the synchronous solar and wind resource — the sun shining in the day, and the wind blowing at night, to deliver the Queensland superpower vision. The central west offers greater protection from cyclones, less competition with intensive agriculture and urban growth, and an environment more conducive to development.

To ensure RAPAD Power Grid is grounded in practical and technical reality early in 2023 RAPAD contacted VisIR seeking their experience, knowledge and know how. In October 2023 an MOU was signed between RAPAD, Barcaldine Regional Council (BRC) and VisIR to resource this community led initiative.

RAPAD stands ready to play a critical role in underpinning the energy transition and being part of Queensland's next wave of economic growth.

**Tony Rayner**

Chair, RAPAD

## BRC Statement

The generation of energy and the associated transmission infrastructure are essential items for modern Australia. Regional Queensland has long been a provider of essential items and activities to support the growth of the broader Australian population and economy. This opportunity to build voluminous transmission capacity and support sites that could facilitate extremely large renewable energy generation, whilst providing large amounts of critical green energy for growth industries as well as growing residential demand, would once again see regional Queensland help sustain the advancement of the state and nation.

The electrification of the Australian economy alongside the social, environmental, and fiscal requirement to decarbonise, provides both challenges and exciting opportunities. The Barcaldine Regional Council has the ability to provide natural comparative geographical advantage, coupled with minor population disturbance, to offer a unique and tailored solution for the state and nation's needs. The social licence conversations around this development have been progressed in such a manner that crucial community stakeholders, such as First Nations residents, local residents, land holders and business owners, are currently engaged in this tailored solution to the nation's electrification needs.

This project, RAPAD Power Grid, transformational in the respect of both infrastructure development and provision of power, will truly transform the region in terms of economic diversification. Employment opportunities, business development and equity investment will all prosper as a result of this style of substantial infrastructure investment. Removed or shielded from the resources boom of the Bowen and Surat Basin, this allows the untapped renewable resources of Central Western Queensland and its sheltered environment to provide critical electricity from source to grid. This inland environment, removed from the rising potential impact of severe tropical cyclones and flooding of large coastal riverine systems caused by climate change, safeguards access to large volumes of base load power as well as power in peak demand times. This region can not only provide more certainty of electrical connectivity in a changing environment, but also allow for the two-way transfer of power in a highly efficient manner, enhancing the ability for all Queenslanders (residents and businesses) to access improved volumes of power.

Central Western Queensland has a proud heritage and history of providing support and is once again ready to pivot and follow the new direction this exciting opportunity presents. A new future, delivered by trusted partners in a region that is willing and ready to step up. The Barcaldine Regional Council is very pleased to be working with RAPAD and VisIR — a regional Queensland business — to progress development of this valuable infrastructure.

**Sean Dillon**

Mayor, Barcaldine Regional Council



# Central West Aboriginal Corporation Statement

The Central West Aboriginal Corporation (**CWAC**) is active in supporting the Aboriginal and Torres Strait Island Central West community through its arts and crafts showroom, Our Spirit Place at Clydesdale Farm and the Red Shed Cultural, Sports and Training Centre.

CWAC is supportive of the RAPAD Power Grid objectives of creating sustainable economic activity for the region which is important for ongoing economic opportunities for the Traditional Custodians in the region.

## Janeece Thompson

Manager, CWAC



Aunty Wendy Scott — Director (left), Janeece Thompson — Manager (centre back), Darryl Frazer — Director (right), Aunty Beryl Thompson — Chairperson (front)

## VisIR

### VisIR Statement

VisIR is proud to be working with RAPAD, the Barcaldine Regional Council and other key stakeholders across western Queensland to develop RAPAD Power Grid.

The incredible vast open plains of the central west combined with the pragmatic and hardworking nature of the people create an ideal environment for clean energy investment from social, environmental, and technical perspectives. RAPAD Power Grid can create enormous value for the communities across western Queensland, the rest of the State and Australia.

## John O'Brien

Chairman, VisIR

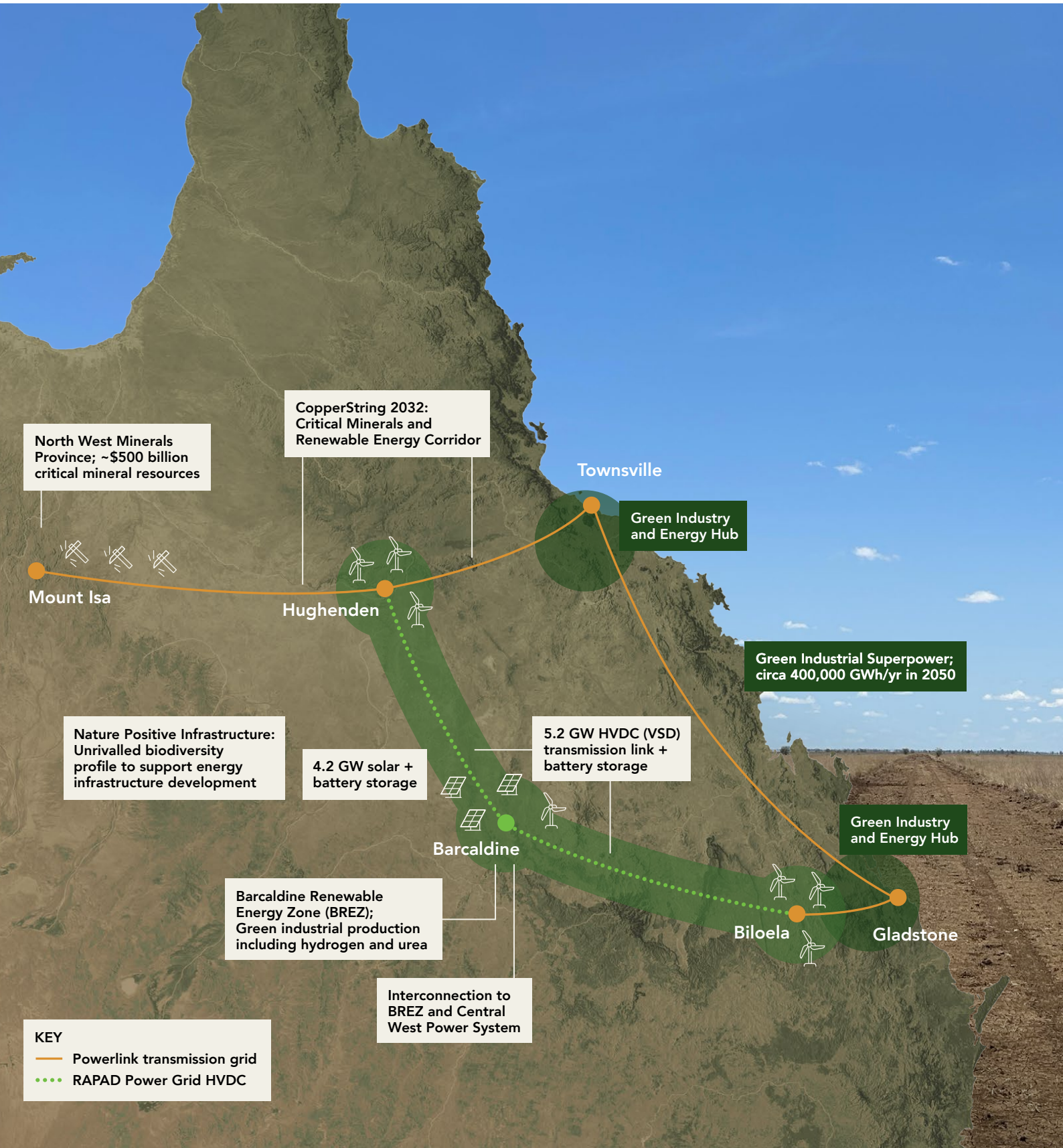
*“The opportunities for competitive production of zero-emissions industrial products are disproportionately located in country Australia. Seizing these opportunities will lead to expansion of employment, incomes and population far greater than rural and provincial Australia has ever known.”*

– Professor Ross Garnaut AC



RAPAD, BRC, VisIR and landowners undertaking site visits and partnership discussions

# Queensland's Clean Industrial Powerhouse



*A unique strategic economic development opportunity exists to link the vast clean energy resources and plains of central western Queensland with Clean Energy Superpower intensive industrial development around Townsville and Gladstone.*

**The RAPAD Power Grid project can be construction ready in approximately four years, with the following elements:**

- HVDC transmission network 5.2 GW capacity
- Solar generation — 4.2 GW
- Common user battery storage (yet to be sized; based on technical and commercial optimisation).

RAPAD, BRC, and VisIR have undertaken initial engagement with landowners, First Nations custodians and other stakeholders including Mayors across the Project's regions. This engagement has commenced very positively and remains a top priority. VisIR intends to submit an Initial Advice Statement in Q1 2024, seeking a coordinated project declaration. Grid connection engagement with Powerlink Queensland (at Hughenden and Biloela) and Energy Queensland (at Barcaldine) will commence and Intending Market Participant status will be sought with AEMO.

Importantly, RAPAD Power Grid will provide unconstrained power infrastructure for the industrial developments associated with the BREZ and reinforce the power system currently supplying the towns in the central-west. VisIR has exclusive rights agreement in place for circa 23,000 ha of land ideally suited to large-scale nature positive solar, capable of approximately 5,500 MW of solar (and battery storage).

**The RAPAD Power Grid agreement between RAPAD, BRC, and VisIR creates an exclusive collaboration that will:**



Via grassroots engagement, ensure the communities of CWQ have a strong positive influence on the development of major power infrastructure in the region.



Facilitate enormous investment opportunity to expand the Queensland Government funded (with Zen Energy) BREZ initiative with clean industrial production and forecast regional economic benefits of \$2.1 billion over ten years and some 500 permanent jobs.



Implement a unique economic development and revenue framework to provide investment, employment and other opportunities, and revenue streams to local communities.

# RAPAD Power Grid has a clear and efficient path to be truly nature positive

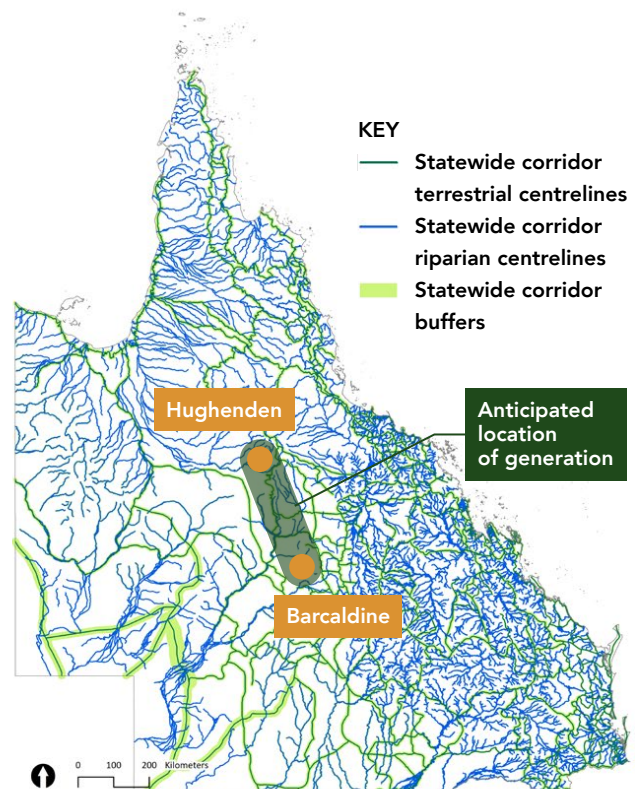


Initial environmental studies found that, although Queensland is home to 85% of Australia's native mammals, 70% of native birds and 45% of plant species, the solar plus storage study area:

- has 'Nil to very low' potential for threatened fauna
- the solar generation sits outside of all state Wildlife Corridors
- is located within a region with 99.6% classified as 'no concern at present' with respect to terrestrial ecosystems conservation status
- has a biodiversity value limited to 'local' significance, i.e., no Regional or State significance
- can facilitate 4.2 GW of solar and align with the World Business Council for Sustainable Development (WBCSD) Roadmap to Nature Positive framework.

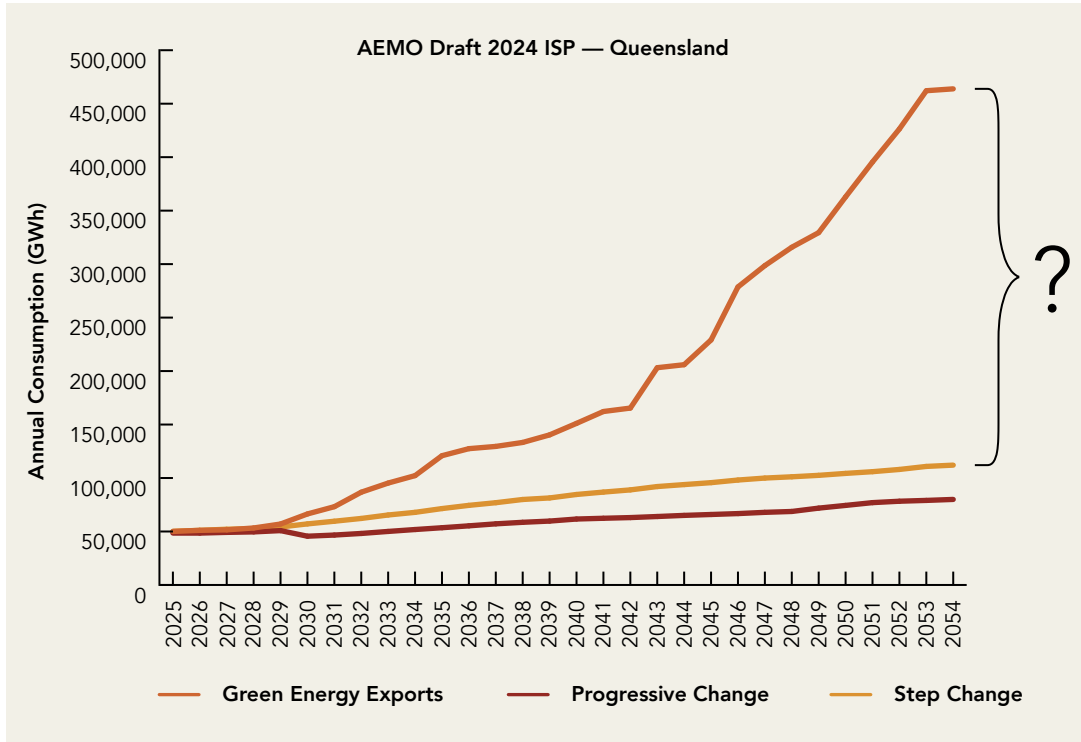
**RAPAD Power Grid will facilitate the location of transmission and renewable generation infrastructure in regions that reflect the most ideal environmental characteristics for development.**

## Queensland Statewide terrestrial and riparian nature corridors and buffers, with generation focus region identified:





# How will Queensland provide 9x today's electricity production required to power our clean industrial potential?



RAPAD Power Grid will address a substantive portion of the gap between current infrastructure plans and the Green Exports future.

**AEMO have forecast over 450 TWh of renewable energy will be required by 2054 in Queensland alone, under the scenario where Australia exports green energy.**

- RAPAD Power Grid aims to meet the energy demands of a Green Energy Superpower outcome for Queensland whereby electricity consumption exceeds the forecasts to be delivered via the QEJP; RAPAD Power Grid infrastructure plan is designed to complement and build on the QEJP.
- Australia's emissions are roughly a third from electricity, a third from mining, manufacturing, and buildings, and a third from transport and agriculture; achieving net zero by 2050 is more than simply net zero electrification.<sup>3</sup>
- The Commonwealth and all NEM state governments have now confirmed the objective of Net Zero greenhouse gas emissions by 2050 or sooner. However, no published state government plan designed to achieve Net Zero would allow for Australia to become a green energy superpower, falling short in both transmission and renewable generation capacity.
- Net Zero could leave Australian economically vulnerable; The October 2023 inquiry by the Joint Standing Committee on Trade and Investment Growth into Australia's transition to a green energy superpower, noted that the high proportion of coal and gas in Australia's export profile leaves Australia economically vulnerable in the face of the decarbonisation of its major trading partners.<sup>4</sup>
- Net Zero requires a power system pathway; transmission strategy increases the value of large-scale, high-quality renewable energy resources in CWQ — low value projects become highest value projects.
- Land, grid, and stakeholder constraints are understated; low-impact ecosystem locations, landholder and traditional-owner support, and transmission pathway to market will grow exponentially in value, with social licence being called out as a priority action in the AEMO 2022 IPS.
- Government collaboration is essential; creating a green energy export economy requires a transitional pivot toward central orchestration, resulting in government collaboration being essential.
- The potential of the wind and solar resource in CWQ to generate large quantities of renewable energy is enormous but has not been fully evaluated; these significant resources are remote from existing infrastructure and therefore have low short-medium term development potential without infrastructure to connect them with load centres.

<sup>3</sup> <https://theconversation.com/the-road-is-long-and-time-is-short-but-australias-pace-towards-net-zero-is-quickenig-214570>.

<sup>4</sup> Australia's trade and investment opportunities in a global green economy, Commonwealth of Australia, Joint Standing Committee on Trade and Investment Growth, October 2023.

# The most advanced transmission technology in the world

*RAPAD Power Grid will utilise world-leading, innovative, HVDC technology; a first for the Australian transmission industry.*



Indoor equipment at a HVDC converter station utilised in advanced power systems around the world

**RAPAD Power Grid's HVDC technology offers superior performance, control, efficiency, reliability and economics resulting in excellent outcomes for both customers and network.**

Power system modelling has been undertaken to define HVDC performance advantages, technical strategy, and key business model performance considerations. RAPAD Power Grid HVDC is expected to add significant performance value to the Queensland and NEM power systems in a Green Energy Superpower scenario.

RAPAD Power Grid will utilise world leading Voltage Source Converter (VSC) technology for the HVDC system to facilitate the regional development of very significant volumes of renewable energy to complement and support the High Voltage Alternating Current (HVAC) east coast SuperGrid under development as part of the QEJP. The RAPAD Power Grid technology will facilitate very significant bi-directional power flows as well as provide power system control and support services and enhance the whole of Queensland power system performance.

## Control and performance

In a world where we are increasingly replacing conventional power stations with variable renewable generation (Solar and Wind), the technical challenges to control the flow of power needs to be addressed. VSC HVDC systems provide millisecond precision in a way that synchronous AC systems cannot.

HVDC system can provide 'grid forming' capability to support to the broader network and keep voltage stable, which is increasingly important with the higher penetration of renewable generation as Australia moves to Net Zero. The HVDC system can also provide 'synthetic inertia' which in effect mimics the performance of the older thermal power stations in terms of maintaining frequency on the network.

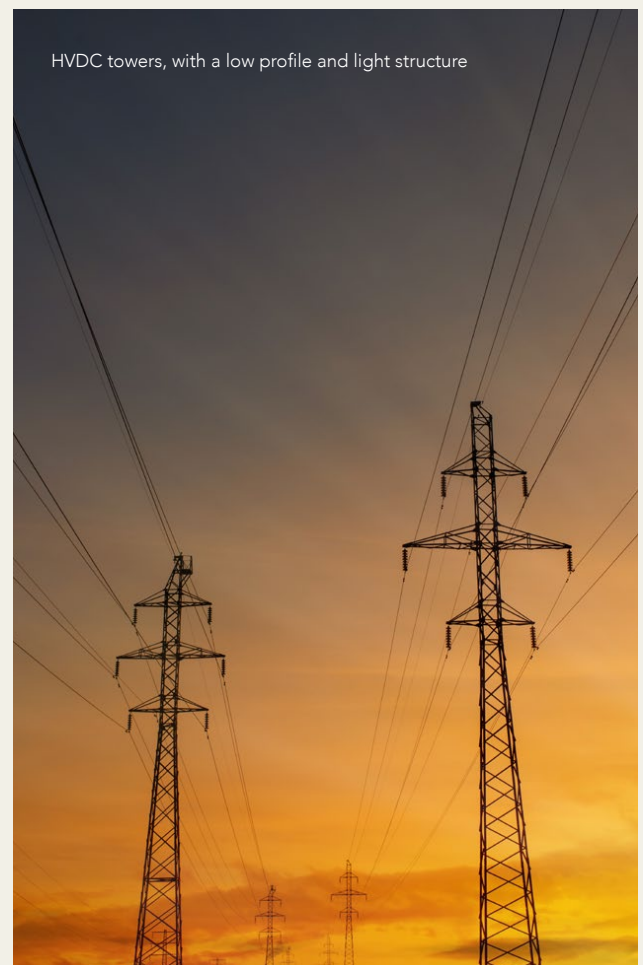
## Efficiency and reliability

Transmission of electricity across long distances results in energy losses. HVDC technology substantially reduces these losses, particularly when dealing with significant volumes of energy transfer. The VSC HVDC technical solution can provide valuable services to the electricity supply system, including greater resilience to voltage disturbances from within the National Electricity Grid, stability in contingency events, and can even provide 'black start' and system restoration support.

## Visual impact

Via the location, in perhaps the most environmentally responsible renewable energy infrastructure development region in Australia, RAPAD, BRC, and VisIR seek to create a robust pathway to true 'nature positive' status as an exemplar project globally. An important aspect of any development is the visual impact to the community. HVDC excels as compared to HVAC due to the difference in both tower and converted configuration. HVDC towers provide a lower profile and lighter structures, and converter stations can be housed indoors. The HVDC towers will be approximately 50–55 metres high, while the equivalent HVAC towers would be 70+ metres.

The towers carry much lighter conductor loads and hence are more slender in design, using less steel with less visual impact. The AC/DC converter stations consist mainly of indoor equipment and can be contained within sheds. Additionally, as compared to HVAC, the electromagnetic fields generated around HVDC lines are static in nature and significantly reduce impact to local communities.



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*RAPAD Power Grid is a community-led energy infrastructure development with strong support from local government, regional economic development organisations, First Nations custodians, and numerous landowners engaged to date. Together RAPAD, BRC and VisIR have a unique capability to build strong and mutually beneficial relationships with the community and stakeholders.*

*Community collaboration  
World leading innovation  
Powering the superpower*

For more information, please contact

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