

Better Buildings Webinar Series

We'll be starting in just a few minutes....

Tell us...please send your response to the webinar organizers via the question box:

What topics are you interested in for future webinars?



Efficiency Treasure Chest

Unlocking Energy Savings in
Warehouses and Distribution
Centers

January 10, 2016
3:00-4:00 PM ET

Today's Presenters

Name		Organization
Bob Valair	 A professional headshot of Bob Valair, a middle-aged man with short brown hair, wearing a dark suit jacket, a blue shirt, and a patterned tie.	Staples, Inc.
Kirk Myers	 A headshot of Kirk Myers, a man with a beard and short brown hair, wearing a blue t-shirt, set against a background of green foliage.	Recreational Equipment, Inc. (REI)
Alan Moran	 A headshot of Alan Moran, a man with a beard and short brown hair, wearing a dark blue button-down shirt, set against a plain light green background.	Cascade Energy

Bob Valair

Staples



Unlocking Energy Savings in Warehouses

The Staples Story

Bob Valair

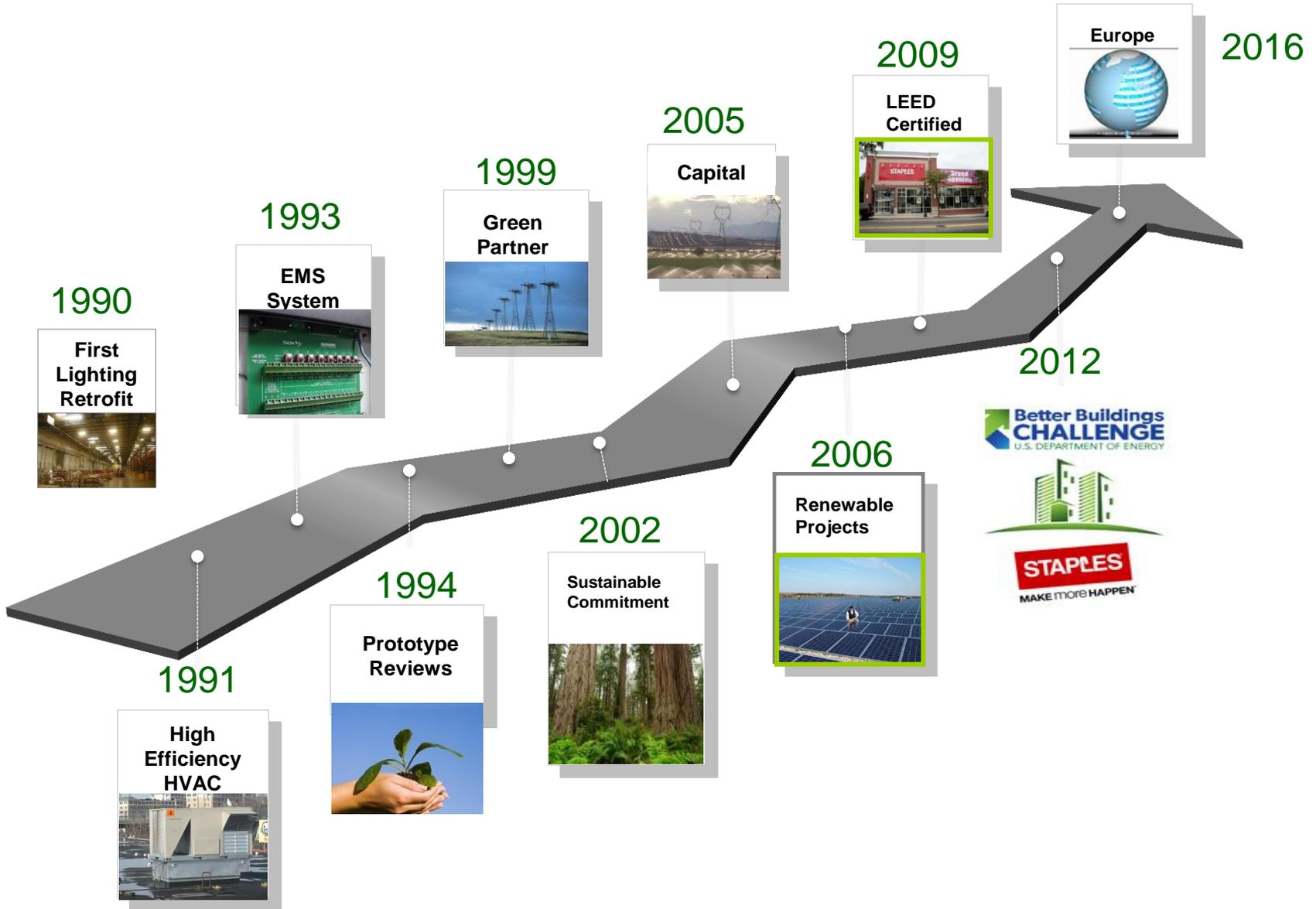
Staples, Inc.

Director of Energy and Environmental Management

Staples, Inc.



Energy Management Journey



ENERGY STAR® Journey

- 1999 - Staples joined Green Light
- 2002 – Staples joined the EPA launch the retail building category
- 2007 – Benchmarking in Portfolio Manager
- 2009 – EPA Partner of the Year, 6 years
- 2016 – Certified 718 buildings, re-certified 81 buildings



[Home](#) > [My Portfolio](#)

Portfolio Averages	
Baseline Rating: 48 Facilities Included: 1635	Current Rating: 63 Facilities Included: 1570
Change from Baseline: Portfolio Adjusted Percent Energy Use (%): -14.9% Facilities Included: 1606	
Averages are weighted by Total Floor Space. More about Baselines More about Change from Baseline: Adjusted Energy Use	

ENERGY STAR Lifecycle



Staples energy efficiency is through the supply chain, beginning with energy efficient building design, selling more than 600 ENERGY STAR products, and transporting these products from an ENERGY STAR distribution center to an ENERGY STAR store.

Participate in Energy Programs



**ENERGY STAR
AWARD 2011**
PARTNER OF THE YEAR



**Designing Commercial
Buildings to Achieve
ENERGY STAR**

U.S. ENVIRONMENTAL PROTECTION AGENCY



**Better Buildings
CHALLENGE**
U.S. DEPARTMENT OF ENERGY



BATTLE OF THE BUILDINGS
EPA'S NATIONAL BUILDING COMPETITION



ENERGY STAR



STAPLES
MAKE more HAPPEN

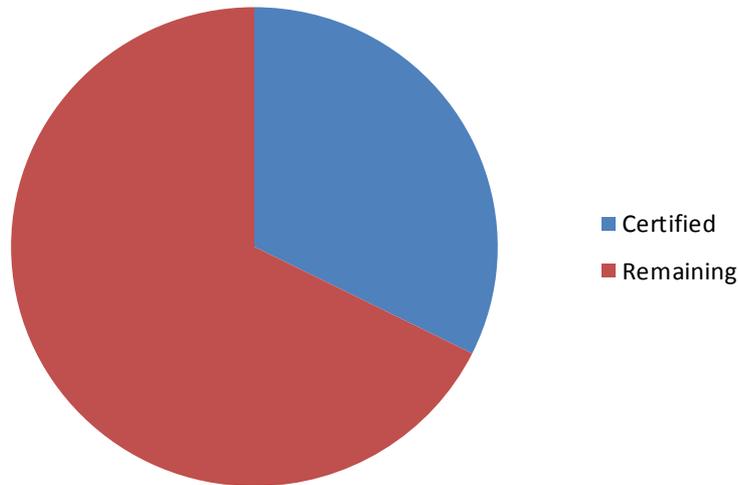


Building Portfolio Profile

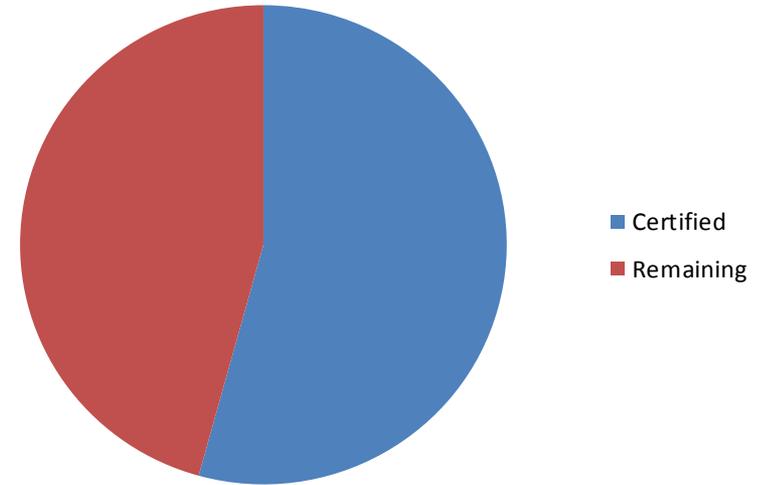


Retail vs. Non Retail Opportunities

Retail Energy Star Square Footage



Non-Retail Energy Star Square Footage



Retail Status (Store # < 2000)	Square Ft.
Total Square Feet	33,584,545
Square Feet Energy Star Certified	10,863,630
Percent Energy Star Certified	32%

Non-Retail Status (Store # > 2000)	Square Ft.
Total Square Feet	16,006,952
Square Feet Energy Star Certified	8,689,714
Percent Energy Star Certified	54%

Energy Champions

- Each warehouse has energy champion
- Bi-monthly webinars with peers
- Review ENERGY STAR program progress
- Seasonal best practices shared & studied
- View educational videos
- Review Staples treasure hunt program

STAPLES

MAKE more HAPPEN

Treasure Hunt Program



ECO TREASURE HUNT



Together, the Hagerstown team and the Staples Energy team will be searching for new ways to save energy for you and the planet

You Can Make A Difference Contest
Win \$50 gift card for the best energy saving idea

- Best Energy Saving ideas win
- 3 winners
- Submit your ideas in the idea box at the front desk
- Contest ends Friday, May 1

April 26 - 27, 2015 **STAPLES**

STAPLES recycles



WOOD PAPER PLASTIC CARDBOARD

880-1218-A

Treasure Hunt Program Day One

- Four teams meet on Sunday afternoon at warehouse to review scope and goals
- Teams are HVAC, lighting, plug load and communications
- Teams walk the closed facility looking for lights on, equipment working and checking space temperatures
- Team regroup to brainstorm opportunities for energy savings

- Monday team arrives early to observe start-up
- Measure energy use of all major equipment
- Teams regroup midday to introduce prospects to management
- Employee rally scheduled at lunch break
- End of the day each team quantifies prospects

- Tuesday the team arrives early to finalize all prospects
- Together the team compares all prospects and analyze energy reduction savings
- Team prepares presentation and does a dry run
- Report final recommendations out to management

Employee Engagement



Bring Your **GREEN TO WORK**
with ENERGY STAR®



Better Buildings Challenge
makes good business sense
and helps the environment.



Kirk Myers

Recreational Equipment, Inc. (REI)



REI Goodyear, AZ Distribution Center



Sustainability



Water

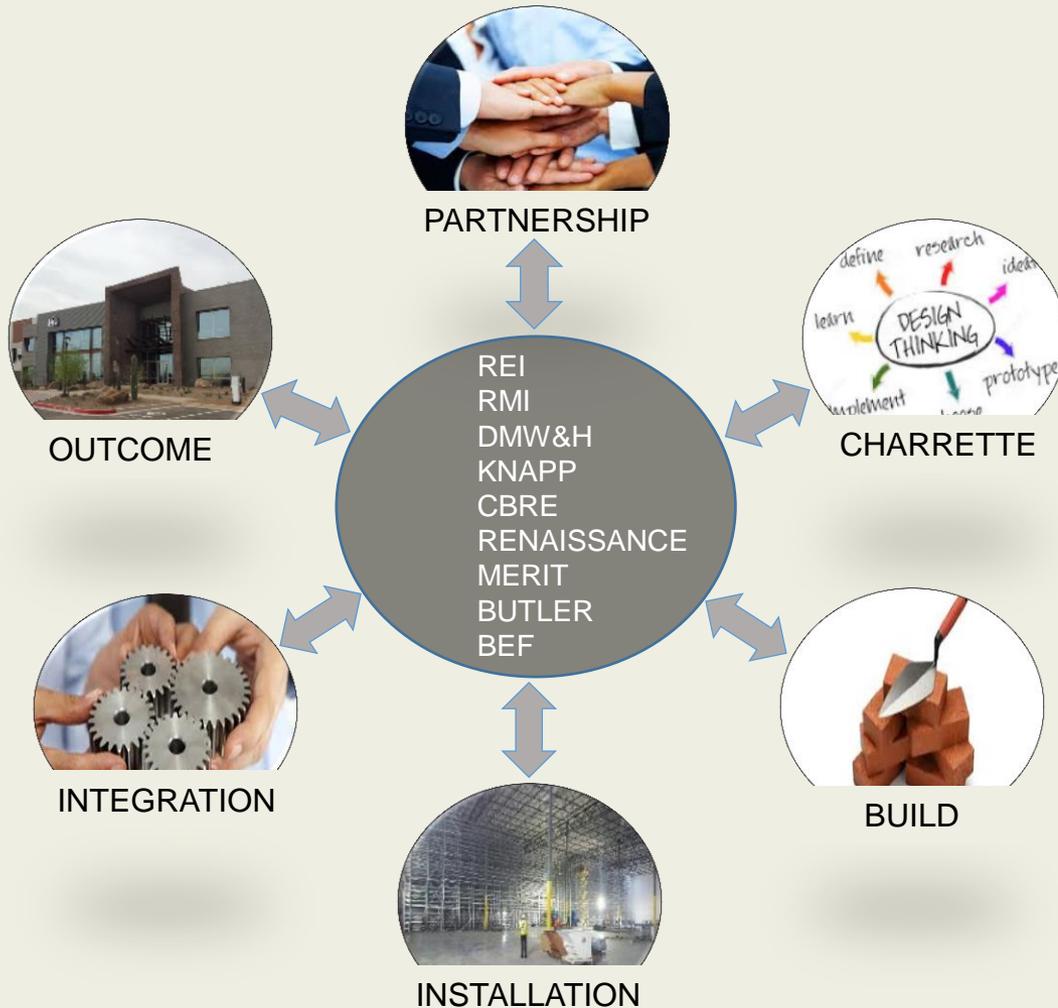


Technology



People

Co-operative Design



- Integrated design approach
- Clear requirements of Net Zero Energy and long-term total cost of ownership
- Partners work in parallel, starting with charrette

Sustainability



- **Net Zero Energy**

- Integrative design process led to significant energy efficiency improvements
- 2.2MW solar array produces all of the energy that building consumes
- More than doubles REI's current solar production
- Equivalent to powering 390 homes for one year
- Provides REI with 20 years of free energy

- **LEED Platinum**

- Design, construction, maintenance and operations

- **Water Conservation**

- Non-evaporative cooling saves millions of gallons of water annually—trades power for water conservation
- Saves enough to provide water for more than 20 homes each year

Efficiency Measures

- 57 measures were considered post-charrette
 - Optimized orientation, envelope and insulation through extensive energy modelling
 - Used all LED lighting
 - Included Air Turnover Units to de-stratify building; highest-efficiency mechanical cooling used
 - Focused on “vampire loads” for all material handling equipment
 - Hyperchairs are one cool example of innovation
- Reduced consumption over 50% below ASHRAE 90.1-2007
- Significantly downsized size of needed PV array
- Energy modelling for a production facility is difficult

Water Project

- Whole systems thinking
 - Intersection of energy and water: “embedded water” in energy
- Habitat restoration project in Verde Valley in partnership with Bonneville Environmental Foundation and The Nature Conservancy of Arizona
 - Putting water back in river
 - Supporting local farmers
 - Creating recreation economy
- Balanced facility’s annual water footprint over five years and earned two LEED points
- USGBC now recognizes Water Restoration Certificates for LEED points



People



Every Trail Connects

Life Outdoors



Personal Comfort

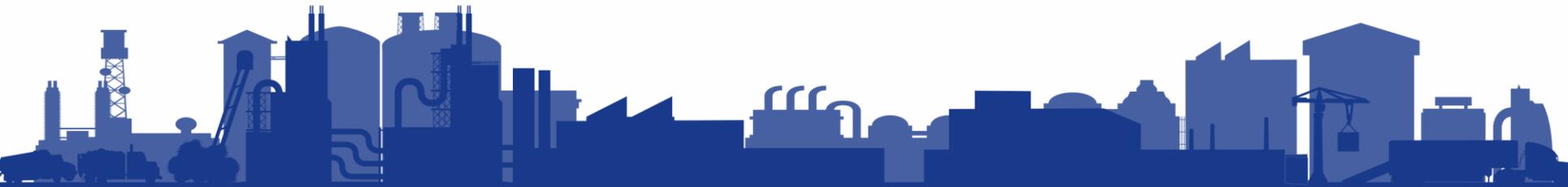




Alan Moran

Cascade Energy

Refrigerated Warehouse Energy Efficiency



Cascade Energy, Inc.

- Cascade Energy: In business for 20+ years
- 115+ employees, about 66.6667% are engineers
- Experts in industrial energy efficiency
- Worked with 700-800 ammonia refrigeration systems



CascadeEnergy

Visit us at: www.cascadeenergy.com

Refrigerated Storage

Refrigerated Warehouses and
Distribution Centers

=

1,300 aMW of energy per year

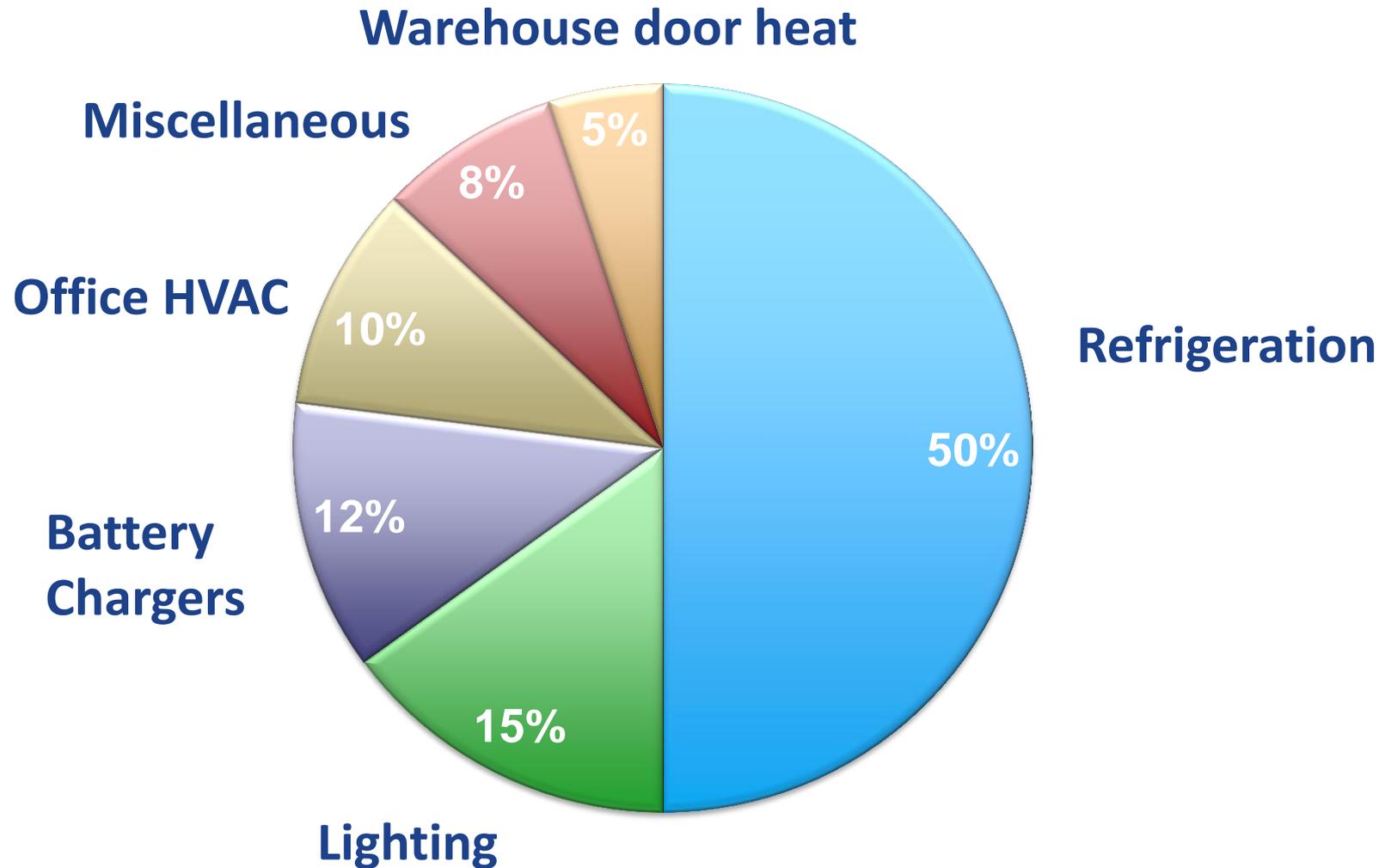
Elec. costs ~\$800 million per year



Where is energy efficiency on your list of priorities?

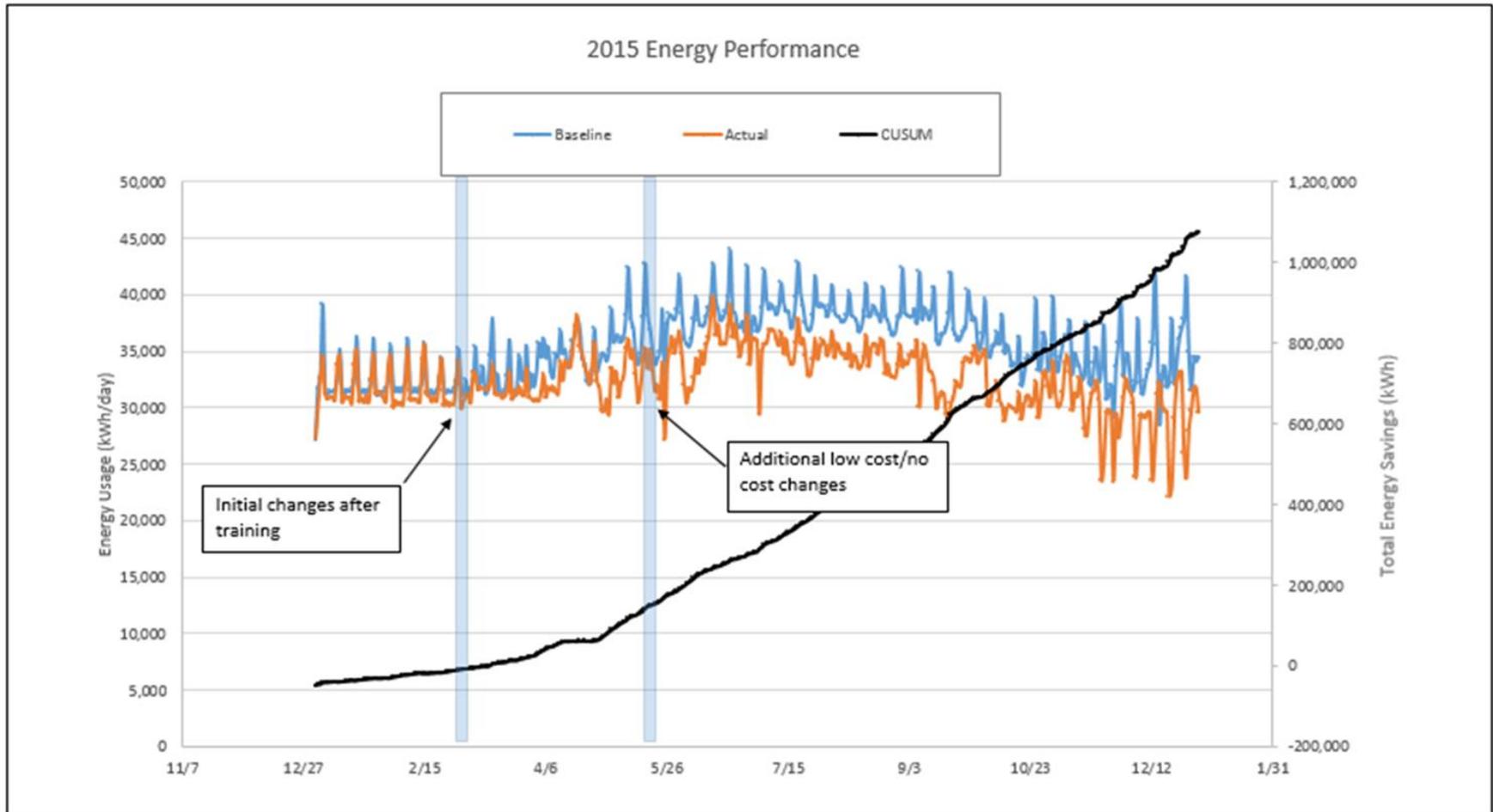
1. Be safe
2. Keep things **COLD**
3. Save energy

Where does your energy go?



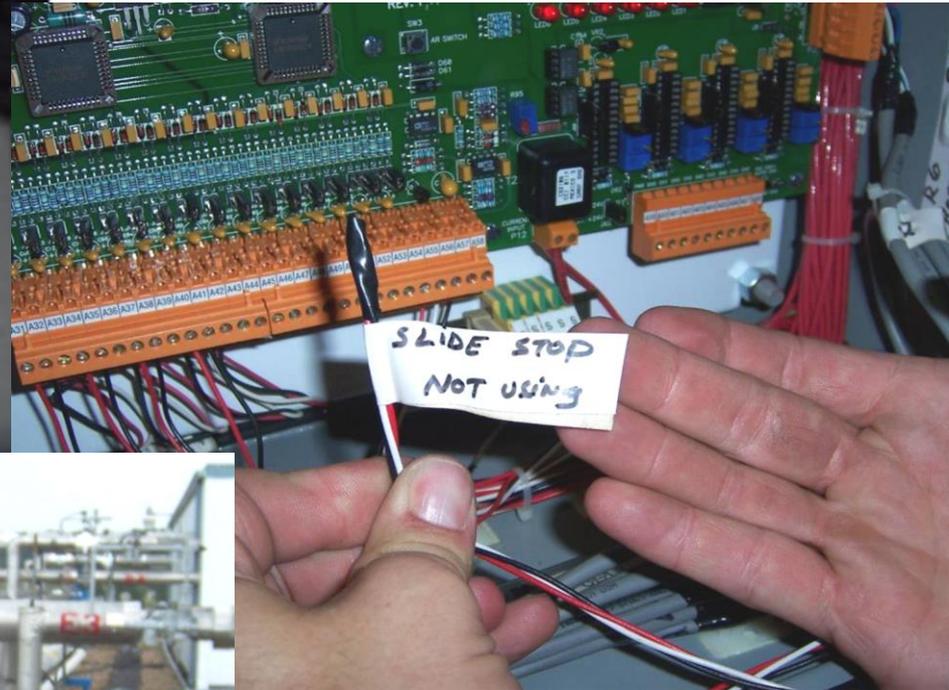
What can you do?

- Track energy performance



What can you do?

- Make sure refrigeration equipment is functional



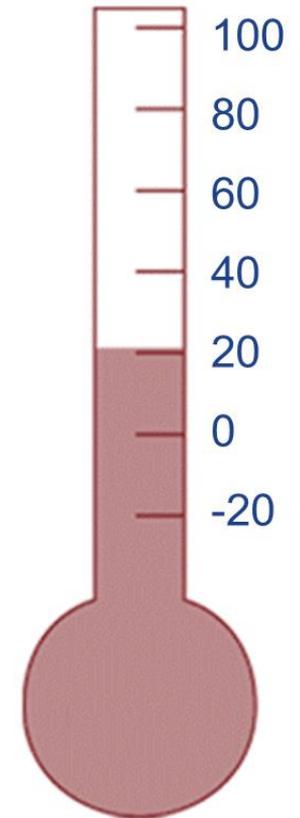
What can you do?

- Minimize refrigeration load



What can you do?

- **Standardize temperature requirements**
 - Is there a contracted product temperature?
 - Capability of maintaining tight temperature controls?
 - Lower than necessary temps can dictate inefficient control



What can you do?

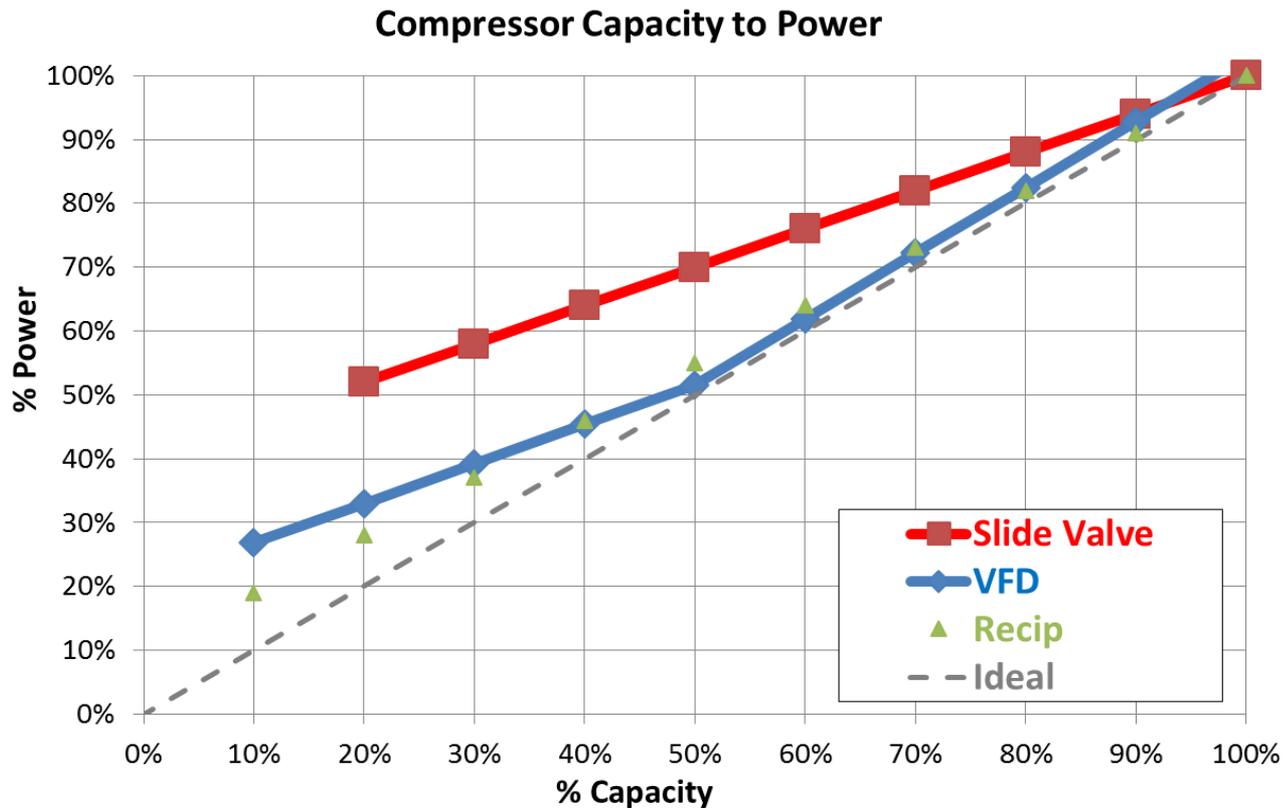
- Set appropriate refrigeration system pressure settings



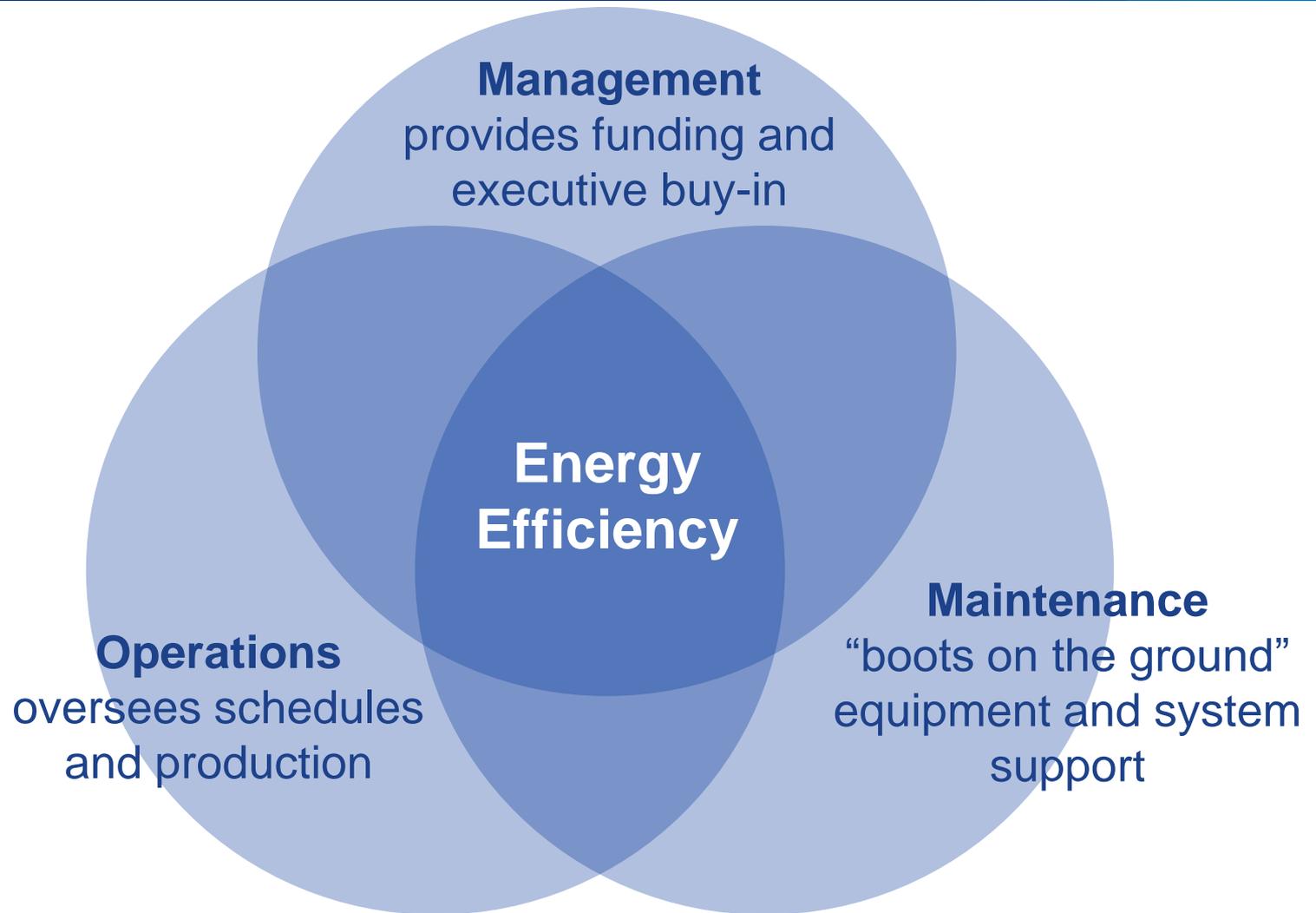
Reduce Compressor Lift

What can you do?

- Efficiently match equipment capacity with refrigeration load



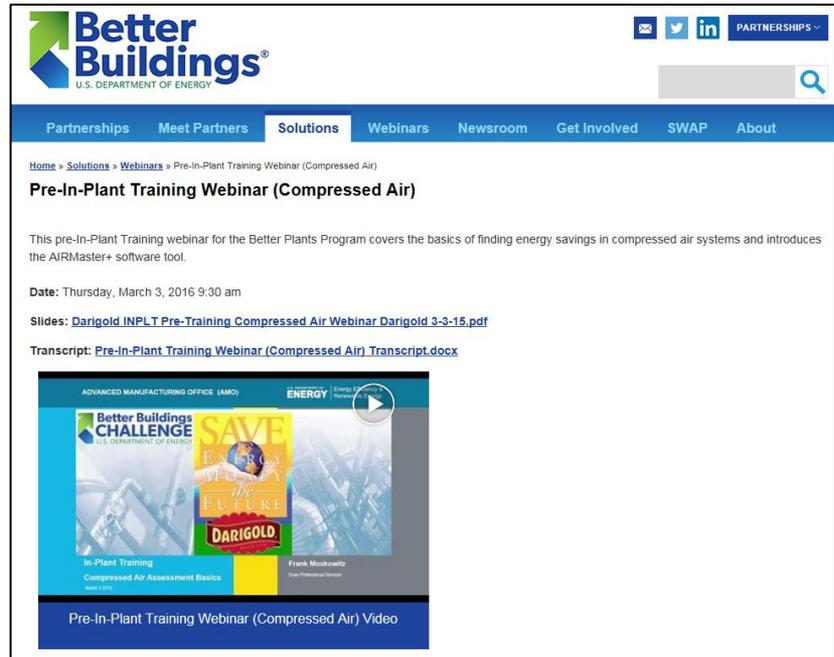
Everyone Contributes to Energy Efficiency



Better Plants Program: In-Plant Trainings

- Teach participants how to conduct assessments, use DOE tools, and implement projects
- Open to employees from host plant, peer companies, suppliers
- More than 60 INPLTs covering steam, compressed air, process heating, pumps, and fans since 2011
- More than 850 participants
- Identified > 3 TBTU and \$14 million in energy savings
- Pre-INPLT webinars available on program website

Process heating INPLT at an ArcelorMittal plant in Nov. 2013. Photo courtesy ArcelorMittal and ORNL.



The screenshot shows the Better Buildings website interface. At the top, there is a navigation bar with links for Partnerships, Meet Partners, Solutions, Webinars, Newsroom, Get Involved, SWAP, and About. Below the navigation bar, the page title is "Pre-In-Plant Training Webinar (Compressed Air)". The main content area includes a description of the webinar, the date (Thursday, March 3, 2016 9:30 am), the slides (Darigold INPLT Pre-Training Compressed Air Webinar Darigold 3-3-15.pdf), and the transcript (Pre-In-Plant Training Webinar (Compressed Air) Transcript.docx). A video player is embedded, showing a thumbnail for the webinar with the text "Better Buildings CHALLENGE U.S. DEPARTMENT OF ENERGY SAVE ENERGY MORE EFFICIENT DARIGOLD In-Plant Training Compressed Air Assessment Basics March 3, 2016 Frank Moskowitz Chief Professional Services".



Refrigeration INPLT Objectives

1. Knowledge



2. Tools

1) Top 10 Categories of Refrigeration OEM Energy Savings

- Optimize Suction Pressure (2% compressor savings per °F)
- Optimize Condensing Pressure (1.5% compressor savings per °F)
- Use your Best Part Load Option
- Condenser Water Delivery: Nozzles, Pumps and Treatment
- Re-Commission Evaporator Valves & Regulators
- Reduce Loads
- Keep Frost Out
- Optimize Defrost
- Calibrate
- Document, Standardize

2) Compressor "Lift": Suction Pressure and Discharge Pressure

2% compressor savings per °F

	psig	°F
Existing	22	8
Proposed	25	11

Tonnage increases by 6% for that compressor.

Decreasing condensing pressure **decreases power**:
1.5% compressor savings per °F
Removing non-condensables has a similar effect!

	psig	°F
Existing	140	81
Proposed	120	71

Kilowatts decrease by 12% for that compressor.

Based on your climate (Mixed-Humid), reducing the condensing pressure setpoint will effectively save energy for 50% of the year.

3) Slide Valve Position ≠ Capacity

% Slide Valve	% Capacity			
	2.2 sl	3.0 sl	3.8 sl	5.0 sl
0%	19%	18%	15%	15%
10%	26%	23%	20%	20%
20%	33%	29%	26%	26%
30%	40%	34%	31%	31%
40%	48%	40%	36%	36%
50%	54%	45%	41%	41%
60%	61%	50%	46%	46%
70%	68%	55%	51%	51%
80%	76%	62%	59%	59%
90%	86%	71%	70%	70%
100%	100%	100%	100%	100%

Up to 32% compressor power penalty for running compressor at:

What is the ideal VI for my compressor?

Suction Pressure	40	psig
Condensing Pressure	140	psig
Ideal VI	2.2	

Compressor Slide Valve Position to Capacity

Energy Savings

3. Action



New Offering: Refrigeration In-Plant Training

- **What?**
 - 3 day on-site refrigeration system training
- **Who?**
 - Refrigeration operators
 - Maintenance managers
 - Plant engineers
 - Corporate energy managers
 - Service contractors
- **How do I sign up?**
 - Application process opens later this spring

<https://betterbuildingssolutioncenter.energy.gov/better-plants/plant-trainings>

Additional Resources

Resources

- Staples Showcase Project: Coppell Fulfillment Center
 - <https://betterbuildingsolutioncenter.energy.gov/showcase-projects/coppell-fulfillment-center>
- Staples Implementation Model: Eco-Treasure Hunts at Fulfillment Centers
 - <https://betterbuildingsolutioncenter.energy.gov/implementation-models/eco-treasure-hunts-fulfillment-centers>

Q & A

Better Buildings Webinar Series



MADE TO FIT:

HOW PAID-FROM-SAVINGS PROJECTS CAN WORK FOR SMALL ORGANIZATIONS TOO

Tuesday, February 7, 2017 | 3:00 - 4:00 PM ET

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Learn how to seek out technical experts and financing options for saving energy and water while protecting your interests.



**SAVE
THE
DATE**

SUMMIT

WASHINGTON, D.C.
MAY 15-17, 2017

U.S. DEPARTMENT OF
ENERGY

Additional Questions? Please Contact Us

betterbuildingswebinars@ee.doe.gov

Today's Presenters	Bob Valair Staples bob.valair@staples.com Kirk Myers Recreational Equipment, Inc. (REI) kmyers@rei.com	Alan Moran Cascade Energy alan.moran@cascadeenergy.com
DOE Program Leads	Holly Carr DOE, Better Buildings Challenge Holly.Carr@EE.Doe.Gov	
Program Support	Kendall Sanderson JDM Associates ksanderson@jdmgmt.com	Holt Mountcastle JDM Associates hmountcastle@jdmgmt.com

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