

Estimating Kylie's energy and water usage

Below is a chart that estimates the daily and annual energy and water we expect Kylie will consume at her house once the renovation is completed. We will be sharing actual usage data once Kylie moves in to see how accurate our estimates were; we'll show you what it's like to live in an off-grid home in the middle of a city. Remember that Kylie will have no electricity or water costs!

| Item | Description | Energy usage | Water usage | Assumptions | Total energy/year (kWh) | Total water per year (L) | Cost to run per year if on-grid (excl. fixed charges) |
|-------------------|--|----------------------|--|---------------------------------|-------------------------|--------------------------|---|
| Induction cooktop | 4 burner, 60cm wide cooktop | 4 burners: 2.1-3.7kW | | 1 burner x 20 mins per day | 353 | | \$98.79 |
| Fridge | 283L fridge; 3.5 star | 0.82 kWh/day | | | 300 | | \$84.00 |
| Heat pump | 250L tank split system | 0.64 kWh/day | | 50 L of hot water per day | 234 | | \$65.41 |
| Television | 55" screen | 201 kWh/year | | | 201 | | \$56.28 |
| Electric oven | 60cm 11 Function Built-In Pyrolytic Oven | Average of 3.0 kW | | 10 mins per day | 183 | | \$51.10 |
| LED lighting | 25 lightbulbs | 5 W/lightbulb | | 8 hours per day among all bulbs | 14.6 | | \$4.09 |
| Dishwasher | 60 cm with sensor wash | 244 kWh/365 uses | Average of 8.9 L/load | 3 loads per week | 104 | 1388 | \$32.30 |
| Clothes washer | 7 kg Front Load | 315 kWh/365 loads | 68 L/wash | 2 loads per week | 90 | 7072 | \$40.92 |
| Toilets | | | 4.5/3 L/flush (average of 3.75 L/flush) | 4 flushes per day | | 5475 | \$12.22 |
| Kitchen tap | | | 4 L/min | 5 mins per day | | 7300 | \$16.29 |
| Bathroom tap | | | 4 L/min | 5 mins per day | | 7300 | \$16.29 |
| Shower head | | | 7.5 L/min | 7 mins per day | | 19163 | \$42.77 |

TOTAL ENERGY CONSUMED

- 1,479 kWh per year
- Average of 4 kWh per day

TOTAL WATER CONSUMED

- 47,698 L per year
- Average of 130 L per day

TOTAL COST TO RUN (if Kylie were on-grid for electricity and water)

- \$520 per year
- Average of \$1.42 per day
- PLUS an additional \$330 per year for water and electricity fixed charges

*Note: an average of 28 cents/kWh and \$2.232 per kL of water were used to estimate annual costs to run appliances

Putting Kylie's energy and water usage into perspective

Induction cooktop

Kylie doesn't usually spend much time cooking, but we still expect her induction cooktop to be the top energy user in the house. Although the model she has chosen has a very low standby power usage (less than 1W according to the manufacturer), induction cooktops have an efficient yet high power draw when burners are on. However, in her goal to be off-grid for gas, Kylie doesn't mind this extra solar energy going to her cooktop. According to IPART, households that use gas only for cooking consume about 2,000 MJ per year¹. By using a solar-powered induction cooktop instead of a gas cooktop, Kylie will be saving about 140 kg CO₂ from going into the atmosphere each year². Paying for natural gas supply isn't cheap either; an average household using 2,000 MJ of gas for cooking will pay about \$350 per year including daily fixed charges for a gas connection³.

Refrigerator

In the majority of homes, the refrigerator is the largest energy consumer of all appliances, and Kylie's fridge isn't far from it. In addition to choosing the most efficient integrated fridge model she could find, Michael Mobbs has also designed a custom ventilation system that brings in a constant airflow from outside and helps keep the fridge cool. This ventilation system has shown to improve refrigerator efficiency by 30%, so we can actually expect Kylie's fridge usage to be closer to 210 kWh per year, which is extremely efficient!

Heat pump

Kylie chose one of the most efficient heat pumps available on the market today; it only consumes 1kW of electricity to generate 4.5 kW of heat. This heat pump model does not continuously circulate water and will only turn on when hot water has been consumed. It heats 78 L/hour from 17°C to 65°C, and according to the manufacturer it uses 78% less energy than an electric storage hot water system and has a heat recovery up to 50% faster than other available hot water heat pumps.

Taps and shower head

All the taps that Kylie chose for her house are low-flow, and one of her biggest water savings will come from her shower head. Unlike conventional shower heads that run at about 20 L/min, the flow rate in Kylie's shower will be 7.5 L/min. At an average shower length of 7 minutes per day, that's a savings of over 30,000 litres per year! By the way, Kylie has tested one of these shower heads and is very happy with the strong, relaxing pressure.

¹ http://www.ipart.nsw.gov.au/Home/For_Consumers/Compare_Energy_Offers/Typical_household_energy_use

² [http://www.epa.vic.gov.au/agc/r_cc_causes.html#page-3/!](http://www.epa.vic.gov.au/agc/r_cc_causes.html#page-3/)

³ https://www.originenergy.com.au/content/dam/origin/residential/docs/energy-price-fact-sheets/nsw/NSW_Natural%20Gas_Residential_Tamworth_Regulated%20Offer.PDF