PREFACE

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This report was not originally scheduled to be a part of the portfolio of Synthesis and Assessment Products (SAPs) of the U.S. Climate Change Science Program (CCSP). It was added when the U.S. Congress compared the proposed coverage of the SAP process with subjects identified as national concerns in the U.S. Global Change Research Act of 1990, which listed energy as one of the climate change impact sectors of national concern. After this comparison, questions from the Congress led CCSP in mid-2005 to add a report on climate change effects on energy production and use in the United States: SAP 4.5.

This addition is important in at least two ways. First, it fills a gap left by the first U.S. National Assessment of Climate Variability and Change (NACC), carried out from 1997-2000. NACC commissioned studies of five sectors; but energy was not one of them, at least in part because NACC was focused on impacts and it was felt at that time that an energy sector impact assessment could not be separated from politically controversial issues related to emission reduction (mitigation). Second, it directly addresses a kind of myopia where relationships between the energy sector and climate change are concerned. The energy sector is universally considered a key part of mitigation strategies that emphasize reductions in fossil fuel use; but it is also a sector that is subject to impacts of climate change. Now that climate change is increasingly being accepted as a reality over the next century and more, it is important to consider vulnerabilities and possible adaptation strategies for this sector as well as others such as health, water, agriculture, and forestry.

For a combination of these reasons, SAP 4.5 is a timely contribution to U.S. discussions of possible climate change response strategies. Although it is possible to politicize issues of climate change implications for energy needs and energy supplies, it is also possible to provide both a foundation for that discussion based on available scientific and technological information and to indicate where additional knowledge would be useful in resolving issues and developing effective adaptation strategies.

This report has benefited from the thoughtful leadership of Jerry Elwood of DOE's Office of Science, without whose perspectives the job would have been impossible. When Dr. Elwood succeeded Ari Patrinos as acting Director of DOE's Office of Biological and Environmental Research (BER), Jeff Amthor moved in smoothly and professionally as the activity contact and manager, maintaining continuity and oversight. The report has also benefited from the steady roles of the CCSP principals and the CCSP program office, who have consistently insisted on such values as scientific independence and stakeholder participation. Finally, we acknowledge and express our gratitude to Jim Mahoney, who as Director of CCSP recognized the value of producing a set of statements of current knowledge about the various aspects of climate change science as a vitally important way to reduce uncertainties about what actions make sense now.

One of Jerry Elwood's decisions was to rely on a team of DOE national laboratory leaders and staff members to produce the report. This decision arose from a number of considerations, including the fact that the national laboratories as a family were in close touch with all of the relevant research communities. But it proved to be especially important because of the imperatives of the CCSP time schedule for the SAPs, which called for the first draft of SAP 4.5 to be produced so quickly that contracting with other participants would have been incompatible with established deadlines. The schedule could not have been met otherwise.

*Retired.

Given this reality, the DOE national laboratories responded with a collaboration among seven laboratories, including high-level leaders of many of them, and produced drafts and a final product that is intended as a starting point for a national discussion of a set of issues that had been previously largely overlooked.

But SAP 4.5 is not just a product of the DOE national laboratories. It has benefited profoundly from comments, questions, and other insights from a host of stakeholders in industry, federal, and state government, nongovernmental institutions, and academia. For a list of specific contributors, see Annex A; but research and assessment contributions from many others have been included as well. This is intended to be a summary on behalf of interested parties across the nation, not a summary of the knowledge of the national laboratories.

Having said this, the fact is that a summary of the current knowledge about possible effects of climate change on energy production and use in the United States, as of early 2007, does little more than scratch the surface of a very important and complex topic. Because of a natural tendency to focus on the energy sector as a driving force where climate change is concerned, the impacts on the energy sector from climate change have been under-studied. Until this oversight is corrected, the energy sector – on both the energy use and energy supply sides – is vulnerable to stresses from climate change that, if identified early enough, can probably be addressed by adaptation strategies that will reduce unnecessary costs to society and to the energy institutions that seek to meet social needs for energy services.