Maximizing Energy Efficiency

SWEEP Workshop
December 9, 2011
Salt Lake City, Utah

Claire Fulenwider, Executive Director
NORTHWEST ENERGY EFFICIENCY ALLIANCE
Today’s Talk

About NEEA

Recent work

New Projects
NEEA’s Unique Value

Fills the energy efficiency pipeline, championing innovation, driving emerging technologies

Accelerates market adoption of energy-efficient products, services and practices

Leverages regional advantage through shared resources, economies of scale, reduced risk

Helping the region capture efficiency better, faster, cheaper.
Initiative Risk vs. TRC (Using 6th Plan Surrogates)

Bubble size represents 15 year estimated Total Regional Savings opportunity

- More Attractive TRC
- Less Attractive TRC

Relative Likelihood of Success

- Low Risk
- Moderate Risk
- More Attractive

Green outline indicates additional savings potential from codes & standards development

Planning Estimates Only
Filling the Pipeline

NEEA Active Portfolio – Total Regional Savings Estimates

Balancing Short and Long Term to Create a Pipeline

Planning Estimates Only

Annual Savings (aMW)

-15 5 25 45 65 85 105 125 145 165


Irrigation
Dairy Production
Food Processors
Small/Medium Industrial
Other Com. Standards
Other Com. Codes
Bus IT - ENERGY STAR 5.0
Healthcare
Commercial Real Estate
Existing Building Renewal
Com. Lighting Solutions
Other Res. Standards
Other Res. Codes (Multi-family)
Ductless Heat Pumps
Heat Pump Water Heaters
Televisions
Efficient Homes
(incl. Single Family Codes)
Today’s Talk

About NEEA
Recent Work
New Initiatives
NEEA focuses on creating and configuring a strategic energy management solution for Northwest food processors.

**Key Initiative Strategies**

- Leverage Northwest Food Processors Association to mobilize members and other groups to reach energy efficiency goals
- Provide Strategic Energy Management (SEM) tools and education
- Promote and encourage adoption of SEM
- Demonstrate value of Continuous Energy Improvement
- Promote value of ISO 50001
Televisions

Market Barriers
- Limited retail availability
- Lack of product differentiation
- Lagging ENERGY STAR standard

Market Intervention:
Super-Efficient TV Initiative
- Upstream retailer incentives
- Materials and training
- Influence 2012 ENERGY STAR spec

Regional Results
- Launch of Energy Forward label
- Widespread participation
- 2012 ENERGY STAR spec 65% more efficient
- 20.4 aMW total regional savings (2011 forecast)
Televisions

TV’S Use almost 50% of the energy since program start

AVERAGE WATTS PER TV – WEIGHTED AVERAGE

Televisions

12
## Televisions

Since Program start Walmart and Sam’s have earned almost $6,000,000 in incentives!!

<table>
<thead>
<tr>
<th></th>
<th>PG&amp;E</th>
<th>SMUD</th>
<th>NEEA</th>
<th>NV</th>
<th>Total</th>
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<tbody>
<tr>
<td>2009 Actual</td>
<td>$1,224,720</td>
<td>$306,418</td>
<td>$181,030</td>
<td>n/a</td>
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<td>2010 Actual</td>
<td>$1,550,408</td>
<td>$306,038</td>
<td>$979,308</td>
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<td>2011 YTD (approved)</td>
<td>$684,122</td>
<td>$128,955</td>
<td>$238,814</td>
<td>$173,237</td>
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<td>Total</td>
<td>$3,459,250</td>
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## Business and Consumer Electronics Program

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<th>Spec Level</th>
<th>10 to 33 Inches</th>
<th>34 to 49 inches</th>
<th>50 and above inches</th>
<th>Program period</th>
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<td>PG&amp;E and SMUD</td>
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<td>$10.00</td>
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<td>NEEA and NV</td>
<td>Energy Star 5.0</td>
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<td>$4.00</td>
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<td></td>
<td>Energy Star 5.0+20%</td>
<td></td>
<td>$10.00</td>
<td>$18.00</td>
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<td><strong>2012 Program</strong></td>
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<tr>
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<td>Energy Star *6.0</td>
<td>$4.50</td>
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<tr>
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<td>$23.00</td>
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<td>NEEA and NV</td>
<td>Energy Star *6.0</td>
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<td>$20.00</td>
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</table>

*Assumes ES6.0 is current proposal*
Business and Consumer Electronics Program (BCE)

- Leverage Retailers’ market power to deliver more efficient products
- Capture energy savings
- Lower total cost
- Improve customer experience through marketing and training
- Build a lasting relationship with Retailers

TV’s are now almost 50% more efficient than pre-BCE!

As a result of the BCE program, a new Utility-Retailer dynamic is emerging

High utility cost effectiveness.
Today’s Talk

About NEEA
Recent Work
New Initiatives
1. Commercial HVAC Opportunity

Northwest Commercial Buildings
- 2.7 billion sf total space in 2007
- 75% of floor area mechanically cooled
- 174,000 buildings w/ light commercial HVAC systems

Large RTU Inventory
- 400,000 packaged roof top units (RTUs)
- 80% of RTUs under 10 tons

Many old inefficient systems
- 50% of RTUs are over 10 years old
- 16% are over 20 years old

Need an efficient replacement for small roof top units
Commercial HVAC – Evaporative Cooling

Saves Electric Energy
- 50% over direct expansion (DX) air conditioning

Decreases Peak Load
- Fan energy is the only load
- Becomes more effective at higher supply temperatures

Uses Indirect / Direct Cooling
- Maintains comfortable humidity level
- Limited moisture added to supply air

Requires Water
- ~200 gals / week / ton cooling
- Desert Coolaire; 5 ton (RTU) replacement; 33-50% savings. Problems of size, cost, mold on evaporative media.

Generation 2. 2011
- Speakman Air2O Quattro HCRS-2500; Met 99% of cooling with indirect/direct evap cooling only. Small package, good price. Problems: fan energy and heating.

Generation 3. 2012
- AirmaxIDEC 5 ton add-on not replacement. $3k target price. Reduces duty cycle, extends life by adding evap cooling for 1st state cooling. Field tests 2012.
Collaboration Opportunities

Lab Testing
- Support lab testing to document range of performance of current and next generation AirMax unit

Field Testing
- Increase the sample size of field tested AirMax units by testing units in the Southwest

Specification Development
- Collaborate to develop an evaporative roof top unit that supports warm and colder climates
2. Irrigation: 20% efficiency improvement by 2020

For Corporate/Family growers, center pivot, 100 acres+
Irrigation equipment and services supply chain focus

Objectives:
- API (Application Programming interface) specification for integrating information between sensors, controls and platforms
- Grower profitability optimization calculator
- ISO Standard development for Ag Irrigation
- Best practices in Agricultural Energy Efficiency
Integrated Irrigation Package Solution

Optimization tools and strategies:
- Optimum irrigation management (risk, management, scheduling, deficit irrigation)
- Right sized irrigation equipment and enterprise management
- Variable Rate & Speed Irrigation
- Reduced energy and resource input farming

Technical support and Equipment:
- Soil mapping services (3D)
- Sensors & Instrumentation (weather, soil, etc.)
- Infrared Monitoring
- Mobile, intuitive user interface

Management services:
- Management Commitment & Structure
AG Irrigation Pilots

Q1 & Q2 2013
Implement 3-5 pilot programs across the region

Q2-Q3 2013
Field days and early findings report out

Q3-Q4 2013
Report out on Pilots results. Refine Pilot Program 2014

Strengthening of Relationships & Cementing Solutions
3. Refrigeration Certification, Warehouses

Target: Food Processors, Cold Storage and Food distribution Facilities.

Efficiency curriculum in Refrigeration Education Technical Assistance (RETA)

2-7% Savings

- Level 1 Certified Refrigeration Energy Optimizer (CREO) 12-24 hours of commitment
- Level 2 Certified Industrial Refrigeration Energy Specialist (CIRES) 24-36 hours of commitment
# Savings Opportunities (RETA)

<table>
<thead>
<tr>
<th>Type of Facility</th>
<th>Conservative</th>
<th>Modest</th>
<th>Optimistic</th>
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<tbody>
<tr>
<td>Blast Freezing</td>
<td>3-5%</td>
<td>5-8%</td>
<td>6-14%</td>
</tr>
<tr>
<td>Cold Storage</td>
<td>5-8%</td>
<td>9-13%</td>
<td>10-15%</td>
</tr>
<tr>
<td>Food Processing</td>
<td>3-6%</td>
<td>4-8%</td>
<td>6-14%</td>
</tr>
<tr>
<td>Distribution</td>
<td>5-12%</td>
<td>8-14%</td>
<td>12-16%</td>
</tr>
</tbody>
</table>
Collaboration Opportunities 2012

AG | IRR
- Demonstration sites (3-4)
- Promote and endorse concept
- Support Standard API’s and ISO Standard

RETA
- Financial contribution funding curriculum development ($75-100K)
- Promote and support “Impact Learning Events” in Region
- Commit to long term regional support ($5-15K)/year (3-4 years) to RETA
Questions & Comments

Filling the Energy Efficiency Pipeline
Accelerating Market Adoption
Delivering Regional Advantage

Thank You!

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503-688-5401