WHO IS SPARK RENEWABLES?

SPARK RENEWABLES

Spark Renewables is a leading developer and long-term owner of renewable energy generation. Our portfolio comprises the 100MW operational Bomen Solar Farm near Wagga Wagga as well as an extensive development portfolio of wind, solar and storage projects in Australia. Spark Renewables is owned by the Spark Infrastructure Group. Spark Infrastructure is an owner of essential energy infrastructure, including generation, transmission and distribution infrastructure across Australia. Visit our website at www.sparkrenewables.com.

CLEAN ENERGY COUNCIL MEMBER

Spark Renewables is a member of the Clean Energy Council (CEC) and a signatory to the CEC's Best Practice Charter for Renewable Energy Developments.

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Umwelt Environmental and Social Consultants has been engaged by Spark Renewables to develop the Environmental Impact Statement (EIS) and Social Impact Assessment (SIA) for the proposed project. Umwelt is an Australian consultancy with experienced environmental and social impact practitioners that are well-known for leading environmental and social practice across Australia. Umwelt will be consulting the community alongside Spark Renewables to inform the EIS and SIA.

Wattle Creek Energy Hub

Project overview

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Proposed hybrid renewable energy facility to be located on the 'Arthursleigh' property owned by the University of Sydney, approximately 12km north-east of Marulan.

Generation equivalent to powering ~170,000 NSW homes per year.

Offsetting the emission of 950,000 tonnes of greenhouse gases per year.

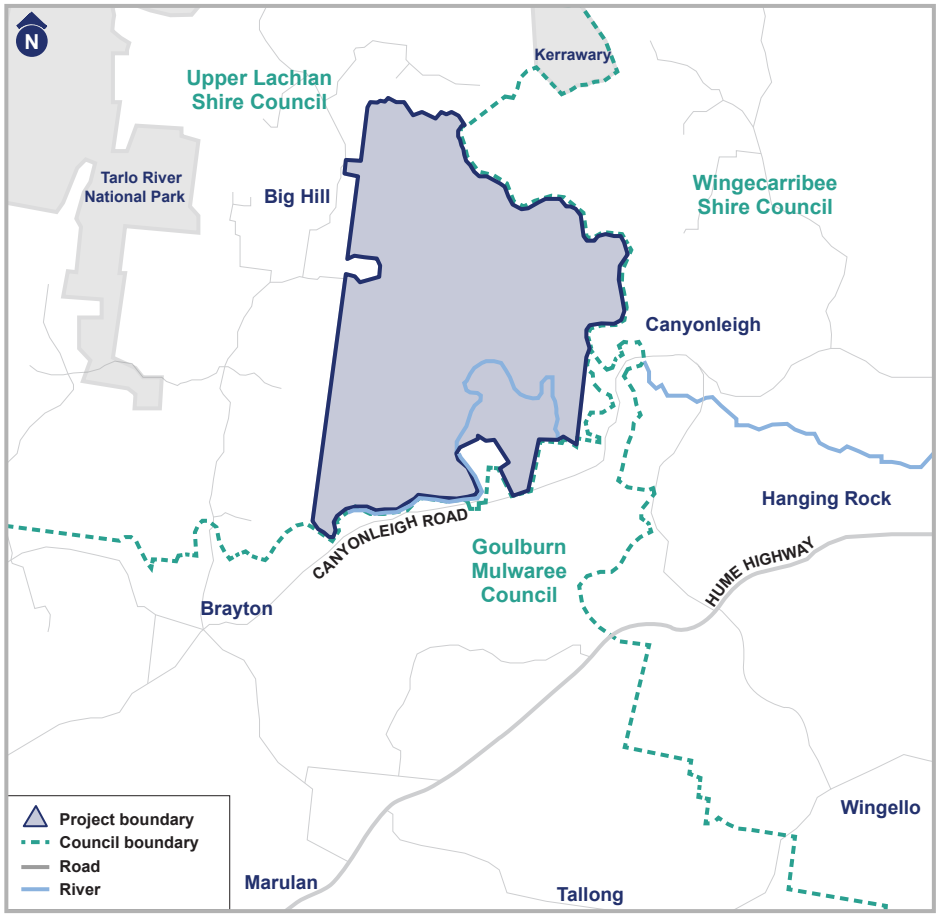
~300 construction jobs and ~10 direct ongoing jobs through operations.

What is being proposed?

WIND TURBINES
Up to 34 wind turbine generators spaced 500-1000 meters apart, connected via underground cables.

SOLAR
Photovoltaic (PV) panels mounted on single axis trackers that slowly rotate and follow the sun from east to west each day.

BATTERY
A containerised battery energy storage system.



Why has this site been chosen?

- The proposed site is strategically located to take advantage of local wind conditions, local solar resource and its location relative to the existing electricity transmission network, with a proposed connection to the Marulan Substation.
- The property is owned by the University of Sydney after being bequeathed in 1979.
- The land is operated commercially and is used for a range of research initiatives including agricultural science, pasture agronomy and unmanned aerial vehicle applications.
- Agricultural land use will continue with the operation of the project, with sheep grazing within the wind and solar farm areas.

WHAT ASSESSMENTS ARE REQUIRED?

Wattle Creek Energy Hub Project

- The project is considered **State Significant Development** and will require development consent from the NSW Department of Planning and Environment (DPE) under the *NSW Environmental Planning and Assessment Act* (EP&A Act).
- Three Development Applications (DAs) are proposed to be submitted, one for each component of the proposed project; wind, solar and BESS, which would be accompanied by detailed **Environmental Impact Statements** (EISs), and would include comprehensive assessments identifying the potential impacts of the Project and how to best manage these impacts.
- A detailed **Social Impact Assessment** (SIA) will be prepared for each component of the Project as part of the EISs. The SIAs will include a comprehensive community engagement program and be prepared following DPE SIA Guideline (2021) and *Undertaking Engagement Guidelines for State Significant Projects* (2021).
- The project may also require approval under the Federal *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act).

Scoping Report - first step in the development application process

- A Scoping report provides an outline of the proposed project and identifies important issues that will require further technical studies, assessment and consultation, and is a formal request to the DPE to issue Secretary's Environmental Assessment Requirements (SEARs).

Studies to be undertaken as part of the Environmental Impact Statement

- Noise and vibration
- Social impact assessment
- Visual amenity
- Shadow flicker
- Biodiversity
- Aboriginal heritage
- European heritage
- Traffic and access
- Contamination
- Flooding and hydrology
- Soils
- Bushfire
- Waste
- Aviation
- Electromagnetic interference
- Land use
- Cumulative impacts

Planning process

Proposal announcement
Project announced to industry, government and community

We are here

Scoping report
Community consultation and preliminary technical studies undertaken

SEARs issued
Secretary's Environmental Assessment Requirements

EIS and SIA preparation
Community engagement and technical studies to inform the EIS and SIA

EIS submission and exhibition
Public exhibition for agency and community comment

Response to submissions
Addressing comments and issues raised about the EIS in a Response to Submissions report

Assessing the proposal
Assessment and recommendation by the Department of Planning & Environment

Determination of the proposal
The Minister for Planning or the Independent Planning Commission decides the proposal

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COMMUNITY & ENGAGEMENT

Community engagement

Spark Renewables is committed to undertaking extensive community consultation to enable all stakeholders to provide feedback on the proposal and identify issues that should be considered through the development process.

Stakeholders and the community will have multiple opportunities to input into the Social Impact Assessment via two rounds of community consultation, and through continuous, ongoing processes with Spark Renewables. Stakeholders will also have opportunities to provide feedback at various stages of the assessment process.

We encourage all stakeholders and community members to be involved in this process.

Stakeholders to be consulted

Community benefits

There will be a range of opportunities for the regional community hosting the Wattle Creek Energy Hub to benefit, including a community fund, neighbour benefit fund, and opportunities to provide goods and services for the construction and operational phases should the project proceed.

Spark Renewables is looking to work with the community to co-design a program that meets the unique needs of the wider community, and delivers long-lasting social, economic and environmental benefits for decades to come.

We are keen to hear any ideas from community members as the community benefit scheme is developed. If you wish to have a chat or organise a time to meet, please contact us via email at info@wattlecreekenergyhub.com or call 1300 271 419.

Construction and operation

Focus on engaging Aboriginal people and businesses to support the project construction and operation.

Committed to engaging with local workers and services wherever possible and will set targets to measure our achievement of this.

Committed to protecting human rights, responsible sourcing of materials, and upholding high ethical standards in our working practices. We do not tolerate forced labour within our business or our supply chains and have systems and processes in place to address risks.

How to get involved

Stay informed by signing up to our newsletters at the project website **www.wattlecreekenergyhub.com**

Need more information? Ask us about having a one-on-one meeting or call

E: info@wattlecreekenergyhub.com
P: 1300 271 419

facebook.com/wattlecreekenergyhub

Consultation

Consulting with the community is in early stages and will inform the Environmental Impact Statement

Scan to provide feedback via survey or go to

www.surveymonkey.com/r/Wattle-Creek-Energy-Hub-SIA

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WIND FARM TECHNOLOGY

- Wind farms are a sustainable form of electricity generation.
- Wind turbines occupy a relatively small land footprint, occupying around 2% of the total land area.
- Farming practices including cropping and grazing can continue largely unaffected when operational.

Wind turbine generators

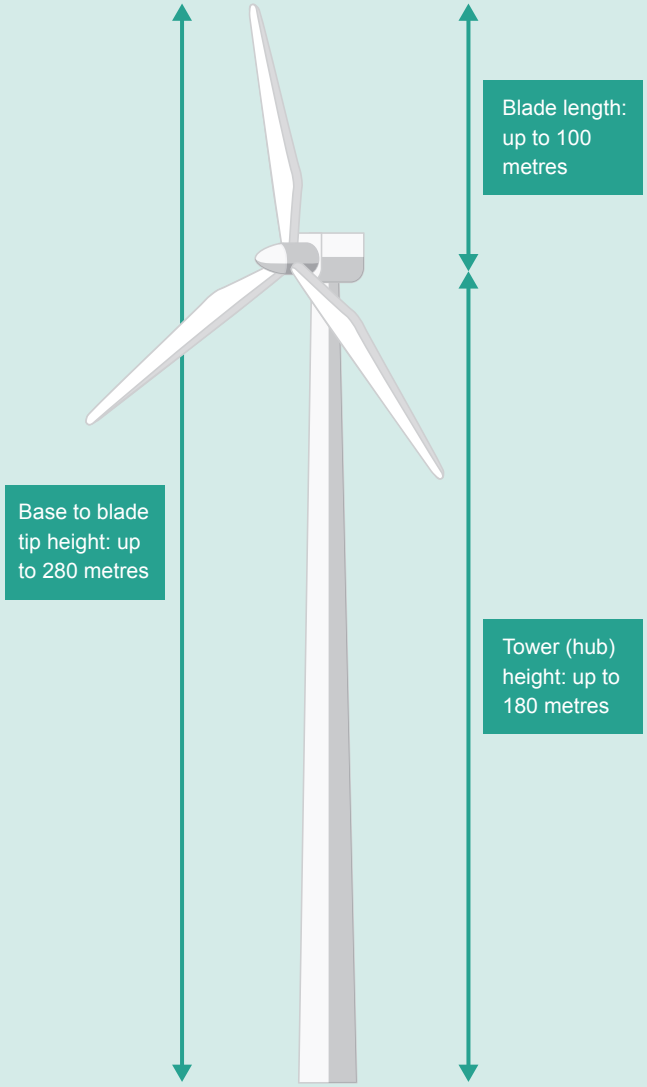
POWER

Modern wind turbines are around 6-7 megawatts (MW) each. A single turbine produces enough electricity to power the equivalent of ~3,000 homes.

EMISSIONS

Each wind turbine abates ~13,000 tonnes of CO_2 equivalent greenhouse emissions.

Approximate wind turbine height



Ancillary infrastructure - indicative dimensions

Crane hardstands	Footprint of 90 by 60 metres
Internal roads & drainage	Footprint of 10 metres wide
Substations	Footprint of 200 by 200 metres
Operations & maintenance	Footprint of 200 by 200 metres
Typical depth of underground cabling	0.9 metres
Met masts	125-180 metres

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SOCIAL IMPACT ASSESSMENT

A key component of the assessment of the Project will be a Social Impact Assessment which will be conducted by Umwelt Environmental and Social Consultants.

Social impacts are the potential effects that people experience when a new project brings change to their lives.

Conducting a Social Impact Assessment places **people at the centre** – to understand impacts from the perspectives of key stakeholders.

Types of social impacts

The SIA process

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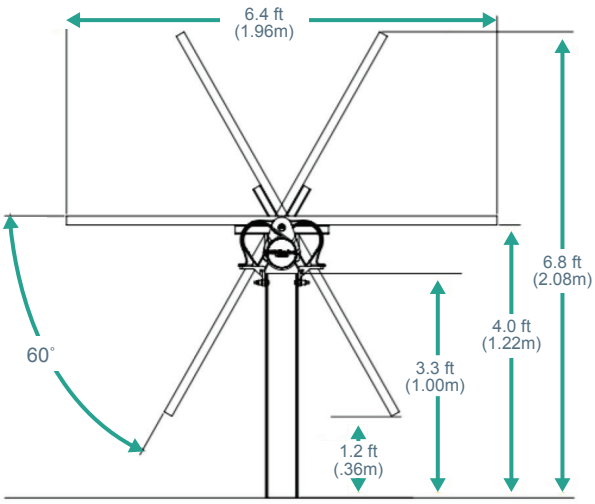
SOLAR FARM TECHNOLOGY

- Australia has the highest average solar radiation per square metre of any continent in the world which makes it an attractive location for solar energy development.
- Solar farms use solar photovoltaic technology that converts sunlight directly into electricity using a system known as a semiconductor cell or solar PV cell.
- Areas associated with solar within the Project area will operate as an agrisolar system, through the integration of grazing during operation and agricultural rehabilitation following decommissioning.

Panels	~200,000 bifacial modules (~600 watts each) which are ~2 by 1 metres in size.
Panel mounting	Single axis trackers ~90 metres long and 80-90 modules per tracker.
Inverters	Containerised power conversion stations to convert direct current (DC) to alternating (AC) power.
Materials	Responsibly chosen low-impact materials and environmentally safe maintenance.

Approximate tracker directions



BATTERY TECHNOLOGY

Battery Energy Storage System (BESS)

CHEMISTRY

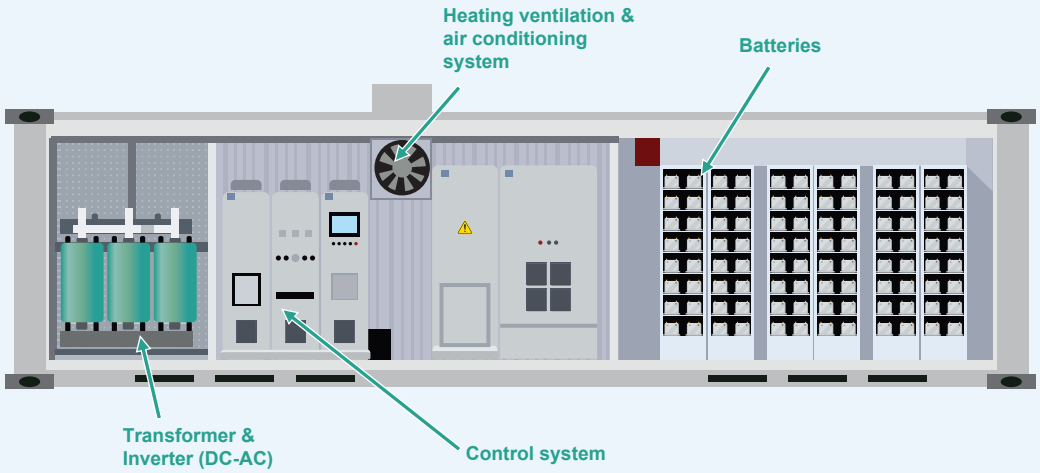
Lithium-ion or similar.

DIMENSIONS

Either 40-foot containers in a purpose-built compound or smaller DC coupled units distributed within the wind farm.

PURPOSE

- Provides firm generation 'on demand' for the electricity grid, aswell as a range of network services such as voltage support.
- Store excess electricity from the solar panels when the wind is blowing and then would distribute to the electricity grid when demand is at its highest.



Battery packs (smaller units) and containerised battery design

FIRE HAZARDS & RISK MITIGATION

Integrated within the battery design will be an Asset Protection Zone serving as a fire break, as well as a heating, ventilation and air conditioning system.

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RESEARCH PARTNERSHIP

As part of the project proposal, a research collaboration will be set up between Spark Renewables and the University of Sydney with a fund for research initiatives focused on supporting the energy transition. Research initiatives will be in line with the Office of the NSW Chief Scientist & Engineers 20 year Research and Development road map titled: *Shaping the future of NSW in science and technology* (May 2022).

This will include the development of a new Research Facility (or 'Testbed') which could be used to test innovative technologies such as Gelion batteries, a company of the University of Sydney.

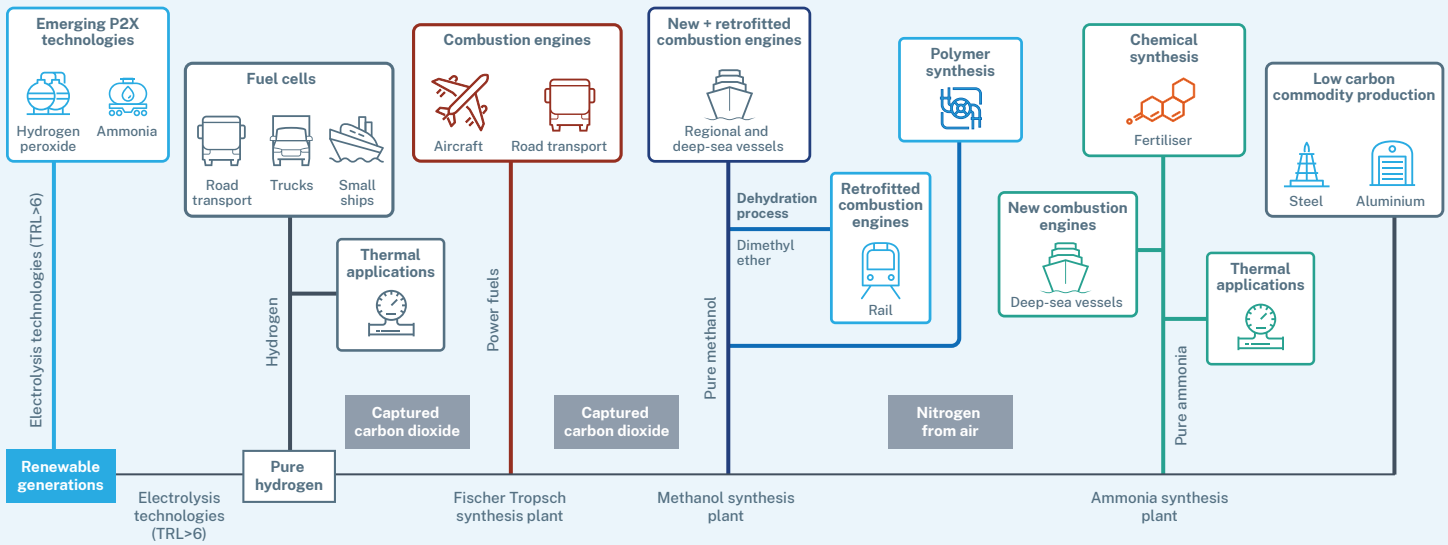
THE FACILITY WILL INCLUDE:

- A 2-acre (8,000m^2) hardstand area.
- 200kVa power supply and 100kVA dummy load.

The exact research initiatives are yet to be determined but could include:

- **ENERGY STORAGE** - storage of energy for later use to mitigate imbalances between energy demand and supply.
- **ENERGY EFFICIENCY AND OPTIMISATION** - systems to optimise energy generation, transmission, storage, and consumption e.g. demand response and control, virtual power plants, smart appliances and meters, digital energy management and trading.
- **SUSTAINABLE FUELS** - power fuels produced from sustainable feedstocks and renewable energy e.g., biofuels, green hydrogen, synthetic fuels produced from renewable energy and sustainable or waste feedstocks.
- **POWER TO X (P2X)** – P2X is an umbrella term for technologies and processes producing green power fuels and clean chemicals using renewable energy and sustainable materials. P2X products include green hydrogen, ammonia, synthetic hydrocarbons such as methane, methanol and aviation fuels.
- **ELECTRIFICATION** - energy from electricity replacing other direct power sources, especially fossil fuels e.g., electric engines, heat pumps.
- **SMART GRIDS** - advanced electricity grids and localised power systems, especially decentralised grids with advanced control, automation and other digital technologies e.g., smart grids, microgrids, stand-alone power systems that have advanced control and monitoring systems.
- **AG TECH** - use of advanced technologies in agriculture e.g., automated farm equipment, AI-assisted remote sensing, in-field disease testing, real-time soil monitoring, weed control.

Pathways to unlock sector coupling and allowing deep-rooted decarbonisation



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