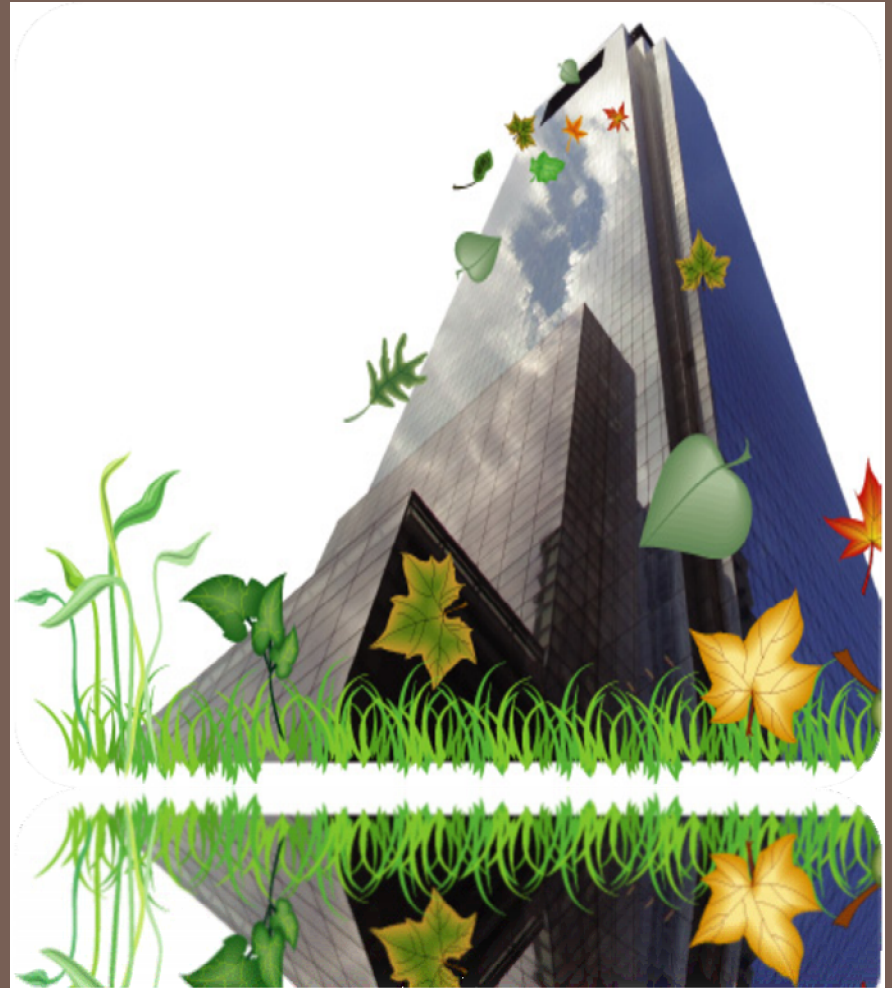


GREENING THE OPERATIONS AND MAINTENANCE OF BUILDINGS



Marla Thalheimer, LEED AP, Sustainability Manager
Liberty Property Trust

Who We Are

LIBERTY
PROPERTY TRUST

- The nation's second largest publicly-traded office and industrial REIT
- 20 markets in the United States and United Kingdom
- Over 750 office and industrial properties totaling 78 million square feet
- More than 2,700 tenants
- A key corporate strategy to be a leader in "High Performance" Sustainable Buildings

Who We Are

Liberty has over 7.2 million square feet of LEED projects throughout the United States:

- 1 Platinum certified
- 17 Gold certified
- 12 Silver certified
- 3 Certified
- 2 LEED registered (Under construction or completed and awaiting certification)
- 4 LPT offices LEED CI, 2 in process



Who We Are

- But what about the other 700+ buildings???



Greening Operations & Maintenance

• Basic Formula:

- ✧ Educate
- ✧ Benchmark
- ✧ Set Goals
- ✧ Track Results
- ✧ Acknowledge Failures
- ✧ Celebrate Successes



Focus on Operations & Maintenance



• Basic Principles

- ⊗ AVOID
- ⊗ Reduce
- ⊗ Reuse
- ⊗ Recycle

Basic Formula + Basic Principles =
Business Optimization = Less Operating Costs = Higher
Profits = Happier, Healthier Employees = Less
Environmental Impact = Sustainability!

Educate

- Internal: Property Management Staff:
 - ✘ Monthly 1 Hour Informational Calls
 - ✘ "Green Guide" Database
 - ✘ Required Green Advantage Designation
 - ✘ Required Green Advantage/LEED Green Associate
- Internal: Employees
 - ✘ Monthly Tips
 - ✘ "Green Guide" Database
 - ✘ Dedicated Sustainability Intranet Portal Page
 - ✘ Lunch & Learns and Peer Group Sessions
 - ✘ Blog
 - ✘ New Hire Training
 - ✘ Designations encouraged



Educate

- External: Vendors
 - Worked with existing Vendors whenever possible
 - Revised Contracts and Specs
 - They must be accountable!
- External: Building Occupants
 - Tenant roundtables
 - Monthly email tips
 - Green Office Guide



**ENERGY
USE**

24%* -50%**

**CO₂
EMISSIONS**

33%*** -39%**

**WATER
USE**

40%**

**SOLID
WASTE**

70%**

Green Buildings Can Reduce...

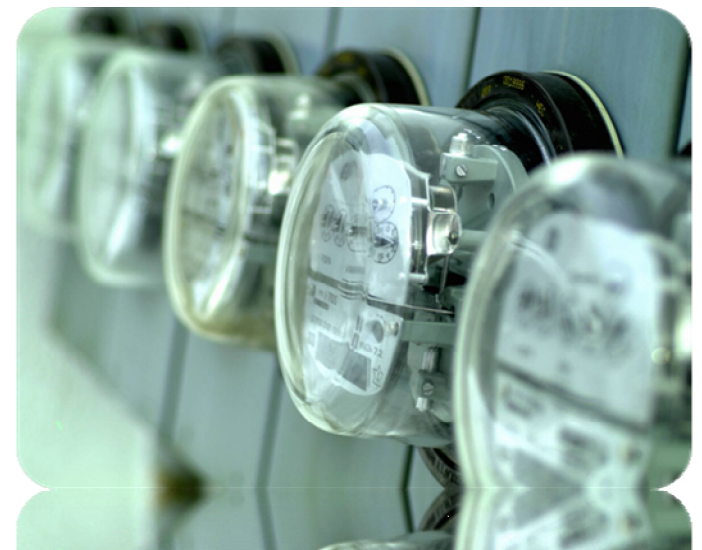
* Turner, C. & Frankel, M. (2008). Energy performance of LEED for New Construction buildings: Final report.

** Kats, G. (2003). The Costs and Financial Benefits of Green Building: A Report to California's Sustainable Building Task Force.

*** GSA Public Buildings Service (2008). Assessing green building performance: A post occupancy evaluation of 12 GSA buildings.

Energy

- Benchmarking/tracking in Energy Star Portfolio Manager
- Goal: Reduce energy consumption 30% by 2012
- Energy audits
- Low cost/no cost energy conservation measures
- Lighting retrofits
- BWAN Energy Monitoring
- Grants & incentives
- Employee financial incentives
- Tenant communications
- Renewable energy



Energy Star Portfolio Manager

Is 10 MPG high or low for an automobile?



Fuel Efficiency Rating
MPG

Is 90 kBtu/sf/year high or low for an office building?



Energy Performance Rating

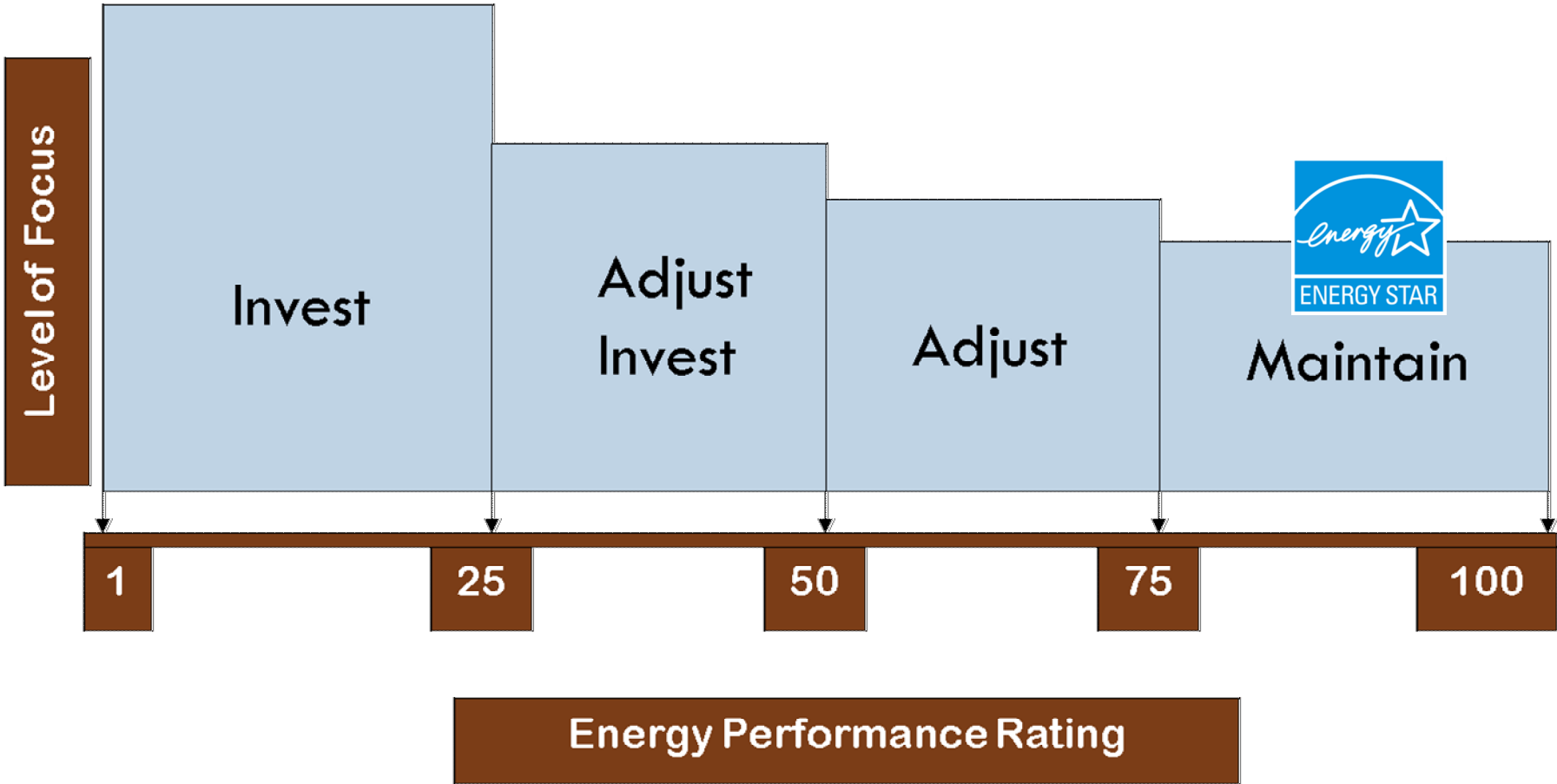
1 - 100



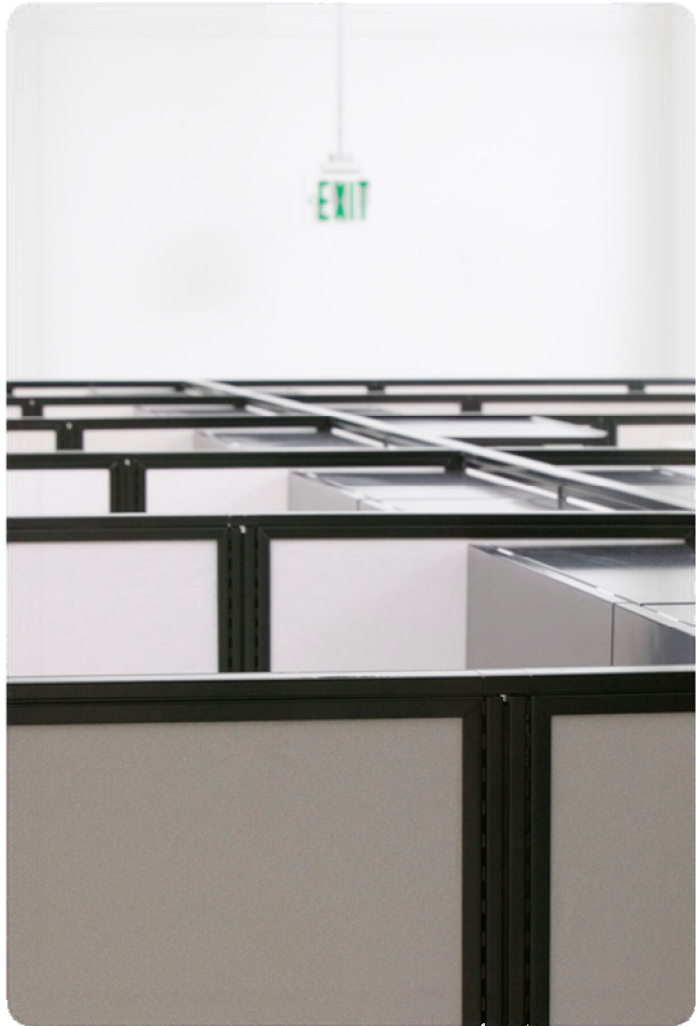
The report card shows various energy performance metrics and a table of data. The table has multiple columns and rows, with some cells containing numerical values and others containing text.

Energy Star Portfolio Manager

Prioritize portfolio-wide upgrades



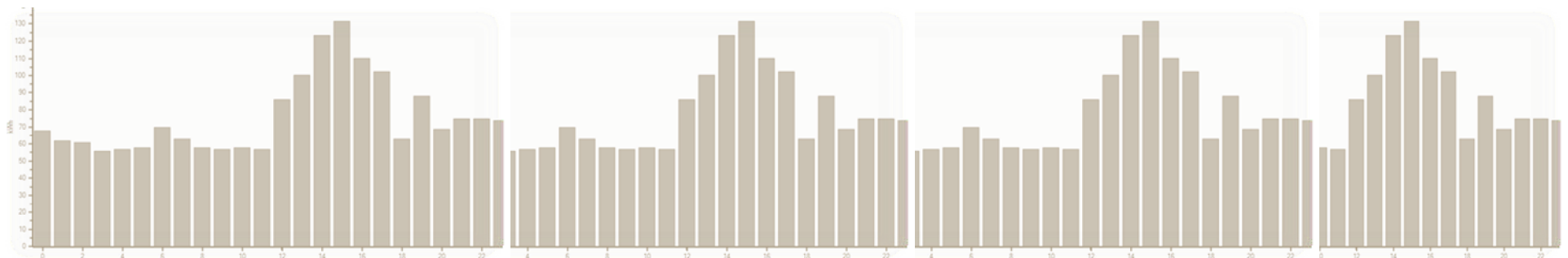
Low Cost/No Cost



- What is running when it doesn't need to be?
 - ▣ Lighting
 - ▣ HVAC
 - ▣ Misc equipment
- Adjust HVAC set points
- Calibrate thermostats
- Occupancy sensors
- LED exit signs
- [BOMA: 30 Easy Ways to Save Energy](#)

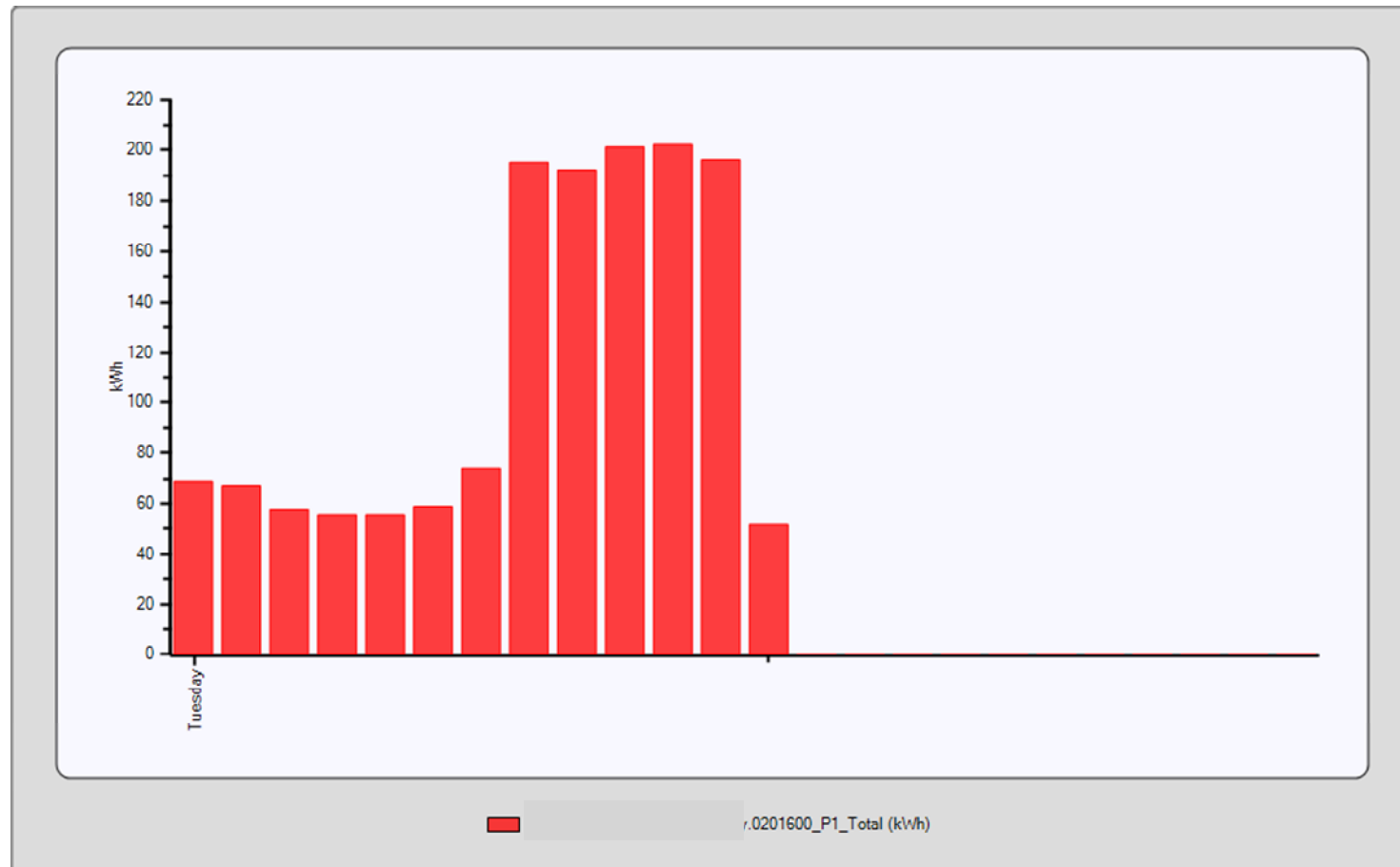
BWAN Energy Monitoring System

- BWAN = “Building Wide Area Network” Energy Monitoring
 - ⊗ Monitoring of electric utility consumption at building level
 - ⊗ Near real time electric usage is monitored and data stored in a centralized database
 - ⊗ Provides visibility on existing internal corporate Liberty network
 - ⊗ 130 Multi-tenant office properties, 11.5 million sq ft project
 - ⊗ Multiple Electric/Gas Utility and ISP Market Jurisdictions



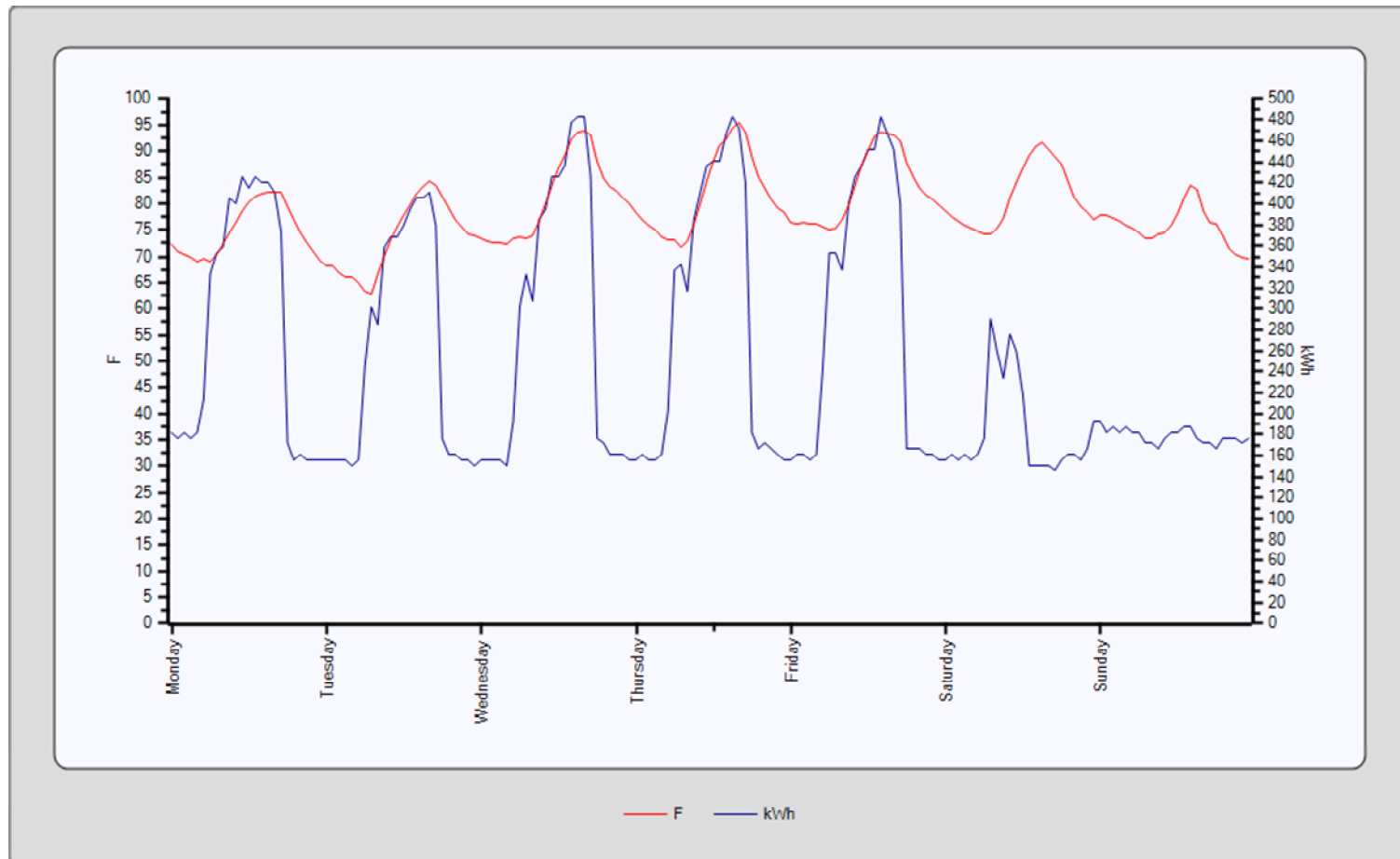
BWAN Energy Monitoring System

- Today's energy usage



BWAN Energy Monitoring System

- Last weeks trended usage



BWAN Energy Monitoring System

"We discovered [the building] had been running on Sundays for, we don't know how long."

"We found too many units coming on too close together causing a spike at 6 am"

"After review of the RTU's programming, [our vendor] discovered that one of the 60 ton units was indeed running in manual 24x7 because someone had changed the programming from running in program mode to manual mode."

BWAN Energy Monitoring System



“We had requested that the air be set back to 6-6 once [the tenant] moved out in March. The tech also was under the impression that it had been set back already. Further investigation found that it had never been set back.”

“There was some spike in electric each morning at 4am at [the building]. We requested our HVAC contractor to investigate and what they found was that at 4am each morning, the entire building was exhausting out all of the air and bringing in fresh air.”

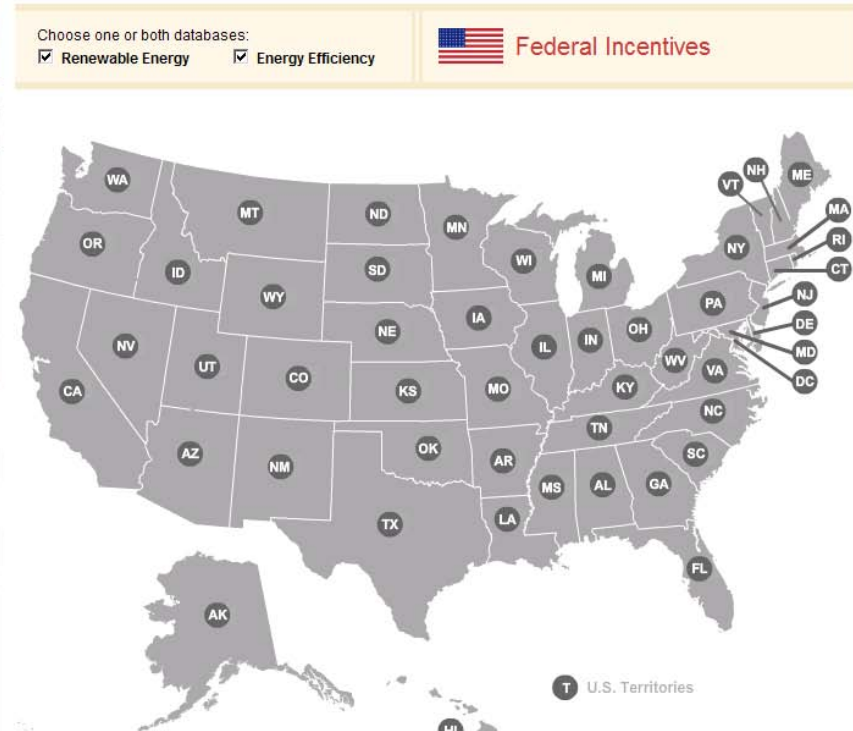
Energy Savings

- Currently tracking 160 buildings where we control bills
- We have saved over 20M kWh from our 2008 baseline = avg \$2.2M savings for tenants
- Options for tenants:
 - ✧ Submeter
 - ✧ Request monthly data from landlord, even if pro rata
 - ✧ Request Energy Star score from landlord



Incentives

- To finance:
 - Tax incentives and grants
 - PECO 129 - Smart Ideas
 - DSIRE USA



Renewable Energy

- Solar pilot – Tasty Baking
- Spend your capital wisely
 - ✧ Optimize
 - ✧ Renewables
 - ✧ RECs, or Offsets
 - ✧ Zero-net-energy



Water – Did You Know?



- ❑ The average American uses about 151.9 gallons of water per day, with about 60 percent of that being used out-of-doors (watering lawns, washing cars, etc.).
- ❑ The average European uses 66 gallons of water per day.
- ❑ 1.1 billion people lack adequate water access, using less than 5 gallons per day

Circle of Blue



Water

- Benchmark & tracking usage
 - ✧ Energy Star Portfolio Manager
 - ✧ Look for jumps in usage to determine possible leaks
 - ✧ Water footprinting
- Ways to reduce
 - ✧ Leaky faucets and running toilets
 - A leaky toilet can waste 200 gallons per day!
 - ✧ Dishwashers running half empty
 - ✧ Aerators on faucets
 - ✧ Low flow fixtures
 - ✧ Changes in landscaping
- Eliminate bottled water!



Waste

- ❑ Waste audit
- ❑ Recycle everything your waste hauler will allow
- ❑ Additional recycling programs:
 - ❑ Batteries, light bulbs, techno-trash, e-waste, cell phones, Tyvek envelopes
- ❑ Track your totals
 - ❑ [EPA Waste Reduction Model](#)
 - ❑ [GHG Equivalencies Calculator](#)



2009 Waste Reduction Achievements

The sum of the greenhouse gas emissions reduced is 29,445 Metric Tons of Carbon Dioxide Equivalent, which is equal to the CO₂ emissions from one of the following:



Removing **5,630** passenger cars from the road for one year



3,312,148 gallons of gasoline consumed



68,477 barrels of crude oil consumed

2009 Waste Reduction Achievements

Through our recycling program we have also kept the following out of landfill:



3,939
pounds of
batteries

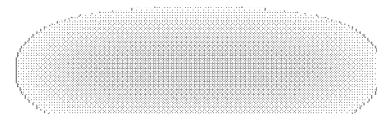
83,270
light bulbs




4,920 phone card minutes given to soldiers to call home from "Cell Phones for Soldiers" recycling program

Indoor Environmental Quality

- According to the [EPA](#) :
 - ▣ On average, Americans spend about 90 percent or more of their time indoors.
 - ▣ Indoor levels of pollutants may be two to five times higher, and occasionally more than 100 times higher, than outdoor levels.
- Green cleaning
 - ▣ Green Seal Certified Products
- Low/no VOC paints and finishes



LEED EB O&M – The Roadmap

 LEED 2009 for Existing Buildings: Operations & Maintenance		Project Name																																																																																																			
Project Checklist		Date																																																																																																			
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Total Possible Points: 110																																																																																																					

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110

Business Case

.. Risks

- ⊗ Building obsolescence
- ⊗ Higher operating expenses
- ⊗ Lower occupancy rates
- ⊗ Increased liability and insurance costs
- ⊗ Reputational
- ⊗ Regulatory

.. Opportunities

- ⊗ Lower operating costs
- ⊗ Healthier work environments
- ⊗ Higher tenant & employee retention
- ⊗ Reduced liability and insurance costs
- ⊗ Higher asset value
- ⊗ Innovative solutions

Thank You!

Marla Thalheimer, LEED AP
Sustainability Manager

mthalheimer@libertyproperty.com

610-722-4150

JOEL PETT
USA TODAY



Cartoonists International: www.ny1syn.com/cartoons