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Physics, Physicists, and Our Energy Future

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Abundant energy is intimately linked with global stability, economic prosperity, and quality of life. However, even with aggressive conservation and energy efficiency measures, the projected increase of the Earth's population accompanied by rapid technology development and economic growth is projected to double the demand for energy by mid century and more than triple the demand by the end of the century. The reserves of fossil fuels that currently account for 85% of U.S. energy will fall far short of demand over the long term, and their use is associated with environmental contaminants ranging from greenhouse gases and toxic gases to particulates. Our energy challenges cannot be met by incremental improvements to existing technologies. Transformational changes and disruptive technologies will be required to provide clean, reliable, economic solutions. As in the past, many of these changes will likely come from fundamental research in the physical sciences. How we approach the problem as a Nation and how we respond as a community of scientists will determine our success.