

Smoothing out the bumps of compressed-air storage

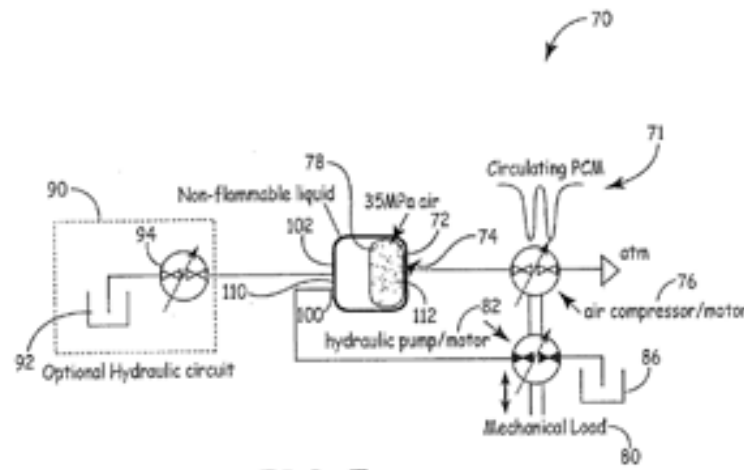


FIG. 5

The University of Minnesota has licensed a new technology that could be used to smooth out many of the peaks and valleys in wind and solar power generation.

The invention, by mechanical engineering professor Perry Li, is a method for setting up a compressed-air energy storage system that releases energy at a constant rate.

Compressed-air energy storage typically involves using excess electricity to pump air into an underground cavern. When electricity is in higher demand, the airflow can be reversed, spinning a set of turbines with a stream of air as the container depressurizes.

One drawback is that the intensity of the energy released constantly declines. It's like filling balloons with a helium tank. As the tank empties, it gradually takes longer to fill each balloon.

There's inefficiency and variability in that type of system — two qualities that are undesirable when it comes to managing an electricity grid.

Li came up with a configuration for an above-ground storage system, using a set of tanks and vessels, in which the pressure inside stays nearly constant, which means the energy output stays consistent, too.

"It's really about the configuration — how you put it together," says Li. "The idea is to allow the system to operate at more constant pressure, rather than at varying pressure. That's the key to the invention."

Li imagines the systems could be installed on individual wind turbines, where they could regulate the electricity output to a rolling eight-hour average.

The project, which was funded by the National Science Foundation, started out as a search for storage solutions for hydraulic hybrid vehicles, which capture energy from braking and store it in a vessel containing pressurized fluid.

What they came up with, however, appeared to be better suited for larger energy storage systems instead of vehicles, so Li turned his attention to wind and solar applications.

The technology has been licensed to SustainX, a New Hampshire company that's developing above-ground isothermal compressed-air energy storage systems.

For those who want to delve into the technical details, you can find the patent information [here](#).

Source: <http://www.midwestenergynews.com/2012/04/18/smoothing-out-the-bumps-o-compressed-air-energy/>