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NREL National Renewable Energy Laboratory

Innovation for Our Energy Future

April 30, 2008

Dr. Michael Strayer, Associate Director
Office of Advanced Scientific Computing Research
Office of Science, SC-21/GTN
U. S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585-1290

Dear Dr. Strayer:

On behalf of the workshop co-chairs, organizers and participants representing a large group of discipline scientists, engineers, applied mathematicians, and computational scientists from the DOE National Laboratories as well as leading universities and industry, I am pleased to deliver the attached final report from the workshop on Computational Research Needs in Alternative and Renewable Energy held September 19 and 20, 2007.

It is nearly impossible to overstate the imperative and the magnitude of the grand challenge we face as we look to develop cost effective renewable energy sources to meet future energy demand in an environmentally responsible manner. The scale of the challenge dictates a strategy that pursues multiple technologies simultaneously and aggressively. It is clear from the discussions at the workshop that success in meeting the ambitious national goals being set for renewable energy technologies as well as the need for a robust future electrical grid will depend critically on computational capabilities including petascale computing systems, scalable modeling and simulation codes, capacious data storage and informatics, and high speed communication networks.

Fortunately, continued advances in computational capability, numerical methods and algorithms, and scientific software infrastructure coupled with the formation of multidisciplinary technical collaborations will enable significant progress toward meeting alternative and renewable energy goals.

Respectfully submitted,

Steven W. Hammond

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