Buildings Technology Research and Development Subcommittee

November 17, 2011

Location: 950 L'Enfant Plaza DOE
Time: 2:00-4:00 p.m.

Senior Principals	**Agency/Office**	
William Grosshandler	DOC/NIST	BTRD Co-chair
Roland Risser	DOE/EE-Buildings	BTRD Co-chair
Paul Domich	BTRD Ex-Sec	
Amir Roth	DOE/Buildings	
Doug Helmann	AOC	
Laura Janet	CDC	
Angela Wagner	CDC	
Ab Ream	DOE	
Amir Roth	DOE	
Jerry Dion	DOE	
Caterina Hatcher	EPA	
Dale Manty	EPA	
Judith Heerwagen	GSA	
Kevin Kampschroer	GSA	
Kinga Porst	GSA	
Patrick Fee	GSA	
Don Meyer	GSA	
Alfred Cypress	HHS	
Jonathan Herz	HHS	
Stephen Christopher	HHS	
Bill Brodt	NASA	
Greg Leifer	NIH	
Natasha Milesi-Ferretti	NIST	
Allen Whitley	SI	
Martin J. Savoie	USACE	
Teresa C. Schubert	USPS (telephone)	
Jeremiah Schofield	SSA (telephone)	
Rick Diamond	na (telephone)	
Bill Cork	na (telephone)	

Next Meeting: October 13, 2011 2:00-4:00 PM, 950 L'Enfant Plaza DOE

Meeting Calendar:

November 17, 2011	December 15, 2011

Introductions: Subcommittee Co-Chair William Grosshandler (NIST) opened the monthly meeting of the Subcommittee for Buildings Technology Research and Development (BTRD) welcoming the agency representatives and thanking them for their participation. All participants provided self-introductions.

Overview of the ISO 50001 International Meeting: BTRD Co-Chair Roland Risser provided an overview of the International ISO 50001 meeting held in Tysons Corner VA in October. Previously, the ISO/FDIS 50001 standards was unanimously approved by the international members. The 50001 Standard was published in June 2011 for public review. Risser serves as the lead of the ISO Technical Committee 242 Energy Management 50001.

The ISO/TC 242 scope is standardization in the field of energy management, including for example: energy efficiency, energy performance, energy supply, procurement practices for energy using equipment and systems, and energy use as well as measurement of current energy usage, implementation of a measurement system to document, report, and validate continual improvement in the area of energy management.

Previously, member countries voted on a slate of motions for the structure and identified lead responsibilities for working groups to the TC 24: Energy Management Systems – Korea, Energy Performance Indicators – Brazil, Baselines – Canada, Measurement and Verification – South Africa, and Energy Auditing – United Kingdom. The lead countries generally have existing standards in place that will provide a solid foundation for the development of the technical specifications for the Standard.

The major outcomes from the meeting were the development of a workgroup structure and lead responsibilities. As the Standard develops, additional work group elements will be formed to address future needs. A German initiative, proposed prior to the meeting but after earlier voting process will be formally pursued by the Committee. Additionally, the Measurement and Verification working group will collaborate with the ISO TC 257 to work jointly. South Africa will serve as Convenor.

The working groups have established timelines for project deliverables.

ISO 50001 Description and Case Study: Jeffrey Engelstad (GSA) provided an overview of the ISO 50001 standard. The Standard's framework is intended to transcends LEED and Energy Star through a enterprise-wide, systems approach, so to reduce waste, increase efficiencies, and provide for automated reminders, renewed prioritization, and re-education.

The framework begins with development of an Energy Policy that originates with top-level management, established boundaries and scope, accommodates relevant regulations and laws, and delegates responsibilities to appropriate

individuals/entities. Targets and objectives are created using existing baselines and translating existing “facility performance mandates” down to the building and systems level. Specific systems/buildings are identified as priority areas for performance improvements. Energy data supporting the management system must be rationalized – common formats developed, high-use and priority areas identified, metered and integrated.

After the improvements are implemented, the framework requires that measurements be taken to assess results. The measurements must be normalized and standardized to make reasonable comparisons. The energy manager and team members must analyze and comprehend the results generated, educating all parties on the outcomes.

The outcomes in turn require that the policies used be reviewed for effectiveness, allowing them to be modified to support continual improvements to the system. Once completed, external audits will provide verification and certification, and will set the “new” baseline. For continuous improvement for superior energy performance GSA uses:

- DOE Certification of Continuous Improvement
- ISO Audits Management, SEP Audits Improvement
- 3 Year Cycle with “Sliding Scale”
- Verification of Improvement based on EUI % Reductions and PM Score
- Industrial Success, Commercial Pilot

Engelstad identified challenges to ISO 50001 that include potential confusion over competing standards (ISO 14001 Environmental Management), issues on normalization approaches for comparison purposes, the diversity of commercial building types, verification and accreditation barriers, and the cost of acquiring data need for the analyses.

GSA Energy Savings Performance Contract (ESPC) Charrette: Kinga Porst (GSA) provided an overview of a recent GSA-sponsored charrette focused on addressing challenges to developing, evaluating, and establishing contracts to maximize ESPC project savings.

GSA is seeking to use and promulgate best “ESPC” practices to advance EISA goals, accelerate the deployment of underutilized and renewable technologies, expose GSA regions to IDIQ contract processes (e.g., DOE ESPC IDIQ), improve Energy Service Companies (ESCOs) selection. GSA is also focused on identifying structural, contractual, and technical impediments to the ESPC process.

To develop, demonstrate, and evaluate improvements to the existing process GSA has created a “Challenge Framework”. In the Framework, GSA has identified 30-35 buildings for a competition across multiple regions. The award

process will use DOE's streamlined competition process, and a panel of independent experts will evaluate performance and identify exceptional performance in terms of:

- absolute energy savings of pre-retrofit energy use
- progress towards Federal Government goals for energy, water, fossil fuel, renewable energy, and sustainability
- financial and technical creativity
- ability to extend best practices to other Federal buildings.

Participants at the charrette included public and private sector stakeholders including federal building managers, ESPC and technology providers, and technical experts. The facilitator asked attendees to set aside incremental solutions and answer: "What single change in the ESPC process would be most impactful for achieving deep savings?" Each attendee wrote down their own headline for the project. Key observations included:

- Rethinking the funding model (potentially to include a blend of ESPC and appropriations)
- Redistribution of risk (modifying guaranteed savings approach, government take on some risk)
- Streamlining the process (speeding up approvals and ESCO selection from 18 month to around a year, or 4 months)
- Bundling and integrating measures (including behavior/including tenants)
- Discussion of the innovative elements of the process (radical new process/way of thinking)
- Redefining avoided costs (including O&M savings and non-energy related projects

The five breakout group topics included:

1. Analysis and Integrative Design: Integrative, whole building analysis and measures are not commonly included in ESPC's for a variety of reasons including time constraints, risk, confidence in results and unfamiliarity with the process.

2. Project Economics: Deep energy retrofits may need a different angle on funding ESPC projects that takes into account blending appropriated funds with ESPC funding, long term contracting, bundles of ECM's and aggregated delivery.

3. ESPC Delivery Process: The current ESPC delivery process is too long and lacks consistency among project managers in different agencies.

4. Occupant Behavior: Energy savings strategies that rely on occupant behavior modifications are rarely part of the ESPC process, and this potential savings is unrealized.

5. Measurement and Verification: M&V is complicated and may not be providing the highest value possible, particularly as deeper energy retrofits drive more interactive ECM's.

Challenges for Analysis and Integrated Design included: savings from deep retrofits may not be cost effective over the contract term, lack of available

information on existing buildings, typical approaches look for typical ECMS, Federal Mandates require energy savings while the ESPC process requires monetary savings, risk to implementing deep saving retrofits.

Project Economics challenges included high financing costs, lack of integration with planned improvement projects, lack of consistency between ESPC and UESC contract terms, and Lifecycle cost analysis does not match ESPC contract durations.

Challenges to the ESPC Delivery Process include disagreement on eligible savings criteria, excessive duration of the process from inception to award, and significant project delays due to lack of incentives.

For Occupant Behavior, it is difficult to quantify energy/cost savings from changes in occupant behaviors, there is an absence of good examples, and it is hard to incentive the diverse types of occupants.

Measurement and Verification challenges include the variation on how buildings are operated after installation, costs for M&V, and the lack of consistency across the federal building sector.

For each breakout session, GSA identified possible means to address these barriers. Please see the presentation for additional details.

High priority solutions from the Charrette included:

- GSA and FEMP intend to expedite the process of ESCO selection for the Challenge targeting between 4 and 12 months.
- Certain risk sharing or interest rate reductions would reduce project costs and make greater energy savings more viable. Combining appropriated funding for designated projects with ESPCs could lead to bigger savings, more robust projects and better buildings.
- Including avoided capital and maintenance costs (even over just 1-2 years in the future) can increase project financing. Clear and consistent guidance from GSA on what the ESPC can include is necessary
- ESCOs could incorporate occupant behavior savings into bundles (through the implementation of each measure) instead of as a stand-alone measure. Solutions to share risk, or incentives for ESCOs to over-perform would encourage the inclusion of occupant behavior.
- Bundling of ESPC projects (and associated financing) could lower analysis costs and financing costs and could make more measures viable.

The envisioned reduced timeline for ESPC task order development would allow 28 days for project planning, 132 days for preliminary assessment and ESCO selection, 15 days to generate the RFP, 105 days for IGA and Final Proposal, 30 days for site/agency review, 14 days for GFO review, 45 days for final reviews,

negotiations, and awards, for a total of 12.1 months. This compares favorably to the existing timeline that takes 19.5 months.

Task Group Reportouts: BTRD Exec Sec Paul Domich provided a brief update on the activities of the behavioral task group and the commissioning (Cx) task group. Subcommittee members provided comments on the content of the CX survey developed jointly by the BTRD and FEMP.