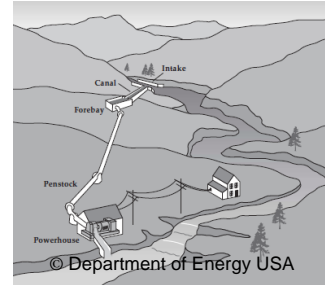


Hotel Energy Solutions

Micro Hydropower System



Micro hydropower is one of the most reliable and consistent sources of renewable energy available. A good water resource with a year-round flow and elevation drop can provide years of continuous power. Hydro resources are the most site specific, since your hotel must have a usable water source. If you are one of the lucky few hotels with a stream running down your hillside, it's the resource to assess first.

How does a micro hydropower system work?

A micro hydropower system converts the energy from flowing water into electricity. Flowing water turns a turbine, which in turn converts this energy to electricity.

What can my hotel use a micro hydropower system for?

This electricity can then be used, offsetting the cost of buying in electrical power, and any excess power can be sold back into the grid, often generating significant incomes to your hotel.

How much electricity can my hotel produce by installing a micro hydropower system?

The first step before installing a micro hydropower system is to evaluate your water resource by measuring the vertical drop and flow of your stream. These two measurements are necessary to calculate the energy potential of your stream/river/creek.

The next step is to design a system that will effectively harness that potential since the electrical power output depends of the efficiencies of the turbine and generator.

How many types of micro hydropower systems exist?

Although there are several micro hydropower systems, run-of-the-river systems, which do not require large storage reservoirs, are the most often used for micro hydropower systems.

What is a run-of-the-river micro hydropower system?

Although there are several ways to harness the moving water to produce energy, run-of-the-river systems, which do not require large storage reservoirs, are often used for micro hydro systems. A 'run-of-river' system means that the water passing through the generator is directed back into the stream with relatively little impact on the surrounding ecology. In run-of-river systems the turbine generates electricity as and when the water is available and provided by the river meaning that they have no or relatively small water storage capability.

Is a micro hydropower energy system suitable for my hotel?

To build a small hydropower system, your hotel needs access to flowing water and sufficient quantity of falling water must be available, which usually, but not always, means that hilly or mountainous sites are best.

What happens in summer?

If the river dries up and the flow falls below some predetermined amount or the minimum technical flow for the turbine, the electricity generation stops.

Do I need to build a dam?

The dams built for micro hydropower systems are very small and impound little water—and many projects do not require a dam at all.

What are the environmental impacts of a micro hydropower system?

Micro hydropower systems are free from many of the environmental problems associated with large-scale hydropower systems (impacts on wildlife habitat, fish migration, and water flow and quality) because they use the natural flow of the river, and thus produce relatively little change in the stream channel and flow.

How can I avoid any visual impact by installing a micro hydropower system?

The turbine and the majority of the machinery for micro hydropower systems can be hidden in a small building by the side of the river. This may be designed in a traditional style to blend in with the surroundings. Similarly the pipes can be buried, reducing any visual impact that they might have to the hotel.

What are the advantages of micro hydropower systems?

If your hotel has a suitable site, harnessing the energy from a stream or creek can be the most cost-effective way to produce renewable electricity. Compared to the sun and wind's variability, a stream's flow is relatively consistent, making micro hydropower systems output one of the most predictable of all the renewable energy systems.

Do I need any planning permissions in order to install a micro hydropower system?

Planning permission will almost certainly be required for any micro hydropower system. Contact your local planning authority for more information. Installing dams, weirs or other water diversions in rivers and streams requires a permit or approval

How much does it cost to install a micro hydropower system, and how much can my hotel save?

It is difficult to generalize the cost of micro hydropower systems, as every site is unique. The initial costs could be quite high, but with micro hydro sites having the potential to run indefinitely, they represent a good investment that can be very cost effective. The price for a turbine and generating equipment may be similar at two sites but pipelines length and required civil works can vary greatly, impacting the costs.



How much maintenance does a micro hydropower system need?

Micro hydropower systems generally require less time for operation and maintenance than other renewable energy systems. However, hotels must be willing and able to perform maintenance to keep their systems running optimally and safely. Micro hydropower systems will require periodic component replacements, e.g. a new generator every 10-15 years and new turbine approximately every 25 years, but with this maintenance they can produce clean, green electricity indefinitely.

What is the impact of a micro hydropower system for fish?

Well-designed micro hydropower systems are environmentally benign. However, poor design can disrupt an ecosystem, especially for spawning fish.

What is the payback time of a micro hydropower system?

This will vary depending on the local cost of electricity, state and local rebates or incentives, and the installed cost of the micro hydropower system. The range can be from 5-10 years up to 20 years depending on these factors.

How can I finance a micro hydropower system?

You may fund your renewable energy system in several ways. Many financial incentives which can benefit your hotel are available for example. However, these have not been used to their maximum potential. Incentives can save you in some cases more than 50% of the cost of your micro hydropower system. Check for national incentives and don't forget that your local utility company or other local organization may also provide additional support. There also banks promoting the use of micro hydropower systems by granting long-term, low interest loans. Visit



www.iea.org/country/index.asp under 'related country and regional information' for more information about available incentives in your country (available for IEA member countries only).

Who can help me with the paperwork for applying to receive financial incentives?

Installation companies are more and more taking over of the application paperwork to receive an incentive. Local energy agencies may also help.

Should my hotel receive an energy audit?

Definitively yes. Doing an energy audit before investing in a micro hydropower system is in your best interest, because it will help make the existing energy consumption as efficient as possible and will lower your energy consumption and monthly energy bills. By reducing your energy consumption you will need to pay much less for a micro hydropower system that's capable of meeting your lowered-new energy demand.

Who can install a micro hydropower system for my hotel?

A qualified installer or an Energy Service Company (ESCO). Installers will estimate the overall cost, and will also inform your hotel about rebates and incentives for which you may qualify.

What is an ESCO?

An Energy Service Company (ESCO) reduce the hotel energy costs, by taking care of the investments involved of installing a micro hydropower system and sharing the resulting future cost savings with you by letting the ESCO install micro hydropower system in your hotel.

Follow the next steps to make your micro hydropower system a reality:



- Learn as much as you can about micro hydropower systems before you make a decision.
- Schedule an on-site energy audit.
- Call an installer and obtain estimates.
- Check zoning, permit and utility requirements, insurance, and other legalities.
- Look for financing options.
- Install and learn how to safely maintain your system.