

Electricity Volume 227 March 29, 2011

Researchers claim fuel cell breakthrough

U.S. researchers say they've made a breakthrough in the development of low-cost hydrogen fuel cells that one day could power electric cars.

Researchers at Case Western Reserve University in Cleveland say catalysts made of carbon nanotubes dipped in a polymer solution can outperform traditional platinum catalysts in fuel cells at a fraction of the cost.

The scientists say the new technology can remove one of the biggest roadblocks to widespread cell use: the cost of the catalysts.

Platinum, which represents at least a quarter of the cost of fuel cells, currently sells for about \$30,000 per pound, while the activated carbon nanotubes cost about \$45 per pound, a Case release said Tuesday.

"This is a breakthrough," Liming Dai, a professor of chemical engineering and the research team leader, said.

Soaking carbon nanotubes in a water solution of the polymer for a couple of hours coats the nanotube surface and pulls an electron partially from the carbon, creating a net positive charge, researchers said.

When placed on the cathode of an alkaline fuel cell, the charged material acts as a catalyst for the oxygen-reduction reaction that produces electricity by electrochemically combining hydrogen and oxygen.

In testing, the researchers' carbon catalyst fuel cell produced as much power as an identical cell using a platinum catalyst.

Dai said he's confident his lab can increase the energy output of the new process.

"We have not optimized the system yet," he said.

One widely researched use for such cells would be to produce electricity to power an electric car, using hydrogen and oxygen from the air. The only emission from such a vehicle, researchers say, would be water.

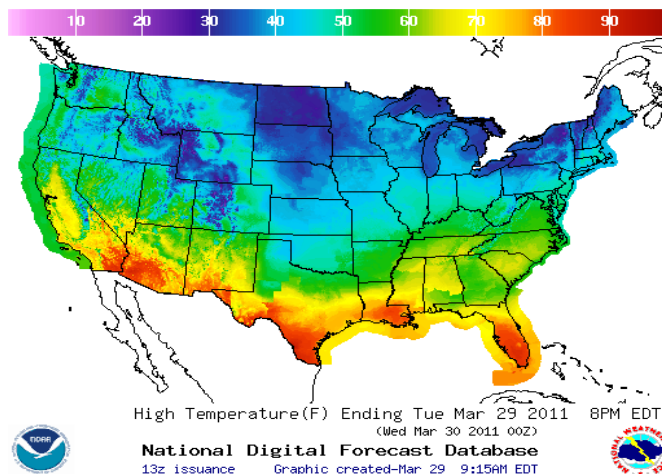
Electricity Pricing Areas – On Peak - Month – Apr 2011

	Mar 29, 2011	Per kWh
Cinergy	Hub Peak Swap Monthly	\$.03713
PJM Hub	Electricity Monthly	\$.04676
PJM	No. Illinois Peak LMP	\$.03680
PJM	Western Peak LMP	\$.04676

ComEd Average Day Ahead LMP Electric Price

Time Period	Average per Kwh
Apr 1 – Apr 30	\$.02911
May 1- May 31	\$.03389
Jun 1- Jun 30	\$.04184
Jul 1 - Jul 31	\$.04741
Aug 1 –Aug 31	\$.04628
Sep 1 - Sep 30	\$.02934
Oct 1 - Oct 31	\$.02702
Nov 1 - Nov 30	\$.02778
Dec 1 – Dec 31	\$.03545
Jan 1 –Jan 31, 2011	\$.03871
Feb 1 – Feb 28	\$.03581
March 1 thru Mar 28	\$.03636

Weather - Tue: Partly to mostly cloudy. High near 40F. Winds NE at 10 to 15 mph. **Wed:** Some clouds in the morning will give way to mainly sunny skies for the afternoon. High 44F. Winds NE at 5 to 10 mph. **Thu:** Mix of sun and clouds. Highs in the mid 40s and lows in the low 30s. **Fri:** Mix of rain and snow showers. Highs in the low 40s and lows in the upper 30s. **Sat:** Partly cloudy. Highs in the upper 40s and lows in the upper 30s.



Extended Temperature Forecast: Chicago Area

Tue	Wed	Thu	Fri	Sat
30 - 40	31 - 44	33 - 45	37 - 43	39 - 47