**PAESTA Podcast Series  --  You Asked, We Answered!**

**Episode 38 -- What is hydroelectric power?**

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Hello, my name is Joseph Longobardi, an undergraduate student at Penn State Brandywine, and today we are going to talk about hydroelectric power.

Many people have heard of hydroelectric power, but what is it and how does it work? Hydroelectric power is a method of generating electricity using water. Water flows passed a turbine, which is similar to a fan intended to be spun by water. The turbine spins a metal shaft connected to a generator which is what actually generates the electricity. The generator is connected to the electric mains to power homes and businesses in the area. Think about those old crank flashlights for when the power goes out. The flashlight doesn’t require batteries because it uses the spinning motion of the crank with a generator to generate electricity. Hydroelectric power is very similar, it just uses water to turn a turbine on the generator instead of using a person to turn a crank on the generator. Unfortunately, simply putting a turbine in some flowing water won’t be enough to drive the generator; some accommodations need to be made to make it work. The location of hydroelectric power plants will usually be determined by those accommodations. In a typical construction of a hydroelectric power plant, a large river with a large drop in elevation will be dammed up. [1] A small channel at the bottom of the dam’s reservoir called a penstock will be drilled to the output of the dam with the plant’s turbine in between. [1] Because there is a huge mass of water in the reservoir, the gravity will force the water through the penstock at a high pressure, driving the turbine and then exiting out the other side of the dam. [1]

If it sounds like hydroelectric power is some sort of new, innovative technology, it’s actually not. Hydroelectric power has actually been around since the end of the 1800s. [2] The first hydroelectric plant was built in 1879 at Niagara Falls. [2] It was used to power the street lamps in the city of Niagara Falls. [2] Many more hydroelectric power plants have been built since then. In fact, you might be getting some of your energy from hydroelectric right now! Although many more plants have been built since then, hydroelectric power still only accounted for 2.6 percent of the United States’ energy generation in 2014. [3]

Hydroelectric power has some good advantages. Because water is usually renewed through the water cycle, the power plant’s “fuel” so-to-speak is free. Speaking of fuel, no fuel is burned in hydroelectric power generation, so there is minimal pollution. After the plant is built, there is only very little maintenance costs required to keep the plant running. [3]

Unfortunately, hydroelectric power does have some disadvantages as well. It does require a large up-front investment in the infrastructure like for the plant itself and the dam that is required to run the plant. [3] Also, the plant would be rendered useless in the event of a drought because of its dependency on water. In addition, it can prevent fish from traveling through the now dammed up river and modify their habitat. [3]

To conclude, hydroelectric power is a very capable form of power generation. It has been around for a long time and has proved reliable. Hydroelectric power has a lot of advantages but it also has some disadvantages as well. Hydroelectric power plays a small but important role in our power generation.

Once again, I’ve been Joseph Longobardi, undergraduate student at Penn State Brandywine talking about hydroelectric power. Thanks a lot for listening today.

*(This audio file was recorded by Joseph Longobardi on November 11, 2016)*

**Works Cited**

[1] Perlman, H. (2016a, May 2). Hydroelectric Power: How it works, USGS Water-Science School. Retrieved September 6, 2016, from http://water.usgs.gov/edu/hyhowworks.html

[2] Hydropower. Retrieved from http://environment.nationalgeographic.com/environment/global-warming/hydropower-profile/

[3] Perlman, H. (2016b, May 2). Hydroelectric power and water. Basic information about hydroelectricity, the USGS Water Science School. Retrieved September 6, 2016, from http://water.usgs.gov/edu/wuhy.html