Edify

Peninsula Solar Power Station
Frequently Asked Questions

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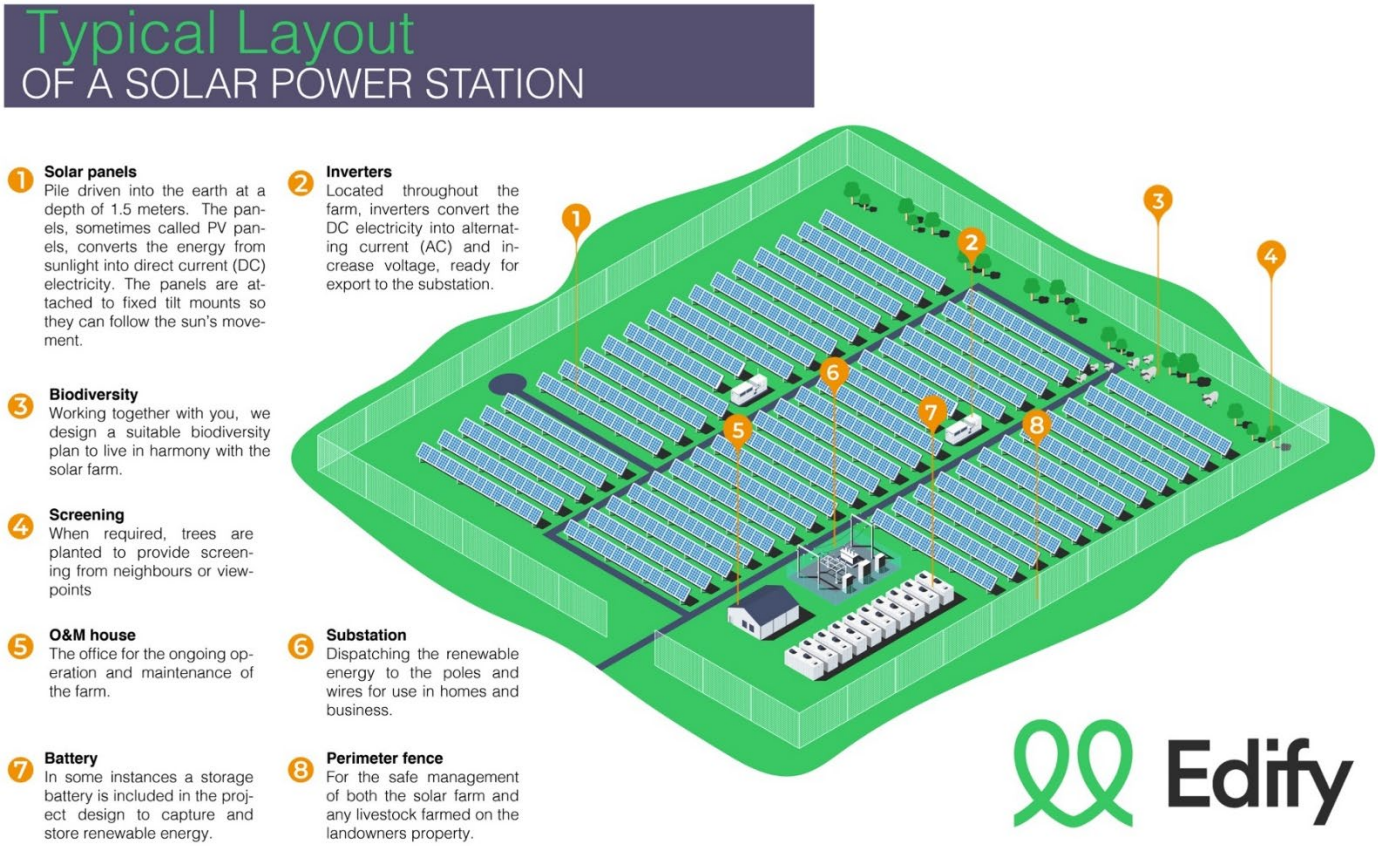
How does solar generation work?

When sunlight photons shine on a solar panel they 'knock' electrons free on 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 converts this to Alternating Current (AC), delivering this AC power through the substation to the transmission network.

In regards to the solar panels, the angle of incidence of the light ray on the panel is of high importance in the amount of energy that can be extracted from it. This is why installing tracking systems helps increase the energy generation.



What type of infrastructure makes up a Solar Power Station?

Edify's projects incorporate a similar solar module to that used in residential solar photovoltaic installations. The main difference however is that utility-scale solar modules are often mounted on systems that track the sun through the sky. Edify has broad experience in financing, constructing and operating solar and battery projects. This proven track record is reflected in the suppliers and components that we procure for the project. The Peninsula Solar Power Station will utilise premium Tier 1 quality solar modules and battery technology, provided by leading manufacturers. This is selected through a competitive process for each project. All components come with long term warranty periods and performance guarantees, which is important as Edify act as Asset Managers throughout the multi-decade life of the Solar Power Station.

What's the difference between a 'solar farm' and a 'solar power station'?

Edify has vast experience in the integration or large-scale batteries into the Australian electricity network, owning and operating Australia's first solar plus battery project – Gannawarra Solar Power Station – which is located in regional Victoria.

'Solar farms' typically refer to large solar projects that do not include a battery system. Instead, solar farms only include the solar modules (and tracking systems) needed to produce electricity. Solar farms are an important contributor to Australia's energy mix, however they are solely depending on sunlight conditions and cannot generate electricity on-demand, nor after the sun goes down.

'Solar Power Stations' refer to hybrid projects that integrate solar and battery systems into the one project. 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 contingency or disruption to the network.

The Solar Power Station'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, this design achieves 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 than simply building more poles and wires. Transmission network augmentation can be deferred as this project has the ability to support New South Wales' network congestion (which have been notable in 2021). Batteries and other 'non-network solutions' can create savings for the network owners, government and most importantly – household consumers.

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 100 MW power plant, an 8 to 12-month timeframe is typical, with a peak construction period of 2 to 3 months. A larger project like Peninsula will take around 14 to 18 months to construct with a peak construction period of 3 to 4 months.

What is the life cycle of a solar power station?

A solar power station will typically operate for between 25 and 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 30 years or more with only about 0.5% efficiency loss each year. It is anticipated that the Peninsula Solar Power Station will operate for between 25 to 30 years.

How long will the batteries last?

The battery's lifespan is dictated by the usage and frequency of cycles (charge / discharge). Edify will procure the batteries from Tier 1 supplier, who are able to provide a performance guarantee that will warrant the performance of the battery cells for 10-20 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.

In addition, the ambient and operational temperature of the battery system is a key factor that has impacts upon the overall life of the battery cell. This is why the battery system is housed within a climate-controlled enclosure, which includes multiple HVAC units to regulate the operating temperature of the system, ensuring the battery cells stay within the optimal temperature envelope to preserve the cell's longevity.

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 4m tall. Generally speaking solar panels have a dimension of 1m x 2m. Rows of solar panels are usually 30, 60 or 90 meters long. And rows of panels are separated by 5 to 7 meters. 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 common place 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.

Fresnel's equation predicts that roughly 4% of the 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 – designed to achieve greater than 99% transmittance. This coating is applied as a spray process integrated into the panel manufacturing process. Because of these 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 Brisbane Airport represents the largest solar installation at any Australian airport, consisting of 22,000 solar modules that span an area twice the size of the Melbourne Cricket Ground. 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 perspective, the Mildura airport has 400 panels with a capacity of 100 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 solar power station is proposed to have a capacity of 130MW and will be split between two sites that are separated by Paytens Bridge Road. Access to the sites will be provided via Paytens Bridge Road, which connects to Lachlan Valley Way, Forbes and the inland rail network, which is expected to support the project's logistics requirements. A vehicle crossing will be established across Paytens Bridge Road to provide traffic movements between the north and southern sites. A detailed Traffic Impact Assessment and Management Plan has been undertaken by Edify in the Environmental Impact Statement (Development Application).

Economy

Do solar power stations 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 $50 per megawatt hour. The costs of other sources of generation are:

» Existing coal: approximately $40 per megawatt hour

» New coal: approximately $130 per megawatt hour

» Combined gas-cycle generation: approximately $75 per megawatt hour

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 stations 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 add to the supply side of the electricity supply / demand equation, which puts downward pressure on all electricity bills.

Does Edify require government subsidies to build its projects?

Edify does not require government subsidies to finance its projects. We finance our projects through a combination of our own equity and long-term bank loans. In addition, Edify also enters into agreements with governments or businesses that are seeking to purchase the renewable energy that is produced by our projects.

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

The main regulator for the Peninsula Solar Power Station is the New South Wales Department of Planning, Infrastructure and Environment (NSW DPIE). All Edify projects meet strict State and Federal Government

regulations and are assessed under these regulations. We work closely with governments to ensure we meet all legal requirements and exceed these requirements wherever possible.

Once the Environmental Impact Statement (Development Application) is lodged by Edify, this 'Major Project's Portal' will allow members from the public to view the Development Application and associated reports (search: https://www.planningportal.nsw.gov.au/major-projects/project/41241; SSD #14757962).

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 it 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 eight projects throughout Australia, including the largest solar and battery project in New South Wales, Edify is not aware of, and has not been presented with, any reliable, impartial 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 was commissioned by the NSW Office of Environment and Heritage and published by planning consultancy Urbis in July 2016[1]. 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 the Peninsula Solar power station would affect productivity of neighbouring agricultural properties.

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

Edify will have its own insurance policy in place to provide coverage in the unlikely event that solar power station equipment is damaged (i.e. fire, flood, etc). A Bush Fire Management Plan will include procedures to deal with a fire on site, which is why the project's design requires water to be kept on site for that specific purpose.

The Environmental Management Strategy will include obligations that prevent the spread of fire across the site (such as grass cutting and a buffer / asset protection zone). Edify understands the concern of adjoining landowners regarding potential damage to a 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 to the solar power station, it has to be demonstrated that the landowner was negligent in causing damage.

» The occurrence of a fire from a weather event (e.g. a lightning strike) that migrates from the landowner property to Edify property would not necessarily create a legal liability for the landowner, likewise if there was

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

a heavy rainfall event and water drained from an adjoining property to Edify facility this again is not necessarily a negligent act of the landowner.

In summary, Edify has its own insurance and would seek to make claim on that first in the event of fire damage to the solar power station. Notwithstanding, Edify recommends that farmers on nearby properties take all necessary precautions to prevent the ignition and spreading of fires, and seek advice from their insurance providers on individual insurance policy matters.

Health & Culture

Are there any health risks associated with solar power stations?

Solar panels are deployed on almost 30% of Australian homes and have been deployed for the past 10 to 15 years on people's homes in the world. The Peninsula 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. They pass hail tests, and are regularly installed in Arctic and Antarctic conditions.

Can solar power stations' noise affect local residents?

The project has undertaken a noise assessment for the Environmental Impact Statement (Development Application), prepared by a 3rd party acoustic engineering expert. This indicates that the Solar Power Stations emits a noise level which is similar to typical residential and industrial levels during daytime hours. These results can be seen via the NSW Major Projects Portal.

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.

Is cultural heritage taken into consideration?

Edify and the Wiradjuri People have conducted a detailed Cultural & Heritage survey, which complies with all legislation, including laws regarding the protection of cultural heritage. A cultural heritage assessment forms part of the critical studies, as does consultation with local Indigenous groups to ensure cultural heritage is protected. This collaboration between Edify and the local indigenous groups will remain an ongoing commitment throughout the lifecycle of the project.

Environment

Do solar power stations 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 the Peninsula Solar Power Station, in part due to the lack of vegetation that is present on the development area today. Pre-existing patches of vegetation are retained, while other mitigation measures include preparing management plans, identifying 'no-go zones' within the project site and conducting pre-clearance surveys. Edify also consults with government departments of environment and biodiversity throughout the development, construction and operational stages of projects, as well as local non-government organisations.

Do solar power stations 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.

How do you stop the solar facilities from impacting our landscape?

We acknowledge that solar facilities do impact the visual amenity of its near area, but will work with communities to ensure our solar power stations have the least possible detrimental impact on visual amenity. Edify encourage 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 power stations bring to communities offset any loss of visual amenity.

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 will implement such recycling practices with a local company, such as Reclaim PV Recycling or Tindo Solar. Based in Adelaide, Reclaim PV and Tindo Solar offer a solar waste management / resource recovery solution. This includes logistics and recycling of PV modules, inverters and batteries.

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

Lithium-ion batteries and PV modules forming 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 genuine 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.

Edify stipulates in the supply contract that the original battery manufacturer will be required to implement or support Edify with a recovery and recycling scheme. Within this recovery process, an assessment of the

battery's capacity and health will determine if the manufacturer disposes it, recycles the valuable metals, or prepares the battery cell for reuse in a '2nd-life application'.

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 10-15 year expected lifespan, these battery cells will still possess useful capacity that can be used in '2nd-life applications' that require less-frequent battery cycling (charge/ discharge). An example of an alternative use case is in 'standby back-up' power systems that require less cycling and capacity than Edify's primary use case via the Project. This is exemplified by the ARENA project at the Netherland's national soccer stadium[2]. This project utilises recycled Nissan Leaf car battery cells and repurposes the lithium-ion batteries from previous applications to match them with an second alternative use case – such as the stadium's back-up power system.

How is any potential fire risk managed?

The design of the Peninsula Solar Power Station incorporates a cleared vegetation zone around the edges of the solar power stations to prevent fire propagation. This is complemented by a strict vegetation management plan.

The Battery system is monitored on a constant basis, utilising metering and power plant controllers that automatically assess, control and diagnose the 'health' of individual battery modules.

The project will incorporate a Battery Management System (BMS) for control and safety, ensuring that in the event the temperature rises in the battery cabinet (e.g. due to HVAC failure), the battery module and individually fused cells will trip when facing high temperatures and automatically shut down the module or entire battery system. This is possible due to the dedicated power electronics and system architecture that isolate the batteries from the common DC bus.

This key safety aspect will be designed by Edify and / or the Designated Construction Contractor, and must be agreed by the local Fire Authorities (NSW Rural Fire Service, or Fire and Rescue NSW) prior to construction commencing. The initial report that the project presents to the NSW Fire Authorities has been undertaken by a fire and risk specialise engineer. This report (Preliminary Hazard Assessment) is the first of a multi-stage process that we assist Edify and the regulators to refine the project's design and fire mitigation features.

[2] https://insideevs.com/news/356320/nissan-leaf-batteries-power-soccer-stadiums/