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PG&E seeks more 'pumped hydro' to store energy

David R. Baker, Chronicle Staff Writer
Tuesday, August 24, 2010



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Sources: ESRI, TeleAtlas, USGS

Todd Trumbull / The Chronicle

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Through a system called pumped hydro storage, water from one reservoir can be released into another downhill, turning turbines along the way and generating

electricity when the state's power grid needs it. Then, when the grid has ample energy, the water is pumped back uphill, to wait until it's needed again.

Six of these systems already exist in California. Now Pacific Gas and Electric Co. wants to build at least one more, arguing that large-scale energy storage will help smooth out the addition of more solar and wind power to the grid. The project is likely to take six years or more to receive all the necessary government permits.

The utility, based in San Francisco, asked California regulators on Friday for permission to spend almost \$33.5 million to study and design a pumped hydro system in the Mokelumne River watershed in Amador County. Some of the money would also pay for exploring other possible sites, including one in the Kings River watershed in Fresno County.

The Mokelumne River project would connect two existing reservoirs that PG&E already uses to generate hydroelectric power on a regular basis: the Lower Bear and Salt Springs reservoirs. Other possible variations would include using Upper Bear Reservoir or a new reservoir that would be built on nearby Cole Creek.

Construction of the entire project would cost an estimated \$2.5 billion, although the price could vary significantly depending on the final design.

The importance of large-scale energy storage has grown as the nation increases its use of renewable power.

Solar cells and wind turbines are notoriously fickle, their energy output literally changing with the weather. Relying on them for a substantial portion of our electricity supply requires adding backup generation from fossil-fuel power plants or developing some form of energy storage.

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"Often wind blows the hardest overnight, when we least need it," said Stephanie McCorkle, spokeswoman for the California Independent System Operator, which manages the state's electrical grid. "Some of the storage technologies could be beneficial in terms of capturing wind power and using it when needed."

But storing energy at that scale isn't easy.

Pumped hydro has been around for decades, with PG&E operating one such system in Fresno County since the 1980s. But other proposed storage technologies remain in the experimental stages. A PG&E project announced last year would use renewable power sources to compress air and pump it into an underground reservoir. The pressurized air would later be fed into turbines, when needed.

Pumped hydro is limited by geography. It requires steep terrain, which the Mokelumne watershed has in spades. Salt Springs Reservoir sits 1,863 feet below Lower Bear Reservoir, lending velocity to the water as it flows from one to the other.

PG&E estimates that the project could one day generate between 400 megawatts and 1,200 megawatts of electricity. A megawatt is a snapshot figure, roughly equal to the amount of electricity used by 750 typical homes at any given instant.

Despite the limitation, pumped hydro has several benefits, including speed. A pumped hydro facility can increase its power output quickly.

"It's really almost a matter of turning the valve and increasing the water flow," said PG&E spokesman Paul Moreno. "**Hydropower** has the ability to ramp up very quickly, much faster even than fossil-fuel plants."

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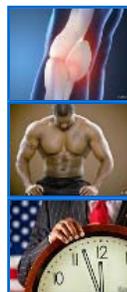
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echobox 8:12 AM on August 24, 2010

Pumped storage is one of the many technologies we need to store our daytime generated green power. Great idea PG&E but watch out. Here comes the extreme unreasonable opposition to any project that will ultimately have a smart meter connected to it at the end of the line.

POPULARITY: 15



bobster94901 2:45 PM on August 24, 2010

Pumped storage works well with nuclear power. PG&E's Helms pumped storage plant was built to store energy from Diablo Canyon Nuclear plant during the night when the electric demand is at a minimum. Helms is then operated during the day to help meet the peak demand.

POPULARITY: 4



publius197 11:55 AM on August 24, 2010

" The project is likely to take six years or more to receive all the necessary government permits."

WTF?!?!? 6 years?!?!?!

Our Corrupt State Govt is a bad joke.

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