

Making going solar easy

Background Information

1 How much electricity will I save?

It depends on which solar water heating system is chosen, but knowing how much electricity you use with an electric geyser is the place to start.

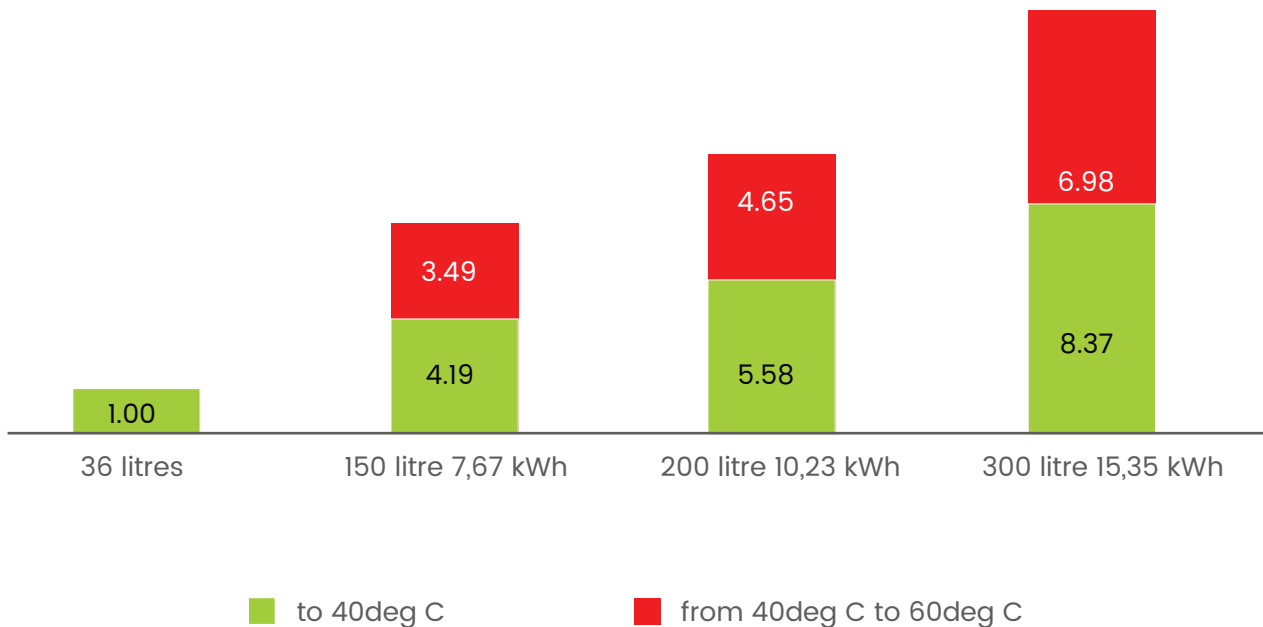
At its simplest, you can work on the basis that 1 kWh unit will heat 36 litres of water to 40deg C (the temperature we wash at).

36 litres is approx. 2 ½ minutes in a typical shower.

An electric geyser will heat from cold water normally 16 C to the typical thermostat setting of 60deg C, and use just over 5 kWh's of electricity for every 100 litres of tank volume.

As examples, a tank of 150l (the most common size) will use 7,67 kWh, and 200l (the next most common size) will use 10,23 kWh.

kWh units used heating water to washing temperature at 40deg C (washing temperature) and 60deg C (Thermostat setting)



2 How long will it take to heat hot water (in an electric geyser)?

In an electric geyser the number of kWh's used needs to be divided by the rating of the heating element in kW's to calculate the amount of time it will take to reach both washing temperature at 40deg C and the normal thermostat setting at 60deg C.

How long does it take to heat water from cold at 16deg C to hot 40deg C (washing temp) & 60deg C (normal thermostat setting)



Note: a 5 kW element is normally used for 300l as otherwise it would take too long

Size of geyser	Time to reach 40deg C	Time to reach 60deg C
150 litre 3kW element	1 hour 24 minutes	2 hours 34 minutes
200 litre 3 kW element	1 hour 52 minutes	3 hours 25 minutes
300 litre 3kW element	2 hours 47 minutes	5 hours 7 minutes
300 litre 5 kW element	1 hour 40 minutes	3 hours 4 minutes

3 How long will it take to heat water with solar?

Normally the whole day from morning to mid to late afternoon.

About 7-8 hours is the normal heating time.

As an example, if you had a solar system that was able to replace 100% of the electricity used in heating a tank of 200 litres (example Ubersolar 200I 42 EVT), it would take 7-8 hours assuming good weather while the electric element would be quicker at 3 hours and 25 minutes.

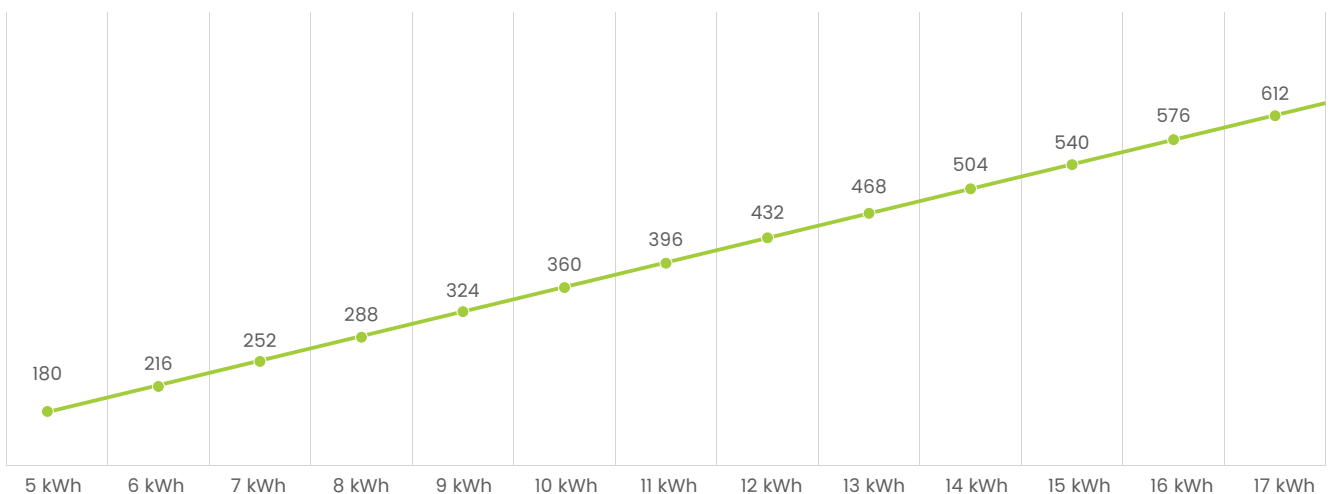
4 How hot will the water get with solar?

The easy guideline to use is the deemed kWh output of the system from a day's solar heating (assuming good weather).

This requires a little maths. You need the deemed kWh output and the tank volume. Take the kWh's and multiply by 860 and divide by the tank volume to get the expected temperature rise in Celsius. This needs to be added to the existing cold water start temperature 16deg C (the average cold water temperature in Johannesburg).

Tank volume	Solar Deemed kWh's	Increase in Temp C	Final Temperature
150 litres	7,67	44deg C	60deg C
200 litres	10,5	45deg C	61deg C
300 litres	16,5	47deg C	63deg C

Hot water litres at 40deg C at the tap from solar KWH's



The easy guideline as to the amount of useable hot water you have at the tap at 40deg C (washing temperature) is to take the deemed kWh and multiply by 36.

5 How Does the Weather Affect the Performance of Solar?

Not surprisingly a lot.

A perfect cloudless hot sunny day is likely to be 110% performance. A near perfect sunny day close to 100%. Sun and cloud 80%. Cloudy 50%. Rain and cloud from 0% to 30%.



Rain all day
0%-30%



Some rain & cloud
30%-50%



More cloud than sun
50%



Sun some Cloud
80%-100%



Very sunny
100%+

Poor weather days will need electrical back up to guarantee hot water.

6 What Size of Solar System Do I Need?

Almost certainly larger than you would expect.

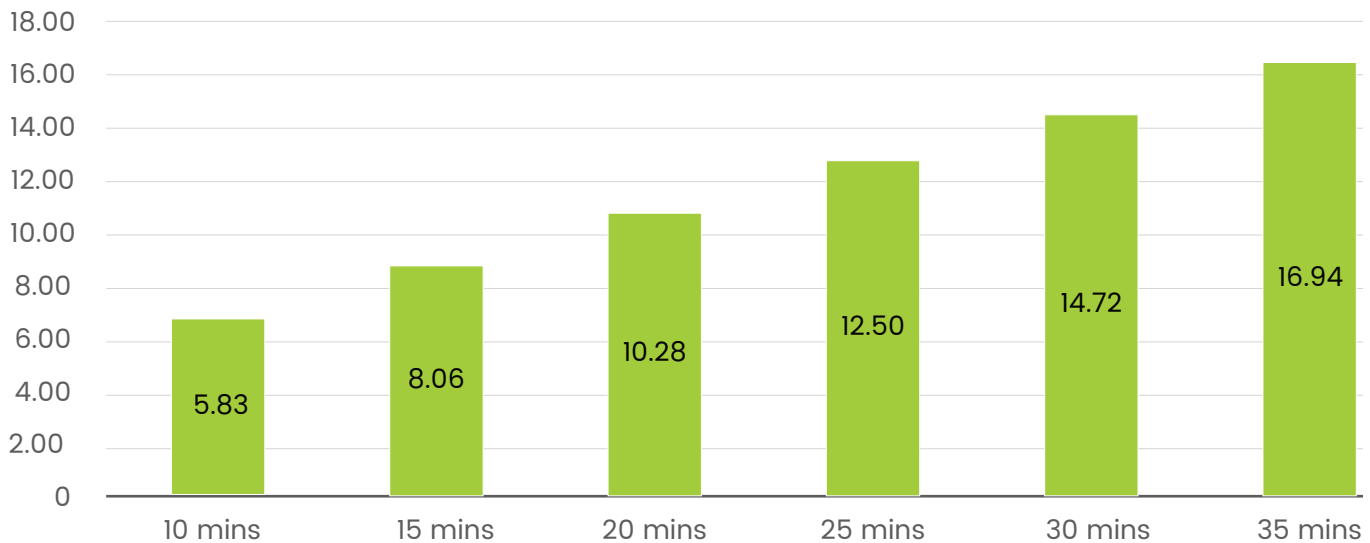
The reason being that people use much more hot water than they realise.

It does of course depend on the individual washing behaviour of each person in the home and collectively.

There are 2 simple ways to calculate it.

1) Add up all the minutes all the occupants spend in the shower in 24 hours, take the result, add 50 litres for general use and divide by 36 to get the amount of kWh's used to heat the water.

kWh's used for time in the shower in 24 hours



2) **Do an audit of the amount of electricity used on a daily basis** by reading the electric meter at the same time for 3 days.

- a. Calculate the total amount of kWh's used each day.
- b. Then turn off the electric geyser at the distribution board at the same time and read the meter the next day at the same time.
- c. Compare the amount with the average of the previous 3 days readings.
- d. This will give you the amount of electricity used in heating water on a daily basis
- e. Repeat the exercise a couple of times to make sure.

Then choose the solar system that has a deemed kWh output that will match or exceed the kWh consumption

7 Why is Solar a Good Investment?

Simply because there are few, if any, investments that will give you the investment returns that solar water heating will provide.

- 1) You always need hot water and heating it by electricity is expensive
- 2) The price of electricity is always going up
- 3) South Africa enjoys the almost perfect climate for solar water heating
- 4) The payback on the investment can be as little as 20 months (the time when you recover the cost of the system and installation)
- 5) The life expectancy of the solar system can be upwards of 25 years
- 6) The investment returns over 10 years can be as high as 800%

8 What pitfalls does one need to avoid?

Unfortunately there are many.

- 1) The solar water heating industry does not enjoy the best of reputations and for many reasons.
 - a. The great majority of suppliers and installers do not provide the information you need to make an educated and informed buying decision.
 - b. Do not be 'fobbed off' with explanations like 'lots of hot water' and it 'gets very hot'.
 - c. Demand the real information relating to the performance.
- 2) Beware hidden charges like maintenance
 - a. For example, some flat plate solar panels require new glycol every 18 months and the cost maybe R1,500 each time.
 - b. Without it the solar system does not work!
- 3) Some manufacturers will deny warranty claims based on areas like the sacrificial anode not being replaced every 2 years by a qualified technician again at a cost of R1500 each time.

9 Other Questions?

The above answers are just a few important examples. There are many other questions you might want to ask. Just drop us an email info@ubersolar.co.za or call and we will provide you with the answers and information