

Emerging Technology Field Test

February 5, 2015

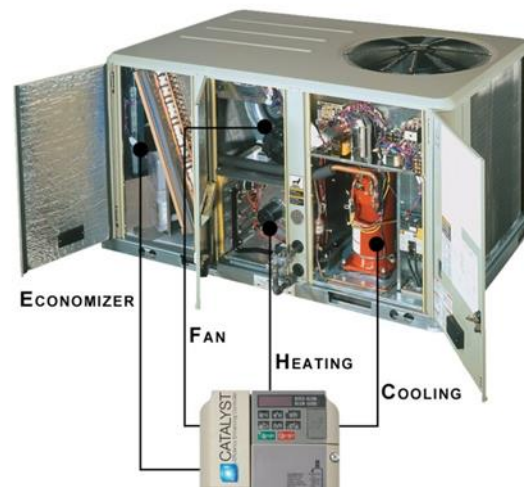
Brown Bag

Mira Vowles, BPA

Wesley Saway, BPA

Emerging Technology Field Test

BPA is seeking utilities to participate in an ET Field Test that will fully fund up to 30 retrofits of HVAC rooftop-units serving dry-good* retail stores, gyms, offices or restaurants



*no grocery stores

Agenda

1. The need for new measure research
2. ARC –Lite Retrofits
3. Emerging Technology (ET) Field Tests
4. This funding announcement

The ET Dilemma

Lots of new promising technologies...



Advanced Rooftop Unit and Control Retrofits



LED's



Behavioral and Energy Management Strategies



Variable Capacity Heat Pump Systems



CO2 Heat Pump Water Heaters

...but unproven savings

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

Why is new measure research needed?

- To stay current with new products,
- To evaluate new product savings potential and cost effectiveness,
- To fill the pipeline with energy efficiency measures, and
- To meet Power Plan targets.



LED's



CO2 Heat Pump
Water Heaters



Variable Capacity
Heat Pump
Systems

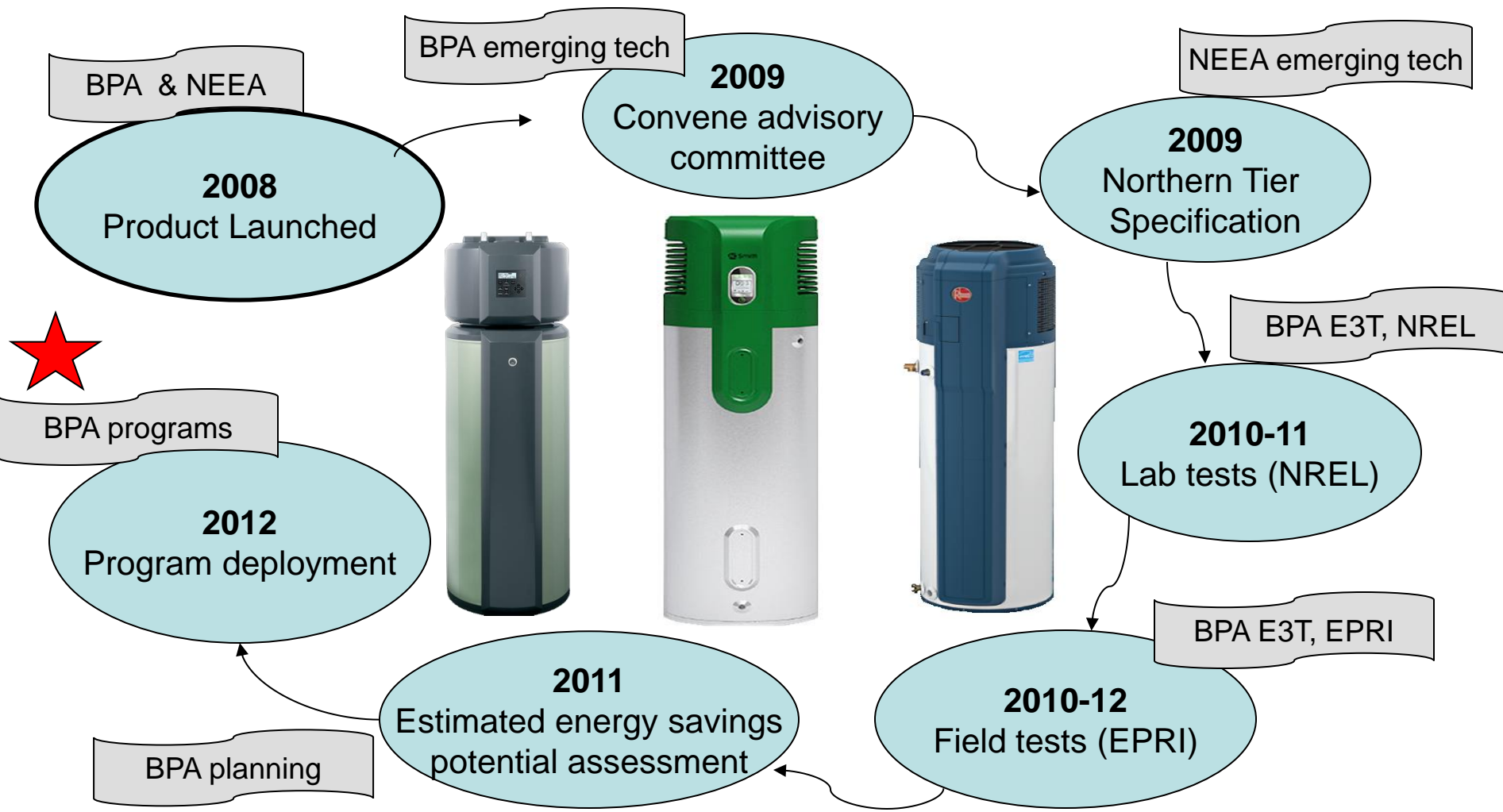
EE Emerging Technologies

Emerging technologies (ET) are commercial products with electrical-savings potential, that aren't currently being incented as energy efficiency measures because of savings and technology uncertainties.

E3TNW.org

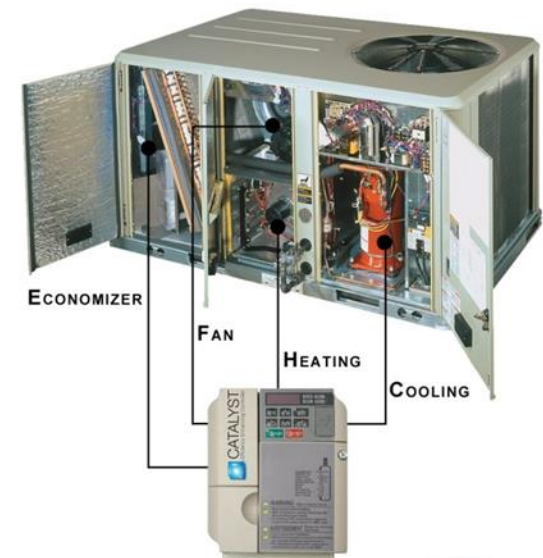


Example: Heat Pump Water Heaters



What is an ARC –Lite Retrofit?

- ARC = Advanced Rooftop-Unit Control
- ARC –Lite Retrofit
- ARC Retrofit
(existing measure)



ARC Retrofits

1. Supply Fan Control
 - Fan-cycling
 - Multi-speed
 - VSD
2. Demand Controlled Ventilation
3. Digital, integrated economizer control
4. Web-enabled



ARC = Advanced Rooftop-Unit Control

ARC –Lite Retrofit (new measure)

1. Supply Fan Control

- Fan-cycling
- Multi-speed
- VSD



~~2. Demand Controlled Ventilation~~

~~3. Digital, integrated economizer control~~

~~4. Web-enabled~~



ARC = Advanced Rooftop-Unit Control

Why ARC –Lite Retrofit?

- ARC Retrofit
(existing measure)

Occupied Hours	ARC
	kWh/ton
2,000 – 4,000	750
4,001 – 8,760	1,125

- ARC –Lite Retrofit
(new measure)

Occupied Hours	ARC -Lite
	kWh/ton
2,000 – 4,000	500
4,001 – 8,760	750

- No EEI savings
- No performance payments

Good ARC –Lite Retrofit Applications

Characteristics:

- Long hours of occupancy and
- Other?

Building types of interest:

- dry-good* retail stores, gyms, offices and restaurants

*no grocery

Rooftop Unit Requirements

Eligible rooftop units must:

- serve commercial spaces,
- operate continuously during occupied hours,
- have a minimum of 5 tons of direct-expansion, mechanical cooling,
- have an operational economizer, and
- are scheduled to operate a minimum of 3,000 hours of per year.

ARC –Lite Retrofit Requirements

- Adds controls to reduce RTU supply fan energy use; Catalyst strategy:
 - 90% in heating mode
 - 90% in cooling mode
 - 40% in ventilation mode
- Adds web-enabled monitoring system that provides one year of data on: fan status, cooling status, heating status, fan speed, fan power and fan fault status, and
- Continues to provide all required heating, cooling and ventilation.



ET Field Test Eligibility Requirements

- Rooftop Units that meet the Requirements,
- Retrofits that meet the ARC –Lite Requirements,
- Only BPA Customer Utilities can apply,
- Applications must be received by the deadline, and
- Application amounts must not exceed \$50,000 for one utility.

How will applications be selected?

- A maximum of 3 awards will be made for the following building types: gyms, restaurants, dry-good retail stores and offices.
- Selections for each building type will first be made for the RTU heating type and secondly for the lowest cost.
- Preferred RTU heating types are:
 - 1) electric resistance,
 - 2) heat pump, and
 - 3) gas or other heat.

ET Field Test Long-Term Plan

This year -one technology

- BPA will fully fund up to 30 **ARC –Lite Retrofits**
- Review both technology and ET Field Test concept

Future - multiple technologies

- Open solicitation
- BPA will fully fund a limited number of the technologies listed on the ET Field Test web-page

ARC –Lite Retrofit ET Field Test Timeline

- 3/11/2015 Application Deadline
- 4/14/2015 Anticipated Awards
- 4/15/2015 ET Field Test starts

- 9/15/2015 ARC –Lite Retrofits complete
- 9/30/2016 Final reports received

ET Field Test Resources

Emerging Technologies ARC-Light Retrofit ET Field Test



Field Test Details

Bonneville Power Administration (BPA) is seeking a limited number of utilities to participate in an Emerging Technology (ET) Field Test. This ET Field Test will fully fund up to 30 Advanced Rooftop-Unit Control (ARC) –Light Retrofits. BPA offers incentives for full ARC Retrofits, which include multi-speed, supply-fan control, optimized ventilation levels and integrated, differential economizers, but ARC -Light Retrofits include only supply-fan control. Since the fan savings represent most of ARC Retrofit savings, and ARC -Light Retrofits are lower in cost, this ET Field Test will research ARC -Light Retrofit cost effectiveness, with the intent of informing a region-wide offering in 2016.

For more information, please see [Funding Announcement](#).

Timeline

2/5/2015	Utility Brown Bag
3/11/2015	Submit Applications to wjsaway@bpa.gov
4/14/2015	Anticipated award date
4/15/2015	ET Field Test Research project starts
9/15/2015	All ARC –Light Retrofits must be complete
9/30/2016	Final Reports Received

Participation Details

Please consider participating in this ET Field Test to help fill the pipeline with a new conservation measure. If effective, ET Field Test grants may be used to explore other promising emerging technologies. Only BPA Customer Utilities can apply. Utilities interested in participating in this ET Field Test are invited to submit an application. To apply, complete the [Application form](#), attach a copy of the contractor quote and the [RTU detail sheet](#) for each building site, and submit to Wesley Saway at wjsaway@bpa.gov by 4:00 (PST) on March 11, 2015.

For more information, please see [Funding Announcement](#).

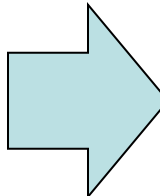
Resources

- [ARC-Light Retrofit ET Field Test Application](#)
- [RTU Detail Sheet \(Filled out by the Contractor\)](#)
- [ARC-Light Field Test FAQ](#)
- [Brown bag webinar \(February 5th\)](#)
- [Announcement](#)
- [Funding Announcement](#)

ARC –Lite Retrofit ET Field Test
Web-Page: www.bpa.gov/go/FieldTest

Resources

- [ARC-Lite Retrofit ET Field Test Application](#)
- [RTU Detail Sheet \(Filled out by the Contractor\)](#)
- [ARC-Lite Retrofit Field Test FAQ](#)
- [Brown bag webinar \(February 5th\)](#)
- [Announcement](#)
- [Funding Announcement](#)
- [Retrofit or Replace Checklist](#)



Customize the ET Field Test Flyer*

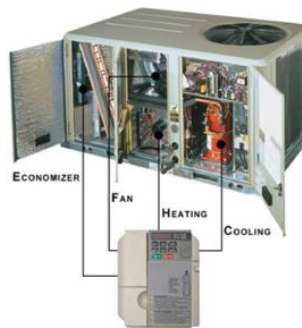


BPA will fully fund up to 30 energy-efficiency retrofits of HVAC rooftop-units, which can save up to \$1,500 per year. If you're interested, please contact your serving electric utility - applications are due 3/11/15!

These energy efficiency retrofits are called Advanced Rooftop-Unit Control, (ARC), and are supported by the US Department of Energy. ARC -Lite Retrofits reduce the supply-fan energy use, while still providing all the required heating, cooling and ventilation needs. As part of this Field Test, BPA will also add a web-enabled system to verify the savings.

Eligible rooftop units should serve dry-good (no grocery stores) retail stores, gyms, offices or restaurants, operate continuously during occupied hours, have a minimum of 5 tons of direct-expansion, mechanical cooling capacity; the economizer must be operational, and it must be scheduled to operate a minimum of 3,000 hours of per year.

ARC-Lite Retrofit



For more information on this Field Test, go to www.bpa.gov/go/FieldTest

Customize this flyer with your logo, by emailing it to: mcgross@bpa.gov

* This flyer is located at: www.bpa.gov/go/FieldTest

-under Resources

What do I have to do to apply?

- Confirm customer participation
- Get a contractor's quote and "Detail" sheets for each RTU, and
- Submit application by 4pm on 3/11/2015 to wjsaway@bpa.gov



ET Field Test Application



ARC-Lite Retrofit ET Field Test Building Application Form

Submit one application for each building site.

Utility Name:

Name of Utility Point of Contact:

Phone:

Email Address:

Name of Utility Financial Point of Contact:

Financial Point of Contact Email Address:

Name of Business at the Proposed Project Site:

Proposed Project Site Address:

City/State/Zip code:

Business Type (Please Describe):

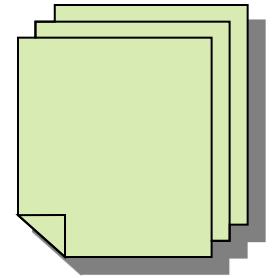
Annual Business Hours:

Square footage of the conditioned floor area of the building:

What do I have to do if my application is selected?

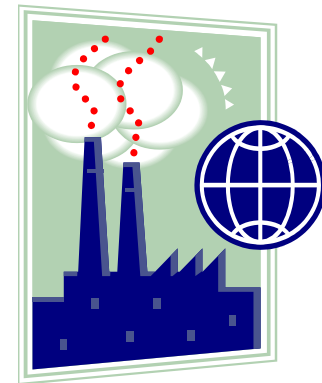
Commit to a minimum of 2 hours per month to:

- Provide monthly status emails,
- Provide funding to owner,
- Provide a final report consisting of:
 - Copy of installation invoice and
 - Copy of M&V data
- Provide feedback.



Why should I apply for a grant?

- Help your customer save money,
- Be seen as green and cutting edge and
- Help develop new measures so we can all meet our targets.



Questions?

Technical: Mira Vowles
503-230-4796
mkvowles@bpa.gov

Grant: Wesley Saway
503-230-3985
wjsaway@bpa.gov