



Energy Storage Breakthroughs

Renewable energy sources like wind and solar are expanding, but we still need to meet the challenge of storing this energy when the sun isn't shining or the wind isn't blowing. In this video, you'll see how three companies are solving this challenge using molten salt, pumped hydro storage, and bidirectional power plants.



0:03

Video clips of wind turbines and solar panels.

Video clips of energy technologies.

Company logo for and video clips of Malta.

Wind and solar powered generation is expanding, but one challenge we face is how to store that energy when the sun isn't shining or the wind isn't blowing.

Here are three innovative companies searching for breakthroughs to solve this challenge.

For the first time ever, renewable power is cheaper than fossil intensive fuel sources. I mean that's a remarkable statement. Malta's mission is to enable the supply of reliable, resilient, and affordable electricity anywhere in the world. And we're doing that by developing an energy storage technology that is long duration and cost competitive. The Malta system is very simple. On the front end as the electricity comes in it basically operates a heat pump. What you're doing is taking the hot side and storing that in molten salt and salt stores heat very well. And you're taking the cold side and storing that in an antifreeze solution. And then when the electricity is needed to go back out to the grid, what you're doing is basically reversing that process.

1:09

Company logo for and video clips of Quidnet Energy.

Quidnet is taking the largest form of energy storage today, which is called pumped hydro storage. Effectively running water up and down a hill. And we're just bringing that to regions where there are no hills and it's all flat terrain. For pumped hydro storage the majority of the cost is building the dam and constructing on the side, and on the top of the mountain. With Quidnet's subsurface, geo-mechanical pump storage we take that cost and bring it down about an order of magnitude. A Quidnet facility essentially involves a surface pond, a mechanical room, and a well. When the system is charging water is pulled from the pond and pumped down into the well and kept at high pressure. When we're discharging, the high-pressure water is allowed to come back up through the well, flowing through the turbine, and back into the pond.

1:54

Company logo for and video clips of Form Energy.

Form Energy's bidirectional power plants are quite different from other kinds of energy storage. Lithium ion is one that most people know. Whereas lithium ion batteries are fantastic sprinters you would never take a sprinter and ask that sprinter to run a marathon. In our case what we are going after is a very different kind of race. In that marathon racer is a different electrochemical challenge. To smooth out those intermittencies over long periods of time. Days, weeks, or potentially even months. The bidirectional power plant operates under the same principles that any energy storage device does. You have a source of charging and then it's discharged according to the value maximizing algorithm that we have developed. We use earth abundant elements and we use elements which are non-toxic and very benign.

2:42

Malta CEO Ramya Swaminathan.

Every day I can wake up and tell myself that I'm doing something about climate change. That I'm doing something that matters, that will matter to my children's generation.

*Quidnet Energy CEO Joe
Zhou.*

The window for solving these problems isn't that long. Being able to dedicate our capabilities by doing something about that is what finally keeps us going and excited. Being able to dedicate our capabilities by doing something about that is what finally keeps us going and excited.

*Form Energy's CEO Mateo
Jaramillo.*

Humans are incredibly and endlessly inventive. I do like the idea that we're just going to go do it.



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