

Solar power is the most abundant source of renewable power available to our planet. It is the conversion of sunlight into electricity using solar cells, or photovoltaic (PV) systems

The City of Ryde encourages the installation and use of PV systems in homes and businesses to generate clean electricity. Residents and business owners will benefit from long-term savings, and the community will benefit from reduced air, noise and water pollution, visual intrusion and carbon emissions.

**PV systems are proven technology that add value to homes and business and have the potential to generate electricity for 20 years or more without intervention.**

## Selecting a PV system

### Components of a PV system

The components of a PV system include:

Solar panels, either mounted on the roof or the building facade, or replacing the roof material.

An inverter, which turns the electricity from the panels into a form you can use for your home or business (from DC to AC).

A grid-connected PV system generates electricity during the day. Excess electricity generated is delivered to the grid (the electricity wires in your street). The excess electricity is then credited to your electricity bill in the form of a feed-in tariff.

### Solar Modules

There are two main types of solar modules available on the market today:

Crystalline (monocrystalline and polycrystalline) solar modules are covered with tempered glass and a strong backing which protect the solar cells from moisture.

There needs to be good ventilation behind them, as their efficiency starts to decline at temperatures over 25°C.

Amorphous silicon can be applied as a thin film to low cost substrates of various materials and sizes, providing advantages including ease of production and assembly.

The efficiency of amorphous silicon is not as high as crystalline solar modules and requires as much as four times more space to generate the same electricity output.

### Installation

There are various approaches to installation, including:

#### Array frames, which can be:

- Fixed, where the frame is fixed at the optimum angle.
- Adjustable, where the frame can be adjusted manually during the year (often not carried out as years progress)
- Tracking, where the frames automatically move to receive optimal sunlight during the day and throughout the year. While trackers are most efficient, they are more expensive and require maintenance.
- Building integrated PV modules, where the PV system is fully integrated into the building or replace an existing building element.

#### Roof integration, which can be:

- Partially integrated which requires a waterproof layer.
- Fully integrated, which must have the strength and drainage required of a building.

#### Connection to the electricity grid

- PV systems can be standalone or connected to the electricity grid.

#### Capacity

To work out the capacity required for your home, you may like to analyse your household's daily electricity load requirement. Retailers of solar panels will often generate this information using modelling based on average household usage.

First, find the wattage (W) of each appliance in your home and estimate the time that each appliance is used each day in hours (h). Multiplying the wattage by the time and dividing by 1000 will give you the equivalent kilowatt hours (kWh) used by each appliance. Adding up the total for all appliances in the home gives an indication of the average daily electricity requirements of your household. Alternatively average daily kWh are listed on your electricity bill.

You may like to consider the benefits of taking energy conservation measures before installing your PV system, such as updating old appliances for new energy-efficient models and improving the insulating qualities of your home.

Note also, that unless you intend to install battery storage with your PV system, then only the electrical items used during daylight hours will draw on home generated solar power. After sunset and overnight you will be paying for electricity drawn from the grid.

#### **Further reading**

Your Home Design For Lifestyle and the Future Technical Manual 4th Edition  
[www.yourhome.gov.au/energy/photovoltaic-systems](http://www.yourhome.gov.au/energy/photovoltaic-systems)

## **Development application and construction certificate**

Solar panels can be installed under Exempt and Complying conditions. To check if this applies to your home see the following fact sheet at this link [www.planning.nsw.gov.au/exemptandcomplying](http://www.planning.nsw.gov.au/exemptandcomplying) or refer to the relevant SEPP (infrastructure) 2007 that can be found at this link [www.planning.nsw.gov.au/exemptandcomplying](http://www.planning.nsw.gov.au/exemptandcomplying).

In those circumstances where a Development Application is required, you must submit a Development Application and a Construction Certificate to the City of Ryde. It is recommended that you lodge the Development Application and Construction Certificate at the same time to speed up the process.

A Development Application must be accompanied with plans and specifications that include the following information:

- A site plan showing the location of the PV system in relation to the allotment boundaries and existing buildings.
- An elevation showing the PV system's dimensions and the relationship to adjoining buildings.
- A Statement of Environmental Effects addressing the environmental impacts of the PV system during and after installation and how any negative impacts will be minimised.
- A Heritage Report (heritage buildings only) prepared by a suitably qualified person (ie Heritage architect/planner) in order to assess the impact of the proposed works on the heritage significance of the building.
- A Construction Certificate can be lodged with a private certifier. It must include fixing details for cyclonic conditions that describe how the PV system will be attached or fixed to the roof.

## **FAQs**

### **Legal requirements**

#### **Can I install a PV system if I am renting?**

Possibly – you would need to obtain approval from your landlord, either directly or via your rental agency.

#### **Can I install a PV system in a duplex/villa that I own?**

Possibly – if your property is part of a strata plan, you will have to obtain approval from the body corporate and lodge a Development Application with your local council.

### **Development consent**

#### **Is Council approval required to install a PV system?**

Only in certain circumstances – refer to the relevant SEPP (Infrastructure) 2007 Part 3, Division 4, Clause 39, Section 3 [link]. For further advice phone 9952 822 to speak to a Customer Service Officer or book a meeting with a Planner.

#### **What are the costs of submitting a Development Application for a PV system?**

In those circumstances where a Development Application is required, Council will consider waiving any fees applicable to the installation of a PV system.

#### **How long does the Development Application process take?**

Applications will be referred to Council's Fast Track Assessment Team to expedite consideration and determination.

## **Cost**

#### **How much will a PV system cost to purchase and install?**

The cost will vary depending on the capacity and configuration of your PV system. However, a domestic installation of a 5-6 kW PV system to suit an average household will typically cost less than \$5000 to install making the current market for solar panels affordable with low payback timeframes. There are various 'green loans' and payment plans on the market that you may wish to investigate as a way of managing the cost outlay for your system.

You are encouraged to seek more than one quote to purchase and install your PV system.

### **Are there other costs involved?**

It is important to maintain insurance cover for your system, in the case of storm damage or other events.

## **Technical**

### **Will solar power meet all of my energy demands?**

Solar power can meet all of your energy demands, but it depends on the capacity of the PV system that you install and your energy use of your household. The aim may not be to replace 100% of energy needs.

Installation of a battery with your solar system will allow for use of your solar energy outside of sunlight hours. Unused solar power generated by your system may be fed back into the grid and paid back to you in the form of a credit (feed-in tariff) on your electricity bill. For current feed-in tariffs contact your energy company. Generally speaking the feed-in tariff you are paid for your excess solar power generation is less than half the tariff charged to you for power consumed from the main grid.

### **Do PV systems work effectively in our climate?**

Yes, PV systems work most effectively at around 25°C making Sydney an ideal location to install solar panels.

### **What size PV system should I choose?**

The size of the PV system you require will vary according to your individual circumstances, such as the size of your home, the number of people living in your home and the electrical items you use.

By reducing your energy demand, you can reduce the size and cost of the system you install.

### **Is maintenance required for PV systems?**

Minimal maintenance is required. It is important to have someone suitably qualified, equipped and ensured to clean the panels without damaging them and to ensure ongoing maximum power output.

### **Can PV systems be damaged in storm conditions?**

Yes, PV systems can be damaged, for example, by lightning strike. It is important to maintain appropriate home and contents insurance to cover the cost of damage to the system.

## **Environmental**

### **Which is the most sustainable type of PV system?**

The most sustainable type of system varies depending on your circumstances. Here are some important points to consider in order to maximise the sustainability of your system:

- PV systems manufactured locally will have less transportation emissions than those manufactured overseas or interstate
- A long warranty period may help ensure a long life for your system. Check who holds the warranty and the reputation and longevity of the company to help ensure you are covered for the life of your system.
- Install a system that is large enough to meet your energy requirements.
- Ensure the company used is accredited with the Clean Energy Council, the peak solar body in Australia, and therefore required to meet set standards for installation. Proper installation will ensure your system is working to maximum efficiency for solar power generation.

### **What else can I do to save energy in my home?**

There are lots of energy saving tips on-line to help you save money and the environment. Here are a few: [www.yourhome.gov.au](http://www.yourhome.gov.au)

## **Obtain a quote for your photovoltaic system**

It is recommended that you seek several quotes from for your PV system with retailers and installers accredited with the Clean Energy Council.

[www.solaraccreditation.com.au](http://www.solaraccreditation.com.au)

### **Disclaimer**

*The information contained here is a guide only. It is recommended that the advice of Customer Service or the Duty Officer at Council be sought regarding any enquiries and Development Applications.*

For more information visit [www.ryde.nsw.gov.au/sustainableresources](http://www.ryde.nsw.gov.au/sustainableresources)