

Hydroelectric Dam Model

Introduction

Hydroelectric power is one of the cleanest sources of electricity, and it is generated by capturing the energy of flowing water. Hydroelectric power can be generated many ways, but the most common way is to build hydroelectric dams at rivers. This project is a small-scale version of a hydroelectric dam, which serves to demonstrate how power is generated at dams around the world.

Background

Oregon is one of the leading producers of hydroelectric power in the United States. With over 20 active hydroelectric dams, Oregon is able to produce more than 70% of its energy using hydroelectricity. Hydroelectric power is sustainable, and causes little harm to the environment. At 90% efficiency it is also one of the most efficient forms of power generation.

How It Works

A typical dam (**Figure 1**) produces power by converting energy from potential energy to electrical energy. First, the dam blocks the flow of river water to create a man-made lake called a reservoir. As the water level rises, more energy is stored, as the water level on one side of the dam is higher than the other; due to gravity, causing the water in the reservoir to travel to the other side of the dam.

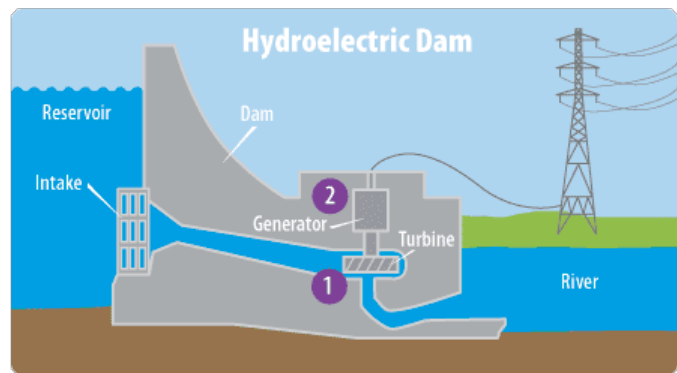


Figure 1: A Typical Hydroelectric Dam

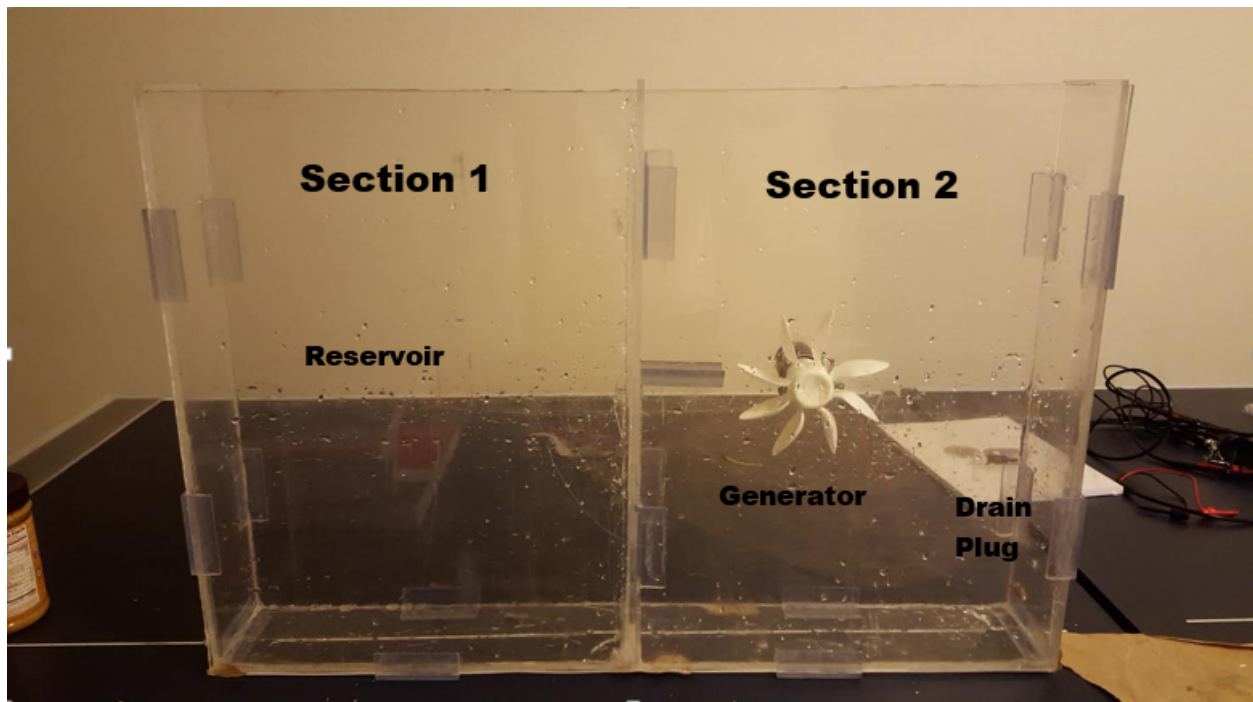
Water flows through the dam and spins a

To capture this energy, a hollow channel exists through the center of the dam. Water from the reservoir travels through the channel at high speeds and pressure until it reaches a turbine. Similar to a large fan, the turbine spins around to create rotational energy. The turbine is connected to a generator, which then

spins as well. As the generator spins, it converts mechanical energy into electrical energy.

How to Use the Model

The dam model consists of two chambers with a dividing wall in the middle representing a dam. Water is stored in the first chamber (the reservoir) and allowed to flow through a hole in the middle wall into the second chamber. As water makes its way into the second chamber, it passes through a black generator. As the water passes through the generator, the generator creates electricity, which can be used to power a device.



To use this model, first make sure that Section 1 is half full with water and that Section 2 is nearly empty. Add water to Section 1 to allow water to flow; water will build up in Section 2 until it reaches a drain plug. The generator should begin to produce some current. Water will need to be captured with a cup from the drain plug in Section 2 and put back in the first chamber to keep the model running.