

Volume 232 May 3, 2011

A new advance in solar cells that tips the surface with minuscule cone structures could neutralize manufacturing defects, boosting efficiency up to 80 percent. In conventional solar panels, more than 50 percent of the charges generated by sunlight are lost due to defects, said Jun Xu, a researcher at the Department of Energy's Oak Ridge National Laboratory. The irregularities in the formation of the crystalline structure of solar cells can trap electrons and limit the transfer of sunlight to electrical energy. This is why his team is looking at how nanocones -- cone-shaped structures one-millionth of a meter long -- can neutralize the burden of defects. The negative-polarity nanocones are made of zinc oxide, and surrounded by a positive-polarity cadmium telluride semiconductor that absorbs sunlight. The three-dimensional cone structure acts as a junction between the zinc oxide and cadmium telluride, making for a smoother conversion of the solar charge to electricity.

With the nanocone structure, the team was able to increase the overall electric charge to overcome the pitfalls of defects. "You need to increase the efficiency ... you need to be able to increase change of transport. With a nanocone structure, you can do that." On a small level, the efficiency gains are relatively minor -- rising to 3.2 percent, compared to 1.8 percent for panels without the nanocones.

"Our efficiency is moderate in generation, but the difference between the two platforms is huge," he said, referring to the models with and without nanocones. In the real world, even a much smaller percentage increase would be an important achievement for solar. "If we can reduce the defective material, and we can increase the efficiency about 15 or 10 percent," he said, "that would be a huge success." Zinc oxide and cadmium telluride serve as relatively cheap materials to create nanocones, as well, said Xu, with the potential to reduce the cost of commercial solar panels if applied to silicon -- the most common material used for solar panels.

Extended Temp Forecast: Chicago Area

Tue	Wed	Thu	Fri	Sat
35 - 49	39 - 58	44 - 58	45 - 55	46 - 59

Electricity Pricing Areas – On Peak June 2011

	May 3, 2011	Per kWh
Cinergy	Hub Peak Swap Monthly	\$.04248
PJM Hub	Electricity Monthly	\$.05448
PJM	No. Illinois Peak LMP	\$.04252
PJM	Western Peak LMP	\$.05448

ComEd Average Day Ahead LMP Electric Price

Time Period	Average per Kwh
May 1-May 31, 2010	\$.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- Mar 31	\$.03668
April 1 - April 30	\$.03448

Weather - Tue: Sunshine and clouds mixed. Slight chance of a rain shower. High 48F. Winds NNE at 10 to 15 mph. **Wed:** Mainly sunny. High 58F. Winds N at 5 to 10 mph. **Thu:** Showers possible. Highs in the upper 50s and lows in the mid 40s. **Fri:** Times of sun and clouds. Highs in the mid 50s and lows in the mid 40s. **Sat:** Showers possible. Highs in the upper 50s and lows in the mid 40s.

