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M. Stanley Whittingham, State University of New York
at Binghamton, USA**Materials fuel sustainable development**

Every human endeavor is informed by the ramifications of sustainable development because there are only a few sustainable sources of energy (solar, wind, tidal, and geothermal), and none of the earth's materials resources are infinite. Sustainable development captures under one tent the concepts of environmental stewardship, materials management, green manufacturing, renewable and clean energy technologies, and water and air management. The most popular definition of sustainable development comes from the 1987 Brundtland Commission Report of the United Nations: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." More specifically, it can be thought of as the process by which policies for continual improvements of the economy, environment, and society (the "triple bottom line") are guided by scientific analysis.

Materials have always been technology enablers; there would be no direct conversion of solar power to electricity if efficient and manufacturable photovoltaic materials did not exist, no information age without silicon, no commercial aviation industry without high-strength aluminum alloys, and no skyscrapers without steel girders. At the 2012 Materials Research Society Spring Meeting, a special issue of *MRS Bulletin* entitled "Materials for sustainable development" will be released. The issue will explore the intersection of sustainable development and materials science. This event contributes toward the Society's efforts to regularly feature sustainable development programming at meetings and in publications.

Energy production enjoys an extremely important position and large footprint under the sustainable development tent. However, numerous critical materials issues regarding sustainable energy arise that the materials community must address to move forward. Do we have a sustainable supply of energy critical elements such as tellurium, neodymium, or uranium? Is nuclear fission a sustainable energy source? Coal will be burned in ever-increasing quantities worldwide until sustainable sources of energy become a sufficiently large part of the global energy portfolio (50 years? 100 years?). Do we have materials to enable "clean coal" technology in the meantime?

Materials researchers have a vital role to play in enabling sustainable development.

Marty Green

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