

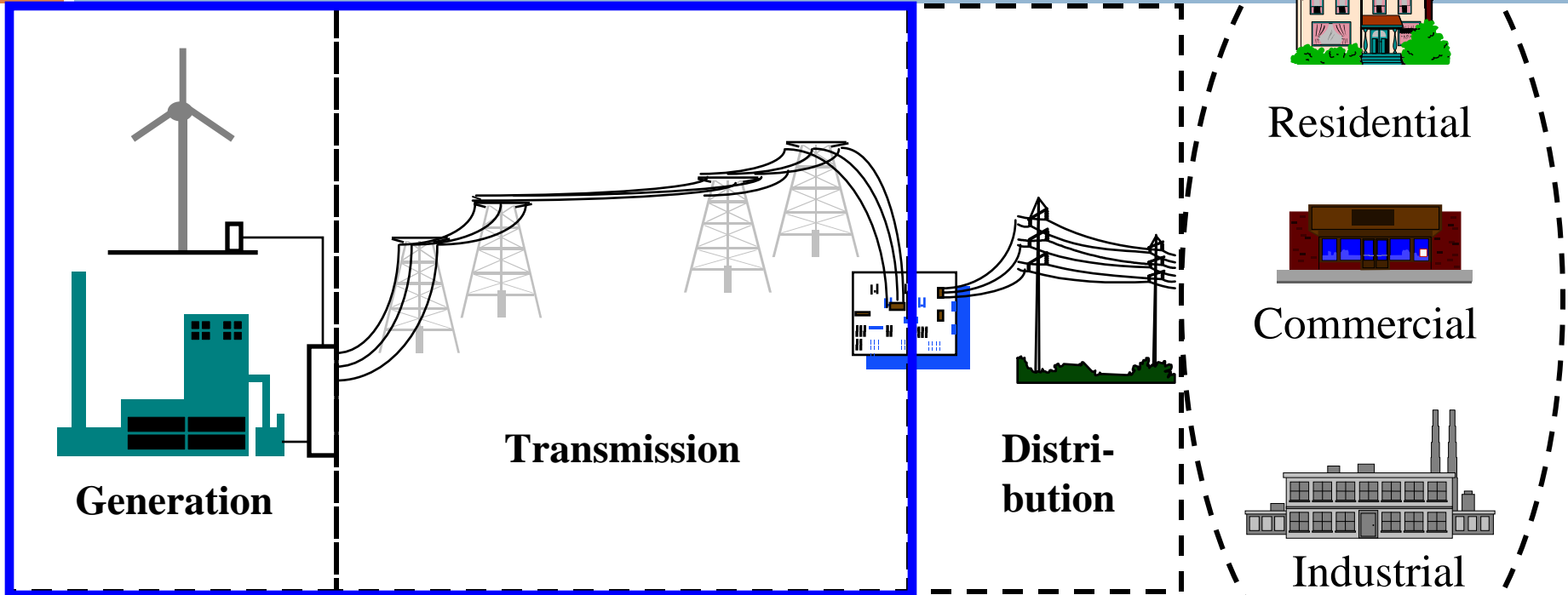


October 11, 2012

# TUNING UP MEDIUM SIZED BUILDINGS COST-EFFECTIVELY



# Platte River Power Authority



**Generation**

**Transmission**

**Distribution**

**Residential**

**Commercial**

**Industrial**

**Platte River Power Authority**

- Sole Supplier
- Joint Ownership / Equity
- Local Governance

**Estes Park  
Fort Collins  
Longmont  
Loveland**

**Customers**



**PLATTE RIVER  
POWER AUTHORITY**

# Commercial Energy Efficiency Programs

- ▣ **LIGHTENUP** – existing building lighting retrofits and redesign
  
- ▣ **Electric Efficiency Program** – new and existing buildings
  - Prescriptive: typically non-lighting upgrades
    - Food service, Grocery, Office Equipment, etc...
  - Custom Efficiency
  
- ▣ **Building Tune-up Program**
  - Retro-commissioning for existing buildings



# How we got here

2010

2011

2012

BTU program for larger buildings

City of Boulder PR/Fort Collins Pilot

Platte River – Small/Med BTU Pilot  
2011 with GEO/ARRA Grant

Platte River/city full roll out  
BTU for all size buildings



PLATTE RIVER  
POWER AUTHORITY

# Building Tune-up Program Goals



- Tune-up (or retro-commission) existing building/energy systems
- Identify and implement low to no cost measures resulting in less than a 2 year payback
- Provide financial incentives for cost effective energy savings
- Drive EE measures not covered by BTU to our other rebate programs (EEP/LIGHTENUP)
- Persistence of measures and customer education

# Building Tune-up Program

## Persistence of measures and customer education

- Increase contractor and customer awareness of issues in their building and checklist for future examination
- Specify measure life per each measure for larger projects – some are long because they are hard equipment fixes and some are soft changes to BAS sequence of operations
- Analysis of meter data after 12 months identifies issues or added load for follow-up with customer
- Customer surveys ask likelihood of persistence



# Building Tune-up Program Partner Roles

## ■ Retro-commissioning Service Provider (RSP)

- Identifies and analyze potential RCx measures, coordinate with implementation contractor (if applicable), and verifies savings, plus outreach to customers

## ■ Implementation contractor

- Typically HVAC/controls contractor and/or customer facility staff implements the measures

## ■ Customer

- Chooses RSP and contractors, selects from a list of RCx measures, funds implementation costs

## ■ Utility Staff and Platte River

- Facilitates overall process and provides funding plus outreach to customers

# Building Tune-up Program (BTU)

## All types of Buildings:

- ❑ Schools
- ❑ Office
- ❑ Gov't
- ❑ Heath Club
- ❑ Retail
- ❑ Light industrial
- ❑ Warehouse
- ❑ Industrial





# Building Tune-up Program

## General prerequisites for all buildings:

- The facility shall be at least 2 years old
- Facility is served by four utilities and on commercial rate
- HVAC equipment shall be between 2-20 years old and must have regular preventive maintenance
- All Projects require completed application and pre-approval.
- BTU project must be performed by qualified Retro-commissioning Service Provider (RSP)

BTU Manual was developed for more detailed information

# Building Tune-up Project Tiers

**Tier #1 – Small Buildings**

**Tier #2 – Medium Buildings**

**Tier #3 – Large Buildings**



# Building Tune-up Project Tiers

## Tier #1 – Small Buildings

Typically less than 50K sq ft, single zone thermostats, roof top units (RTU) or split systems

Rebate is based on **\$0.15 per sq ft** for implementation of selected measures and customer commits **\$0.05 per sq ft**.

# Building Tune-up Project Tiers

## Tier #3 – Large

Typically greater than 100K sq ft, BAS and trending, central plant and industrial processes

## Tier #2 – Medium

Typically between 50K to 100K sq ft, BAS and trending, AHU/VAV systems

Rebate is based on 100% of the cost of RCx study and implementation support and verification by RSP and customer commits \$0.05 per sq ft for implementation of selected measures.

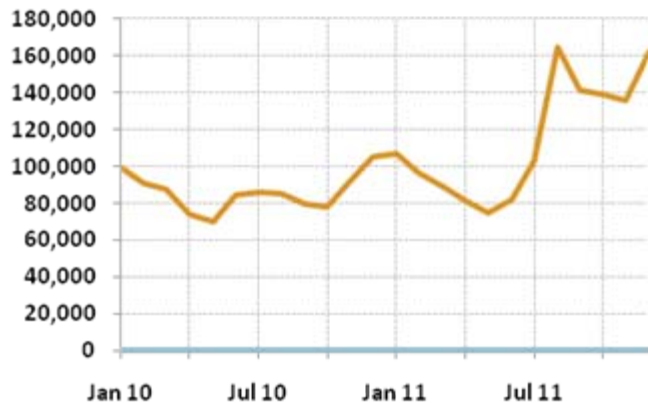
# Tier II Goals

- Cost effectiveness
- Balance the details and risk between Tiers 1 & 3
- Use prescriptive savings approach from Tier 1 where possible
- Combine two sets of reports leading up into implementation into 1
  - ▣ Keep the report format simple; minimize reporting
- Provide sufficient implementation support
- Provide simplified verification

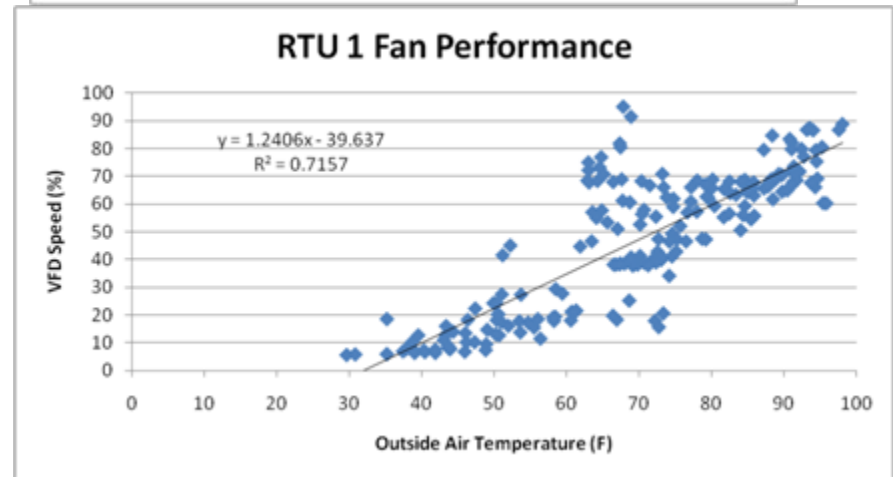
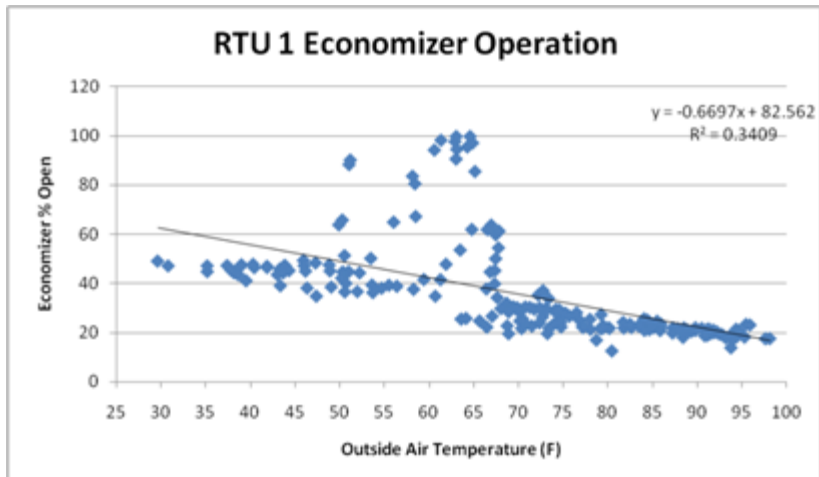
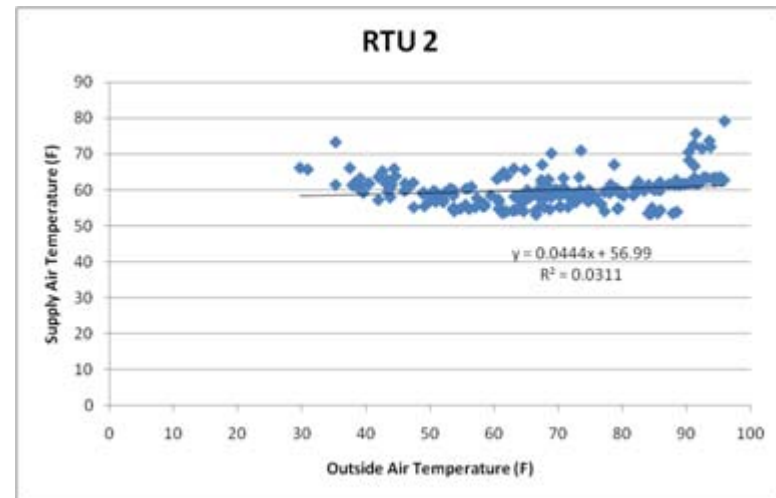
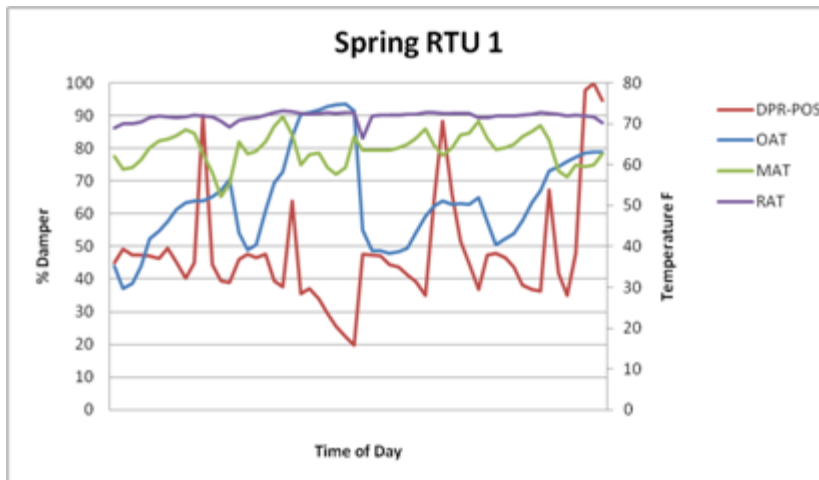


# Project Description

- 60,000 SF Office Building in Ft Collins, CO
- (2) Packaged 65 ton, VAV RTUs with Gas Preheat
- (48) VAV Boxes with Electric Reheat



# Methodology to Identify RCMs



# RCMs Identified

- HVAC Scheduling
- Airside Economizer Tuneup
- SAT Reset
- Electric Reheat Lockout
- Optimum Start
- Other Measures Considered
  - ▣ Static Pressure Reset
  - ▣ DX OAT L/O





# Report Components

- Executive Summary/Project Contacts
- Introduction
- Building Description
- Measure Assessments/Descriptions
- Project Plan
- Appendix



# Analysis Methodology

- Bin Model
- Regression Analysis
- Baseline Model Calibration to Utility Bills
- Proposed Sequences
- Bundling of Measures Based on Interactions



# Implementation & Verification Support

- Meet with contractors to discuss recommended measures and scope
- Review scope and fee prior with owner prior to giving contractor notice to proceed
- Start verification activities towards the end of implementation, while contractor still on site
- Trending, if necessary
- Adjust savings, if necessary.



# Lessons learned (so far)

- 10% Electricity, 12% Natural Gas Savings
- BAS trending is available/functional
- Electric Reheat – terminal units can be trended
- RSP oversight of subcontractor negotiations
- Implementing based on planning report is not a problem
- Using prescriptive savings approach from Tier 1, handled on a case by case basis

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