HEXHAM
Wind Farm

FREQUENTLY ASKED QUESTIONS
July 2020

KEY FACTS

Number of turbines
Up to 125

Turbine height
Up to 250 metres

Proposal location
South-west of Hexham and south-east of Caramut

Project area
About 16,000 hectares

Rates payable
Estimated at $900,000 per year, for 25 years

Local Government
Moyne Shire

Responsible authority
Minister for Planning

Landholders
15

Installed capacity
Up to 700 megawatts (MW)

Power generation
About 2400 gigawatt hours (GWh) per year

Dwellings powered
About 530,000 per year, or a city the size of Warrnambool more than 36 times over

Emission savings
About 2.7 million tonnes of $C0^2$ per year

Project status
Feasibility stage

Construction period
Two to three years

Project lifespan
25 years plus

Thank you to everyone who has submitted feedback on the proposed Hexham Wind Farm. This document encompasses answers to the most common questions from our community engagement to date.

Why did Wind Prospect choose the Hexham area for a wind farm?

The wind resource in Victoria, particularly south-west Victoria, is very strong. Wind Prospect has been monitoring wind speeds in the Hexham area for several years and this has confirmed a solid, consistent resource. While this is one of the most critical aspects of a good wind farm site, there are other elements which make the Hexham area a good location.

These include the proximity to existing transmission infrastructure and a relatively low density of dwellings. There are 216 neighbour dwellings within six kilometres of the Hexham Wind Farm. Excluding the townships of Caramut (four kilometres), Hexham (three kilometres) and Ellerslie (five kilometres), there are 130 dwellings within six kilometres of the proposed turbines. Data from the Australian Bureau of Statistics 2016 census shows that Moyne Shire has a population density of 3.35 persons per square kilometre, substantially less than the Victorian population density of 27.2 persons per square kilometre.

Wouldn't a solar farm be better?

To create a viable project which will generate clean renewable energy and ultimately bring down energy prices, it's important that the project is able to generate low cost electricity.

It is also important that there are a diversity of energy generation technologies that complement each other to supply the energy load. Wind farms can generate energy whenever the wind is blowing, not just during daylight hours, so complement the use of solar generation technology.

This is important as there is substantial energy demand when the sun isn't shining. With the strong wind resource in south-west Victoria, it is also more cost effective to generate electricity from wind than solar.

Do wind farms cause fires?

There are no recorded instances of lightning strikes to wind turbines or wind monitoring masts causing a bushfire in Australia. Wind farms can actually assist in fire emergencies, with the access tracks built as part of the wind farm creating natural firebreaks that can also be used by firefighters for access across otherwise inaccessible country. The Country Fire Authority is consulted as part of project development and wind turbines are fitted with comprehensive lightning protection systems that safely transfer any high voltages or currents directly to the earth in the event of a lightning strike. Wind turbines are also fitted with automatic shut-down systems that will switch off turbines if temperatures reach a set level. All high voltage connections between turbines run underground, meaning the risk of electrical related fire is extremely low.[1] In the event of a fire at the wind farm, the project owner will switch off the turbines. This can be done remotely and in a matter of minutes.

What about aerial firefighting?

The current design of the proposed Hexham Wind Farm will not prevent aerial firefighting. The Country Fire Authority's 2019 Guidelines for Renewable Energy Installations state that when wind turbines are located at least 300 metres or more apart, there is *'adequate distance for aircraft to operate around a wind energy facility, given the appropriate weather and terrain conditions. Fire suppression aircraft operate under visual flight rules. As such, fire suppression aircraft only operate in areas where there is no smoke and can operate during the day or night.'* [2] Turbines at the proposed Hexham Wind Farm are expected to be 300 to 500 metres apart.

I am a neighbour to the proposed wind farm. Will there be a caveat over my property?

No, the wind farm does not and cannot put a caveat over any neighbouring properties.

I want to build another dwelling on my farm, can I still do this?

Any new dwelling must meet the requirements of the local planning scheme and all relevant building and planning permits must be obtained. If you meet these requirements then yes – you are able to build. The wind farm does not stop neighbours from building on their own property.

Is wind energy efficient and reliable?

Yes! Wind energy is an efficient form of energy production. When discussing wind farms, terms such as efficiency, reliability and capacity factor are often spoken of and all have different meanings. For clarity here is a brief explanation.

Efficiency – Efficiency is the process of converting wind energy to electrical energy. Betz' Law states that no wind turbine can capture more that 59.6% of the kinetic (motion) energy available in the wind. Modern wind turbines can convert up to 80% of the Betz limit with losses due to conversion processes, heat and sound.

ENERGY SOURCE	ENERGY CONVERSION TO USABLE ENERGY
Wind	About 45 per cent
Typical petrol combustion engine	About 20-30 per cent
Coal	About 29-37 per cent

Capacity factor – This is the amount of energy produced by a wind turbine, compared to what could be produced if it operated continuously at peak rated capacity. Capacity factor is site specific, as it depends on factors such as wind speed, wind density and rotor swept area. Capacity factors have increased as wind turbine technology has improved. Wind farms built around 2014 had capacity factors of about 40%, compared to about 30% for wind farms built between 2004 and 2011. Modern wind farms can have capacity factors above 45% and close to 50%.

Reliability – Wind turbines generally operate more than 80 per cent of the time, making wind a very reliable source of energy. When turbines are not operating they can be serviced, an essential part of any infrastructure maintenance.

Renewable energy will be able to provide more energy to the grid with the introduction of battery storage at many projects. It is also important that reliability is not mistaken for intermittency; the reality is no form of energy is 100 per cent reliable. For instance, many coal-fired power stations have periods of unavailability in summer due to high temperatures.

[1] Wind Farms, A guide for communities, Clean Energy Council SKM (2012) Wind Farm Investment, Employment and Carbon Abatement in Australia
[2] Guidelines for Renewable Energy Installations (CFA, February 2019)

But isn't the wind industry subsidised, which is the only reason it is viable?

Advancements in wind turbine technology including higher hub heights and longer blades that provide for capture of more energy from the wind, have led to significant cost reductions in the levelised cost of wind energy. As a result, modern wind energy projects are not dependent on subsidies. A recent study by the CSIRO and Australian Electricity Market Operator (AEMO) found that wind and solar generation technology is cheaper than other forms such as coal, gas and nuclear.[3]

What about the VRET - isn't that a subsidy?

No. The Victorian Renewable Energy Target (VRET) is a program that allows renewable energy developers to bid for long-term power purchase contracts. Through a robust reverse auction application process, the program provides contracts for selected projects that have the lowest cost of energy and that provide other benefits to the economy through use of local content. While the VRET provides increased security for investment, it is not a subsidy and is available to only selected projects. The State Government has also determined that successful applicants will transfer all Large-scale Generation Certificates (LGCs) created by the project to the State Government, removing any potential financial benefit from the Renewable Energy Target program.

My electricity bill is going up. Is this because of the increasing use of renewable energy?

AEMO cites the main reasons for the increase in prices as increased demand due to summer heat, reduced output from hydro generators (due to dry conditions and climate change), high wholesale gas prices and *'an increase in the price of offers from black coal-fired generation'.*[4] The cost of producing wind energy is expected to continue to decrease, in turn reducing the wholesale and retail cost of electricity – and leading to a lower bill for the consumer.[5]

Can wind power provide base load power?

Baseload power refers to the minimum amount of power that coal fired power stations can provide without being switched off. However, the most critical role of electricity generators is to provide for electricity demand, not to provide baseload power. Wind and solar generators can provide the lowest cost form of bulk energy with any gaps provided by energy storage such as hydro, pumped hydro and batteries as well as gas peaking plants. These technologies are referred to as firming technologies and because they generate only when required, are much more efficient than the generation of baseload power. The Hexham Wind Farm proposal incorporates a substantial battery energy storage facility.

[3] CSIRO & AEMO (2018) GenCost 2018: Updated projections of electricity generation technology costs. [4] Quarterly Energy Dynamics, Q1 2019, AEMO
[5] Renewable Power Generation Costs in 2017, IRENA.

What will happen at the end of the wind farm's lifetime?

The design life of modern wind turbines is generally 25 years. After this period, it is possible but unlikely the wind farm will continue operating in its current form, and one of the following two options would be chosen.

1. **Remove the wind farm, at the cost of the wind farm owner.** Above ground infrastructure must be removed and the land must be returned to its previous state, unless the landholder wants some of the infrastructure to remain in place. Keeping the access tracks can be a positive for landholders who find them useful for access around their farm.

2. **Repower the wind farm, with more modern technology.** This would likely involve 'upgrading' the wind farm to incorporate the latest technology. This would involve redesigning the wind farm and seeking a new planning permit.

Each of these options would be investigated in consultation with the landholders. While there is no wind farm in Australia that has reached the end of its lifespan, there are many in Europe that are more than 25 years old and have gone through one of the above processes. The requirement for decommissioning is included both as a planning permit condition and in the contracts with landholders.

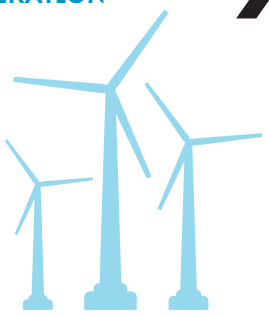
Can we use some of the electricity generated by the Hexham Wind Farm to power our own dwellings?

While this is a great idea in theory, in reality it is not possible. The Australian electricity network consists of transmission lines that transmit large amounts of electricity at high voltages. These transmission lines are supported by distribution lines that deliver this electricity to households and dwellings at a usable voltage.

All the electricity generated by the proposed Hexham Wind Farm project would be fed into the electricity transmission network, where it is mixed with electricity from a variety of sources. While it is not possible to supply electricity to local dwellings directly, we have taken this feedback on board and developed an Energy Cost Offset Plan as part of our Neighbour Benefit Sharing Program, to assist local residents with the cost of energy at their dwellings.

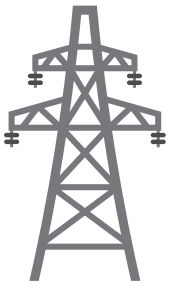
Electricity distribution

ELECTRICITY GENERATION



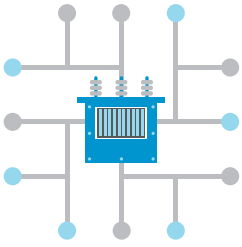
Electricity generation may be from renewable energy sources such as wind, solar or hydro or from fossil fuels such as coal or gas.

500kV TRANSMISSION LINE



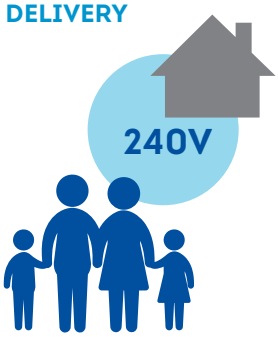
Often built many years ago to transport large amounts of fossil fuel generated electricity to population bases or industry. The 500kV line near Hexham was largely created to get power from the coal generators in the Latrobe Valley to Portland's aluminium smelter.

DISTRIBUTING THE POWER



Sub-transmission networks transport electricity to terminal stations and substations before the distribution network carries power to dwellings. At these levels voltages are anywhere between 66kv and 12.5kv.

CONSUMER DELIVERY



Dwellings utilise power at 240V, a significant reduction from the initial 500kV, where the power from the proposed Hexham Wind Farm would begin.

HEXHAM Wind Farm

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JULY 2020

Is there a benefit sharing program?

Yes. The Hexham Wind Farm Benefit Sharing Program includes an annual Neighbour Benefits Payment, which will see annual payments of between $1000 and $30,000 per annum to owners of dwellings within six kilometres of a wind turbine, an annual Energy Cost Offset Plan and a Community Benefit Fund. More information on the Hexham Wind Farm Benefit Sharing Program will be provided to the community in coming months.

Is the benefit sharing program 'buying us off'?

No. Hexham Wind Farm does not expect anything in return for any component of the Benefit Sharing Program. Neighbour Benefit Payments are available to all eligible dwellings and retail premises, irrespective of resident's and owner's opinions on the wind farm. The annual payments are an acknowledgement of the changes a wind farm can bring to the community and to share the financial benefits that come with a development of this size.

The turbines have a tip height of up to 250 metres. Won't that mean they are noisy?

There is no clear relationship between noise emissions and turbine height or power output. A turbine with a tip height of 250 metres does not necessarily emit a higher level of noise than a turbine with a tip height of 125 metres. The Hexham Wind Farm will have up to 125 turbines spread across about 16,000 hectares. The turbines are expected to be between 300 and 500 metres apart, meaning the project is much more widely spaced than some others. In addition to the spacing we are committed to designing the project in a conservative manner that provides for lower noise than required under regulations.

The Hexham Wind Farm will have up to 125 turbines across about 16,000 hectares.

How do we know the noise modelling will reflect reality?

Sound and the way it propagates through air is relatively well understood. As a result, it is possible to predict sound pressure levels around a single or number of noise sources. Wind farm noise level predictions use a very conservative noise propagation model that generally over-predicts noise generated by the turbines. This model produces a 'worst case' prediction, by modelling sound generated if all turbines were facing the measuring location at once – a situation that can never occur in practice. The modelling also does not consider the screening of wind farm noise by other sources such as the sound of the wind in the trees. The results from the modelling represent the down-wind noise level predictions for all wind directions. In reality, when a dwelling is up-wind or cross-wind of a wind turbine, the actual noise levels would be lower than those predicted by the model.

Have you made any changes to the project?

Yes, there have been changes to the project design in direct response to community feedback. For example, in response to community concerns regarding overhead transmission lines, the Hexham Wind Farm proposal will not include overhead transmission lines external to the project boundary. Instead, a new onsite terminal station within the project boundary is proposed, connecting into the existing 500kV transmission line that runs through the project area. We hope to hold public information sessions later this year - if restrictions allow - and share a revised project design at this time.

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JULY DROP IN SESSIONS

Wind Prospect staff have not visited the Hexham Wind Farm project area as a precaution during the global COVID-19 pandemic. However, we value personalised community engagement and in line with our engagement policies will be holding drop-in sessions in and around the project area in the last week of July.

These sessions will be manned by our Moyne Shire based Community Engagement Manager and held in line with COVID-19 restrictions. Our Project Manager Rory McManus will be available for teleconference from Melbourne during these sessions. Please note: a revised project design is still being developed, and will not be available during these drop-in sessions.

Each session will be held with strict social distancing protocols and numbers inside the halls will be limited, in line with government regulations.

If COVID-19 restrictions increase these sessions may be cancelled. If cancelled, this will be communicated via our website, your community facebook page (if applicable) and a sign on the hall door.

For information on the Hexham Wind Farm project or to join the email distribution list for further information on the project please email: info@hexhamwindfarm.com.au or telephone: 1800 934 322

Drop in sessions will be held at:

Hexham Old School	Ellerslie Hall	Caramut Hall
Tuesday, July 28	Wednesday, July 29	Thursday, July 30
9am - 1pm	11am - 3pm	1pm - 5pm

CONTACT US

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