Prospects for a Low Carbon Energy Future

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The abundance of CO_2 is demonstrably higher now than at any time over the past 650,000 years and is likely over the next few decades to rise to levels not seen since dinosaurs roamed the Earth 50 million years ago. The increase in the abundance of CO_2 and a variety of other so-called greenhouse gases (notably CH_4 and N_2O) has resulted in a serious perturbation to the global energy balance. The Earth is now radiating significantly less energy to space than it absorbs from the sun. The extra heat, stored largely in the ocean, is responsible for important changes in global and regional climate with consequences, which though difficult to predict in detail, are surely serious. This paper will discuss potential options for a low-carbon energy future. Options to be discussed include prospects for carbon capture and sequestration with particular attention to the potential for an energy future based largely on electricity produced from a combination of wind, solar and geothermal sources complemented to an extent by nuclear. Particular attention will be directed at the challenges faced by large developing countries such as China and India, the former now having surpassed the U.S. as the world's largest national source of greenhouse gas emissions.

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