

Assumptions for delivering 200 litres of hot water per day

Prices

- The standard domestic electricity price of 13.94 cents per kilowatt hour (c/kWh) has been used. The supply charge (about \$93 a year) is not included.
- Off-peak electricity is priced at 6.56 c/kWh. This is Western Power's off peak energy charge during 9pm - 7pm all year round. It assumes that no boosting occurs during the much more expensive shoulder or peak periods. If this happens, there may be a big increase in the cost. The supply charge (about \$93 a year) is not included.
- Natural gas is priced at 6.65 c/kWh for the first 12 units (1 unit = 1 kWh) used on average per day, 4.31 c/kWh for the next 24 units used on average per day and 3.17 c/kWh for units used on average thereafter. The supply charge (about \$33 per year) is not included.
- A 45 kg LPG cylinder is priced at about \$68 which does not include any hire or pick-up costs. A full 45 kg cylinder contains 630 kWh of energy. LPG prices can fluctuate widely and vary geographically.
- Wood is priced at \$130/tonne. Its energy content is 4.5 kWh/kg or 16.2 gigajoules/tonne (GJ/t)

Greenhouse Gas Emissions

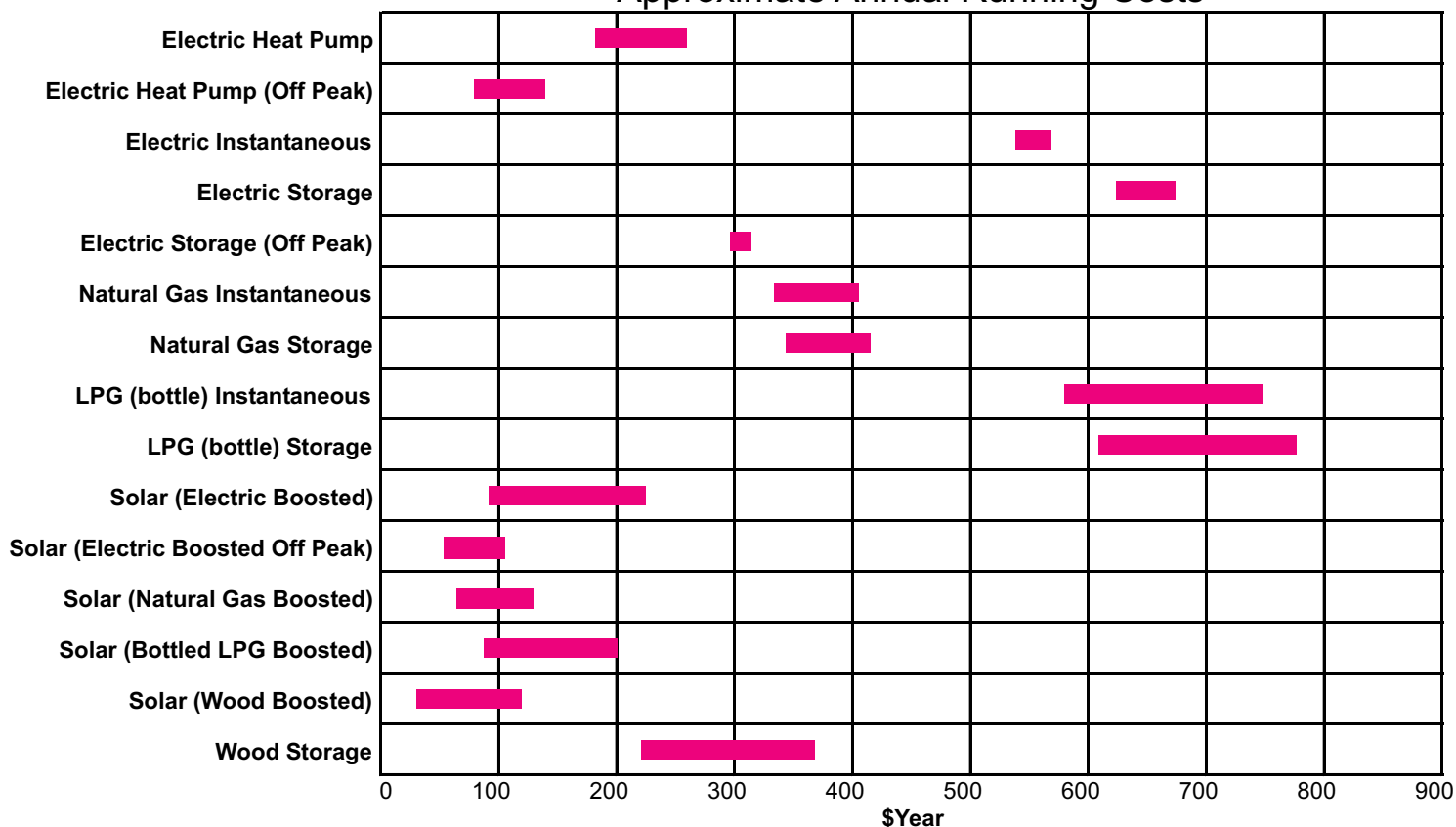
- Consuming 1kWh of electricity from Western Power's south west electricity grid emits approximately 0.99 kg of carbon dioxide, the main greenhouse gas.
- Consuming 1kWh of natural gas emits approximately 0.21 kg of carbon dioxide equivalent.
- Consuming 1kWh of LPG emits approximately 0.22 kg of carbon dioxide equivalent.
- Consuming 1kWh of wood emits 0.34 kg of carbon dioxide. If the wood is sustainably regrown the new tree absorbs this carbon dioxide making the fuel greenhouse neutral (ignoring transport emissions).

Technical

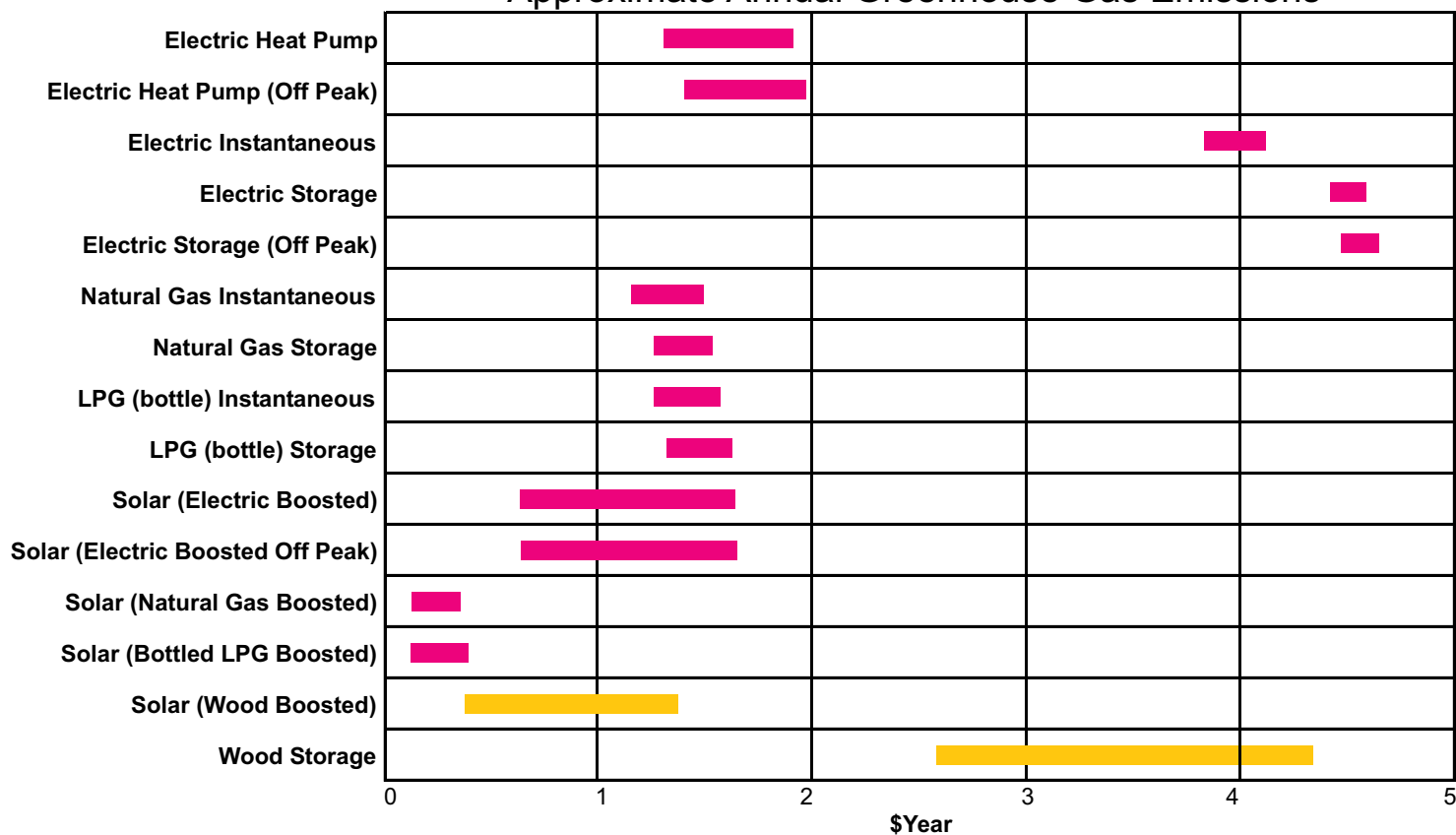
- Water is raised 45°C above a cold water inlet temperature of 15°C and an ambient temperature of 20°C.
- Heat losses from hot water pipes and losses from on/off tap switching have not been taken into account.
- Electric instantaneous hot water systems operate with an efficiency of 93 to 98% due to start up and shut down losses.
- Tank losses for electric storage hot water systems are taken from Australian Standard 1056.1 for systems with a rated hot water delivery capacity of 100-250 litres. For a given amount of water use, the larger the delivery capacity the more your daily heat losses and thus the larger operating cost.
- Tank losses for electric storage (off-peak) hot water systems are taken from Australian Standard 1056.1 for systems with a rated hot water delivery capacity of 250-315 litres. Larger tank sizes are required for off-peak systems.
- Tank losses for electric heat pump hot water systems are taken from Australian Standard 1056.1 for systems with a rated hot water delivery capacity of 250 litres. The coefficient of performance (COP) range is 2.4 - 3.5 at an average temperature of 19°C (an estimate of the average year round Perth temperature).
- Tank losses for electric heat pump (off-peak) hot water systems are taken from Australian Standard 1056.1 for systems with a rated hot water delivery capacity of 250-315 litres. The COP range is 2.25 - 3.2 at an average temperature of 16°C (an estimate of the average year round off peak Perth temperature).
- The energy consumption of natural gas hot water systems is taken from the Australian Gas Association's January 2001 'Directory of Certified Gas Appliances and Components'. The range of costs depends on whether the hot water system is 2 star or 6 star.
- The energy consumption of LPG hot water systems is taken from the Australian Gas Association's January 2001 'Directory of Certified Gas Appliances and Components'. The range of costs is based on the star rating of the hot water system depends on whether the hot water system is 2 star or 6 star.
- Solar contribution is from 65% to 85%, suitable for latitudes similar to Perth. Solar contribution will depend on many factors including when the water is required, how the booster is operated and the angle of the solar collector.
- Tank losses for both electric and gas boosted solar hot water systems are based on a heat loss rate of 2.65 W/°C and a 40°C temperature difference. No corrections have been made for continuous off-peak energisation or tank size. Gas-boosted solar hot water systems are based on a burner efficiency of 85%. Wood-boosted solar hot water systems are based on a heating efficiency of 40% to 60%.
- Tank losses for wood storage systems are based on tank sizes of 250-315 litres and heat losses between 100% and 150% of the equivalent sized electric off-peak storage system. A heating efficiency of 40% to 60% has been assumed.

The major factor that influences your operating costs is the amount of hot water used. The graphs are specific to 200 litres per day hot water use and the assumptions listed above.

Approximate Annual Running Costs



Approximate Annual Greenhouse Gas Emissions



Range is from most efficient to least efficient models known to be available.

If wood is sustainably regrown, the fuel is greenhouse neutral.

Note Electric hot water systems which use Natural Power instead of conventional electricity will have no greenhouse gas emissions but will cost more to run.