

Geyser Usage

Your geyser – does it help to turn it off and on?

A brief explanation of how your geyser works is necessary here for the “not-so-technical”. Your geyser is basically a big kettle – a container with an electric element inside. A geyser also has a thermostat, which is a device which continuously tries to keep the water inside at a specific temperature – a temperature which can be manually set. So if your thermostat is set to 60 degrees, and the water drops below this temperature, the element will be activated until the water temperature returns to 60 degrees.

When you turn on the hot water tap, hot water leaves the geyser and is replaced with cold water. This means the water in the geyser is now at a much lower temperature, so the element kicks in to reheat the water to 60 degrees. When you are not using hot water, the geyser temperature should remain the same since no cold water is being added, but this is not the case because even when the geyser is not being used, some of the heat “leaks” through the geyser tank and into the surrounding environment, and this causes the water temperature to gradually decrease. When this goes below 60 degrees, the thermostat activates the element to heat the water up again.

So, let’s get back to this question of switching the geyser off. The two main arguments for and against switching off the geyser are as follows:

1. Switching your geyser off will prevent the element coming on to maintain the set temperature during the it is not being used, and as such you will save energy
2. If you switch the geyser off, the water inside loses heat and when you eventually turn it on again, it has to heat the water from a much lower temperature to get to the set point, which uses more energy than coming on periodically to keep it at temperature The reason there is so much disagreement on this issue is that both arguments are correct to a certain extent.

So let’s try to sort fact from fiction: The extent of heat loss differs from geyser to geyser, and the usage patterns in households differ drastically. We can go into the principles of thermodynamics, and the law of conservation of energy, but the fact is that the potential saving depends completely on your specific geyser and pattern of use. There are many documented studies available on the merits of switching off your geyser, some of which have been carried out in labs by scientists, and some by regular people in their own homes. The results of these tests show savings from 2% to 40%. The obvious problem with these tests is that the playing field is not level, which is essential for good science. Some household have two people only showering in the morning, and some households have two people showering in the morning and two in the evening. Some geysers are newer, or better insulated. Some of the reported savings are simply a result of a placebo-like effect, i.e. because you are conscious of your hot water use, you use less hot water. Simply reading about somebody’s savings should not be a good enough reason to believe the same would apply to your house. The water you use needs to be replaced and get heated up again, so switching your geyser on and off will never reduce this basic amount of energy needed. So, the only time you are wasting energy is during the period where the water has reached its set temperature and starts decreasing slowly due to that heat dissipating into the environment. This is more the case with old geysers, where the insulation is less effective. Even if your geyser and piping were perfectly insulated, you could not make any savings at all by switching off because you are only using more energy to heat the water you have emptied out of the geyser. Three things that affect geyser power consumption are how much hot water you use how often it’s used and the condition of your geyser. It’s obvious that there is no universal right or wrong here, since all of these factors can be different in every situation. So instead of picking a side on these points, I have decided to rather explain how to make real savings, and to make a valid difference with your geyser usage.

I would advise the reader to simply think about how you use hot water:

1. Try to use less water Shower rather than bath,
2. Shower for shorter periods and don't use hot water for anything other than showering (Definitely not for washing hands!).
3. Turn the geyser off only when you will be away for longer than 1 day.
4. Make sure your geyser and pipes are properly insulated. If you have an old geyser, consider upgrading, or even better, consider a solar water heater.

These measures can reduce the electricity consumption of your geyser, but I feel there is a much more important issue here.

I think the most important part of this discussion is not really about how much electricity can be saved by controlling the use of your geyser, because I believe this is minimal and relatively useless when looking at the bigger picture.

What I believe to be a more important contribution you can make is reducing the load on the national electricity grid during peak periods. A major problem with our electricity supply at the moment is not necessarily that we can't meet the demand. The problem is we are struggling to meet the peak demand. Peak demand occurs between **6am and 9am** and between **5pm and 9pm**, when most of the population are either getting ready for work or getting back from work. A large part of Eskom's new build program is to meet peak demand, so to make a real difference to electricity usage in South Africa (probably a bit more worthwhile than a difference of R30 in your pocket?) you should try to ensure your geyser is off during peak periods. This is possible without affecting your hot water needs or shower time. The easiest would be to install a controller, where you program the times in, similar to your irrigation system or pool pump and program it to turn on between 3am and 5am. This ensures you have hot water in the morning and has not added demand during peak periods. The same for the evening period if you shower at night. Program it to turn on between 3pm and 5pm. The water will be hot all evening.

So, in conclusion, the benefits in terms of actual electricity savings achievable by controlling your geyser operating times in order to save yourself some money is inconsequential when compared to the difference that could be made by changing the period of use. The residential sector makes up a large part of the electricity demand in South Africa, and the hot water portion of this is significant. Reducing use during peak periods will not only help alleviate those pesky blackouts, but also reduce the need for new power stations, and therefore make a truly meaningful contribution to preservation of the environment.