

# Sustainability through Nanotechnology

One of the great promises of nanoscience and nanotechnology is that we will be able to do more with less. By using less material overall, the load on our natural resources will be lower. By using less energy to operate smaller, more efficient devices, we will require less fuel and pollute less. The concepts and their application go much deeper. Through green syntheses that minimize waste and avoid routes that produce potentially harmful side products,<sup>1–3</sup> we can go further; these are among the potential benefits of starting a field from the bottom up.

New energy technologies are a focal point where nanoscience could make significant impact and has already shown great progress. In this issue, for example, Zaban and co-workers demonstrate a dye-sensitized solar cell (DSSC) that uses Förster resonance energy transfer as an enabling mechanism to funnel light more effectively from TiO<sub>2</sub> quantum dot donors to dye molecule acceptors.<sup>4</sup> An accompanying Perspective by Grimes and co-workers describes the developments and outlook of nanomaterials-based DSSCs.<sup>5</sup> Grimes and co-workers also contribute a Review article on another solar-energy-based technology—photocatalytic conversion of carbon dioxide and water vapor into hydrocarbon fuels;<sup>6</sup> developing this transformation into a technology is to be the focus of a (yet-to-be-awarded) new U.S. Department of Energy center.



IMAGE COURTESY OF RICH NIEWHOSKI, JR.

The Spring 2010 National Meeting of the American Chemical Society theme will be “Chemistry for a Sustainable World” and features the current and future roles of nanoscience. Image used under the Creative Commons Attribution 2.5 Generic license.

Some of the contributions that nanoscience is making toward sustainability are featured in the technical program for the 240th American Chemical Society National Meeting, which will take place March 21–25, 2010 in San Francisco, just as we go to press. The European Union’s Sustainable Energy Week will be held at the same time in Brussels. The overall ACS meeting program theme of “Chemistry for a Sustainable World” includes many nanoscience highlights, including The Kavli Foundation Sustainable Energy Symposium, organized by Professor Josef Michl and featuring prominent figures in the field, many of whom are con-

tributors to *ACS Nano*. We would also like to recommend the large program in “Nanoscience Fostered Advances in Sustainability”, which takes a broad look at the field and runs through much of the conference.

In what is sure to be an exciting meeting, and in this and future issues, we will continue to see the significant contributions that nanoscience is making toward sustainability.

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Published online March 23, 2010.  
10.1021/nn100462j

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