

# Emerging Technology Field Test Overview

**June 14, 2012**

**Brown Bag**

Mira Vowles, BPA

# Emerging Technology (ET) Field Tests

- ET Field Test Overview
  - What, why & who
  - How (logistics)
- First Two ET Field Tests
  - Premium RTU Retrofit
  - VRF Systems



# The ET Dilemma



Advanced Rooftop HVAC



LED

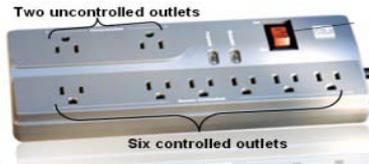
Lots of new promising technologies...



Web-Enabled T-stats



VRF Systems



Smart Plug Strips



Ductless Heat Pump



PTHP with Occupancy Control

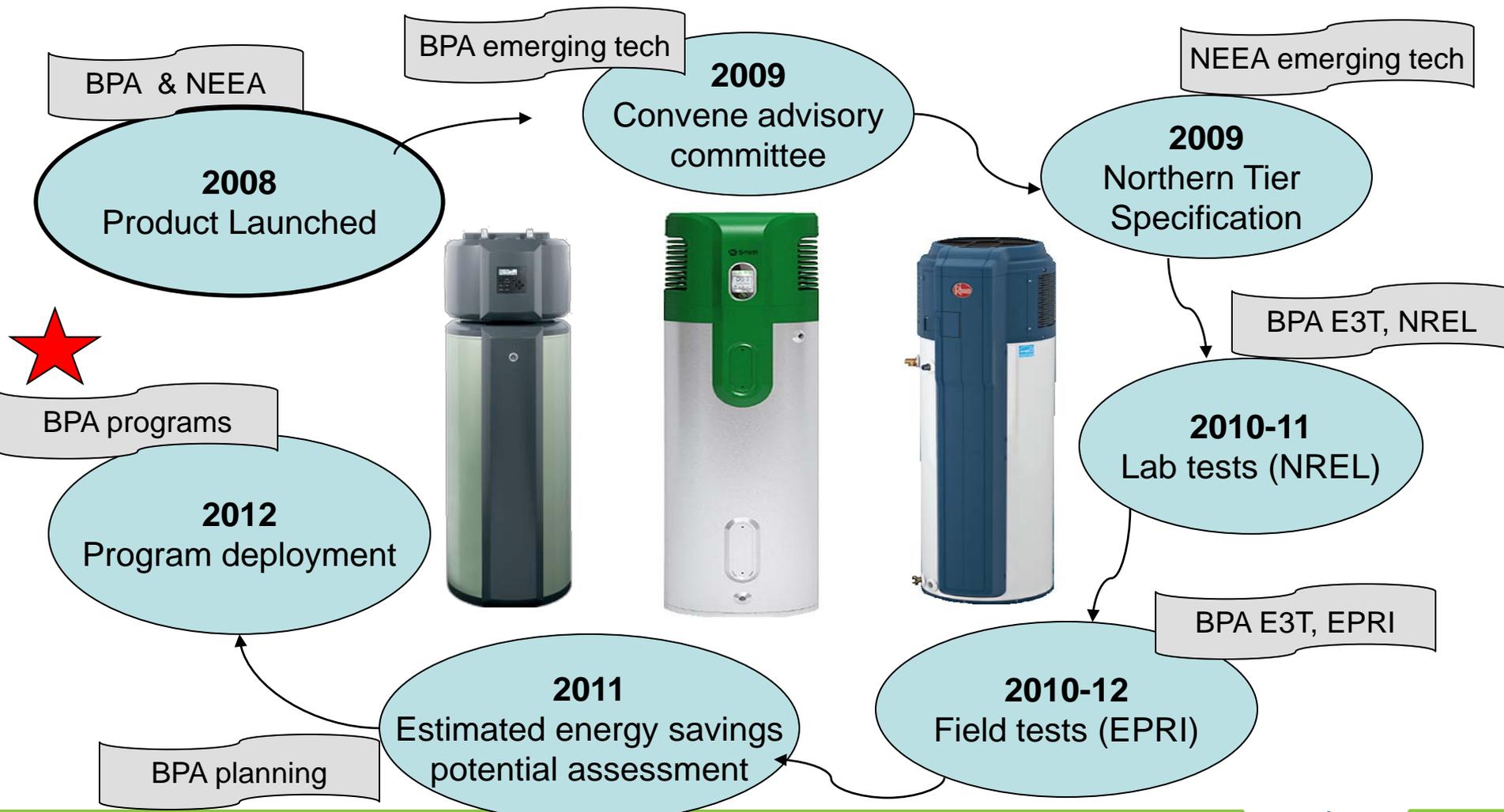


Heat Pump Water Heater

...but unproven

1. Is the technology reliable?
2. Will customers purchase it?
3. Are there any energy savings?
4. How can we measure and verify the savings?
5. Where are the good applications?
6. Is this cost effective?
7. What are the qualifying specs?
8. What is an effective program design?

# Example: Heat Pump Water Heaters



# ET Field Tests -what?

## BPA Energy Efficiency Research

- Technology Innovation
  - new technology applied research
- Energy Efficiency Emerging Technology (E3T)
  - focused research on commercially available products
- Emerging Technology Field Tests
  - focused field tests on commercially available products
  - Using EEI budgets and CPP process

# ET Field Tests -what?

- Field Tests to answer research questions
  - Get field experience
- Streamlined Custom Projects
  - Quick approval with pre-defined savings
- BPA metering and research
  - Share results
  - Fill the pipeline with new measures

# ET Field Test Advantages –Why?

- Low risk -limited number
- Quick focused process to develop new measures
- Custom Projects
  - Option 1 Custom Project Proposal Process
  - Standardized CPP & Completion Report templates
  - Pre-defined savings & reimbursement
  - Engineering Calculations with Verification
  - EEI or self-funded
- BPA research and analysis

# ET Field Test –How?

## Step 1: Utility submits online

### ET Field Test Participation Request

- Quick turn-around

## Step 2: Submit CPP, using supplied template

- ET Field Test in name  
(e.g. “ET Field Test Premium RTU Retrofit –xyz Mall”)

## Step 3: After installation & Completion Report

- BPA research
- Project feedback

# NEW ET Field Test Web Page

[www.bpa.gov/go/FieldTest](http://www.bpa.gov/go/FieldTest)

- “Go Field Test”
- Dynamic list of new field tests
  - eligibility requirements,
  - number of installations available,
  - participation obligations,
  - Pre-defined savings and
  - documentation requirements
- Participation request links
- Technology briefs
- Marketing materials

# ET Field Test -Who?

- ET Field Test Project Manager: *Varies by technology*
- Participating Utilities: *Varies –based on submitted requests*



# ET Field Test Schedule

## Available NOW:

- **Premium RTU Retrofit**
- **VRF systems**

## Coming in the Future:

- Engine Generator Block Heaters
- Others

# Premium Rooftop Unit (RTU) Retrofits



# Premium RTU Retrofits –What?

1. Supply Fan Control Savings
  - Cycling
  - Multi-speed
  - VSD
2. Demand Controlled Ventilation
3. Premium economizer control



# Good Premium RTU Retrofit Applications

- Long hours of occupancy,
- High occupant density (# of people/SF),
- Varying levels of occupancy,
- High cooling loads,
- Electric heat and
- No energy management system
- Applications: big-box retail, small-box retail, offices, grocery stores, gyms, fitness centers, places of assembly, auto dealerships, theaters, schools, casinos, bowling alleys and restaurants

# Premium RTU Retrofit Details

- Unitary, single-zone RTUs,
- with an economizer,
- greater than five tons of cooling capacity and
- serving a commercial facility,
- In BPA territory

Limited to 75 ET Field Tests

# Premium RTU Retrofit Pre-defined Savings

<b>Occupied hours per year</b>	<b>Savings (kWh/ton)</b>	<b>Incentive (\$/ton)</b>
2,000 - 4,000	600	\$120
4,001 - 8,760	1,000	\$200

# Premium RTU Retrofit Research

1. Capability to simulate baseline operation after retrofit

OR

2. Up to 3 months of baseline and post-retrofit metering

# Premium RTU Retrofits –Who?

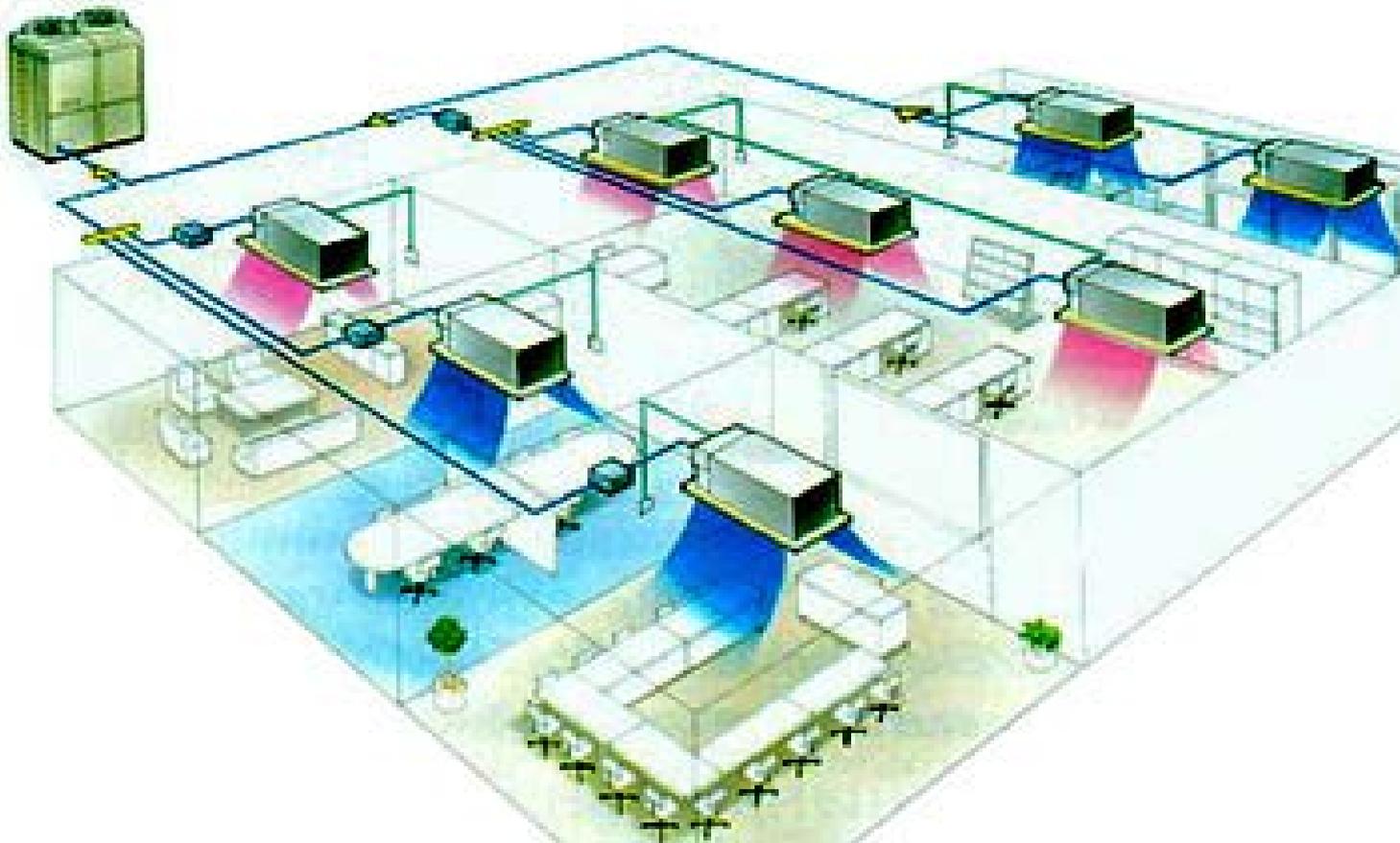
## BPA Team

- Project Manager: Mira Vowles (503-230-4796)
- BPA back-up: Rick Hodges (503-230-4362)

## Products:

- Transformative Wave Technology's Catalyst,
- Honeywell JADE controller with DCV, VSD and speed controller,
- KMC FlexStat or
- other products as they become available

# Variable Refrigerant Flow (VRF) Systems



# VRF Systems –What?

- Inverter driven compressors and fans
- Electronic variable expansion valves
- Sophisticated control algorithms and oil flow management
- Fan savings
- Optimized ventilation loads
  - Dedicated outside air systems (DOAS)
  - Exhaust air heat recovery
  - Premium economizer or
  - Other



# VRF System Details

- Replacing electric heating
- 24 months of baseline billing data
- Minimal other changes anticipated
- Minimum IEER= 12.3 and 3.4 COP at 47 F
- Optimized ventilation loads
- Commissioned systems serving over 90% of the building

Limited to 10 ET Field Tests

# VRF System Pre-Defined Savings

<b>Occupied hours per year</b>	<b>Savings (kWh/ton)</b>	<b>Incentive (\$/ton)</b>
2,000 - 4,000	1,000	\$200
4,001 - 8,760	1,500	\$300

# VRF Systems –Who?

## BPA Team

- Project Manager: Mira Vowles (503-230-4796)
- BPA back-up: Rick Hodges (503-230-4362)

## Products:

- Daikin,
- LG,
- Mitsubishi, or
- other products as they become available

# Emerging Technology Field Test

## Questions?

Mira Vowles  
[mkvowles@bpa.gov](mailto:mkvowles@bpa.gov)  
503-230-4796