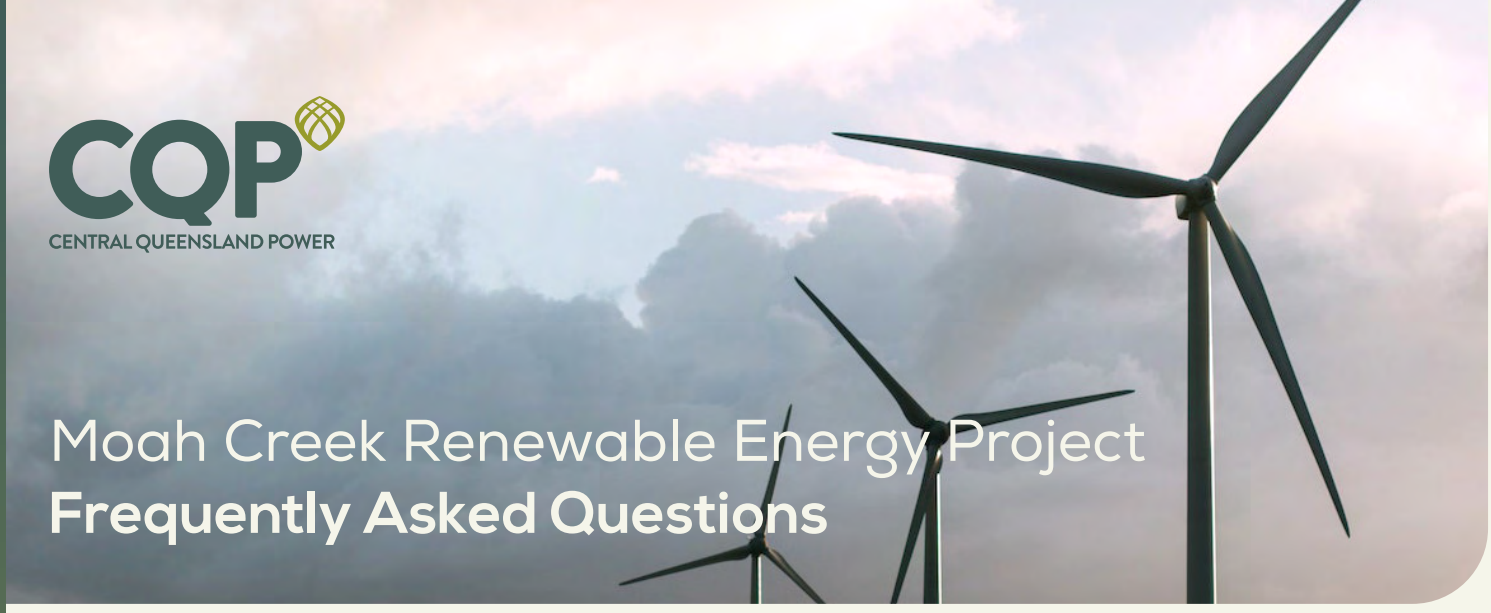


CENTRAL QUEENSLAND POWER

Moah Creek Renewable Energy Project
Frequently Asked Questions

In response to the feedback that we have already received about our project we have prepared some Frequently Answered Questions. This document is dynamic and will evolve as we continue our engagement with the Darumbal People and all the stakeholders to the Project.

Q: WHY HAVE WE SELECTED THIS SITE FOR THE WIND FARM?

CQP undertakes a rigorous assessment process for a site that considers key factors including the quality of the renewable energy resource (wind or solar), proximity to transmission lines and existing infrastructure (such as roads) and the impact on the environment and local communities.

All energy, resources and infrastructure projects have impacts - there is no such thing as a major energy generation facility that has no impacts.

The Moah Creek Wind Farm will require limited clearing of vegetation. The impact on the ecosystem has been minimised through the design stages of the project - we have halved the project area in consideration of the ecological value of the region. The design also includes corridors of connectivity which will remain uncleared.

Our analysis indicates there are 72 dwellings within a 5km radius of a wind turbine. This is on the basis of 1 dwelling per property so the total number will be slightly higher as some landowners will have more than one dwelling on the land – we will assume 80. According to the Australian Bureau of Statistics Census in 2021, the Rockhampton Region's average number of people per household is 2.5, so we have estimated there are around 200 people living within a 5km radius.

Q: WHAT IS OUR APPROACH TO ENGAGEMENT WITH VARIOUS GROUPS, INCLUDING TRADITIONAL CUSTODIANS ?

The Darumbal people are the Traditional Custodians for the Project with deep and continual connection to land, sea, sky, waterways and community. Listening to and learning from them is a cornerstone to our development process. We have been working with them since the early stages of the project to explore opportunities for genuine partnerships and long-term benefits, ensure we fully understand their relationship to and use of the land, and minimise any impact on the cultural and heritage importance of our proposed site. We are also negotiating an Indigenous Land Use Agreement with the Darumbal people.

The Project continues to undertake extensive consultation with a wide range of relevant stakeholders and will do so in an open, authentic and informative way in line with our Partnership and Engagement Strategy and our detailed engagement program. Our third round of advertised information sessions in April 2023 are another opportunity for the community, the Council and all stakeholders to ask questions, provide us with their feedback and explore issues. Our website and newsletters provide links and information about the project and the planning approvals process.

Q: WHAT ARE THE ECOLOGICAL IMPACTS OF THE PROJECT?

The ecological impacts of the Project are described in the development application documents, particularly the Terrestrial Flora Assessment, Terrestrial Fauna Assessment, Bird and Bat Utilisation Assessment, and the Planning Report. Section 3.0 of our Planning Report describes the iterative process that the design development went through to arrive at the preferred layout, including the removal of a northern cluster of turbines based on cost and ecological factors. This revision was informed by a number of technical assessments to balance ecological impacts with the design of a commercially feasible wind farm and the impacts on the local community.

Q: WILL THE PROJECT IMPACT THE GREAT BARRIER REEF?

The Great Barrier Reef marine park and world heritage area are protected under the Environment Protection and Biodiversity Conservation Act 1999 (the EPBC Act) and the Project will be subject to assessment under this Act. The Project has developed a Conceptual Erosion and Sediment Control Plan (ESCP) to manage soil erosion and deposition into waterways. A more detailed ESCP will be prepared prior to construction to ensure the environment, including waterways flowing to the Great Barrier Reef, is protected from sedimentation and dirty water. In addition, areas disturbed by project works will be rehabilitated or stabilised to ensure that the long term water quality is not materially impacted by the Project.

Q: HAVE WE ASSESSED NOISE IMPACTS OF THE PROJECT?

Noise impacts associated with increased traffic movements and construction activities will likely be experienced during construction, as is the case with other large scale infrastructure projects. Management measures for these impacts will be agreed with affected residents and implemented during construction. Importantly, CQP will provide a dedicated local contact so that any issues or concerns can be reported and addressed efficiently.

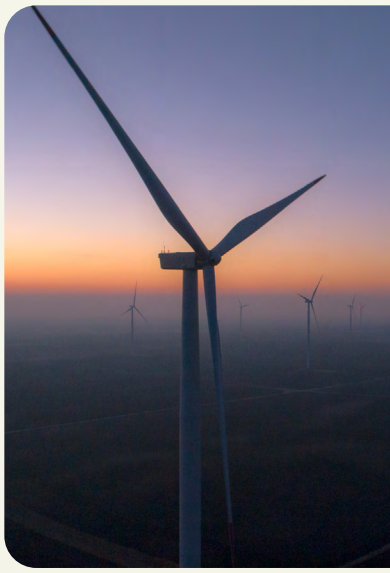
Once operational, modern wind turbines make limited noise due to the innovative designs and materials used for turbine construction. Noise levels can vary considerably depending on topography, humidity, location of the listener, wind speed and wind direction. The sound made by spinning wind turbine blades are often described as a "swoosh".

The noise from our project must comply with the criteria in State Code 23: Wind farm (State Code 23 or The Code). We have undertaken a detailed noise assessment to demonstrate that the project complies with the noise criteria included in the code. The threshold criterion is 35 db(A). For context, 30 dB(A) is equivalent to a whisper and 40 dB(A) is equivalent to a quiet library.

Q: WHAT IS WIND TURBINE SHADOW FLICKER AND HOW IS IT REGULATED?

When light shines on rotating turbine blades, intermittent shadows known as shadow flicker can be cast on surrounding areas. We undertook an assessment to understand the shadow flicker impacts of the Project in line with State Code 23. We used the suggested assessment methodology in the Code for determining potential shadow flicker impacts on sensitive land uses (referred locations where people reside who could be impacted by the project). These people are reared to as "sensitive receptors ".

The recommended modelling assumptions in the Code required us to calculate the "zone of influence of shadows" which is based on a distance of 265 m multiplied by the maximum blade chord. The Code states that no assessment is required for sensitive land uses beyond the zone of influence, as the likelihood there to be any shadow flicker impacts caused by the Project turbines is low. The maximum blade chord of our proposed turbine for the Project is 4.7 m creating a zone of influence of approximately 1,246 m. All identified sensitive receptors are more than 1,246 m from the proposed turbine locations. As a result, a detailed shadow flicker assessment has not been undertaken due to the limited risk and low likelihood for there to be any shadow flicker impacts from our proposed turbines.



Q: HAVE WE CONSIDERED THE CUMULATIVE IMPACT OF THE OTHER PROJECTS IN THE REGION?

The opportunity for new renewable energy generation to replace the existing coal-fired generators in the CQ region as they retire over the coming decade has been identified by the Queensland Government and supported through the establishment of the Central Queensland Renewable Energy Zone (Central QREZ). The Central QREZ region is proposed to host a number of wind farms as well as solar farms and large scale battery storage systems, with several projects currently in the development and planning phase. Currently there are two wind farms in construction – the Banana Range Wind Farm and the Clarke Creek Wind Farm and there are no wind farms in operation in the region.

The potential cumulative impact of planned developments in the area is a risk that will be considered by the Queensland regulator (SARA) and under the EPBC Act.

CQP are developing several wind, solar and storage projects in the Central QREZ and the potential cumulative impacts are taken into consideration in the siting and design of each project. We are working with local and regional conservation and advocacy groups to establish how we can collaborate in addressing cumulative impacts of renewable energy projects. Once we have our development approvals, we will also look to collaborate with other developers who have planning consent to consider how we can minimise impacts and deliver shared infrastructure and enduring outcomes across the Central QREZ .

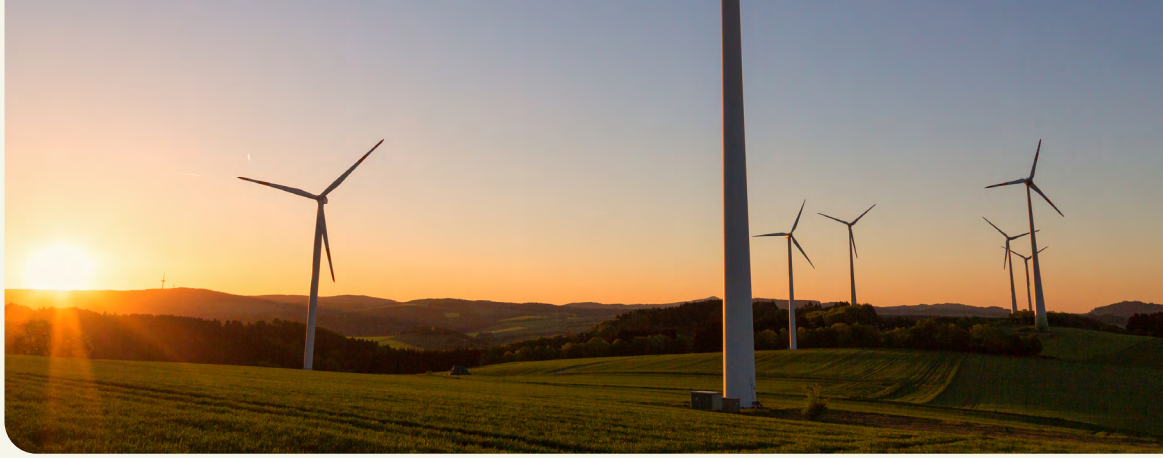
Q: WHAT ARE THE EXPECTED VISUAL IMPACTS OF THE PROPOSED WIND FARM?

The proposed turbines for the Moah Creek wind farm will have a maximum hub height (i.e. the hub that the blades are connected to) of up to 175 m and a maximum blade length of 100 m. This results in a maximum tip height of up to 275 m.

A Landscape and Visual Impact Assessment (LVIA) was undertaken by our consultant LatStudios (Lat 27) to determine the potential impacts to the scenic amenity and landscape values of the region from the proposed wind farm. There are few locations in which a wind farm will not be a new and distinctive element to the landscape. The LVIA identified that views of the Project will be experienced by a variety of receptors including local residents, rural workers and motorists and visitors travelling on various roads around this part of the CQ with Central Queensland.

The potential visual impact within 30 km of the Project was considered and the LVIA concluded that there would be no significant impact on the landscape character of the site or on any regionally or nationally important scenic viewpoints.

The assessment considered methods to reduce the visual impact - screening views of turbines up to 275m high is not possible or practical. The Project has been designed to minimise and mitigate the impacts on landscape character, scenic amenity and landscape values to the greatest extent possible, whilst acknowledging that viewpoints will alter.



Q: WILL THE PROJECT AFFECT LOCAL TOURISM?

The LVIA Study undertaken by Lat27 concluded that no regionally important scenic viewpoints would be significantly affected by the Project, but we acknowledge that distant views of the Project will be possible from some popular local destinations.

Some communities are concerned that turbine placement, visibility and noise could have a negative economic impact on the tourism industry in rural localities and spoil an untouched natural landscape. In 2021 Dr Barrie Shannon of the School of Humanities and Social Science at Newcastle University examined the global academic literature on the relationship between wind farm developments and the tourism industry in rural communities.

The review concluded that tourists are not deterred by the presence of wind turbines and wind farms, and in fact, are often drawn to them as points of interest. Opportunities for eco-tourism exist for communities in proximity to wind turbines, particularly if supporting infrastructure such as visitor centres, viewing platforms, hiking and bike trails and other amenities are incorporated.

Q: HOW WILL THE PROJECT IMPACT BIODIVERSITY?

The EPBC Act is the Australian Government's central piece of environmental legislation providing a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places, referred to as matters of national environmental significance. We will be referring the Project under the Act shortly.

We have undertaken numerous field ecological assessments, comprising 13 field surveys conducted between 2020 and 2022. Field surveys included baseline characterisation of values, bird and bat utilisation surveys and targeted assessments. The surveys complied with the EPBC Act's threatened species survey guidelines. The outcomes of the ecology field surveys were a key input into the project's layout and impact avoidance.

Approximately 40% of the Project footprint is located in previously cleared areas. The majority of proposed native vegetation clearing is located in areas mapped as 'least concern' vegetation communities. Vegetation communities known as concern and endangered represent 0.4% and 0.5% of the Project footprint respectively.

The Project is considered likely to result in "significant residual impacts" to protected wildlife habitat and connectivity areas, and the Endangered Cycas megacarpa, and environments offsets will be provided in accordance with the Environmental Offsets Act 2014. We will develop a Rehabilitation Management Plan to stabilise and revegetate areas of disturbance that are not required during the operational phase. Our Rehabilitation Management Plan will be publicly available on our website once it is finalised.

Q: DO WIND FARMS IMPACT SOIL SALINITY?

Soil salinity can be caused by a number of factors, including clearing of land, which is also known as dryland salinity. Clearing of deep-rooted and perennial vegetation can lead to changes to water table levels, which may increase soil salinity near the surface. Irrigation is another cause of salinity due to the repeated waterlogging of soils and subsequent evaporation leading to a concentration of salts in the upper soil profile. Due to the relatively narrow clearing corridors, the likelihood of soil salinity resulting from the project is expected to be lower than the broader areas cleared for cropping or similar activities. Soil testing will be completed as part of geotechnical investigations during detailed design. This testing will identify the need for any enhancement to ensure that the soils are appropriately stabilised during the life of the project.

Q: HOW WILL WE ASSES AND MANAGE THE RISK OF SOIL EROSION?

CQP has prepared a conceptual Erosion and Sediment Control Plan (ESCP) which was submitted with the development application. This document outlines the general principles of erosion and sediment control that will be employed on the site during construction to minimise the amount of soil loss and dirty water entering the waterways. A more detailed and site specific ESCP will be developed in conjunction with the comprehensive civil design for the Project. It will include a soil testing regime and detailed hydrological calculations to identify the appropriate soil amelioration approach and the sizing and location of physical structures such as check dams and sediment basins.

Erosion and sediment control is a critical consideration on any major construction project, particularly in Central Queensland where erosive soils and intense rainfall can cause significant pollution incidents. We will take into account the lessons learned from other wind farms in construction in Queensland and ensure that the controls applied are appropriate for the site.

Q: HOW MUCH WATER DOES THE PROJECT REQUIRE?

During construction, material amounts of water will be required for concrete batching, soil conditioning during access track construction, dust suppression, and for the construction workforce (i.e. potable water and sewage). It is estimated that approximately 2 megalitres of water will be required per wind turbine for the construction period, based on the water usage for other wind projects constructed in Queensland (so 120 megalitres in total for a wind farm of 60 wind turbines). To put this in context, the Stanwell coal-fired power station has a water licence which entitles it to use up to 24,000 megalitres of water per annum.

A water sourcing strategy is included in the project budget and will be finalised during detailed design. The sourcing strategy may include groundwater, water collected in sediment basins, surface water in watercourses, or offsite sources. The relevant licences, permits and landholder agreements will be obtained for the preferred water sources prior to the commencement of construction. During operation, the water requirements will be minimal and significantly less than during construction. Typically the water used on an operational wind farm consists of drinking water, water for amenities and weed control activities.

Q: HOW WILL WE MANAGE SITE TRAFFIC FOR THE PROJECT?

A conceptual Traffic Impact Assessment was completed for the development application and this assessment will be updated as further detail of the projects and our traffic requirements are developed.

Wind farm construction does generates traffic when materials, machinery and turbines are being delivered to site. It is expected that a peak construction workforce of approximately 300 will travel to site on a daily basis. We will liaise with the local community to identify appropriate measures to best manage the impact of the increase in light vehicle movements to the site.

During the construction phase, impacts such as noise, dust and increased road safety risk will be managed through the implementation of site and activity specific management plans. Additionally, we will maintain a local presence and provide a point of contact who will be responsible for responding to issues and maintaining communication with residents effected by the increased traffic movements. We will be establishing a Community Consultative Committee once we have development approval, and one of the key functions of this committee is to raise and respond to issues like the frequency, timing & impact of traffic movements – one example is to avoid coinciding with the school bus route.

Q: WILL THERE BE ROAD UPGRADES?

The size of the vehicles and loads for this project will require upgrades to each of Kalapa Black Mountain Road, Native Cat Road, Rosewood-Wycarbah Road and Toowarra Road. These upgrades will be designed following consultation with Rockhampton Regional Council.

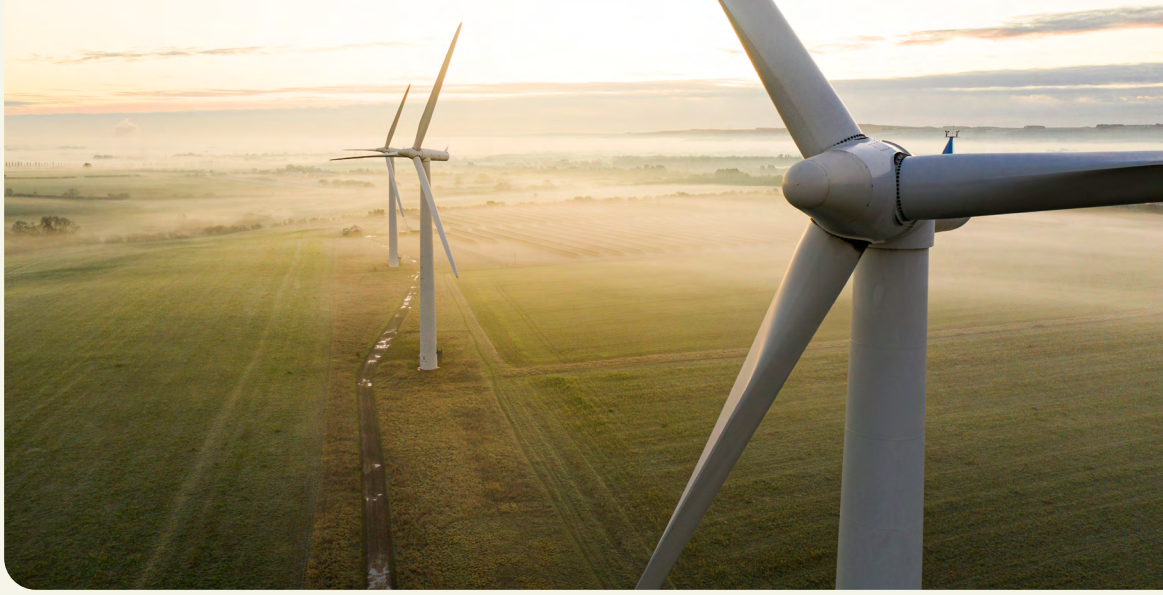
CQP will coordinate and fund local road upgrades required to safely transport the turbine components and plant to site. This will entail a detailed study to identify vehicle routes and swept paths that will inform the design for these upgrades. It is likely that CQP will enter into infrastructure agreements with Rockhampton Regional Council and Gladstone Regional Council to provide the necessary road upgrades required to construct the Project, and to ensure that the road conditions are equal to or better than the conditions prior to construction.

Q: HOW IS DUST MANAGED DURING CONSTRUCTION?

Increased dust generation is expected during the construction phase and will be associated with both the traffic movements on the local road network and major earthworks activities. Together with our contractors we will conduct the works in accordance with the Construction Environmental Management Plan to be developed for the works. It is expected that the main management measures for addressing potential dust impacts will be through the use of water carts to spray road and track surfaces. In extreme circumstances such as during high winds and dry weather, we may stop certain dust generating activities until such time as the worst conditions have passed. Dust deposition gauges will also be set up at several locations around the site to determine if construction is causing an increase in dust. Results will be reported on the project website on a monthly basis.

We understand that several residents rely on tank water for their main water supply. CQP will monitor water quality at individual properties where it is suspected that dust impacts may occur. If water quality is impacted, CQP will provide appropriate reparations to residents including temporary deliveries of clean water where required.

CQP
CENTRAL QUEENSLAND POWER



Q: WHAT MEASURES ARE TAKEN FOR BUSH FIRE RISK?

All wind farms in Australia are required to have a plan in place to deal with bush fires. A site-specific bushfire hazard assessment and a detailed Bushfire Management Plan (BMP) were prepared as part of our development application and will be a condition of planning approval. This assessment confirmed that the Project has a combination of medium, high and very high potential bushfire intensity areas. It identifies the bushfire hazard and fire ignition risks and sets out a range of mitigation measures that must be implemented during the construction and operation of the Project. The BMP establishes procedures in the event of a fire moving through a wind farm and requires that during construction, we will ensure that firefighting equipment is available on site.

The BMP requires the construction contractor and the operations and maintenance contractor to hold annual bushfire preparedness meetings with the local Queensland Fire & Emergency Services personnel, the local Rural Fire Brigades (RFB) and the landowners who are hosting the wind farm. These meetings are critical for familiarising those attending with the Project's infrastructure, access tracks, dedicated fire-fighter water storage tank and fittings, communication procedures and safety requirements for operating within the site. Importantly, it will include a bushfire response training drill as the RFB are volunteers and are unlikely to have previously had any training or experience operating around electrical infrastructure (such as the substation and switching yard). Opportunities to upgrade dams and access tracks will also be discussed.

CQP recognises the importance and value of the local knowledge held by the local rural fire brigade and acknowledge that that they are voluntary primary producer brigades with limited resources to respond to a fire ignition within our site. We are committed to partnering with the RFBs in the continued development of an appropriate management approach.

Q: WHAT IS THE RISK THAT A TURBINE STARTS A FIRE?

Wind turbines are designed using materials to provide a safe path for lightning strikes to the ground and thus limit fire risk. They have systems that can monitor and respond automatically to conditions inside the turbine by following shutdown and isolation procedures.

In 2013, during a grass fire at a wind farm in South Australia started by lightning, it was revealed that the access roads built for a local wind farm were in fact beneficial to the fire fighters. The access tracks installed to build and maintain the wind farm increased the accessibility onsite and were described as an unexpected bonus that acted as a natural fire break and access for back burning. Overall they had a positive impact on the response time and ability of the local fire brigade to fight fires onsite or on neighbouring properties. There was a more recent experience in January this year where an accidental spark from machinery operating in a neighbouring field caused a grass fire. In this case the wind farm's access tracks worked as a fire break. Without these the Country Fire Authority believes the fire would have likely raced to the next ridge, and range, creating a much bigger incident. The turbine's footings, with their clear line of site, were also used by crews to coordinate air and ground crew actions.

Source: *https://www.cleanenergycouncil.org.au/news/in-case-of-fire-a-real-life-experience-at-a-wind-farm-site*

Q: WILL THE WIND FARM AFFECT AVIATION?

Wind farms require careful consideration of the necessary changes in operational procedures for aviation operators. The introduction of tall structures into the landscape can present a risk to aviation; however, the frequency of aviation related incidents involving wind farms is extremely low globally. There has been no incidents in Australia of collisions despite the large number of turbines installed to date (including areas where neighbours/ landowners operate helicopters for mustering).

Should aerial waterbombing be needed for fire containment the turbines can be halted quickly so that the blades are in a fixed position. Fire moving across the area of a wind farm will be generally managed in the same way as any other bush fire. Firefighting strategies by aircraft would avoid wind turbines in the same manner as they avoid other obstructions, such as power lines.

We have prepared an Aviation Impact Assessment and will continue to consult with aircraft operators potentially affected by the project.

Q: WHAT IS THE CARBON FOOTPRINT OF THE WIND FARM?

The carbon footprint of wind power is lower than that of a fossil fuel power plant since the operation of wind turbines does not emit carbon. On average, considering its whole lifecycle, a wind turbine is estimated to emit ~26 grams of CO2-equivalent per kilowatt-hour. For comparison, coal emits up to 1,689 grams of CO2-equivalent per kilowatt-hour.This calculation considers the energy intensity of the steel needed to manufacture a wind turbine, the concrete required for the foundations and the emissions from the transportation, installation, and maintenance of turbines including shipping from the different manufacturing sites globally to site. This means that within 9 months of operation wind turbines offset the greenhouse emissions they generate.

The carbon footprint of the Moah Creek wind farm will be also mitigated by including one or more concrete batching plants within the project site. It is expected that the cement will be sourced from Gracemere but the on-site batching plant means there will be significantly less truck movements to our site.

The renewable energy industry in Australia and globally is actively working with other industries to lower the carbon footprint of the key components for wind turbines such as steel and concrete. In Australia there are a number of initiatives underway. For example, Energy Estate is a founding member of the Materials Embodied Carbon Leaders Alliance (MECLA) which was founded by WWF and has a goal of reducing embodied carbon in the building and construction industry. Energy Estate also works closely with Beyond Zero Emissions which has published The Zero Carbon Industry Plan Rethinking Cement report which outlines strategies for reducing carbon-related emissions from the cement industry.

Sources:
https://8billiontrees.com/carbon-offsets-credits/most-popular-types/renewable-energy-sources/wind-energy/
https://climate.mit.edu/ask-mit/does-steel-and-concrete-needed-build-renewable-energy-cancel-out-benefits
https://bze.org.au/wp-content/uploads/2020/12/rethinking-cement-bze-report-2017.pdf
https://mecla.org.au/mecla-spotlight-concrete-and-cement-14-03/
https://yaleclimateconnections.org/2021/06/whats-the-carbon-footprint-of-a-wind-turbine/

Q: WILL THE PROJECT CAUSE ELECTROMAGNETIC INTERFERENCE?

All television broadcasts in Australia are now digital. Digital TV signals are generally much less susceptible to interference from wind farms than analogue signals. A report on electromagnetic interference was prepared by a specialist consultant (DNV) and concluded that there is a low risk of interference to television and radio reception strength for just 3 near neighbors to the Project. The report sets out options to avoid this interference in consultation with the affected residents or relevant operator, if interference is experienced after the project is operational.Solutions include re-aligning the antenna at affected dwellings to the existing tower, re-directing the antenna to alternative tower, installing a more directional or higher gain antenna, changing the location of antenna, installing cable or satellite television, or installing a relay transmitter . Our development approval is likely to include pre-and post-construction assessments of television and radio reception strength to confirm that the operation of the wind farm has not disrupted these signals.

Q WHAT ARE THE PLANS FOR DECOMMISSIONING THE WIND FARM?

The wind farm will have an operating life of around 30 years. Decommissioning a wind farm involves dismantling and removing the wind turbines, removing related infrastructure, (such as buildings and overhead power lines) covering and revegetating roads and foundations. Landowners can request that parts of the wind farm that continue to serve a purpose, such as buildings or access tracks, remain in place.

Who is responsible for decommissioning?

The wind farm owner is responsible for decommissioning. Requirements for decommissioning – such as reinstating the land – are set out in contracts with landowners and may be included in the planning approval. This Project takes into account the cost of decommissioning during the development stage, and a sum is allocated and set aside for this, acknowledging that components of a wind farm have a high scrap or salvage value.

What happens to wind turbines at the end of their life/after decommissioning?

There are a number of wind farms in Australia that will soon come to the end of their operating life, and while decommissioning is something that must be factored into every wind farm, individually, what happens to the components once they've been taken out of the groundshould be done in an ethical way so as to set an industry best practice standard. It is widely understood that landfilling giant blades is an unacceptable end-of life solution, and the industry is actively developing processes that are in line with circular economy principles: cradle to-cradle design, achieving 100% recyclability, designing out waste and using recycled inputs.

Leading Turbine manufacturer, Vestas, has calculated the average recyclability across the components of wind turbines is currently around 85% with their goal of reaching 90% by 2030.

Will the wind farm be repowered?

Reenergisation or repowering is emerging in Europe and the USA, where there was early uptake of wind energy in the 1980s and the first projects have come to the end of their design life. The first wind projects in Australia are also starting to come to the end of their design life and the project owners are considering whether to decommission the site or repower the wind farm. The extent of works required and the viability of repowering will depend on the improvements in technology over that timeframe and the state of remaining infrastructure. For example, perhaps only the blades need replacing, or gains could be made by upgrading the drive train and power electronics. However, reenergisation could involve replacing whole turbines and improvements to access tracks.

Sources:
https://www.cleanenergycouncil.org.au/advocacy-initiatives/community-engagement/decommissioning
https://www.vestas.com/en/sustainability/environment/zero-waste

Q : DO WE USE INDEPENDENT SUITABLY QUALIFIED EXPERTS TO VERIFY THE MATERIALS SUBMITTED FOR THE DEVELOPMENT APPROVAL?

CQP is a joint venture between RES and Energy Estate whose teams include experts who have significant experience and have clocked up many years developing wind farms in Queensland and across Australia. Their collective experience includes reviewing third-party assessments, assumptions, data and calculations.

For the development application, we have used independent and suitably qualified experts to prepare the application and undertake the with various specialist studies which are required for a project of this nature. Additionally, during the process of assessing our development and secondary approvals, the Queensland Government uses internal specialists and third party consultants to check and verify the information provided by the referring party/project.

The independent and suitably qualified third party consultants who have supported the development application for the Moah Creek wind farm include:

- Umwelt – our lead consultant for the development application; a leading Australian, employee owned environmental and social consulting business with a strong presence across Australia, providing services to the Defence, Renewables, Resources and Infrastructure sectors.
- AHS –a cultural heritage consultancy, trusted by clients such as councils across Australia. Their office is in Brisbane and they have undertaken site visits and walkovers for the Moah Creek project.
- DNV - a highly regarded global independent advisor and certifier for the global wind energy. DNV have offices in Brisbane and around Australia and has visited the site.
- Lat27 – a leading landscape architecture firm based in Brisbane and undertook our landscape and visual impact assessment.
- Aviation Projects – Aviation Projects is a trusted advisor of airport planning, development and operations, and aerodrome safeguarding, with industry-leading knowledge and integrity.
- Access Traffic Consulting – Based in Rockhampton, Access Traffic is an experienced independent consultant with deep understanding of the region. They produced the traffic assessment for the project for the development application.
- Marshall Day - Established in 1981, Marshall Day Acoustics is one of the world's largest and most respected acoustic consultancies and undertake the acoustic assessments for wind farms around Australia.
- LEC Land and Environment Consultants – specialists in bushfire management with experience of offering bushfire management plans for the Department of Defence, power stations and industrial sites.

Q : IS WIND POWER AN EFFICIENT FORM OF POWER GENERATION?

Generation capacity, capacity factor and efficiency are important but differing measures in the energy industry.

Capacity or Generation Capacity is the amount of electricity a generator such as a coal-fired power station or wind turbine can produce when it is operating at full design capacity. The maximum amount of power is typically measured in megawatts (MW) or kilowatts. Therefore, it would take 4 projects of the same size as Moah Creek Wind Farm (planned for 360MW) to be equivalent to Stanwell Power Station (1445MW), or 240 Wind Turbine Generators (assuming 6MW for each WTG for example).

Capacity Factor measures how often a plant is running at maximum power. For example being offline for maintenance, shutdowns or forced outages would be a period when a plant is not generating. The National Electricity Market (NEM) operates on a least cost basis, therefore if during a certain bidding period an energy source is more expensive than another in the system it will not be instructed to operate by AEMO, the system operator. Wind Farms typically have a capacity factor ranging between 30% and 45% which largely depends on the location of the project and prevailing wind conditions. In 2021 the best performing wind project in Australia had a capacity factor of 46% (and for comparison the best performing solar farm in Australia had a capacity factor of 28%). The capacity factor of Stanwell Power Station in FY 21/22 was 67.4% and in FY 20/21 was 63.7%. This is consistent with the capacity factor for coal-fired power plants operating in the NEM generally which was ~67% in 2020 (IEEFA, 2021). The capacity factor of gas-fired power plants in the NEM in 2020 was 16% (IEEFA, 2021).

The efficiency of wind turbine generators varies between 30-45%, rising to 50% during times of peak wind (University of Michigan, 2023). According to Betz Law of aerodynamics, the maximum power that can be extracted from the kinetic energy in wind is 59%. The efficiency of a coal fired power plant is dependent on its thermal efficiency, that is how much coal is required to heat the water, and how effectively that steam can turn the turbine. Typical coal-fired power plants in Australia have a thermal efficiency of 38%(What's Watt powered by Stanwell Corporation, 2023).. 'Super-critical' coal fired power plants operating at high temperature and pressure, often called high efficiency, low emissions (HELE) plants, can operate at an efficiency of 42-47% however these plants have not been built in Australia.

Sources:
Capacity vs Capacity Factor
https://www.energy.gov/ne/articles/what-generation-capacity#:~:text=The%20Capacity%20Factor&text=It%20basically%20measures%20how%20often,of%20the%20time%20in%202021.
Capacity Factor of CFPP
https://ieefa.org/wp-content/uploads/2021/06/Australias-Gasfired-Recovery-Under-Scrutiny_June-2021.pdf
Energy Efficiency of CFPP
https://whatswatt.com.au/what-is-hele-coal-power/
Energy Efficiency of WTG
https://css.umich.edu/publications/factsheets/energy/wind-energy-factsheet
Stanwell Power Corporation Annual Report 21/22
https://www.stanwell.com/story/annual-reports/
https://reneweconomy.com.au/australias-best-performing-wind-and-solar-farms-in-2021-and-the-leading-states/

Q: WHAT ARE THE ENVIRONMENTAL BENEFITS OF WIND FARMS?

Unlike fossil fuels, generating energy from the turbines does not emit noxious gases like nitrogen oxides and sulphur dioxide, all of which pollute the environment and harm human and non-human health. Wind turbines do not release any carbon emissions. By replacing electricity generated from other sources such as fossil fuel power stations, wind energy can lead to an overall reduction in Queensland's carbon emissions. The project will produce enough energy to power more than 250,000 homes each year.

DOES THE NOISE FROM WIND FARMS IMPACT HEALTH?

The top Australian authority on health issues, the National Health and Medical Research Council (NHMRC), conducted a review into wind farms and potential health issues and released a statement (Evidence on Wind Farms and Human Health) in 2015 concluding that there was no consistent evidence that wind farms cause adverse health effects in humans. More recently, research conducted by Macquarie University and the Woolcock Institute of Medical Research showed conclusively that the infrasound generated by wind turbines has no impact on sleep, brain functioning, cardiovascular or psychological health and does not cause dizziness or nausea. These findings are consistent with the theory that wind turbine syndrome is caused by nocebo effects, that is, a person's belief that the exposure will do them harm.

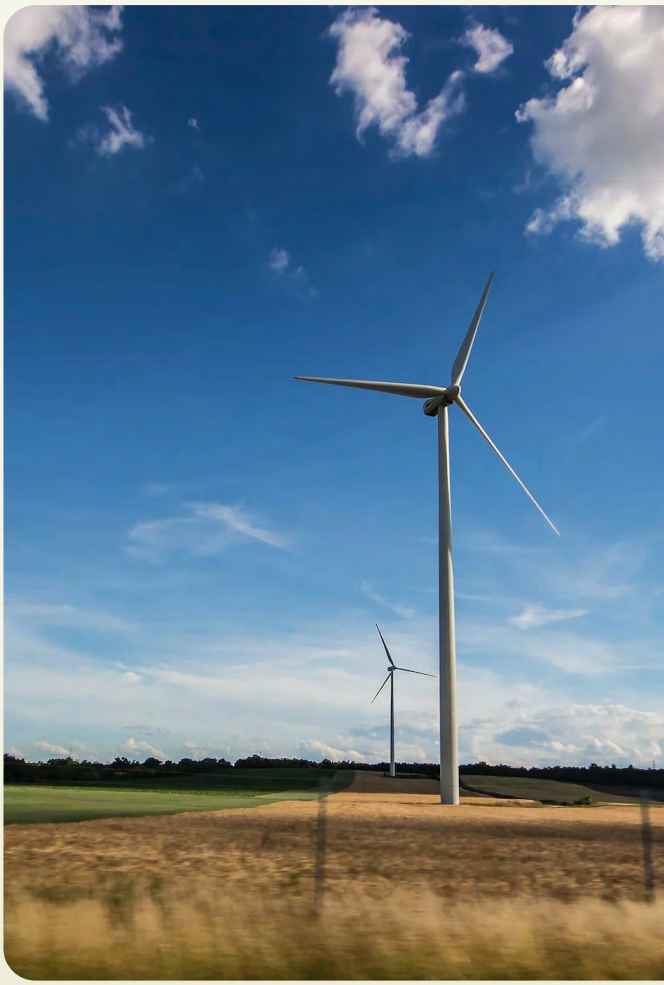
Source - https://www.woolcock.org.au/news/wind-farm-noise-not-harmful

WILL BIRDLIFE OR BATS BE IMPACTED BY WIND TURBINES?

Unfortunately some deaths will occur but deaths from birds or bats flying into wind turbines represent only a fraction of those caused by other human-related sources such as vehicles and buildings. Up to half of all bird species are threatened by climate change. Replacing fossil fuels with wind is a key solution. Wind is estimated to be 35 times safer for birdlife than fossil fuels; replacing them with wind would save 70 million birds per year worldwide.

Wind turbine bird strike is one of the key environmental impacts assessed as part of the approvals process. Our team has conducted extensive 'bird and bat utilisation surveys' at several vantage points around the site. These surveys have provided information on species, numbers, and flight heights relative to the proposed turbine heights. This information is used to conduct an assessment of the risk of bird strike for key species known to occur in the region.

CQP will develop a Bird and Bat Adaptive Management Plan (BBAMP) for the Project that will identify the necessary maintenance and monitoring measures required to reduce bird strike as far as possible. The BBAMP will also identify thresholds for action to reduce bird strike, which may include temporary shutdowns in certain conditions where impacts are considered too great. The BBAMP will be subject to review and approval by the Commonwealth environment department as part of the EPBC Act approvals process.



Source: https://d3n8a8pro7vhmx.cloudfront.net/vicwind/pages/2610/attachments/original/1625532621/Factsheet_Wind_energy___bird_life.pdf?1625532621

Q: WILL THE TURBINES BE FITTED WITH WARNING SIRENS?

No, there is no intention or current requirement to install sirens on the turbines if there is high winds. All wind turbines must include a high speed cut off capability. Each individual turbine has a wind monitoring device installed (anemometer) and cut off will happen automatically in the case of high wind speeds (around 95 km per hour).

CQP
CENTRAL QUEENSLAND POWER

TO FIND OUT MORE ABOUT THE PROJECT, REGISTER FOR PROJECT UPDATES OR IF YOU HAVE ANY OTHER QUESTIONS YOU WOULD LIKE ANSWERED PLEASE VISIT MOAHCREEK.COM