



1.0 General Information

1.1 Title of the Action

The title of the action is the Chalumbin Wind Farm.

1.2 The Proponent

The proponent for the Chalumbin Wind Farm (hereafter referred to as the Project) is Chalumbin Wind Farm Pty Ltd (CWF), a fully owned subsidiary of Ark Energy Projects Pty Ltd (Ark Energy). The proponent's details are provided in **Table 1-1**.

Ark Energy is a leading Australian renewable energy company with a focus on the development of utility scale wind and solar projects across Australia. Ark Energy (as Epuron) has been developing renewable energy projects since 2003, with the successful permitting of over 4,000 MW of wind farm projects and over 400 MW of solar farm projects.

Table 1-1 Proponent Details

PROPONENT DETAILS	
Proponent Name	Chalumbin Wind Farm Pty Ltd (CWF)
Proponent Contact	Anthony Russo, General Manager – Development, Qld
Proponent Postal Address	Level 25, 239 George Street, Brisbane QLD 4000

1.3 Objectives of the Action

The objective of the proposed action is to develop a renewable energy generation facility of approximately 602 MW nameplate generation capacity within the Northern Queensland Renewable Energy Zone in order to facilitate the generation and consumption of renewable electricity within Queensland and the National Electricity Market in an efficient manner.

To achieve this, CWF proposes the form of the Project as a wind farm that consists of up to 86 wind turbine generators (WTGs) and associated infrastructure. The Project is proposed to have a maximum nameplate wind farm generation capacity of 602 MW (depending on final turbine specification). The Project will generate around 1,985 GWh of renewable electricity per year, which is equivalent to supplying power to around 320,000 Queensland homes. The Project will connect to the existing 275 kV Chalumbin to Woree transmission line, which is part of the Powerlink network in the central north of the Project area.

Key elements of the Project include:

- WTGs and associated foundations and hardstands;
- Substations and potential battery energy storage system (BESS);
- Medium-voltage (≤ 66 kV) overhead and underground powerlines and communication cables;
- High voltage (≤ 275 kV) overhead powerline;
- Permanent meteorological monitoring masts;



- Unsealed access tracks;
- Permanent site entrance;
- Fencing;
- Temporary construction compound/laydown and stockpile areas including temporary site offices, workshops, warehouses and amenities;
- Operations and maintenance facilities;
- Grid support equipment such synchronous condensers or reactive plant at the Project substation; and
- Temporary concrete batching plants.

The Project may be developed in two discrete stages, delineated according to the “Wooroora” (Stage 1) and “Glen Gordon” (Stage 2) properties.

A detailed Project description is provided in **Section 2.0**.

1.4 Location of the Action





The Project is located across two properties (Wooroora and Glen Gordon) approximately 15 km southwest of Ravenshoe in Queensland, within the Tablelands Regional Council Local Government Area. The Project includes some modification works within the road reserve of Wooroora Road to facilitate access to the Project area. A secondary, alternative access is currently being investigated for site access through Innot Hot Springs. The viability of this access option will largely depend on engineering studies currently underway associated with the structural integrity of the bridge crossing of the Herbert River. Glen Gordon Station (31SP288862) is a freehold property and Wooroora Station (1CWL3298) is a leasehold property. Both properties are primarily used for grazing and there are several easements intersecting them associated with roads and high-voltage electrical infrastructure.

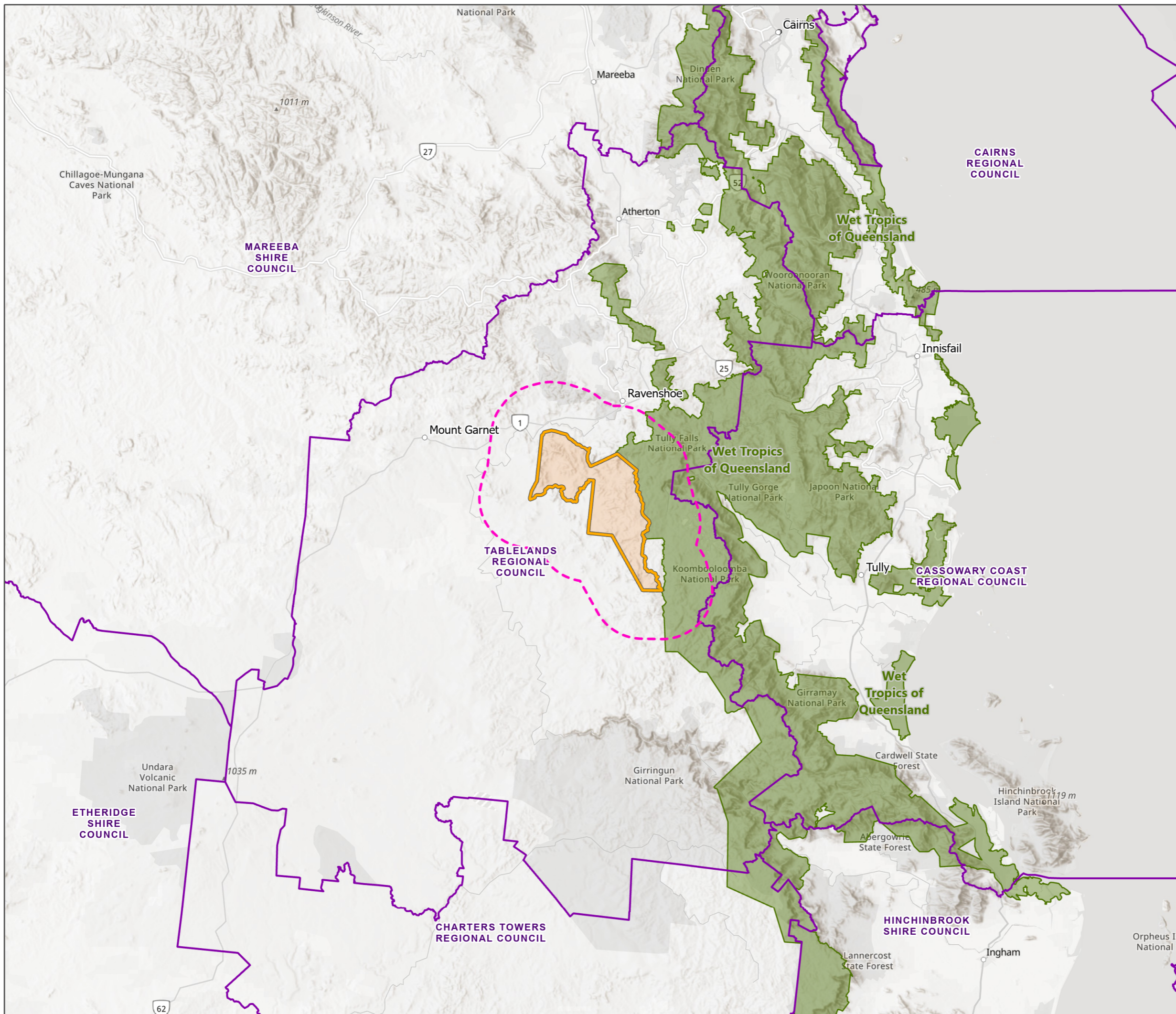
The Wet Tropics of Queensland World Heritage Area (WTQWHA) is located adjacent to the eastern side of Project. All Project disturbance is located outside the WTQWHA with a buffer of 600 m to the nearest proposed infrastructure. The boundary of WTQWHA demarcates an ecotone from rainforest (within the WTQWHA) to an open woodland (outside the WTQWHA within the Project boundary) with the Project located between vegetation bioregions referred to as the Einasleigh Uplands (to the west) and the Wet Tropics (to the east). Surrounding properties are used for grazing and conservation purposes, with National Parks and Timber Reserve abutting the northern and eastern boundaries of Wooroora Station.

The Project location is illustrated in **Figure 1-1**.

Chalumbin Wind Farm
Project Location

Figure 1.1

-  Project Area
-  Study Area (10km Buffer)
-  WTQ Boundary
-  Local Government Area



Date: 19/09/2022 Author: TOD
Project: EPU-004 Reviewed: NOD



Scale: 1:750,000@A3

Data Source(s):
Local Government Area - Department of Resources (2022)
Department of Resources, Dept. of Environment and Science,
Esri, HERE, Garmin, Foursquare, FAO, METI/NASA, USGS, © State
of Queensland (Department of Resources) 2022, Esri, CGIAR



1.5 Background to the Development of the Action

On a macro-scale, there is a general trend towards the decarbonisation of the Queensland, Australian and global economies. This is primarily through the universal acceptance of human-induced climate change and the threat it poses to humanity and ecosystems, and notably, a key threatening process to the Outstanding Universal Values (OUVs) of the WTQWHA. The Paris Climate Accord and the Glasgow Climate Pact are evidence of the current urgency to address the climate change challenge. The impetus behind decarbonisation has increased the demand for renewable energy developments such as this Project. This decarbonisation trend is further accelerated through the bringing forward of closure dates for the existing coal fired power stations throughout Australia; this is largely due to poor economics for aging coal fired generators within the National Electricity Market (NEM), combined with high maintenance costs and increased risk of technical failure. Whilst Queensland has the youngest fleet of coal fired generators in Australia, planned closure dates in the 2040s are anticipated to be brought forward due to an overwhelming push for renewable energy generation throughout the NEM under the Australian Electricity Market Operator (AEMO) “step change” scenario (AEMO 2021a). This is exemplified through recent statements regarding the likely 2025 closure of Australia’s largest coal-fired power station (Eraring), seven years earlier than planned (ABC 2022). Through the displacement of more expensive black coal-fired electricity generation, the Project and other renewable energy projects, will contribute to a reduction in prices for electricity in the NEM over the long term. Queensland’s electricity prices have been trending above those of other Australian states where renewable energy penetration in the market is higher (AEMO 2022).

The anticipated growth of renewable energy in Australia is shown in **Plate 1-1** and **Plate 1-2**, extracted from the AEMO Draft Integrated System Plan.

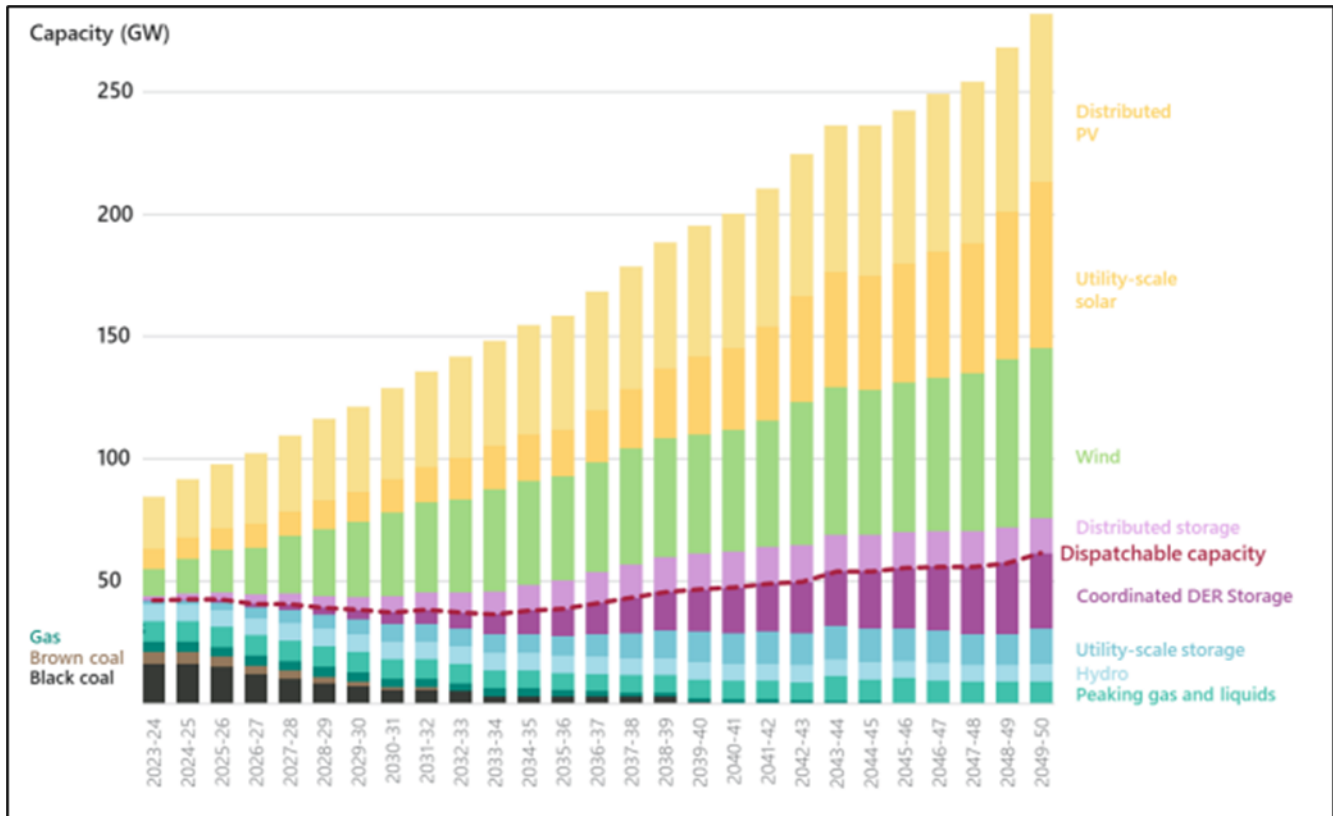


Plate 1-1 Forecast NEM capacity to 2050 under AEMO’s “step change” scenario (AEMO 2021a)

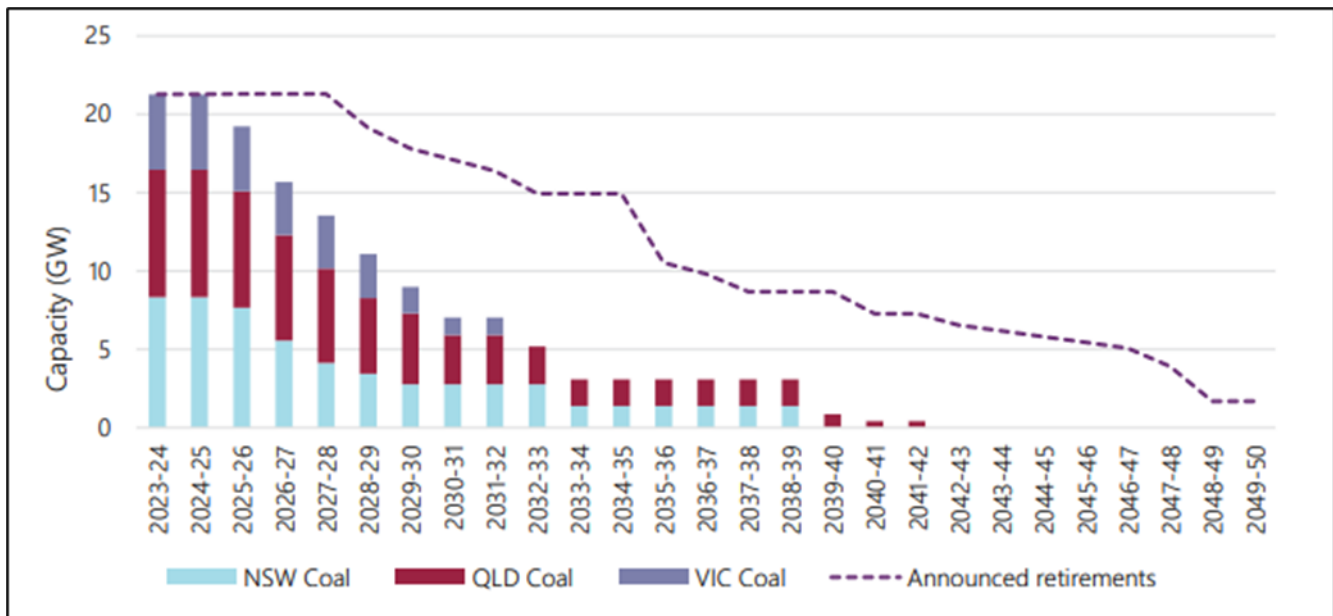


Plate 1-2 Forecast coal retirements under AEMO’s “step change” scenario (AEMO 2021a)

In recent years there has been a renewable energy boom in Queensland, with around \$10 billion of investment in mostly regional areas. In 2015 there was only one operational wind farm project in Queensland over 5 MW in size. Since then, 44 large-scale renewable energy projects have become operational, with the majority of these being solar farms. With the relative ubiquity of solar power in Queensland heavily influencing the price of electricity in the national electricity market (NEM), wind farm developments in Queensland are becoming highly sought after due to their different generation profile (generally improving after the sun sets in the evening) and the undeniable driver of



governments and socially responsible investors seeking renewable energy sources. Furthermore, these renewable energy projects play a notable role in helping Australia work towards meeting international agreements including the Paris Climate Accord and the Glasgow Climate Pact to help achieve reductions in future greenhouse gas emissions and to lessen the impact of climate change, mitigating a key threatening process to the OUV of the WTQWHA.

The 44 operational renewable projects in Queensland represent over 5 GW of clean energy capacity and 12.6 million tonnes of avoided carbon emissions each year. Driven by this investment, Queensland reached 20% renewable energy supply for the first time at the end of 2020, which is a key milestone on the path to reaching the Queensland Government's target of 50% renewable energy by 2030 (DEPW 2021) with ongoing growth in electricity demand fuelled by electric vehicles.

In order to support and promote the ongoing development of the renewable energy industry in the State, the Queensland Government and the Australian Electricity Market Operator (AEMO) have identified the northern, central and southern Queensland Renewable Energy Zones (QREZ). These are areas of the Queensland electricity network that will be developed in a coordinated way to support new and existing industries, complement local communities and deliver a diverse mix of cleaner, cheaper and reliable energy generation. The three QREZs were identified based on a range of criteria including quality of the solar and wind resources, suitability of terrain for renewable project development and proximity to transmission infrastructure (DEPW 2021).

The Project is located within the Northern QREZ, which is considered to have some of the best untapped wind resource in the country. The Project site is suitable for a wind farm on the basis of the wind resource (confirmed from wind monitoring) and access to an existing high voltage transmission line. The first stages of investment in the Northern QREZ were announced in May 2021, with the Queensland Government committing \$40 million for network upgrades that will unlock additional renewable energy capacity in Far North Queensland (DEPW 2021). It should be noted that the proposed action does not rely on investment into the grid infrastructure by any other party; the proposed action is designed such that it is a viable project in its own right. The Queensland Government also recently released the Queensland Energy and Jobs Plan (QG 2022), which increases the State's renewable energy targets to 70% by 2032 and 80% by 2035, foreshadowing even further upgrades and investment in network and system upgrades to facilitate this transition.

REZs are spatially defined areas possessing high-quality renewable resources, suitable topography, available land and existing or potential transmission infrastructure to support the coordinated connection of renewable energy projects to the national electricity grid (PQ 2022). The Northern QREZ is a large area that extends from Mackay to Cairns and inland to incorporate Hughenden, Julia Creek and Normanton (see **Plate 1-3**). The Queensland Government has committed to upgrading transmission within the Northern QREZ to more efficiently utilise the high-quality renewable energy resources within the REZ. The Kaban Green Power Hub is currently under construction and is approximately 12 km from the Project area (see **Plate 1-4**).

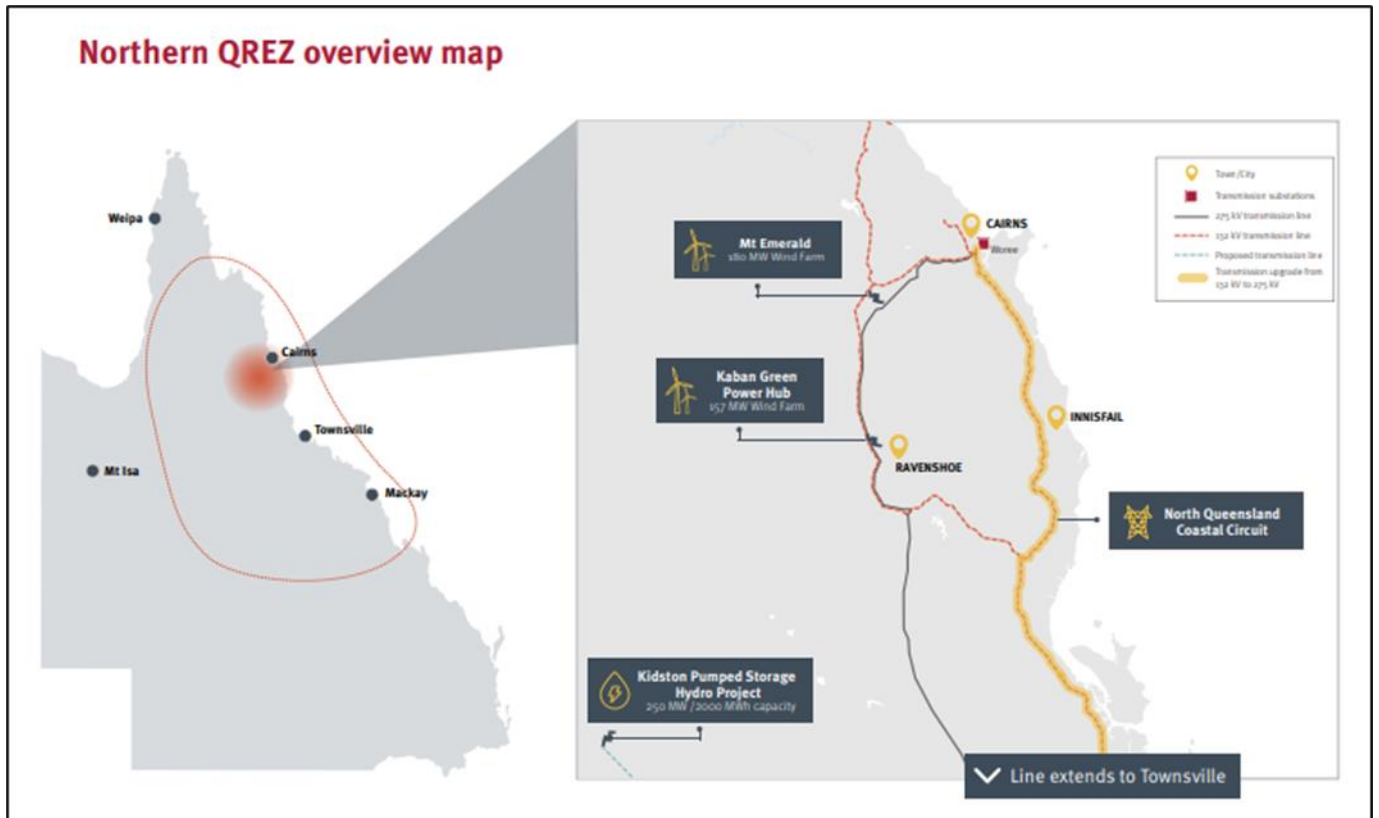


Plate 1-3 The Northern QREZ (Qld Gov, n.d.)



Plate 1-4 The Northern QREZ and Transmission Upgrades (PQ n.d.)

1.6 Related Actions

Other renewable energy projects are currently proposed or underway within the Northern QREZ; however, these other actions are not related in any way to the Project. The Northern QREZ infrastructure augmentations identified in **Section 1.5** are considered to be broadly related to the Project. There are no other related actions that are relevant to the Project.

1.7 Current Status

Attexo Group Pty Ltd (Attexo) has been engaged by CWF to provide planning and approvals support for the Project, including environmental impact assessment. The Project was referred to the then Department of Agriculture, Water and the Environment (DAWE) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 8 July 2021 (EPBC 2021/8983)³. On 10 August 2021 a delegate of the Minister for Agriculture, Water and the Environment determined the Project was a controlled action due to the likely significant impacts on the following Matters of National Environmental Significance (MNES):

³ The EPBC Act Referral contemplated up to 95 WTGs as part of the Project. Following Project refinement – as described further in this PER – CWF proposed to vary the Action in accordance with section 156 of the EPBC Act (to include up to 86 WTGs) and this variation to the Action was accepted on 18 February 2023 by DCCEEW.



- World Heritage property;
- National Heritage place;
- Listed threatened species and communities; and
- Listed migratory species.

The delegate of the Minister also determined the assessment approach to be by Public Environment Report (PER). Draft Guidelines for the PER were developed by DAWE and issued for public comment on 6 October 2021. Final Guidelines were issued by DAWE on 29 November 2021 and are provided in **Appendix A**.

This PER contains information about the Project and its relevant impacts in accordance with the PER Guidelines, enabling stakeholders and the Minister to understand the environmental consequences of the Project relevant to the above MNES. The Draft PER was published online and copies made available for public comment from 7 November 2022 to 9 January 2023. The public comments received during this process were considered by CWF and a Response to Submissions on Draft PER report is provided in **Appendix U**, which provides responses to the issues raised within the public comments. Some updates were also made to the PER based on the comments received. This Final PER is now provided to DCCEEW for decision.

Assessment of the Project by PER under the EPBC Act is separate from the State assessment process that is now complete under Queensland State Code 23: Wind Farm Development and State Code 16: Native Vegetation Clearing.

Subject to timely approvals and commercial agreements, construction of the Project is expected to commence in H2 2023 or H1 2024. The construction phase is expected to last for a period of 24-30 months.

1.8 Consequences of Not Proceeding with the Action

The Project will be an important part of the future energy generation portfolio within Queensland, helping the state to achieve its renewable energy target of 70 % by 2032. If the Project were to not proceed, it would be a considerable setback to the achievement of this target. The proposed action is located in an area of significant wind resource, close to existing fixed infrastructure (high voltage transmission line) and represents an efficient land use solution for renewable energy generation. A replacement project would likely require greater land area as it would need to utilise a less optimal wind resource and may require additional high voltage transmission lines. Economic wind resources in Queensland typically correlate with steep topography along the Great Dividing Range which were not historically cleared for farming (due to the steep land) and are now extensively used for grazing within the open woodlands. Any alternative project is therefore unlikely to avoid clearing of vegetation.

Feasible alternatives to the Project are discussed in **Section 3.0**, with discussion including a “no action” alternative, alternative location in the Northern QREZ, alternative configuration at Chalumbin (one higher intensity alternative and one lower intensity alternative) and a fossil fuel alternative.

Ultimately, this Project represents an efficient use of the wind resource and the consequences for not proceeding with the action will likely lead to a less efficient project in another part of the Northern QREZ with greater amounts of vegetation clearing on a per-MW basis.

1.9 Consultation

CWF recognises the importance of effective, comprehensive and meaningful consultation for the successful delivery of the Project and the realisation of positive outcomes. Community and stakeholder consultation has been, and will continue to be, undertaken in accordance with best practice.



Detail including identification of affected parties, consultation undertaken to date and proposed future consultation is provided in **Section 11.0**.

1.10 Structure of this PER

The PER is structured in accordance with Schedule 4 of the *Environment Protection and Biodiversity Conservation Regulations 2000*, as follows:

- **Section 2.0** describes the Project, including precise locations of proposed infrastructure, planned timing and the activities to be undertaken during each stage (construction, operation and decommissioning);
- **Section 3.0** discusses the feasible alternatives to the Project, within the context of the potential impacts of each alternative on the MNES that are controlling provisions for the Project;
- **Section 4.0** provides a detailed description of the existing environmental values within the Project area, including desktop and field studies undertaken to determine the likely presence and/or habitat characteristics for each of the relevant MNES;
- **Section 5.0** provides an assessment of potential environmental impacts associated with the Project before the implementation of mitigation and management measures;
- **Section 6.0** describes the proposed safeguards and mitigation measures that will be implemented to avoid, minimise or mitigate the Project's environmental impacts;
- **Section 7.0** describes the rehabilitation requirements for areas of temporary disturbance during construction, including the proposed procedures, monitoring and acceptance criteria for habitat restoration;
- **Section 8.0** assesses the significance of residual impacts on the relevant MNES, after mitigation and rehabilitation measures have been implemented;
- **Section 9.0** describes the Project's proposed environmental offset program;
- **Section 10.0** lists the other approvals and conditions relevant to the Project;
- **Section 11.0** describes the engagement and consultation that has taken place regarding the Project;
- **Section 12.0** describes the environmental record of the proponent;
- **Section 13.0** provides further information on economic and social matters;
- **Section 14.0** provides an overall conclusion on the findings of this PER; and
- **Section 15.0** lists the references used in developing this PER.

A number of plans are prepared in support of the Project's environmental management framework; these have been prepared for both State and Commonwealth approval processes. These plans are generally preliminary in nature owing to the preliminary design of the Project; however, they provide important principles for the management of potential impacts during future design, construction and operational phases of the Project. These plans are the foundations upon which the more detailed plans will be based. They include:

- Preliminary Fauna Management Plan – **Appendix D**;
- Preliminary Vegetation Management Plan – **Appendix E**;
- Preliminary Weed and Pest Management Plan – **Appendix F**;



- Preliminary Bird and Bat Management Plan – **Appendix G**;
- Environmental Management Plan Outline – **Appendix H**;
- Preliminary Construction Management Plan and Preliminary Erosion and Sediment Control Plan – **Appendix I**;
- Sediment and Erosion Management Plan – **Appendix J**;
- Preliminary Rehabilitation Plan – **Appendix K**; and
- Offset Management Strategy – **Appendix O**.

A “document map” is provided in **Plate 1-5** to demonstrate the interrelated nature of the various plans provided in this PER.

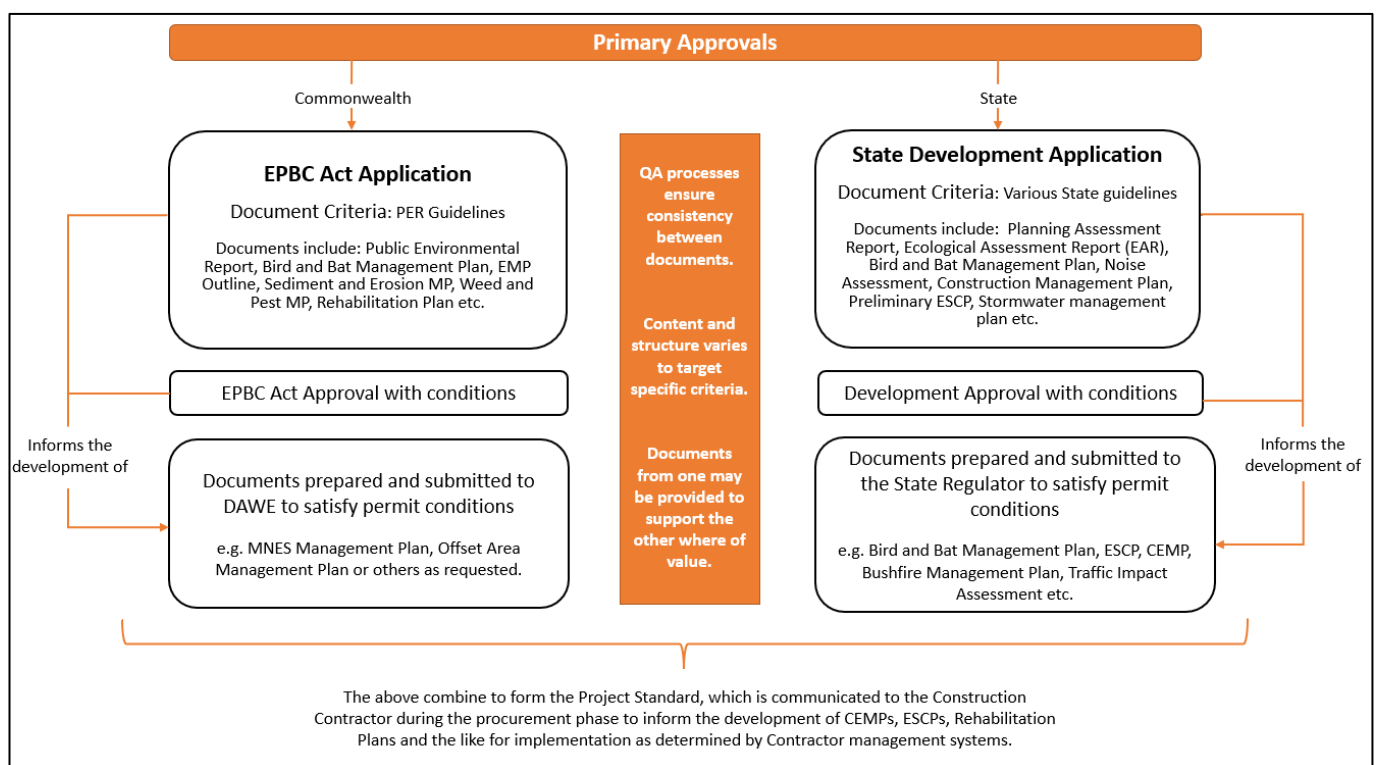


Plate 1-5: Document Map Showing Interrelatedness of Management Plans