DRAFT - Solar Energy Facilities

Design and Development Guidelines

VICTORIA State Government | Environment, Land, Water and Planning

Accessibility

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Contents

Introduction

These guidelines outline the assessment and development process for large-scale solar energy facilities in Victoria and provide advice on how potential impacts can be avoided or effectively managed. These guidelines will inform the development of positive and appropriate projects that enhance communities and support the transition to a clean and prosperous energy system.

They have been developed to provide information for applicants, the community, regulators and responsible authorities. The responsible authority for solar energy facility planning permit applications under the *Planning and Environment Act 1987* and planning schemes is the local council.

These guidelines apply only to large-scale facilities, and do not apply to solar panel arrays that supply energy for an existing use of the land on which they are located. The first section, **Policy, Planning and Legislative Requirements**, sets out the framework in Victoria for planning and assessing proposals for solar energy facilities. The second section, **Best Guidance for Proponents**, gives proponents guidance on improving the quality of their development proposal, and effectively engaging with, and minimising impacts on, local communities.

What are solar energy facilities?

Solar energy facilities harness energy from the sun to generate electricity. The most common solar energy facilities use photovoltaic (PV) solar panel arrays. Concentrated solar thermal (CST) technologies are less common, although several facilities are in operation overseas and under development in Australia.

PV solar technologies consist of solar panels containing groups of photovoltaic cells that convert sunlight directly into electricity. These panels are usually set out in arrays that are connected to inverters and associated controls that convert the direct current (DC) electricity generated by the panels into alternating current (AC) and distribute it through the electricity grid.

CST technologies use reflectors or heliostats (mirrors) to focus sunlight on a receiver to heat a fluid, molten salt or another medium, which in turn produces steam or hot air. The steam is then used to drive a turbine connected to a generator to produce electricity.

Battery storage may also be an important component of a solar energy facility, particularly as technology in this area develops.

Policy, Planning and Legislative Requirements

Solar energy facilities provide a clean source of energy generation and contribute to the reduction of greenhouse gas emissions. Their development will form part of Victoria's transition to a modern, renewable energy supply. Growth of the renewable energy industry also brings significant investment into regional areas, creating new jobs in construction and ongoing employment in facility operation and maintenance.

Co-locating solar energy facilities with agricultural production can also help stabilise farm incomes, which can fluctuate due to changing commodity prices and climatic patterns.

Most well-sited and carefully designed solar energy facilities have minimal impacts on surrounding communities, the environment and on agricultural activities. However, significant land use change can raise concerns across communities about potential impacts, which is why public engagement is an important part of the development process for solar energy facilities.

Proponents and regulatory authorities should consider:

- relevant government policy
- appropriate site location – analysis of opportunities and constraints
- regulatory requirements
- best practice design and development features
- early and effective community engagement.

1. State policy directions

Proposals for development of solar energy facilities must reflect the Victorian Government's key policy directions which include renewable energy, water, regional development and agriculture, and biodiversity. Solar energy facility proponents should consider state policy objectives and priorities early in the planning stages and site selection process.

1.1 Renewable energy

The Victorian Government has committed to renewable energy targets to ensure an affordable, reliable and renewable energy future for Victoria. To progress this goal, Victoria's Renewable Energy Target (VRET) requires increasing renewable energy generation to 25 per cent by 2020 and 40 per cent by 2025. The VRET policy also encourages investment in energy storage and new energy technologies, and is supported by Victoria's Renewable Energy Action Plan.

1.2 Water

Water for Victoria (2016) sets out water policy in Victoria and long-term strategies for managing the state's water resources. The plan highlights the importance of rural water infrastructure for future growth in the agriculture sector, and emphasises the need to maximise benefits for the community when considering questions of land use change and the water grid.

1.3 Regional development and agriculture

Victoria's Regional Statement (2015) recognises the diverse and changing components of the regional economy, including food, fibre, wine, tourism and renewable energy. The Statement highlights the significant job opportunities expected to emerge in the new energy industries that will drive this transition and defines nine Regional Partnership areas across the state.

The Statement also identifies key investments and strengths that underpin the potential of these areas, including the Goulburn Murray Water Connections project, a $2 billion rejuvenation of the Goulburn Murray Irrigation District. The Statement notes that prime agricultural land is a priority for this area.

The Agriculture Victoria Strategy (2017) identifies food and fibre as a priority industry sector, and recognises that Victoria is well placed to meet the demand for many high-value and high-quality products such as nuts, fruit and wine, along with dairy and meat products.

Regional growth plans provide broad direction for land use and development across regional Victoria.

1.4 Biodiversity

In Victoria, there is a range of legislation to protect biodiversity. The relevant biodiversity requirements are outlined in these guidelines.

2. Planning policy framework

As part of the Victoria Planning Provisions (VPP) under the *Planning and Environment Act 1987*, the Planning Policy Framework (PPF) contains state-level policies on land use and development in Victoria.

Clause 19.01-1S Energy supply aims to facilitate appropriate development of energy supply infrastructure. The objective of this clause is to support the transition to a low-carbon economy through renewable energy development and greenhouse gas emission reductions.

State planning policy recognises that local energy generation developments help diversify the local economy and improve sustainability outcomes. The policy supports the development of energy facilities in appropriate locations to take advantage of existing infrastructure and provide benefits to industry and the community.

Clause 19.01-2S Renewable energy has the objective to promote the provision of renewable energy facilities that meet appropriate siting and design considerations. When assessing proposals for renewable energy, a key strategy is to consider the economic and environmental benefits to the broader community from renewable energy generation, while considering the need to minimise any adverse effects on the local community and environment.

Other relevant sections from the PPF include:

- Clauses on planning in regional Victoria, including regional growth plans
- Clause 12.01 'Biodiversity'
- Clause 12.05 'Significant environments and landscapes'
- Clause 13 'Environmental risks and amenity'
- Clause 14.01 'Agriculture – Protection of agricultural land'
- Clause 14.02 'Water'
- Clause 15.02 'Sustainable development'
- Clause 17 'Economic development'

3. The Victorian electricity transmission network

Large solar energy facilities connect into the National Electricity Market (NEM) through the Victorian electricity network. Electricity generated from the solar energy facility is transported via high voltage transmission lines to large industrial energy users and to low voltage electricity distribution networks in each region, which deliver electricity to homes and businesses.

In Victoria, the best solar resources are not always located in close proximity to suitable network infrastructure, and existing network infrastructure can become constrained at specific locations within increasing connections and generation.

Proximity to the existing electricity network and spare connection capacity available at the anticipated connection point are highly important considerations for solar energy facilities.

The Integrated System Plan, which the Australian Energy Market Operator (AEMO) released in July 2018, identified five Renewable Energy Zones in Victoria. The Zones are areas where clusters of large-scale renewable energy, including solar energy facilities, can be developed through coordinated investment in electricity transmission and generation. The five Zones identified highlight for renewable energy proponents where AEMO is proposing infrastructure planners prioritise their network upgrades, and a high-level timeline for their delivery, which may guide decisions about future project placement.

Further information on existing electricity network constraints can be identified using the interactive maps on the Australian Energy Market Operator (AEMO) website. Additional information is also available from the relevant electricity distribution business (Powercor and SP AusNet) planning reports.

4. Strategic site selection assessment criteria

4.1 Land use planning

In Victoria, local planning schemes have been prepared and adopted for each municipality that articulate state, regional and local policy directions for land use and development. The planning scheme outlines the strategic intent for the local government area and the criteria that planning permit applications will be assessed against.

Assessment of planning permit applications is usually carried out by the relevant local council in its capacity as the 'responsible authority' under the *Planning and Environment Act 1987*. In some instances, the Minister for Planning may be the relevant responsible authority.

Proponents should consider multiple site options within a region, as part of responding to state and local planning policy. These assessments will help determine if a site is suitable for establishing a solar energy facility, including the advantages of a site, any inherent constraints and challenges, and the relevant land use planning policies and provisions that apply. A proponent should try to avoid, mitigate or offset impacts on important environmental, cultural or landscape values when selecting a site for a solar energy facility. Selecting a suitable site can help streamline the assessment process and result in a more timely decision.

The proponent is strongly encouraged to hold pre-application discussions with the relevant local government to understand key local values and strategic planning priorities.

Community input is a fundamental part of the Victorian Planning System. Stakeholder engagement from the outset of project planning is strongly recommended to assist implementation of solar energy facility projects and encourage long-term growth of the renewable energy sector. The Department of Environment, Land, Water and Planning (DELWP) guide *Community Engagement and Benefit Sharing in Renewable Energy Development* provides suitable advice.

Once a site has been selected, more detailed analysis is needed to confirm feasibility of the site and address approvals issues.

This checklist lists the site considerations that should be investigated at the regional level.

Strategic considerations	
☐	Policy context, zones and overlays
☐	Agricultural values including irrigation infrastructure impacts
☐	Heritage and Aboriginal cultural values
☐	Landscape values and visual amenity
☐	Biodiversity and native vegetation
☐	Access to the Victorian electricity grid
☐	Other infrastructure requirements
☐	Cumulative effect of solar energy facilities in the area

4.2 Planning policy, zones and overlays

The broad strategic intent for land use and development in each region of the state is set out in the relevant regional growth plan. This information can be used to identify potentially suitable locations for solar energy facilities.

Applications for planning permits must be assessed against state and local planning policy set out in the VPP.

All land in Victoria is subject to a planning zone, which is defined in the VPP. Each zone establishes a range of potential land uses, which may be 'as-of-right' and do not require planning permission or require a permit or are prohibited. Multiple planning overlays may also apply to a potential development site, and these must be considered as part of the planning permit process. The zone and overlays ultimately determine whether a solar energy facility is allowable on a particular site in accordance with the Planning Policy Framework and may impose certain conditions on development.

Planning schemes do not apply to Commonwealth government land. Proponents seeking to develop a solar energy facility on Commonwealth land need to contact the relevant land manager of the 'Commonwealth place'.

Proponents are advised to obtain a planning property report for proposed sites as part of the selection process and consult the relevant council. This is an efficient way of finding out which planning provisions apply to a specific location.

Once a viable site has been selected, proponents should undertake a more detailed review of the planning controls, including the particular provisions of the VPP and any relevant planning policies and issues that need to be addressed as part of the permit application process.

4.3 Agricultural values

Victoria produces over 30 per cent of Australia's food, and accounts for about one-quarter of Australia's agricultural value.

The state produces a diverse range of produce including meat, grains, fruit, vegetables and dairy products.

Agricultural land, particularly irrigated land, is a valuable resource, and successive governments have invested heavily in improving agricultural production, including by modernising irrigation infrastructure.

In most rural areas, renewable energy generation, such as solar energy facilities, can effectively co-exist with agricultural production. Solar energy facilities can contribute to the rural economy and support farm incomes by providing property owners with a diversified revenue stream.

4.3.1 Planning strategies for protecting agricultural land

Strategies to protect agricultural land are set out in all Victorian planning schemes. Clause 14.01 Agriculture: Protection of agricultural land includes the objective to protect the state's agricultural base by preserving productive farmland. Key measures are outlined, including the need to:

- protect strategically important agricultural and primary production land from incompatible uses
- protect productive farmland that is of strategic significance in the local or regional context
- avoid permanent removal of productive agricultural land from the state's agricultural base without consideration of the economic importance of the land for the agricultural production and processing sectors.

The Farming Zone (Clause 35.07) sets out decision guidelines for 'Agricultural issues and the impacts from non-agriculture uses'.

Non-agricultural developments may be appropriate in the Farming Zone, and this clause outlines criteria for the council to consider when assessing a planning permit application.

Productive farmland that is of 'strategic significance' represents the most productive farming land in the state. This productivity arises from a combination of land attributes and economic factors, as set out in Table 1. Most rural land is not considered to be strategically significant agricultural land.

When making decisions on the appropriate location of solar energy facilities, councils should require permit applicants to provide an assessment of:

- the agricultural quality of the proposed site
- the amount of strategically significant agricultural land in the council area and in the region (the regional assessment should include impacts across the area defined by the Regional Growth Plan boundaries, unless otherwise determined by the council)
- the potential impact of removing this land from agricultural production.

The proponent should lodge a report on this assessment with the permit application. Table 1 provides information that these reports should contain. Strategically significant agricultural land may include other elements - these criteria have been adapted for use specifically in relation to solar energy facility development.

Table 1 - ATTRIBUTES OF STRATEGICALLY SIGNIFICANT AGRICULTURAL LAND	
Land attributes	
Soils and landscape	The following soil characteristics can be important to agricultural productivity depending on the locality: • **Inherent soil quality**: soils that are high value due to their year-round and multi-purpose properties • **Niche soil**: soils that are particularly good for certain crops and support niche industries • **Versatile soil**: soils that assist in risk mitigation by being suitable for a range of cropping, horticulture and pasture purposes in industries that require different soil types
Water and climate	Access to secure water supply and resilience to the impacts of climate change • **Access to modernised irrigation infrastructure**: access to modernised irrigation delivery is a high priority for agricultural regions, including significant existing and planned areas requiring infrastructure investment by government and water authorities (See assessment criteria below) • **Resilience and adaptability**: resilience of land to the potential impacts of climate change, such as through access to a recycled water supply
Economic attributes	
Structural	• **Favourable subdivision:** a pattern of subdivision that favours sustainable agricultural production • **Post-farm-gate processing and value adding:** areas that support industries with critical links including processing plants and major packing houses • **Industry clusters:** areas where industries have successfully clustered to achieve significant efficiencies • **Access:** good access to existing markets, labour and transport, including airports and logistics facilities
Economic	• **Government investment:** areas of significant government investment targeted at food production and other agricultural economic development • **Market trends:** the potential for commercial agricultural growth based on commodity market trends

As well as following the guidance in Clauses 14.01–1 and 35.07 of the planning scheme, responsible authorities will also seek advice about the implications of specific solar energy facility proposals for management of the modernised irrigation grid from the relevant rural water corporation.

If it is determined as appropriate to develop a solar energy facility on strategically significant agricultural land, consideration should be given to:

- the opportunities and benefits from dual use or co-location, such as combining a solar energy facility with agricultural production
- how the facility could contribute to the agricultural economy by providing energy security or an alternative income stream
- how the facility could be decommissioned, and the land rehabilitated in the future to an agreed standard.

The weight that can be given to these factors will vary according to a site's particular environmental and economic conditions and the agricultural commodities it produces.

4.3.2 Assessment criteria for irrigated agricultural land

Areas serviced by modernised irrigation infrastructure are designated as strategically significant agricultural land (Table 1). Councils should give notice to rural water corporations under section 52 of the *Planning and Environment Act 1987* of planning applications for solar energy facilities in these locations.

Proponents should demonstrate that the development will have limited impacts on the significant investments that have been made by the Victorian and Commonwealth governments to upgrade irrigation infrastructure, supporting agricultural production in the region.

Advice from rural water corporations to the relevant council will focus on an assessment of whether the proposed development site is in an area serviced by modernised irrigation infrastructure and farmed using intensive irrigation.

The Government proposes to review the role of relevant rural water corporations in the planning permit application process, to provide them with a formal role as a referral authority for specific non-agricultural developments in areas serviced by the modernised irrigation grid. This change would require the responsible authority to seek advice from the relevant water corporation which would have a recommendatory role. It is proposed to give effect to this by amending the State planning policy to include reference to a map of the modernised irrigation grid, supported by planning provision changes, in order to guide proponents.

The policy would provide decision makers with clear assessment criteria for water corporations when providing their input to the Responsible Authority on relevant solar farm applications, such as the implications of the proposal on the irrigation system, its viability and sustainability. It is intended that all maps required to guide decision making will be prepared and updated by relevant water corporations to reflect ongoing adjustments to the irrigation system.

4.4 Heritage and Aboriginal cultural values

Solar energy facility developments may affect heritage assets both above and below ground. Impacts may be on the heritage site, its landscape setting or direct impacts on archaeological deposits through ground disturbance.

Proponents must check whether the proposed site for the solar energy facility is an area of heritage sensitivity and should avoid locations of high significance.

Proponents can use Aboriginal Victoria's online map tool and the Victorian Heritage Register to check whether the land is affected by a Heritage Overlay, or consult a suitably qualified heritage adviser.

Engaging with local Aboriginal groups beyond planning requirements, such as Cultural Heritage Management Plans, should also be a key consideration. Early dialogue with Traditional Owners and Aboriginal groups is important as part of identifying, verifying, managing or where necessary excluding areas of cultural heritage value from development (see section 5.3.5).

4.5 Landscape values and visual amenity impacts

The visual impact of a solar energy facility and the transmission lines connecting it to the grid should be considered at the pre-application stage. The most significant environmental effect of solar energy facility development can be its impact on landscape character and visual amenity, and it is vital that this be considered early in the planning process.

Ideal sites have:

- flat, low-lying topography that is not visible from surrounding areas
- appropriate setbacks from residential areas and other sensitive land uses
- the potential to be screened, such as areas with vegetation along the boundaries
- the potential for visual corridors to be maintained along key sightlines.

CST systems, which use reflecting mirrors, require more extensive landscape impact and visual amenity analysis.

4.6 Biodiversity and native vegetation

Proponents must consider how the proposed development would affect local biodiversity and native vegetation, and the impact on any species listed under the *Flora and Fauna Guarantee Act 1988* and the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999*.

Planning provisions for protection, management and removal of native vegetation are set out under Clause 52.17 Native vegetation in the VPP.

Planning permit applications must include an assessment of flora impacts.

All developments must avoid the removal of native vegetation, or minimise impacts where removal cannot be avoided, before considering mitigation by offsetting residual impacts. The overall requirement is to ensure that there is no net loss to biodiversity because of the removal, destruction or lopping of native vegetation.

One option to avoid or minimise impacts on native flora and fauna is to choose a site for a solar facility that has previously been cleared for other land uses.

4.7 Electricity grid connection and transmission and distribution Infrastructure

Any electricity generation facility anticipating connection to the NEM (including solar energy facilities) will be required to submit a grid connection application in accordance with the National Electricity Rules. In Victoria, transmission level (large scale) connection applications are administered by the Australian Energy Market Operator (AEMO) while smaller scale (typically below 10 MW) connections are administered by the local electricity business. To find more information about Victoria's electricity network, consult the AEMO brochure on Electricity infrastructure in your community. A developer of a solar energy facility will be required to identify a point of connection if connecting to the NEM.

Construction of distribution and/or transmission lines and substations can create significant change across the landscape of an area. Communities can be concerned about unwanted impacts on visual amenity related to the route, pole placement and appearance; as well as changes to road use or traffic conditions.

Comprehensive consultation ensures all the relevant stakeholders are engaged through the planning and construction stages of the project. All affected landholders, communities, councils and relevant authorities should be fully aware of works – including design, placement and appearance – before they commence. This includes any landowners and occupiers adjacent to road reserves.

It is also important to hold discussions with the relevant electricity authority to determine what connections are necessary for the project and their possible impact on the local area. This consultation should occur early in the development process and should factor in network connection route and options and the extent of roadside or other public land proposed to be utilised compared to private land. Any works on public land will require the approval of the public land manager. This may

be the local council or the Victorian Government through DELWP. In terms of siting power line infrastructure on road reserves or Crown land, it is the responsibility of the developer to ensure that all relevant approvals are in place for any given project. Relevant authorities are identified below:

- *Local roads:* Local councils are typically the relevant authority that manages local roads. Approval will be required from the council as the road manager for any works within the road reserve. DELWP generally administers roads that are unused and occupied by the adjoining owner.
  Note that councils and their constituents will be concerned with the final design and placement, as well as appearance, of power lines. It is recommended that as much information is shared with councils as possible throughout the design phase to maximise social acceptance.
- *State roads (VicRoads)*: Approval will be required from VicRoads as the road manager for any works within the road reserve. Further information is contained within relevant VicRoads guidelines listed at the end of this document.
  It is recommended that design and placement information is also shared with councils to maximise local understanding and acceptance.
- *Crown land*: Any works on public land will require the approval of the public land manager. This may be the local council or the Victorian Government through DELWP or Parks Victoria.

Public land managed as parks, for conservation or related public purposes should be avoided where practicable. Works on Crown land also may require consultation around matters pertaining to the *Native Title Act 1993* (Commonwealth) and *Traditional Owner Settlement Act, 2010*. This legislation is administered in Victoria by DELWP. Additional considerations also apply to Crown land under the *Fauna and Flora Guarantee Act*, *1988* and the *National Parks Act, 1975*.

4.8 Cumulative effect of solar energy facilities in an area

Clustering of a solar energy facility with other solar energy facilities or other renewable energy facilities in an area can provide efficiencies in facilities sharing existing or augmented grid network infrastructure, but may also have cumulative effects, such as visual impacts.

When assessing a potential site and preparing a description of it as part of a planning permit application, proponents should list other significant infrastructure in the vicinity.

Proponents should consider the cumulative impact of the proposed facility with other nearby development, and the potential effects on the community or locality. Proponents are also required to consider cumulative impacts on biodiversity under Clause 12.01 Biodiversity in the VPP.

Cumulative impacts, as defined in the Ministerial Guidelines for assessment of environmental effects under the Environmental Effects Act 1978, occur where a project, in combination with one or more other proposed projects, or existing activities in an area, has an overall significant effect on a particular environmental asset.

A regional perspective is also needed on the potential effects of a project to provide a wider context for assessing potential impacts on biodiversity, landscape and agricultural values, such as the impact of several solar energy facilities along the same upgraded irrigation channel.

5. Detailed development assessment

The local council is the responsible authority under The *Planning and Environment Act 1987* for assessing planning permit applications for solar energy facilities[1]. The council will consider state planning polices, the applicable zone and overlays that apply, the relevant particular provisions and local planning policies or other guidance provided within the planning scheme when assessing an application.

The council will assess the planning permit application and any other associated approvals. The reconfiguration of lot boundaries and operational works permits for earthworks, roadworks and other civil engineering activities all require approvals.

The planning scheme may also require the application to be referred to DELWP or other referral authorities. Referral authorities will assess the application and provide comments to the council to inform its decision making.

All permit applicants are encouraged to engage an experienced planning consultant to help prepare, lodge and navigate the planning permit application through the process. This approach is generally the most efficient option and will save applicants time and resources over the whole development application process.

5.1 Application requirements

The relevant particular provision for solar energy facility developments in the VPP is Clause 53.13 Renewable energy facility (other than wind energy facility and geothermal energy extraction). It applies to any building or other structure or thing used in or in connection with the generation of energy by a renewable resource. It does not include a renewable energy facility principally used to supply energy for an existing use of the land.

This clause sets out the application requirements for proponents and the decision guidelines for the responsible authority to consider in their assessment of a planning permit application for a solar energy facility.

To successfully apply for a planning permit to construct and operate a solar energy facility, proponents should complete the following steps.

5.1.1 Pre-application discussions

Proponents should discuss the following matters with the responsible authority (e.g. local council or Minister):

- the relevant state and local planning policies, guidelines and other planning scheme requirements that apply to the proposal
- the requirements of any referral authorities or other agencies that may have an interest in the proposal, or where other consents are required (such as AEMO or the relevant Distribution Network Service Provider)
- other parties and stakeholders who may be affected by the proposal and the potential actions that might need to be taken to address any issues that are likely to be raised in the assessment process.

The DELWP guide Community Engagement and Benefit Sharing in Renewable Energy Development contains more information about pre-application discussions.

1 The Minister for Planning can 'call in' any planning permit application in Victoria under section 97 of the Act

5.1.2 Lodgment and processing of planning permit applications

The information that proponents need to provide will vary depending on the context of the proposal and the requirements of any referral authorities (Pre-application discussions with the responsible authority will help refine what is most relevant).

When all the relevant information has been received and is determined to be satisfactory, the responsible authority will proceed with public notice and referral of the application. Upon completion of notice and referral processes, the council will determine the application.

The relevant assessments for this information are discussed in the following sections.

5.2 Permit application documentation

All assessments and documentation submitted with the application should clearly state the facts, the scope of the matters and all assumptions on which the assessments were based.

Permit applications must include:

- a signed application form
- payment of the relevant fee
- a current copy of title for the subject land
- a site and context analysis, including the relevant land use zone, overlays and
- consideration of any applicable particular provisions in the planning scheme
- a design response, as described in Clause 53.13 of the VPP.

5.2.1 Site and context analysis

The site and context analysis should reflect the process of site selection (as outlined in section 4) and feasibility analysis.

The site analysis should:

- demonstrate consideration of the site selection criteria discussed in these guidelines
- list any significant constraints of the site and surrounding area
- demonstrate consideration of how the development may be affected by these characteristics.

5.2.2 Design response

The design response must include:

- detailed plans of the proposed development (see below)
- accurate visual simulations illustrating the development in the context of the surrounding area and from key public viewpoints
- an assessment of the extent of vegetation removal and a rehabilitation plan for the site
- a written report with comprehensive information about the proposal (see below).

The detailed plans should cover:

- information on the layout and dimensions of the facility and any associated building and works
- relevant design elements
- the reflectivity of the facility
- the electricity distribution point (where the electricity will enter the distribution system)
- site access points
- vehicle access to roads and parking areas
- a description of any drainage system for the site.

The written report should include:

- an explanation of how the proposed design responds to the site analysis
- a description of the proposal, including the types of processes that will be utilised,
- materials to be stored, and the nature of any onsite treatment of waste
- whether a works approval or licence is required from EPA Victoria
- the potential amenity impacts such as noise, glint, light spill, emissions to air, land or water, vibration, smell and electromagnetic interference (see Best Practice section)
- the effect of traffic to be generated on roads, including a traffic management plan
- a strategic assessment of the impact upon Aboriginal or non-Aboriginal cultural heritage
- a strategic assessment of the impact of the proposal on any species listed under the *Flora and Fauna Guarantee Act 1988* or the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (where relevant)
- an environmental management plan including a construction management plan, and information on any proposed site rehabilitation and monitoring (see Best Practice section)
- the design of any associated electricity transmission or distribution infrastructure, including pole design, route options, road safety considerations, visual amenity impacts, setbacks from sensitive land uses and the relationship to existing infrastructure
- a statement of why the site is suitable for a renewable energy facility (see below).

The statement about site suitability should cover:

- the agricultural quality of the site
- a calculation of the estimated reduction in greenhouse gas emissions due to the facility's production of emissions-free energy
- the amount of strategically significant agricultural land in the council area and the region
- the impact of removing this land from agricultural production.

5.2.3 Access and traffic management

Proponents should provide a traffic management plan to the responsible authority that details how the proposed solar energy facility will affect local traffic flows and road conditions in the surrounding area.

The permit application must include an analysis of site access and transport management for all stages of the project, including design, construction, operation and decommissioning.

Before construction begins, permit conditions will require a proponent to conduct an existing conditions survey of public roads for use during the construction and operation of the facility and provide a copy to the council.

The conditions survey should:

- be prepared by a suitably qualified and experienced independent civil or traffic engineer
- be prepared in line with the requirements of the relevant road management authority
- assess the suitability, design, condition and construction standard of the relevant public roads and access points including recommendations regarding any required upgrades to accommodate construction traffic.

The Best Practice section has more information on addressing traffic impacts.

5.3 Other approvals

Proponents are responsible for contacting relevant agencies to determine which approvals are required for their developments.

Clause 53.13 of the VPP sets out the assessments that proponents may need to conduct to satisfy the requirements of other state legislation and referral authorities.

The approvals required will vary depending on the context of the proposal, the controls affecting the site, and the requirements of any referral authorities.

5.3.1 Native vegetation

Proponents need to assess whether any native vegetation removal, destruction or lopping is needed during development and construction, including for preparatory works and works on road reserves.

Proponents must consider the DELWP Guidelines for the removal, destruction or lopping of native vegetation and whether any vegetation offsets are necessary. The DELWP Assessor's Handbook: Applications to remove destroy or lop native vegetation provides more information about offset reconciliation. The Biodiversity information and site assessment page on the DELWP website provides an up-to-date list of accredited native vegetation assessors.

A permit is required to remove any native vegetation, and the impacts must be assessed in accordance with Clauses 52.16 or 52.17 and Clause 53.13 of the local planning scheme. Proponents must also account for loss of vegetation due to the creation of site access routes and shading from solar panels.

Proponents should ensure that they deal with all native vegetation removal requirements at the beginning of the planning permit application process. Projects can be delayed if proponents need to reapply later for additional vegetation removal permissions.

5.3.2 Flora and fauna

In Victoria, the *Flora and Fauna Guarantee Act 1988* is the key piece of Victorian legislation for the conservation of threatened species and communities and for the management of potentially threatening processes. All native wildlife is protected in Victoria. It is an offence to kill, take, control or harm wildlife under the *Wildlife Act 1975*. A permit may also be required to remove protected vegetation under the *Flora and Fauna Guarantee Act 1988* if it is part of the declared critical habitat of that flora (section 20). Matters listed under the *Flora and Fauna Guarantee Act* can also form the basis for referral to the Minister for a decision about the need for an Environmental Effects Statement (EES).

Proponents must also consider the impact of their proposal on any species listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

5.3.3 Environmental effects assessment: Victorian processes

Assessment of the potential environmental impacts or effects of a proposed development may be required under the *Environment Effects Act 1978*.

The Minister for Planning is responsible for administering the *Environment Effects Act* and for deciding whether an EES is required under the Act. If a proposal is likely to have a significant effect on the environment, the onus is on the proponent to refer it to the Minister for a decision on the need for an EES.

Matters listed under the *Flora and Fauna Guarantee Act* can form the basis for referral to the Minister for a decision about the need for an EES. Where it is reasonably likely that species listed under the *Flora and Fauna Guarantee Act* will be affected by a development, proponents may be required to conduct surveys before applying for a planning permit. Potential impacts on flora and fauna should be considered early in the planning process to enable impacts to be avoided, or at least minimised, where practicable.

If an EES is required, the preparation of a *Cultural Heritage Management Plan* (CHMP) becomes mandatory under the provisions of the *Aboriginal Heritage Act 2006*. See the EES Advisory Note: Aboriginal Cultural Heritage for more information about preparing a CHMP.

The *Ministerial Guidelines for assessment of Environmental Effects under the Environment Effects Act 1978* provide guidance on EES processes.

If an EES is required for a solar energy facility, this process must be completed before the planning permit application can be determined. In some cases, an EES may not be required, but specific conditions may need to be met as an outcome of the Minister's determination.

5.3.4 Commonwealth environmental effects assessment processes

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* protects Matters of National Environmental Significance, including threatened flora and fauna, or migratory species. For guidance on impacts on Matters of National Environmental Significance that would trigger a referral under the Environment Protection and Biodiversity Conservation Act, see the Commonwealth Government's Department of Environment and Energy website.

Proponents should contact the council, the local DELWP Natural Environments Program officer and the Commonwealth Department of the Environment and Energy about whether the proposed large-scale solar energy facility may affect species protected under the *Environment Protection and Biodiversity Conservation Act*.

A bilateral agreement is in place between the Victorian and Commonwealth governments to avoid duplication of assessment processes by allowing Victoria to assess proposals likely to have a significant impact on environmental significance that the Commonwealth has determined to be 'controlled actions'. More information is available at: planning.vic.gov.au/environment-assessment/environmental-assessment-bilateral-agreement.

5.3.5 Heritage and cultural heritage

Land used to generate electricity is defined as a high-impact activity under Division 5 of the *Aboriginal Heritage Regulations 2007*. If the solar energy facility is in an area of cultural heritage sensitivity, a Cultural Heritage Management Plan (CHMP) will be required under the Regulations. A heritage adviser is required to prepare the CHMP on behalf of the proponent.

A CHMP is mandatory if the project:

- requires an EES under the *Environment Effects Act*
- is in an area of cultural heritage sensitivity that has not previously had significant ground disturbance.

Proponents may elect to voluntarily prepare a CHMP to proactively manage any potential social or cultural risks of the project for Aboriginal Heritage. The CHMP will then need to be approved by the relevant Registered Aboriginal Party for the area. The aim is to protect and preserve cultural heritage places, and to identify opportunities to introduce better management of affected assets and designated sites.

The council and permit applicant must also consider Clause 15.03-2S Aboriginal cultural heritage in the PPF, which sets out the Victorian Government's policy for the protection and conservation of places of Aboriginal cultural heritage significance.

Where solar energy facilities are located on Crown land, a range of legal requirements, including the provisions of the *Commonwealth Native Title Act 1993*, may apply.

The DELWP Planning Practice Note *The Aboriginal Heritage Act 2006 and the Planning Permit Process* provides guidance and assistance. Proponents can also contact Aboriginal Victoria and the Heritage Council of Victoria for more information.

5.3.6 Fire Management

The CFA's involvement may be triggered by referral from the council under Section 55 or Section 52 of the *Planning and Environment Act 1987*. In this case, the CFA may provide permit approval conditions.

Crown land

Where a solar energy facility proposal is located on, or adjacent to Crown land, DELWP must be notified for the purposes of bushfire management.

5.3.7 Infrastructure connections and licences

Proponents must demonstrate to the council that their selected site has adequate road access and utility connections necessary for construction and ongoing operations. Some infrastructure connections require licences from relevant authorities.

Infrastructure connections include:

- electricity grid connection and licences
- AEMO connection agreement
- gas supply
- water supply.

Online electricity network mapping resources and links:

1. Australian Renewable Energy Mapping infrastructure (AREMI) maps that provide renewable energy resources info, infrastructure (distribution and transmission, Network opportunities: http://nationalmap.gov.au/renewables/
2. AEMO: http://www.aemo.com.au/aemo/apps/visualisations/map.html

- Powercor Sub-transmission Generation capacity map: https://www.powercor.com.au/our-services/electricity-connections/solar-and-other-generation/connecting-larger-embedded-generator-systems/

5.3.8 Additional infrastructure plans

Proponents should also prepare a concept plan for any new infrastructure they wish to construct, including associated transmission infrastructure, electricity utility works and access road options.

Proponents may investigate and discuss with the council opportunities to develop shared infrastructure, including transmission lines, where possible, to reduce costs and visual amenity impacts.

This plan should include:

- proposed siting and design responses
- pole design and placement for transmission lines
- route options for transmission lines and access roads
- road safety considerations for transmission lines
- landscape and visual amenity impacts
- setback distances from residences
- options to use existing infrastructure
- options for sharing of distribution lines between different generators.

Best Practice Guidance for Proponents

This section outlines a general best practice approach for proponents to apply in the process of developing a solar energy facility.

Proponents are strongly encouraged to use these ideas to improve the quality of their development proposal and minimise impacts on neighbouring properties during construction. Proponents are also encouraged to use specialist advisers, such as planners and ecologists, throughout the design and development of the solar energy facility to ensure that adverse impacts are mitigated, and benefits are maximised.

Following these guidelines is recommended, not mandatory, and other approaches may also qualify as best practice.

6. Community engagement and stakeholder consultation

To balance goals of community wellbeing with individual project development and long-term growth of the renewable energy sector, stakeholder engagement from the outset of project planning is strongly recommended.

Best practice community engagement will help build a positive profile for the project, which in turn will help maximise job, investment and energy sector growth opportunities in regional Victoria.

The Victorian Government has developed a Community Engagement and Benefit Sharing in Renewable Energy Development guide for renewable energy developers seeking support under the VRET and other programs. It provides best practice, up-to-date guidance on community engagement and approaches to the shared benefits of large-scale renewable energy projects, including solar energy facilities.

Pre-application consultation is not a formal statutory requirement of the planning permit process. However, if it is done effectively, this work offers benefits for proponents and interested parties alike.

After a proponent lodges a planning permit application, there are statutory requirements to notify the public of the proposal.

Once a site has been selected, proponents should conduct detailed consultation with relevant stakeholders.

STAKEHOLDERS	
Community	The 'community' refers to all the people who live within, and identify with, the geographic area surrounding the proposed site of the renewable energy project. The developer should engage the community at the pre-design stage, through local exhibitions and presentations where community views can be sought and recorded.
Relevant agencies	Agencies with responsibility for emergency management, catchment protection and environmental protection, such as DELWP, the Country Fire Authority, catchment management authorities, rural water corporations and the Environment Protection Authority.
Landowners and land users	This group includes stakeholders and decision makers such as farmers and Traditional Owners. It is critical to engage early with landowners and land users to understand their current use of the land and discuss their interest in hosting solar projects on their land. Neighbouring landowners should also be actively involved in the process.
Stakeholders involved in prospective resource developments	Owners of mining leases, petroleum production and exploration licences should be consulted. These titles do not prevent development on the land they apply to, but it is important to consult with title holders and to determine the terms of any required access arrangements.

6.1 Engagement plans

The development of a well-planned communications and consultation plan will help drive an effective and efficient engagement program. Effective engagement not only informs communities of project information, decisions and actions, but also involves them in the process.

The engagement process and associated plan should be clear, transparent and tailored to the site context. It should also provide methods for monitoring and opportunities for the community to give feedback to help inform the planning process. This plan should cover the entire project lifecycle, from site selection to decommissioning.

6.2 Benefit sharing

A benefit-sharing program is a plan to strategically deliver added value to the local region over the lifecycle of a project. Proponents who take the time to consider how their development could benefit the local community are more likely to be well received by community and other key stakeholders.

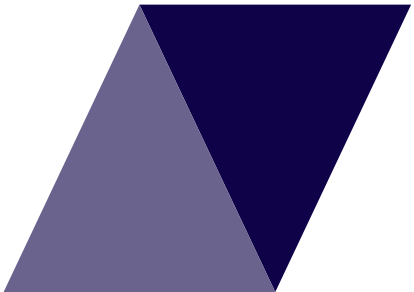
Proponents can demonstrate commitment to community wellbeing by conducting social sustainability activities or by contributing to the local economy through a local industry participation plan.

The proponent may also consider community engagement plans provided by local government authorities where relevant.

6.3 Ongoing engagement

Once a solar energy facility is built, it will become part of the social context of the area. Following construction, solar energy facility operators should shift their engagement focus to maintaining positive, mutually beneficial relationships with the community.

During the decommissioning process, the community should be engaged as part of any plans to rehabilitate the land or to refurbish and upgrade a solar energy facility to extend its operational lifespan.



7. Design stage

7.1 Landscape values and visual amenity

Using best practice design will help minimise impacts on visual amenity for surrounding land users.

Proponents should consider:

- screening the site using vegetation or other barriers (see below)
- implementing methods to reduce the impact of glint, glare and light spill, such as screening and panel row orientation (see below)
- designing fencing and other security measures to reduce impacts on surrounding land use
- designing the height, siting and layout of panel arrays and related infrastructure to minimise visibility from surrounding view points
- choosing materials with colours and textures that provide minimal contrast with the landscape
- using the topography of the site and the surrounding landforms to reduce visibility.

7.1.1 Screening

Proponents should construct screening where necessary to limit the potential visual amenity impacts of solar energy facilities.

Although it may be possible to use the topography of the site to assist in screening, use of vegetation buffers is the most common screening method.

It is important that established vegetation and mature trees are retained as much as possible for screening. Where existing vegetation cannot be used, native vegetation should be planted. Vegetation should be of sufficient height and width when mature to screen the panels and ancillary infrastructure from surrounding sensitive land uses and minimise glare from panels for road users.

Screening should be located on the proponent's land, except where arrangements have been secured with the relevant adjacent landowners.

A project landscape plan should be prepared that may include:

- use of locally indigenous native plants
- planting of vegetation early in the construction process and plans for regular maintenance
- use of retained topsoil where reasonable and feasible to create elevated planting beds to assist with screening
- careful consideration of shading to panels that may result from improper siting of vegetation.

7.1.2 Glint, glare and light spill management

Some stakeholders may be concerned about the impact of glint and glare from solar energy facilities on their visual amenity. Glint may be produced as a direct reflection of the sun from the surface of the solar panel, whereas glare is a continuous source of brightness, relative to ambient light. Glare is significantly less intense than glint. Lighting, including security lighting, may also impact surrounding residents, roads and nocturnal animals, such as bats, if improperly managed.

Proponents should carry out a glint and glare assessment of the solar energy facility to understand these issues. The council may also seek advice from VicRoads where solar energy facilities are located along or facing roads and could pose a risk to road safety. Modelling can be used to assess the level of reflection to guide mitigation strategies and appropriate site management responses.

CST systems are likely to have increased levels of glare compared to solar PV arrays, and CST infrastructure may require larger setbacks from other sensitive land uses.

Proponents should clearly set out information about glare in the planning permit application and consider it in any landscape impact assessment.

A glint, glare and light spill management plan should be prepared and lodged with the permit application.

The plan should include:

- use of anti-reflective solar panel coatings and non-reflective frames
- adjustment of panel orientation relative to glare risks, such as oncoming traffic travelling on a road descending from an elevated area
- strategically located screening that considers topography and surrounding land uses, including possible off-site plantings, by agreement with the relevant landowners
- careful consideration of the height, orientation and design of lighting.

7.1.3 Design of security measures

Along with minimising the visual impacts of solar panels on the landscape, proponents should also reduce the visual impacts of security measures as much as possible and minimise the impact on flora and fauna.

Proponents are encouraged to submit plans with full details and specifications of all security and lighting installations with their application.

When planning security measures, proponents should:

- carefully consider the height, design and materials used for security fencing
- consider the orientation of lighting relevant to sensitive uses and vegetated areas to reduce impacts on people and wildlife
- use features such as topography, landscaping or vegetation to screen security fencing and lighting
- ensure appropriate access is provided for fire suppression, based on advice from the Country Fire Authority.

7.2 Potential off-site impacts

7.2.1 Noise

Solar energy facilities produce little noise. However, some communities are concerned that potential noise emissions may impact their amenity and wildlife.

Proponents should follow the EPA Victoria guidelines Noise from industry in regional Victoria and include a predictive noise assessment with their permit application.

Noise impacts should be managed by:

- introducing measures such as acoustic housing of the noise source, such as around a noisy motor
- documenting potential noise sources from solar energy facility equipment
- limiting noisy operations to the day time.

7.2.2 Electromagnetic radiation and interference

Electrical equipment produces electromagnetic fields. This electromagnetic radiation produced from transformers and inverters is reduced through performance standards that apply to standard components.

The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), advise that the strength of these fields will decrease with distance from the source and become indistinguishable from background radiation within 50 metres for high-voltage power lines and within 5 to 10 metres of substations. Design and layout of the facility should account for these factors.

7.2.3 Heat

Some stakeholders may be concerned about potential 'heat island effects' in relation to solar energy facilities.

A heat island occurs where ambient temperatures around developments are higher than those of surrounding vegetated areas, particularly at night. This is similar to the urban heat island effect.

However, while the heat island effect is known to exist in large urban areas, there is little evidence of impacts on other land uses such as orchards due to heat dispersal from solar energy facilities.

7.3 Co-location and dual use with agriculture

Co-location of solar energy facilities with other rural land uses presents an opportunity to increase the productivity of a site by using it for more than one purpose, such as siting solar arrays on less productive parts of a property.

Dual-use, also referred to as 'agrophotovoltaics', is in-situ agricultural production including sheep grazing between panels or cropping under elevated arrays.

When managed appropriately, sites can share land between solar energy generation, some agricultural purposes or even biodiversity conservation activities.

See Appendix C for more information.

7.4 Biodiversity

Solar energy facilities may affect the biodiversity of the area around a site. Careful assessment of impacts on biodiversity is particularly critical for sites of high biodiversity value.

Proponents should conduct an ecological impact assessment to inform the design and management of their facility. Proposals for CST facilities should include strategies to mitigate the particular impacts of this technology.

Proponents also need to consider how wildlife will affect the infrastructure and operation of the site during the design and development of solar energy facilities.

If a wildlife management plan is required, it should set out how the operators will mitigate the impact from wildlife such as cockatoos and kangaroos. The DELWP Guidelines for Reducing Cockatoo Damage is a useful resource.

The plan should incorporate agreed strategies for working with adjoining landowners to minimise the availability of food that would attract the wildlife to the area, consistent with the DELWP Living with Wildlife Action Plan.

8. Construction stage

The construction stage of the development is likely to have the greatest impact on both surrounding residents and wildlife.

To maintain good relations with stakeholders, it is important for proponents to implement management strategies identified in the design stage and adopt best practice methods during the construction of solar energy facilities. For best practice guidelines on general construction, proponents should consult the *EPA Victoria Environmental Guidelines for Major Construction Sites*.

8.1 Planning for future agricultural use

When solar energy facilities are constructed on viable agricultural land, it is important to plan for the future return of the land to a similar or improved quality and capability.

Proponents should consider protection of topsoil and avoiding soil compaction and damage to land drainage by using low ground pressure tyres, tracked vehicles and other equipment.

If the responsible authority permits the stripping of topsoil and subsoil from affected areas, it should be stored on site for replacement following the completion of construction works or the decommissioning of the facility.

Good practice at the construction stage will yield long-term benefits for site productivity and optimal grazing conditions for co-located agricultural uses.

8.2 Site access

During construction, site access should:

- strictly follow the endorsed traffic management plan
- implement noise management measures
- comply with flood management strategies, such as controlling run-off by not disrupting drainage along access tracks, in line with any flood risk assessment.

The council may require a construction management plan, including a complaint register and response system, as condition of the planning permit.

Proponents are encouraged to use local contractors and suppliers in their construction process as part of a benefit-sharing scheme.

8.3 Dust management

Large projects that remove vegetation and reshape topography can create extensive land disturbance, making soil vulnerable to erosion. Soil removed by erosion may become airborne as dust or be carried into waterways causing pollution.

Measures to address the creation of dust and sediment from land disturbance should be included in the planning and design phase of the project before any land is cleared.

8.4 Construction noise management

Construction noise should be managed in accordance with EPA Victoria Guidelines.

To address impacts on nearby sensitive land uses, proponents should reduce potential noise from vehicles servicing the site, fixed machinery within the site and during construction activities. This may be done by limiting times where noisy operations are allowed and engaging with stakeholders to address any potential impacts.

9. Operations stage

A solar energy facility is expected to operate for at least 20 to 30 years. Solar energy facilities can be operated from the site or from another location. Although solar energy facilities generally require less maintenance than other energy production facilities, proponents will still need to develop plans for monitoring and maintenance and managing ongoing issues. An effective maintenance regime will optimise energy yield and maximise the operational life of the facility. The maintenance regime should respond to the local context and conditions.

An operations management plan should include:

- maintenance of solar panels and ancillary infrastructure
- maintenance of vegetation
- waste management
- ongoing management of fire risk (see below)
- safety, emergency and contamination management (see below)
- a complaint and incident management plan to respond to any incidents or on-site accidents.

9.1 Fire risk

Proponents should monitor and maintain their facility to reduce fire risk resulting from faults, unsafe construction practices and other factors. Proponents should work with the Country Fire Authority and/or DELWP to develop effective fire-prevention measures and clear response protocols for the site and adjacent land, including in the event of fire fighters needing to access and safely operate on the site.

Proponents can also reduce bushfire risk by practising effective vegetation management, particularly during the bushfire season, using techniques including mowing, spraying and mulching. On larger sites, where these techniques may be impractical, the introduction of grazing animals may be a useful solution.

9.2 On-site safety and contamination management

Safety measures for the operation of solar energy facilities should include appropriate training for staff in all aspects of on-site safety, contamination and hazard management and emergency protocols for responding to spills, leaks and breakages, including solar panel or storage battery (if relevant) damage.

Identification and management of risks and hazards should be compliant with best practice standards ISO 31000 'Risk management' and ISO 45001 'Occupational health and safety'.

Management of chemical risk issues must follow WorkSafe Victoria guidelines.

A site hazardous incident response plan should include measures for:

- immediate clean up procedures
- waste containment
- safe transport and disposal
- incident notification to appropriate authorities.

9.3 Off-site impact management

Proponents must provide ongoing management of amenity impacts throughout the life of the solar energy facility.

All potential off-site impacts identified in the design phase, including impacts on visual amenity, glint, glare, noise and heat, must be actively managed and mitigated, and documented in the operations management plan.

10. Decommissioning stage

The operational lifespan of a solar energy facility typically ranges from 20 to 30 years, depending on the environmental conditions of the site, the level of maintenance, the type of technology used and any maximum timeframe for the use specified under an approved planning permit.

The operational lifespan represents the period of time where it is more cost-effective to maintain the solar panels rather than remove or replace them. After this time, some facilities will be decommissioned or may be reconditioned if deemed appropriate.

Decommissioning is an important step in the life of a solar energy facility. Although best practice facilities have minimal environmental impact, decommissioning a facility requires care to ensure the land is returned to its original condition for agriculture or other uses.

Proponents should prepare a decommissioning and rehabilitation plan specifying:

- the party responsible for the decommissioning
- the condition and terms of equipment removal, including disassembly and safe removal of components such as solar arrays and supporting infrastructure such as transmission lines, electricity substations, switchyard and overhead transmission lines
- requirements for restoration of the land, including revegetation and rehabilitation of the land to its pre-development condition, including irrigation layout and soil profile
- a timeline for the decommissioning work.

This plan should be periodically updated in consultation with the council and the property owner if the site is leased.

The proponent must comply with the relevant construction environmental conditions when undertaking the decommissioning of the solar project.

There may also be scope to leave some infrastructure in place, such as access tracks through the site, if the landowner or other stakeholders would like to retain it.

10.1 Recycling equipment

Solar panels are made of mostly recyclable materials, including glass and aluminium, making it feasible to recover and reuse these materials at the end of the panels' useful life.

Proponents are encouraged to recycle materials where possible.

Appendices

A. Useful contacts

Organisation	Key contact	Notes	Contact details
Aboriginal Victoria		For information on Cultural Heritage Management Plans	1800 762 003
Australian Energy Market Operator (AEMO)		For enquiries about connecting to the Victorian transmission network	1300 236 600 connections@aemo.com.au Visit their website
Commonwealth Department of the Environment and Energy	Environment Assessment Branch	To organise a pre-referral meeting for *Environment Protection and Biodiversity Conservation Act 1999* and Matters of National Environmental Significance matters	epbc.referrals@environment.gov.au Visit their website
Country Fire Authority (CFA)		For more information on fire risk and management	Visit the CFA website to find the contact details for the relevant district
Catchment management authorities		For more information on flood risk and management	Visit the DELWP Catchment Management Framework website to find contact details for the relevant CMA.
Department of Environment, Land, Water and Planning (DELWP)	Business and Energy Sector Development	For new energy projects and investment advice, including domestic business engagement and supply chain activation	136 186
	Impact Assessment Unit	For information on *Environment Effects Act 1978* matters	(03) 8392 5503 environment.assessment@delwp.vic.gov.au
	Planning approvals for native vegetation referrals	To contact a local planning approvals officer	**Barwon South West:** (03) 5226 4667 30-38 Little Malop Street, Geelong 3220 **Gippsland:** (03) 5172 2111 71 Hotham Street, Traralgon 3844 **Grampians:** (03) 5336 6856 402 Mair Street, Ballarat 3350 **Hume:** (03) 5761 1611 89 Sydney Road, Benalla 3672 **Loddon Mallee:** (03) 5430 4444 1-7 Taylor Street, Epsom 3551 **Port Phillip:** (03) 9210 9222 609 Burwood Highway, Knoxfield 3180 An up-to-date version of the Native vegetation credit register service providers can be found on the DELWP Environment website, by navigating to Native Vegetation > Native Vegetation Offsets.
	Natural Environments Program	For environmental survey advice	
Department of Economic Development, Jobs, Transport and Resources	Invest Assist	For foreign investors seeking new energy project and investment advice	(03) 9651 8100 Visit their website
Environment Protection Authority (EPA)		For enquiries about works approvals or licences	1300 372 842 contact@epa.vic.gov.au
Heritage Council of Victoria		For enquiries about Victorian heritage	(03) 9651 5060 heritage.council@delwp.vic.gov.au
Local government authority (council)	Statutory planning officer		To find contact details for your relevant council, visit the Know Your Council website
	Economic development officer		
	Road engineer		
VicRoads		To engage with VicRoads as a referral authority	13 11 71

B. Planning permit application checklists for solar energy facilities

Applications for planning permits for solar power facilities are assessed under Clause 53.13 Renewable Energy Facility (other than Wind Energy Facility and Geothermal Energy Extraction).

The purpose of this clause is to facilitate the establishment and expansion of renewable energy facilities, including solar power facilities, in appropriate locations, with minimal adverse impacts on the environment and local amenity.

Proponents must include the following information as part of their planning permit application for a solar energy facility.

Site and Context Analysis

- ☐ Relevant state policy directions, including an assessment of the agricultural quality of the site, the amount of quality agricultural land in the council area and the region and the impact of removing this land from agricultural production.
- ☐ Applicable regional and local planning policy.
- ☐ Existing land uses in the site context, including agricultural uses and other solar energy facilities.
- ☐ Geographical features and landscape values of the site context.
- ☐ Heritage and Aboriginal cultural values.
- ☐ Biodiversity and native vegetation.
- ☐ Electricity grid access, including power line route

Design response

Detailed plans of the proposed development, comprising:

- ☐ layout and dimensions of the facility and any associated buildings and works
- ☐ relevant design elements
- ☐ reflectivity assessment of the facility
- ☐ landscape assessment, including an assessment of the impact of the proposal on significant views, including visual corridors and sightlines
- ☐ accurate visual simulations illustrating the development in the context of the surrounding area and from key public viewpoints
- ☐ proposed connections to the electricity grid (the on-site metered point of output from the converter station where the generated electricity units will enter the distribution system)
- ☐ a concept plan that includes the capacity of new grid connections, network transmission infrastructure, electricity utility works and access road options
- ☐ site access, vehicle access to roads and parking areas
- ☐ the nature of any drainage systems for the site
- ☐ an assessment of the extent of vegetation removal and a rehabilitation plan for the site, as specified in the DELWP *Guidelines for the removal, destruction or lopping of native vegetation*.

Technical analysis

- ☐ An explanation of how the proposed design response derives from and responds to the site analysis.
- ☐ A description of the proposal as specified in Clause 53.13 of the VPP.
- ☐ EPA Victoria requirements, if applicable.
- ☐ A description of the proposal, including the types of processes to be utilised, materials to be stored, hazard management, including management of any battery equipment, and measures for the management or treatment of waste.
- ☐ Potential amenity impacts, which may include:
  - ☐ noise
  - ☐ glint and glare
  - ☐ light spill
  - ☐ emissions to air, land or water
  - ☐ odour.
- ☐ The effect of traffic to be generated on access roads, including a traffic management plan (and glint and glare management to address road safety).
- ☐ The impact on Aboriginal or non-Aboriginal cultural heritage. This should consider:
  - ☐ *Aboriginal Heritage Regulations 2007* (which may include preparation of a Cultural Heritage Management Plan)
  - ☐ *Commonwealth Native Title Act 1993*.
- ☐ The impact of the proposal on any species listed under the *Flora and Fauna Guarantee Act 1988* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.
- ☐ A statement of why the site is suitable for a renewable energy facility, including a calculation of the emissions reduction benefits.
- ☐ An environmental management plan including:
  - ☐ construction management
  - ☐ monitoring, including incident register and response system
  - ☐ maintenance
  - ☐ ongoing engagement with stakeholders
  - ☐ rehabilitation.

Additional approvals

- ☐ Obligations under other legislation, such as the *Victorian Wildlife Act 1975* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.
- ☐ Approvals to connect the electricity grid and other infrastructure connections.
- ☐ Approval of additional infrastructure, such as transmission lines.
- ☐ Environmental effects assessment, if required.
- ☐ Country Fire Authority approvals, if required.
- ☐ Catchment management authority approvals, if required.

C. Bannerton solar farm case study

The Bannerton Solar Farm is an example of co-location of solar energy generation and agriculture. It is located in Bannerton, 100 kilometres south-west of Mildura, on a 192-hectare site, and has a generation capacity of up to 110 MW.

The Bannerton Solar Farm has been constructed on land owned by Almas Almonds farms. The land was not suitable for planting due to the high clay content in the soil. The site experiences long days and good levels of solar radiation, which peak in summer when the electricity load from irrigation is at its peak, making it suitable for construction of a solar energy facility.

This development has benefited the community by providing approximately 180 construction jobs, and by providing grants of up to $5000 to local community groups and organisations. Community engagement was also embedded in the process, with the first consultation sessions being held in 2016.

The Clean Energy Finance Corp invested in this project on behalf of the Australian Government. As part of the Victorian Government Solar Trams project, the Bannerton Solar farm will supply clean power to Melbourne's Tram Network and other sources, and in the future may contribute to agricultural 'value-add' activities, such as freezing and cool room storage operations.

planning.vic.gov.au