



Powering a Greener Tomorrow



www.marmaduaenergypark.com.au

Cubico recognises the First Peoples of this nation and their ongoing connection to culture and country. We acknowledge First Nations Peoples as the Traditional Owners, Custodians and Lore Keepers of the world's oldest living culture and pay respects to their Elders past, present and emerging.

Contents

About the Project	4
Project Development Phases	6
Who is Cubico Sustainable Investments?	7
Community and Stakeholder Engagement	8
Our Commitment	8
Project Benefits	9
Local and Regional Benefits	10
CASE STUDY: Wambo Wind Farm	11
Project Approval Process	12
Land Use and Environmental Impact	15
Land	16
Cultural Heritage	16
Wildlife, Flora and Fauna	17
The Life of a Wind Farm	18
Construction	18
Operations	18
Decommissioning	19
Energy	19
Recycling and Sustainability	20
Materials and Recycling	20
Weathering	21
Water	21
Carbon Footprint	21
Lubrication	21
Potential Impacts and Mitigation Practices	22
Noise	22
Shadows	22
Fire Management	23
Stay in Touch	24

About the Project

The Marmadua Energy Park (the Project) is a proposed renewable energy project located north of Kumbarella State Forest, about 22 km from Tara and 37 km from Dalby, in the Western Downs Regional Council Local Government Area.

The Project site sits on mainly cleared land used for cattle grazing and broadacre cropping. Developing a project on a site like this reduces the need for vegetation clearing. The site was chosen due to its strong wind resources, limited sensitive environmental values and easy access to existing transmission infrastructure. The Project will be designed to integrate with existing land uses where possible.

The Marmadua Energy Park will comprise up to 110 wind turbines and a Battery Energy Storage System (BESS). The Project is forecast to generate 700MW in wind energy, which would power approximately 480,000 homes. The Project aims to connect to the grid via the existing Braemar to Bulli Creek 330 kV transmission lines. As these transmission lines already traverse the proposed Project site, no new overhead transmission lines would be needed.



The Project is strategically located within the Western Downs Renewable Energy Zone (REZ). A REZ coordinates wind and solar projects to optimise renewable energy developments and network infrastructure.



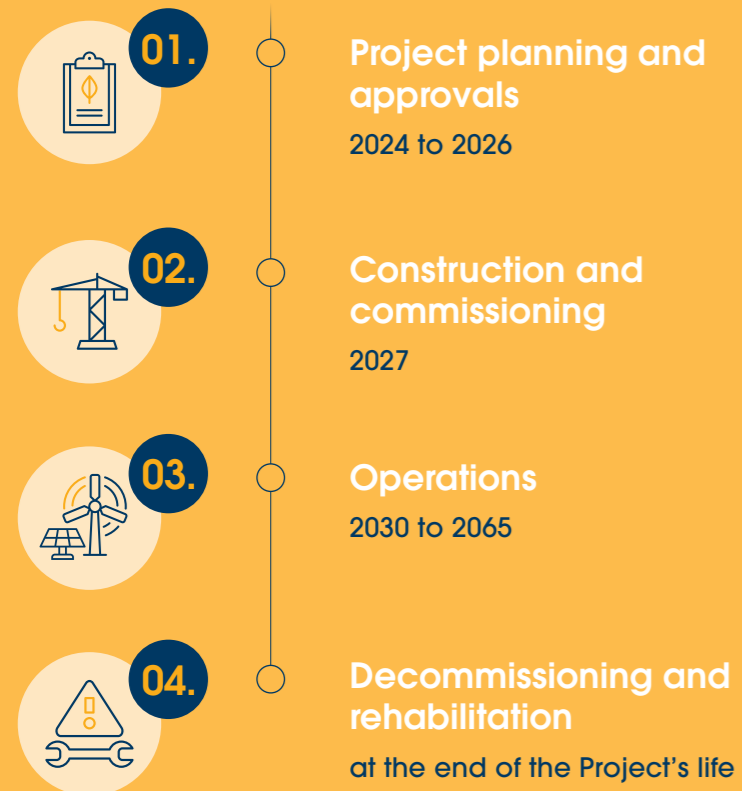
What happens to the Electricity?

The electricity generated by the Project will be fed into Australia's national electricity grid, powering homes and businesses across the country. The Project will generate revenue by selling this energy either at market rates or for a fixed price agreed upon with an energy consumer who requires large amounts of electricity.

As Australia's demand for energy grows, we are confident in our ability to secure competitive rates that enable us to continue investing in renewable energy projects and delivering benefits to the local community.

Project Development Phases

The Marmadua Energy Park lifecycle contains four key phases:



Cubico has commenced comprehensive studies and assessments that will inform the Project's design, planning and construction, ensuring potential impacts can be avoided, mitigated and minimised.

The Project team aims to submit the planning application by late 2024.

If the Project receives the relevant planning and approvals as scheduled, construction is anticipated to commence in 2027 and take approximately 24 months to complete. Once built, Marmadua Energy Park will generate clean energy for up to 35 years.

Wind Monitoring

Cubico has been monitoring the wind resource in the project site with portable Light Detection and Ranging (LiDAR) systems since July 2023 and more recently with a Meteorological Mast installed in August 2024.

Cubico Sustainable Investments is the developer and, if built, will own and operate Marmadua Energy Park. As a long-term investor in clean energy, we prioritise building strong relationships with local communities. We believe that genuine partnerships are essential for the success of our projects.

Who is Cubico Sustainable Investments?

Cubico is one of the world's largest privately owned renewable energy companies, working across Australia, the Americas, and Europe. It currently has 506 MW in construction and 1.8 GW in development in Australia.

Our team of dedicated professionals have substantial industry experience in the infrastructure sector. We have worked on renewable energy projects across Australia and understand how to develop successful projects that not only meet our corporate standards but create a positive impact in the community.

As the developer, operator and long-term owner of its clean energy assets, Cubico is dedicated to building positive relationships with the communities and stakeholders it engages with. As the Project develops, we will frequently attend and hold events around the area to meet with the community and discuss the Project.

› *We believe in honest, genuine engagement. Each community is different, and we'd like to work with you to hear your ideas about how we can bring meaningful and long-lasting benefits to the area.*

We take pride in undertaking best-practice community engagement on all of our projects. We know that genuine relationships are the key to a project's success. Cubico's approach to engagement is to connect and partner with the local community for the Project's lifespan.

Community and Stakeholder Engagement

We believe in building strong, lasting relationships with the communities where we operate. Our approach to community and stakeholder engagement is centred on open communication, collaboration and shared benefits. As the Project develops, we will attend and hold events around the area to meet with the community and discuss the Project.

We believe in honest, genuine engagement. Each community is different, and we'd like to work with you to hear your ideas about how we can bring benefits to Weranga, Tara, Dalby and surrounding communities.

We believe benefit sharing is best done collaboratively. We want to genuinely connect with the local community to understand its needs and aspirations. By working together, we can create a wind farm that benefits the community and the environment.

Our Commitment

Early and ongoing engagement

We will work closely with the community throughout the Project lifecycle, from planning to operation and beyond.

Listening and understanding

We value your input and will actively seek your views on the Project.

Transparency

We will provide regular updates on the Project's progress, including potential impacts and benefits.

Shared benefits

We are committed to maximising opportunities for the local community, including jobs, economic growth and infrastructure improvements.

Building a Strong Partnership

We aim to create mutually beneficial partnerships with local communities. Some of the ways we do this may include:

- › **Supporting local businesses:** by prioritising local suppliers and contractors wherever possible.
- › **Investing in the community:** exploring opportunities for community grants, sponsorships and other initiatives.
- › **Creating job opportunities:** working with local training providers to develop a skilled workforce.
- › **Improving local infrastructure:** contributing to upgrades in local roads, telecommunications and other essential services.

Project Benefits

Cubico is dedicated to playing a significant role in Queensland's transition to clean energy.

The proposed Marmadua Energy Park will generate up to 700MW of clean, renewable energy, contributing to achieving the Queensland Energy and Jobs Plan's 80% renewable energy target by 2035 and the Queensland Government's commitment to net zero emissions by 2050 as legislated in the Clean Economy Jobs Act 2024.



The Marmadua Energy Park project will help deliver clean, reliable and affordable energy to up to 480,000 households and businesses across the state.



Local and Regional Benefits



Job creation

The Project is anticipated to deliver more than 480 jobs during construction and up to 15 jobs once operational. Where possible, Cubico will recruit locally.



Economic benefits

Marmadua Energy Park will help to diversify the region's economy by generating additional and external income. Where possible we will procure goods and services from local suppliers supporting economic development and community participation.



Community Benefit Fund

Cubico is committed to ensuring that benefits from the Marmadua Energy Park project are shared with the community. Benefit sharing works best when it is done in collaboration with the local community. By meaningfully engaging with the local community to understand its unique needs and aspirations, a benefit-sharing package that seeks to have a legacy impact in the region can be developed.



Pre-development Fund

Cubico wants the local and surrounding community to benefit from the Project as soon as possible; that's why we are granting immediate access to a Pre-development Community Benefit Fund.

CASE STUDY: Wambo Wind Farm

Each year, Cubico Sustainable Investments and Stanwell Corporation, the co-owners of Wambo Wind Farm, provide up to \$200,000 in funding to support the local communities and to establish long-term benefits for the surrounding townships.

Some of the initiatives that have recently received funding include:

- Replacement of an air conditioning system at the Jandowae Squash Club
- New shade awnings and a disability ramp at the Jandowae Bowls Club
- Installation of an electronic payment system at the Bell and District Golf Club
- Improvements to the Jandowae Heritage Precinct's former School building and Shearer's Quarters to allow for all-weather access and increased display area
- Installation of air conditioning and the option for members to play table tennis at the Jandowae and District Tennis Association
- Purchase of new safe and fit-for-purpose food preparation equipment at the Bell Memorial Public Hall.

We look forward to partnering with individuals, community clubs, groups and organisations. We want to work with you to hear your ideas about how we can support your local initiatives and programs.

We are open to 'front-ending' the Community Benefit Fund (CBF) to ensure the community can benefit sooner.

If you have a community project or are a community group that could benefit from a partnership opportunity, we would love to hear from you.

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Project Approval Process

A wind farm development requires various planning approvals from the federal and state governments and local councils. The approval process will consider the size, location, potential planning, and social, economic, and environmental impacts associated with the Project.

Cubico undertakes a variety of assessments to inform our design and planning, ensuring potential impacts can be avoided and mitigated. These assessments relate to:

- > Agriculture
- > Aviation, if applicable
- > Bushfire and other fire hazards
- > Cultural heritage
- > Environmental and ecological studies, including fauna and flora, bat and bird, and target species (for example, vulnerable and threatened species)
- > Hydrology
- > Landscape and visual impact
- > Noise
- > Geotechnical surveys
- > Traffic and transportation
- > Erosion and sediment control.

These assessments help inform the design of our project. The Project will require approvals from Queensland and Australian governments.



Queensland State Code 23 Development Application (DA)

The Queensland government code is specifically designed to assess and regulate wind farm development.

Queensland State Code 23 Development Application (DA)



Technical Studies and Stakeholder Engagement:

Cubico conducts various studies as listed above (e.g., environmental impact assessment, noise assessment) and consults with local communities, government agencies, and other relevant parties.



Relevant Purpose Determination:

Submit to the Department of Resources.



Submission:

The detailed development application is lodged with the State Assessment and Referral Agency (SARA).



Assessment and Consultation:

SARA assesses the application against the performance outcomes and acceptable outcomes of State Code 23, prompting any further technical assessments that Cubico may be required to do. SARA will also ask other stakeholders, such as the local council, for input.



Decision

If approved, the developer may proceed with other necessary approvals and development. Ongoing monitoring and compliance with conditions are required during the wind farm operation.



Federal Government Environment Protection and Biodiversity Conservation Act (EPBC)

Australia's overarching environmental protection law. For wind farm projects, it operates as a crucial regulatory framework.

Federal Government Environment Protection and Biodiversity Conservation Act (EPBC)



Submit Referral to the Australian Department of Climate Change, Energy, Environment and Water (DCCEEW).



Referral Review:

DCCEEW assesses the Project's potential environmental impacts. This review determines how much further assessment must be undertaken, if any.



Further Assessment:

Cubico shall undertake the additional necessary studies and mitigation actions if required. This includes seeking input from relevant parties, including Indigenous groups, local communities, and environmental organisations.



Assessment Approval:

Any further works are reviewed again. Once approved by the Minister, the Project can proceed.

Cubico's Project team is aiming to submit the DA by late 2024.



Land Use and Environmental Impact

Cubico is committed to minimising environmental impacts and complying with all relevant Australian and Queensland regulations.

Several measures to avoid and/or mitigate the impacts over the local area are studied and implemented during different stages of the Project's lifecycle, including (but not limited to):

Careful site selection

The project site sits on mainly cleared land used for cattle grazing and broadacre cropping. Developing a project on a site like this reduces the need for vegetation clearing. We have also carefully chosen the Project's location to avoid sensitive ecological areas and selected turbine locations in collaboration with our environmental consultants and host landowners.

Erosion and sediment control

We will employ best practices to prevent soil erosion and protect water quality.

Wildlife monitoring

Further to the studies already undertaken, regular monitoring programs will be in place to assess the impact on local wildlife during the life of the Project.

Rehabilitation

Detailed plans for site rehabilitation after the Project's construction.

Return to original state

It will be Cubico's responsibility to return the land to its original state when the Project is decommissioned at the end of its operational life. Financial guarantees are put in place to ensure these works are carried out at the end of life of the Project.



Land

The Project is located on leased agricultural land and would not encroach on the State Forest. We have been working closely with landowners to ensure minimal disruption and that the Marmadua Energy Park and current farming activities can coexist maximising land use.

To access the site, there will be some interactions with Crown, state and council roads. We will engage with the relevant parties and be subject to strict guidelines to avoid and minimise potential impacts.

Cultural Heritage

Cubico takes a place-based approach to engagement, understanding that different communities and regions have diverse cultural practices, histories, and stories.

Cubico's partnerships with First Nations Peoples go beyond the statutory requirements of Cultural Heritage Assessments and associated strategies. We build genuine relationships which foster opportunities for First Nations participation.

During the development of the Project, Cubico will work closely with the Barunggam and Bigambul people, along with archaeologists and heritage specialists to expand on our understanding of the project site and its cultural significance.

Wildlife, Flora and Fauna

Cubico has and will continue to undertake a range of environmental studies, including wildlife, flora and fauna, to ensure we design a project that minimises environmental impacts during construction and operation.

The majority of the Project's area has been previously cleared of vegetation for agricultural purposes. Any high-value patches can be avoided through careful project design.

Initial ecological surveys have not identified any endangered animals in the proposed Project area, which will continue to be assessed. A Vegetation and Fauna Management Plan (VFMP) will be developed as part of the approvals process. This plan will outline how the Project will avoid, minimise, mitigate and offset any potential impacts on flora and fauna.

Birds and Bats

Wind farms are carefully designed to coexist with wildlife. Studies are conducted to identify and protect critical bird and bat species. Measures such as regulating turbine speeds are implemented during operation to minimise potential harm. State Governments are currently conducting research to address knowledge gaps about the impact of wind energy on at-risk bird and bat populations. Cubico is dedicated to using the latest research to inform its risk assessment processes and implement measures to minimise impacts on bird and bat species.

The Life of a Wind Farm

Depending on size, a wind farm can typically take up to five years to develop and two to three years to build. Once operational, a wind farm's expected operating life is up to 35 years, depending on the turbine technology selection. This is followed by decommissioning, which can take several months to two years.

Construction

The Construction period is when the land will see the most temporary disturbance. This can take two to three years. During this time, trucks use roads to carry construction materials and equipment; earthworks are carried out to prepare the areas where the wind farm infrastructure will be placed and to build the internal roads that will connect the Project. There will be a need for on-site office space, kitchens, bathrooms, catering and, in some cases, accommodation for the construction team.

Operations

Once built, the wind farm will operate for up to 35 years, generating clean energy. Our skilled team will ensure that the turbines function safely and efficiently. Key operational activities include:

- › **Constant monitoring and optimisation:** We will closely monitor turbine performance and environmental conditions to maximise energy output and minimise disruption.
- › **Preventive maintenance:** Regular inspections, cleaning and lubrication will extend turbine life and prevent breakdowns.
- › **Swift repairs:** If issues arise, our team will respond promptly.

We focus on safe, efficient, responsible operation, balancing energy production with environmental and community considerations.

Decommissioning

At the end of the Marmadua Energy Park's operational life, Cubico will be responsible for decommissioning the site in line with the Queensland Wind Farm State Code and relevant planning guidelines. This process includes restoring the site to its original condition and returning it to its previous land use. Cubico will allocate funds specifically for this purpose and engage with the community throughout the decommissioning phase to share plans and address any concerns.

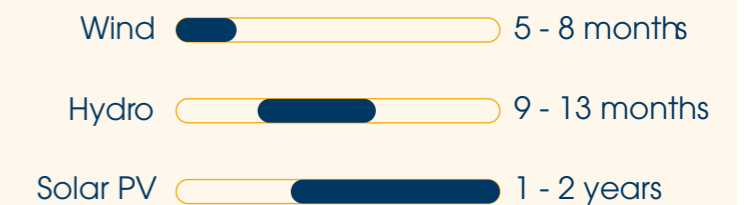
Cubico will also be legally required to remove all infrastructure and ensure there are sufficient funds, held in a third-party arrangement (such as insurance or a bank guarantee), to complete the decommissioning. This ensures that no responsibility or financial burden falls on landowners or the community.



Energy

Wind turbines are very efficient at generating energy. They "pay back" the energy required to build them in just a few months. For example, a study done on Vestas wind turbines (models: V117-4.2 MW, 136-4.2 MW, V150-4.2 MW) showed they generate more energy than what is required to build, operate and dispose of them after only five to eight months of operation.

Energy pay back time for construction, operations and disposal



Source: www.vestas.com/en/sustainability/environment/energy-payback



Recycling and Sustainability



Materials and Recycling

According to Australia's Clean Energy Council, approximately 85 to 94% of a wind turbine can be recycled domestically.

85 to 94%

The steel, aluminium, copper and iron, can be repurposed or fully recycled for use in future turbines or other industries. This recycling rate surpasses the broader Australian business and industry average of 2018-2019 and outperforms the ambitious 80% overall recycling target for 2030 outlined in the Federal Government's National Waste Policy Action Plan.

The growing global wind energy sector has spurred significant advancements in the recyclability of wind turbine blades. This was historically a complex challenge due to their composite make-up of fibreglass, plastic, wood and metals, held together with resin. Manufacturers are now employing innovative techniques, such as using alternative resins that can be chemically separated from other blade components. This breakthrough enables the recovery and reuse of these materials in new applications.



Weathering

Wind turbine blades are built to weather the storm. Like any exterior structure, they have a protective coating to withstand harsh elements. However, this coating, known as leading-edge erosion (LEE), can naturally degrade over time. Wind turbine blade coatings are formulated for high weather resistance and are non-toxic.

While trace amounts of BPA are part of the epoxy used during manufacturing, it is completely cured in the factory before the blades reach the Project site, leaving only microscopic, readily biodegradable remnants.

The wind energy industry constantly seeks ways to extend blade life and combat leading-edge erosion. Promising advancements include nanocellulose and fibre pulp-reinforced coatings, which show potential for significantly delaying blade surface degradation.



Water

At this stage, we are assessing different options to source the water that will be required during construction. Several factors will inform this decision, including the Project's location, local water availability, and environmental considerations. This is something that also forms part of the Project's planning and approvals process.

We are committed to exploring sustainable water management practices and will provide more specific information about the water source once those details become available.



Carbon Footprint

Wind turbines typically offset their manufacturing emissions within the first year of operation, with some achieving this milestone in as little as two months. A 2012 study demonstrated that a 2 MW turbine can recoup its carbon footprint in just seven months (Guezuraga, Zauner, & Polz, 2012). As technology advances and the manufacturing process becomes increasingly reliant on green energy, the efficiency of wind turbines is expected to continue improving, further reducing their overall environmental impact.

Lubrication

Like a bike or car, lubrication with oil products ensures wind turbines operate safely and protects wind turbines from premature wear. A synthetic oil product is usually chosen over a mineral-based oil due to its higher viscosity index, which is more resistant to temperature fluctuations. Many of the oil companies familiar to you, like Mobil and AMSOIL, will produce these lubricants, but the specific type will depend on the turbine model recommendation.

While the amount of oil will depend on the turbine model, larger turbines may have up to 1.3 tonnes of oil in the gearbox. In the Vestas V162-6.2 MW turbine, oil and coolants are reported to account for 0.1% of the turbine's mass. This oil will need to be replaced every seven to ten years, at which point any used lubricants will be collected in designated containers and transported to licensed recycling facilities for proper treatment and disposal.

The frequency of oil changes in a wind turbine can vary significantly depending on the quality of the oil, the turbine model, and the climate conditions where the wind farm is located. Oil checks will be performed every 6-12 months at every turbine service, but due to significant improvements in industry standards, turbines can go much longer without an oil change. Seven years is now about the minimum lifetime operators expect – but some oils now have a warranty lifetime of up to ten years.

Potential Impacts and Mitigation Practices

Fire Management

Noise

Wind turbines produce sound primarily from their rotating blades and internal machinery. This noise can include a mix of high and low frequencies and infrasound. Modern turbines are designed with significant noise reduction features, making them substantially quieter than older models.

Typically, noise levels at a distance of several hundred meters from turbines are minimal. However, factors such as surrounding terrain, background noise, and individual sensitivity can influence how people perceive turbine sound.

To ensure public health and well-being, stringent noise regulations are in place. The World Health Organisation recommends that noise levels from wind turbines should not exceed 45 decibels (dB). Queensland's State Code 23 aligns with this standard, setting nighttime noise limits for nearby homes at 45 dB(A) or 5 dB(A) above background noise.

Importantly, recent Australian research from the Woolcock Institute of Medical Research¹ has definitively concluded that there is no link between wind turbine infrasound and adverse health effects.

¹ ehp.niehs.nih.gov/doi/10.1289/EHP10757

Shadows

Shadow flicker is a visual phenomenon caused by sunlight passing through the gaps or blades of a rotating turbine and casting intermittent shadows on the ground. Queensland's State Code 23 states that modelled blade shadow flicker impacts on existing or approved sensitive land uses must not exceed 30 hours per annum and 30 minutes per day.

Cubico's projects are modelled in all the worst-case scenarios, assuming, amongst other things, that the wind turbines are operating 24 hours a day and the sun is shining for all daylight hours without any clouds in the sky. This ensures that the project design will strictly adhere to code.

The Australasian Fire and Emergency Service Authorities Council (national council for fire and emergency services in Australia and New Zealand) has shared that wind farms are not expected to adversely affect fire behaviour or pose significant ignition risks. Regardless, Cubico has many best practices in place to mitigate risk:

- › **Wind farms are designed with fire safety in mind.** We adhere to strict regulations and industry best practices. This includes developing comprehensive fire management plans that outline how we will address bushfire risks.
- › **Collaboration is key.** We work closely with local fire authorities to understand specific fire risks in the area and incorporate their recommendations into our plans.
- › **Prevention is our focus.** Firebreaks will be established around turbines and other infrastructure to act as barriers. We'll also conduct thorough assessments of vegetation and potential fire hazards.
- › **Rapid response is essential.** Our turbines are equipped with advanced safety systems, including automatic shutdown mechanisms and fire suppression technology. In the unlikely event of a fire, we can quickly isolate turbines and respond to the situation.
- › **Our operations team can adjust turbine speeds or shut them down** entirely in response to concerning weather or safety conditions.
- › **Lightning protection is in place.** Our turbines and equipment are protected by lightning rods to prevent fires caused by lightning strikes. There is no record of wind farms starting bushfires in Australia due to lightning.
- › **We are committed to working with the community.** We will collaborate with landowners on fire prevention measures, such as controlled burns, to reduce overall fire risk in the area.

We want to assure the community that we have taken every precaution to minimise fire risks. Your safety is our top priority.



Stay in Touch



If you're interested in being involved and staying up to date on the Marmadua Energy Park project, please contact us at:

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