



Leveraging Non-Energy Benefits

Logan H. Brown, CEM
Efficiency Vermont Customer Service Project Manager

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Agenda

- I) Definition of Terms
- II) Aesthetics and Energy Efficiency
- III) Overview of Potential Non-Energy Benefits
- IV) Specific Project Examples
- V) Leveraging Non-Energy Benefits
- VI) Questions



Definition: Non-Energy Benefits

Project impacts other than energy saved:

- Beyond BTUs, gallons of oil, therms of natural gas, kilowatt hours...
- For today's presentation, we will not cover quantification of non-energy benefits.



Aesthetic Impacts

Aesthetics: "The science of how things are known via the senses"

- Sight
- Hearing
- Taste
- Smell
- Touch



The Sense of Sight

Adequate Illumination Enhances:

- Awareness of Surroundings
 - Security
 - Comfort
 - Experience
- Is the right type of light in the right place



The Sense of Sight

Safety:

- Less heat output
- Fewer scorched fingers
- Fewer scorched lampshades
- Less hours on the ladder



Sense of Hearing

What kind of auditory experience will occupant have?

What can create a negative auditory experience?

- HVAC
- Bathroom ventilation
- Refrigerator compressors
- Poor controls



Sense of Taste

Energy Efficiency and Taste?

Properly operating cooling equipment helps ensure:

- Quality of food
- Appearance of food
- Taste of food
- Reliability



Sense of Smell

Recall the smells of your childhood home...

- Good memories
- Bad memories



Sense of Smell

Control of ventilation in a building helps manage what an occupant might smell:

- Excessive kitchen odors
- Perfumes
- Bathroom odors
- Basement



Sense of Touch (Feel)

- Temperature
- Comfort/Discomfort
- Consistency
- Control



Economic

Maintenance Costs:

- Annual maintenance
- Periodic maintenance
 - Lighting

Equipment Costs:

- Component replacement
 - Less rapid deterioration of consumables
 - Soft starting motors to reduce failure rate



Economic

Building Longevity:

- Shell maintenance
 - Paint, siding, roof decking
- Proper ventilation
 - Mold on ceilings and windows
 - Repainting in bathrooms



Economic

Labor Costs:

- Indirect labor costs
 - Reduced absences
- Production labor costs
 - Fewer person hours/item



Economic

Productivity:

- Less equipment down time
- Personal productivity
 - Feel good, work more effectively
- Mechanical productivity
 - More items per hour



Economic

Fees and Services:

- Rental fees avoided
 - Hot water tanks
- Utility service fees
 - Second accounts
- Waste disposal



Health and Safety

Physical Health:

- Indoor air quality
 - Control over quantity and quality of air
- Eyestrain
 - Proper light levels
 - Proper CRI



Health and Safety

Safety/Risk:

- Less time on the ladder
- Reduced risk of injury
 - Roofs and ice



Environmental Impacts

- Air Pollution
- Water Pollution
- GHG Emissions
- Solid/Hazardous Waste Production
- Wildlife Habitat



Company Image

Improved Public Image:

- Reduced energy consumption
- Marketing opportunities
- Connections to visible partners
 - ENERGY STAR®



The Customer Wish List

Exploring needs that might be met through energy efficient measures.

What does the customer need and want for their building and/or business?



Facility Issues

Customer (Non-Energy) Need(s):	Solutions:	Deliver the Solutions with:
<ul style="list-style-type: none">• Improved temperature control	<ul style="list-style-type: none">• Control strategies	<ul style="list-style-type: none">• HVAC and refrigeration controls• More efficient lighting to reduce cooling requirements• Proper staging and sizing of equipment



Facility Issues

Customer (Non-Energy) Need(s):	Solutions:	Deliver the Solutions with:
<ul style="list-style-type: none"> • Improved process control 	<ul style="list-style-type: none"> • Control strategies • Reliable equipment 	<ul style="list-style-type: none"> • Process and compressed air controls • Proper staging and sizing of equipment • Energy Management Systems (EMS) • Multiple control points



Financial Issues

Customer (Non-Energy) Need(s):	Solutions:	Deliver the Solutions with:
<ul style="list-style-type: none"> • Increased sales 	<ul style="list-style-type: none"> • Better productivity from sales staff • Reduce product cost • Lower energy bills • Increase facility or product attractiveness to customer 	<ul style="list-style-type: none"> • Better quality lighting from fluorescent systems, also offering better control • Daylighting • Better HVAC system and controls with improved indoor air quality • Better design for employee work stations



Financial Issues

Customer (Non-Energy) Need(s):	Solutions:	Deliver the Solutions with:
<ul style="list-style-type: none"> • Improved cash flow 	<ul style="list-style-type: none"> • Reduce expenses • Increase output 	<ul style="list-style-type: none"> • Efficient, improved lighting • Efficient, improved HVAC with better controls and IAQ • Process controls, efficient motors, VSDs • Operation and maintenance procedures to optimize existing equipment • Retrocommissioning



Equipment Issues

Customer (Non-Energy) Need(s):	Solutions:	Deliver the Solutions with:
<ul style="list-style-type: none"> • Equipment reliability 	<ul style="list-style-type: none"> • Better, newer equipment • Increase reliability by proper functionality and controls 	<ul style="list-style-type: none"> • All new energy-efficient equipment that provide cash flows to help pay for themselves



Equipment Issues

Customer (Non-Energy) Need(s):	Solutions:	Deliver the Solutions with:
<ul style="list-style-type: none"> • Longer equipment life • Delay or reduce capital expenditures 	<ul style="list-style-type: none"> • Reduce equipment runtime • Reduce equipment short-cycling • Maximize system capacity 	<ul style="list-style-type: none"> • Appropriate selection, sizing, and staging of equipment with operation in lead-lag mode • Use of VSDs • Controls to match supply with demand (e.g., hot and chilled water temperature reset) • Detection and elimination of leaks or losses • Energy Management Systems (EMS)



Product Issues

Customer (Non-Energy) Need(s):	Solutions:	Deliver the Solutions with:
<ul style="list-style-type: none"> • Decreased spoilage 	<ul style="list-style-type: none"> • Equipment reliability • Longer equipment lifetimes • Smarter HVAC and refrigeration systems 	<ul style="list-style-type: none"> • Refrigeration controls • Retrocommissioning • Door seals • Strip heater controls • Refrigeration economizers



Employee Issues

Customer (Non-Energy) Need(s):	Solutions:	Deliver the Solutions with:
<ul style="list-style-type: none"> • Employee/tenant satisfaction • Employee retention • Employee health/morale 	<ul style="list-style-type: none"> • Better lighting system design to reduce glare and improve color rendering • Upgrade HVAC system to improve comfort and ventilation rates/indoor air quality • Install superior building envelope to maximize comfort 	<ul style="list-style-type: none"> • Daylighting systems for quality lighting and views • Fluorescent lighting technologies that offer better color rendering, controls • Task lighting to reduce general light levels, offering individual controls • EMS systems that offer individual temperature controls • Commissioning that makes certain that the systems function as planned



Employee Issues

Customer (Non-Energy) Need(s):	Solutions:	Deliver the Solutions with:
<ul style="list-style-type: none"> • Lower insurance liability 	<ul style="list-style-type: none"> • Reduce IAQ problems • Control environment • Fewer sick days to common ailments (allergies, sinusitis) • Reduce work place accidents due to better and flexible control of lighting and process 	<ul style="list-style-type: none"> • Better lighting design • CO2 monitored HVAC • Good ventilation systems with filtration, economizer cooling, and heat recovery



Leveraging Non-Energy Benefits

Energy Efficiency can enhance an experience:

- Tangible/Intangible
- Visible/Invisible
- Consciously/Subconsciously

Energy Efficiency can set a property apart

Energy Efficiency will benefit a bottom line



Project Examples

Printing Facility Lighting Upgrade

- Energy Saving Project:
 - Upgrade from T12 to High Performance T8 lighting.
- Non-Energy Benefits:
 - High color temperature HPT8s in the printing area where colors are evaluated made colors easier to see.
 - Increase in productivity, product quality, and better work environment.



Project Examples

Catalog Order Fulfillment Facility

- Energy Saving Project:
 - Upgrade from T12 to High Performance T8 lighting.
- Non-Energy Benefit:
 - Reduced picking errors. Gs and Cs were easy to confuse in poor lighting.
 - Reduced shipping errors, better work environment, increased productivity.



Project Examples

Automobile Dealership

- Energy Saving Project:
 - Upgrade from T12 to High Performance T8 lighting.
- Non-Energy Benefit:
 - Dropped winter usage enough so that utility moved them to a more favorable small commercial tariff.
 - Removed power factor and demand ratchet considerations from their rate tariff.



Project Examples

Wastewater Treatment Facility

- Energy Saving Project:
 - Addition of timers and VFDs to aeration blower motors (45% decrease in energy consumption.)
- Non-Energy Benefit:
 - Balanced pH level without usual addition of soda ash.
 - Fewer steps and chemicals needed to reach pH goal.



Project Examples

Cheese Manufacturer

- Energy Saving Project:
 - Addition of VFDs to whey roller dryers, saving 10% of energy.
- Non-Energy Benefit:
 - Better drying control means a better end-product.
 - VFDs soft-start feature means fewer motor failures.



Project Examples

Three-Story Hotel

- Energy Saving Project:
 - Changed all lighting from incandescent to CFL, reduced 20kW of heat load from building, saving \$16,000 annually.
- Non-Energy Benefit:
 - Obviated need for new AC unit to meet cooling demand.
 - Reduced bulb changing time.



Project Examples

Ski Area

- Energy Saving Project:
 - Incandescent to CFL switch in condos managed by ski area.
- Non-Energy Benefit:
 - Condo owners charged \$35 each time management company was called out to change a light bulb...owners save on maintenance costs!



Project Examples

Bed and Breakfast

- Energy Saving Project:
 - Transition from central hallway thermostat to individual room thermostats.
- Non-Energy Benefit:
 - More comfortable visitor stay.



Leveraging Non-Energy Benefits

Develop a *Value Proposition*

- A differentiated value for a targeted market
- Unique mix of product, price, service, relationship, and image offered to customer
- What the customer gets for what customer pays

Make non-energy benefits part of that *Value Proposition*



Leveraging Non-Energy Benefits

- Explore customer's needs broadly
- Identify any needs EE measures can address
- Identify additional values that EE project will bring
- Identify how your ability to deliver quality service above and beyond standard makes you valuable



Questions?

