**Nanotechnology may be key to solar energy and energy storage**

New IEC and Fraunhofer ISIstudy finds that nanotechnology will bring significant benefits to energy sector

***Geneva, CH, 2014-02-24*** *– A new study from the IEC (International Electrotechnical Commission) and the Fraunhofer Institute for Systems and Innovation Research ISI* *has found that nanotechnology will bring significant benefits to the energy sector, especially to energy storage and solar energy. Improved materials efficiency and reduced manufacturing costs are just two of the real economic benefits that nanotechnology already brings these fields and that’s only the beginning. Battery storage capacity could be extended, solar cells could be produced cheaper, and the lifetime of solar cells or batteries for electric cars could be increased, all thanks to continued development of nanotechnology.*

In the study, "Nanotechnology in the sectors of solar energy and energy storage" commissioned by the IEC (International Electrotechnical Commission), the Fraunhofer Institute for Systems and Innovation Research ISI found that there is a whole range of nanomaterials which will grow in importance as technology continues to advance. The Technical Report *Nanotechnology in the sectors of solar energy and energy storage* is available [here](http://www.iec.ch/about/brochures/technology.htm).

**The rise of nanomaterials**

A key finding of the study is that technologies where “nano” already plays an important role will be of special interest for industry and research.

The following nanomaterial technologies will be of particular importance: "organic and printed electronics", "nano-coatings," "nano-composites", "nano-fluids", "nano-catalysts", "nanocarbons" and "nano-electrodes". These seven technology profiles form the basis for two comprehensive roadmaps in the technical report.

For example, through the use of nanotechnology the light and energy generation of crystalline silicon solar cells or organic solar cells can already be enabled or significantly increased. Their manufacturing also requires less material and is more cost-efficient.

Energy storage capacity will significantly improve with the use of nanomaterials for lithium-ion batteries. This is by far the most important battery technology for energy storage since the early 1990s. It is especially important in view of the constantly increasing demand for electric vehicles, whose success is also directly linked to battery performance and resulting range extension.

**Large-scale application in solar power generation and energy storage**

Dr. Björn P. Moller, project leader of this study at Fraunhofer ISI is convinced that everything points to its large-scale application in solar power generation and energy storage, unlike many other fields where nanotechnology has been unable to make a break-through.

Moller said, "It can be assumed that in 2035 the share of fossil fuels in global energy production will have decreased to 75 percent. This implies that renewable energy will need to contribute significantly more to the overall energy generation. It is therefore crucially important that key technologies such as solar cells are further developed with the help of nanotechnology and that energy storage is improved.”

“In some areas nanotechnology may even be a key to success. There is great potential for nanotechnology to help to mitigate the intermittency of renewable energy,” Moller said.

**Role of nanotechnolgy in addressing the energy challenge**

“Commissioning this study to evaluate the potential of nanotechnologies and the future role of nanomaterials in addressing the energy challenge helps the IEC to understand the kind of work that it needs to undertake to enable the broad roll out of these technologies,” said **IEC General Secretary and CEO Frans Vreeswijk.**

“Against the backdrop of an anticipated 30% increase of global energy demand by 2035 and the significant expansion of renewable energy coming into the grid, the study has found that nanotechnologies including new nanomaterials, could be a key to successful renewable energy and energy storage integration.”

The Technical Report of the study *Nanotechnology in the sectors of solar energy and energy storage* will be of great use for those planning the use of solar energy and storage, whether they make products, use those products to generate and store electricity, or organize and regulate the use of the electric energy produced.

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**Further Information**

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**About the IEC**

The IEC (International Electrotechnical Commission) brings together 165 countries, and close to 14 000 experts who cooperate on the global IEC platform to ensure that products work everywhere safely with each other. The IEC is the world's leading organization that prepares and publishes globally relevant International Standards for the whole energy chain, including all electrical, electronic and related technologies, devices and systems. The IEC also supports all forms of conformity assessment and administers three Conformity Assessment Systems that certify that components, equipment and systems used in homes, offices, healthcare facilities, public spaces, transportation, manufacturing, explosive environments and energy generation conform to them.

IEC work covers a vast range of technologies: power generation (including all renewable energy sources), transmission, distribution, Smart Grid & Smart Cities, batteries, home appliances, office and medical equipment, all public and private transportation, semiconductors, fibre optics, nanotechnology, multimedia, information technology, and more. It also addresses safety, EMC, performance and the environment. [www.iec.ch](http://www.iec.ch)

**About the Fraunhofer Institute for Systems and Innovation Research ISI**

The Fraunhofer Institute for Systems and Innovation Research ISI analyzes emergence and effects of innovation. We explore the short -and long-term developments of innovation processes and the societal impact of new technologies and services. On this basis, we provide our clients from industry, politics and science policy recommendations and perspectives for key decisions. Our expertise lies in the profound scientific expertise as well as an interdisciplinary and systemic research approach. [www.isi.fraunhofer.de](http://www.isi.fraunhofer.de)