

CITY OF BELMONT

Solar Panels (Residential)

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The purpose of this document is to provide guidance for the development and installation of Solar Panels associated with residential buildings. The City of Belmont encourages its residents to consider the use of renewable energy technologies such as Solar Panels. However, the City also requests that residents be aware of the range of potential implications and limitations associated with their use.

Objectives

1. Guidelines for Designing Solar Panels.
2. General Environmental Efficiency Information.
3. Installation Requirements and Recommendations.

Definitions

“Solar Energy System/s” means any system which converts sunlight and solar radiation into useable forms of energy for practical use.

“Solar Photovoltaic (PV) Panel/s” is a type of Solar Energy System that converts the energy contained within the sun’s rays into electricity.

Throughout this Fact Sheet, Solar PV Panels will simply be referred to as ‘Solar Panels’.

1. Guidelines for Designing Solar PV Panels

Approvals Required:

Planning Approval – Solar Panels are permitted to be located in all areas across the City. A Planning Approval to commence development for the installation of Solar Energy Systems, including Solar Panels, is generally not required under the City’s Local Planning Scheme No. 15.

Planning Approval for Solar Panels may however be required in the following Special Development Precincts:

- Belgravia Estate (refer to the City’s Local Planning Policy No. 5).
- Ascot Waters (refer to the City’s Local Planning Policy No. 6).
- Invercloy Estate (Nulsen Haven) (refer to the City’s Local Planning Policy No. 8).

In these precincts, proposed Solar Panels should be located where they are not directly visible from the street and be installed on the same plane / angle as the pitch of the dwelling’s roof. The relevant Local Planning Policies can be viewed on the City’s website www.belmont.wa.gov.au (refer: *Services, Planning, Local Planning Policies and Planning Information Sheets*).

Building Licence – A Building Licence is not required for the installation of a Solar Energy System (including Solar Panels), however it remains the property owner’s duty of care to ensure that any installation does not impact on the structural integrity of the building on which it is installed or any other structure.

It is advised that before installing Solar Panels (or any other Solar Energy System) the following factors should be taken into consideration (refer to Figure 1):

- Orientation of the Device:
 - Solar Panels produce the most amount of power when they are directed toward the sun. Ideally they should be orientated to be in full sun from 9am to 3pm in mid winter.

Solar Panels should be installed in a north-facing position with minimal shading. North-East facing solar panels are also ideal for collecting solar energy.

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- West and east-facing can also be effective, however generally to a lesser extent.
- South-facing Solar Panels are not recommended.
- The City of Belmont accepts no responsibility for, and will not prevent, disrupted solar access with regards to neighbouring developments. However, new developments are encouraged to be designed to avoid overshadowing of Solar Energy Systems on an adjoining site. In some instances, but not all, where discretion is applied, an adjoining applicant may be requested to modify a building design to minimise the overshadowing on a Solar Panel on a neighbouring property.
- Landowners seeking to install Solar Panels should also be aware of the shadowing of existing and potential surrounding vegetation, permissible

development (i.e. two storey developments), increased density within the area and the setbacks of adjacent properties.

- In relation to potential density increases, a copy of the City's Local Planning Scheme No. 15 Map and the City's IntraMaps program can be found online at the following links below. These will provide information regarding the current and proposed development potential of properties within the City of Belmont:

- City of Belmont Local Planning Scheme No. 15 Map - www.belmont.wa.gov.au (refer: Services, Planning, Local Planning Scheme 15).
- Online IntraMaps - www.belmont.wa.gov.au (refer: Quicklinks, City Maps).

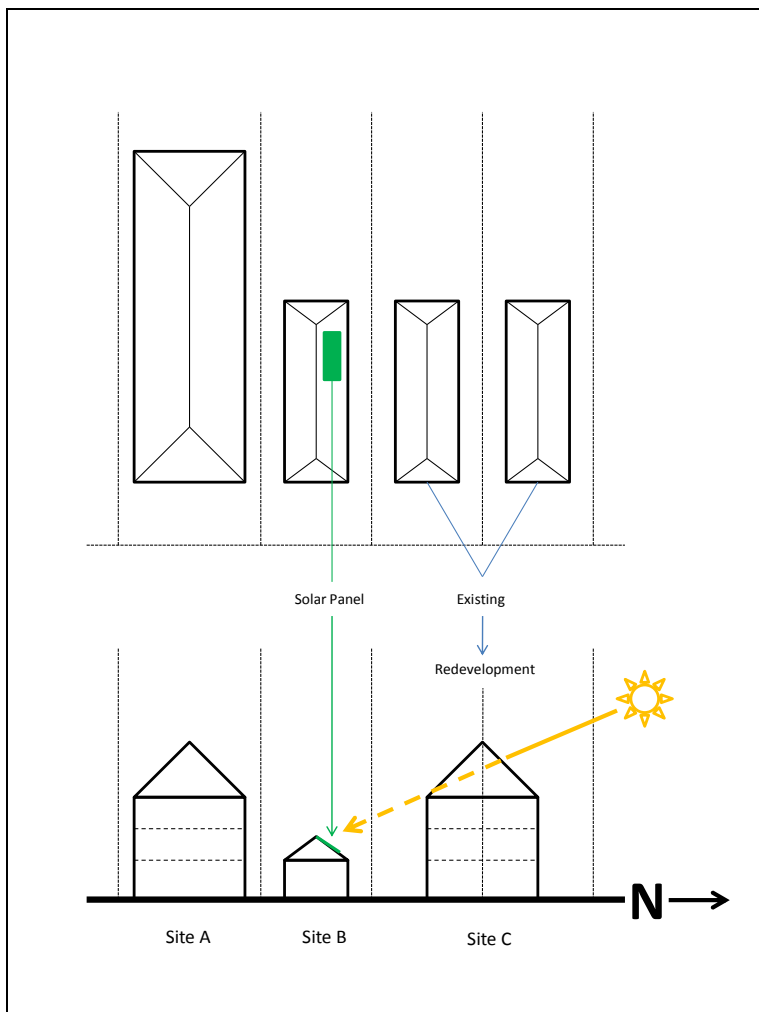


Figure 1: Example of Overshadowing

Figure 1 depicts a high density area. Site A has already been developed to its full potential whereas Sites B and C are low density single dwellings. Should solar panels be installed at the dwelling at Site B and Site C makes the decision to redevelop to its full development potential, it would cause significant overshadowing on the newly installed solar panels.

However, it is noted that State Planning Policy 3.1 – Residential Design Codes may control the amount of overshadowing on adjacent properties by up to 50%.

- Research should be undertaken in regards to the most efficient and effective materials to be used for Solar Panels. This may include:
 - Contacting the Clean Energy Council (CEC) accredited installers to obtain quotes.
 - Obtaining information relating to:
 - The amount of sunshine in your area;
 - Temperature performance ratings for panels;
 - Warranties;
 - The savings on your future electricity bills; and
 - Hidden costs such as the installation of a new meter.

2. General Environmental Efficiency Information

Basic Information Regarding Solar Panels:

- Solar Panels have been widely used to convert light energy from the sun into electricity.
- Solar Panels are also referred to as Solar Modules, Solar Collectors or Photovoltaic (PV) Panels.
- PV Panels have no moving parts, require little maintenance and can be expected to last more than 20 years.
- There are three main types of Solar Panels. These include:
 - Monocrystalline
 - The most commonly used panels.
 - Greatest conversion efficiency (12 to 17%).
 - Multicrystalline
 - Medium conversion efficiency (9 to 16%).
 - Thin Film
 - Lowest conversion efficiency (3 to 10%).
 - Better shade tolerance, heat tolerance and lower embodied energy than mono or multi.
 - Requires double the roof space compared to mono or multi

- Building Integrated Photovoltaic (BIPV) commonly known as Building Integrated Systems are a new technology used to replace conventional building material parts of the building envelope such as the roof, skylights, or facades. BIPV modules have been incorporated into the following materials:
 - Pitched Roofs
 - Modules shaped like multiple roof tiles.
 - Solar shingles designed to look and act like normal shingles, while incorporating a flexible thin film cell.
 - Facades
 - Modules mounted on exterior faces of buildings to provide additional weatherproofing and also used a simple style element.
 - Glazing
 - (Semi) transparent modules can be used to replace a number of architectural elements commonly made with glass or similar materials, such as windows and skylights.

3. Installation Requirements

The City recommends the following steps being taken before deciding to have a Solar Panel installed:

- Consider the need for a Solar Panel and whether it is suitable for your property.

It is important to consider whether the effectiveness of a Solar Panel will be influenced by the position of your existing dwelling, the existing site characteristics, and any development / significant vegetation on adjoining properties.
- Research your product.

Review your personal circumstances and research the type of solar system most suitable. For example, a 1.5 kilowatt system provides approximately 25% of the electricity needed for a family of four with average energy consumption. Some systems are also significantly more expensive than others.

- Choosing a system
 - Choose a Solar Panel system that best suits your budget and environment.
 - Make sure your Solar Panels, inverter and design meet the relevant Australian Standards.
 - A list of approved panels and inverters can be viewed by visiting www.cleanenergycouncil.org.au.
 - Solar Panel Mounting
 - Make sure that the roof, ground mounting or tracking system is engineer certified for the environment you are in.
 - The mounting of the Solar Panel system is a very vital component and some suppliers can on occasion fail to properly assess this matter. It is advised that the contractor provide engineering certification to ensure structural integrity of the panels.
 - Ask about wind certification, warranty arrangements and get copies of relevant documents.

- Installation

- Connecting your Solar Panel system to a grid should only be done by a CEC accredited installer who is a licensed electrician
- There are three types of systems to take into account:
 - Grid-Connected;
 - Grid-Connected with battery backup; and
 - Stand-Alone (off-grid).

- Apply for rebates

There are many opportunities to receive rebates from different government programs for the installation of Solar Panels. Your installer will be able to advise you on rebates, but also try the following websites to learn more about solar credits, feed-in tariffs, etc:

- The Office of the Renewable Energy Regulator – www.orer.gov.au
- Perth Solar City – www.collectiveimpact.com.au

- Switch Your Thinking – <http://www.switchyourthinking.com/>

Further Information

For more information regarding the installation of Solar Panels please visit the following websites:

- The Clean Energy Council 'Consumer Guide to Buying Solar Panels – <http://www.cleanenergycouncil.org.au/cec/home.html> (refer: Resource Centre, Consumer Information, Solar PV Guide).
- The 'Install Solar Power' guide at Living Greener (Government website maintained by DCCCE) – <http://www.livinggreener.gov.au/home> (refer: Take Action, scroll down and click Install solar power).