

The Hoover Dam

by Michael Stahl



Hydropower is energy generated by a process that uses running or falling water. Mankind has used it for centuries. Around the globe during more primitive times, man used hydropower for irrigation of crops located miles around local water sources. Later, hydropower was used to energize mills that manufactured all sorts of things from paper to paint. These days, hydropower is looked to for the generation of electricity more than any other type of energy, so it is now often referred to as "hydroelectric power." Hydropower has both positive and negative effects. If one were to try and find a perfect example of what hydropower can do for society, both positive and negative, they would need to look no further than the border between the states of Nevada and Arizona in the United States of America. There, they would find one of the most iconic and recognizable structures in the entire country. There, they would find the Hoover Dam.

For decades, the people of the United States of America knew that the Colorado River would be a tremendously useful resource. The Colorado River was used to irrigate farmlands for miles, which brought thousands upon thousands of settlers to the Southwest region. At the turn of the twentieth century though, the government became aware of the many technological improvements being made in the world of hydropower. It had been used famously to power steamboats, but these new developments were making it easier for hydropower to be used to generate electricity. With the invention of the light bulb in 1879, it was just a matter of time before electricity, especially amounts generated by hydropower, would become incredibly important in people's day-to-day lives. It didn't take much time either! In Wisconsin, just three years after the light bulb was invented, the first hydroelectric plant opened, proving that the technology in the field of hydropower was being updated rapidly. Therefore, by 1900, the United States felt that action should be taken in the Southwest in order to capitalize on the availability of these new advances, while improving life for both present and

future settlers that were moving westward.

It took quite a while for the outlining of formal plans for a new dam in that area to be agreed upon. For almost thirty years, there were disagreements on where the dam should be built and how it should be built. However, during that time, the technology only improved. In a way then, the delays only helped create a more outstanding final product. Finally, in 1928, President Coolidge approved the building of what would become the Hoover Dam. More planning took place that spanned three additional years. It was decided that the dam would be 726 feet tall, 1200 feet wide at its crest, and 660 feet thick at its base. 6.6 million tons of concrete would be needed then for the 91.8 billion cubic-foot facing. Finally, in 1931 President Herbert Hoover, the man which the dam would eventually be named after, ordered that the work begin on the \$40 million project, which, in 2013, would now cost in excess of \$700 million.

Thirty-five miles north of the dam site in the state of Nevada was a small city called Las Vegas. Once word got out that the tremendous new dam would be built at the Nevada-Arizona border, tens of thousands unemployed workers who were suffering through some of the peak years of The Great Depression flocked to the nearby city and its population quadrupled almost instantly. Though the working conditions were extremely difficult due to high summer temperatures (sixteen people died in just one month from heat stroke), the new Las Vegas citizens were desperate to take any work they could get. Employment for the dam peaked at over 5,000 workers being paid at one time in 1934. By the time the Hoover Dam was completed two years later, 112 people had died during its construction, while many more fell ill from pneumonia caused by the working conditions over the course of the months and years to come. Some of those cases resulted in unfortunate fatalities as well. A memorial tribute to the workers who lost their lives rests on the dam site with the inscription: "They died to make the desert bloom." And bloom it did.

The Hoover Dam has many functions with one of them being irrigation. One million acres of land around the dam and the All-American Canal, which has water fed to it from the Hoover Dam, are irrigated because of the manmade colossus and the hydropower it produces. Irrigation is incredibly important to the survival of the species of man. One-third of all food in the world that is produced comes from irrigated lands. Obviously, the Hoover Dam is quite helpful in that regard.

The Hoover Dam not only provides water to crops, but also to people. Lake Mead is a nearby lake that is the largest reservoir in the United States. It's a manmade lake that, like the All-American Canal, gets its water from what is collected at the dam. Lake Mead has a surface area of 247 square miles and services eight million people with water in Arizona, Nevada, and California. Because so much water moves through the Hoover Dam and into the All-American Canal and Lake Mead, potential floods are also kept under control, making local areas much safer and less susceptible to flooding than in the days before the Hoover Dam.

Still, the biggest reason the Hoover Dam exists is its ability to provide electricity for people in the outlying areas. Each year, the dam generates an average of 4.2 billion kilowatt-hours of electricity. A kilowatt-hour is the energy it takes for a kilowatt to work for one hour. This kind of power is potent enough for the roughly one million people who use electricity from the Hoover Dam to enjoy it. The Hoover Dam has been a key factor in the development of major American cities like Las Vegas and Los Angeles because of the availability of electricity it provides to those sections of the Southwestern states of the U.S.

Safety to people in the surrounding areas and cleanliness are two of the main reasons why

hydropower would be a favored source of energy over others. Once oil burns off after use, like in an automobile, toxic gases and contaminants are thrown into the air, polluting the atmosphere. Coal has a similar, dirty impact. Though nuclear power is also very clean, as well as cost-efficient, there are massive risks to people who live near nuclear power plants should something unfortunate occur at one. Atomic energy creates radiation, which is extremely hazardous if it is leaked into the environment. In general, nuclear power plant activity has not resulted in as many deaths as those associated with the generation of other types of power; however, there is a great risk that it could. Hydropower creates very few gaseous emissions. Safety at the Hoover Dam is a top priority as the workers there constantly inspect the dam for damage. There have been very few incidents since the dam opened nearly eighty years ago.

Even though there clearly are numerous advantages to the activation of the Hoover Dam and the work done at the site, there are a few environmental impacts that are harsh. Local ecosystems have declined as a result of water being used up by the Dam and its emptying into the Lake Mead reservoir. The water levels in the Colorado River have been reduced. Plant life then in the immediate area has suffered because the plants have difficulty growing roots long enough to find drinking water. Therefore, they have been sacrificed so that crops abroad could flourish. The dam has impacted the temperatures of the water in the Colorado River. Certain fish that can only survive in particular water temperatures have been almost completely wiped out, including four species of fish that have since been placed on the Endangered Species list. The turbines that draw in the water and use it to help transform energy also draw in fish that are killed from time to time as well. Scientists and engineers have been working to address these environmental issues for years. Progress has been made as they have invented "fish friendly" turbines that allow fish to pass through them unharmed.

There is widespread awareness of these problems, but, clearly, a majority of legislators agree that the benefits of the Hoover Dam greatly outweigh the negatives. The U.S. government has authorized extensions allowing the operations of The Hoover Dam to continue through at least the year 2067. The people of the Southwest region of the United States will be able to enjoy the benefits that the Hoover Dam provides them: food, water, and electricity. On top of all of that, the local economy will also benefit, due to tourism, with over ten million people taking in the boating and sun of Lake Mead and seven million people visiting the dam each year.