

## Buildings Technology Research and Development Working Group Meeting

April 16, 2009

Location: 950 L'Enfant Plaza DOE  
Time: 1:30-3:30 p.m.

### Attendees<sup>1</sup>

Shyam Sunder

Jerry Dion

Kevin Hurst

Paul Domich

Dru Crawley

Alan Schroeder

Mike Ritter

Andrew Nichols

Patrick Hughes

Paul Torcellini

David Campbell

Bobbie Lippiatt

Steve Bushby

William Brodt

Bob Thompson

Dale Manty

Diana Bauer

Gail Bentkover

Mark Hainsey

Chris Smith

Larry Bank

Sohi Rastegar

Ewa Lewandowska

Terry Watson

### Agency/Office

DOC/NIST

DOE/EE-Buildings

EOP/OSTP

DOC/NIST

DOE/EE-Buildings

DOE/EE-Buildings

DOI/USFS

PNNL

ORNL

NREL

USPS

DOC/NIST

DOC/NIST

NASA

EPA

EPA

EPA

EPA

USACE

Architect of the Capitol

NSF

NSF

Smithsonian Institution

Architect of the Capitol

BTRD Co-chair

BTRD Co-chair

BTRD Ex-Sec

**Next Meeting:** April 16, 2009, 1:30 - 3:30 PM, 950 L'Enfant Plaza DOE

May 28, 2009

June 18, 2009

July 16, 2009

August 20, 2009

September 17, 2009

October 15, 2009

November 19, 2009

December 17, 2009

---

<sup>1</sup> Active Members not attending identified in light gray

**Introductions:** Working Group Co-chair Paul Domich opened the working group meeting of the Subcommittee for Buildings Technology Research and Development (BTRD) welcoming the agency representatives and thanking them for their participation. Participants provided self-introductions.

**Review of Minutes:** Informal review of Minutes for May 12, 2009 was performed prior to the start of the meeting.

### **Emerging Frontiers in Research and Innovation (EFRI)- NSF FY 2010**

**Solicitation:** Larry Bank (NSF) and Sohi Rastegar (NSF) provided a preannouncement of the 2010 selection for NSF's Emerging Frontiers in Research and Innovation program titled *Science in Energy and Environmental Design (SEED): Engineering Sustainable Buildings*. The focus of the program<sup>2</sup> is to develop breakthrough multidisciplinary engineering research needed to move the building industry beyond the qualitative and prescriptive design philosophy of "Leadership in Energy and Environmental Design (LEED)" towards a quantitative and science-based design philosophy "Science in Energy and Environmental Design (SEED)" for sustainable green buildings. At present, the engineering academic research and education community is not sufficiently involved in this movement. The current situation is inadequate to meet the future building performance objectives which require a science-based approach.

The three interrelated research thrusts for integrated multidisciplinary science, engineering and systems research for innovative, transformative buildings research are: Materials and Sensing, Modeling and Simulation, and Concepts for Autonomy and Interdependence. At present,

- Materials, devices and control systems used today to produce, store and distribute alternative energy for buildings are in their infancy
- Building systems software tries to solve complex interacting-system problems with simplistic non-interoperable, un-integrated, and non-user friendly computational tools.

The program seeks to answer two key questions: 1) How can we better model and control, in real-time, the critical flows (e.g., energy, heat, water, light, sound, air and occupants) through the building materials and the building spaces, and 2) How do we create new paradigms for designing, constructing, operating, maintaining, and retiring buildings that will minimize fossil fuel consumption and adverse environmental effects.

The grants awarded will be for \$500k for 4 years for a total of \$2M for each award. There will be five to seven grants in 2010 for a total investment of \$10 - \$14M. Each award will have a minimum of three co-principle investigators with the primary PI from the engineering discipline, co-PI s from architecture and or social science and preferably also co-PIs from the physical/biological sciences.

---

<sup>2</sup> Material contained below is taken in part from presentation material provided at the USGBC Research Committee retreat April 25-27, 2009

As noted by subcommittee members, there have been a number of successful research partnerships between NSF and other federal agencies. Possible partners include EPA, DOE, USDA, HUD, and NIST. Banks encouraged Agency Representatives to participate as partners in this effort and offered to send additional information regarding partnership arrangements.

**EPA Education Initiative:** Bob Thompson (EPA) and Diana Bauer (EPA) provided an overview of a new planned consortium education initiative seeking to better understand the impact of “green” aspects on learning in the K-12 environment. EPA have asked for Requests for Applications (RFAs) to provide five grants of \$1M per year over three years to study the role and effectiveness of environmentally friendly education designs and concepts in education. The solicitation will address the interplay among Indoor Environmental Quality, school performance, and children's health with connections to design practices. The consortium is seeking groups to participate in the effort.

**Update on the ASHRAE Net-Zero Energy Building Conference:** Shyam Sunder (NIST) provided a brief summary of the recent ASHRAE *Countdown to a Sustainable Energy Future...Net-Zero and Beyond* conference which took place March 29-31 in San Francisco. The conference was well attended and attracted over 250 participants. Topics addressed in this conference included simulation technologies, best practices, recent demonstration projects, and the federal activities (including BTRD's) in the realm of net-zero energy buildings. A presentation by Sunder on the activities in the Federal government was well received. Subsequent Q&A revealed a need to better disseminate federal agency information and promote federal technology transfer, for example, via a single clearinghouse where information about all federal programs and activities may be found. Other present needs included developing appropriate accreditation processes for product evaluations services that would provide objective, performance-based evaluations on a wide range of new building products appearing on the market.

Jerry Dion indicated that DOE does provide these services to a limited degree through the SSL program. Additionally, the DOE Commercial Building Energy Alliances (Retailer, Real Estate, and Hospital) have developed prioritized lists of technologies requiring performance evaluations. The Energy Independence and Security Act of 2007 authorizes product certifications and funding for these new efforts is expect in FY09/10 that will begin development of expanded evaluation and labeling programs.

**Update on Cap and Trade:** Kevin Hurst (OSTP) provided an overview of the current perspectives regarding a Cap and Trade program for limiting carbon emissions. The President's budget proposes a cap-and-trade system with emissions limits amounting to a 14% reduction in carbon emissions from the 2005 baseline by 2020 and an 80% reduction by 2050. The President has proposed to devote \$150B of the revenues from auctions of carbon credits over

10 years for the development and deployment of clean energy technologies. Some portion of these funds could be used to advance R&D for high-efficiency building technologies and practices. OSTP has requested the BTRD Subcommittee to propose (informally, for Subcommittee use only) a 10-year funding plan that would use the auction revenue funds to augment current base funding. While there is no formal timeline for producing this plan, a near-term response would be helpful. A cap-and-trade bill is currently being considered by the House Energy Committee, and the US is currently developing proposals in preparation for the Copenhagen Climate Conference in December 2009.

The Working Group decided to develop a Subcommittee Position Paper on the proposed Cap and Trade legislation proposed by Waxman and Markey. This paper will be used to inform BTRD members and agencies on the merits and shortcomings in the current discussion document.

**Action Item:** Agencies will be asked to provide topics of interest in the current Cap and Trade discussion paper by proposed by Waxman and Markey.

**GHG Addendum Section Review and Discussion** Domich provided a brief overview of the current GHG Addendum to the Implementation Plan for Net-Zero Energy, High-Performance Green Buildings. Previous work included programs and budget development with a focus on research and development of technologies which will facilitate greenhouse gas (GHG) reduction. Each section contains a specific GHG Focus, using “Wider, Deeper, Faster” program elements and associated budget impacts. Lead Writers provided a brief review of budgets and program contained in the six sections to the addendum. Hurst suggested that an increased emphasis be placed on demonstrations and deployments.

**Action Item:** Lead writers will be asked to revisit their material and identify demonstration and deployment opportunities.

**Closure:** Domich closed the meeting at 3:30 p.m. and thanked the agency representatives for their participation.