Solar power: Is it time for the big push?

EurekAlert!

There are great expectations for solar power, especially in the coming years, when the International Energy Agency projects solar to grow faster than any other renewable power. But what does science need to do to more fully respond to the opportunities ahead?

Recently, three researchers discussed this with fellow scientist Harry A. Atwater, Jr., director of the DOE Energy Frontier Research Center on Light-Material Interactions in Solar Energy Conversion, as well as member of the Kavli Nanoscience Institute (KNI) at the California Institute of Technology. To really give solar power a push, the scientists raised advancing how new materials are created, developed and then brought to industry.

"We need to engage with manufacturers and end-users of the technology as soon as possible, rather than spend years doing lab demonstrations before anyone talks with industry," said Michael Wasielewski, director of the Argonne-Northwestern Solar Energy Research Center and professor at Northwestern University. "We need to take advantage of manufacturers' expertise in how things are really done. On our part, we need to let them know about promising materials sooner, so they start to think about commercialization pathways earlier in the process."

It was also pointed out that barriers in the laboratory needed breaking. "I work more on the physics side, but there is a separation between what I do and the chemistry needed to make this work," said Albert Polman, director of the Dutch Foundation for Fundamental Research on Matter's Institute for Atomic and Molecular Physics in Amsterdam, The Netherlands. "To make things happen faster, we need to have the disciplines talk to one another more than in the past."

Another challenge is making new technology more affordable. Nathan Lewis is principal investigator of the Joint Center for Artificial Photosynthesis, the U.S. Department of Energy's Energy Innovation Hub in Fuels from Sunlight at the California Institute of Technology, where he is also a member of KNI. Said Lewis, "[W]e need to really scale up manufacturing to make this technology cheap. Right now, making solar cells is like making other highly engineered technologies, such as silicon chips. What we need are technologies that let us churn it out inexpensively, like newspaper or bubble wrap."

Scaling up means bridging a financial gulf, noted Atwater. "[T]o commercialize solar technologies, we must get past the valley of death – that big gap between demonstrating a technology and finding someone to invest $100 million for large-scale manufacturing," he said.

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