

The aquarium and energy consumption. How much does it cost to run a fish tank?



Next to food and maintenance products, the biggest cost of maintaining an aquarium is the energy consumption required to run the equipment. Filters, lights, powerheads, heaters, protein skimmers, air pumps, water pumps, uv-filters etc., more or less constantly consume energy.

General Consumption

Based on a freshwater fish only aquarium at about 72 F, the total consumption for a small tank (10 Gallons) is about 150 kWh a year. A medium tank (30 Gallons) will run between 150 – 200 kWh per year, while a large aquarium (55 Gallons) needs 200 – 400 kWh per year. These values are calculated while considering the basic equipment required and serve as an average only.

Aquarium Lighting

The biggest consumption is used for the lighting system which accounts for approximately 45% of the total bill. Usually the heater comes in second at about 35% of the total cost. Filters commonly run at about 12% while airpumps, etc. account for the remaining 8%. Again this is based on the average aquarium setup.

Lighting is the only component in the aquarium that doesn't run on a 24-hour shift. Furthermore, the lighting expenses can easily be controlled by the lighting time as well as the equipment we use.

The common fluorescent light bulb (15 – 40 Watts) that is provided with most hoods doesn't significantly add much cost. Planted tanks with higher lighting requirements that use power compacts (30- 100 Watts) or VHO fluorescent bulbs (75 and 160 Watts) and/or a combination thereof obviously will lead to higher power consumption. A reef tank may even run on metal halides which run from 150 – 1000 Watts – and that will quickly add to the bill.

The Heating Bill / Heating the Aquarium

Heating an aquarium can also be expensive. The larger the tank the more heat is required. Further, a tropical fish environment usually requires a higher water temperature making it more expensive to heat compared to non-tropical fish tanks. For example, a 30 Gallon tank heated at 72 F (22 C) will consume approx. 110 kWh per year. The same tank heated at 82 F (28 C) will consume about 440 kWh per year. That is 4 times as much!

The Other Toys

Water pumps start at 3 Watts and easily go up to 400 Watts depending on the gallon per hour (gph) rate. Some ball park rates are 10 Watts for 200 gph and 30 Watts for 300 gph. 150 Watts can be consumed by 600 gph and up.

Powerheads, air pumps and filters are low in consumption starting at only 3 Watts and generally not exceeding 25 – 50 Watts for the heavy duty models. UV filters run between 8 – 130 Watts and up.

Generally spoken, a fish only aquarium runs on a rather low cost. Tank size will matter and add on cost, so will a more and more densely planted tank, a saltwater tank and ultimately the reef tank.

Ways to Save \$\$\$

To save on the energy cost and consumption, lighting can be adjusted to more energy efficient bulbs and a change in lighting. A planted tank may do just as well running on a 100 Watt bulb instead of a 150 Watt bulb. This would already be a savings of 1/3 of the total lighting cost.

In many cases the heater can also be turned down by a degree or two without affecting the fish. This can save a lot of energy in the long run. In well heated environments a heater might not even be necessary during the day or heating period.

Water pumps can be reduced to lower gph ratings the same applies to uv-filters.

Choosing energy efficient equipment and comparing them with other makes and models can yield substantial savings in the long and sometimes even short run.

How to Calculate Your Aquarium's Energy Consumption

To calculate the energy consumption of your aquarium, you will need to know the watts per equipment and the overall running time. The running time of the heater can either be observed in measuring the actual running time or by estimating. 15 minutes out of every hour (6 hours total per day) for lower temperatures or 30 minutes out of the hour (12 hours total) for higher temperatures. This will of course vary greatly, depending on your room temperature.

Watts multiplied by hours will give you the daily wattage per equipment. (1000 Watts equal 1 kWh) The cost of 1 kWh can be found on most electric bills. The cost of one kWh should be calculated by adding up all the rates that end with "per kWh (that will include the transmission, distribution, and generation charges).

The Formula

(Watts x hours) : 1000 x kWh cost x 30 = monthly electrical cost of the aquarium

The exact usage of electricity for each piece of equipment can only be determined by actual readings using an ampmeter, which measures the actual energy used and not the energy based on the maximum output. The formula will provide an approximate cost only.