Business Standard

Press Trust of India | Ahmedabad December 09, 2013 Last Updated at 10:10 IST

Researchers develop technique to reduce cost of solar power

Researchers here have claimed to have developed a simple and economical way of processing to manufacture graphene-based solar cell, whose use may reduce the cost of producing solar power considerably.

"A simple and economical way of processing to fabricate graphene-based solar cell has been developed by our scientists," Gujarat Energy and Research Management Institute (GERMI) Director T Harinarayana said.

"Graphene, a single layer of carbon atoms arranged in a hexagonal lattice, has many novel properties that attracted researchers around the world. High electrical conductivity (better than copper) and very high (90%) transparency makes graphene an ideal material for fabrication of transparent and current spreading electrodes," GERMI said in a research paper.

The research was undertaken by Sanjay Behura, Sasmita Nayak and Omkar Jani of GERMI and Indrajit Mukhopadhyay of Pandit Deendayal Petroleum University (PDPU), Gandhinagar. The paper detailing the new research is expected to appear in journal 'Carbon' in February.

These researchers have demonstrated the possibility of using graphene as a component of solar cells, which is expected to reduce their manufacture cost by 10-15 per cent.

At present, silicon is being used for making these cells (als called photovoltaic cells) as it is considered energy efficient. However, this material is expensive, and squeezing higher efficiencies out of silicon-based solar cells has proved a challenge.

The simple fabrication technique of graphene and silicon can be exploited for other applications also.

The fabricated solar cell showed an efficiency of 0.02 per cent, which can be enhanced by optimising the device structure, the paper said.

Various forms of conventional silicon are currently used in solar power plants. However, if graphene can be used to produce low-cost solar cells, the cost of setting up such plants will come down substantially, it said.

Currently, setting up a solar power plant is very costly. The scientific breakthrough, researchers said, can give impetus to solar energy, a clean and environment-friendly form of power.

A solar cell is an electrical device that converts the energy of light directly into electricity.