Regional Technical Forum Meeting Notes

December 12, 2005

DRAFT

1. Greetings and Introductions.

Tom Eckman welcomed everyone to today's meeting, held December 12 at the Northwest Power Planning & Conservation Council's Portland offices. The following is a summary (not a verbatim transcript) of the topics discussed and decisions made at this meeting. Anyone with questions or comments about these notes should contact Eckman at 503/222-5161.

Today's agenda was adopted unanimously. The minutes from the September 20 and October 28 RTF notes were approved as written.

2. Presentation, Discussion and Decision on Rooftop HVAC Scoping Contract.

Charlie Grist led this presentation; as most of you will remember, he said, we have been working on ways to get energy savings from small commercial rooftop HVAC units for some time. What I'd like to do today is to talk about a work plan that will get us to whatever RM&E needs to be done in this area, as well as a budget. Grist touched on the following major topics:

- Need: program specs and evaluation or verification protocols for improving the energy efficiency and performance of packaged rooftop HVAC systems in the 5 to 20-ton size range
- The theory – outside air economizer potential savings (kWh/ton vs. outside air temperature) (graph)
- The pieces and parts and the guys who fix them
- Where we left off: NEEA 2004 proposed research project stalled (estimated to take two years and cost about $300,000); RTF-sponsored Phase I study completed in 2004, assessed the extent of operational, control and setup problems; found significant savings potential – 70-80 aMW @3.9 cents per kWh
- Phase I found multiple problems per unit (graph)
- Phase I: frequency of problems by problem area – refrigerant circuit, economizer, air flow, thermostat, sensors (graph)

- Phase I: high and low range of estimated cooling savings by problem area (graph)

Grist offered the following insights from the Phase I study:

- Both new and old units are problem-ridden
- The greatest savings are from economizers and thermostats
- Initial installation and setup is problematic
- Economizer/controller interaction is not well understood
- Cost and market barriers make repair/service and retro-commissioning problematic
- Field-testing of refrigerant charge is problematic
- Favor dry bulb sensors for economizers

Grist then offered the following potential approaches to fixing these problems:

- System specifications: new or replacement system upgrades
- Component specifications: economizer replacement
- Service protocols: system and economizer service and repair

With respect to the recommendations that emerged from the Phase I study, Grist offered the following general recommendations:

- Address problems at three levels: manufacturer, design/installation, repair/service
- Priority intervention point is during installations and change-out specifications
- Convene regional experts to scope research and monitoring agenda and funding options

Grist then moved on to the recommendations for new and replacement units:

- Develop specs for a Northwest premium RTU
- Review elements of EWEB Western Premier Economizer, CEC PIER Fault Detection Diagnostics
- Identify the best combination of features responsive to Northwest conditions
- Develop a regional procedure for acceptance testing

He then offered the following recommendations for service, repair and retro-commissioning:

- Need a better understanding of components and operation
- Research and field monitoring needed to improve and simplify service protocols, and to identify savings from the protocols
- Monitor performance of PSE Premium Service Program and others

Grist touched on what is happening now:

- Some programs are operating, including PECI's AirCare Plus, EWEB's Western Premium Roof Top
- Some relevant PIER R&D in California
- Emerging evaluations

He discussed program end goals:

- Specifications – equipment, protocols and programs
- Qualifying measurement and verification for BPA reimbursement
- Savings validation
- Tools to estimate savings

Grist then moved on to next steps:

- Convene regional experts to scope research and monitoring agenda and funding options
- Develop a detailed work plan and budget
- Find money to implement work plan
- Contract for the development of the work plan
- Convene technical advisory committee develop detailed work plan and budget over four meetings. Then...
- Shop the plan to the region and get commitments to fund it
- Conduct and manage the work identified

For today, said Grist, what we need the RTF to do is to review, modify as needed and approve the attached draft scope of work for the rooftop HVAC program.

Eugene Roslie said he is somewhat hesitant to commit to the HVAC work plan without a better understanding of how this study fits into the overall regional goals in this arena. Tom and I have developed a draft F'06 RTF work plan for the group to consider, Grist replied. How do the savings from rooftop HVAC unit improvements compare to the potential savings from other measures? Ken Keating asked. It's one of the larger ones, Grist replied, but the feeling to date is that those savings will be difficult to realize. One of the goals of this research program is to see whether that is, in fact, the case. Eckman put up a list of 11 FY'06 RTF work items, noting that he had sent the list out to the RTF members in September. The total budget for all 11 items was estimated to be $300,000; Charlie Stephens said that, in his view, that budget may be somewhat low.

The group devoted a few minutes of discussion to the rooftop HVAC study concept, offering a variety of clarifying questions and comments. Ultimately, one participant noted that, given the fact that the potential savings associated with rooftop HVAC are roughly equivalent to the savings associated with the air-source heat pump program, given the amount of work that has gone into air source heat pumps, this

project is due.

Bruce Cody moved that the RTF move forward with scoping the rooftop HVAC work plan as proposed. This motion was seconded by Jay Himlie and unanimously approved.

3. Smart Grocer Program Initiative – Presentation of Program Opportunity and Discussion of Cost and Savings Estimates.

Bruce Cody began this agenda item by noting that grocery stores are an interesting market, because they're everywhere, they offer the potential for significant savings, but have traditionally been a hard market to penetrate. Working from a series of overheads, Cody touched on the following major topics:

- Proposed new initiative – we propose that the RTF implement and support a grocery program; the savings potential is valuable – 30 to 40 MWa at 1.9 cents per kWh; it's a distinct market; groceries are everywhere; there is considerable experience available
- Challenges: estimating and verifying savings, considerable program cost and infrastructure, requires industry-specific market and technical skills, coordination with existing programs and initiatives
- One possible approach: the PECI Energy Smart Grocer Program

Cody then introduced Diane Levin of PECI, who has been running the Energy Smart Grocer program in California for the past several years. Levin touched on the following topics:

- Project overview
- Inform-to-invest: immediate results, build trust, smaller projects lead to bigger projects
- Program elements: skilled energy experts, sophisticated audit software, menu of prescriptive measures, project delivery assistance, rebates and visibility, quality assurance
- The GrocerSmart audit software
- Multiple options per store (spreadsheet)
- The "Rule of 7–" seven personal interactions – gains trust
- The contractor challenge – they want reduced marketing time/guaranteed sales, customers with low travel times; enough volume to make a difference; we want responsiveness to customer inquiries, competitive bidding, compliance to terms and conditions and clear invoicing
- Delivery assistance: systems make all the difference (extensive database of store contacts, multiple bids per retrofit, multiple retrofits per store etc.
- Rebates and visibility – 15-day turnaround on rebate checks, press releases and awards, point-of-purchase materials
- Quality assurance

- Proven results: California 2003-2005 – have done 1,060 audits and 1,590 retrofits to date, with 578 repeat customers and 75 MWa in savings. Supermarkets are projected to deliver at least another 20 MWa in savings.
- California results: annual savings (kWh) and rebates by measure (pie charts)
- Northwest opportunity: total savings on the order of 225,000-410,000 annual kWh.

The focus of your program is primarily on medium to small grocery stores? one participant asked. So far, in California, yes, although we have had considerable success in going after the national chain stores, Levin replied.

Is Bonneville potentially interested in supporting this type of program? Grist asked. That discussion will begin this Wednesday, Cody replied. And did you have third-party verification of the results of your California program? Jeff Harris asked. For 2003 we did, and those results are available, Levin replied.

After a few minutes of additional discussion, one participant noted that he, at least, will need to see some additional details on this program before he would be comfortable voting on whether or not to proceed. Cody, however, said Bonneville is interested in getting the grocery program underway. In response to a question, Cody said the RTF will receive regular updates on this topic at future meetings, as more information becomes available.

4. Review, Discussion and Decision on Revised Multifamily New Construction Low Rise Technical Specifications and Savings Estimates.

Adam Hadley led this presentation. Working from a series of PowerPoint slides, Hadley touched on the following major topics:

- Lack of Energy Star for multifamily new construction – Long-term Super Good Cents (LTSGC) for single family is being phased out in favor of Energy Star
- Multi-family LTSGC history in C&RD (table)
- Why no tradeoffs? All tradeoff language has been removed from the specifications; tradeoffs will be allowed, but only on a custom project basis; BPA intends to allow tradeoffs the same way they have always been done; as tradeoffs are approved, they may be provided as prescriptive paths
- Wall requirements – existing LTSGC (R-26) and proposed (R-21)
- Window requirements – existing LTSGC (U-0.35) and proposed (U-0.30)
- Components by zone (table)

Hadley provided the following table of estimated FY'06-FY'07 energy savings:

	Heating Zone 1	Heating Zone 2	Heating Zone 3
FY 2006	145	350	557

FY 2007 (cost-effective only)	140	270	402
FY 2007 including R21 interior walls)			

Hadley said that, under his proposed program, the BPA reimbursement or credit would be $40 per unit for Heating Zone 1, $80 per unit for Heating Zone 2 and $120 per unit for Heating Zone 3.

Eckman used the deemed savings calculator to show the savings and B/C ratio associated with the revised multifamily technical specs and savings estimates. To me, the main questions include whether we should maintain R-49 advance-framed ceilings, and whether R-21 interior walls are appropriate, Eckman said.

Eckman noted that Hadley is proposing to retain the R-49 advance-framed ceiling standard, at least at this time. The only problem I see with that is that, if R-49 ceilings don't meet the B/C ratio, that breaks the precedent, Himlie observed. Yes, it does, Eckman replied. And to me, that may not be the best measure to use in this instance, Stephens said. After considerable debate, the sense of the discussion was that R-38 is the cost-effective ceiling standard.

The group devoted a few minutes of discussion to Hadley's proposed multifamily technical specs and savings estimates, offering a series of clarifying questions and comments. Ultimately, Stephens moved that Hadley's proposal be endorsed by the RTF, with the exception that the ceiling standard reverts to R-38 flat and R-30 (vault). This motion was seconded and unanimously approved.

5. Presentation, Discussion and Decision on Request to Revise Deemed Cost and Savings Estimates for Energy Star Residential Lighting Fixtures.

Mary Smith led this presentation. Working from a series of PowerPoint slides, she touched on the following major topics:

- Today's goals: address the role of residential fluorescent lighting fixtures in meeting regional conservation goals – 530 aMW identified in the Power Plan. Clarify the need to include fixtures as part of the region's lighting efficiency strategy. Request that the RTF reconsider its post-2006 program values for dedicated, energy-efficient lighting fixtures.
- Utility experience in the Puget Sound region – to date, Puget Sound Energy and other participating utilities have processed more than 25,000 compact fluorescent (CF) fixture rebates
- Lighting solutions: utilities support a least-cost solution for residential lighting; match applications with market segments; today's solution involves bulbs and fixtures; additional opportunities exist in switching, controls, sensors, placement

and design
- Current programs/rebates in the Puget Sound region (table)
- Response to CF fixture rebates: customers – retrofit and remodel; retailers, large and small; builders, Energy Star new home construction; lighting suppliers, showrooms and distributors and manufacturers
- Energy Star CF fixture applications
- Market needs: SF retrofit
- Market needs: Multifamily
- Market needs: SF new construction
- Utility programs address market needs – example: new construction fixture package. This slide also offered the following table, under the heading "Rebates Level the Playing Field:"

Location	Fixture Type	Watt	Per Fixture Cost	Fixture Type	Watt	Per CF Fixture Cost	After Rebate Cost
Kitchen	Juno recessed can	75	$15	SeaGull Recessed	26	$36.73	$16.73
Living Room	Maxim	120	$20	Maxlite	40	$35.84	$15.84
Hallway	Maxim	100	$18	Maxlite	30	$26.40	$6.40
Exterior	Transglobe	60	$7	Maxlite	18	$24.75	$4.75

Smith then moved on to:

- The importance of the utility role: rebates help the customer adopt new, more expensive lighting; education of showroom reps and builders; manufacturers have demonstrated a willingness to produce better product; rebates are critical to give Energy Star leverage with manufacturers, etc.
- Showroom/distributor and showroom/manufacturer examples – Alexander Lighting/North Coast Electric Company, Seattle Lighting/Dolan Design.

Representatives from Alexander Lighting/North Coast Electric Co. And Dolan Design gave the RTF a sense of what their companies need to continue to support, and aggressively sell, CF fixtures, including marketing support and opportunities, support for the supportive, and the creation of opportunities for profit.

Smith then offered the following recommendations to the RTF:

- Continue using 15-year measure life in establishing value for energy-efficient fixtures
- Additional value of fixtures based on longer life and better persistence than bulbs alone
- Encourage “Utility Sounding Board” process to recommend funding levels to meet market needs
- Regional support to allow BPA to announce fixture incentives in March 2006

That 15-year measure life applies just to CF fixture, or to bulbs as well? one participant asked. To fixtures only, Eckman replied – we assume a higher persistence in fixtures than we do in bulbs. We assume 8,000 hours mean life-cycle for the bulbs – anywhere from 3 to 17 years depending on their duty cycle.

In response to a question from Eckman, the group devoted a few minutes of discussion to the technical feasibility of bringing a dimmable CFL to the market. The consensus among the group was that such a product would be feasible, but expensive. Another participant noted that, given the tightness of C&RR funding in the region, she will need more than just the manufacturers’ assurance that fixture performance has changed sufficiently to warrant re-calculating the deemed savings values for Energy Star residential lighting fixtures.

The question before us is whether we have heard any hard evidence, over the past hour and a half, that would indicate that the fixture performance has changed to the extent that the deemed cost and savings estimates for Energy Star residential lighting fixtures should be revised, said Keating. We need to hear that these fixtures now save more, persist longer, and/or have a lower incremental cost, and I just don’t think we’ve heard that today, he said. If the savings and persistence are the same, then what is our justification for saying that the technical specs have changed? Eckman asked. The only thing I heard that might provide some justification is the fact that these fixtures will be going into higher-use areas, another participant observed.

A lively discussion ensued. Various RTF participants suggested that some additional review and, potentially, research will be needed before the RTF can take action in this matter. Ultimately, the RTF declined to bring the request to revise the deemed cost and savings estimates for Energy Star residential lighting fixtures to a vote at today’s meeting. It was agreed that any additional information that could be made available regarding intensity of use would be very helpful to the RTF. Another utility representative said that, contrary to the assertions he has heard at today’s meeting, his utility has seen a very low rate of CF fixture returns. When they are being returned, he said, they’re being replaced with another Energy Star fixture, rather than an incandescent fixture.

It was agreed that the RTF will revisit this topic at a future meeting.

6. Review, Discussion and Decision on Revised PTCS Air Source Heat Pump

Installation Specifications.

Hadley briefed the RTF on the current status of this effort. He began by distributing the most recent draft of the PTCS air-source heat pump system installation standards, dated December 7, 2005. Hadley briefly recapped the changes that have been made to this document since the last RTF meeting; the group devoted a few minutes of discussion to the revised standards, offering a series of clarifying questions and comments.

All proposed modifications were accepted by the RTF with the exception of a revision that would only require duct leakage testing when "75 % of the duct system was outside the conditioned space." Many of the RTF members asserted that there was no correlation between how much duct work was outside the conditioned space and how much of the duct system's leakage was to the outside. It was pointed out that major duct system leak could occur near the furnace in a garage when virtually all of the duct system was inside the conditioned space. The RTF then adopted Hadley's proposed changes but retained the current requirement that ducts must be tested and sealed if needed when a "substantial portion" of the duct system is outside the conditioned space.

7. Next RTF Meeting Date.

The next meeting of the Regional Technical Forum was set for Tuesday, January 10. Meeting summary prepared by Jeff Kuechle, NWPPCC contractor.

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