



Consultation on the model for QREZ design and access

Delivering Queensland Renewable Energy Zones

TECHNICAL DISCUSSION PAPER

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1.0 Purpose and scope

1.1 Purpose

The Queensland Government has committed to establish three Queensland Renewable Energy Zones (QREZ) – the Northern, Central, and Southern QREZ.

QREZ development aims to improve coordination of investment in electricity transmission and renewable generation infrastructure, creating benefits for local communities and attracting new industries while delivering on Queensland's renewable energy target (QRET) of 50 per cent renewable energy by 2030.

The transformation underway in Queensland's energy sector creates new opportunities for Queenslanders in clean energy jobs, manufacturing, industrial processing, and regional development. To deliver on these opportunities, the Queensland Government is developing an energy plan, which will set a clear direction for the future of Queensland's energy system. The long-term development of the QREZ regions will be a crucial element of the energy plan.

The primary objectives for QREZ development are:

1. Lowering total system cost, keeping energy affordable and attracting investment

To support industrial growth and attract emerging industries Queensland needs to maintain a globally competitive electricity industry. Through coordination of network and generation infrastructure, QREZ will place downward pressure on total system costs, supporting investment and jobs in Queensland's economy while keeping energy affordable for Queensland households.

2. Providing renewable supply to industrial demand

To facilitate renewable access for large energy users and industrial demand, QREZ will highlight geographic locations ideally suited for attracting industrial investment, supporting innovative enterprise and job creation.

3. Ensuring a secure and reliable clean energy system

To ensure system security and reliability, QREZ will help diversify Queensland's generation including the right mix of variable renewable and dispatchable energy sources.

4. Delivering lasting benefits for local communities, businesses, and workers

To deliver real and lasting benefits for regional host communities, local businesses and workers, QREZ will be a product of genuine engagement with a focus on local outcomes.

The Queensland Government has worked closely with Powerlink Queensland (the publicly-owned transmission business and Jurisdictional Planning Body), to prepare a proposed framework for the first stages of unlocking investment in each QREZ. Transmission upgrades are being identified to increase the hosting capacity in key areas of high investor interest, renewable potential, and high demand or potential demand.

This Technical Discussion Paper presents an initial model outline for QREZ design and access to enable the first stages of QREZ investment.

Feedback on this paper will guide and inform the final QREZ model progressed by the Queensland Government. It is expected this paper will primarily be of interest to energy industry stakeholders, such as renewable energy operators, developers, and investors; energy market and network operators; energy market regulators; energy councils; and large energy users.

Updates on further engagement opportunities will be provided through the [Department of Energy and Public Works website](#).

This Technical Discussion Paper is the next in the series following the Community Consultation Paper on *Local benefits in Queensland Renewable Energy Zones*, released by the Queensland Government on 10 August 2021 with an accompanying online survey. A subsequent paper will identify how to support and expand demand for renewable energy.

Ongoing engagement and feedback on the Community Consultation Paper is shaping the development of a proposed *QREZ Local Benefits and Social Licence Strategy*, a key component of the Queensland energy plan, expected for release in 2022.

1.2 Scope

QREZ regions

The Northern, Central and Southern QREZ regions group together candidate zones identified by the Australian Energy Market Operator (AEMO) in the 2020 Integrated System Plan¹. These areas have high quality renewable resources, like wind power, and other suitable characteristics, like proximity to the transmission network, that make them some of the best locations for new generation investment to meet the growing demand for clean energy.

In 2020, the Queensland Government's registration of interest process had 192 projects show interest in developing renewable energy projects within the QREZ regions.

These projects amount to more than 60,000 megawatts (MW) of renewable potential in the broader pipeline, representing 20 times the amount of large-scale renewable energy currently operating in the Queensland system. This demonstrates the significant investor interest that exists for Queensland's renewable sector and acknowledges the probable demand for new industries like green hydrogen.

To harness this pipeline of potential investment, the first stages of QREZ development are focused on finding economies of scale. Network upgrades in areas of high investor interest will unlock greater network capacity and connect new projects in the near-term.

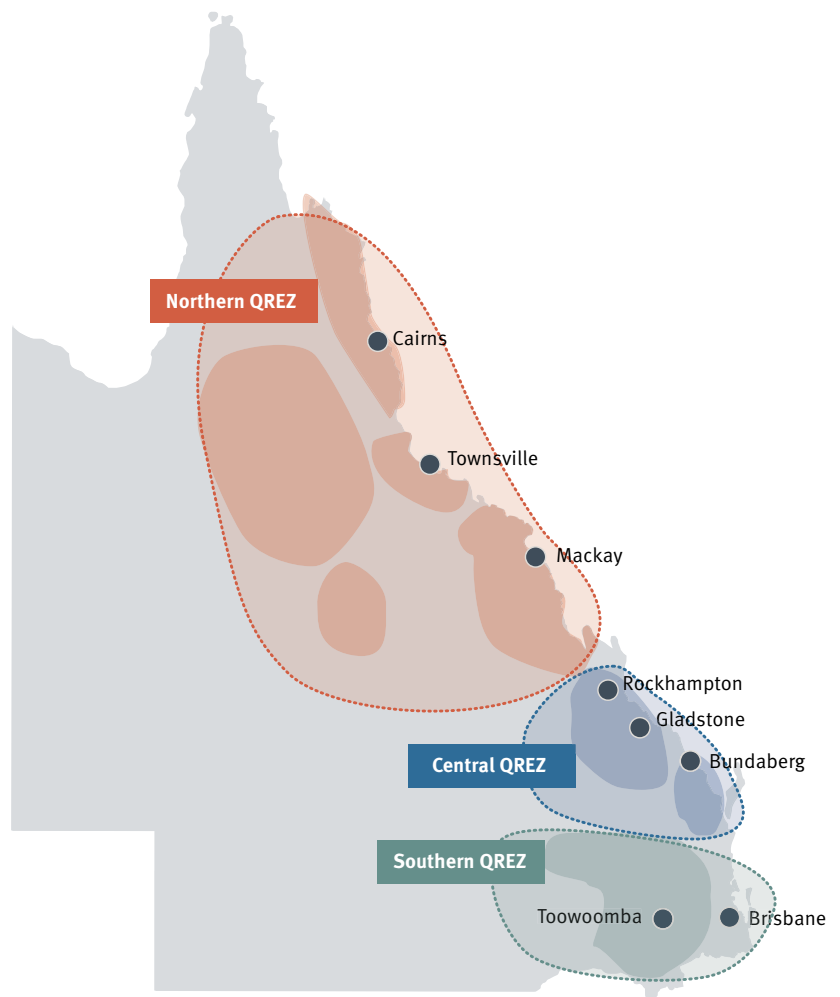


Figure 1 – Northern, Central and Southern QREZ with AEMO candidate zones as per the AEMO ISP 2020

¹AEMO 2020 Integrated System Plan, Appendix 5, <https://www.aemo.com.au/energy-systems/major-publications/integrated-system-plan-isp/2020-integrated-system-plan-isp>

Note: QREZ regions will be updated in line with further iterations of published ISP reports.

An integrated QREZ model

Creating a fit-for-purpose framework to coordinate infrastructure for these first stages of QREZ development will be the primary focus of the preferred QREZ model outlined in this paper. While existing processes still apply for other parts of the network, QREZ follows a targeted approach to deliver scale efficient investments in areas where there is significant investor interest and high quality renewable energy resources to bring new renewable projects forward.

It is also crucial that the QREZ regions are developed in an integrated way that benefits host communities and supports existing and emerging industries.

The integrated QREZ model has three primary components:

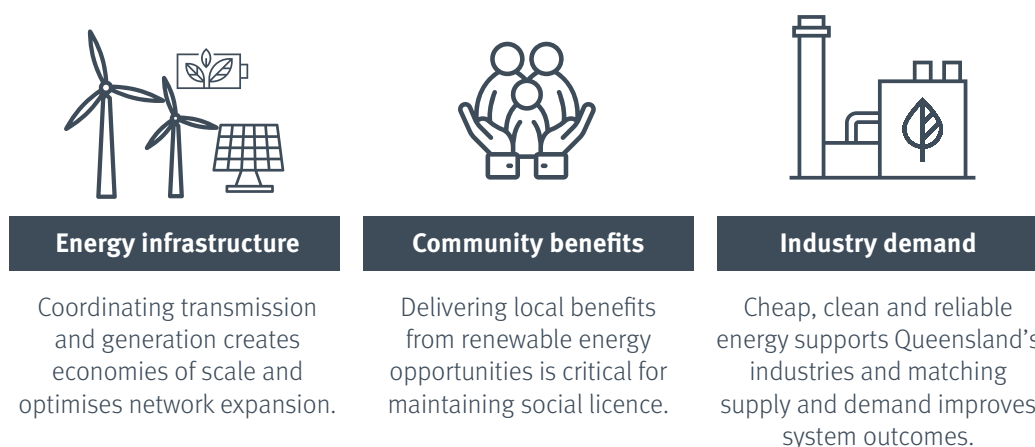


Figure 2 – Integrated QREZ model

The scope of this Technical Discussion Paper is focused on delivering coordinated energy infrastructure, the first component. It also poses consultation questions in relation to the third component, industry demand (section 4). This will support further work underway on how QREZ development aligns with growing industrial demand, including concepts like economic precincts in areas of concentrated industrial activity.

Ongoing work on the development of the *QREZ local benefits and social licence strategy* will address the second component, community benefits.

The final QREZ model will integrate all three components.

Other energy solutions

The QREZ model aims to connect clean energy projects to the Queensland grid, which is part of the National Electricity Market. Renewable energy projects may also be developed for other reasons including to feed clean energy directly into industrial processes and large energy users 'behind the meter' (i.e., not grid connected), or for remote communities and isolated networks. These other energy solutions are not the focus of this Technical Discussion Paper.

1.3 Key terms

Throughout this paper the following key terms will be used regularly:

Northern, Central and Southern QREZ regions

Broad regions grouping together the Australian Energy Market Operator's (AEMO) candidate zones identified in the 2020 Integrated System Plan (ISP). These regions will be developed in a coordinated way to better match supply and demand regionally and support regional economic development opportunities.

Candidate zones and investigation areas

Candidate zones are areas of high renewable potential and other characteristics (like suitable topography) for large-scale renewable energy development that were identified by AEMO in the ISP. The QREZ are made up of the candidate zones AEMO has identified. Investigation areas are those areas the Queensland Government and Powerlink have nominated as having potential for the first stages of coordinated development.

Declared renewable energy zone (REZ)

A smaller geographic area within a broader QREZ region that will be declared a REZ in line with the framework being outlined in this paper. These declared REZ will include specific REZ network infrastructure and generation project connections that will be managed in a coordinated way. A declared REZ may also have bespoke planning frameworks applied and is the final outcome of the candidate zones and investigation areas within the QREZ regions.

2.0 Context

2.1 Growth in Queensland renewable energy

Between 2015 and 2021 Queensland's renewable energy sector has contributed over \$10 billion of investment across the state, supported more than 7,000 construction jobs, and dramatically increased the share of renewable electricity. The share of renewably generated electricity has grown from less than 8 per cent in 2015 to more than 20 per cent in 2021, putting Queensland on track to achieve its 50 per cent target.

The transformation to cleaner electricity sources has created jobs, and facilitated regional investment. However, it has also resulted in shifting energy use profiles and increased complexity for integrating diverse energy technologies.

Technological innovations like batteries and synchronous condensers that help adapt to higher levels of variable renewable energy in the system are being deployed. However, the scale and speed of the energy transformation requires solutions like REZ to support efficient and coordinated expansion of the electricity network. This will help maximise access to high quality renewable resources and support broader industrial decarbonisation.

The Independent Review into the Future Security of the National Electricity Market (the Finkel review) recommended establishing REZ or hubs to facilitate efficient renewable development in 2017. As a result, the Energy Security Board (ESB) has developed a set of principles to assist the development of REZ by providing guidance for resolving key market design issues that have presented a barrier to coordination in the past. The ESB's principles do not attempt to prescribe a particular detailed model of REZ development.

Building from this work, state-based schemes for REZ are rapidly progressing, with New South Wales (NSW) advancing REZ in the Central-West Orana, New England and South-West regions as part of the NSW Electricity Strategy and Energy Infrastructure Roadmap. Victoria is also currently developing a REZ framework while progressing proposals for REZ infrastructure across six locations.

The Queensland Government confirmed its commitment to establishing QREZ in August 2020 as a critical part of the state's economic recovery from COVID-19. All QREZ are interconnected through the transmission network, which forms the backbone of the electricity system.

As our renewable energy supply and uses of energy grow and change, ongoing strategic network planning and investment will be required. This could include new transmission that connects growing renewable energy zones as well as energy demands from industrial processing, clean manufacturing, and the emerging hydrogen economy.

The coordinated development of QREZ has the potential to effectively deliver transmission infrastructure needs that address investment barriers for renewables while improving outcomes for regional hosting communities.

2.2 First stages of QREZ development

The first stages of developing the QREZ regions are already underway in key investigation areas identified by Powerlink and the Queensland Government. These investigation areas are:

- Far North Queensland in the Northern QREZ,
- Fitzroy in the Central QREZ, and
- Darling Downs including Southern Downs to the South Burnett in the Southern QREZ.

Northern QREZ

The Queensland Government will build on existing transmission infrastructure to establish the Northern QREZ to support connection of an initial **500 MW** of capacity in Far North Queensland. This area has excellent wind resources that complement the existing solar generation in the state.

The Northern QREZ investment includes a \$40 million commitment from the Queensland Government for network upgrades for the transmission line between Cairns and Townsville. This supports the connection of Neoen Australia's 157 MW Kaban Green Power Hub wind farm as the foundation project. The project commenced construction in May 2021 and is expected to support 250 construction jobs together with the proposed transmission upgrades.

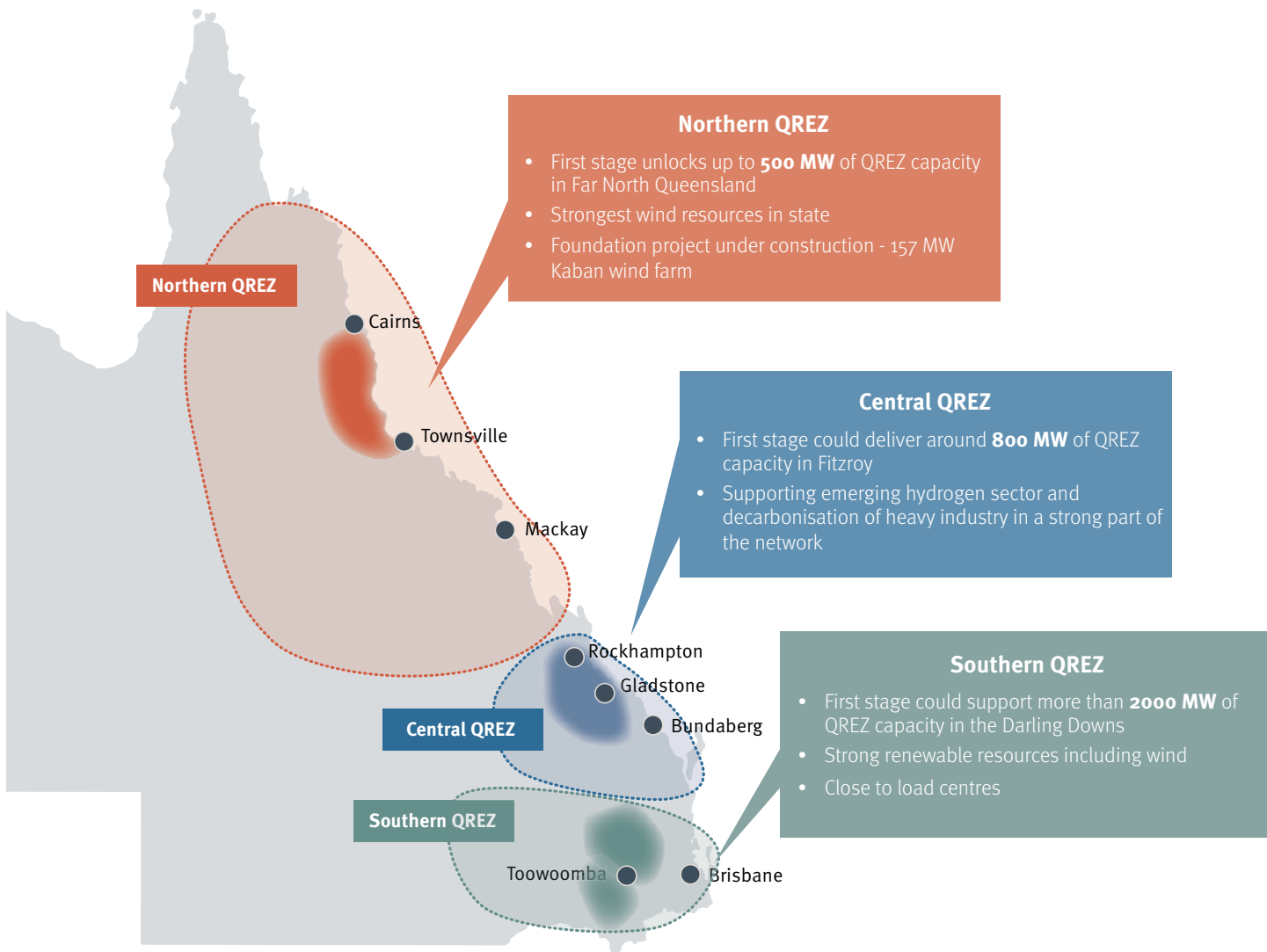


Figure 3 – First stages of developing the Northern, Central and Southern QREZ regions

Central QREZ

The construction of the Central QREZ will support industrial decarbonisation and the emerging hydrogen economy. As a very first stage of development, the Fitzroy region in Central Queensland will be supported to host approximately **800 MW** initially. Further detailed market-sounding and transmission planning is required to unlock this capacity in line with demand for clean energy which is anticipated to grow significantly in this region. Subsequent REZ delivery stages have potential to deliver significantly more renewable capacity in the future.

Southern QREZ

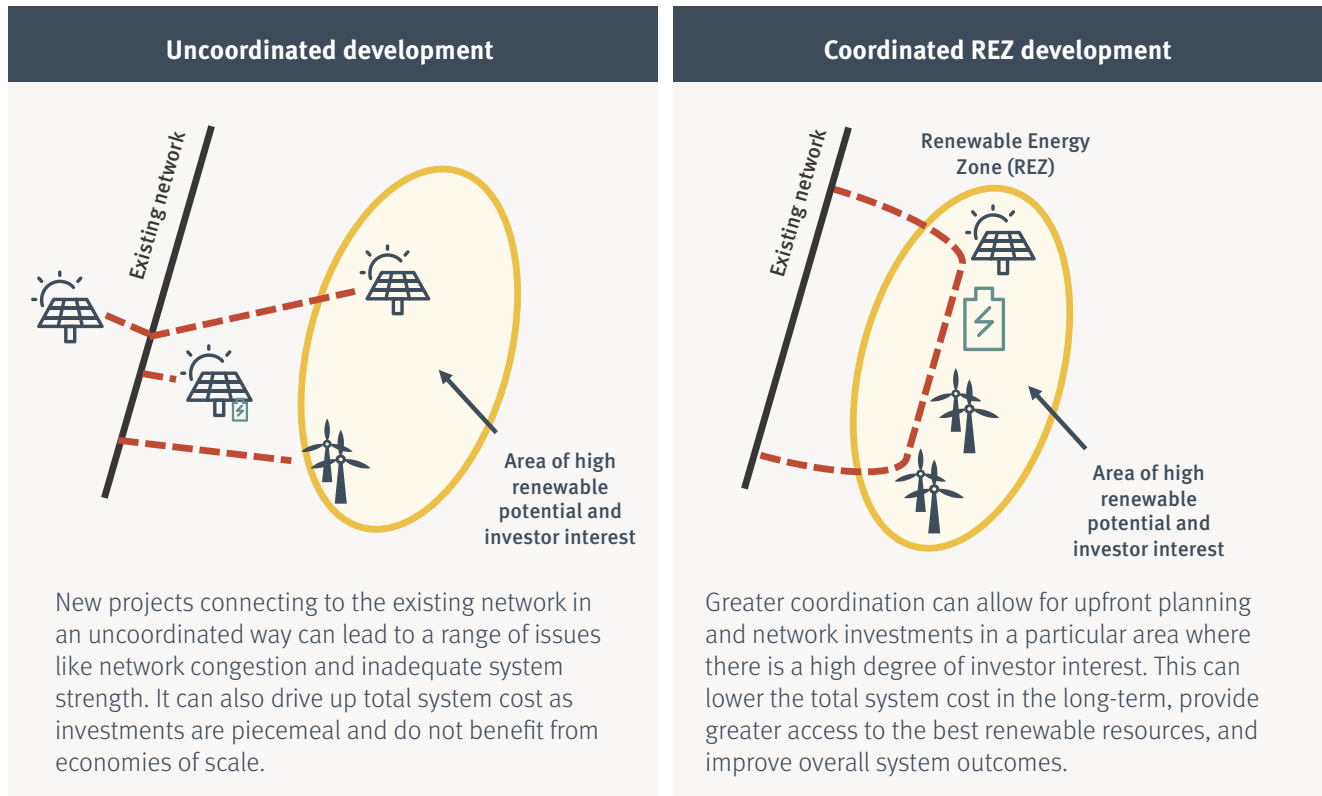
The Southern QREZ will be constructed to enable quality wind resources across the Darling Downs and adjacent regions, with tailored network upgrades to unlock more than **2000 MW** of new renewable energy hosting capacity in the region. This will build on the region's existing strong network capacity supported by the potential development of the proposed **Borumba pumped hydro** energy storage site.

Engagement with community and industry stakeholders will continue for all QREZ investigation areas which will inform future declarations under the model proposed in this paper.

Importantly, the combined **more than 3300 MW** of renewable capacity in these regions form just the first stages of QREZ development. In the long-term, further development of the QREZ regions will support the growing demand for renewable energy from emerging sectors like hydrogen, as well as support the decarbonisation and electrification of job-creating heavy industry in Queensland.

2.3 A fit-for-purpose model for Queensland

Coordinated development of renewable energy in the QREZ regions enables connection of multiple generators in a cost-effective way that supports an optimal generation mix in Queensland.



The existing regulatory framework has several limitations that are sub-optimal for this kind of coordination. A bespoke model for QREZ development can address issues regarding piecemeal development, investment uncertainty, lengthy connection processes, and inefficient costs for generators within a particular geographical area.

Each jurisdiction in the National Electricity Market (NEM) is facing a similar set of technical challenges in integrating higher levels of renewable generation. However, each jurisdiction also has its own unique system characteristics that require a tailored solution. This includes considering the current generation mix, reliance on electricity imports or exports, size, location and shape of load profiles and requirements for essential system services, including system strength. This diversity requires tailored solutions across the jurisdictions.



Consultation questions:

1. Do you support the development of REZ in Queensland? Why or why not?
2. Should Queensland adopt elements of the REZ frameworks from other jurisdictions? Please provide details.

2.4 Attributes of the QREZ model

The preferred QREZ model presented in this Technical Discussion Paper will need to integrate with broader reforms underway in the NEM without creating undue complexity for participating projects.

In the short term, a simplistic approach represents a valuable attribute for QREZ. It will enable prompt implementation so that well-progressed projects can participate and immediately contribute to economic recovery efforts. Several desired attributes and outcomes have been identified that guide the design of the preferred QREZ model, presented in Table 1.

Table 1 – Desired attributes and outcomes of preferred QREZ model

Attributes	Outcomes
1. Simple, transparent, and timely	Minimal administrative burden that prompts timely implementation, high levels of participation, and builds investor confidence through increased transparency and clarity of the QREZ policy.
2. Community and industry partnered	Integrates community benefits and industry priorities with QREZ to foster social licence and create value for Queenslanders in alignment with local benefit principles and needs of industry.
3. Commercially and technically prudent	Generates net benefits and downward price pressure for electricity customers through efficient cost allocation and technically prudent investments.
4. Scale efficient and highly utilised investment	Creates cost savings for network service providers and generators through scale efficiency and supports high utilisation of assets to access high quality renewable resources.
5. Competitive and equitable	Promotes competition and fair and equitable access to improve outcomes for generators, energy users and customers.
6. Adaptable and complementary	Broadly aligns with national and inter-regional REZ frameworks and can be adapted to longer-term reform, if and when implemented.
7. Supports system stability	Results in improved security, reliability and resilience of the electricity network through geographic and technology diversity of renewable energy sources to support the broader energy system.
8. Improves investment certainty	Improving certainty for investment in the development of renewable energy technologies and transmission infrastructure.



Consultation questions:

3. Do you agree with the desired attributes and outcomes? What, if any, additional attributes should be considered?

3.0 The preferred QREZ model

3.1 Model overview

It is proposed that the three QREZ regions are developed in stages to meet the Queensland Government's 50 per cent QRET. This will be achieved by declaring individual zones within a broader QREZ region as 'declared REZ' for coordinated development.

The **declared REZ** will focus on a specific geographic area within a **QREZ region** where selected transmission infrastructure will be designated as **REZ assets**. These assets will be developed and managed under terms set out in documents forming a **REZ Management Plan (RMP)**.

Under this model, a hosting capacity limit will be applied to the declared REZ with generator connections managed through a coordinated process to fill this capacity². This will provide certainty to investors on the physical capacity limits of the declared REZ. It will also allow for greater coordination of scale-efficient transmission and generation investments in areas of high renewable potential and investor interest.

The capacity limits will cover the REZ assets back to a defined point on the shared network. This approach will not exclude the connection of other renewable generators outside of the REZ; however, it will limit the capacity inside the REZ that is available for connection.

Specific technology capacity limits may be required to ensure the declared REZ best utilises the local renewable resource to the benefit of the whole system. For example, an area with high quality wind resources might encourage wind projects to participate in the REZ to provide important diversity of energy supply for Queensland.

Outside the REZ, other potential reforms are being considered like the Congestion Management Model proposed by the ESB. The QREZ model is compatible with these reforms, however further work is needed to ensure these proposals deliver benefits for Queensland.

It is proposed that the **RMP** will outline how the declared REZ will be delivered including the approach to connecting eligible generators, storage or load customers (i.e., large energy users). It will also outline any QREZ specific requirements that connecting parties will need to meet, including potential technology capacity limits and technical constraint arrangements to minimise risks of congestion and curtailment.

The RMPs will be developed through community and stakeholder engagement and will prioritise delivery of real and lasting benefits for regional communities through the alignment to principles for QREZ local benefits and social licence (recently under consultation).

Development of the declared REZ will be planned and facilitated by a 'designated planning body'. It is proposed that Queensland's publicly-owned Transmission Network Services Provider (TNSP) and the State's National Electricity Market Jurisdictional Planning Body, Powerlink, will perform the role of designated planning body for the first stages of QREZ delivery. The REZ development process is summarised in Figure 2 and outlined in further detail in subsequent sections.

² This will enable REZ assets to be designed and built with a rated capability to transfer energy up to the maximum host capacity (with non-firm access).

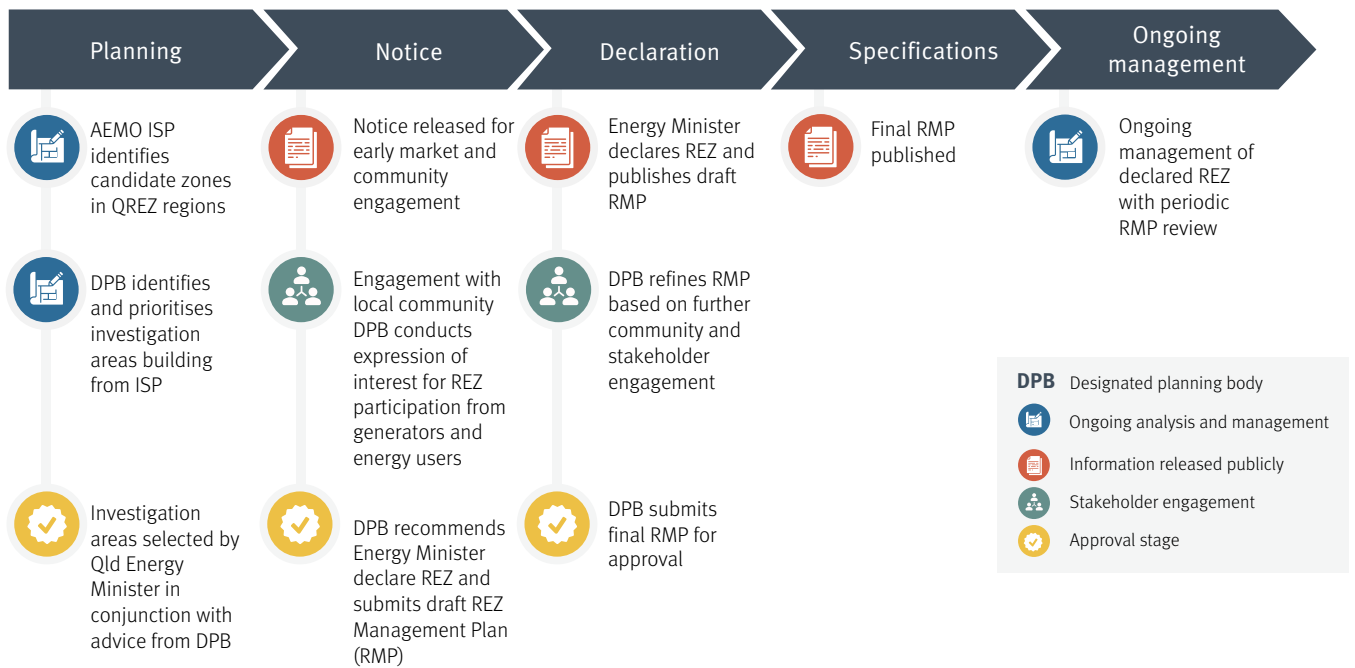


Figure 4 – QREZ development process

Details of the model are outlined under the following sub-sections:

- Planning
- Notice
- Declaration
- Specifications
 - Connections and access
 - Funding of REZ assets
- Ongoing management
 - Project facilitation

A number of aspects of the preferred QREZ model need to be further refined. Stakeholder feedback on this Technical Discussion Paper will be an important input into shaping the final design of the QREZ model for implementation. The remaining sections of this chapter set out specific consultation questions for stakeholder feedback.

3.2 Planning

Zone identification and prioritisation

The investigation areas outlined in section 2.2 were identified through detailed analysis on investor interest received through the Queensland Government’s registration of interest process, alongside further detailed investigations into areas of network capacity by Powerlink.

It is proposed that the identification of investigation areas and prioritisation of ‘declared REZ’ and associated REZ assets within the broader QREZ regions will be conducted by a designated planning body in conjunction with the Queensland Government.

The designated planning body will build on AEMO’s Integrated System Plan (ISP) REZ analysis and its optimal development path. Further detailed investigations of the Queensland network and project pipeline will be incorporated. Engagement will occur with community and industry stakeholders to inform selection of declared REZ.

Importantly, the timing and scale of overall QREZ development will reflect the Queensland Government’s 50 per cent QRET and support broader COVID-19 economic recovery imperatives.

As Queensland's publicly owned TNSP, Powerlink could perform the functions of the designated planning body to undertake network assessments to identify REZ opportunities and provide recommendations to Queensland Government and the Minister for Energy.

Alternatively, Queensland may consider establishing a separate designated planning body to perform all or part of these functions.

In both NSW and Victoria, new bodies are being established to consider and coordinate integrated network development to unlock REZ development and ensure a secure and reliable grid. In both jurisdictions, this has leveraged outcomes of the ISP but also diverged in important ways.

The development of declared REZ will utilise a staged approach wherever possible, matching infrastructure requirements to participation from connecting entities. This staged approach will balance the costs and risk of undersubscription with the benefits of scale-efficient infrastructure.

The risk of undersubscription may also be mitigated by connecting foundation projects for the declared REZ before seeking additional connecting parties. While initial opportunities will be focused on the transmission network, engagement with the Distribution Network Service Provider (DNSP) will also look at how the distribution network may be incorporated.



Consultation questions:

4. Do you agree with this approach to planning declared REZ within the broader QREZ regions? Why or why not?
5. Should Powerlink be the designated planning body to undertake analysis regarding development of declared REZ? Why or why not?
6. If a separate entity were to be appointed the designated planning body, is a new or existing entity more appropriate?
7. How should the distribution network be considered in the QREZ model?

3.3 Notice

The notice stage is intended to provide clarity and transparency of QREZ development to both community and market stakeholders, as well as enable the designated planning body to test the declared REZ business case. It would be a notice of intention to the market to form a REZ in a part of the network.

A notice will be issued outlining selected investigation areas proposed for declared REZ development. The notice will provide initial detail about the opportunity, potentially including:

- the proposed location alongside publication of a geographical map
- estimated generator and/or storage capacity
- existing transmission infrastructure of interest
- potential for new transmission infrastructure (if applicable).

Release of the notice will trigger engagement with community and invite offers of interest from industry participants.

Feedback gathered during the notice period will inform the designated planning body on feasibility of declared REZ development, with business case summaries and recommendations provided to the Queensland Minister for Energy seeking approval to proceed further with the development.



Consultation questions:

8. Do you agree with this approach to community and market notice? Why or why not?
9. Should the REZ notice be issued by the Queensland Energy Minister or the designated planning body?
10. What is an adequate length of time for the market and community notice period and how far in advance of REZ declaration should this be conducted?
11. What level of information should be published in the notice?
12. Are there benefits to aligning QREZ terminology with other jurisdictions? For example, the notice period is similar in intent to the NSW draft REZ declaration stage.

3.4 Declaration

It is proposed that new declaration powers are introduced for the Queensland Energy Minister to announce a **'declared REZ'** and associated REZ assets.

The Ministerial declaration would be made following advice from the designated planning body and prompt engagement on the draft REZ Management Plan or 'RMP'. The RMP will outline the detailed specifications of the REZ (see section 3.5).

These declared REZ will be more targeted geographical areas within the broader Northern, Central and Southern QREZ regions. These will be refined versions of the investigation areas identified for development as part of the planning and notice periods. The Minister's declaration could entail nominating if the declared REZ includes or intends to include any of the following components:

- REZ assets (existing or proposed network infrastructure)
- Bespoke access scheme (capped at a designated MW capacity limit – as distinct from the current open access framework under the National Electricity Rules)
- Specific local benefit and social licence requirements
- Development of a bespoke planning framework, such as a State Development Area³
- Access to specific project facilitation services by Government
- Demand attraction initiatives to support industrial development.

It is anticipated that these components would then be further defined through the development of the final RMP by the designated planning body in conjunction with the Queensland Government for planning, facilitation, or demand attraction aspects.



Consultation questions:

13. Do you agree with the approach for declaration of REZ within the broader QREZ regions? Why or why not?
14. Should the REZ Management Plan published at the time of declaration be a final version based on engagement through the notice period or should this be a draft?
15. Should declaration of a REZ include a bespoke planning framework within the declared area? What would be the advantage of this?

³ A State Development Area (SDA) is a clearly defined area of land established by Queensland's Coordinator-General to promote economic development in Queensland.

3.5 Specifications

The detailed specifications of the declared REZ, including technical requirements relating to participating generators, are proposed to be outlined in a published RMP. Timing of the release of the final RMP is subject to the consultation questions but could occur at the time of declaration taking effect immediately or could be a draft RMP that is finalised soon after declaration.

The RMP may include information such as:

- a staged approach to develop the maximum capacity for the proposed REZ assets
- any applicable technical requirements for the REZ such as system strength
- generation profile including potential storage requirements or technology capacity caps
- market sounding processes to support utilisation of REZ infrastructure
- other requirements associated with ensuring appropriate community engagement and local benefits for host communities.

Upon the Ministerial declaration of a REZ and the release of the RMP, the designated planning body will work further with renewable proponents through market soundings or similar engagement activities to connect projects.

Projects participating in a declared REZ will be managed through the development of 'REZ assets' as a new asset category that will define the connection, access arrangements and the treatment of allocated and unallocated capacity. Specifications of REZ assets are outlined further in section 3.5.1 and 3.5.2. Selected generators connecting to the REZ asset will have guarantees on network capacity limits within the declared REZ (but not outside the declared REZ).

A hosting capacity limit will be set for the declared REZ with some level of flexibility to fully utilise the "operational" hosting capacity of the REZ. REZ assets could include transmission infrastructure that benefits all connecting parties, infrastructure that supports the provision of essential system services, such as system strength, or connection assets.



Consultation questions:

16. Do you agree with the approach for developing the specifications for the declared REZ? Why or why not?
17. Should the REZ Management Plan take effect from declaration of the REZ or should there be two-stage draft and final process?
18. What level of information should be included in the REZ Management Plan?
19. Should the designated planning body be responsible for developing and administering the REZ Management Plan?
20. What are the advantages or disadvantages of creating a new asset category for REZ?

3.5.1 Connections and access

The connection and access scheme proposed intends to provide certainty to participating generators and limit the risk of adverse impacts to network operation such as congestion and curtailment.

Access rights

Access rights under the proposed model will follow a physical access scheme, whereby a maximum connection hosting capacity limit will be set out in the RMP and implemented by the designated planning body. The capacity limit will apply to infrastructure designated as REZ assets and therefore REZ assets will not be subject to the open access scheme as applies to the shared network.

Once the nominated hosting capacity limit has been filled, no further connections to REZ assets will be allowed. As with other REZ models in development, caps on access will only be applicable within the declared REZ geography.

Operation of generators connecting to REZ assets will continue as per the existing National Electricity Market operation with no guarantees on dispatch, congestion, constraints, network limits or marginal loss factor (MLF) values.

Setting hosting capacity limits

The maximum hosting capacity limit of the declared REZ will be based on the capacity of the transmission assets, outage considerations and technical constraint options. In this way the declared REZ can provide certainty on the network capability for the generators within the REZ for system normal conditions, while network conditions outside the declared REZ will be managed based on the existing regulatory arrangements.

It is proposed the designated planning body will determine the hosting capacity limit under the RMP. While this arrangement will not guarantee capacity on the shared network (or provide any firm or financial access rights), network limitations on the shared network will be an important factor to consider in the selection, design and REZ infrastructure locations.

Capacity connection caps should provide greater certainty to connecting generators and contribute to lower total system costs through efficient transmission development. Coordinated REZ development will also provide opportunities for scale-efficient network services like technical constraint options, support for essential system services, including system strength, or a greater role for storage.

While access rights for generators will nominally be assigned on nameplate capacity of the generation for the design of the REZ, there will be some level of flexibility to fully utilise the “operational” hosting capacity of the REZ. To ensure an optimal technology mix in the REZ, the RMP may consider the need for reserving certain amounts of the total declared REZ hosting capacity for certain generation profiles. This would consider the benefits of certain generation to the broader network including system security and reliability outcomes.

Connection arrangements and REZ assets

Connection arrangements may include asset sharing requirements, with performance standards and requirements for essential system services, including system strength. System standards will be aligned to the regulated network and the National Electricity Rules, however additional bespoke technical requirements may apply as needed for the declared REZ and be outlined in the RMP.

Technical and operational requirements of REZ infrastructure will be outlined in the RMP and managed in line with a newly established REZ asset class. The operation and specifications of REZ assets remain under development and are likely to include:

- connection assets (including potentially shared connection assets)
- transmission infrastructure that benefits QREZ connecting parties
- shared transmission infrastructure (either existing or new)
- shared infrastructure supporting the provision of essential system services (either existing or new)

Through engagement at the national level and with other jurisdictions, some stakeholders have raised concerns about projects connecting to the shared network immediately outside the declared REZ. While considerations of external impacts will factor into the REZ identification process, there may remain risks of network congestion between REZ and load centres if this process is not managed effectively.

In October 2021, National Cabinet endorsed a proposal from Energy Ministers to support further design work and analysis to develop a congestion management model (CMM) to complement REZ as a tool for managing transmission and access, as identified by the Energy Security Board as part of the post-2025 market reform work. The final model for QREZ will consider how it can adapt to any national transmission and access reforms as they are implemented.

Expression of Interest and project selection

The declared REZ capacity will be filled through an expression of interest (EOI) process. The process will seek projects suited to the needs of the specific declared REZ and requirements in the RMP. Successful projects will be selected by the designated planning body based upon criteria set out in the EOI.

Queensland's publicly owned generators may also participate in the EOI process, including through the \$2 billion Renewable Energy and Hydrogen Jobs Fund, which supports Government Owned Corporation (GOC) projects in partnership with the private sector.

Opportunities will also be sought to coordinate project connection applications wherever possible to expedite progression through the application process, ideally reducing the risk of time delays for connection.



Consultation questions:

21. Do you agree with the approach to connections and access? Why or why not?
22. Does the proposed QREZ model offer sufficient benefits to connecting generators to encourage participation? If not, what additional benefits could the QREZ model provide?
23. Are there any circumstances where projects connecting outside declared REZ that materially impact the efficient development of the REZ should be restricted?

3.5.2 Funding of REZ assets

The connection and access fees charged to participating generators to connect to a declared REZ asset will be determined in negotiation with the designated planning body and will reflect the benefits of REZ participation and the costs of the REZ assets. REZ augmentation might be staged in order to manage the timeframes for different connecting projects.

In NSW, it is also anticipated that generators would pay an access fee to connect to the REZ which would include a component to support community and employment initiatives.

Funding of generator connections assets

Under the proposed QREZ model, generators will fund the assets required for their own shallow connection (i.e., transformers, dedicated substations), unless otherwise agreed through the Connection Agreement process with Powerlink.

Funding of shared REZ assets

Funding of shared REZ assets will be managed by the designated planning body with charges to individual proponents negotiated at the time of connection.

In cases where assets would pass the Regulatory Investment Test for Transmission (RIT-T) these would be funded by customers under the actionable ISP framework.

Some jurisdictions are investigating alternate tests for investment for REZ transmission infrastructure so that end-users contribute to the costs of efficient REZ development.

The first stages of QREZ development are focused on strategic network investments by Government and commercial solutions with generator contributions, however longer-term development of REZ might consider whether the current test for investment is sufficient.



Consultation questions:

24. Do you agree with the approach for funding REZ assets? Why or why not?
25. Should the Queensland Government consider an alternate test for efficient REZ investment similar to NSW?
26. Should the access fee for generators also support community and employment outcomes (similar to NSW model)? Why or why not?

3.6 Ongoing management

In order to optimise connections to REZ assets, it will be critical that the designated planning body can set out desired features of the connecting generators and manage connections in a transparent manner.

This provides physical access protection for foundation and connecting parties and ensures that the generation mix connected to the shared infrastructure supports a secure and reliable grid. This approach makes the best use of Queensland renewable resources without contributing to network issues like congestion and curtailment.

Within a declared REZ there may also be opportunity to better facilitate renewable energy project development in relation to their interaction with the Queensland Government.

While the primary focus of QREZ delivery relates to the connection of clean energy projects to the declared REZ, multiple interactions will occur with Queensland Government throughout the project development process.

Several local and state planning instruments apply to project developments. There may also be approvals and requirements in relation to:

- land tenure including interactions with resource sector
- land use planning and environmental assessments (including Commonwealth environmental approvals)
- vegetation management
- native title and cultural heritage
- transport management
- workplace health and safety requirements.

Individual proponents have had the responsibility of managing these issues to date and given the level of successful investment in Queensland, it is considered that proponents have generally navigated these issues effectively. However, there may be a greater role for Government when projects are delivered in a coordinated manner through QREZ.

To support the development of QREZ and the state's renewable energy industry more broadly, there may be opportunity to improve or streamline project facilitation activities to support renewable developers.

The Queensland Government is interested in hearing from industry about their experiences in Queensland and other jurisdictions on areas of focus.

Land use planning and environmental assessment frameworks that maintain land and environmental protections will be upheld both within existing frameworks and any potential bespoke planning framework. Existing land uses will be a significant consideration for identification and selection of QREZ areas of interest as part of the QREZ planning process and renewable projects will be encouraged to locate where land use, environmental and community impacts can be minimised and managed effectively.



Consultation questions:

27. What could the Queensland Government do to improve or streamline project development, and at which stages of project development would this be most helpful?

4.0 Supporting competitive industries

Large industrial energy users are becoming more active in the energy market and choosing to source their energy from renewable technologies to support their decarbonisation objectives.

For many, the switch to renewables is as much about finding cost effective energy solutions as it is about meeting investor expectations or customer preferences and leading in a global market that is rapidly transitioning to net zero.

Better matching energy supply to industrial demand for clean energy within each broad QREZ region can improve overall electricity system outcomes, like security and reliability. REZ development can also serve to attract investment into regions through access to reliable and renewable energy at globally competitive prices. There are many ways that QREZ development can support competitive industries in Queensland including both within a declared REZ or connected to a declared REZ.

Within a declared REZ:

- Attracting industrial loads (like energy intensive manufacturers) to connect directly into declared REZ through policies or incentives that encourage co-location and use of renewable energy (for example, discounts on network charges).
- Providing common user network infrastructure for large energy users in declared REZ to connect (for example, developing scale efficient connections for industrial precincts).

Connected to a declared REZ:

- Linking industrial demand physically with declared REZ developments (for example, through new transmission infrastructure connecting industrial load centres with nearby REZ).
- Linking industrial demand contractually through programs that aggregate industrial demand to secure cheaper renewable energy supply contracts.

Linking industrial demand to declared REZ can have other benefits, like easy access to renewables or hydrogen in order to convert existing industrial activities to electricity to reduce emissions. Demand management, when large users are flexible in their energy use, has already been a useful tool for secure operation of the network, and could also be used in a REZ context.

Developing economic precincts that link to declared REZ can deliver economies of scale to bring down costs across several large users. It can also support greater coordination across other aspects like workforce, training, access to infrastructure like ports or water infrastructure, and other inputs for competitive industries. This approach is particularly attractive for energy-intensive businesses which are prevalent in some of Queensland's regions like Townsville and Gladstone.



Consultation questions:

28. What policies or incentives (if any) should be offered to attract industrial load into declared REZ and how should load be integrated?
29. How should large loads connected within declared REZ be encouraged to be flexible to improve overall system outcomes and lower total system cost?
30. Should the Queensland Government establish economic precincts that provide special access to energy provided by declared REZ?
31. What are the current barriers for large energy users to access renewable energy?

5.0 Alternative models and related reforms

5.1 Energy Security Board

Interim REZ Framework

In October 2021, National Cabinet endorsed the Energy National Cabinet Reform Committee's proposal to adopt the Interim Framework for Renewable Energy Zones (REZ), as recommended by the ESB. This principles-based framework provides an overarching approach to the state-based development of REZ that remains compatible with the efficient development of the power system as a whole. In particular, it supports a nationally consistent framework to promote adoption of, encourage participation in, and improve connections to REZ.

The proposed QREZ model has sought to incorporate stakeholder feedback on the ESB's earlier REZ proposals, noting in particular stakeholder preferences for the relative simplicity offered by a physical access model, as compared to the financial access model.

Post-2025 transmission reform

The ESB's Post-2025 Market Design project considered what should change in the NEM to maintain system security and reliability as the amount of renewable energy in the system increases. This included potential transmission and access reforms that may replace the interim REZ Framework over the longer term.

In October 2021, National Cabinet endorsed Energy Ministers' proposal to support further design work to develop a congestion management model (CMM) to complement REZ as a tool for managing transmission and access.

Under the CMM arrangements proposed in the ESB's Final Recommendations to Energy Ministers, generators would face a congestion charge based on their impact on congestion at the time. Eligible generators would also receive a congestion rebate funded from revenue collected from the congestion charges, where "eligible generators" includes both incumbent and new generators that locate in accordance with the planning framework (such as in a REZ).

Further development of the CMM is continuing in conjunction with jurisdictions.

5.2 National Electricity Market reforms

Connection to dedicated connection assets (DCA)

Recently finalised Rule changes established a new regime for 'designated network assets' (DNA) to replace the existing concept of large dedicated connection assets (DCA) to enable sharing of connection assets by generators.

The new framework enables multiple generators to share connection assets while utilising individual metering, settlement, loss factor calculations, and system strength and performance standards. Additionally, DNAs will not be subject to the open access regime of the shared network, enabling protections for asset investors and connecting parties. Considered as part of the transmission network, TNSPs will be responsible for operation, maintenance and the setting of functional specifications, while open to contestable design, construction and operation.

While this Rule change may be utilised in a number of REZ applications, limitations have been identified. The limited applicability of the DNA framework to 'radial' infrastructure, for example, prevents its use across a number of identified prospective REZ locations where looped or meshed developments would be more appropriate.

System strength service provision

Though the planning processes, AEMO and the system strength service providers (Powerlink in Queensland's case) will together identify the key locations for when system strength will need to be provided to meet requirements at the investment time horizon. AEMO will declare these locations to be system strength nodes.

Powerlink will play a key planning role in both QREZ and system strength service planning. This should allow for cost-effective and streamlined solutions to be identified and implemented that support both QREZ and system strength outcomes.

5.3 Other jurisdictions

NSW and Victoria have each committed to the development of REZ, with both jurisdictions applying their own framework for REZ development. Both jurisdictions are in the process of establishing government-controlled bodies to lead the planning and delivery of their REZ. Table 2 provides a high-level comparison of the REZ models currently proposed in each jurisdiction.

Table 2 – Comparison of REZ models across jurisdictions

	Queensland	New South Wales	Victoria
REZ announced	Three QREZ regions in Northern, Central and Southern Queensland.	Five REZ with Central-West Orana first to be developed.	Six REZ as identified in the AEMO ISP
Planning	Proposed to be designated planning body (potentially Powerlink Queensland)	Newly established Energy Corporation of NSW	Newly established VicGrid
Declaration	Proposed to be Minister declared REZ	Minister declared REZ	AEMO ISP identified
Specification	Proposed to be outlined in REZ Management Plan	Determined by Energy Corporation NSW	Planning coordinated by VicGrid – further details to be determined
Connections	Connection to REZ assets as set out under the RMP (not open access)	Enabled through Energy Corporation NSW (not open access)	To be determined
Access schemes	Proposed to be physical access rights using a hosting capacity limit	Financial access rights (time-weighted)	To be determined
Funding	Support from QREZ \$145M funding and \$2 billion Renewable Energy and Hydrogen Jobs Fund, otherwise projects to be delivered commercially	Bespoke transmission efficiency test (in development) and Long Term Energy Services Agreements (LTESA)	Supported by recently established REZ Fund

5.4 Other access schemes

A wide range of access schemes have been investigated in the public domain by both NSW and the ESB. The merits of a physical versus financial access model have been the primary focus, with significant feedback already provided by energy stakeholders through various forums.

The QREZ model has built from this feedback to determine the preferred approach, whereby stakeholders expressed support for a physical access framework.

In addition, physical access arrangements, such as through hosting capacity limits, are relatively simple, would easily integrate with any future transmission reform as part of the post-2025 market design reforms, and require minimal administrative burden.

6.0 Have your say

The Queensland Government will incorporate stakeholder feedback on this Technical Discussion Paper into the next stages of development of the QREZ model and implementation arrangements.

6.1 Summary of consultation questions

A fit-for-purpose model for Queensland

1. Do you support the development of REZ in Queensland? Why or why not?
2. Should Queensland adopt elements of the REZ frameworks from other jurisdictions? Please provide details.

Attributes of the QREZ model

3. Do you agree with the desired attributes and outcomes? What, if any, additional attributes should be considered?

Planning

4. Do you agree with this approach to planning declared REZ within the broader QREZ regions? Why or why not?
5. Should Powerlink be the designated planning body to undertake analysis regarding development of declared REZ? Why or why not?
6. If a separate entity were to be appointed the designated planning body, is a new or existing entity more appropriate?
7. How should the distribution network be considered in the QREZ model?

Notice

8. Do you agree with this approach to community and market notice? Why or why not?
9. Should the REZ notice be issued by the Queensland Energy Minister or the designated planning body?
10. What is an adequate length of time for the market and community notice period and how far in advance of REZ declaration should this be conducted?
11. What level of information should be published in the notice?
12. Are there benefits to aligning QREZ terminology with other jurisdictions? For example, the notice period is similar in intent to the NSW draft REZ declaration stage.

Declaration

13. Do you agree with the approach for declaration of REZ within the broader QREZ regions? Why or why not?
14. Should the REZ Management Plan published at the time of declaration be a final version based on engagement through the notice period or should this be a draft?
15. Should declaration of a REZ include a bespoke planning framework within the declared area? What would be the advantage of this?

Specification

16. Do you agree with the approach for developing the specifications for the declared REZ? Why or why not?
17. Should the REZ Management Plan take effect from declaration of the REZ or should there be two-stage draft and final process?
18. What level of information should be included in the REZ Management Plan?
19. Should the designated planning body be responsible for developing and administering the REZ Management Plan?
20. What are the advantages or disadvantages of creating a new asset category for REZ?

Connections and access

21. Do you agree with the approach to connections and access? Why or why not?
22. Does the proposed QREZ model offer sufficient benefits to connecting generators to encourage participation? If not, what additional benefits could the QREZ model provide?
23. Are there any circumstances where projects connecting outside declared REZ that materially impact the efficient development of the REZ should be restricted?

Funding of REZ assets

24. Do you agree with the approach for funding REZ assets? Why or why not?
25. Should the Queensland Government consider an alternate test for efficient REZ investment similar to NSW?
26. Should the access fee for generators also support community and employment outcomes (similar to NSW model)? Why or why not?

Ongoing management

27. What could the Queensland Government do to improve or streamline project development, and at which stages of project development would this be most helpful?

Supporting competitive industries

28. What policies or incentives (if any) should be offered to attract industrial load into declared REZ and how should load be integrated?
29. How should large loads connected within declared REZ be encouraged to be flexible to improve overall system outcomes and lower total system cost?
30. Should the Queensland Government establish economic precincts that provide special access to energy provided by declared REZ?
31. What are the current barriers for large energy users to access renewable energy?

6.2 Contact us

Engagement and consultation will occur throughout development and implementation of the QREZ model with engagement updates to be published on the Department of Energy and Public Works website.

The Queensland Government welcomes input from Queensland communities, industry, and other interested parties to help us improve QREZ delivery and refine the proposals outlined in this discussion paper.

Visit our website to find out more about QREZ including timing and location of any consultation activities:

www.qld.gov.au/renewable-energy-zones

For enquiries, please email QREZ@epw.qld.gov.au

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