

# Diy gravity energy storage

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To construct a gravity battery, gather the following:

I've stated it before on Hackaday but one of the most interesting engineering challenges posed to me this year was "how could you store enough energy to power a decent portion of a home for several hours without using batteries, all while staying within the size of a typical suburban plot?" [Quint Builds] attempts something up that alley by using solar power to pump water up onto his roof and later releasing it for power generation. (Video, embedded below.)

It's incredible to see lights come on powered by water alone but also sobering to realize just how much water you'd need to power a typical home. Perhaps if [Quint] upgrades, he can swap out the small motor for a larger 3D printed water pump.

A lot of work for small amount of power, don't compete with nuclear power.

It's small scale hydro storage. That much water elevated to 10m stores about 5Wh of energy, about as much as two li-ion cells.

Not quite; a reasonably good Li-ion 18650 battery stores 3350mAh at 3.6V nominal, so that's 12Wh per cell. Also, this battery has a cycle efficiency of over 95%, if the current is reasonable, while the pumped hydro has a cycle efficiency of about 25%, probably a lot less with this really crappy pump (it gets hot for a reason).

It may have been a fun build, but it's very impractical, and economically absolutely unviable.

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I agree that the efficiency of this setup is likely near zero, but why are you mentioning 25%? Pumped hydro normally has a cycle efficiency pretty comparable to lithium-ion batteries at grid scales. The battery \*itself\* has a cycle efficiency of ~95%-ish, but that's like comparing it to the actual energy difference between "water high" and "water low"; so by that metric the cycle efficiency is 100% for hydro!

The losses come in how you're moving the water, just like the losses for a lithium ion battery come in how you regulate and deliver the power. The whole "95%" number typically ignores those losses. Typically at grid scale, both of them are around 80% round-trip efficiency at a system level.



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A few feet of elevation won't give you any efficiency at the turbine.

And the water pressure is dependent on the water level in the bucket because of weight.

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