



2009 BPA E3T Lighting Technical Advisory Group Progress Report

July 17, 2009

The goal of the Energy Efficiency Emerging Technology Assessment and Demonstration Program (E3T) is to establish an ongoing collaborative effort to “fill the pipeline” *with innovative energy efficiency products, technologies, and strategies* (measures) that promise significant region-wide energy savings and which are appropriate for the Bonneville Power Administration and its partners to promulgate to end use utility customers in the Northwest. To address that goal, two technical advisory groups (TAGs) were convened in spring of 2009.

The goals of the initial TAG meetings included recommending measures to be adopted based on the results of previous assessments and to nominate a limited number of additional measures for assessment by BPA or its partners in FY2009. Additionally, the initial two TAGs established in 2009 will provide a model for similar groups convened in the future as part of the effort to create and sustain collaboration among experts in the Northwest and other recognized experts in each area of focus (technology, end use, or sector).

This report summarizes results to date of the first TAG, which was convened in March and April focused on lighting. A parallel report focuses on a TAG focusing on heating, ventilation, and air conditioning (HVAC), which was convened in May.

Each TAG progress report includes

- a list of Technical Advisory Group members
- a brief description of the attendance at, locations of, and processes used for each TAG meeting
- an initial list of technologies and practices developed during the meetings
- a shorter list resulting from a voting process aimed at limiting further scrutiny to the most promising items, including the tally for each
- graphics detailing the scored results of TAG members’ reviews of top measures

The information contained in this report is intended for the staff and organizations directly involved in this project and should not be shared with external parties.



Lighting Technical Advisory Group Members

July 2009

NAME	ORGANIZATION	LOCATION	MARCH 16	APRIL 16
Jack Callahan	BPA Energy Efficiency	Portland, OR	In person	Teleconference
Craig Ciranny	BPA Energy Efficiency	Portland, OR	In person	Unable to attend
Luís Fernandes	California Lighting Technology Center	Davis, CA	Teleconference	Teleconference
Larry Giardina	City of Ashland	Ashland, OR	In person	Teleconference
Charlie Grist	NW Power and Conservation Council	Portland, OR	In person	Teleconference
Ira Krepchin (Micah Allen 3/16) ***	E Source Technology Assessment Service	Boston, MA	In person	Teleconference
Michael Lane	Lighting Design Lab	Seattle, WA	Teleconference	Teleconference
Marc R. Ledbetter	Pacific NW National Laboratory	Portland, OR	Unable to attend	Unable to attend
Jonathan Livingston*	Livingston Energy Innovations	Mill Valley, CA	In person	Teleconference
Peter Morante	Lighting Research Center	Troy, NY	Teleconference	Teleconference
Doug Oppedal	Energy Trust of Oregon	Portland, OR	In person	Teleconference
Rob Penney**	WSU Energy Program	Olympia, WA	In person	In person
Mark Rea	Lighting Research Center	Troy, NY	Teleconference	Teleconference
Frank Rice	Lumen Sales	Boise, ID	Teleconference	Unable to attend
Michael Siminovitch	California Lighting Technology Center	Davis, CA	Teleconference	Unable to attend
Jeff Smith	e2co	Boise, ID	Unable to attend	Unable to attend
Joe Vaccher	Eugene Water & Electric Board	Eugene, OR	In person	Teleconference
Jon Van Stone	e2co	Boise, ID	Unable to attend	Unable to attend
Cindy Wills	WSU Energy Program	Olympia, WA	Teleconference	In person
Jack Zeiger	WSU Energy Program	Olympia, WA	In person	In person

* served as facilitator

**served as recorder

*** Micah filled in for Ira 3/16/09

E3T Lighting TAG Process

In early 2009 the Energy Efficiency Emerging Technology Assessment and Demonstration (E3T) Program recruited highly qualified and experienced lighting specialists, including experts from utilities, industry, policy-making bodies, and other key entities to serve on the Lighting Technical Advisory Group (TAG). Most were asked as well to suggest other top people in their fields. A substantial list of potential members was developed, with attention to their knowledge of emerging technologies and approaches to implementation of lighting systems that went well beyond standard practice. Members with an understanding of market potential for lighting technologies were also sought. From that pool a representative core of experts was asked to serve on the TAG. The E3T staff greatly appreciated the high level of participation among busy TAG members; only 15% were unable to participate in person or via phone, and those that had to step away for other engagements took the trouble to return promptly.

Brainstorming

The E3T Lighting TAG met initially in Portland on Monday, March 16, in advance of BPA's 2009 Energy Efficiency Utility Summit, which was held over the course of the following two days. The timing and location was chosen to facilitate the participation of a number of TAG members who had made plans to travel to the Summit. The list above lists current TAG members and notes attendance at the initial meeting.

During the day-long meeting, participants used a facilitated brainstorm process to identify a list of promising products, technologies, and strategies (measures) not yet widely adopted in the Northwest that they were familiar with through their experience with lighting research, design, procurement, installation, maintenance, utility programs, and systems development. Participants were asked to share what they knew about studies, assessments, and lab and field research in regard to each measure. The brainstorm session resulted in a long list of unranked items that was appended to a list researched prior to the session by the WSU Energy Program (WSU). Measures were then reviewed to identify overlap and to gauge TAG members' sense of whether each was correctly identified as emerging, rather than a developed, mature technology or in too early a stage of development such that assessment would be premature if not impossible. Participation was active, highly informed, and energetic, yet patiently respectful, partly as a result of skillful facilitation.

Once the list of measures was established, TAG members voted on those they thought should be included in the short list of good measures to assess. Each member was allowed to vote for up to fifteen measures. WSU Staff then tallied the votes. The seven measures that received the most votes moved on to the next stage to be ranked in more detail.

Ranking

In early April, WSU staff assigned seven individual TAG members the task of ranking one of the top measures using a Measure Review Sheet devised in collaboration with E3T partners at BPA, Livingston Energy Innovations, and WSU. One review was done for each of the seven measures that rose to the top of the voting from the previous stage, in most cases by the TAG member who had identified it or expressed support for it during the brainstorm process.

TAG members were then asked to evaluate their assigned measure on a one-to-five scale for a series of multiple choice questions and narrative questions about how the measure compares with common practices and its ability to be adopted widely in the Northwest.

Reviewing

A follow-up TAG teleconference was held Thursday, April 16. In that session, reviewers delineated their approach and thinking regarding ranking the measure assigned to them. Discussion was engaged during each reviewer's presentation, including the group's determination whether each was suitable to "fast-track"—that is, program-ready and requiring little additional assessment before being implemented.

A brief overview of the next step in the process for reviewed measures, a Measure Evaluation Form (MEF) was presented. MEFs require more extended research, including dozens of questions and critical energy savings calculations at the unit and regional level. MEFs were completed by E3T staff members with TAG members providing invaluable assistance.

The following pages include a table depicting the brainstorm list ranked by votes garnered (with the seven selected for further evaluation highlighted in green) and a bar graph showing the scores resulting from the Measure Review process.

VOTES**Measure**

- 6** Bi-level occupancy sensors in stairwells parking lots, parking garages
- 5** T5 High-bay lights
- 4** Bi-level occupancy sensors in offices instead of daylight sensors
- 4** Simplified daylight controls
- 4** Improved CFLs ("Super CFLs")
- 3** Educating and training
- 3** Wireless lighting controls
- 3 Supermarket LED Refrigerated and freezer Case Lighting
- 3 Fluorescent dimming controls
- 3 SSL Downlighting
- 2 Cutting ambient lighting, more task lighting: offices, schools, warehouses.
- 2 High Color Temperature Lighting
- 2 Elevator LED lighting, and other niche applications.
- 2 Continuous dimming - Daylight harvesting
- 2 Wireless controls (combine with line #7 above)
- 2 T-5 / T-8 HO wall packs for outdoor applications(related to bi-level above)
- 2 LED's for Commercial Signs & Linear/Channel SSL Signage
- 2 Purpose-design classroom lighting, like FineLight (related to ambient/task above)
- 2 Solar Canopy Illumination System
- 2 HID Electronic Ballast
- 2 Advanced lens fluorescent fixtures
- 1 Solid state plasma lighting
- 1 Electron Stimulated Luminescence
- 1 Non-daylight sensors (motion sensor, task-oriented) for outdoor lighting
- 1 OLED lighting
- 1 Daylighting interior spaces with mirrored light pipes
- 1 Mesopic lighting
- 1 LED testing (lamp and applications)
- 1 Residential LED luminaires
- 1 Task-ambient systems with LED
- 1 LED lamp replacement
- 1 Dimmable applications for MR-16s and PAR halogens in restaurants, maybe LEDs
- 1 Improved street lighting and signage
- 1 Commissioning for controls and lighting systems
- 1 CFL Downlights
- 1 Replacing incandescent or halogen with dimmable fluorescent or dimmable cold-cathode
- 1 SSL display lighting
- Fiber optic daylighting
- Low-wattage metal halide for residential applications
- LED that can change colors to support circadian rhythms
- Hotel Room Lighting
- Induction Lighting

Lighting TAG - April 2009 Measure Scoring Results

