Retail, Food Service, and Grocery Sector Meet-Up

Marta Schantz, Waypoint Building Group
Kyle Wilkes, JCPenney
Darrel Carter, Sprint

Moderators: Holly Carr, DOE, Zach Abrams, ICF, Cara Bastoni, ICF

Agenda

- 10:05 Welcome & Program Updates
- 10:15 Sector Updates and New Resources
- 10:20 Meet Your Colleagues in the Room
- 10:35 Roundtable Discussion
- 10:50 RTU Retrofits and Replacements
  - Overview of Business Case Considerations for Proactive RTU Replacement – *Marta Schantz*
  - JCPenney Case Study – *Kyle Wilkes*
  - Sprint Case Study – *Darrel Carter*
- 11:20 Conference/General Q&A
- 11:30 Adjourn

Sector Tour

Tour Today!

Starbucks

1730 Pennsylvania Ave NW

For those that have registered, meet in the Lobby at 3:15

Conference Sessions of Interest for Retail, Food Service, and Grocery

- **Wednesday**
  - Maximizing Supermarket Refrigeration System Energy Efficiency, 1:30 to 3pm
  - Reducing Energy Consumption in Restaurants and Kitchens, 1:30 to 3pm
  - The Value Proposition for Data Center Optimization, 3:30 -5pm
  - Retrofits: Making the Most of What You Have, 3:30 -5pm
- **Thursday**
  - Integrating Solar PV: Strategies and Case Studies, 10-11:30pm
  - Finding and Funding an Energy Management Information System That Is Right for Your Building Portfolio – 1:30 -3pm
  - High-Performance Troffer Lighting Solutions
  - FREE MONEY!: Working with Utilities to Make Your Energy Reduction Dreams Come True 3:30 -5pm
  - How to Drive Change with Workplace Charging 3:30 -5pm
- **Friday**
  - High-Impact Technologies Forum: Harnessing American Ingenuity and Innovation 1:30-3pm

Program Updates

About Better Buildings

- **Better Buildings:** A broad, multi-strategy initiative aiming to improve the energy use of our nation's commercial, industrial, residential, and public buildings by 20% over 10 years
  - **Better Buildings Challenge:** A leadership initiative calling on CEOs, university presidents, building owners, state and local government leaders, and residential housing developers to publically pledge to reduce entire portfolio's energy use
  - **Better Buildings Alliance:** Members address energy efficiency needs in their buildings by setting savings goals, developing innovative resources, and adopting cost-effective technologies and market practices.

Better Buildings Challenge Snapshot, 2014

Membership	
Number of Partners and Allies	250+
Square Feet Represented	3.5 billion
New Members in 2014	60
Solutions	
Partner Solutions Available for Replication	160+
Results	
Energy Saved (Btus)	94 trillion
Dollars Saved	$840 million
Avoided C0$_2$e emissions (tons)	5.8 million
Funding Committed/Placed	$5.5 billion / $3 billion

Better Buildings Alliance Snapshot, 2014

Membership	
Number of Member Organizations	185
Square Feet Represented	10 billion
Percent of U.S. Commercial Buildings	11%
New Members in 2014	14
Activities	
Energy Savings Activities Available to Members	50+
Results	
Increase in Member Activity in 2014	More than 20%
Average Annual Energy Savings Reported	More than 2%

New Better Buildings Partners

- CKE Restaurants and Arby's Restaurant Group are the first food service organizations to join the Better Buildings Challenge

- Suncoast Credit Union joins the Better Buildings Challenge

Water Savings Expansion

Last year, DOE launched a Water Savings Pilot with 23 BBC Partners

- Partners reported water savings between 10% and 20%, against their baseline years
- In 2014, total water savings are equal to about 570 Olympic-sized pools
- Partners are sharing solutions!
  - Best practice guides for water efficiency
  - Strengthening the business case for water saving projects

Water Savings Expansion

- Based on the success working with this group, DOE **is expanding** its water-saving efforts
- Organizations partnering in the Water Savings Expansion will set water efficiency goals, report progress and share solutions with the market
- Participation is open to all partners with a complete energy data display and one energy-focused showcase project or implementation model
- DOE will work with other federal agencies, including EPA and HUD, as well as leading NGOs, to deliver greater water-related expertise to partners
- Talk to your sector lead or account manager about this opportunity today!

Interior Lighting Campaign (ILC)
High Efficiency Troffer Lighting with Controls

- Official launch - 2015 Better Buildings Summit
- Recognition and awards initiative similar to LEEP Campaign
- Goal to replace 100,000 standard troffers with high efficiency troffers by May 2016
  - Represents about 6.7 million kWh savings
- Resources to include a specification for 2x2, 2x4, and 1x4 troffers, utility incentives database, product lists, technical reports, case studies, free technical assistance.
- Join early!
  - Better Buildings members may join before the launch, and be recognized at the BB Summit as early adopters.
  - PNNL can help you identify appropriate sites, and the best product options to meet your unique needs.
  - Contact Linda Sandahl at linda.sandahl@pnnl.gov.

BOMA International · IFMA International Facility Management Association · IES Illuminating Engineering Society · Better Buildings U.S. Department of Energy

Share the EE  with the Better Plants Supply Chain Pilot

- DOE is working with a select group of existing partners to extend the benefits of energy efficiency to their suppliers.
- Through this pilot initiative, DOE will partner with participating suppliers to:
  - Join Better Plants
  - Set energy saving goals
  - Develop energy management plans
  - Track and report progress
- Referring Partners receive recognition and an annual report of supplier energy savings.
- Summit Session: “Driving Energy Savings in the Supply Chain,” Thursday, 10-11:30, Roosevelt 5

Benefits to Suppliers

- National recognition for leadership
- Access to DOE resources and expert assistance
- Priority access to free energy audits from DOE's Industrial Assessment Centers (IACs)
- Opportunity to network and learn from peers

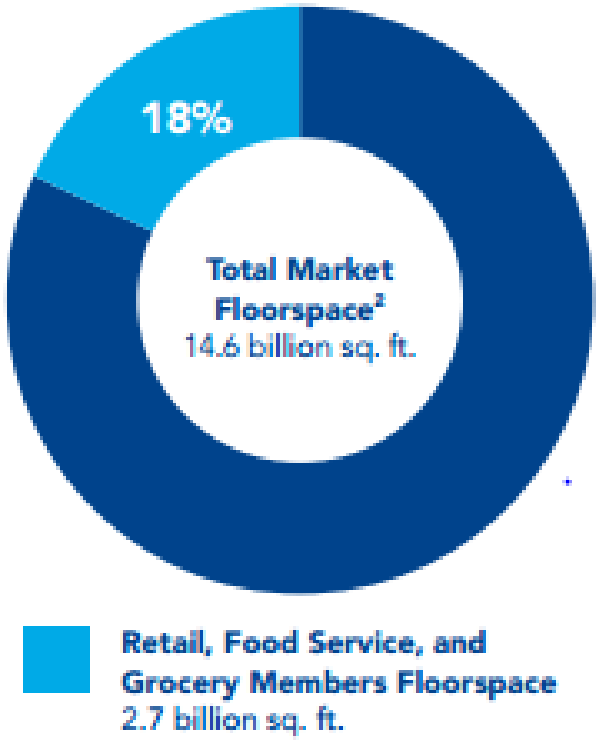
These benefits are all designed to help your suppliers save energy and reduce costs

Sector Updates and New Resources

The Retail, Food Service, and Grocery Sector of the Better Buildings Alliance

- **45 members 2.7 billion sq. ft.**
- **18% of the sector's 14.6 billion square feet in the U.S.**
- **Top 3 Technology Teams:**
  - Food Service
  - Lighting & Electrical
  - Space Conditioning
- **Key Links**
  - **Sector Webpage**
  - **Sector Opportunities document**

Retail, Food Service, and Grocery Members as a Percent of Market Floorspace



Steering Committee Members

- Kyle Wilkes, JCPenney (Chair)
- Mike Ellinger, Whole Foods Market
- Bert Etheredge, American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE)
- Pat Hagan, Wawa
- David Harpring, Yum! Brands
- Erin Hiatt, Retail Industry Leaders Association (RILA)
- David Oshinski, The Home Depot, Inc.
- James P. McClendon, Walmart Stores, Inc.
- Bob Valair, Staples

New Resources & Activities

- **Technology Solutions Updates**
  - Advanced Power Strip Specification
  - 50% Advanced Energy Design Guide for Grocery
- **Market Solutions Updates**
  - 2015 Green Lease Leaders announced today
- **Latest Implementation Models**
  - Whole Foods Market: Customized Utility Incentives
  - Sprint: Corporate Goal is a Catalyst for Custom Efficiency Strategies
- **Annual Progress Update Reports**
  - Better Buildings Alliance
  - Better Buildings Challenge

Check the Summit webpage in June for all session presentations!

Meet Your Colleagues in the Room & Roundtable Discussion

Introductions

Please answer one or both of the following questions:

- **What's the most exciting energy efficiency project you're working on, or will be soon?**

- **What's your biggest energy efficiency barrier/challenge?**

Common Barriers

- *How do I pay for it?*
- *How can I motivate my organization?*
- *How do I reach my community?*
- *How do I engage employees, occupants, and customers?*
- *How do I access data?*
- *How do I use data (or technologies) to track progress?*
- *How can I build expertise within my organization?*
- *How do I partner with my utility?*

Roundtable Discussion

- **What project did you just hear about that makes you want to learn more?**
- **What barrier did you hear about that you have faced yourself?**
- **What should Better Buildings be focused on in the next year?**

Marta Schantz, Waypoint Building Group

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Advanced Rooftop Unit Campaign (ARC)

- ARC is a DOE/industry partnership to promote and support high-efficiency RTU solutions:
  - High-efficiency new installations and replacements
  - Advanced RTU control retrofits
  - Quality Installation and Quality Maintenance
- Up to 50% less efficient, aging RTUs waste building owners anywhere from $900 to $3,700 per unit annually, depending on building size and type
- Over 193 ARC partners are driving reductions in the heating and cooling of commercial buildings upgrading over 35,000 high-efficiency RTUs saving 4 Trillion BTUs of energy savings or $32 million annually

ASHRAE

RILA
RETAIL INDUSTRY LEADERS ASSOCIATION
Educate. Innovate. Advocate.

FEMP
Federal Energy Management Program

Better Buildings
U.S. DEPARTMENT OF ENERGY

www.advancedrtu.org

The Business Case for Proactive RTU Replacement

Marta Schantz

Waypoint Building Group

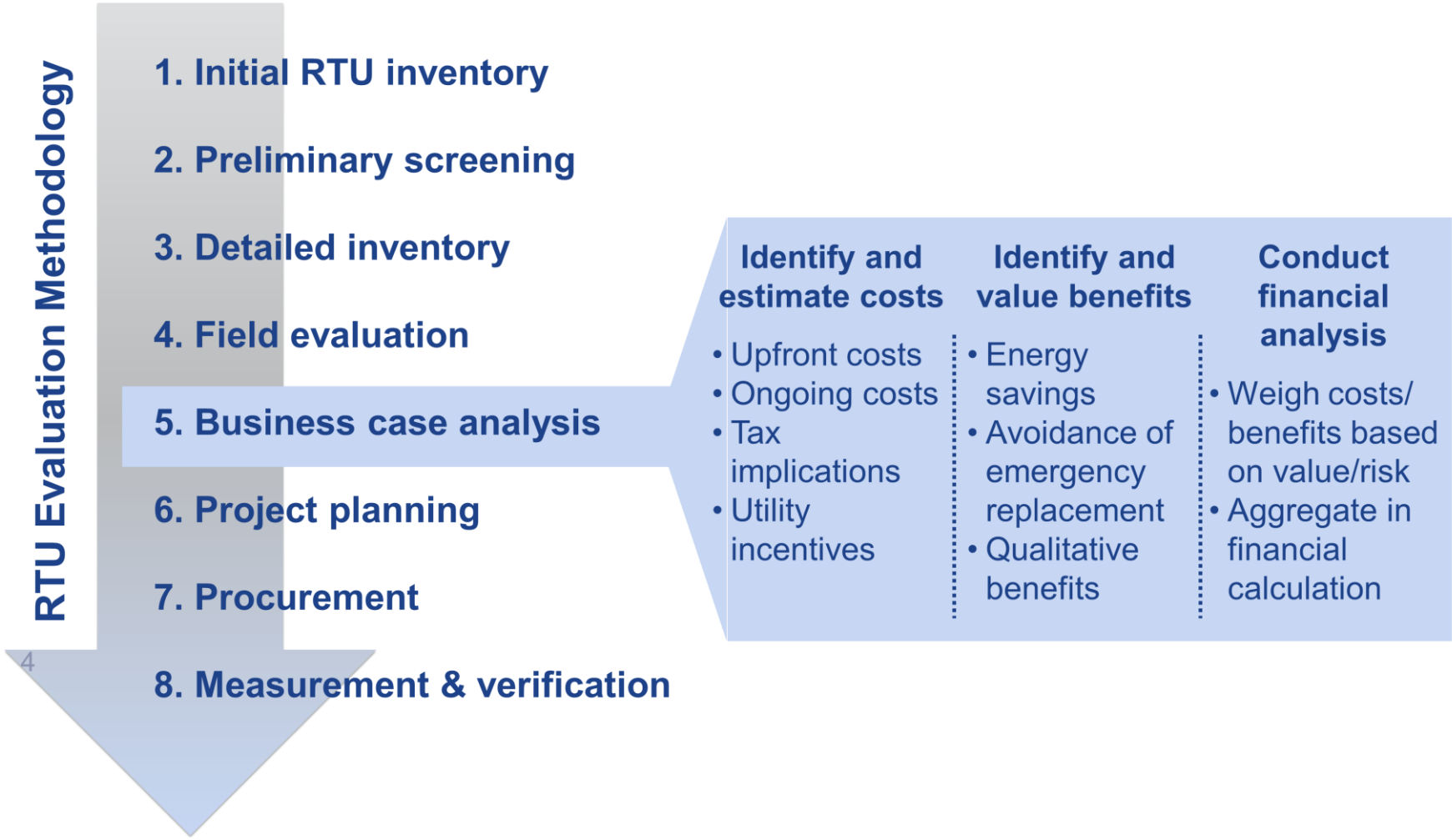
May 2015

Better Buildings Summit

Business Case Considerations for Proactive RTU Replacement

U.S. DEPARTMENT OF ENERGY

The Business Case for Proactive RTU Replacement



RTU Replacement Strategies that include Varying Levels of Efficiency

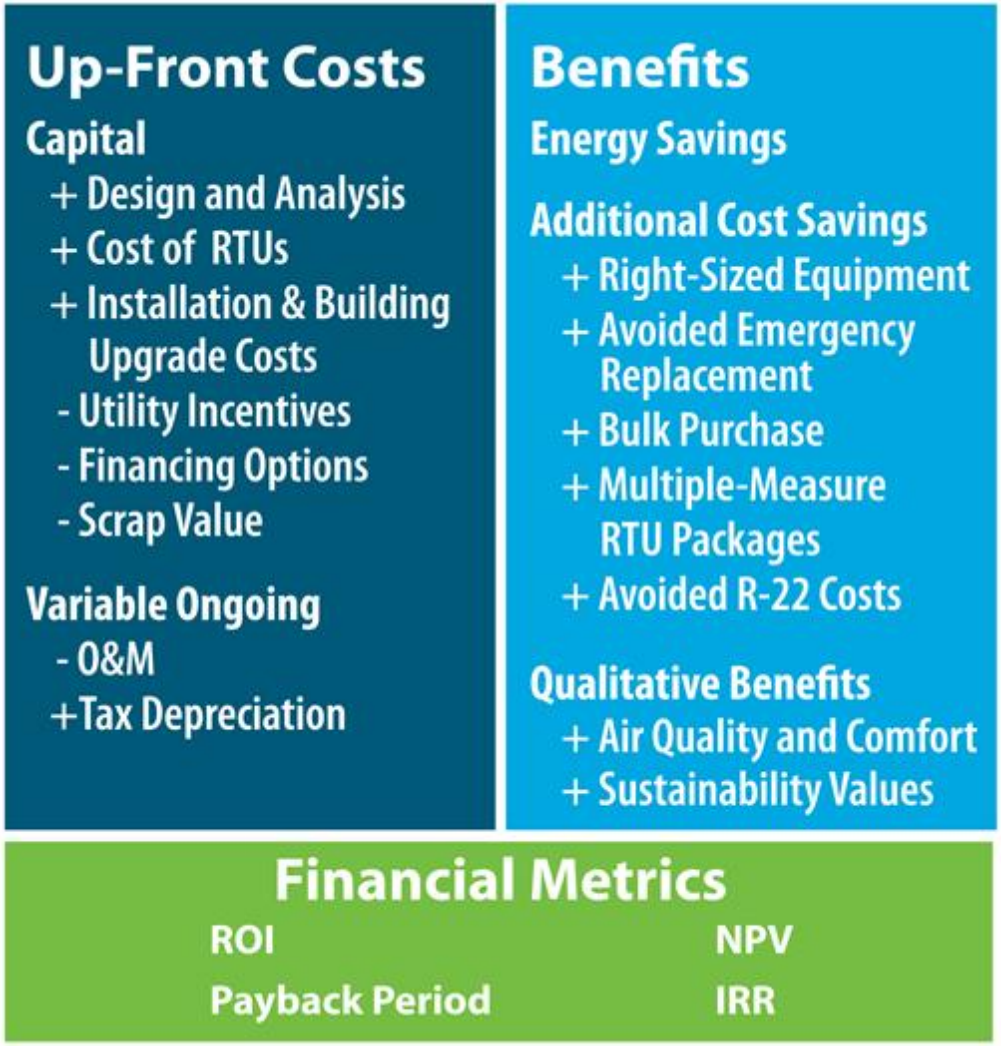
1. **Replacement-on-failure with like-for-like RTUs**

2. **Replacement at End of Useful Service Life (EUSL) with like-for-like RTUs**

3. **Proactive replacement at EUSL or early retirement with right-sized and higher-efficiency RTUs**

4. **Proactive replacement at EUSL or early retirement with an engineered and optimized design**

Estimate Costs & Value Benefits of RTU Proactive Replacement



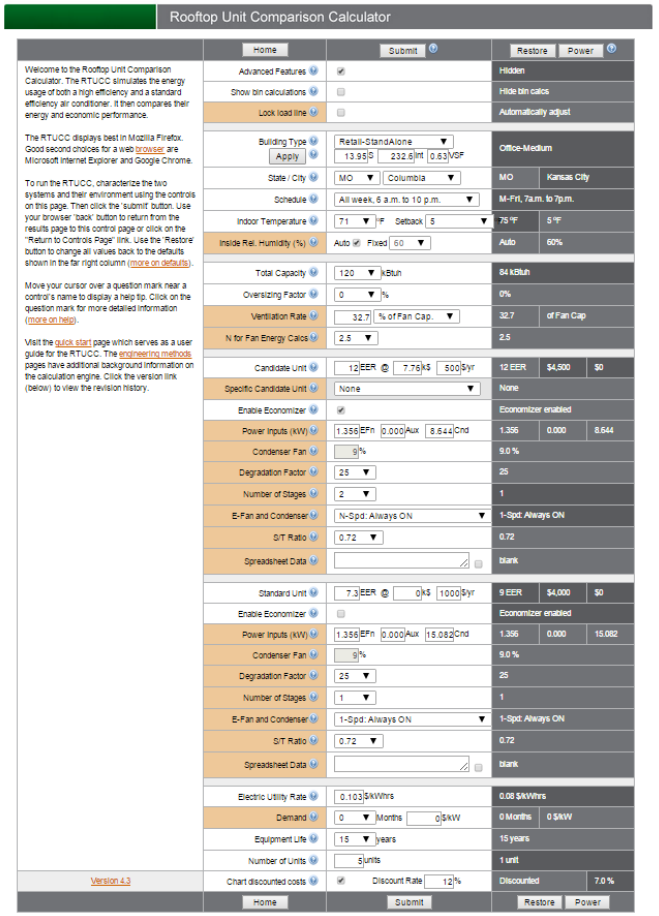
Decision-Makers rely on Financial Calculations to Confirm or Deny Proposed Projects

Financial Calculations Tailored for RTU Replacements

Metric	Equation
ROI	$\dfrac{\left(\begin{array}{c}Energy\ Cost\ Savings + OM\ Savings - Tax\ Write\text{-}Off + Value\ of\ Avoiding\ Unexpected\ Failure \\ +Value\ of\ Other\ Benefits - Up\text{-}front\ Cost\ of\ RTU\ Replacement\end{array}\right)}{Up\text{-}front\ Cost\ of\ RTU\ Replacement}$
Payback Period	$\dfrac{Up\text{-}front\ Cost\ of\ RTU\ Replacement}{\begin{array}{c}Energy\ Cost\ Savings + Annual\ OM\ Savings - Tax\ Wrte\text{-}off \\ +Value\ of\ Avoiding\ Unexpected\ Failure + Value\ of\ Other\ Benefits\end{array}}$
NPV	$-Up\text{-}front\ Cost\ of\ RTU\ Replacement + \sum_{t=1}^{n} \dfrac{(Energy\ Cost\ Savings + O\&M\ Savings - Tax\ Write\text{-}Off)_t}{(1+d)^t}$
IRR	*In the NPV equation, solve for d when NPV = 0*

RTU Comparison Calculator (RTUCC) to Estimate Energy Savings

- The PNNL developed an online calculator tool to estimate energy savings when comparing between different RTUs for a commercial building
- Tool can be used to compare two potential units for purchase, or to compare a current existing unit with a potential replacement unit
- This business case example lists the candidate unit as a new 10-ton 12-EER RTU with a $12,160 net cost, with the “standard” unit as the existing 7.3 EER unit at $0



Example Business Case for “Superstore” Proactive RTU Replacements

Example Business Case for Proactive RTU Replacement at "Superstore" (Strategy 3)

- Superstore is a hypothetical retail business with a stand-alone store in Columbia, MO. The building has five 15-year old 12-ton RTUs, with EER of 8.7 (code at the time) that degraded to an effective 7.3.
- Superstore is considering proactive replacement of all five RTUs with CEE Tier II units. Engineers right-sized the new RTUs down from 12-ton to 10-ton units, thus saving on the cost of the units priced at $800/ton. New units' efficiency is 12 EER and 13.8 IEER. They require less O&M, partially due to the lack of R-22. Superstore saves on installation costs by replacing all units at once.

Inputting this information into the RTUCC results in a savings comparison of 74,638 kWh/year, or $7,688/year in energy savings alone

Financial Outputs of Business Case Example for Proactive RTU Replacement

Financial Calculations	*Energy-Related Considerations*	*Adding Qualitative Considerations*
ROI	-3.2%	52.4%
Payback Period	5.2 years	3.3 years
NPV	-$15,337	$5,029
IRR	-1%	16%

Details of Financial Calculation Inputs and Assumptions for “Superstore”

Weighing the Energy-Related Costs and Benefits at "Superstore"

- **Net Cost: $50,800**
  - RTU Cost: $800/ton
  - RTU Size: 10 Tons
  - Cost to Replace 5 RTUs: $40,000
  - Cost to Install 5 RTUs: $20,000
  - Utility Rebate for the 5 RTUs: ($8,200)
  - Scrap Value of 5 old RTUs: ($1,000)

- **Net Savings over 5 years: $49,189**
  - Annual Tax Depreciation Write-off for 5 RTUs: ($350)
  - Annual Energy Cost Savings for 5 RTUs: $7,688
  - Annual O&M Savings for 5 RTUs: $2,500

Valuing the Qualitative Benefits of Proactive RTU Replacement at "Superstore"

- **Value of Avoiding Unexpected Failure: $26,250**
  - Emergency Replacement 50% Premium (higher cost of units & labor for installation): $23,500
  - Lost profit from 2 days of a non-conditioned building: $20,000
  - Probability of Failure over 5 years: 50%

- **Willingness to Pay for Improved Air Quality at Superstore: $2,000**

Weighing all the Costs and Benefits at "Superstore" for Proactive RTU Replacement

Up-Front Costs

Capital

+ Design and Analysis	
+ Cost of RTUs	$8,000/Unit
+ Installation & Building Upgrade Costs	$20,000
- Utility Incentives	-$1,640/unit
- Financing Options	
- Scrap Value	-$200/Unit
Total Cost for 5 Units	**= $50,800**

Variable Ongoing

- O&M	-$12,500
($500 * 5 Units)=$2,500/yr * 5 yrs	
+ Tax Depreciation	$1,750
($70 * 5 Units) =$350/yr * 5 yrs	

Benefits

Energy Savings

+ $7,688*5 years =	$38,439

Additional Cost Savings

+ Right-Sized Equipment	(included in price)
+ Avoided Emergency Replacement	$26,250
+ Bulk Purchase	(included in price)
+ Multiple-Measure RTU Packages	(included in price)
+ Avoided R-22 Costs	(included in O&M)

Qualitative Benefits

+ Air Quality and Comfort	$2,000
+ Sustainability Values	

Financial Metrics

ROI Energy and Other Costs	52%	**NPV**	$5,030
Payback Period	3.3 Years	**IRR Energy and Other Costs**	16%

Contact Information

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  - 231-598-2332
- **Advanced RTU Campaign (ARC)** Website
  - www.AdvancedRTU.org

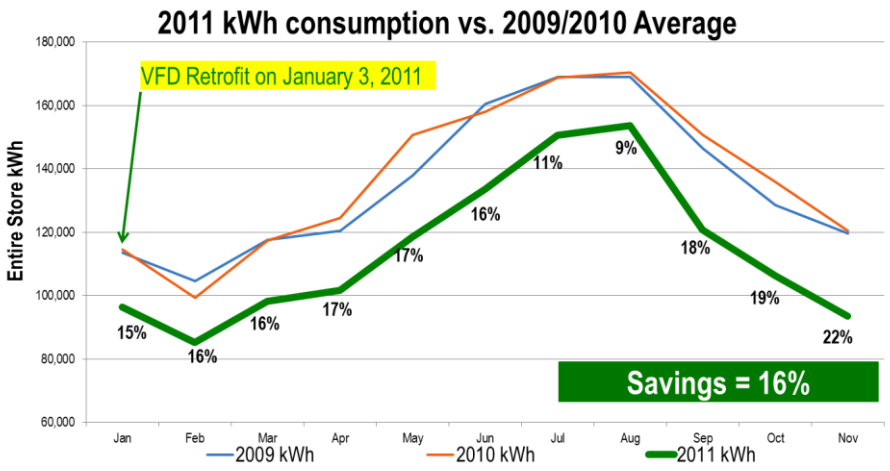
RTU Retrofit with Advanced Controllers – JCPenney Case Study from Kyle Wilkes

Kyle Wilkes, JCPenney

Energy and Engineering Director

- ## Texas Pilot Test Store RTU Details
  - Built in 2006 and approximately 100,000 square feet in size
  - Conditioned with 12 packaged rooftop units
  - Savings of 16% achieved after retrofitting its RTUs with this type of VFD retrofit technology

Texas Pilot Test Store Energy Savings



Texas Pilot Test Score RTU Details		
RTU Count	**Size**	**Blower hp**
10	25 tons	7.5 hp
1	15 tons	5 hp
1	10 ton	3 hp

The retrofit package had an ROI of 8 months

Kyle Wilkes, JCPenney

Energy and Engineering Director

- Nationwide VFD Retrofit Upgrade on Rooftop Units
  - Roll out begging June 2011
  - Reduced Overall Energy Usage by 14%
  - Improved Operational Efficiency

JCPenney Organizational Profile	
Established	1902
Number of Facilities	~1,062 stores
Employees	~114,000 associates
Project Scope	RTU Retrofit Pilot expanded to 131 stores with 1330 Rooftop Units
VFD Retrofit Results	
Energy Savings	14% reduction from years prior to VFD installation
Cost Savings	$3.5 million annual savings years prior to VFD installation
Payback	Less than one year

Kyle Wilkes, JCPenney

Energy and Engineering Director

- Sustaining Savings
  - Maintenance
  - Warranty Management
  - Same 131 stores 2014 energy reduction in now at 22%
  - $5M annual savings
  - Improved Operational Efficiency
    - Store Scheduler
    - Emap
    - AEM
    - EMS revision upgrades

Darrel Carter, Sprint

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Darrel Carter, Sprint

Real Estate Manager

Sprint Corporate Retail Profile:

- 3 million ft^2 of corporate retail space
- 1100 corporate retail stores
- Average Retail size: 2,500 ft^2

Roof Top Unit End of Life Replacement Program 2013 & 2014

- Total Number of Locations: 197
- Total Number of Units: 259
- Total ft^2 Impacted: 614,332

Internal Standard Requirements for RTU End of Life Replacement:

All Sprint Retail HVAC units are to be reviewed and assessed at least one year prior to end of life expiration.

- Condition assessment report of HVAC
- Maintenance History
- End of Life Expiration
- Length of lease remaining

Darrel Carter, Sprint

Real Estate Manager

Roof Top Unit Replacement Drivers:

- HVAC Maintenance savings
- Business operation continuity
- Energy savings

2013 Retail RTU Replacements:

▪ Sites:	94	Total cost of project:	$1.08 M
▪ Units Replaced:	96	Average Replacement Cost:	$10,614
▪ Ft^2 Impacted:	317,075	Average Unit Size:	5.08 Tons
▪ kWh Reduction:	38.3%	Age of Equipment:	5-33 years
		Average Age:	16.8 years

2014 Retail RTU Replacements:

▪ Sites:	103	Total cost of project:	$1.71 M
▪ Units Replaced:	163	Average Replacement Cost:	$10,501
▪ Ft^2 Impacted:	297,257	Average Unit Size:	5.5 Tons
▪ kWh Reduction:	33 %	Age of Equipment:	10-28 years
		Average Age:	15.1

Q & A

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Thank You

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Overcoming the Barriers to Energy Savings – Recent Implementation Models

How do I partner with my utility? Try Whole Foods' IM on Customized Utility Incentives:

- Barrier: Utility incentives for energy efficiency are often prescriptive and not always relevant to the grocery sector
- Solution: Propose sector-specific incentive package to utility, and enter into an agreement specifying multi-site regional annual kWh consumption reduction targets with aggregate, streamlined incentive process

How can I motivate my organization? Try Sprint's IM on Corporate Goal is a Catalyst for Custom Efficiency Strategies:

- Barrier: Lack of corporate energy goal or enterprise energy reporting and management effort
- Solution: A multifaceted energy efficiency strategy includes applying a unique energy savings approach to each asset class and tying compensation to energy reduction, which has resulted in more than $60 million in avoided energy costs.

How do I reduce water use? Try Kohl's IM (soon) on Multi-pronged Strategy for Water Use Reduction:

- Barrier: Retail tenant water use charges are based on square footage occupied rather than metered usage do not incentivize water conservation
- Solution: Negotiate water-favorable leases at initiation or renewal to allow submetering and tenant control of exterior grounds maintenance. Upgrade or decommission irrigation systems to take advantage of water and cost savings.