

Hydropower: Grand Coulee Dam Turns Water into Electricity

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Using hydropower, the Grand Coulee Dam in Washington provides electricity to 11 states. NBC's Kevin Tibbles tours this largest hydroelectric plant in the U.S. and explains how water is converted to energy.

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Transcript

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MATT LAUER, co-host:

And this morning on our special week-long series, GREEN POWER TODAY, we are focusing on water. Hydroelectricity is a relatively inexpensive form of energy. Many experts say it's a better alternative than solar or wind power, because water is so abundant. NBC's Kevin Tibbles is just back from a visit from the largest hydroelectric plant in the country. I'm interested to hear about this, Kevin.

Good morning.

KEVIN TIBBLES reporting:

Well, good morning, Matt. It may not be exactly new. Hydropower has been around since the Industrial Revolution and the water wheel. But it is relatively cheap and relatively clean. For example, did you know that people on the Pacific Northwest pay about half the electrical bills of people on the East do because they use water instead of coal.

As our thirst for power grows, quenching it becomes a greater challenge. Today, a traditional source is undergoing a renaissance. Hydroelectric power from water.

Mr. MICHAEL BARBER (Washington State University): Well, it is a clean, renewable source of energy. It doesn't contribute to the greenhouse gas effect as a traditional coal-fired plant might. It doesn't have the nuclear waste problem.

TIBBLES: And when it comes to generating hydropower, the Grand Coulee Dam in Washington state, spanning the mighty Columbia River, remains a formidable player.

The Grand Coulee Dam is not only the biggest source of hydroelectric power in North America, it is also an engineering marvel. Five hundred and 50 feet tall, just short of a mile across, and harnessing the power of 6.2 trillion gallons of water to light up our cities.

So how does hydroelectric power work? First, a dam is built on a large river, creating huge quantities of water in a reservoir. Gravity causes the water to pour through massive tubes called pen stocks. The rushing water turns a giant turbine propeller and the shaft of that propeller goes up into the generator. The more the propeller turns, the more electricity the generator produces.

This is the largest hydroelectric generator in the world. The shaft alone is 11 feet across and weighs 250 tons. Unlike wind or solar power, a hydroelectric plant can turn on or off like a spigot.

Mr. DAVID MURILLO (Grand Coulee Dam): We have a fairly quick response time. So basically if the demand goes up, we can start generating more power fairly quickly.

TIBBLES: In 1918 when Wilfred Woods' father proposed the idea for a dam on the Columbia, people laughed.

Mr. WILFRED WOODS (Father Proposed Dam): Nowadays, hydropower is really gold. It's more than gold.

TIBBLES: We're standing on one of the generators. I mean, how many people could this power up?

Ms. LYNNE BROUGHER (Grand Coulee Dam): Well, this generator here can produce enough power for about 100,000 people.

TIBBLES: The Grand Coulee powers the Pacific Northwest and reaches a total of 11 states, sending electricity as far east as Chicago and as far south as Los Angeles, if needed. Sixty percent of the city of Spokane's electricity comes from hydropower, much of it from the Grand Coulee.

Ms. MARY VERNER (Spokane, Washington): And the city of Spokane's economy really grew around having hydroelectricity, which was cheap, almost free electric power.

TIBBLES: But there is an environmental cost. Damming large rivers has impacted native Indian communities, whose livelihood depends on salmon fishing.

Mr. BARBER: Whenever you put an impediment in the water like a dam, you're going to stop the free migration of fish.

TIBBLES: Still, here at Grand Coulee, they expect to provide millions of megawatts for years to come. And it's still going strong?

Ms. BROUGHER: Absolutely. Grand Coulee Dam is as relevant today as it was back in the 1940s.

TIBBLES: And as the demand for power continues to rise, maybe even more. And, Matt, speaking of the salmon, some of the newer dams actually have salmon bridges built into them so the fish can get up and down stream. That's something that they're trying to look at, at the Grand Coulee now. The Grand Coulee, how big is it? Enough cement went into that structure to go around the world, make a sidewalk around the world not once, but twice.

LAUER: That's a big dam.

TIBBLES: That's a big dam.

LAUER: Kevin, thanks so much for the information. We appreciate it.