

Volume 344 July 9, 2013

Hydrogen may hold key to storing wind power

A system that could make renewable sources of power more reliable has begun operating in Germany, marking a milestone for a new energy storage system, the companies involved say. The plant converts surplus power from wind turbines into energy-dense hydrogen gas and is one of several efforts in the area of energy storage that are attempting to boost renewable power sources.

A major barrier to wider adoption of renewables has been the inconsistency of obtaining energy from wind that doesn't always blow and sun that is hidden at night. Germany's new power-to-gas system, built by Canada-based Hydrogenics for E.ON, a German utility, takes advantage of the wind's tendency to blow hardest at times when there isn't a lot of power demand.

The 2-megawatt facility uses the excess power from wind turbines to fuel a chemical reaction that produces hydrogen from water. The plant then feeds the hydrogen into natural gas pipelines, where it mixes with natural gas. The mixture then can be burned in natural gas turbines to generate electricity when needed. The "green gas" displaces natural gas, resulting in less fossil fuel combustion and ultimately more power generated from renewable sources, he said.

The approach has great potential, he said, because existing pipelines can hold enormous quantities of hydrogen. Other systems being developed to store renewable power have limitations. Battery systems, for example, can store large amounts of power, but can be drained in a matter of minutes.

Stored hydrogen, by contrast, can fuel existing gas generation plants to provide power when demand rises. E.ON said the plant operated properly earlier this month during tests. The plant is the largest of its kind and cost about \$2 million. While the technology holds promise, it takes a lot of wind power to produce the hydrogen gas, said Haresh Kamath, program manager for energy storage at the Electric Power Research Institute.

The process converts about 50 percent of the excess wind power into hydrogen, with the remainder required to fuel the chemical reaction. In addition, the hydrogen, when burned, produces power at about the same rate as natural gas, with a maximum efficiency of around 60 percent. The system also depends on natural gas turbines, meaning that it does not do away with the need to burn fossil fuels, though the hydrogen does provide a renewable replacement.

Electricity Pricing – July 9, 2013 Com Ed Average LMP Electric Price

Time Period	Average per Kwh
June, 2012	\$.03089
July, 2012	\$.04303
Aug, 2012	\$.03112
Sep, 2012	\$.03034
Oct, 2012	\$.02829
Nov, 2012	\$.03327
Dec, 2012	\$.03081
Jan, 2013	\$.03111
Feb, 2013	\$.03219
Mar, 2013	\$.03665
April, 2013	\$.03821
May, 2013	\$.03501
Jun, 2013	\$.03215

Extended Temperature Forecast: Chicago Area

	Tue	Wed	Thu	Fri	Sat
High	87	84	79	81	84
Low	73	66	62	64	69

