

Department of Planning, Housing and Infrastructure

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# Large-Scale Solar Energy Guideline

August 2022



Guidance for State significant large-  
scale solar energy development



# Acknowledgement of Country

The Department of Planning, Housing and Infrastructure acknowledges that it stands on Aboriginal land. We acknowledge the Traditional Custodians of the land, and we show our respect for Elders past, present and emerging through thoughtful and collaborative approaches to our work, seeking to demonstrate our ongoing commitment to providing places in which Aboriginal people are included socially, culturally and economically.

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Large-Scale Solar Energy Guideline

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Pg 5, 31 – Griffith Solar Farm, Neoen

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Pg 23, 29, 53 – Bomen Solar Farm, Spark Renewables

Pg 59, 62 – Parkes Solar Farm, Neoen

# Glossary of terms

Term	Explanation
<b>Applicant</b>	A person seeking consent for a development or modification application for a State significant development project under the <i>Environmental Planning and Assessment Act 1979</i> , or any person who seeks to carry out the development
<b>Associated residence</b>	A residence on privately owned land in respect of which the owner has reached an agreement with the applicant about the development and management of impacts
<b>Benefit sharing</b>	Approaches and mechanisms that aim to distribute the financial and other benefits of a project between the applicant and the host community
<b>Consent authority</b>	The authority responsible for granting or refusing consent for a development application or modification application
<b>Decommissioning</b>	The removal of solar panels and ancillary infrastructure
<b>Development application</b>	An application made seeking consent for State significant development under part 4 of the NSW <i>Environmental Planning and Assessment Act 1979</i>
<b>Dwelling</b>	A room or suite of rooms occupied or used as a separate domicile as well as a building that meets the criteria outlined in section 1.3 of <a href="#">Large-Scale Solar Energy Guideline - Technical Supplement for Landscape and Visual Impact Assessment</a>
<b>Environmental impact statement</b>	A document prepared by or on behalf of the applicant to accompany a development application that includes a comprehensive assessment of the environmental, social and economic impacts of a project
<b>Landholder agreement</b>	An agreement negotiated between an applicant and landholder to manage the impacts of hosting infrastructure on the land and any exceedances of relevant environmental impact assessment criteria. It also governs the type of tenure an applicant will have over the land hosting the project infrastructure and sets out a detailed set of terms for which both parties will be governed by for the life of the project
<b>Glare</b>	A continuous source of bright or strong light caused by the reflection of sunlight on a solar energy project

Term	Explanation
<b>Glint</b>	A momentary flash of bright or strong light caused by the reflection of sunlight on a solar energy project
<b>Important agricultural land</b>	Land mapped as biophysical strategic agricultural land or a critical industry cluster, land of LSC classes 1 to 3 and farmland mapped as state or regionally significant on the north coast
<b>Large-scale solar energy project</b>	Works, infrastructure and buildings for the purpose of generating electricity using ground-mounted photovoltaic panels that are considered state-significant development
<b>Landscape</b>	A holistic area comprising landform, vegetation, buildings, villages, towns, cities and infrastructure
<b>Landscape character</b>	An area or sense of place definable by the quality of its built, natural and cultural elements
<b>Modification application</b>	An application seeking to modify a development consent, which may include revoking or varying a condition of consent – modification requires consent under the NSW <i>Environmental Planning and Assessment Act 1979</i>
<b>Neighbour agreement</b>	An agreement negotiated between an applicant and the owner of land surrounding the project area (referred to as ‘adjacent land’) to manage the impacts from a development (including any exceedances of relevant environmental impact assessment criteria)
<b>Non-associated residence</b>	A residence on privately-owned land in respect of which the owner has not reached an agreement with the applicant in relation to the development or A residence on privately-owned land in respect of which the owner has reached an agreement with the applicant in relation to the development, but the agreement does not cover the relevant impact or the performance measure under the agreement has been exceeded
<b>Planning Secretary</b>	The Secretary of the Department of Planning, Housing and Infrastructure
<b>Protected area</b>	Lands reserved or otherwise protected for conserving biodiversity or Aboriginal cultural heritage – this includes lands reserved under the NSW <i>National Parks and Wildlife Act 1974</i> , flora reserves under the NSW <i>Forestry Act 2012</i> , declared wilderness under the NSW <i>Wilderness Act 1987</i> , Indigenous protected areas, world heritage areas and Ramsar wetlands
<b>Rehabilitation</b>	The restoration of land disturbed by the development to a good condition to ensure it is safe, stable and non-polluting

Term	Explanation
<b>Renewable energy zone</b>	A designated area to support renewable energy development as declared in the NSW <i>Electricity Infrastructure Investment Act 2020</i>
<b>Regionally significant development</b>	A development deemed to have regional significance due to its size, economic value or potential impacts
<b>Planning Secretary's environmental assessment requirements</b>	Document that set out the matters that must be addressed in an environmental impact statement
<b>Sensitivity</b>	A measure of the capacity of an element of the landscape to absorb the impacts from a proposed land use change and/or built form
<b>State significant development</b>	A development declared to have state significance due to its size, economic value or potential impacts
<b>Vacant land</b>	Any lot that does not contain an existing dwelling
<b>Viewpoint</b>	A location within the private or public domain with a potential view of a large-scale solar energy project
<b>Visual magnitude</b>	The apparent size of a solar energy project in the landscape or when viewed from a given viewpoint

An aerial photograph of a large-scale solar farm. The image shows numerous rows of solar panels, which are a mix of dark blue and lighter blue. The panels are arranged in a grid-like pattern, with dirt access roads and paths winding through them. The overall scene is a vast, organized expanse of solar energy infrastructure.

# 1

# Introduction

The transformation of the global energy sector presents a huge opportunity for Australia. Renewables are now the cheapest form of new energy generation, and technology is available to support large-scale energy storage.

Australia has the highest average solar radiation per square metre of any continent in the world. NSW has an abundance of excellent solar resources and an established electricity infrastructure that, along with declining technology costs, makes it an attractive location for solar energy development.

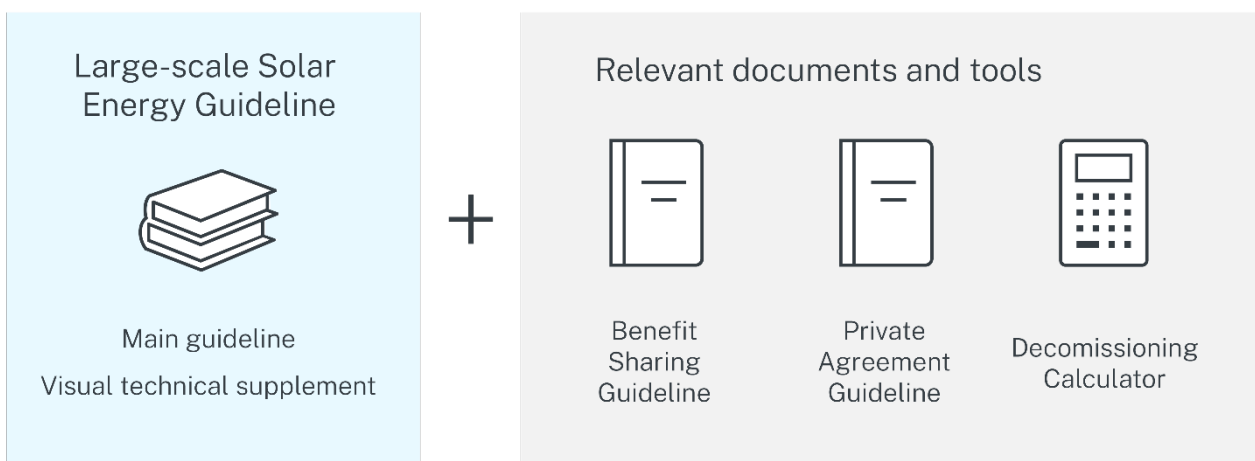
The NSW Government strongly supports the ongoing development of a sustainable solar energy industry in NSW. Solar energy supports our transition away from fossil fuels and helps deliver a safe, stable and reliable energy supply. This transition will help us meet our legislated emission reduction targets by driving down carbon emissions and increasing our resilience in the face of climate change.

This *Large-Scale Solar Energy Guideline* will help the community, industry, applicants and regulators navigate the planning framework under which we assess large-scale solar energy projects. This guideline identifies key planning considerations relevant to solar energy development and provides policy and technical guidance on key issues of the technology.

The guideline is supported by a technical supplement – *Large-Scale Solar Energy Guideline: Technical Supplement for Landscape and Visual Impact Assessment* – that provides additional guidance and tools for assessing, evaluating, and mitigating visual and landscape impacts.

This guideline and its supplement are part of the Renewable Energy Planning Framework and should be read in conjunction with the other documents making up this framework (where relevant), including the *Benefit Sharing Guideline* and *Private Agreement Guideline*.

We will regularly review and update this guideline to ensure it reflects any changes in knowledge and technology as the solar industry continues to develop and evolve.





## 1.1 Objectives

The objectives of this guideline are to:

- support the development of a sustainable solar energy industry in NSW
- encourage the industry to select suitable sites and locations to avoid or reduce the likelihood of land use conflicts, environmental impacts and impacts on the community
- provide clear and consistent guidance on how to measure and assess the key environmental and social impacts of large-scale solar energy projects
- provide clear and consistent expectations to improve the quality of development applications and reduce delays in assessments
- promote meaningful, respectful, effective and best-practice community and stakeholder engagement throughout the development assessment process.

## 1.2 Strategic context

Our state's coal-fired power stations, which have been a reliable source of electricity for our community and businesses for generations, are aging and scheduled to close in the next 15 years. As they reach the end of their operations, they become more expensive to maintain. The cheapest form of energy generation to replace these stations is renewable energy.

Urgent investment in renewable energy infrastructure, including in solar energy, is needed to transition our energy system away from coal and to ensure NSW has continued access to cheap, clean and reliable energy. It will also help us meet our legislated emission reduction targets under the [Climate Change \(Net Zero Future\) Act 2023](#).

The NSW Government's [Electricity Infrastructure Roadmap](#) (the Roadmap) sets out a 20-year plan to ensure that the transition happens in an orderly way and benefits everyone. The move will bring new investment to regional NSW, boosting funding and creating new local jobs. There will be demand for workers in local manufacturing, agriculture, retail and transport in the construction phase, as well as ongoing roles in operating and maintaining the facilities.

We estimate the Roadmap will attract up to \$32 billion of private-sector investment in electricity infrastructure by 2030, supporting 6,300 construction jobs and 2,800 ongoing jobs.

### 1.2.1 Renewable energy zones

As part of the Electricity Infrastructure Roadmap, the NSW Government has committed to deliver at least 5 renewable energy zones (REZs). The planned zones are in the Central-West Orana, New England, South-West, Hunter Central Coast and Illawarra regions of NSW. The

Energy Corporation of NSW will lead the delivery of these REZs. Renewable energy zones are modern-day power stations. They combine renewable energy generation such as wind and solar, storage such as batteries and network infrastructure such as high-voltage poles and wires in dedicated areas in NSW.

The NSW Government will encourage development in REZs to support a transition to renewable energy. This will ensure that development occurs in appropriate areas close to existing infrastructure and has fewer environmental and land-use constraints than in other parts of NSW. While most development will be concentrated in the REZs, there is development potential outside the zones that will further support the transition. This guideline applies to solar energy projects both inside and outside REZs.

## 1.3 Application and scope of this guideline

This guideline applies to the development of large-scale solar energy projects that are declared as a State significant development or critical State significant infrastructure under the *Environmental Planning & Assessment Act 1979* (EP&A Act). The criteria for a solar energy project to be in one of these categories is described in sections 2.1 and 2.6 respectively.

This guideline does not apply to large-scale solar energy projects that use other technologies such as concentrated thermal or lens concentrators. These are likely to have different site selection and impact assessment issues.

Applicants<sup>1</sup> of solar energy projects must prepare their environmental impact statements according to the Planning Secretary's environmental assessment requirements and this guideline. This guideline and its supporting technical supplement must also be considered when preparing and assessing applications to modify a State significant development consent for large-scale solar energy development. We encourage applicants to consult with us to determine the level of assessment needed. The level of detail should be proportionate to the scale of the modification and the likely additional impacts.

Although this guideline focuses on large-scale solar energy projects, we encourage applicants, councils and planning panels to consider its objectives and principles when preparing, assessing and determining solar energy development applications for regionally significant development. The assessment process and level of detail in a statement of environmental effects should be proportionate to the scale of the development and likely impacts.

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<sup>1</sup> If the development is declared to be Critical state significant infrastructure, the 'applicant' is referred to as the 'proponent'

# 2

## Planning framework



The EP&A Act sets out the environmental planning and assessment framework for all development in NSW. This framework identifies where large-scale solar energy development may be permitted and the process by which it must be assessed and determined.

## 2.1 Solar energy projects as ‘state-significant development’

A solar energy project is state-significant development<sup>2</sup> if it requires development consent and has:

- a capital investment value of more than \$30 million  
or
- a capital investment value of more than \$10 million and is in an environmentally sensitive area of state significance<sup>3</sup>.

Most solar energy projects in NSW are considered State significant development.

The Minister for Planning and Public Spaces may also, by way of an order, declare specified development on specified land to be State significant development. The minister is generally the consent authority for State significant development. The minister may delegate a senior departmental officer to exercise the consent authority functions.

In cases where the application to carry out the development is not made by or on behalf of a public authority or the development is not related to State significant infrastructure, the Independent Planning Commission is the consent authority for State significant development applications when:

- there are 50 or more submissions of objection (other than from council) made during the exhibition of the application  
and/or
- the local council objects to the State significant development application  
and/or
- the applicant has disclosed a reportable political donation.

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<sup>2</sup> Section 4.36, EP&A Act; section 2.6 and schedule 1, section 20, State Environmental Planning Policy (Planning Systems) 2021

<sup>3</sup> ‘Environmentally sensitive area of state significance’ is defined in section 2.2, State Environmental Planning Policy (Planning Systems) 2021

## 2.2 Areas where large-scale solar energy development may be allowed

The EP&A Act and relevant environmental planning instruments, including local environmental plans and state environmental planning policies, determine where large-scale solar energy development is permitted. Key considerations include:

- the zoning and land use provisions of the relevant local environmental plans
- part 2.3, division 4 of the State Environmental Planning Policy (Transport and Infrastructure) 2021 (the Transport and Infrastructure SEPP) for electricity generating works.

In general, large-scale solar energy development can be permitted with consent on any land zoned for rural (RU1, RU2, RU3 and RU4), industrial (IN1, IN2, IN3 and IN4) or special-purpose (SP1 and SP2) uses in the relevant local environmental plans<sup>4</sup>. In effect, this means that solar energy development is permitted across large parts of NSW to ensure flexibility about where this development can occur. Where large-scale solar energy development is permitted with consent (or partly permitted), the applicant can lodge a development application for determination by the relevant consent authority if it has the consent of the owner of the land.

For electricity transmission and network connection works, we encourage applicants to consult with the relevant transmission or distribution network service provider early in the project planning process to identify the scope of works required to enable connection and to determine the planning assessment pathway for those works (see section 2.4 of this guideline).

### 2.2.1 Landowners' consent

If the applicant is not the owner of the land to which the development application relates (or is not the only owner), an application can only be made with the consent of all owners of the land<sup>5</sup> (subject to the exceptions in s 23(2) of the NSW Environmental Planning and Assessment Regulation 2021).

The consent of the owners of the land is not required for a development application made by a public authority or if the application is designated as public notification development<sup>6</sup> provided the applicant gives notice in accordance with sections 23(3) and (4) of the Environmental Planning and Assessment Regulation.

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<sup>4</sup> Section 2.36(1)(b), State Environmental Planning Policy (Transport and Infrastructure) 2021

<sup>5</sup> Section 23(1)(b), Environmental Planning and Assessment Regulation 2021

<sup>6</sup> Section 23(2), Environmental Planning and Assessment Regulation 2021

Once approved, the applicant has a set time within which to begin constructing the project. Consent will lapse after this time. The landowner is not required to carry out the approved development.

If a project proposes changes to an existing substation as part of the project, the applicant must get consent from the transmission network operator or the relevant distributor.

If an applicant is seeking to modify an existing development consent (see section 2.3.2 of this guideline), a modification application can only be made if all owners of the land provide written consent<sup>7</sup>.

### 2.2.2 Regional cities

The NSW Government's regional plans identify cities that are strategically important to the ongoing growth and development of regional NSW.

We expect significant growth in regional cities over the next few decades. Investment in these cities is important. They represent major centres for housing, employment, commerce, tourism, education, health and other regional infrastructure and services.

To approve large-scale solar energy development near certain regional cities, the consent authority must be satisfied that any urban land conflicts, impacts on urban growth potential and important scenic values are not significant<sup>8</sup>. This applies to State significant solar energy generation projects located on mapped land for the regional cities of Albury, Armidale, Bathurst, Dubbo, Goulburn, Griffith, Goulburn, Mudgee, Orange, Tamworth and Wagga Wagga.

While these provisions do not prohibit solar development in these areas, a consent authority must not grant development consent unless it is satisfied that the development:

- is located to avoid significant conflict with existing or approved residential or commercial uses of land surrounding the development
- is unlikely to have a significant adverse impact on the regional city's capacity for growth, scenic quality or landscape character.

The consent authority must factor in any proposed measures to avoid or mitigate those conflicts and adverse impacts.

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<sup>7</sup> Landowner's consent is required from all owners of land to which the approval the subject of the modification applies (i.e. the owners of land specified in the approval).

<sup>8</sup> Section 2.42, Transport and Infrastructure SEPP

## 2.3 Process for assessing large-scale solar energy projects

All development applications for large-scale solar energy projects will be subject to a rigorous, merit-based assessment. The assessment must include extensive community consultation and a detailed consideration of any environmental, social and economic impacts.

The main steps in the assessment process are shown in Figure 1 and are summarised below.

The process is explained in more detail in our [State Significant Development Guidelines](#).

### 2.3.1 Development applications

All development applications for State significant development projects must be accompanied by an environmental impact statement. The purpose of the environmental impact statement is to help the community, councils, government agencies and the consent authority understand the impacts of a project so they can make informed submissions or a decision about a project's merits.

Applicants must prepare an environmental impact statement in accordance with the Planning Secretary's environmental assessment requirements. These requirements identify the information the applicant must provide in the environmental impact statement and the community engagement they must conduct.

Large-scale solar energy developments may be eligible for industry-specific environmental assessment requirements. These are tailored to the relevant industry and are issued by us within 7 days of an application being made. A project will be eligible if it is wholly permissible with consent, would not meet the criteria for designated development and is not a concept development application. Large-scale solar energy development that was not state-significant development would meet the criteria for designated development if it:

- includes a battery storage facility that can supply more than 30 MW of power<sup>9</sup>
- is located on a floodplain and includes photovoltaics that can supply more than 30 MW<sup>10</sup>.

In all other circumstances, we will issue project-specific Planning Secretary's environmental assessment requirements.

To enable us to issue the Planning Secretary's environmental assessment requirements, the applicant must submit a scoping report that provides a clear overview of the project and identifies the key environmental assessment issues. The overview should include information

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<sup>9</sup> Section 7 and schedule 3, Environmental Planning and Assessment Regulation 2021

<sup>10</sup> Section 7 and schedule 3, section 24(3), Environmental Planning and Assessment Regulation 2021

such as the project's location, proposed layout and proximity to important features, protected areas and neighbours.

The applicant must also outline in the scoping report how it has engaged with the local community about the project and how it intends to undertake meaningful consultation with affected stakeholders during the assessment process (refer to section 3 of this guideline).

The applicant must prepare the scoping report to a high standard and in line with our State Significant Development Guidelines.

While the length of the environmental impact statement will vary depending on the scale and nature of the project, the main report should be as succinct as possible. Applicants should prepare the environmental impact statement according to the general structure and length requirements outlined in our State Significant Development Guidelines.

Once we receive the environmental impact statement, we will exhibit the development application for at least 28 days – we may extend the exhibition if it runs over the Christmas and New Year period<sup>11</sup>. This gives the community an opportunity to have a say on the merits of a project before any final decision is made. Other government agencies may also provide advice during this stage.

After the exhibition, the applicant must respond to submissions. The consent authority will then assess the overall significance of any impacts by reviewing the environmental assessment, submissions, and the applicant's response to submissions. It will also consider the broader public interest. Any development consent granted will be subject to certain conditions (see section 2.5 of this guideline).

We are committed to assessing projects in a timely manner to support a rapid transition to renewable energy.

We will make every effort to assess applications within 100 government days. We may need or request additional information from the applicant to support our assessment. The time taken to respond to any material matters is not counted in our assessment time frames. However, we will use our best endeavours to limit major information requests (meaning requests that are material to the assessment of a project) to once per stage of the assessment process.

### **2.3.2 Modifying an approved project**

An applicant may apply to amend a State significant development consent. A consent authority may modify the consent provided that, among other matters, the modified

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<sup>11</sup> Schedule 1, Clause 16, Environmental Planning and Assessment Act 1979.



development will be substantially the same as the development for which the consent was originally granted.

Modifications may be needed to change or improve the design of the project (for example, by adding battery storage or increasing the size and height of solar panels) or to change the conditions of the development consent.

We will assess and determined the modifications under the EP&A Act and according to the process described in our *State Significant Development Guidelines*.



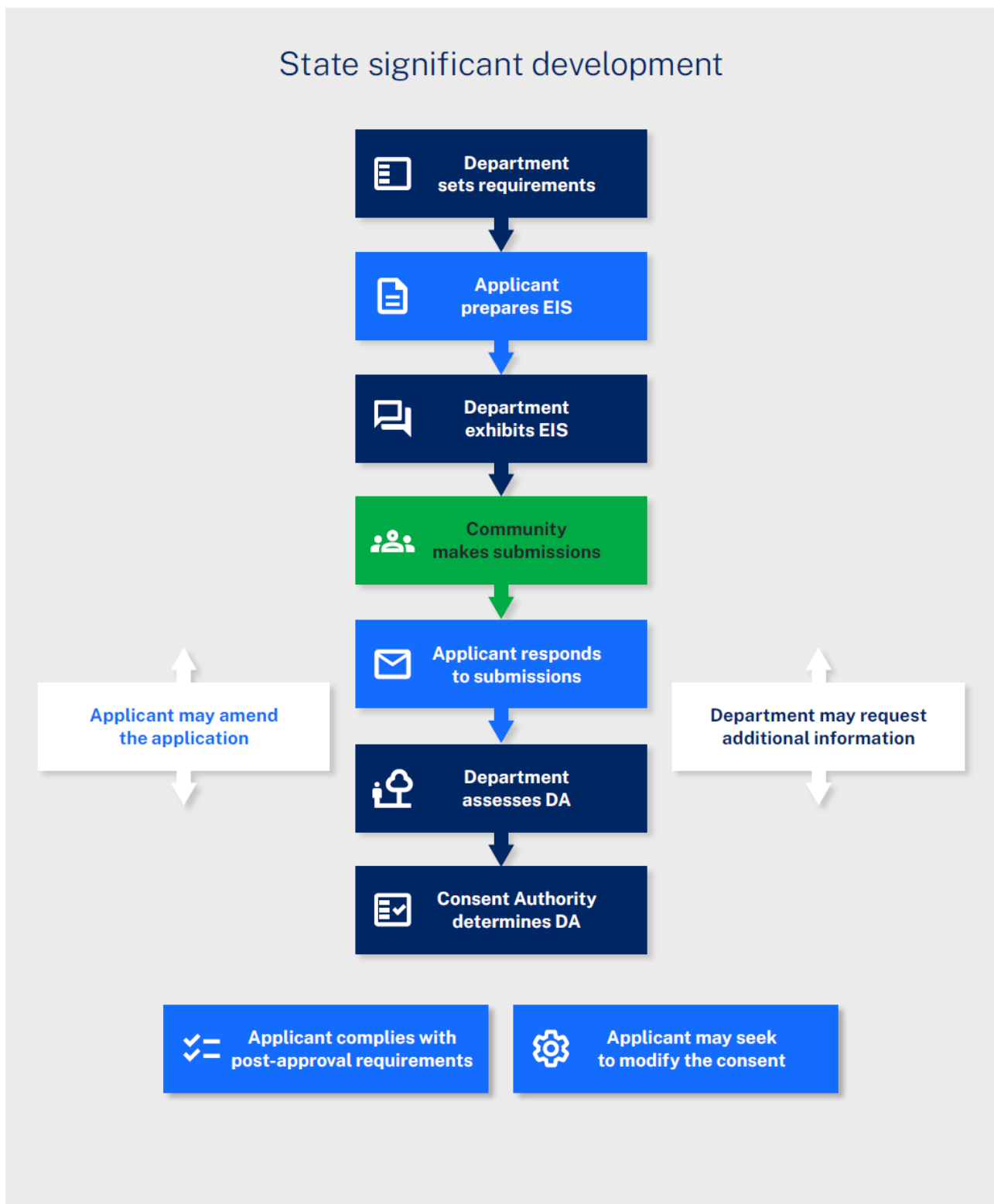


Figure 1. State significant development assessment steps

## 2.4 Other approvals that may be needed

This section outlines some approvals that may be required in addition to the development consent. If in doubt about what approvals are needed, consult the department or relevant government agency.

### 2.4.1 Australian Government approval

Under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (the EPBC Act), The Australian Government may need to give approval if a development is likely to have a significant impact on matters of national environmental significance or other protected matters. This includes, but is not limited to, impacts on listed threatened species and ecological communities. In such cases, the applicant must refer their project to the Australian Department of Climate Change, Energy, the Environment and Water.

The Australian Government's *Significant Impact Guidelines* will help applicants determine whether an impact is likely to be significant. You can make a referral on the Australian Government's [EPBC Act Business Portal](#).

The NSW assessment process for State significant development under the EP&A Act has been accredited under a bilateral agreement with the Australian Government. The assessment of both state and federal matters can be integrated into a single assessment process. This means that as well as the Planning Secretary's environmental assessment requirements, the environmental impact statement will need to consider additional matters identified by the Australian Government.

After we make a determination under the EP&A Act, the Australian Government makes its decision under the EPBC Act by reviewing the department's report and issuing any additional conditions of consent as part of its approval.

### 2.4.2 Subdivisions

Some sites may require land subdivision to support the proposed development. For example, subdivisions may be needed to accommodate substations or for land that will be leased for longer than 5 years<sup>12</sup>.

If an applicant wishes to include a subdivision in the scope of its State significant development application, it should first discuss subdivision options with the relevant council. This will allow

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<sup>12</sup> Section 7A, *Conveyancing Act 1919* (NSW).

applicants to make an informed decision on whether to include the subdivision in its application.

### 2.4.3 Network connections and transmission lines

Large-scale solar energy developments need connections to the electricity transmission network or distribution grid. This may include associated infrastructure such as substations, converter stations, transmission lines and access roads.

Applicants should include network connection works as part of their State significant development application to help streamline stakeholder engagement and to ensure that we can consider all aspects of the development during the assessment process.

Applicants should include the potential environmental impacts of network connections in the environmental impact statement. This includes the impacts associated with the construction of substations and above-ground and underground infrastructure. You may need additional approvals for transmission lines.

The applicant can refer to the [Transmission Guideline](#) for guidance on assessment issues and considerations associated with major transmission infrastructure. However, the will only apply to a project if expressly stated in the Planning Secretary's environmental assessment requirements.

### 2.4.4 Environment protection licence

An environment protection licence regulated under the *NSW Protection of the Environment Operations Act 1997* is generally not required for a large-scale solar development. However, an environment protection licence is needed where the development is a hybrid system or combined energy generating system that incorporates other energy sources such as gas.

An environment protection licence is issued by the [NSW Environment Protection Authority](#) after development consent has been granted for a project. The licence regulates issues such as noise, air quality and water management. The requirements of the licence are informed by and must be consistent with the development consent conditions, which form part of the regulatory framework for solar energy developments.

## 2.5 Regulation of approved large-scale solar developments

When a large-scale solar energy development is approved, the development consent will include conditions for things like:

- visual impact mitigation, such as landscaped screening at affected dwellings
- road upgrades, site access and maintenance requirements
- stormwater management, erosion and sediment control and flood mitigation work
- biodiversity management and mitigation measures
- heritage protection measures
- the obligations to manage risks associated with bushfire and dangerous goods
- decommissioning and rehabilitation of the site
- the requirements for minimising and managing waste.

These conditions continue to apply to the project and related land throughout its construction and operational life, as well as during the decommissioning and rehabilitation phases.

### 2.5.1 Compliance

Applicants are responsible for complying with the conditions of consent under the EP&A Act. Our compliance teams are responsible for monitoring compliance with the conditions of consent, including following up any suspected breaches reported by the public.

Compliance-related complaints regarding solar energy development consents can be made using the Make a complaint form on the [NSW Planning Portal](#). Our compliance team will contact the complainant within 14 days to seek further information or provide a progress update.

All large-scale solar energy development must comply with the environment protection licence for the project. The NSW Environment Protection Authority is the regulatory authority for the purpose of *Protection of the Environment Operations Act 1997*.

## 2.6 Critical state-significant infrastructure

The minister may declare a development to be critical State significant infrastructure under section 5.13 of the EP&A Act. Critical State significant infrastructure is infrastructure considered essential to the state for economic, environmental, or social reasons. The [Declaration of SSI and CSSI – State Significant Infrastructure Guide](#) sets out the general principles and reasons for the minister to declare development as critical State significant infrastructure.

The minister will consider requests to declare large-scale solar energy development as critical State significant infrastructure if it includes a significant energy storage system (for example,

a battery with a power capacity of 750 MW and a usable energy storage capacity of 1,500 MWh or more).

While the assessment process is generally the same as for State significant development, there are few key differences. The minister is the determining authority for all critical State significant infrastructure decisions and cannot delegate this function. Additionally, applicants do not need the landowners' consent to lodge an application, and a decision is not subject to judicial review (a review of the administrative decisions and conduct) by the Land and Environment Court unless approved by the minister.

A critical State significant infrastructure application or approval does not allow the applicant to compulsorily acquire land. Compulsory acquisition is a process undertaken only by an authority of the state under the *NSW Land Acquisition (Just Terms Compensation) Act 1991*. It also does not allow the applicant to construct or operate a project without the consent of the landowner.

The critical State significant infrastructure process is explained in more detail in the [Critical State Significant Infrastructure Guideline](#).



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# 3

## Community and stakeholder engagement



Effective community and stakeholder engagement is essential for the development of the large-scale solar energy industry and the environmental assessment process. Applicants should consider a diverse range of views to achieve positive planning outcomes.

Applicants must undertake meaningful engagement with stakeholders throughout the environmental impact assessment process and during the construction, operation and decommissioning phases of a project. They must consult the community according to the *Undertaking Engagement Guidelines for State Significant Projects*.

These guidelines include requirements for applicants to:

- provide clear and concise information to the community and stakeholders about projects and their impacts
- implement activities that encourage and facilitate public participation
- report on what was heard and what changes were made in response to feedback and why.

The Planning Secretary's environmental assessment requirements and consent conditions may include additional consultation requirements that applicants must also comply with.

Applicants should engage with the community as early as possible to identify potential opportunities and constraints associated with the proposed development. The applicant should identify the elements of the project and the environmental assessment that can be influenced or shaped by the community. These could relate to the project design, the characterisation of the area and/or the management and mitigation measures proposed. Examples include:

- the positioning and siting of the project
- characterisation of the scenic quality and sensitivity of the landscape and viewpoints (see the Large-Scale Solar Energy Guideline: Technical Supplement for Landscape and Visual Impact Assessment)
- visual impacts including mitigation measures.

Applicants must also ensure that stakeholders are given the opportunity to participate in the engagement process in a meaningful way. The environmental impact statement should include details of consultation with surrounding residents, community members, relevant authorities and councils. This includes the key matters raised and how feedback was considered and incorporated into the project.

Where an applicant is proposing multiple projects close to each other, they should consider combining the engagement activities to reduce consultation fatigue and provide greater transparency for the community.

The applicant must also consult with the holders of any mining tenements on the subject land to identify potential conflicts.



It is common for an applicant to have private agreements with landholders to either host infrastructure from the development or to manage the impacts. The applicant should properly inform landholders about the implications of such agreements and ensure consultation and negotiations are undertaken in a fair and reasonable manner. Our *Private Agreement Guideline* provides further advice for applicants and landholders who are considering such an agreement.

Applicants should continue to engage with stakeholders after any development consent has been granted. They must have an effective complaint handling system that addresses community concerns in a timely manner. However, if such concerns relate to compliance with the project's development consent, concerned community members are encouraged to lodge a complaint with us for investigation (see section 2.5.1).

If there are other complaints that cannot be resolved through the applicant's complaint handling system, concerned community members are encouraged to lodge a complaint with the [Office of the Australian Energy Infrastructure Commissioner](#).

The Department of Planning, Housing and Infrastructure also plays a role in consulting with stakeholders and the community. We must:

- consult with relevant government agencies and councils to ensure that issues are fully considered in the assessment process
- exhibit the environmental impact statement for public comment for a minimum of 28 days
- publish documents and submissions relating to the project on the NSW Planning Portal
- ask the applicant to respond to issues raised in submissions and agency advice to help the community and stakeholders understand how issues have been addressed and considered
- outline our decision or recommendation, including how community feedback was considered.



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# 4

## Site selection and project design



Good site selection and project design helps to avoid or minimise negative impacts at the outset, allowing the assessment of a project to focus on mitigating and managing unavoidable impacts.

## 4.1 Importance of site selection

Well-sited solar energy projects can have minimal impacts on the environment, surrounding land uses and the community. A good site can result in greater social licence to operate, shorter assessment timeframes, reduced offset obligations and fewer conditions of consent to manage residual impacts.

Sites with multiple environmental and planning constraints may still be capable of being developed in a suitable manner by using good and innovative design. The consent authority is obliged to consider each application on its merits.

If the applicant is not proposing to avoid impacts on the site's constraints, they must outline a clear justification for site selection and the layout of the development in the environmental impact statement.

## 4.2 Process of site selection and project design

There are many technical and commercial factors that applicants need to consider when selecting a site for a large-scale solar energy development. The primary driver will be the availability of good solar resources.

However, there are other significant environmental, technical and commercial factors that need to be considered, including:

- proximity to existing and planned transmission infrastructure
- availability of land
- available network capacity
- development restrictions including land use zoning
- areas of high biodiversity value, including threatened species, native vegetation and endangered ecological communities
- proximity to major roads and transport infrastructure
- proximity to sensitive viewpoints such as residences and public viewpoints and the potential for noise and landscape and visual impacts
- distance to major towns and regional cities
- proximity to airports

- proximity to protected area boundaries
- Indigenous and non-Indigenous heritage items and places of significance
- watercourses and other important wetlands
- flood-prone and bushfire-prone land.

Applicants must also consider other environmental issues and land use conflicts when selecting a site. This includes the agricultural productivity of the land, visibility of the site, land topography and biodiversity values.

Nevertheless, site selection factors are complex and often compete (see Figure 2). The large scale of solar energy developments adds to the challenge of finding sites that do not have some conflicts. Projects also need to be cost-effective and designed to provide benefits to energy consumers by reducing electricity costs.

Variations in topography can reduce the usability of land and minimise the efficiency of energy production (by increasing the potential for panels to overshadow each other). Higher gradients will also increase construction costs, create access challenges and increase the potential for erosion and sedimentation unless substantial controls are implemented.

Projects should strike an appropriate balance between competing environmental, commercial and social factors.

Overall, the site selection process should follow a mitigation hierarchy by first avoiding impacts as far as possible and then minimising and mitigating residual impacts.

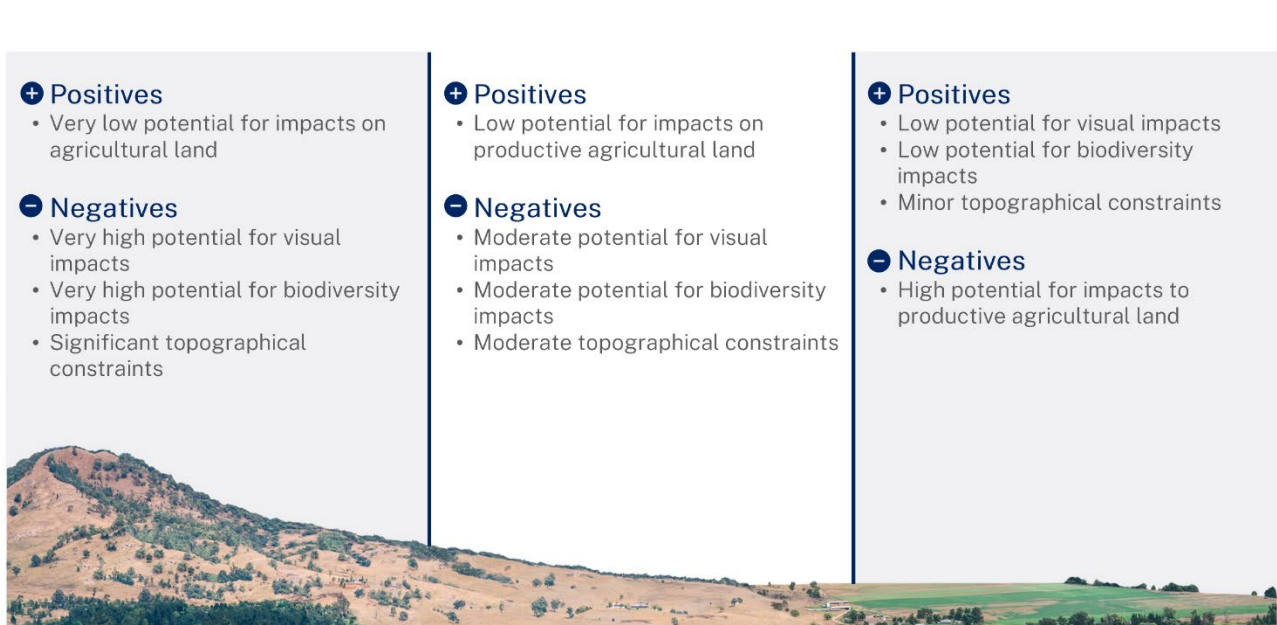


Figure 2. Site selection considerations

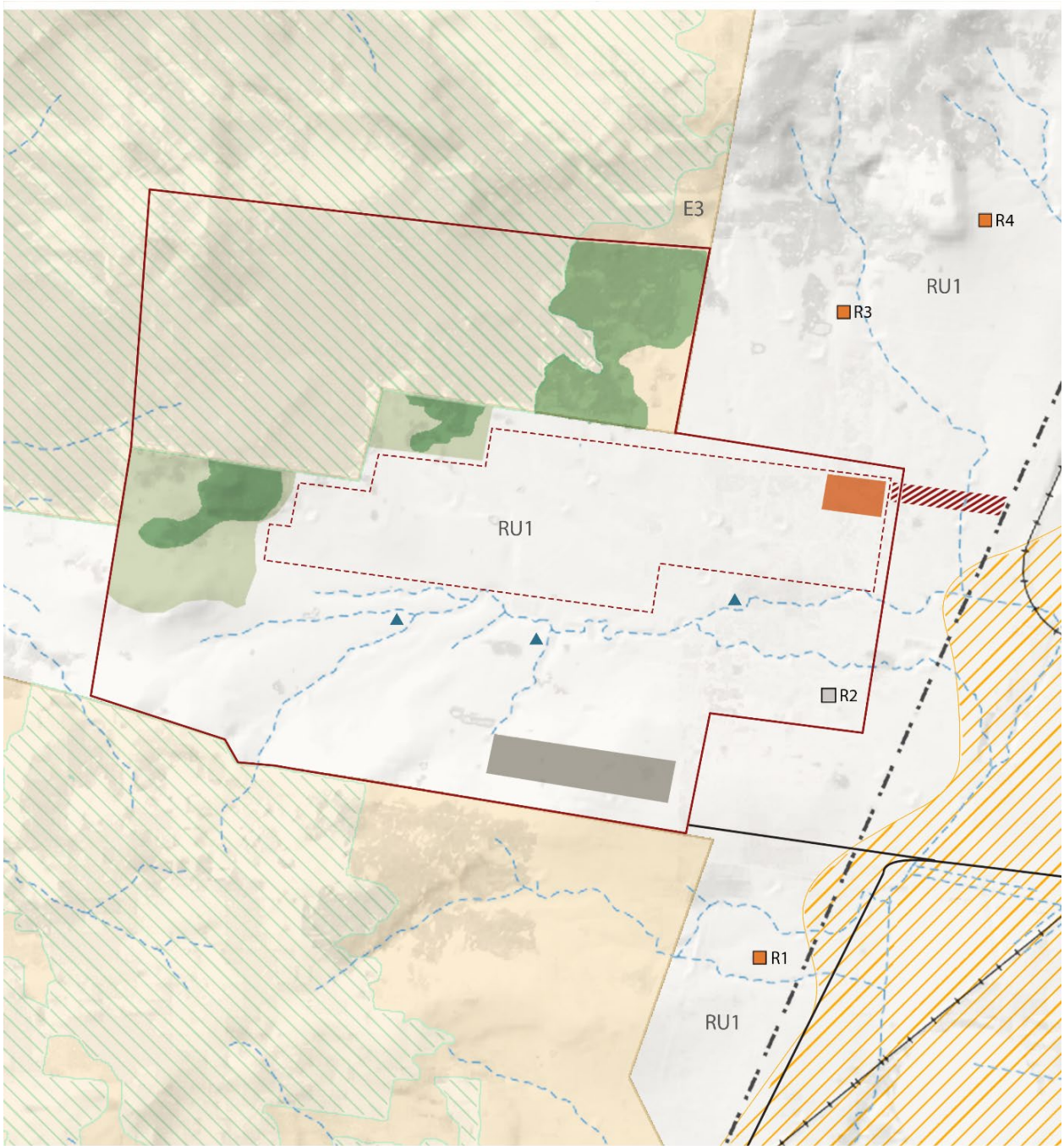
### 4.2.1 Constraints mapping

As part of the site selection process, applicants should do a ‘constraints mapping’ exercise that is informed by early engagement with local communities and councils. This should provide an overview of the project and map:

- administrative boundaries, including renewable energy zones, local government areas and the extent of the project
- nearby residences, including identifying numbers for each and whether they are subject to any private agreements (see our [Private Agreement Guideline](#))
- current, approved and proposed infrastructure, including transmission infrastructure, airports and roads
- current, approved and proposed renewable energy projects (where the Planning Secretary’s environmental assessment requirements have been issued)
- any mining tenements, including exploration licenses
- vegetation, including potential visual screening
- areas of high biodiversity value
- important agricultural land and the soil capability class of subject land and surrounding land
- relevant environment and land use constraints on and around the project site including national parks, large waterways and waterbodies.

Applicants should include a constraints map, like that shown in Figure 3 in the scoping report.





**Legend**

**Project**

- Project area
- - - Indicative footprint
- Construction compound
- Substation
- ▨ Transmission line corridor

**Zoning**

- E3 - Environmental management
- RU1 - Primary Production

**Features**

- Roads
- - - Transmission line
- + Railway
- - - Waterway
- Non associated dwelling
- Associated dwelling
- ▲ AHIMS

**Vegetation**

- Native woodland
- Derived native grassland

**Land**

- ▨ Class 3 agricultural land
- ▨ Environmentally sensitive land



Figure 3. Sample constraints map

# 5

## Assessment issues and requirements



This section outlines the assessment requirements for some of the common issues found with large-scale solar energy development. This includes visual amenity impacts, glint and glare, agricultural land use conflict, rehabilitation and decommissioning and waste management. This section also includes the key principles involved in site selection and design and the detailed assessment of projects.

## 5.1 Landscape and visual impacts

Changes to our rural and natural landscapes will be necessary to facilitate a transition to renewable energy. This guideline and its supporting *Large-Scale Solar Energy Guideline: Technical Supplement for Landscape and Visual Impact Assessment* aim to achieve balanced outcomes that support the development of the solar energy industry while avoiding and managing major impacts on the landscape and private views.

The visual impacts of solar energy developments vary depending on the size of solar arrays, the distance they are located from the viewpoint and differences in elevation between the viewpoint and the arrays. For example, a distant large-scale solar energy development may have a lesser impact than one nearer to residents. The impact may also be higher from areas overlooking a solar array because more of the project would be visible than if the viewer were at a similar elevation.

The visual impact assessment technical supplement outlines thresholds for a range of these scenarios based on solar array distance and relative height differences from the viewpoints (see section 3.1 of the supplement). Visual impacts can largely be managed through careful siting of the solar arrays and implementing mitigation measures such as vegetation screening and agreements with affected landowners.

### 5.1.1 Key principles

#### Visual amenity principles

- Applicants must consider landscape character and visual impacts early in the site selection and design process to minimise impacts and conflicts, including cumulative impacts.
- Solar energy projects should be sited and designed to avoid areas with topographical constraints that would increase the visibility of a development.
- Applicants must adopt strategies to reduce or manage moderate or high visual impacts.



## 5.1.2 Landscape and visual impact assessment

The applicant must prepare a landscape and visual impact assessment according to the visual impact supplement. The supplement provides a methodology for assessing, evaluating and mitigating potential impacts on landscape character and individual viewpoints.

The purpose of a landscape character assessment is to understand the sensitivities of the landscape and to determine a project's impact on the character of the area and sense of place. It should also determine any impacts on private locations such as residential dwellings (also known as 'private receivers') and viewpoints in the public domain.

The supplement includes tools to determine the viewpoints that need to be assessed, the level of assessment required and the extent of the impact. These tools consider factors such as:

- a distant solar energy project generally has a smaller impact than one closer to a viewpoint.
- views from some viewpoints are more sensitive than others (for example, a residence is more sensitive than a local road, where views are more intermittent and less frequent).
- a view is more sensitive to change if it has higher scenic qualities and more valued features.
- the magnitude of impacts is likely to be higher from areas overlooking a solar array because more of the project would be visible.

Impacts are assigned a rating from 'very low' to 'high' based on these considerations.

Applicants must avoid high impacts (unless they can be justified, or the applicant has an agreement with the affected landowner) and provide mitigation (such as vegetation screening) to reduce moderate impacts. Appendix C of the visual impact technical supplement provides a range of visual impact examples.

## 5.2 Agricultural land use

The nature of agricultural land in NSW often makes it desirable for developing large-scale solar energy projects. This is because:

- agricultural land is often flat, which reduces the scale and likelihood of visual impacts
- agricultural land is often cleared of vegetation, which limits any biodiversity impacts
- large-scale solar energy projects require larger portions of contiguous land (approximately 500 ha on average) compared to other types of industrial development
- solar energy development is permissible on land zoned for agricultural and rural uses.

Despite these factors, the cumulative risk to agricultural land and productivity because of large-scale solar development is very low. The Australian Energy Market Operator estimates that NSW will need approximately 20,000 MW of large-scale solar generation by 2050. This would require approximately 40,000 ha of land or only 0.06% of rural land in NSW. Even in the highly unlikely scenario that all of NSW's solar generation were located on important agricultural land (this land covers around 13.8% of the state and is 6 to 7 times more agriculturally productive than the remaining 86.2% of the state) only 0.4% of this land would be needed.

While the cumulative risk to both rural land and important agricultural land is relatively low, we must balance the need for renewable energy with the need to safeguard important agricultural land for food and fibre production and to ensure that any use of this land would not have a significant impact on the local and regional agricultural industry.

### 5.2.1 Agricultural land mapping

Land and soil capability mapping (LSC mapping) classifies land into 8 classes based on the agricultural practices that could be sustained on the land, the ease of management and the risk of degradation. The limitations to agricultural use are determined by factors such as soil properties and climate.

LSC Class 1 represents land capable of sustaining most land uses, including those that have a high impact on the soil (such as regular cultivation). LSC Class 8 represents land that can only sustain very low-impact land uses (such as nature conservation). The different LSC classes are described in the Office of Environment and Heritage's [Land and Soil Capability Assessment Scheme](#). The map data can be viewed on the NSW Government's [SEED portal](#).

Biophysical strategic agricultural land is land with high-quality soil and water resources capable of sustaining high levels of productivity. Biophysical strategic agricultural land data can be downloaded from the [Safeguarding our agricultural land](#) section of our website.

### 5.2.2 Co-location of large-scale solar development and agriculture

Large-scale solar energy development and agricultural practices can coexist to the benefit of both landholders and solar development applicants.

There are many examples of co-location within Australia and internationally.<sup>13</sup> Examples of activities that support co-location include sheep grazing, beekeeping and/or horticultural

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<sup>13</sup> Clean Energy Council, March 2021, Australian Guide to Agrisolar for Large-Scale Solar, p. 2.

activities.<sup>14</sup> Solar panels can offer shade for sheep, protection from the elements and green pasture during droughts.<sup>15</sup>

### 5.2.3 Key principles

#### Agricultural land use principles

- Applicants should consider the agricultural capability of the land during the site selection process.
- Applicants should avoid siting solar energy projects on important agricultural land as far as possible.
- Agricultural assessment should be proportionate to the quality of the land and the likely impacts of a project.
- Mitigation strategies should be adopted to minimise any significant impacts on agricultural land.

### 5.2.4 Agricultural impact assessment

Applicants may need to provide an agricultural impact assessment for a large-scale solar energy project. Appendix A of this guideline provides details to help applicants determine the level and content of any agricultural assessment that may be required.

The purpose of an assessment is to ensure that applicants, communities and consent authorities have a detailed understanding of the:

- agricultural capability and productivity of land subject to the project site
- potential impacts of the solar energy project on agricultural land and associated industries
- ways in which the potential impacts may be mitigated.

If a large-scale solar energy project is located on or adjacent to important agricultural land or located on moderate capability land (LSC Class 4), the applicant must verify the agricultural quality and capability of the land. They should then use the results of this verification process (which should include a soil survey) to design the layout of their project and to avoid impacts on productive land.

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<sup>14</sup> Clean Energy Council, March 2021, Australian Guide to Agrisolar for Large-Scale Solar, p. 6–7.

<sup>15</sup> Clean Energy Council, March 2021, Australian Guide to Agrisolar for Large-Scale Solar, p. 8.

Once the capability of the land is verified, applicants may need to assess the impacts within the proposed layout. The triggers for and level of assessment required are summarised in Table 1 and explained in further detail in Appendix A.

Table 1. Levels of agricultural impact assessment

Project location	Level of assessment	Purpose of assessment
Located adjacent to rural zoned land	Level 1 – basic	Ensure that applicants, in consultation with landholders, identify and consider potential impacts on immediately adjacent agricultural land.
Located on rural zoned land verified as LSC Class 4	Level 2 – reduced	Consider impacts and conflicts with the agricultural land subject to the project site.
Located on rural zoned land verified as LSC classes 1 to 3	Level 3 – detailed	Provide a detailed justification for the project and include an assessment of whether the project would significantly impact the local or regional agricultural industry.
Other scenarios	No assessment required	Not applicable

## 5.3 Infrastructure contributions, benefit sharing and private agreements

### 5.3.1 Infrastructure contributions

Councils collect local infrastructure contributions to help fund infrastructure needs resulting from development, including managing increased traffic and providing community facilities.

Large-scale solar energy projects typically have limited impacts on local infrastructure, except for traffic and transport infrastructure.

Generally, local infrastructure contributions therefore have little or no application to solar energy projects as:

- These projects often do not create sufficient demand for public amenities or services to warrant s7.11 contributions
- For s7.12 contributions to be charged, a council must have a contributions plan in place. Contributions plans require that councils have a sense of the type and volume of development they should expect in an area. This is often not the case for solar energy development.

Roads will generally need to be improved to accommodate the increased traffic during construction. Issues like this should be addressed through conditions of development consent rather than through local contribution mechanisms or planning agreements. If a benefit-sharing rate will be paid, the consent authority should not require local contributions unless they are needed to address specific direct impacts on infrastructure services and development (which as mentioned above, are likely to be low to nil).

There may be limited circumstances where it is reasonable for Councils to collect local infrastructure contributions to help fund infrastructure needs resulting from a solar energy project. For example, a project which includes a workforce accommodation camp may affect local infrastructure, public amenities, and services due to the increase in the local population. Whether local infrastructure contributions are required will depend on factors such as the size of the camp and the expected impacts to local infrastructure and services.

### 5.3.2 Benefit sharing

Benefit sharing is a term used to describe different approaches and mechanisms that aim to distribute the proceeds of a project (financial and other benefits) between the applicants and the community through mutually agreed opportunities.

Benefit sharing can help build community support by ensuring that projects deliver an overall positive outcome for local and regional communities, including tangible and long-term social and economic benefits.

The NSW Government strongly supports benefit sharing programs. Applicants should develop the details of a benefit sharing program according to our [Benefit Sharing Guideline](#), which contains best-practice guidance for applicants to coordinate benefit sharing programs in their communities. The guideline includes detailed information on how applicants can work with councils and communities to fund community programs and projects. Applicants should detail the benefit sharing program in the environmental impact statement.

### 5.3.3 Private agreements

It is common for applicants to enter into private agreements with landholders to either host infrastructure or to manage the impacts from the development. The 2 most common forms of private commercial agreements for large-scale solar energy developments are landholder agreements and neighbour agreements. Our [Private Agreement Guideline](#) gives more details.

#### Landholder and neighbour agreements

Landholder agreements are where applicants enter into agreements with ‘host’ landholders who are willing to have project infrastructure located on their land. These agreements are

essentially commercial leases and should set out the terms that let the applicant or project owner install, operate and maintain the project infrastructure, as well as the arrangements for decommissioning and rehabilitating the project infrastructure and land.

Neighbour agreements are agreements made between the applicant and neighbour of a development. These agreements are typically made to manage and mitigate significant impacts on the neighbour or their land. For example, neighbour agreements are commonly used to mitigate high visual impacts from projects.

### **Agreement assessment requirements**

Where an applicant and landholders have an agreement, the affected residence is taken to be ‘associated’ with the development for the purpose of the assessment (if the agreement relates to the relevant impacts). This means that any impacts accepted in an agreement do not need to be assessed in the environmental impact statement.

Where an applicant and landholders do not have an agreement, the affected residence should be identified as ‘non-associated’ in the environmental impact statement (see the map in Figure 3 in section 4.2.1 of this guideline for an example) as it relates to the relevant impacts.

Separately to the environmental impact statement, the applicant should provide the department with a register of agreements. The register should clearly identify the landholder and the type, extent and duration of any impacts covered by an agreement. This register should be provided with the environmental impact statement. Further requirements are outlined in the [Private Agreement Guideline](#).

## **5.4 Waste management and circular design**

Solar energy projects can generate different waste streams throughout the phases of their development, operation and decommissioning. Large volumes of waste, typically cardboard packaging, wooden pallets and plastic wrapping from the photovoltaic panels, may be generated during construction. Most of this waste is likely to be classified as general non-putrescible and has the potential for recovery through reuse and/or recycling.

Project operation typically produces a negligible amount of waste. The waste produced is mainly generated from repair and maintenance activities, administration and maintenance buildings, and any workforce accommodation (general waste, food waste and co-mingled recycling).

When projects are decommissioned, large amounts of waste materials can be generated. This comes from discarding the infrastructure, including photovoltaic panels. A typical photovoltaic

panel and its associated infrastructure comprises glass, copper cabling, aluminium framing, silicon wafers, silver and other materials.

The current volume of photovoltaic panel waste from large-scale solar energy projects is not significant but is expected to grow over the next few decades. The entire solar industry (including household solar energy systems) currently generates less than 2,000 tonnes of solar panel waste per year. By 2025, solar energy systems in NSW are anticipated to generate approximately 3,000 to 10,000 tonnes of waste, and this is expected to grow to between 34,000 and 63,000 tonnes per year by 2035.

The NSW Government is committed to reducing waste to landfill and has created a \$10 million [Circular Solar Fund](#) that supports adopting technologies to manage end-of-life solar waste and a transition to a circular economy.

### 5.4.1 Key principles

#### Waste management principles

- Construction waste must be minimised, and this waste should comprise as much reusable and recyclable material as possible.
- Impacts on local waste management facilities must be minimised as far as practicable during construction, operation and decommissioning.
- Recycling of photovoltaic panels and associated equipment should be prioritised and maximised as far as possible to avoid landfill.
- Applicants should monitor technological and industry advancements over the life of the project and give preference to the most efficient and cost-effective recycling and recovery methods.

### 5.4.2 Assessment

Applicants should clearly demonstrate how waste will be minimised at all stages of the project and how reuse and recycling will be optimised.

The environmental impact statement must:

- identify waste types (including the appropriate waste classification)
- estimate the waste generated at each stage of the project (construction, operation and decommissioning)
- identify potential end markets for waste materials, noting that some end-of-life market options will be subject to technological advances and market development over time

- consider how the applicant will ensure all recyclable materials are sent to appropriate recovery facilities to minimise waste sent to landfill at each stage of the project
- consider circular design principles<sup>16</sup> and strategies to mitigate impacts and reduce waste throughout all stages of the project (such as minimising product packaging prior to transport to the site and using recycled, reusable, low-emissions and low-impact raw materials)
- consider end-of-life reuse, refurbishment and recycling strategies for photovoltaic panels and associated equipment that maximise high recovery methods.

Appropriate mitigation measures may include:

- selecting manufacturers, distributors and installers of photovoltaic panels that are members of relevant product stewardship schemes
- selecting manufacturers and distributors of photovoltaic panels and associated infrastructure that minimise packaging and/or maximise the recyclable components of packaging
- separating waste streams on site prior to transport to waste management facilities
- ensuring all recyclable materials are sent to the appropriate recycling facilities and minimising waste sent to landfill
- consulting with local councils to ensure that the impacts on local waste management facilities are minimised as far as practicable
- developing and implementing strategies that prioritise and maximise waste avoidance and re-use, including exploration of ‘second-life’ options
- selecting waste management providers that specialise in recycling end-of-life photovoltaic panels and associated infrastructure.

## 5.5 Decommissioning and rehabilitation

Once installed, large-scale solar energy projects typically have an expected operating life of around 20 to 30 years. Large-scale solar energy projects have the potential to operate for a long period of time if the solar panels are refurbished or upgraded over time. At the end of the operating life, the main options for decommissioning are to:

- replace the solar panels with new technology (subject to landholder agreements, planning approvals and the condition of the equipment), or
- decommission the project and remove the solar panels and associated infrastructure.

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<sup>16</sup> NSW Circular Economy Policy Statement: Too Good To Waste (2019) - Chapter 1: Circular economy definition and principles



In most circumstances, refurbishing solar panels and infrastructure will not require a new development application or a modification to the existing consent. The terms of the existing consent may authorise refurbishment.

The applicant may choose to stop the operation of a large-scale solar energy development and decommission and rehabilitate some (or all) of the project at any time. Decommissioning typically follows the reverse order of installation. This involves dismantling and removing solar panels, structures and the above-ground and ancillary infrastructure and returning the site to its pre-existing use and LSC class. Pending the final agreed land use and conditions of consent (including requirements to rehabilitate ecologically sensitive areas), below-ground cabling and conduits may be left in-situ and access tracks retained to support the ongoing use of land for agricultural use.

Applicants must remove materials and waste products from the site for recycling, reuse or disposal in approved waste facilities (see section 5.4 of this guideline). This also involves disconnecting the project from the electricity network.

### 5.5.1 Key principles

#### Decommissioning and rehabilitation principles

- The land on which a large-scale solar energy project and supporting infrastructure is developed must be returned to its pre-existing or an agreed use (by the Planning Secretary) if the project is decommissioned.
- Land must be rehabilitated and restored to pre-existing use, including the pre-existing LSC class if previously used for agricultural purposes.
- If operations cease, the project site must generally be rehabilitated within 18 months to the satisfaction of the Planning Secretary.
- The applicant of a solar energy project should be responsible for decommissioning, and this should be reflected in the agreement with the landholder hosting the project infrastructure.
- Applicants should ensure landholders hosting project infrastructure are informed about the proposed decommissioning plan for the project.

### 5.5.2 Responsibilities and financial assurances

We expect the applicant of a large-scale solar energy development to be responsible for decommissioning and rehabilitation. This should be reflected in an agreement with the landholder (see our [Private Agreement Guideline](#) for specific guidance).

However, there are some situations where this obligation may fall to the landholder, such as when the owner or operator of the project becomes insolvent. This is because the conditions of development consent apply to the land and not to a particular party or company.

Consequently, the landholder should have a clear understanding of how the project owner or operator will manage the decommissioning phase. The landowner may also request assurances to fund decommissioning, including providing ongoing evidence that the applicant has the capacity to fund decommissioning activities.

Applicants and landholders may estimate the potential costs of decommissioning for the development using our [decommissioning cost calculator tool](#). The cost of decommissioning is estimated to be around \$52 per solar panel (inclusive of recovery costs). This rate can vary substantially depending on factors such as whether the access roads and underground cables are removed, the location of local waste facilities and haulage requirements, the decommissioning process and methods adopted at the time of decommissioning, and the value of the scrap metal. If they are not removed, the value of materials from the solar components can help to offset the costs of decommissioning (based on 2023 estimates).

If an applicant or landholder fails to meet the decommissioning and rehabilitation obligations of the project's development consent, we can use our enforcement powers under the EP&A Act to address any breaches.

### 5.5.3 Assessment

Applicants must identify the decommissioning and rehabilitation activities that will take place and address all relevant issues for decommissioning and rehabilitation in the project's environmental impact statement.

Issues may include dust and noise impacts from earthwork activities and vehicles, increased traffic generation and/or traffic disruptions and risks to biosecurity, particularly related to pests, diseases and weeds. We recognise that decommissioning and rehabilitation impacts are likely to be short-term and of a similar or lesser magnitude than the construction impacts.

The consent authority should impose conditions to ensure that the key principles are met. Conditions of consent should generally include performance objectives that are outcome-based and not post-approval requirements such as management plans. It is the NSW Government's policy that financial assurances should not be required by conditions of consent and any financial assurances should be dealt with in agreements negotiated between the applicant and landowner.

## 5.6 Glint and glare

Glint (a momentary flash of light) and glare (a continuous, excessive brightness) can affect people and land users near large-scale solar energy developments, including residents, road users and rail and airport operations.

However, significant glint and glare impacts are uncommon with large-scale solar energy developments because:

- solar panels are designed to absorb light and typically reflect less than 2% of incoming sunlight<sup>17</sup>
- glint and glare typically occur for short periods of time and require very specific geometric and atmospheric conditions
- many solar energy projects are now fitted with tracking panels that can be adjusted to avoid or minimise the geometric conditions needed to cause glint and glare.

While glint and glare impacts can be relatively uncommon, it is important to model and assess these impacts to ensure any potential significant impact is avoided or mitigated appropriately.

### 5.6.1 Key principles

#### Glint and glare principles

- Solar panels should be sited to reduce the likely impacts of glint and glare.
- Solar panels and other infrastructure should be constructed of materials and/or treated to minimise glint and glare.
- If a large scale-solar energy development is likely to exceed the relevant criteria for glare and standards for glint, mitigation strategies must be adopted to reduce the impacts.

### 5.6.2 Assessment

Applicants should assess glint and glare according to the requirements in Appendix B of this guideline. The assessment must demonstrate that glint and glare would not pose a significant risk to motorists or pilots and that nuisance from glare is minimised for residential locations, according to the objectives outlined in Table 2.

<sup>17</sup> Spaven Consulting 2011, Solar Photovoltaic Energy Facilities: Assessment of Potential for Impact of Aviation, Report No.10/344/RPS/1.

Table 2. Impact rating and performance objectives for glare impacts to residential dwellings

High glare impact	Moderate glare impact	Low glare impact
> 30 minutes per day > 30 hours per year	< 30 minutes and >10 minutes per day < 30 hours and >10 hours per year	< 10 minutes per day < 10 hours per year
Significant amount of glare that should be avoided.	Implement mitigation measures to reduce impacts as far as practicable.	No mitigation required

## 5.7 Other assessment issues

Table 3 gives an overview of other matters relevant to solar energy developments that require careful consideration and assessment.

Table 3. Other assessments issues

Issue	Consideration
<b>Air quality</b>	Applicants should detail dust suppression measures that will be used during construction and operation. The measures could include using water carts during land preparation, temporary wind fences and the revegetation of disturbed areas.
<b>Batteries</b>	If the project includes battery energy storage that has a capacity of more than 30 MW, the applicant must do a preliminary hazard analysis in accordance with <a href="#">Hazardous Industry Planning Advisory Paper No 4 – Risk Criteria for Land Use Safety Planning</a> , <a href="#">Hazardous Industry Planning Advisory Paper No 6 – Hazard Analysis and Assessment Guideline –Multi-level Risk Assessment</a> .
<b>Biodiversity</b>	If clearing is proposed on sites containing native vegetation or the habitat of threatened species or threatened ecological communities, the applicant must prepare a biodiversity development assessment report in accordance with the <i>Biodiversity Conservation Act 2016</i> and the <i>Biodiversity Assessment Method 2020</i> . We expect applicants to demonstrate that they have applied the principles of avoiding, minimising and mitigating impacts.
<b>Cumulative impacts</b>	Any cumulative impacts from other developments (proposed, approved and operative), especially on biodiversity, social and economic wellbeing and construction, must be assessed according to the latest version of <a href="#">Cumulative Impact Assessment Guidelines for State Significant Projects</a> . For example, multiple solar energy projects near each other may have a cumulative impact on dwellings or neighbouring land uses.

<p><b>Development rights</b></p>	<p>The applicant may need to consider whether the proposed development would impact the right for neighbouring landholders to develop their land for the purposes of any of the following permitted land uses:</p> <ul style="list-style-type: none"> <li>• residential accommodation</li> <li>• tourist and visitor accommodation</li> <li>• eco-tourist facility.</li> </ul> <p>In considering the impacts, applicants and consent authorities should only assess impacts on vacant land. That is, land in which there is a development right that has not been acted upon and is vacant of buildings and structures.</p> <p>Additionally, an assessment should only be undertaken if the land is vacant at the time the Planning Secretary’s environmental assessment requirements are issued, and would:</p> <ul style="list-style-type: none"> <li>• immediately adjoin the development, or</li> <li>• experience exceedances of the relevant noise criteria.</li> </ul> <p>The assessment should consider whether the proposed development would unduly impact the development potential of the vacant land. In determining the impact, it may be relevant to consider:</p> <ul style="list-style-type: none"> <li>• whether the vacant land is part of a broader contiguous property holding with an existing dwelling, building or structures</li> <li>• if a future development could be designed, sited and oriented to avoid or reduce significant impact from the project, and</li> <li>• any mitigating effects including topography and vegetation.</li> </ul> <p>An example assessment is provided in Appendix B.</p> <p>If, at the time the Planning Secretary’s environmental assessment requirements are issued, the vacant land is subject to:</p> <ul style="list-style-type: none"> <li>• a development application that has been lodged but is yet to be determined, and/or</li> <li>• a development application or complying development certificate has been determined/granted but the development is yet to physically commence<sup>18</sup></li> </ul> <p>the applicant should consider measures to mitigate the impacts on these rights. Measures may include:</p> <ul style="list-style-type: none"> <li>• helping affected landholders modify the existing consent</li> <li>• seeking a new development consent that would minimise impacts</li> <li>• screening or landscaping treatments.</li> </ul> <p>For the avoidance of doubt, these approvals should not be treated as existing dwellings, or other receivers for the purpose of conducting a visual impact assessment or noise impact assessments.</p> <p>Any consents or approvals that have physically commenced at the time the Planning Secretary’s environmental assessment requirements should be treated as</p>
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Issue	Consideration
	existing dwellings, or other receivers for the purpose of conducting a visual impact assessment or noise impact assessment.
<b>Hazards</b>	<p>Solar energy infrastructure should avoid land subject to identified natural hazards (such as bushfires, flooding or land instability) and should not increase natural hazard risks.</p> <p>Any natural hazards or risks associated with the construction, operation and decommissioning of the solar energy project must be assessed. These include those associated with hazardous materials (such as from photovoltaic panels and battery storage) and the threat of fire spreading to a solar development or being caused by associated infrastructure such as cables, panels or transmission lines.</p> <p>If the project is in a bushfire-prone area, applicants must prepare a strategic bushfire study according to the NSW Rural Fire Service’s <a href="#">Planning for Bush Fire Protection</a>.</p>
<b>Heat island</b>	Where a solar energy project is located adjacent to a horticultural or cropping activity, the solar array should be setback from the property boundary by at least 30 m to mitigate any heat island effect.
<b>Health</b>	Applicants should consider the power frequency and electric and magnetic field exposure guidelines <sup>19</sup> referenced by the <a href="#">Australian Radiation Protection and Nuclear Safety Agency</a> .
<b>Heritage</b>	<p>An Aboriginal cultural heritage assessment report is required for all State significant projects. Proponents must also consult with the Aboriginal community according to <a href="#">Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010</a>.</p> <p>Applicants should also assess the likely impacts on European historical and archaeological objects and places.</p>
<b>Noise and vibration</b>	<p>Applicants should assess:</p> <ul style="list-style-type: none"> <li>• construction noise impacts according to the <a href="#">Interim Construction Noise Guideline</a></li> </ul> <p>operational noise impacts according to the NSW <a href="#">Noise Policy for Industry</a>.</p>
<b>Public interest</b>	Assess the public interest in the project, including the public interest in renewable energy, the objects of the EP&A Act and the principles of ecologically sustainable development.

<sup>18</sup> ‘Physically commenced’ has the same meaning as that in section 96 of the [Environmental Planning and Assessment Regulation 2021](#).

<sup>19</sup> ICNIRP Guidelines for Limiting Exposure to Time Varying Electric and Magnetic Fields (1 Hz – 100 kHz) 2010.

Issue	Consideration
<p><b>Regional cities</b></p>	<p>Where an applicant proposes a large-scale solar development within a mapped area in proximity to a regional city, they should comprehensively address the provisions within the Transport and Infrastructure SEPP.</p> <p>Residential and commercial developments that have been approved (but not yet commenced) should be included when identifying the surrounding urban environment.</p> <p>The applicant should consult with the relevant council and identify any land identified for future growth in strategic planning documents, including in local strategic planning statements and housing strategies.</p>
<p><b>Social impacts</b></p>	<p>A social impact assessment is required for all State significant projects and must be undertaken according to the latest version of our <a href="#">Social Impact Assessment Guideline</a>. This will include an assessment of the positive and negative impacts of the proposed development on people and groups, including how the impacts are distributed.</p> <p>The assessment should consider any increase in demand for community infrastructure and services, the need for temporary construction workforce accommodation, job opportunities and the flow-on economic impacts to local communities.</p>
<p><b>Strategic context</b></p>	<p>Assess whether the project is consistent with local or state planning strategies and government climate change and energy policies. Look at the capability of the project to contribute to energy security and reliability<sup>20</sup>.</p>
<p><b>Traffic and transport</b></p>	<p>Applicants should consider whether the local and classified road network can accommodate the traffic generated by the construction of the solar energy project, having regard to any advice from relevant road authorities.</p> <p>Applicants should provide a clear list of road upgrades required and an assessment of the relevant impacts of these upgrades, having regard to advice from relevant road authorities. Applicants must identify whether the road upgrades require landowner’s consent.</p>

<sup>20</sup> For guidance on addressing electricity system security and reliability, see *Electricity System Security and Reliability Environmental Assessment Requirement* on NSW Climate and Energy Action’s [Electricity system security and reliability requirement web page](#).

Issue	Consideration
<b>Water supply</b>	<p>Surface -water-related impacts, such as flooding, discharge/run-off and erosion, must be assessed. Applicants must propose appropriate mitigation measures, such as sediment controls, must be proposed where warranted.</p> <p>Applicants should consult with landholders regarding potential surface-water - related impacts of the project on neighbouring properties and any mitigation measures.</p> <p>Any assessment of surface water-related impacts must be informed by a soil survey that considers the potential for erosion. If there is any water take associated with the project, the applicant should identify the source of water (both potable and non-potable), and they may need to acquire water access licences if the project is approved.</p> <p>The applicant should detail the volume of water needed during construction and operation and the assumptions used to estimate water consumption. If water will be trucked to site, evidence must be provided that potential water suppliers for the project can meet demand, and truck movements must be accounted for in the traffic assessment.</p> <p>The applicant should outline the proposed wastewater management plan as well as the potential impacts of the project on downstream flows and flooding, including measures to mitigate and manage surface water runoff.</p>





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# Appendix

# A

# Agricultural impact assessment requirements



Applicants of large-scale solar energy projects should use this appendix to determine whether they need to assess the impacts on agricultural land. If such an assessment is required, they should use this appendix to determine the appropriate level of assessment.

## Level of assessment

Applicants must undertake a level of assessment that is proportionate to the agricultural capability of the land that may be affected by the project.

There are 3 levels of assessment:

1. Basic assessment – for projects proposed on land adjacent to rural zoned land
2. Reduced assessment – for projects proposed on moderate-capability land
3. Detailed assessment – for projects proposed on important agricultural land.

To determine the level required, applicants should follow the steps outlined in Figure 4 and described below.

### Step 1: Identify zoning

Rural-zoned land is mostly used for primary production practices and agricultural industries. An assessment of the impact on agriculture may be needed if the project site or immediately adjacent land is zoned as rural land under the applicable environmental planning instrument.

An assessment of impacts on agricultural land will not be required if the project site:

- is not zoned as rural land under the applicable environmental planning instrument
- is not adjacent to land zoned as rural land under the applicable environmental planning instrument.

### Step 2: Identify available mapping

An assessment of agricultural impacts will be required where the land that is the subject of the application and/or immediately adjacent to the project site is of moderate capability or important agricultural land.

Applicants must use available mapping datasets to identify:

- the LSC class of the project site
- whether any biophysical strategic agricultural land is present on the project site
- whether immediately adjacent land is mapped as LSC classes 1 to 3 or biophysical strategic agricultural land.

In some cases, applicants must verify the quality and capability of the site (see Step 3).

### Step 3: Site verification

Site verification is an important component of the environmental assessment process as it provides an understanding of the quality of the land and its capacity for agricultural use.

In circumstances where the subject site is located on or adjacent to land mapped as moderate capability or important agricultural land, the applicant must verify the capability of the land by analysing the soil, climate and landform features.

Soil verification is critical to ensure that applicants, communities and consent authorities have accurate and objective information about the land and soil characteristics of the project site and can understand any associated limitations and hazards of the land.

Site verification will help applicants to:

- understand the biophysical features of the land, including soil type, slope, landform position, acidity, salinity, drainage, rockiness and climate
- understand the on-site and off-site limitations and hazards of the land, including erosion, soil structure decline, soil acidification, salinity, waterlogging, shallow soils and rockiness
- consider appropriate land management strategies in light of the biophysical features and hazards present
- refine the siting and layout of the project, avoid impacts on productive agricultural land and manage any land limitations.

Applicants required to verify land should refer to the sections following for guidance. Site verification is not required for large-scale solar development located on poorer agricultural land of LSC classes 5 to 8.

#### Soil survey

A soil survey must be completed for all large-scale solar energy projects proposed on land mapped as moderate capability or important agricultural land.

Soil surveys provide objective, scientific and detailed information not otherwise available under mapping systems, which have been completed at a broader regional scale and are a critical component of the soil verification process.

Soil surveys should be completed at an inspection density of one site per 5 to 25 ha. This inspection density is recommended for moderately intensive uses at 'field' level and detailed project planning under the [Guidelines for Surveying Soil and Land Resources \(Second Edition\)](#).

In some circumstances, an inspection density of 1 site per 5 ha to 25 ha may not be appropriate. Applicants can complete the soil survey at a different inspection density if they provide clear and sufficient justification for doing so in the environmental impact statement.

Site verification and soil sampling is only required for the subject site and not for any adjoining land. In all cases, a baseline soils report, which summarises the soil survey methodology and conclusions reached, should be submitted as part of the project’s environmental impact statement.

Use the references listed in Table 4 to guide the soil survey.

Table 4. Soil survey resources

Activity	Guideline
Soil sampling and survey	McKenzie NJ, Grundy MJ, Webster R and Ringroase-Voase AJ (2008) Guidelines for Surveying Soil and Land Resources. Second Edition. CSIRO Publishing, Melbourne.
Classification of soil types	Isbell RF and National Committee on Soil and Terrain (2021) The Australian Soil Classification. Third Edition. CSIRO Publishing, Clayton South, VIC.
Soil physical measurements and interpretation	McKenzie N, Coughlan K and Cresswell H (eds) (2002) Soil physical measurement and interpretation for land evaluation. CSIRO Publishing, Collingwood.
Soil chemical measurements and interpretation	Rayment GE and Lyons DJ (2011) Soil chemical methods – Australasia. CSIRO Publishing, Collingwood.

### Verification of LSC class

After completing a soil survey, the applicant must verify the agricultural capability and LSC class of the land according to the Office of Environment and Heritage’s [Land and soil capability assessment scheme](#).

The assessment scheme uses the biophysical features of the land and soil, including landform position, slope gradient, drainage, climate, soil type and soil characteristics, to derive detailed rating tables for a range of land and soil hazards. These hazards include water erosion, wind erosion, soil structure decline, soil acidification, salinity, waterlogging, shallow soils and mass movement. This information can help support the sustainable use and management of the land and soil resources.

Where soil verification has determined that the agricultural capability of the land is inconsistent with the mapped LSC class of the land, the applicant must identify the inconsistencies and the LSC class of the land as verified. The level of assessment to be completed (see Step 4) will be determined by the verified LSC class.

## Step 4: Determine the level of assessment required

An agricultural impact assessment is required where:

- the applicant has verified the land as LSC classes 1 to 4  
or
- the project site is adjacent to rural-zoned land.

The level of assessment required depends on the agricultural capability of the land and location of the project as outlined in Figure 4 and Table 5. To avoid doubt, the highest quality land present on the site must determine the level of assessment required.

Table 5. Level of assessment required for state-significant development solar energy projects

Project location	Level of assessment
Located adjacent to rural zoned land	Level 1 – basic
Located on rural zoned land verified as LSC Class 4	Level 2 – reduced
Located on rural zoned land verified as LSC classes 1 to 3	Level 3 – detailed
Other scenarios	No assessment required

There may be times when the applicant of a large-scale solar energy project is prepared to accept that the subject site is important agricultural land without verifying the capability as described in Step 3.

In these circumstances, the applicant must complete a level 3 detailed assessment and should be prepared to accept a condition of consent that requires the land to be returned to the mapped LSC class.



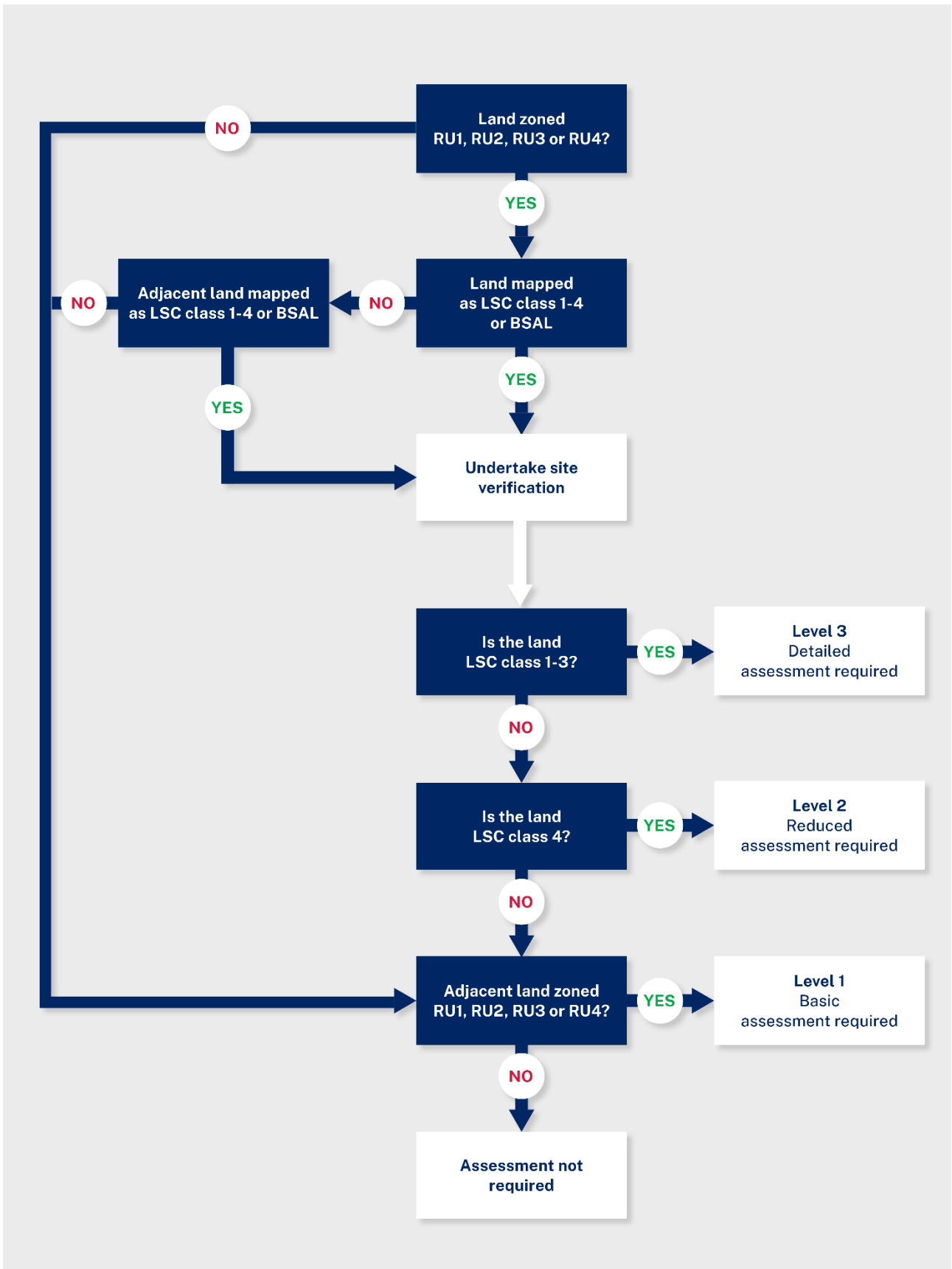


Figure 4. Determining the level of assessment required for large-scale solar energy projects

## Content of assessment

If applicants are required to complete an assessment, the EIS must be prepared in accordance with the requirements detailed below. Above all, the information must be presented in a manner that is clear and easy to understand.

### Level 1 assessment – basic

Solar energy projects have the potential to impact neighbouring properties and landholders if the project is not managed correctly. Applicants must consult with neighbouring landholders to understand potential impacts on immediately adjacent agricultural land. Consultation should inform strategies to mitigate these impacts.

Project impacts may include disruption to existing agricultural operations, biosecurity-related risks, changes to water supply and/or fire hazard risks.

The purpose of a level 1 assessment is to ensure that applicants consider project impacts on immediately adjacent agricultural land and to encourage open and honest dialogue between applicants and owners of this land. Applicants are encouraged to consult with the local community and other rural stakeholders about the potential impacts on neighbouring agricultural land.

A level 1 assessment must:

- present LSC mapping and the results of any site verification completed to confirm land capability
- include consultation with neighbouring landholders to identify potential project impacts (if any) on immediately adjacent land
- describe project impacts (if any) on immediately adjacent land
- describe the consultation undertaken
- consider measures to reduce impacts on neighbouring agricultural land.

### Level 2 assessment – reduced

A level 2 assessment is required when solar energy projects are proposed on moderate-capability land verified as LSC Class 4.

LSC Class 4 land is land that has moderate to high limitations for high-impact land uses such as cropping, high-intensity grazing and horticulture. These limitations can only be managed using specialised practices with a high level of knowledge, expertise and investment.

As LSC Class 4 land can be used for productive agricultural uses such as cropping with appropriate management and technology, applicants must undertake an assessment of the key issues and potential impacts of the solar energy project on this land.

Table 6 outlines the information required in a level 2 assessment. All information required for a level 1 assessment must also be included in a level 2 assessment.

Table 6. Requirements for level 2 assessment

Assessment required	Content and form
<p><b>Project description</b> Describe the nature, location, intensity and duration of the project and include a map of the project area.</p>	<ul style="list-style-type: none"> <li>• Project description</li> <li>• Location</li> <li>• Duration</li> <li>• Areas of the site that would be disturbed or temporarily removed from agricultural use</li> </ul>
<p><b>Regional context</b> Describe the regional context.</p>	<ul style="list-style-type: none"> <li>• Zoning of the project site</li> <li>• Climate and rainfall</li> <li>• Regional landform</li> <li>• Regional land use including any significant agricultural industries and/or infrastructure</li> </ul>
<p><b>Site characteristics and land use description</b> Describe the nature and location of agricultural land that may be impacted by the development.  Describe the current agricultural status and productivity of the proposed development area and surrounding locality, including the land capability as per Office of Environment and Heritage's <u>Land and soil capability assessment scheme</u>.</p>	<ul style="list-style-type: none"> <li>• Land subject to the project site</li> <li>• Existing agricultural land uses (e.g. orchards, vineyards, breeding paddocks, intensive livestock areas)</li> <li>• The history of agricultural practices on the project site</li> <li>• Soil type, fertility and land and soil capability</li> <li>• Map showing the verified LSC class of the project site</li> <li>• Map showing the topography of the site</li> <li>• The agricultural productivity of the site</li> </ul>
<p><b>Land use conflict risk assessment</b> Conduct an assessment of potential land use conflicts, including completing an assessment according to the Department of Primary Industries' <u>Land Use Conflict Risk Assessment Guide</u>.</p>	<ul style="list-style-type: none"> <li>• Land use compatibility and conflicts</li> <li>• Discuss compatibility of the development with the existing land uses on the site and adjacent land (e.g. aerial spraying, dust generation and biosecurity risk) during operation and after decommissioning, with reference to the zoning provisions applying to the land</li> </ul>



Assessment required	Content and form
<p><b>Impacts on agricultural land</b></p> <p>Identify and describe the nature, duration and consequence of any potential impacts on agricultural land subject to the project site and in the wider region.</p>	<ul style="list-style-type: none"> <li>• Project impacts on identified agricultural lands including, but not limited to, potential weeds, pests, dust, bushfire, livestock, crop production</li> <li>• Impacts to the agricultural productivity of the site</li> <li>• Project potential to permanently remove agricultural land and/or fragment or displace existing agricultural industries</li> <li>• Cumulative impacts of multiple solar energy projects on agriculture in the region</li> </ul>
<p><b>Mitigation strategies</b></p> <p>Outline strategies that may be adopted to mitigate potential impacts on agricultural land and minimise land use conflict.</p>	<ul style="list-style-type: none"> <li>• Strategies to mitigate project impacts on agricultural land</li> <li>• Co-location with existing agricultural practices and the feasibility of agrisolar where it would result in a meaningful benefit (see the Clean Energy Council's <a href="#">Australian Guide to Agrisolar for Large-Scale Solar</a>).</li> </ul>

### Level 3 assessment – detailed

A level 3 assessment is required where solar energy projects are proposed on land verified as LSC classes 1 to 3 or biophysical strategic agricultural land. This land is the state's most productive land and has the least limitations for sustaining various land uses.

Applicants should generally avoid siting solar energy infrastructure on important agricultural land, including land mapped as LSC classes 1 to 3 or biophysical strategic agricultural land.

Where it is not possible to avoid this land, the applicant must prepare a comprehensive assessment that addresses the requirements of both level 1 and level 2 assessments and includes:

- a detailed assessment of whether the project would significantly impact the local or regional agricultural industry, including production and supply chains
- justification for the project and a consideration of alternatives that would have lesser impacts on agricultural land – applicants must demonstrate that other project sites and siting options have been considered and state the reasons why the site and layout was chosen over alternative options
- an analysis of whether the site design could be amended to reduce impacts.

## Mitigation measures

Mitigation strategies should be developed to minimise project impacts on agricultural land. The environmental impact statement should clearly identify potential project impacts on agricultural land and strategies to mitigate these impacts. Mitigation measures may include:

- design:
  - locating solar panels in consultation with landholders
  - designing temporary fencing and access routes to minimise impacts on existing farm operations and livestock
  - ensuring that access to the site does not fragment surrounding land and is of an appropriate design standard to support agricultural use
  - amending project design to avoid important agricultural land
  - implementing appropriate buffer zones between the project disturbance area and adjacent agricultural land
- construction:
  - establishing ground cover on the site within 3 months of completing construction
  - implementing erosion and sediment controls
- operation:
  - maintaining the ground cover with appropriate perennial species and managing weeds
  - appropriately managing waste and pollution risks
  - allowing for grazing, horticulture and biodiversity regeneration activities to continue.

We encourage applicants to consider the following guidance published by the NSW Department of Primary Industries when determining suitable mitigation measures:

- Right to Farm Policy
- Infrastructure proposals on rural lands
- Managing biosecurity risks in land use planning and development guide
- Buffer Zones to Reduce Land Use Conflict with Agriculture.

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# Appendix

# B

## Glint and glare assessment



The glint and glare assessment should represent a ‘worst case’ scenario that assumes no cloud cover throughout the year. The assessment should address the general requirements outlined below and in Table 7. The glint and glare assessment must include:

- a description of the proposed photovoltaic panels indicating:
  - the axis of rotation and maximum tilt angle
  - the light absorption efficiency and/or refractive index values at different angles
  - whether any backtracking is proposed and the time and duration of these operations
- the results of the glint and glare analysis for each assessable receiver
- an identification of existing vegetation or built structures and a qualitative assessment of whether these features would eliminate or reduce the modelled impacts
- a justification for excluding any modelled glare results because they would be insignificant due to the size, position and luminance of the glare source or high ambient luminance.
- details of strategies to either avoid or mitigate impacts including re-siting or sizing the project, altering the tracking patterns, implementing vegetation screening or entering into agreements with landholders if all other measures have been exhausted.



Table 7 Glint and glare requirements

View	Scope	Methodology	Performance objective
<b>Residential receivers</b>	All residential viewpoints within 3 km of the proposed solar array that have a line of sight  Representative viewpoints may be used for residential receivers that are clustered together (see additional guidance in the technical supplement).	Analysis of the daily and yearly glare impacts in minutes  All residential receivers must be assessed at a height of 1.5 m above ground level.	See the impact ratings and performance objectives for residential receivers outlined in Table 2.
<b>Road and rail</b>	All roads and rail lines within 1 km of the proposed solar array	Solar glare analysis to identify whether glint and glare are geometrically possible within the forward looking eyeline of motorists and rail operators	If glare is geometrically possible, then measures should be taken to eliminate the occurrence of glare. Alternatively, the applicant must demonstrate that glare would not significantly impede the safe operation of vehicles or the interpretation of signals and signage.
<b>Aviation</b>	All air traffic control towers and take-off and landing approaches to any runway or landing strip within 5 km of the proposed solar array	Solar glare analysis that is worst case in all scenarios accounting for all aircraft using the airport (e.g. gliders, helicopters, etc)	Any glint and glare should be avoided unless the aerodrome operator agrees that the impact would not be material (e.g. occurs at times when there are no flights or would not pose a safety risk to airport operations).

# Appendix

# C

## Example development rights impact assessment



The applicant may need to consider whether the proposed development would impact the right for neighbouring landholders to develop their land for a permitted use. This assessment should be prepared in accordance with the guidance in section 5.7. An example assessment is provided below.

Table 8. Example of a dwelling entitlement impact assessment

Receiver number	Impacts	Evaluation
DE-1	<ul style="list-style-type: none"> <li>• The subject lot is approximately 450 ha. It is relatively flat, pastoral in nature and predominately cleared of vegetation. It is largely unconstrained and could support a dwelling over much of its extent.</li> <li>• The proposed solar farm is located immediately north-east of the subject lot. The lot is as close as 40 m from the proposed infrastructure but up to 300 m away at its furthest point.</li> <li>• The noise impact assessment predicts that there will be no exceedances of the noise criteria.</li> </ul>	<ul style="list-style-type: none"> <li>• The subject lot contains sufficient space and views away from the project such that a dwelling could be located or oriented to avoid any significant visual impacts.</li> <li>• The proposed vegetation planting would also minimise any impacts on the subject lot.</li> <li>• The development is not expected to significantly impact the ability of the land to be developed in the future.</li> </ul>
DE-2	<ul style="list-style-type: none"> <li>• The subject lot is part of a subdivision and covers approximately 900 m<sup>2</sup>.</li> <li>• The lot adjoins the development site and would be located 20 m from the proposed solar infrastructure, including the proposed battery energy storage system.</li> <li>• In the absence of any mitigation, the subject lot would experience high visual impacts from the development.</li> <li>• Noise from the battery energy storage system would also result in exceedances of the 35 dbA noise criteria.</li> </ul>	<ul style="list-style-type: none"> <li>• The development may cause visual and noise impacts that would unreasonably hinder the ability of the landholder to develop the land.</li> <li>• The applicant is negotiating an agreement with the landholder to mitigate the impacts of the project.</li> </ul>