



# Decommissioning Assessment

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Gunnedah 2A Solar Farm

## DOCUMENT CONTROL

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Decommissioning Assessment of the Gunnedah 2A Solar Farm June 2021



## ABOUT ITP DEVELOPMENT

ITP Development Pty Ltd (ITPD) is a developer of town-scale solar farms in regional Australia designed to match current and future electricity demand. We undertake solar farm landholder engagement, system design, planning approvals, financing, electrical connection approvals and commissioning. ITPD maintains relationships with multiple stakeholders to ensure projects are successfully delivered in accordance with their expectations.

We are part of the international ITP Energised Group, one of the world's largest, most experienced and respected specialist engineering consultancies focussing on renewable energy, energy efficiency, and carbon markets. The Group has undertaken over 2,000 contracts in energy projects encompassing over 150 countries since it was formed in 1981.

## ABBREVIATIONS

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ha	hectare
ITPD	ITP Development
MW	Megawatt, unit of power (1 million Watts)
MWp	Megawatt-peak, unit of power at standard test conditions used to indicate PV system capacity
NSW	New South Wales
PV	Photovoltaic

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## 1 INTRODUCTION

The proposed Gunnedah 2A Solar Farm (referred to as the Project) is located on Wandobah Road to the southwest of the Gunnedah township, within the Gunnedah Shire Council area, NSW (Figure 1). ITP Development (ITPD) is proposing to construct a 6.4 MW DC solar facility within the 49.6 ha site.

Table 1 - Site information

Parameter	Description
<b>Solar farm name</b>	Gunnedah Solar Farm
<b>Site reference</b>	Gunnedah 2A
<b>Lot/DP(s)</b>	Lot 48 DP755474
<b>Street address</b>	781 Wandobah Road, Gunnedah, NSW 2380
<b>Council</b>	Gunnedah Shire Council
<b>AC capacity</b>	5 MW
<b>DC capacity</b>	6.4 MW
<b>Site area</b>	49.6 ha
<b>Project area</b>	12 ha
<b>Current land use</b>	Grazing





Figure 1 - Proposed 49.6 ha solar farm site and surrounding farm area (note the project will comprise 12 ha within this area)

## 2 PROJECT DESCRIPTION

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ITPD is proposing to construct a solar farm with a DC capacity of 6.4 MWp and AC output of 5 MW on an approximately 12 ha site that is currently used minimally for grazing.

There are to be approximately 12,000 solar modules installed in 140 rows (each row being approximately 103.5 m long and 2 m wide) running east to west. Each row of solar photovoltaic (PV) modules will rotate to track the sun across the sky from east to west each day. There is approximately 6.25 m spacing between each row. The maximum height of each module is 2.75 m.

The solar farm will also consist of an inverter station. The inverter station incorporates the high/medium voltage switchgear and transformers and two 3 MW inverters. The inverter station is ground mounted and incorporated on a 12.19 m skid.

The mounting system is constructed on piles that are driven into the ground. During construction there is expected to be 50 personnel on site working from 7 am – 4 pm Monday to Friday. The construction is expected to take approximately 3 months. Once operational the site will be unmanned. Maintenance is expected to be carried out quarterly by a crew of 2 – 3 people.

Solar panels and related infrastructure will be decommissioned and removed upon cessation of operations. This is likely to occur within two years of the end of the project. The site will be returned to the pre-development land use of agriculture.



## 3 DECOMMISSIONING

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The Gunnedah 2A solar farm is intended to be operational for 35 years, at which point the solar farm will be decommissioned and the site returned to the original state. In the unlikely event that the Gunnedah 2A solar farm is required to be decommissioned prior to the completion of the 35-year lifespan, the decommissioning process will be the same as that outlined in Section 3.1 below.

### 3.1 Decommissioning Plan

The decommissioning process for the Gunnedah 2A solar farm will be undertaken all at once and will involve the following stages of decommissioning:

1. Notification of stakeholders of proposed de-energisation
2. De-energisation of the solar farm and disconnection of assets
3. Removal and recycling of PV modules and associated infrastructure
4. Removal of electrical wiring
5. Rehabilitation of land

Relevant equipment will be brought to site to facilitate decommissioning, including amenities for site crew for the duration of the works. This equipment may include mobile cranes, excavators, skid steers, loaders, rollers/compactors, pile drivers, telehandlers, skip bins, water carts, temporary shipping containers for storage, site office and site ablution blocks.

#### 3.1.1 Notification of stakeholders of proposed de-energisation

ITPD will contact Essential Energy, the state-owned enterprise responsible for operating the distribution network 12 months prior to the commencement of decommissioning.

Gunnedah Shire Council will be notified and any necessary permits or approvals required for decommissioning will be sought from the Council or issuing authority. Any measures stipulated in these approvals will be implemented prior to works commencing on site.

ITPD does not foresee any issues arising from stakeholder notification of decommissioning.

#### 3.1.2 De-energisation of the solar farm and disconnection of assets

Essential Energy crew or subcontractors will be brought to site to disconnect the service mains from the point of connection and ensure full isolation of the site from the grid.

All aspects of the solar system will be turned off for safety prior to commencement of work on the site in accordance with the shut-down procedure stipulated in the system operation manuals. All generation assets will be disconnected and isolated.

The inverter, transformer will be removed from the site via a crane onto a semi-trailer or e-waste dismantling, recycling, scrapping and safe disposal at the waste disposal facility

identified in Section 5 of the associated waste assessment. If possible, the transformer can be reconditioned and refurbished for additional service life at another site.

The concrete foundations of the inverter, transformer will be excavated and the concrete recycled.

### **3.1.3 Removal and recycling of PV modules and associated infrastructure**

At the end of their life, the PV modules will be removed from site and transported on semi-trailers to a dedicated solar panel recycling facility. Lotus Energy have opened Australia's first PV recycling facility operating in South Australia, with the ability to recycle 100% of end-of-life solar modules, batteries and associated materials, including the inverter, cables and mounting structures.<sup>1</sup> A number of other PV recycling plants are under development in Australia and are expected to be operational by the time of commissioning. The panel recycling technology will be monitored over the lifespan of the project and the specific plant used for recycling the panels for this project will be determined prior to decommissioning works commencing.

In the unlikely case there are no dedicated solar panel recycling facilities operating in 35 years, the panels can be broken down by removing the aluminium frame for recycling and the glass casing can be broken down to granular form for reuse.

The PV module tracker structure will be disassembled. The steel piles will be excavated from the ground and recycled at a scrap metal facility. Other site infrastructure, including the security fence surrounding the solar farm and concrete on site will be removed and re-used or taken to a waste facility to be recycled where possible.

### **3.1.4 Removal of electrical wiring**

Underground cabling and earthing networks will be excavated and recycled. Other cable materials, including cable covers, will be put into skip bins and taken to landfill. Any trenches excavated during this process will be refilled and levelled.

### **3.1.5 Rehabilitation of land**

Any disruptions to the site created during the decommissioning process will be filled and/or levelled as required, such as the locations where piles were removed.

Gravel surfaces and accessways that were established as part of the development will be removed and the ground remediated unless a request is made by the landholder for them to remain for future use.

The site will be revegetated for cropping or grazing, as per the original use of the site in consultation with the landholder. It is intended that established landscaping, including trees

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<sup>1</sup> RenewEconomy 2021, available [here](#)

planted during the construction, will remain on-site. After 35 years, the trees planted during construction will likely be large, hence if the removal of trees is requested by the landholder, a permit may be required.

The construction and decommissioning works do not result in significant damage to the land or grading. The measure of success for rehabilitation work will be whether the land is returned to the pre-works state to be used for grazing and cropping and rehabilitation is to the landholder's satisfaction.

## 4 SUMMARY

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The project will predominantly generate waste during the construction and decommissioning phases, rather than during operation. To comply with the NSW legislation and policies, waste will be recycled or re-used where possible and only disposed of if no alternative is available.

Cardboard, scrap metal and wood from the construction phase can be recycled. Plastics and general waste will require disposal at the local waste facilities. Technology for recycling of PV panels is advancing rapidly worldwide and while recycling options currently exist, they are likely to be more advanced and readily available at the time of decommissioning. Options for recycling of PV panels should be reviewed as the project progresses.



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