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ITRI eyes dye-sensitized solar cells

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The Industrial Technology Research Institute (ITRI, ●●) is working on improving production technologies related to dye-sensitized solar cells, hoping to mass produce the low-cost component in three to five years, sources at the Hsinchu-based institution said yesterday.

ITRI officials said that although its prototype cells have an energy conversion rate of 6 percent, lower than the optimal 10 percent rate achieved in the laboratory, the efficiency is still good enough for commercial purposes.

ITRI's prototype dye-sensitized solar cells are being presented to the public at the three-day Taiwan Nano 2008 Exhibition in Taipei.

The sixth Taiwan Nano Exhibition, the second biggest of its kind in Asia, focuses on the latest nano applications in household items, including nano ceramics, nano light-emitting diodes and nanocatalysis.

The first dye-sensitized solar cell was developed in 1991 by two Swiss-based scientists, Michael Graetzel and Brian O'Regan at the Ecole Polytechnique Federale de Lausanne.

The cells use titanium dioxide-laced dye material to capture photons. The energy in the particles can then be converted to electrical energy.

Although dye-sensitized solar cells are far less efficient in capturing energy than conventional silicon crystal solar cells, which have conversion rates of 30 percent or more, they still have market potential because of their inexpensive production costs — roughly 80 percent to 90 percent lower than the silicon crystal version.

Dye-sensitized solar cells have yet to be marketed commercially, but ITRI researchers said gains have been made in the development process and two patents related to the process have been obtained in Taiwan, giving the institute confidence that the solar cell can be commercialized by 2011.

“These solar cells, which combine nanocrystal technology and nano thin films, are efficient in

converting sunlight into electrical energy,” Tung Yung-liang, an ITRI senior researcher, said on Wednesday.

Within three to five years, the cells could be incorporated into marketable products, Tung said.

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