EMERGING TECH FIELD TESTS FOR COMMERCIAL APPLICATIONS

Brown Bag
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BACKGROUND:

Why do we do field tests?
How do field tests work?
How will you benefit?

THE EMERGING TECH CHALLENGE

lots of new promising technologies…
but many unknowns

- Is it reliable?
- Will customers purchase it?
- What are the energy savings?
- How can we measure and verify the savings?

- What are good applications?
- Is it cost effective?
- What are the qualifying specifications?
- What is an effective program design?

FIELD TESTS

We need your help finding Field Test sites!

BPA

- Supports the project
- Provides funding
- Helps with custom projects
- Measures and verifies savings
- Develops measures for viable technologies

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Utility

- Finds site - Trade Allies can help
- Receives funding
- Claims self-funded savings **OR**
- Uses EEI budget for custom project

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New measure

- Help your customer save money,
- Be seen as green and cutting edge
- Help the region meet our targets

FIELD TEST DETAILS

1. Funding - limited
   - Some projects may be fully funded
     - Claim self-funded savings
   - Use EEI budget for custom projects, in addition to BPA funds
2. Metering and Research
   - Get field experience, reduce risk

How it works

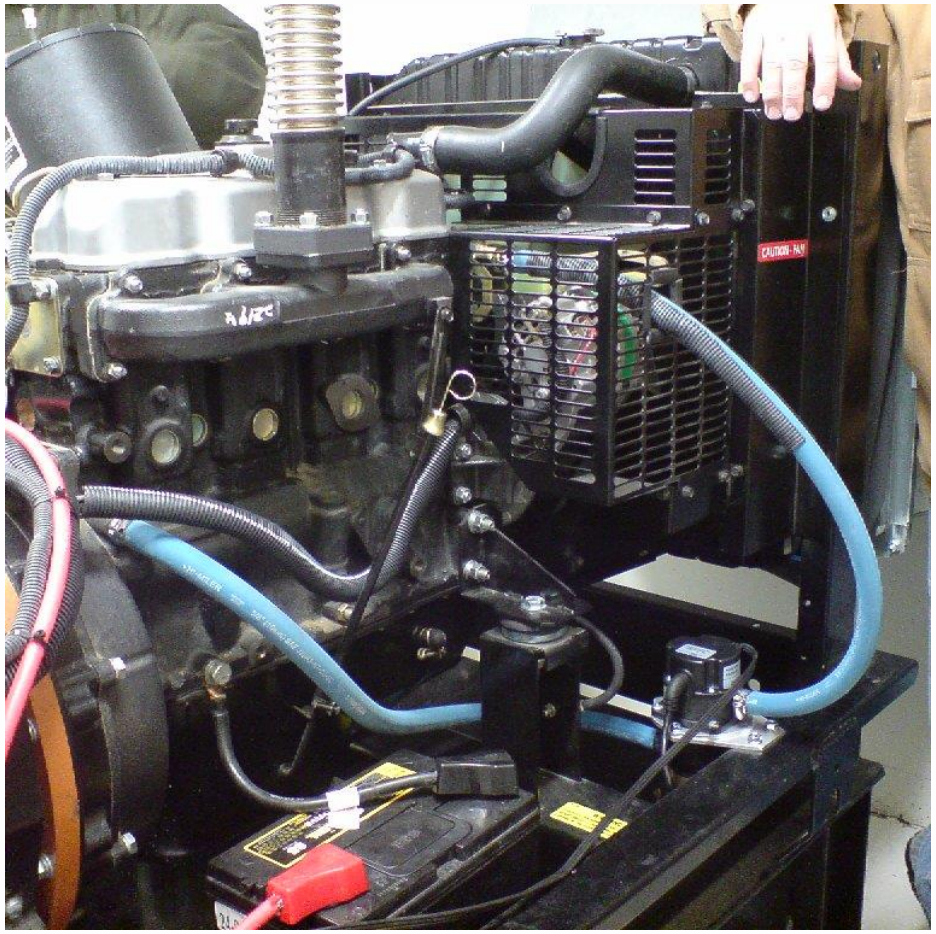
- Find a site
  - Air Northwest Trade Allies can help!
- Work with your customer to have them join the ET Field Test
- Apply for BPA funding
- Provide funding to your customer
- Provide a final report:
  - Copy of installation invoice
  - Copy of billing data
  - Project feedback

PREVIOUS COMMERCIAL SECTOR FIELD TESTS:

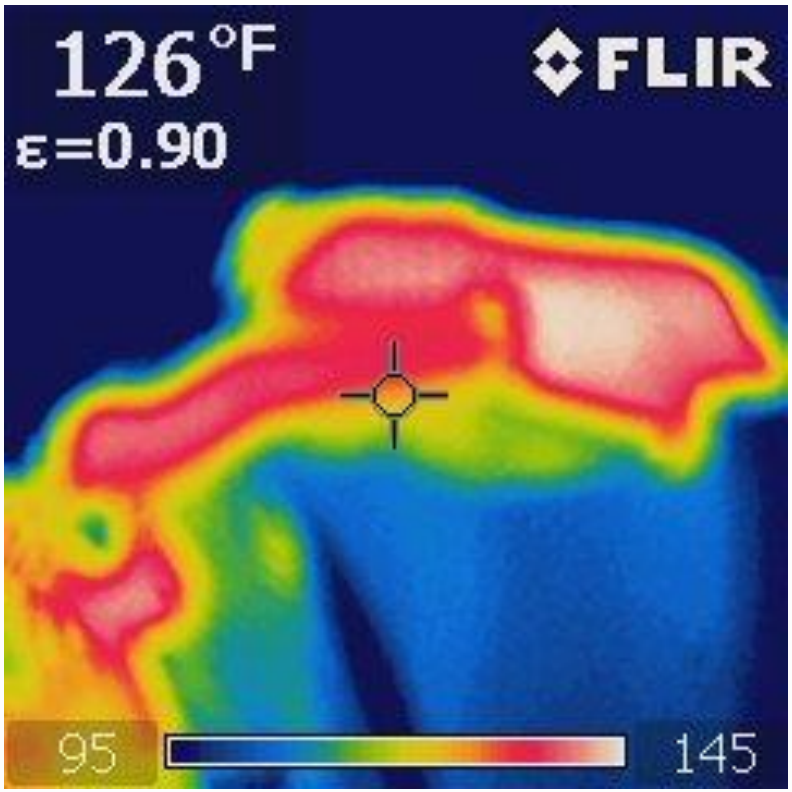
- Generator Block Heaters -City of Cheney, City of Ellensburg, Flathead Electric, Kootenai Electric and Ravalli Electric
- Vehicle Block Heaters -City of Cheney
- Server Room Airflow Management -SCL
- ARC –Lite -City of Richland, Clark Public Utilities, Columbia River PUD, SCL, Tacoma PU
- RTU Replacement with HRV -Flathead Electric
- Large Capacity HPWH -Ravalli Electric

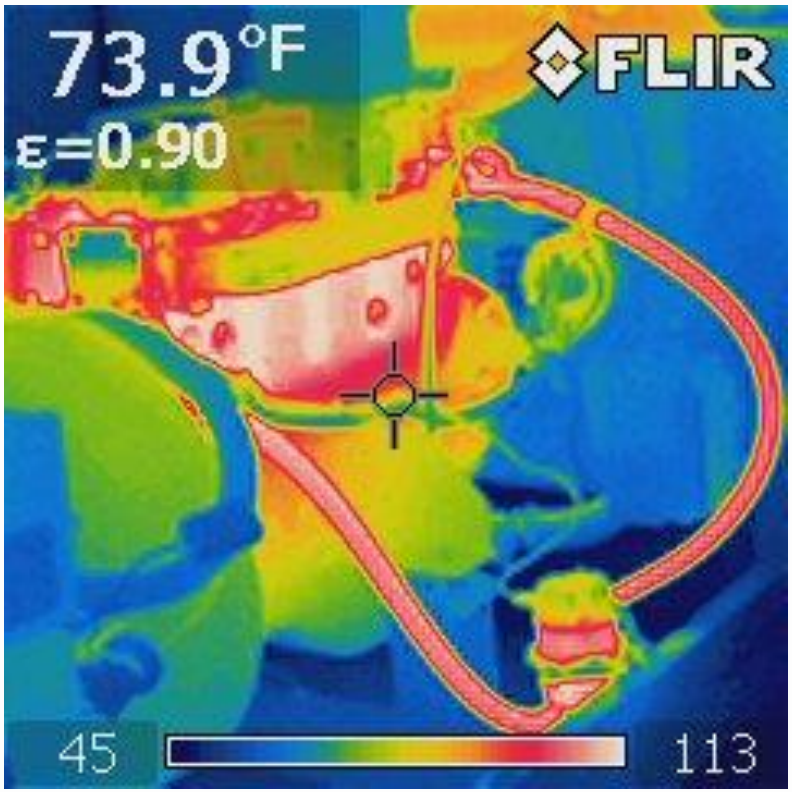
SUCCESS: Generator BLOCK HEATERS

- Darby, MT
- Collaboration-BPA/REC/TCJC
  - BPA Grant
  - REC EEI
- W & WW Plant Generators
- Baseline-thermo-syphon heater
- Post-circulating heater
- Completed 3/1/13



SUCCESS: Generator Block Heaters





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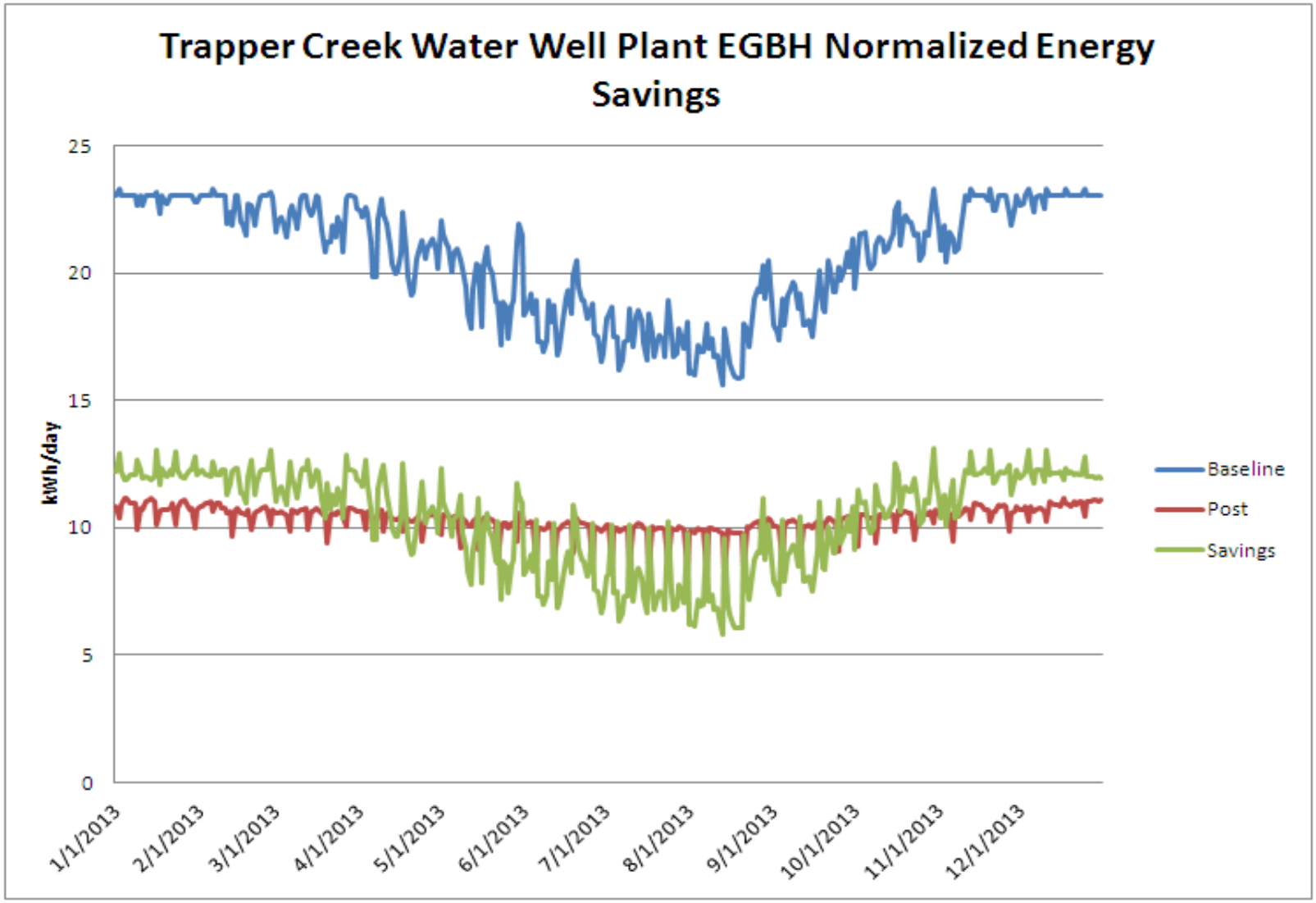

SUCCESS: Generator BLOCK HEATERS

Now a measure!

SUCCESS: FEC RTU REPLACEMENT

- Libby, MT
- NEEA/BPA/FEC Collaboration
  - NEEA Grant
  - BPA Grant
  - FEC EEI
- 5,800 sqft-office + warehouse/truck bay
- Baseline – ASHP, ER with hydronic
- Post – HRV + VCHP
- Completed 11/1/16

SUCCESS: FEC RTU REPLACEMENT

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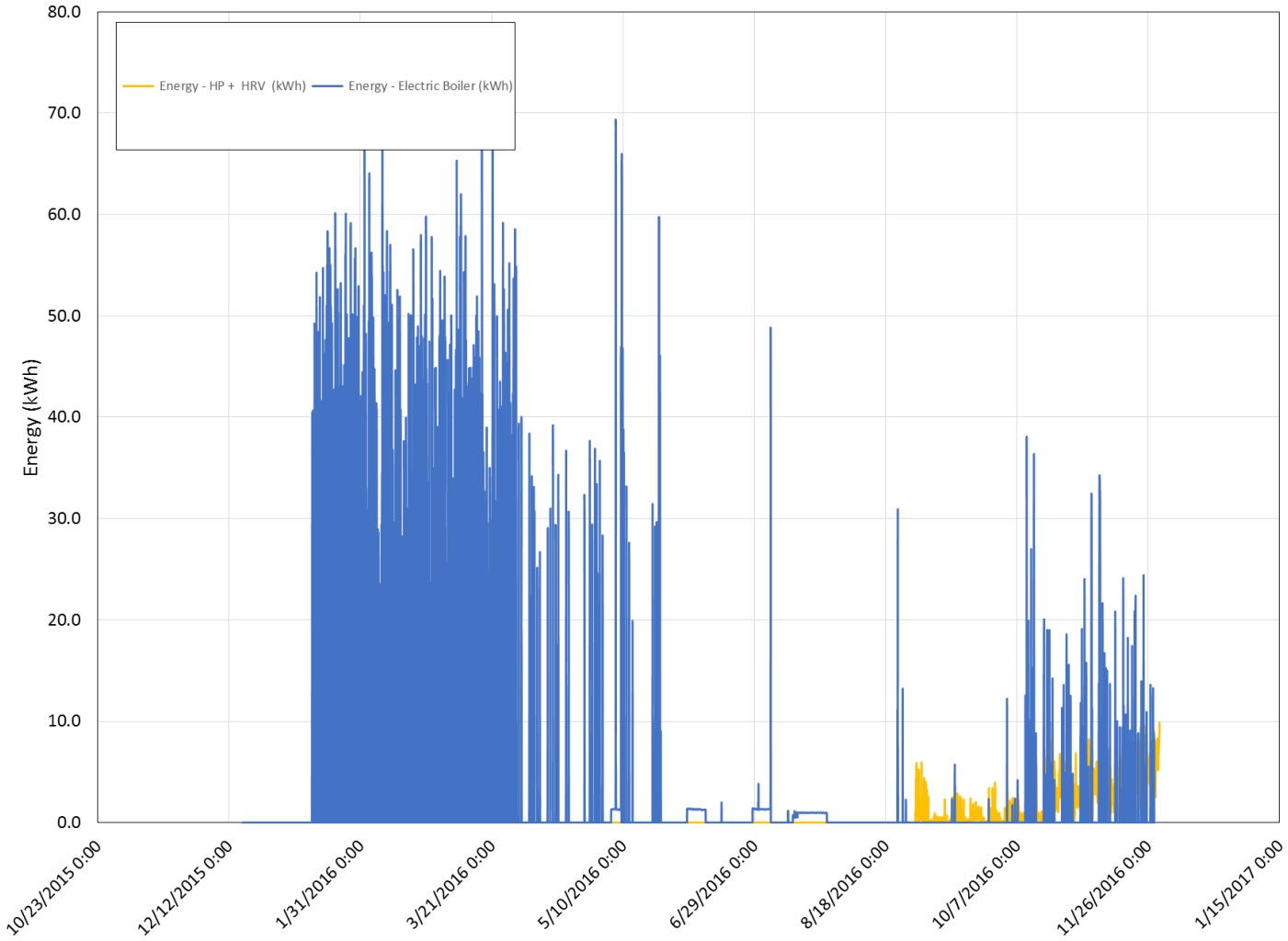

Utility Field Test Experience

NEW FIELD TESTS:

- Commercial HVAC Efficient Pumping Systems (CHEPS)
- Rooftop Unit Replacement using HRV

www.bpa.gov/go/FieldTest

BPA CONTACT

Project Manager: Erik Boyer (509-822-4586) ebboyer@bpa.gov

CHEPS
COMMERCIAL HVAC EFFICIENT PUMPING SYSTEMS

WHAT IS AN EFFICIENT PUMPING SYSTEM?

BEFORE CHEPS

- Constant speed pump(often oversized and inefficient)
- Typically operate at 100% during occupied periods
- Operates more than needed for the load

AFTER CHEPS

- Integrated high efficiency variable-speed pumps with controls
  - <3hp via ECM pump
  - >3hp-10hp via pump VFD
- Clear control strategy
  - Pressure Differential
  - Temperature Differential

HVAC CHEPS RETROFIT

SELECTION CRITERIA

- Preference given to:
  - Integrated ECM (<3hp) or VFD (>3hp)
  - Longer Hours of Operation

IDEAL BUILDING USE TYPES

- High hours of operation
- Hospitals
- Grocery stores

AVAILABLE FUNDING

- $50,000 total available
- Estimated $10,000 per project

PRODUCTS

- Grundfos Alpha & Magna
- B&G Ecocirc
- Taco Viridian
- Armstrong e-90
- Wilo Stratos
- Other

APPLICATIONS FOR FIELD TEST

ELIGIBILITY REQUIREMENTS

Pre-conditions:

- ❑ Commercial space
- ❑ HVAC system variable loads (heating water, chilled water and condensing water)
- ❑ Constant speed
- ❑ .33 – 10 Hp range
- ❑ Operate a minimum of 2,000 hours per year

Post-conditions:

- ❑ Integrated variable-speed pumps with controls
- ❑ Clear control strategy
- ❑ Be installed and programmed by a licensed contractor per manufacturer's specs
- ❑ Be installed by June 30, 2017

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ROOFTOP UNIT (RTU) REPLACEMENT

HEAT RECOVERY VENTILATION (HRV) + VARIABLE CAPACITY HEAT PUMP (VCHP) RETROFIT

WHAT IS AN HRV + VCHP RETROFIT?

BEFORE HRV + VCHP

- ❑ RTU with Elect Resist or ASHP
- ❑ Combined HVAC requires significant fan energy
- ❑ Typically operate at 100% during occupied periods
- ❑ Operates more than is needed for required ventilation

AFTER HRV + VCHP

- ❑ High efficiency HRV (DOAS)
- ❑ Small fan energy only operates at when needed
- ❑ Uses sensors to bring in correct amount of required ventilation
- ❑ DHP/VRF system

Best practice: professionally designed retrofit

RTU TO HRV + VCHP REPLACEMENT

AVAILABLE FUNDING

- $160,000 total available
- Estimated $40,000 per project

SELECTION CRITERIA

- Preference given to:
  - Longer Hours of Operation
  - Variability of loads
  - Regional Applicability

IDEAL BUILDING USE TYPES

- High hours of operation
- Hospitals
- Grocery stores/C-Store
- Restaurants

PRODUCTS

- HRV
  - Ventacity and
  - other products as they become available
- VCHP
  - Daikin
  - Fujitsu
  - Mitsubishi
  - Etc.

RTU REPLACEMENT ELIGIBILITY REQUIREMENTS

Pre-conditions:

- ❑ Commercial space
- ❑ Electric resistance or existing heat pump
- ❑ RTU in 2 – 10 ton range
- ❑ RTU without DCV
- ❑ Operate a minimum of 3,000 hours per year
- ❑ Good working order

Post-conditions:

- ❑ Variable capacity heat pump to provide heating and cooling
- ❑ HRV has sensible effectiveness ratio of 85% or greater
  - ❑ Variable Speed Fans
  - ❑ Integrated DCV
  - ❑ Economizer capability
- ❑ Be installed and programmed by a licensed contractor per manufacturer's specs
- ❑ Submit project information by June 30, 2017

THANK YOU!

QUESTIONS?