Neopower Solar Hot Water – Frequently Asked Questions

Is my home suitable for solar?

Most homes are suitable for solar energy. All you require is an unshaded roof facing roughly north (any aspect between northwest and northeast will give good results). Even an easterly facing roof can work without too much loss of efficiency.

The solar collector should be mostly unshaded by large trees and buildings, especially between the hours of 9 am to 3 pm.

If your roof aspect is very limited, there are always solutions, and the lightweight of the Neopower collector combined with the flexible mounting frame options means we can be very flexible with its placement.

Are evacuated tube solar systems better than flat plate ones?

Evacuated tube collectors work more efficiently than flat plates for three reasons.

1) They perform well in both direct and diffuse solar radiation.

2) The vacuum in the tube minimizes heat losses to the outdoors, making these collectors particularly useful in areas with cold, cloudy winters. On a cold windy day a flat plate collector will lose almost as much heat as is gained.

3) Because of the circular shape of the evacuated tube, sunlight shines directly into the absorber for most of the day. At acute angle sunshine tends to reflect off flat plate collectors, resulting in a drop off in efficiency.

In warm climates the performance of the two systems is fairly comparable. In cooler climates, evacuated tubes work better in winter – when it really matters.

What size solar system do I need?

Here you need to consider a number of factors, such as the size of your house (how many rooms?), the size of your household (how many residents?), your lifestyle choices (long hot showers?) and your budget.

You also need to consider any likely changes to any of these factors in future years (growing families, possible sale of house, children leaving home etc).

Household hot water consumption can vary from 70 litres per day to several hundred, depending on usage patterns.

If you underinvest, you are likely to need excessive electric/gas boosting which will end up costing you more than your saving in capital cost.

If you overinvest, you may produce more solar heat than you can use up and will also increase your payback period.

In Australia conditions for a typical household (2 adults and 2 kids) it is generally recommended to install a 315L water tank with 25 tube system.

Remember that solar hot water cylinders are normally designed to store water for use over 2 days, rather than one, thus allowing you hot water even if the following day is cloudy.

What size hot water cylinder do I need?

This largely depends on the size of the solar system you install.

Normally we recommend a minimum cylinder size of 250 litres. Large families (4+) should go for a 315 litre cylinder.

If you fit a smaller cylinder, you may have hotter water, but less of it, and you will lose some system efficiency.

A larger cylinder will enable you to store more heat during periods of inclement weather and will enable you to maximise the efficiency and solar gain from your system.

How much heat energy can I store in my cylinder?

By way of example a 250 litre cylinder of water heated to 65° C will hold around 14.3 kw/h of energy storage. (This is equivalent to running a 1 kilowatt heater for 14.3 hours.)

The Neopower system will boost the cylinder temperature to 60 degrees, so a fully charged hot water cylinder will give you ample heat capacity for a typical home.

What rebates are available?

In these times of climate crisis, renewable energy rebates are being offered by various levels of government. The Neopower system is built to Australian standards and qualifies for rebates.

In all cases you will have to apply for and recover the rebate only after purchase and installation, so you will need adequate finance to cover the purchase costs.

At present the following rebates are available in New South Wales:

Small-scale Technology Certificates (STCs): This rebate varies according to the size and performance of the system you purchase. STCs are a market driven item, and so you should check on the latest prices. In most cases where installation is happening straight away, this can be taken as a point of sale rebate (i.e off the upfront cost).

Federal Government rebate: Some people are eligible for a $1,000 rebate, which is no longer means tested. Some conditions apply: e.g. newly constructed houses are ineligible.

How long will it take to recover my investment?

In most cases, within a few years. Your actual savings will depend very much on your lifestyle and household hot water consumption pattern.

A thumbnail estimate can be made by noting down your annual hot water bill and expect this to be at least halved. Then calculate the payback period by dividing this annual saving into the all up cost of the solar system – taking into account renewable energy rebates you can apply for.

For a typical home, expect a recovery within 5 years at current prices. Some homes opt to turn off the booster during warmer months and this measure can dramatically shorten your payback period.

However, keep in mind too that grid power prices are mooted to escalate sharply in coming years, and this will further shorten your payback period.

Going solar is an ethical choice, as much as a financial one. But there has never been a better time to go solar even for your hip pocket!

Can I take other steps to improve the system's performance?

There are many other ways you can improve the performance of any hot water system, by building an insulated box around the cylinder, dropping the ensuring the HWC thermostat is set to 60 degrees (so that it does not cut in unnecessarily), or by making sure your hot water pipes are well insulated.

Why not have the hot water cylinder on the roof?

There are several reasons for this.

1. Rooftop thermosiphon solar systems work satisfactorily, but a vertical cylinder works more efficiently (owing to temperature stratification in the tank).
2. Research also shows that circulating the water faster, via a small pump, improves the solar system's efficiency by drawing heat from the solar collector more rapidly. This more than compensates for the small amount of power used by the circulating pump.
3. A rooftop hot water cylinder is extremely heavy, making it much more difficult to tilt the solar array to the optimum 45 degree slope.
4. Many roofs are not strong enough to handle the weight of a rooftop hot water cylinder, requiring structural work before being able to install. By contrast, a 'split' evacuated tube solar system weighs no more than an adult person and is suitable for virtually all roof structures.

Where should the hot water cylinder be sited?

Ideally, as close to the solar panel as possible - to limit heat losses.

You will need to identify a route for the hot water pipes to get from the solar system down to your household plumbing. Your plumber may advise on the best way to do this.

How much power does the circulating pump use?

Think of the circulating pump like your heart. It is very small and operates on very low power (23 watts). In addition it is very quiet.

The pump will only switch on intermittently when there is hot water to deliver to the cylinder. It does not operate at other times, including at night. You can forget it is there.

How hot will the water get?

This partly depends on the size of the hot water cylinder / solar combination that you choose.

In any event, the Neopower solar system is designed to automatically shut down once the hot water cylinder gets up to a preset temperature (factory set at 70℃C).

(There is also a legal requirement that all hot water systems must be fitted with a temperature limiting valve for safety purposes. This will generally limit the water to around 55℃ out of the tap).

If your system is electrically or gas boosted then any shortfall in temperature will be 'topped up' by the booster, if you don't like the thought of fluctuating hot water temperature.

How fragile are the glass tubes?

Care must be taken in transit and during installation, because a severe impact (dropping) can shatter them. However, once installed they are as durable as your house windows are.

The evacuated glass tubes are constructed from a special, tough borosilicate glass and will withstand all normal day to day environmental hazards such as hailstones and animals.

In the event that a tube is broken it can simply be removed and replaced with a new one. The tubes are inexpensive and the system will carry on working (at slightly lower efficiency) if any tubes are removed.

Does the system work with low pressure hot water systems?

In most cases, yes. But the header tank or water pressure must be high enough to enable the system to function properly.

In some low pressure installations an optional larger pump may be required.
It is best to refer to a plumber on this.

What about freezing in cold weather?

One beauty of evacuated tube systems is that they will not freeze, thus eliminating this perennial problem with solar collectors.

The manifold is surrounded by moulded rock wool insulation and cannot freeze except in exceptionally cold conditions, well below freezing.

How much maintenance is required?

Very little maintenance is required for solar water heating systems.

You should occasionally check the light on the controller.

On rare occasions a glass tube may lose its vacuum and therefore its performance. If it does, the silver coating in the bottom of the tube will go clear, however the tube will also usually get a large build up of condensation between the glass walls, and look white, making it easily identifiable. A glass tube can be easily replaced by the owner or plumber.

Do I need to get an electrician?

It depends on your installation, and most plumbers will be able to tell you what your electrical requirements are.

Do I need planning permission?

Unless you live in a heritage area, or unless your building is heritage listed, then you will not require planning permission.

Can I power the pump with solar energy?

Yes, the system uses very little power (less than 23 watts intermittently). However the automatic temperature monitor (controller) plugs into a 240 volt power outlet, so your 12 volt system will need an inverter for this to operate.

Can I heat my house with evacuated solar tubes?

Heating a house is a lot larger task than heating an insulated cylinder of water. 'Hydronic' space heating is possible, but not very viable unless integrated with another technology the problem being, that space heating is mostly required in winter and at night, precisely at the wrong times of year and day!

These factors mean that an enormous volume of hot water storage (several thousand litres) would be necessary for space heating purposes, and this means very large tube arrays.

In practice you can provide a significant amount of supplementary heat in the spring and autumn (and some people have implemented such systems). You would also need to fit many more solar tubes to your roof.

By contrast, solar water heating is effective even in winter, as the amount of heat required is considerably less than that required to heat a house and it can be effectively stored throughout the night for use the next day.

We suggest you contact an expert in this area to discuss this, and point you in the direction of some of these experts.