Edify®

Smoky Creek & Guthrie's Gap Solar Power Station

Frequently Asked Questions

How does solar generation work?

When sunlight photons shine on a solar panel, they 'knock' electrons free in an electrical circuit (semi-conductor) and produce electricity. This electricity is initially generated as Direct Current (DC). Inverters then regulate the accumulation of electricity from a cluster or string of solar panels and convert this to Alternating Current (AC), delivering this AC power through the substation to the transmission network.

Regarding the solar module components, the angle-of-incidence for which the sunlight interacts with the panel is of high importance, as this determines the amount of energy that can be extracted or generated. This is why installing tracking systems helps increase energy generation.

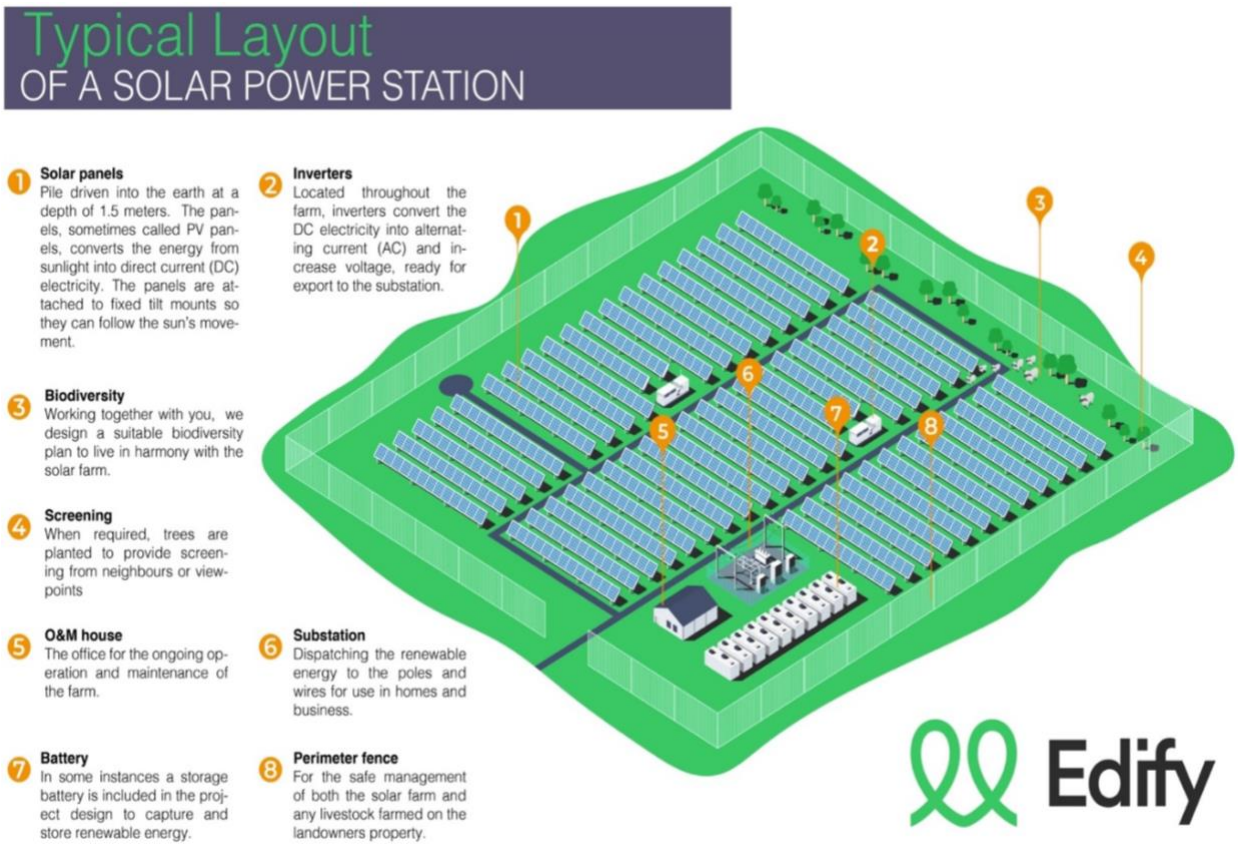


Figure 1. Indicative project

What is a solar power station?

Solar power station refers to projects that integrate solar and battery systems into the one project. The difference with traditional 'solar farms' is largely in the naming convention – however we purposefully distinguish our projects as 'solar power stations' due to the inclusion of the battery energy storage system, which assists in optimising the output of the solar farm. This combination represents the maximum value derived from the site.

Traditional solar farms typically do not include a battery system. Instead, solar farms only include the solar infrastructure needed to produce electricity, limiting their productivity to times when demand align with supply during daylight hours. Solar farms are an important contributor to Australia's energy mix, however they are

solely dependent on sunlight conditions and cannot generate electricity on-demand, nor after the sun goes down. They often do not maximise the use of the energy generated.

The solar modules utilised by these projects are the same as those used in residential solar photovoltaic installations. The main difference however is that utility-scale solar modules are mounted on systems that track the sun's movement across the sky.

By adding a large-scale battery, this enables the generator to dispatch electricity on-demand and can remove price spikes by creating a more stable market with reduced costs for consumers. The battery component supports the variability of solar generation by smoothing output. The battery component also interfaces with the transmission network via a digital inverter, which enables the project to support the grid's frequency, in the event of a disruption to the network.

The project's inverters have a response time within 200 - 300 milliseconds, which is incredibly fast and accurate when compared to traditional power plants. By integrating both solar and battery facilities into one project, solar power stations achieve a balanced power and frequency and allows the operator to control exactly when energy is sent into the grid to ensure sufficient generation is available when it's most needed.

Finally, the battery can also provide an alternative solution to simply building more poles and wires. Transmission network augmentation may be deferred as this project has the ability to support Queensland's network congestion. Batteries and other 'non-network solutions' can create savings for network owners, government and most importantly, household consumers.

Edify has broad experience in financing, constructing and operating solar and energy storage projects. This proven track record is reflected in the suppliers and components that we procure for our projects, which totals almost $2.0 billion of renewable energy investments in Australia.

All components are procured from premium, tier-1 providers, supported by long term warranty periods and performance guarantees. This product and performance guarantee is important to us, since Edify also acts as the Asset Manager throughout the multi-decade life of the solar power station.

What are the stages of building a solar power station, and what can you expect from each stage?

Each new project can vary slightly, but typically there are 3 distinct stages in building a solar power station:

1.Development

2. Construction

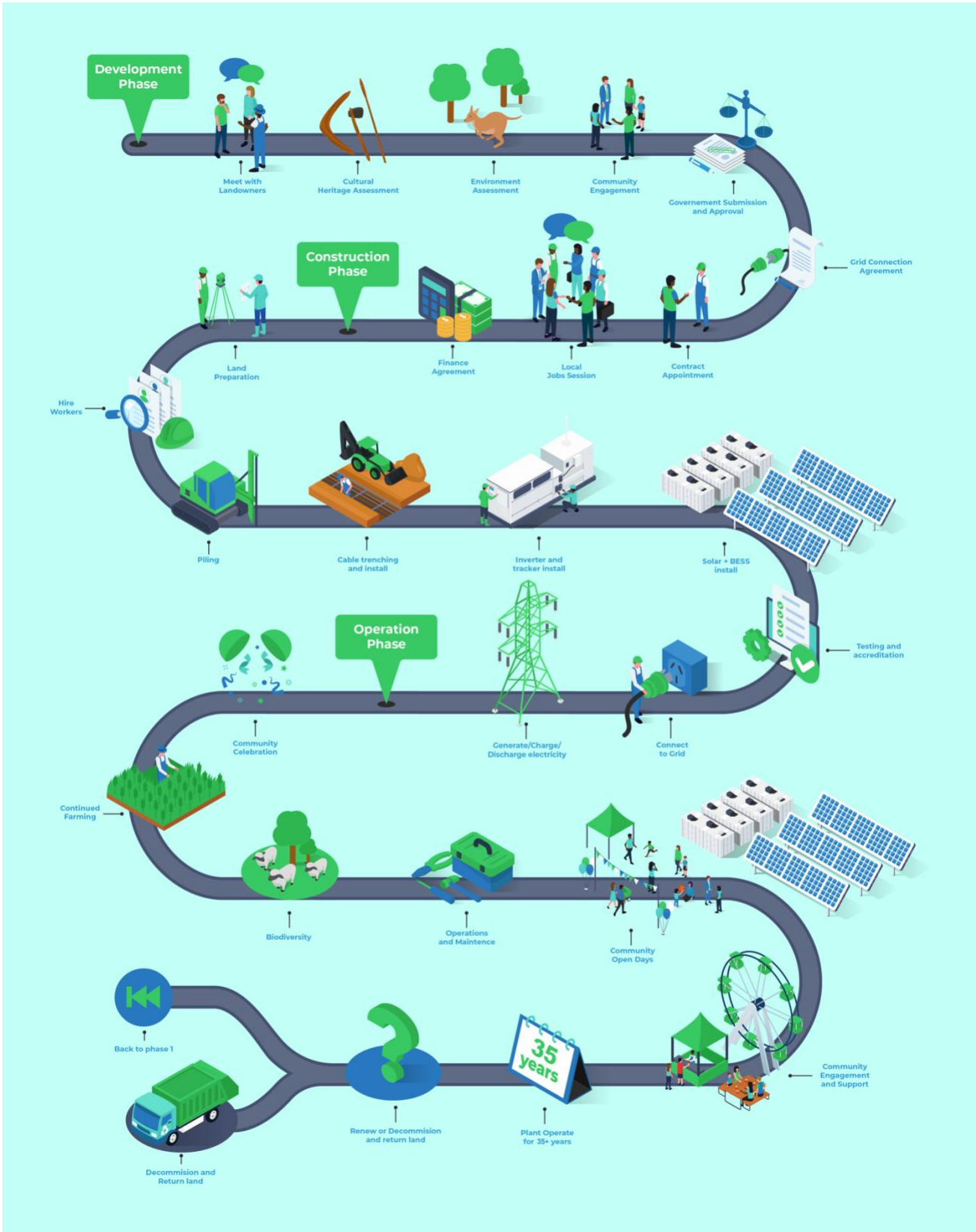
3. Operation.

Development is the preparation phase where we explore, assess and initiate the plan and partnerships, which carry the project through.

The construction phase is boots on the ground. There is a lot of activity on site through this stage with machinery, hardware and local workers all closely managed by the construction team.

Flicking the switch and creating renewable energy is the operation phase – our favourite part of the process.

Importantly, the solar power station lives within a working farm and a local community. Over the next 35 years, the solar power station will contribute not only renewable energy to families and business across the region, it will also give back to landowners, livestock and the broader community.


Development Phase
Meet with Landowners
Cultural Heritage Assessment
Environment Assessment
Community Engagement
Governement Submission and Approval
Grid Connection Agreement
Construction Phase
Land Preparation
Finance Agreement
Local Jobs Session
Contract Appointment
Hire Workers
Piling
Cable trenching and install
Inverter and tracker install
Solar + BESS install
Testing and accreditation
Operation Phase
Community Celebration
Generate/Charge/ Discharge electricity
Connect to Grid
Continued Farming
Biodiversity
Operations and Maintence
Community Open Days
Community Engagement and Support
35 years
Plant Operate for 35+ years
Renew or Decommision and return land
Back to phase 1
Decommision and Return land

What is 'Agri-solar'?

'AgriSolar' incorporates agriculture (e.g. sheep grazing) that is co-located within the solar generating infrastructure. The favoured sheep breeds to co-locate with renewable energy infrastructure are dorper and merino sheep, which have successfully proven to graze within the solar and energy storage infrastructure.

Sheep grazing can contribute to the agricultural sustainability of the host land. The incorporation of sheep grazing can expand the sheep grazing industry in the region, which will result in direct and indirect economic benefits through the grazing itself, farm jobs and growth in the production of sheep meat or wool.

The sheep grazing within the solar and energy storage infrastructure also benefit from the solar power station activity. Existing projects of this nature have seen:

- The sheep growth rate and fertility should be higher under the solar panels compared to the direct sunlight, due to the abundant shade and lower temperatures
- The shading effect of solar panels creates a micro-climate under the panels with differences in air temperature, humidity, wind speed and soil moisture. This leads to higher water efficiency and soil moisture retention which will help with pasture production for the sheep
- Increased sheep stock and health will ensure a better product for farmers, resulting in lower mortality rates and increased profit potential. The benefits will follow on through to butchers and customers who can sell and experience quality meat; and
- Controlled grazing of the sheep will reduce the risk of fire and reduce the cost of slashing, which in turn lowers the operational cost of the project and supports the provision of low-cost electricity supply.

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Edify has proven experience in the integration or large-scale batteries into the Australian electricity network, owning and operating Australia's first solar plus sheep grazing plus battery project. Edify's Gannawarra solar and battery project is located in regional Victoria, Kerang (see Figure 2).

Figure 2. Edify's Solar and Battery project in Kerang, VIC

How long does it take to build a solar power station?

The construction timeframe depends on the project size and the number of workers deployed on site. For a 200 MW power plant, an 18-month timeframe is typical, with a peak construction period of 5 to 6 months. Following the construction of the solar and battery infrastructure, there will be an additional period of time required for rehabilitation of groundcover in the areas not covered by the operational footprint.

Smoky Creek & Guthrie's Gap is likely to be a combined 600MW or more power station, and as such may require at least a 2-year construction timeframe. Peak construction could be an 8 to 9 month period.

What is the life cycle of a solar power station project?

A project will typically operate for more than 30 years. Tier 1 solar panels that will be procured for the project generally come with a 25-year manufacturer's warranty. Depending on the local environment, they can generate electricity for more than 30 years with only about 0.4% efficiency loss each year. It is anticipated that Smoky Creek & Guthrie's Gap Solar Power Station will operate for at least 35 years, with potential to extend.

How long will the batteries last?

The battery's lifespan is dictated by the usage and frequency of cycles (charge / discharge). Tier 1 suppliers are able to provide a performance guarantee that will warrant the performance of the battery cells for 20-25 years. Edify's battery procurement contracts include an agreed 'degradation rate', which provides certainty over the long-term performance of the battery cells and cycling frequency.

The ambient and operational temperature of the battery system is a key factor that has impacts upon the overall life of the battery cell. The battery systems used will have protection systems which will constantly measure the temperature of the cells and will disconnect the batteries in the case of abnormal operation.

With solar panels having a longer operational life than battery cells, we will typically look to repower the battery cells at about the half-way point in the project's operational phase to continue accessing the benefits of the battery system.

What is the maximum height of a solar panel when mounted on a tracking system?

The maximum height of the solar panel occurs when the tracking system is tilted at sunrise and sunset. This height is approximately 4.2m tall. Generally speaking, solar panels have a dimension of 1m x 2m. Rows of solar panels are usually 30, 60 or 90 metres long. And rows of panels are separated by 5 to 7 metres. However, this varies from project to project.

Will the solar panels generate glare?

All tier 1 solar modules are coated with an Anti-Reflective material, which is why solar systems are commonplace across most major airports in Australia.

Improved manufacturing techniques on tier 1 panels include Anti-Reflective (AR) coatings on solar panels to increase the amount of energy converted by the panels from sunlight. In addition, by minimising reflective losses from (or trapping more light within) solar panels, their performance can be increased while costs are lowered.

A useful way to represent this is by calculating Fresnel's equation, which predicts that roughly 4% of sunlight is reflected off the panel at normal incidence (i.e. when the sun's rays make an angle of 90°). Because every photon makes a difference in the efficiency electricity generation, significant investment has been made in AR coatings. AR coating can reduce the normal incidence reflectance to less than 1%.

The AR coating performance directly translates to increased power and energy output, which is designed to achieve greater than 99% transmittance. This coating is applied as a spray process integrated into the panel manufacturing process. Because of these anti-reflective innovations, solar panel installations are now commonly found in airports around the world where any issue of glare would be highly scrutinised. For example, the Melbourne Airport represents the largest solar installation at any Australian airport, consisting of solar modules that span an area nine times the size of the Melbourne Cricket Ground. The Brisbane airport includes 22,000 solar panels, whilst the Adelaide airport also has 5,000 solar panels with a capacity of 1.28 MW on the roof of the terminal and carpark. From a regional QLD perspective, the Mt Isa airport has 820 panels with a capacity of 258 kW on the roof of the terminal. Finally, the upcoming Western Sydney Airport is also considering significant solar investments to help contribute towards electricity demands and lower greenhouse gas emissions. All of these installations have been undertaken by stakeholders that are highly cognisant of risks, such as glare and other safety related concerns.

Where is the site and what route will large vehicles utilise?

The Smoky Creek & Guthrie's Gap Solar Power Stations are proposed to have an anticipated combined capacity across both solar and battery of 600MW or more. The project's main delivery and access point will be established via Tomlins Road and Dodson's Road, via the Burnett Highway.

Edify's consultants have engaged with Banana Shire Council and Department of Transport and Main Roads to determine which local roads and / or intersections may require upgrades to accommodate the transport of materials to site. The project will seek to upgrade roads or intersections utilised for construction purposes, in consultation with Council and the Department of Transport and Main Roads.

Do solar power stations projects benefit the Australian / local economy?

Each project benefits the local community by creating employment, utilising local services and by increasing the long-term assets and investments that generate opportunities for decades to come. At Edify's Darlington Point Solar and Battery project, approximately 350 people were employed locally during the construction phase and five are employed locally in full-time positions during operations, as well as ongoing indirect employment (e.g. ground, fencing and building maintenance, engineering, Control Centre for 24hr monitoring, project management, vegetation control, calibration services, cleaning services, etc.).

Edify's Local Participation Plan provides opportunities for local contractors to submit tenders and local jobseekers to seek employment by hosting a series of 'Contractor Information Sessions' in the local area and online, prior to any construction commencing. In addition, Edify establishes a community fund with the local council for each solar power station, which is designed to support community group projects. Media reports also indicate that some drought-stricken farmers are turning to renewable energy contracts as a way of earning additional income and future-proofing their enterprises against increasingly unpredictable climates.

How much do renewables cost compared with other energy sources?

Renewable energy projects are now the cheapest sources of new energy generation in Australia. Solar energy projects produce energy at less than $58 per megawatt hour. The costs of other sources of generation are:[1]

- Existing black coal: approximately $60 per megawatt hour
- New black coal: approximately $133 per megawatt hour
- Existing Combined Cycle Gas Turbine (CCGT): approximately $115 per megawatt hour
- New CCGT: approximately $160 per megawatt hour

[1] New plants based on average of 2024 low and high LCOE values from CSIRO's GenCost 2024-25 Consultation Draft Report

Edify also pays for any electrical transmission upgrades that are necessary to connect and operate the project in the electricity grid. This includes construction and maintenance costs for the life of the project.

Do solar power station projects result in a decrease in electricity prices?

Solar energy forms just one part of the Australian Energy Market Operator's (AEMO) move towards a sustainable energy system. Solar power stations supported by battery energy storage systems add to the supply side of the electricity supply / demand equation, which puts downward pressure on all electricity bills.

The Australian Energy Market Operator provides excellent guidance for Australia's anticipated energy mix, particularly since AEMO is tasked with managing Australia's energy transition, balance the power system and orchestrate the cheapest mix of electricity generators across every minute of the day[2].

Which regulatory agency is responsible for assessing the project's Development Application?

The main regulator for Smoky Creek & Guthrie's Gap Solar Power Station is within the Banana Shire Council and, as the project is classified as an Impact Assessment for Material Change of Use for a renewable facility, the assessment involved concurrence with the QLD Department of State Development, Infrastructure, Local Government and Planning (DSDILGP). All Edify projects meet strict Local, State and Federal Government regulations and policies, and are assessed under these regulations and policies. We work closely with all levels of government to ensure we meet all legal requirements and exceed these requirements wherever possible.

Should I expect the value of my near-by property to decrease due to the project's development?

Some neighbours have questioned what impacts a development of renewable (primarily wind) projects will have on the value of their neighbouring property. Edify is cognisant that for most households, their home is their primary asset, which in turn means that any factor which may affect its value is significant and important to understand. Accordingly, Edify takes concerns regarding property values very seriously.

After delivering nine projects throughout Queensland and Australia, including the first combined solar plus battery project in Victoria, Edify is not aware of any reliable research or evidence which establishes a correlation between declining real estate values and proximity to renewable infrastructure.

The most recent and relevant study carried out in Australia that Edify is aware of was commissioned by the NSW Office of Environment and Heritage and published by planning consultancy Urbis in July 2016[3]. This report comprised an analysis of available sales data and a 'literature review' of Australian and international studies. An example of the literature review includes a 2009 report prepared for the NSW Valuer General's office. Its conclusions are most easily understood when divided into 'agricultural' and 'lifestyle' land. The report recognises that property values are influenced by a range of factors and it is therefore difficult to determine if solar power stations (or other similar infrastructure) can cause land values on neighbouring agriculture properties to increase or decrease.

In summary, it is not expected that Smoky Creek & Guthrie's Gap Solar Power Station would affect the values of neighbouring agricultural properties.

What are the insurance implications for my nearby property or the broader community?

Edify will have its own insurance policies in place to provide coverage in the unlikely event that the solar power station equipment is damaged (i.e. fire, flood, etc), or in the event that our operations cause loss /

[2] AEMO (2024) Integrated System Plan: https://aemo.com.au/energy-systems/major-publications/integrated-system-plan-isp/2024-integrated-system-plan-isp

[3] https://epuron.com.au/documents/444/review_of_the_impact_of_wind_farms_on_property_values_urbis_2016_07_21.pdf

damage / injury to any third parties. These insurances will be placed with major, globally recognised insurance companies, and will provide a very high standard of cover in line with the expectations of our investors, financiers and various other counterparties to the project.

As a requirement of these policies and as a part of our overarching approach to proactive risk management, a project-specific Bush Fire Management Plan will consider both fire-risk mitigation, and detailed procedures to follow in the event of a fire on site (whether arising from within the site or from outside – e.g. an adjacent premises). We would also note that the project's design requires water to be kept on site for firefighting purposes. Further, the Environmental Management Plan will include obligations that prevent the spread of fire across the site (such as a detailed vegetation management plan and a buffer / asset protection zone along all boundaries of the project).

Edify understands the concern of adjoining landowners regarding potential damage to an Edify facility, however the important elements for consideration are:

- For an adjoining landowner to have any liability for fires that have spread from their property into the solar power station, it has to be demonstrated that the landowner was negligent in causing damage. In this regard, Edify's facilities are no different from any other – e.g. rural buildings, an adjacent commercial facility e.g. substation, abattoir, etc.
- The occurrence of a fire from a weather event (e.g. a lightning strike) that migrates from the neighbouring landowner's property to Edify's project property would be deemed a natural event and would not likely create a legal liability for the neighbouring landowner. Likewise, if there was a heavy rainfall event and water drained from an adjoining property into Edify's facility, this again would be considered a natural event. In any case, Edify would never seek to pursue a claim directly against an adjacent landowner's insurances – this is precisely what Edify's own insurance program is for. Any claim in respect of Edify's assets would be made against Edify's own insurers.
- An adjacent landowner would not be required to make any adjustment whatsoever to their own insurances – only the landowner whose property is being leased would need to do so. For adjacent landowners, it would only be in the event that your own insurers specifically asked about the land use of adjacent properties (which to our knowledge, major rural insurers are not doing) that this situation would need to be disclosed.

In summary, Edify has its own comprehensive insurance program which would respond to any claim in the event of loss or damage to the solar power station. Notwithstanding, Edify recommends that landholders on nearby properties continue to take all necessary precautions to prevent the ignition and spreading of fires, in the same way that they already do for the present land users.

Health & Culture

Is cultural heritage taken into consideration?

Edify recognises the Gaangalu Nation People (GNP) as the original custodians of the lands throughout Biloela and Mount Morgan areas. As such, we have established an agreement with the GNP to undertake the appropriate Aboriginal cultural heritage assessment as part of this project. A cultural heritage assessment forms part of the critical studies, as does consultation with the local Indigenous group to ensure cultural heritage is protected. This collaboration between Edify and the GNP will remain an ongoing commitment throughout the lifecycle of the project.

Are there any health risks associated with solar projects?

Solar panels are deployed on over 30% of Australian homes and have been deployed extensively for the past 10 to 15 years on homes in the world. The Smoky Creek & Guthrie's Gap Solar Power Station would use the same type of technology, with the exception that the project operates at a higher voltage and scale. High voltage infrastructure is an inherently risky undertaking, due to the complexity of operating national electricity networks. However, these risks are contained within the project boundary, where the project's staff are trained to perform and operate tasks in this work environment.

Is there any risk of chemical leaks from the solar PV modules?

Because PV panel materials are enclosed, and do not mix with water or vaporize into the air, there is little, if any, risk of chemical releases to the environment during normal use. The most common type of PV panel is made of tempered glass. These tier-1 modules with tempered glass pass hail tests and are regularly installed in extreme conditions.

Can solar projects produce noise that affects local residents?

Potentially sensitive equipment (inverters, substation, transformers and BESS) can create some noise emissions for the project. The noise emissions can become higher during high temperatures as the fan speeds for inverters and batteries increase, and if the wind speed and direction carry the noise direct to adjacent landholders this could create a nuisance. The project's design allows flexibility to situate potential noise emitting equipment as far away from neighbouring residences as possible, to allow the noise levels to dissipate to low levels that are typical for this regional setting during the adverse climatic conditions.

The project's construction will be during 'standard' working hours to limit nuisance noise to the surrounding landholders that could impact on health and wellbeing. Standard working hours would be Monday to Friday 7am to 6pm, and potentially Saturdays 8am to 1pm.

Will the project reduce air quality?

Monitoring of dust levels during construction is a basic requirement of each project. Dust generating activities are assessed during windy conditions and are stopped and rescheduled where adequate control of dust generation cannot be achieved. Visual observation of machinery is undertaken during site inspections in addition to daily pre-start checks which ensure all machinery has appropriate emission control devices, is in good working order and is maintained correctly. Trucks that spray water to suppress dust will be utilised when required – mostly likely on a daily basis – which will reduce the impact of dust from the various truck deliveries throughout the construction phase.

Environment

Do solar projects impact on flora and fauna?

Edify engages specialist consultants to undertake detailed flora and fauna surveys to determine the ecological attributes of the land. On all of our projects, we aim to minimise the impact on flora and fauna by designing projects to be constructed outside areas of high conservation significance and adopting control measures during the construction process.

Edify has selected Smoky Creek & Guthrie's Gap Solar Power Station, in part due to the lack of vegetation that is present on the development area today. Pre-existing patches of vegetation will be retained, while adopting other mitigation measures including preparing management plans and conducting pre-clearance surveys. Edify also consults with state and federal government departments of environment and biodiversity throughout the development, construction and operational stages of projects, as well as local non-government organisations.

Does solar or energy storage infrastructure affect farm / domestic animals?

Edify built and operates the Gannawarra solar and battery project in Victoria. This project is now host to around 500 merino sheep. This experience has proven that the sheep take a couple of days to get used to the site, and then are very comfortable with the solar and battery infrastructure. The sheep commonly use the shade from the solar arrays during summer to escape the harsh temperature and conditions.

Merino sheep, particularly wethers and merino-cross, are currently the most common breeds of sheep involved in solar grazing at Australian solar farms[4]. As a breed, the merino has a reputation for keeping its head down and not jumping on equipment. Dorpers have also been successfully grazed on Australian solar farms, despite a reputation for being livelier and are often chosen for solar grazing in the USA.

In relation to Smoky Creek & Guthrie's Gap, Edify will determine the suitability to co-locate with sheep grazing in later stages of the project.

How do you stop solar facilities from impacting our landscape?

Edify acknowledge that solar facilities may impact the visual amenity of the immediate surrounds, however we will work with communities to ensure our projects have the least possible detrimental impact on visual amenity. Edify encourages individuals and groups that have questions about visual impact and remedies to engage with us early. Overall, we consider that the immediate and long-term benefits which solar and energy storage projects bring to communities offset any loss of visual amenity.

For Smoky Creek & Guthrie's Gap, Edify has conducted a rigorous Landscape Visual Impact Assessment (LVIA) which considers potential visual impacts of the project infrastructure on the surrounds and nearest neighbours with a line of sight towards the project land. Project neighbours and Banana Shire Council were consulted through the preparation of the LVIA and vegetation screening buffers (or landscape screening) has been agreed to.

How does Edify manage solar panels after they are decommissioned and no longer in use?

Solar panels are manufactured using few components; predominantly aluminium, glass and silicon, and over 90-95% of a panel's weight can be recycled. These materials can be separated and captured, for reuse in the manufacture of other products. Edify is committed to Project Custodian responsibilities and intends to implement such recycling practices with a local company. Edify is working closely with the Solar Recovery Corporation, which has a facility located in Biloela, to incorporate a circular practise into our projects. Other companies such as Reclaim PV Recycling or Tindo Solar are based in Adelaide and offer a solar waste management / resource recovery solution. This includes logistics and recycling of PV modules, inverters and batteries. Such companies are expected to open facilities in Queensland in the future and Edify would seek to utilise as many local services as possible.

Specific to Australia, new recycling facilities designed specifically to handle end-of-life solar modules have recently been constructed and commissioned. Sustainability Victoria has supported the creation of a solar recycling facility in Thomastown, Melbourne, which is expected to scale throughout the 2020s in correlation to the increasing quantity of end-of-life modules. This represents the circular economy and long-term sustainable solutions that are critical to the success of the energy transition. In short, we as Australians do not want to export these precious metals to be processed overseas.

Edify is committed to working with domestic solar recycling facilities and applauds the early investments undertaken by Sustainability Victoria to date.

[4] Clean Energy Council, Agri-solar Report: https://assets.cleanenergycouncil.org.au/documents/resources/reports/AgriSolar-guide/Australian-guide-to-AgriSolar-for-large-scale-solar.pdf

Will the batteries end up in landfill once their capacity is diminished?

There is no intention for project's batteries to be discarded to landfill. Lithium-ion batteries and PV modules form the critical asset components. Therefore, Edify recognises that a total cost of ownership strategy must encompass a robust end-of-life management process to ensure the project is a sustainable investment.

Edify works with key equipment supply partners and newly emerging e-waste recycling parties, who share our 'Project Custodian' commitments. These end-of-life commitments represents a commercially viable incentive that strengthens the company's commitment to sustainability, local industry and circular economy procurement strategies.

Innovations are emerging in the battery value stream that extend the useful life of the battery cells beyond the original project's use case. At the end of the initial 20-25 year expected lifespan, these battery cells will still possess useful capacity that can be used in 'second-life applications' that require less-frequent battery cycling (charge / discharge).

How are any potential fire risks managed?

The design of Smoky Creek & Guthrie's Gap Solar Power Station incorporates a cleared vegetation zone around the edges of the project to prevent fire propagation. This is complemented by a perimeter access track for emergency access and a strict vegetation management plan.

In addition, the project design ensures there are emergency access gates and the installation of multiple large water tanks will be located throughout the project, as agreed with the local Fire Authorities.

The battery systems used will have protection systems which will constantly measure the temperature of the cells and will disconnect the batteries in the case of abnormal operation making the risk of thermal runaway and fire very low. In the event of fire, the spacing of the battery units will prevent the fire spreading to adjacent units such that the fire can safely self-extinguish without further damage. All battery units will be surrounded by an area which is permanently clear of vegetation which eliminates any risk of spread of fire to grass or other vegetation.

This key safety aspect will be designed by Edify and / or the Designated Construction Contractor and must be agreed by the local Fire Authorities prior to construction commencing.