

BANGO WIND FARM

HEAD OF
CONSTRUCTION

CONSTRUCTION
UPDATE

SAFETY ON SITE

TOWERS

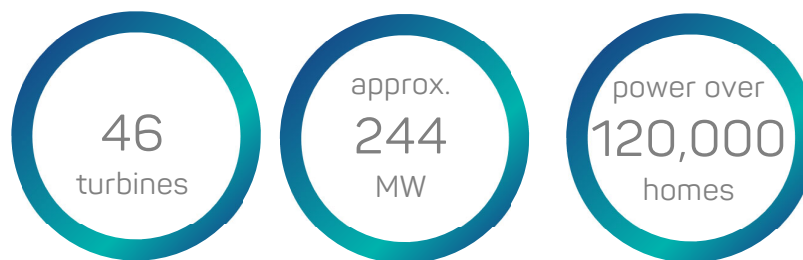
Winter brings with it the usual challenges, cold, wet and windy conditions but COVID-19 continues to be an additional factor we have to manage on site to ensure the workforce and broader community remain safe. We continue to perform temperature testing before workers commence works each day, maintain social distancing where we can and monitor where our workforce travel to and from. So far have managed to continue works on site with little impact.

We have 14 turbines fully erected, with several more at various stages of erection. We have commenced testing and commissioning of the turbines and are undertaking hold point testing to demonstrate compliance with the grid requirements. Erection of the turbines will continue over the next few months, along with bringing more turbines through hold point testing processes. Construction will likely be complete by the end of 2021, however commissioning and testing will likely run through into early 2022.

CWP is also proud to say that an agreement has been signed with Woolworths to purchase enough electricity from BWF to supply over 100 of their stores. A great move by Woolworths in their drive towards zero emissions.

A new CWP website has been launched providing information and links to all our projects and I invite everyone to take a look at www.cwprenewables.com. Stay well and I look forward to providing the community with the next update on progress at Bango Wind Farm.

Dr. Brendan McAvoy
Head of Construction



CONSTRUCTION UPDATE

Bango Wind Farm has:

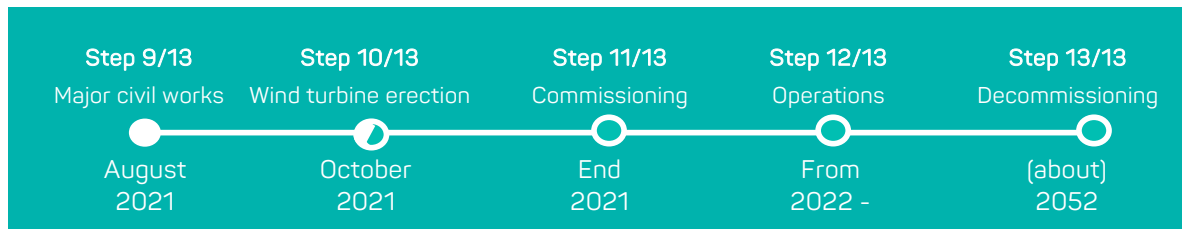
- 14 wind turbine towers fully constructed.
- 7 wind turbines have been partially built.
- a further 7 tower base sections installed.
- 2 turbines are currently undergoing 'Hold Point' testing.
- approximately 95% of all site tracks completed.
- progressive energisation of wind turbines.
- eastern cluster underground reticulation in progress.
- large turbine component deliveries in progress and nearing completion.



The next three months will see:

- completion and handover of the remaining hardstands for tower erection in the eastern cluster.
- rehabilitation and remediation works across all parts of the project.
- progressive electrical cable terminations.
- completion of underground reticulation in the eastern cluster.
- progressive energisation of wind turbines.
- finalisation of delivery of large turbine components.
- lifting and installation of tower sections, nacelles, blades and other large turbine components.
- energisation, commissioning and hold point testing of turbines in the western cluster.

PROJECT TIMELINE (for more details go to www.bangowindfarm.com.au)



HOLD POINT TESTING

Starting up and commissioning of wind turbines is a progressive process and permission is needed to commence 'Hold Point Testing'. This is done in consultation with the energy regulator *Australian Energy Market Operator* (AEMO) and *TransGrid* (operator of the grid).

Hold Point Testing is mandatory and is critical to ensuring and enhancing the level of quality control when generating energy and 'feeding' it into the national grid. It is designed to check performance of wind turbines and the capacity of the grid to take up the energy they generate.

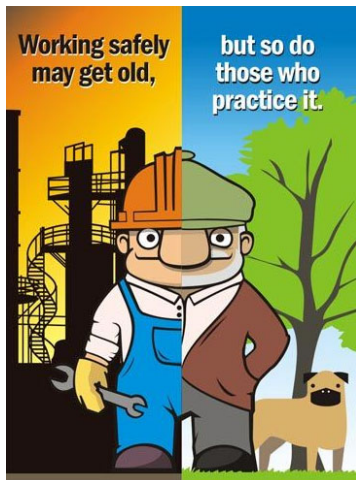
No final start-up and operation of any turbine can occur without Hold Point Testing being completed and approved by AEMO.

Hold Point Testing will be done over 4 stages for the 973-feeder line:

- HP0 – 2 turbines to a maximum of 11 MW
- HP1 – 10 turbines to a maximum of 52 MW
- HP2 – 20 turbines to a maximum of 105 MW
- HP3 – 30 turbines to a maximum of 155 MW

The checks are undertaken by AEMO/TransGrid and once approved, the project can move to the next stage.

SAFETY ON SITE



Our safety strategy is to *'Own our safety'*. CWP demonstrates this by living its primary value of 'Safety First'. This means being able to provide a safe and healthy workplace for all its employees, partners, and external stakeholders at all sites, at all times.

To achieve this, it is crucial that everyone involved understands their WHS responsibility to themselves and their colleagues. Leading safety with positive, proactive role model behaviour is the goal that everyone must aspire to. This approach empowers our workers to proactively identify hazardous conditions or situations and understand the risks to health and safety that those hazards may present to them or another worker. This is followed by eliminating the hazard entirely or mitigating the risk of harm, through the use of robust controls that are regularly reviewed so that their effectiveness in protecting workers is maintained.

Strong safety behaviours are instigated and supported by work health and safety management systems. These are the policies, procedures and processes that guide and instruct workers on how to create a safe workplace that meets or exceeds the expectations of the WHS Act, regulations, codes of practise and Australian Standards. CWP is constantly maintaining and reviewing these processes in consultation with all business groups and the WHS committee as well as through an internal and external quality audit program.

CWP has clear expectations of its contractors, that they must meet or exceed our own standards of health & safety and if they fall short of that expectation, we provide all the assistance needed to help them attain the standards we set in maintaining a safe workplace.

CWP also supports and enables the requisite training opportunities to support workers WHS awareness. Training is essential, especially within an industry whose workers operate in remote or isolated areas, performing high risk construction and electrical work whilst in proximity to heavy machinery and mobile plant and equipment. A well trained and competent workforce is instrumental in preventing workplace injuries.

The CWP safety team works closely with all workers, contractors and management to provide advice and support on a range of WHS topics such as regulatory compliance, reviewing safety documentation, conducting site safety walks and inspections, conducting inductions and toolbox talks to name a few activities.

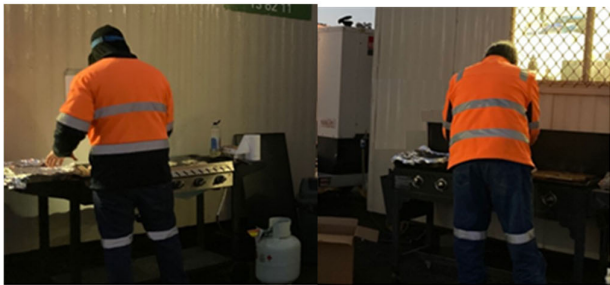
Each workday on-site commences with pre-start meetings, and it is mandatory for all site workers to attend. Not only are workers advised of tasks for the day, but most importantly, risk management and safety points are stressed to each worker.

Specific advice is also available on occupational hygiene, handling of dangerous substances and emergency management and many other topics.

Remember, *safety doesn't happen by accident*. Start a safety conversation with a colleague now.

Encouraging and supporting safety among site workers, CWP Renewables hosts Safety Awards presented during site BBQ brekkies.

Held at a pre-start meeting, and apart from the great cooking by senior CWP, GE and Downer personnel, safety actions are commended, and awards presented to those workers who have shown outstanding safety actions in their day-to-day work.



Breakfast cooks hard at work!



Very cold time of day but the food is worth it!



Above – Downers Site Safety Manager, Chris Fisher presenting awards.
Right – Award recipients.

ENVIRONMENT

Weed management at Bango Wind Farm

Weeds can have damaging effects on natural landscapes and biodiversity. They can harm native plants and animals, water catchments and agriculture and have a negative impact on the economy, human health, and recreational activities.



Weed management activities are undertaken at Bango Wind Farm to control existing weeds and to prevent the spread of weeds within the project and into adjacent lands. Weed control must be undertaken in accordance with the *Biosecurity Act 2016*, and the [South East Regional Strategic Weed Management Plan 2017 – 2022](#).

Weed spraying has recently been conducted at the Bango Wind Farm by a qualified weed management contractor. All weed spraying activities are completed in accordance with the *Pesticides Act 1999*.

Weeds will continue to be regularly monitored, with follow-up control implemented as required to ensure that weed management actions are effective. Weed management activities will be ongoing

throughout construction and operation of the wind farm.

Feral pest management

Feral animals have no place in our landscape. The ability and responsibility to manage feral animals rest with every land manager.

The 'Feral Fighters' pest management program

Feral Fighters is an initiative to strategically target pest animals at a regional and state scale through strategic, coordinated group baiting control programs. The 'Feral Fighters' initiative that was born out of the Jerrawa Creek Landcare and Yass Area Network of Landcare Groups' Feral Fox Fighters. South-East Local Land Services, with support from these groups, has expanded the program to a much larger scale. The program has over 2,000 members.

In consultation with the South-East Local Land Services, BWF have participated in the 'Feral Fighters' fox baiting program in 2021, with further fox baiting proposed to take place on BWF owned properties in the coming months.



Why become a Feral Fighter?

By joining the Feral Fighters campaign and becoming a Feral Fighter you are making a commitment to your neighbours, community, local industries, and the environment. You will be a local champion for effective invasive species management.

Any land manager can become a Feral Fighter. By doing so, you are making a commitment to providing support to strategically manage feral animals.

For more information, visit the South East Local Land Services [Feral Fighters website](#), or contact Local Land Services South East offices:

- **Yass Local Land Services:** 02 6118 7700
- **Boorowa Local Land Services:** 02 6385 1018

Woolworths buys electricity from Bango Wind Farm

On 3 June 2021, Woolworths Group announced its first renewable power purchase agreement (PPA). Woolworths has partnered with CWP Renewables on a 10-year agreement to purchase power generated by Bango Wind Farm, supporting regional investment and jobs.

From January 2022, around 30 per cent of Woolworths Group's NSW energy needs will be met using energy generated by the BWF turbines.

This will power 108 supermarkets, avoiding almost 158,000 tonnes of carbon emissions each year and adds to the group's existing network of rooftop solar panels at around 140 locations nationally.

As Woolworths Group transitions to 100 per cent renewable electricity by 2025, it is prioritising investment in a number of initiatives, including developments like Bango Wind Farm.

Woolworths Group Director of Format, Rob McCartney said: *"We know the steps we take to become a more sustainable business today will help create a better tomorrow for generations to come."*

Supermarkets are particularly energy intensive to run and we want to use our scale for good by supporting the transition to renewable electricity."



Jason Willoughby CEO CWP Renewables with Brad Shaw Manager, Woolworths Yass.

CWP Renewables CEO, Jason Willoughby said:

"Woolworths is not only buying renewable energy from Bango Wind Farm, they are also supporting regional NSW and reducing greenhouse gases emission."

With Woolworths' decision, CWP Renewables is developing both stages of the approved Bango wind farm and will be generating renewable energy for Woolworths from the start of next year."

NSW Energy Minister, Matt Kean said: *"This is great news and further proof that the NSW electricity infrastructure roadmap is providing the certainty to businesses and energy market investors to make financial decisions that will help power our state into the future."*

I am fully supportive of all energy market investment in NSW, but this partnership and agreement is particularly significant because it is prioritising the building of new infrastructure, providing for local jobs and investment and helping us grow our renewable energy base."



Bango Wind Farm in the Community

Wind Farm Workers Cook for Burrowa House

In March, members of the GE team from the Bango Wind Farm cooked sausage and egg & bacon sandwiches at the Boorowa Rotary Markets to raise funds for a local charity.

A great job was done on a brisk morning by these wonderful volunteers, ably assisted by local resident Jamie Tadd.

After much deliberation, these generous individuals decided to donate the funds to Burrowa House to assist with purchasing some of the small things that can help with the wonderful home-like atmosphere that is found there.

In May, GE Renewables' Site Manager Thomas Landry was given a tour of the new section of the facility with Care Manager Judy-Ann Stokehill, before presenting Andrew Mitchell (President Boorowa Hostel Inc.) with the cash donation.



GE Volunteers and Jamie



Judy-Ann Stokehill with Thomas Landry and Andrew Mitchell



Wind Farm Workers Donate to Local Op-Shops

Workers at the Bango Wind Farm are not only great cooks – they are also very generous people. Donations to local Yass and Boorowa Op Shops are often brought in to the CWP site office. The items donated by workers are good quality clothing, footwear, household items, books, and even some small furniture items.

Great support for local communities from wind farm workers.



ABOUT WIND TURBINES

Towers

A wind turbine tower supports the nacelle, hub & blades, and absorbs the vibration of working turbines. Bango Wind Farm uses steel cylinder wind turbine towers, which make up half of the complete wind turbine generator system weight.

As the wind speed increases at higher levels above ground, taller towers are used to reach greater heights in less turbulent winds. This aids in absorbing vibration of the wind turbine generator and reducing wear and fatigue.

BWF towers are 120.9 metres high, and each tower is divided into five sections of between 12.5 and 30 metres long and weighing between 50 and 78 tonnes each.

Flanges are the connecting pieces of the towers located on each end of each tower section which allows each section to be secured to the previous and following ones.

The tower sections are transported to the site where they are erected and bolted to each other prior to the nacelle, hub, blades and other internal components being set in place.



INSIDE A TOWER

While the turbine tower is the support component of the system, there are many different components set inside each tower including platforms, ladders, a lift, lights, control panels, power cables, etc.

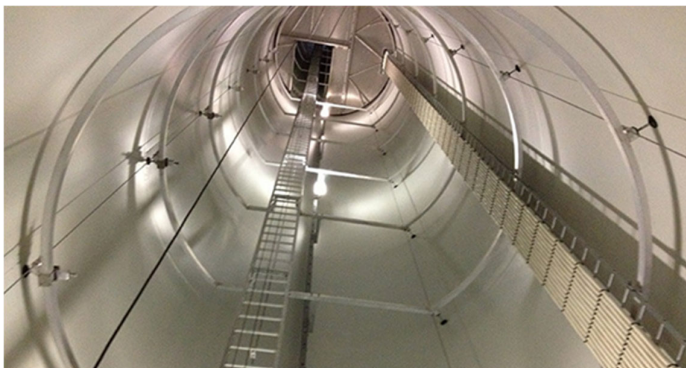
Cables are important internal wind tower components. They transport the electricity generated by the turbines to the grid and supply the needed electricity for wind turbine tower internal lights and other components. There are also control and data cables inside the towers that monitor turbine operation online.

Other infrastructure components for turbine towers include tower door, stairway, tower inner platforms, lift, etc.

The tower door is set above ground level and the entrance stairway is the only tower infrastructure that is placed on the outside.

Inside the tower's aluminium platforms have been installed providing workers with a safe place to prepare their working equipment and have a rest when climbing up towers for inspection and maintenance. Turbine towers ladders are set up on the inside giving access to each platform level and to the nacelle, hub, and blades.

The turbine towers being used at Bango Wind Farm also have an internal lift that goes from the platform where the entrance door is, up to the nacelle.



FAQs

- **What is a wind turbine made of?**

The towers are mostly tubular and made of steel, generally painted light grey or white. The blades are made of fibreglass, reinforced polyester or wood-epoxy. They are light grey because it is inconspicuous under most lighting conditions. The finish is matt, to reduce reflected light.

- **Can wind turbine towers be made from something other than steel?**

The use of lighter materials in the tower could greatly reduce the overall transport and construction cost of turbines, however safety and stability must be maintained.

Wood is being investigated as a material for wind turbine towers, and a 100-metre-tall tower supporting a 1.5 MW turbine has been erected in Germany. The wood tower shares the same transportation benefits of the segmented steel shell tower, but without the steel resource consumption.

- **Are there any wastes from the wind turbines and if so, how are these managed?**

Turbines require small amounts of lubricating oils, grease, hydraulic and insulating fluids (within electrical transformers). When spent, these materials are handled and managed in accordance with hazardous materials and solid waste regulations. Lubrication oils are returned to the suppliers for recycling. Otherwise, properly maintained wind projects do not produce hazardous waste nor emit radiation, particulate matter, or greenhouse gases.

- **Why don't we put all wind turbines out to sea?**

At present, onshore wind is more economical than development offshore. Furthermore, offshore wind farms take longer to develop, as the sea is inherently a more hostile environment. To expect offshore to be the only form of wind generation allowed would therefore be to condemn us to miss our renewable energy targets and commitment to tackle climate change.

However, in the coming years, as offshore turbines are manufactured on a larger scale, prices will come down, making offshore wind energy increasingly competitive.

- **How will issues such as fire, weeds and pest animals be managed during the life of the Project?**

Land management issues such as fire, weeds and pest animals will be managed in accordance with Federal, State and Local Government laws and applicable land management practices specifically prepared for the Project.

Tuppence the Orphan Turbine

Chapter 4 – Meeting Topsy

Next morning, the kids, Tuppence and Jac eagerly awaited the return of Willy and Mick with Topsy Turbo.

"I hope she is still coming" said Ali.

"I hope that Mick is alright" said Lenny.

"He will be" said Tuppence. "Willy will look after him. Remember, no turbine wants to hurt any creature".



Bryan had brought with him the old binoculars that his Grandfather had given him and was scanning the sky looking for Mick, Willy and a wind turbine.

"There they are!" he said excitedly.

"Where, where?" chorused Ali, Lenny & Tuppence as they all stood up to look. "Woof, woof" of course was Jac.

"Over there!" said Bryan pointing way off to the west "and Mick is riding on Topsy's head, behind her blades".

Soon Willy had Topsy (with Mick still on her head) hovering over where the others were waiting. He gently placed Topsy down facing Tuppence.

Topsy was a bit taller than Tuppence, at least a metre taller, so even Tuppence had to look upwards to see Topsy's face.

"Thank you for that lovely ride Willy," said Topsy very politely.... she was a very polite turbine. "I enjoyed it very much – and I enjoyed your company too, Mick. Thank you for being with me on this ride".

Then she turned to the group and said (politely) "good morning, I am Topsy Turbo and I have come to see what I can do to help find out what happened to Tuppence's wind farm friends".

"You must be Tuppence" she said bowing nicely to Tuppence. "And you must be Ali, Bryan and Lenny. Oh, and I mustn't forget Jac!"

"Good morning" said the three kids just as politely, "we are pleased to meet you Topsy". "Woof, woof" was the polite response from Jac.

Tuppence just sat down and cried. This worried Topsy, Willy, the three kids and the animals.

"Boo – whoosh – hoo – whoosh – hoo – woosh – sniff," sobbed Tuppence. "Please don't worry". Sniff, sniff.

"I am crying because I am so very happy to meet Topsy! Thank you Topsy for coming all this way to try and help me".

Topsy sat down next to Tuppence and put one of her blades around Tuppence. "Don't cry. I am happy to be here and will do my best to help you" she said.

"Sob – whoosh – sniff – sniff. Thank you", said Tuppence.

"Why don't we all sit down so I can tell you about my adventure with Wild Willy Wind" said Topsy.

"Wild Willy Wind certainly knows all about wind turbines", Topsy said to the kids and Tuppence when she finished her story. "Maybe because that's his real job, helping turbine blades to spin and make electricity."

"That must have been an exciting trip with Wild Willy Wind", said Tuppence. "But did you see any of my old wind farm friends? Did you see where they are now?"

"I am sorry Tuppence" said Topsy. "I wasn't really looking for retired wind turbines on that journey."

"Perhaps when we know more about wind farms, we might be able to ask Willy to help us search for them" she added.

"That's a good idea" said Ali.

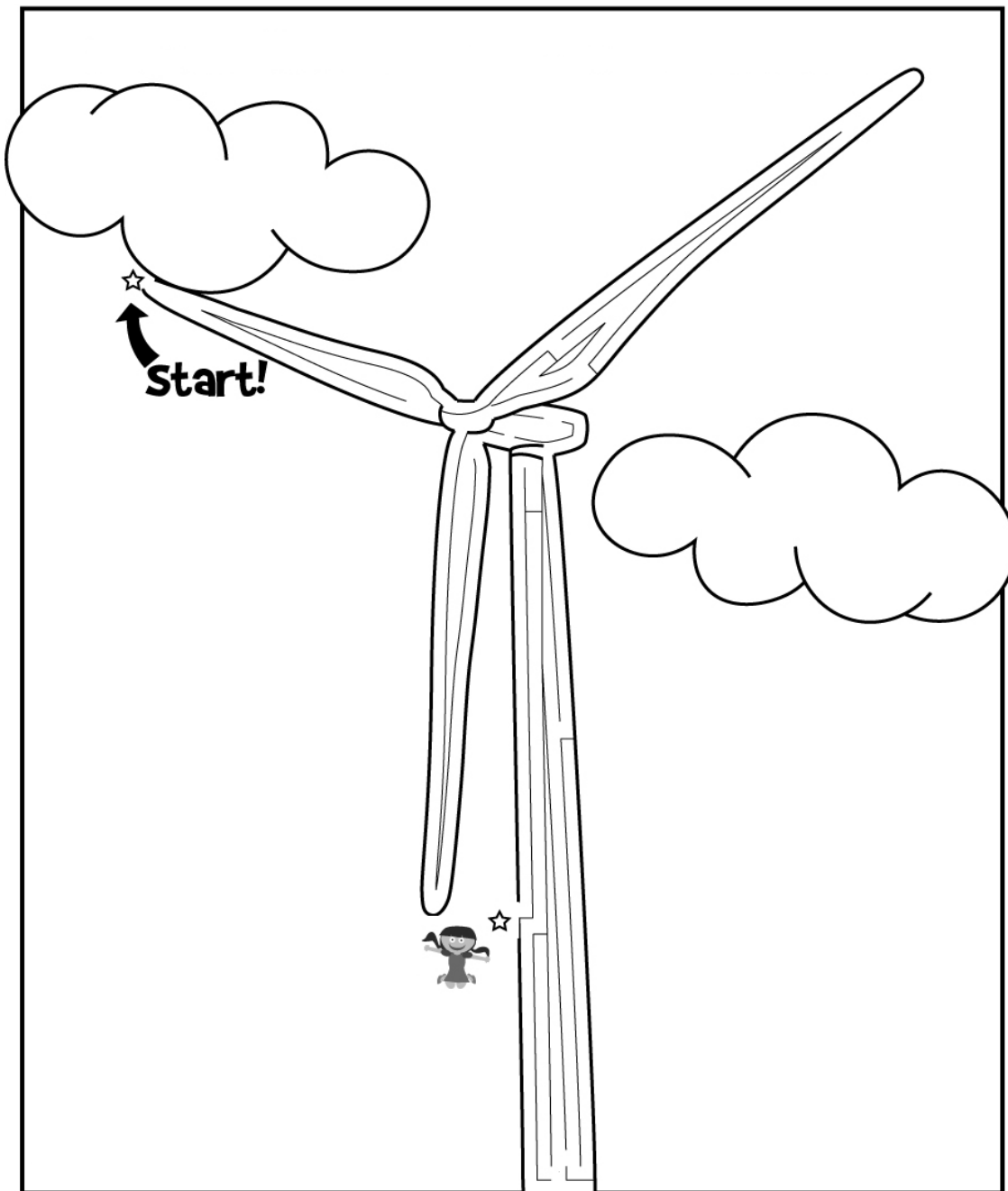
"Yes, but did you know that the history of windmills is much older than that?" asked Lenny. "We have been researching them and it is very interesting. I think we need to understand all of this much more before we can find Tuppence's friends".

"Let's go into the history of windmills and how they turned into wind turbines" said Bryan.

After lunch of sandwiches and fruit, they all settled down to look at the history of windmills.

For the Kids

Follow the maze then colour in the picture.



CONTACT US

Jonathan Post – Project Manager

Phone: 1300 634 865

Email: info@bangowindfarm.com.au

PO Box 1858, Canberra ACT 2601

cwprenewables.com