Discovering Energy Savings with Energy Treasure Hunts

2020 ENERGY STAR Partner of the Year Winner Winner Webinar Series

April 29, 2020
Thanks for joining us!

- Let us know if there are ways ENERGY STAR can help

- Today: the first in series of our 2020 Partner of Year Award Winner webinar series

https://www.energystar.gov/buildings/training/poy_webinars
Today’s Speakers

- **Barry Abramson**, Principal, Servidyne LLC, Atlanta GA
  
  *Servidyne is a 2020 ENERGY STAR Sustained Excellence Award winner and earned its first Partner of Year award in 2002*

- **Tyler Puls**, Energy and Environmental Specialist, Des Moines Public Schools, Des Moines IA.
  
  *DMPS is a 2020 ENERGY STAR Sustained Excellence Award winner and earned its first Partner of Year award in 2012*

Moderator:

- **Walt Tunnessen**, ENERGY STAR Industrial Program Manage, US EPA, Washington DC
Background on Energy Treasure Hunts

Suppliers → Industrial Partners → 2008 Great Recession

2014 Guidebook → Hundreds of Industrial Companies

2018 Short Guide, Videos, Treasure Maps, Detail Sheets → 2019 Launch Campaign
2019 Results

35 organizations
145 Teams & Hunts
Lost of potential savings!

Energystar.gov/treasurehunt
What’s an Energy Treasure Hunt?

- Process for finding no and low cost energy savings opportunities:
  - Typically a 1 – 3 day “event”
  - Conducted during non-business & business hours
  - Concludes with report-out to management

- Involves internal staff who may be supplemented by outside experts

- Engages senior management / financial decision makers to authorize action on projects

- Establishes an action plan for implementation
Treasure Hunts vs Audits

- TH are less threatening to employees than audits or assessments
  - Focus on “opportunities,” not problems
  - Engage employees responsible for implementation
  - Help build energy teams
- TH generally look for operational & behavioral opportunities
  - Pick the low hanging fruit
  - Identify opportunities for further study (capital projects)
- TH get management approval to implement findings at the end of the event

TH can be expanded to address water, safety, and other issues.
Des Moines Public Schools

Discovering Energy Savings with Treasure Hunts

April 29, 2020

Tyler Puls – Energy and Environmental Specialist

Think. Learn. Grow.

www.dmschools.org
Our Mission:
Providing Students with the Knowledge, Skills and Abilities to be Successful at the Next Stage of Their Lives
DMPS Overview

- >6,000,000 Square Feet Under Roof
- 73 Facilities
  - 39 Elementary Schools
  - 10 Middle Schools
  - 1 9th Grade Academy
  - 5 High Schools
  - 5 Alternative/Pre-K Early Learning Centers
  - 1 Career and Technical Center
  - 12 Support/Auxiliary Facilities
- Average Age of DMPS Buildings = >65 years
- 33,000+ Students
- 4,900+ Staff
DMPS & ENERGY STAR

Partner of the Year – Energy Management 2012 to 2020
Partner of the Year – Climate Communicator 2014 to 2016
80% of Eligible Buildings are Currently ENERGY STAR Certified
Direct Relationship to ENERGY STAR

kBtu/SqFt

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</table>
DMPS and Treasure Hunts

• Use Treasure Hunts as an Opportunity to Explore Facilities and Determine Savings Opportunities
• Process has Evolved Over the Years to be More Productive
• Completed Treasure Hunts in 25 Facilities
• Proven to be a Valuable Tool to Operating Facilities Effectively and Efficiently
DMPS Treasure Hunt Process

Target
- Usage Increase?
- Comfort Issues?

Walk
- Use Checklist
- Ask Questions
- Fix Easy Items

Research
- Compile Plans
- Evaluate Historic Trends

Meet
- Compile Team
- Focus on Facility
- Use Technology

Evaluate
- Modeling
- Payback

Implement
- Install Equipment
- Change Occupant Activity

Reflect
- Did the Project Accomplish the Goal?
East High School Treasure Hunt

- One of Our Largest Facilities
- Built in 1912 with Multiple Additions/Renovations
- HVAC is a Combination of Steam, Heat Pump, VAV, VRF, Package Units

- Process Started in December 2018
- Projects Complete July 2019
At East High a Number of Savings Opportunities Were Identified

- Exterior Door Seals
- LED Lighting
- Contraband Appliances
- Shared Thermostats
- Vestibule Heaters
Evaluate

Constant Volume Air Handler to Pressure Dependent System

• Option #1
  • New VAV Boxes
  • New High Efficiency Motor with VFD

• Option #2
  • Modify Existing VAV Boxes and add Flow Sensing Devices
  • New High Efficiency Motor with VFD
  • Add Sensors to Balance Pressure

• Economics of the Project Proved Option #2 to be the Best Choice
Implement

- Modified Variable Air Volume (VAV) Boxes
- Installed High Efficient Motor
- Installed Variable Frequency Drive (VFD) and Controls/Sensors
- Balanced Air Handler

• Project Financials

• Total Project Cost = $17,509
• Utility Rebate = $7,711
• Out of Pocket Cost = $9,798

• Yearly Savings = $4,901

Simple Payback of 2 Years
Reflect

- Treasure Hunt Led to the Completion of Multiple Projects
- Increased Energy Savings and Occupant Comfort
- Increased the Useful Life of Equipment
- What Went Right? What Can Improve?
LED Treasure Hunt

- District Initiative to be 100% LED
  - Currently 100% Exterior Fixtures Converted
  - At the time of the Treasure Hunt Approximately 96% of Interior Square Footage Had Been Converted

- Designed Treasure Hunt Activity to Engage Building Staff to Identify Remaining Lighting to be Changed
  - Electronic and Verbal Communication District Wide
  - Used Electronic Questionnaire to Compile Results
LED Treasure Hunt

- Nearly Half of Building Chiefs Responded Through Questionnaire
- Provided a Beverage Tumbler to Chiefs Who Participated
- Gave Facilities a Concise List of Areas Remaining
Treasure Hunting Gold
Treasure Hunting Gold
Treasure Hunting

- Engage Appropriate Personnel
- Listen to Occupants – Solve Problems
- Focus on One Issue at a Time
- Solutions Are Not Always Complex

tyler.puls@dmschools.org
Operations Phone: 515-242-7706
ENERGY STAR® Treasure Hunts from a Consultant’s Perspective

2020 ENERGY STAR Partner of the Year Webinar
April 29, 2020

Barry Abramson
SERVIDYNE
ENERGY STAR
PARTNER OF THE YEAR
Pirates and Pandemics Part 1: A Brief History of the Pirate Flag
Treasure Hunts vs. Audits

Treasure Hunts focus on quick fixes with a short payback period. Many improvements can be made immediately and without significant expenditures or capital investments.

Treasure Hunts strike a positive, optimistic tone, focusing on outcomes and improving day-to-day operations. And building operators and employees who help “discover” treasure are more likely to take ownership of projects, ensuring their completion.
The Consultant’s Role – Our Approach

KEEP SAYING TO YOURSELF: “NOT AN AUDIT! NOT AN AUDIT! NOT AN AUDIT!”

ENGAGE AND COLLABORATE FROM THE START

FOCUS ON QUICK FIXES BUT DON’T MISS OTHER OPPORTUNITIES

DISCUSS THE FINDINGS AND NEXT STEPS ON THE SPOT

FOLLOW UP WITH A ONE-PAGE LETTER TO REINFORCE THE EXPERIENCE AND ENCOURAGE CONTINUED PROGRESS
• The Client: Parmenter Realty Partners
• The Buildings:
  • 8 Class A office buildings
  • Clustered in 3 Metro areas – Orlando, Dallas and Atlanta
  • Multi-building properties managed by the same team per City
  • Total floor area 1.9 Million GSF
  • Mix of high and low ENERGY STAR scores
Testing the Concept

• The Timing
  • Conducted concurrently with ENERGY STAR Licensed Professional verification site visits
  • Sep/Oct 2019
  • Walk-throughs during occupied and unoccupied periods

• The Teams
  • Typically 4 people
  • Building Engineer, Property Manager, Asst. Property Manager, Consultant

• The Cost
  • $0
The Findings

- 52 opportunities identified in the 8 buildings
- 5% average energy savings potential
- Quick fix examples:

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<th>Opportunity</th>
<th>kWh/Yr</th>
<th>$/Yr</th>
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<tr>
<td>AHU Schedule Adjustments</td>
<td>175,000</td>
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<td>After-Hours Mode for Minimum Chiller Load</td>
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<td>Lighting Control Repairs</td>
<td>62,000</td>
<td>$5,600</td>
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<td>Saturday On-Demand HVAC</td>
<td>39,000</td>
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<td>Static Pressure and Temperature Resets</td>
<td>26,000</td>
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<td>Unoccupied Floor Setback Mode</td>
<td>12,000</td>
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<td><strong>Totals</strong></td>
<td><strong>405,000</strong></td>
<td><strong>$21,200</strong></td>
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The Multiplier Effect

- Most quick fix measures addressed energy waste during unoccupied periods
- More widely applicable when building occupancy dropped
- Unoccupied Floor Setback
  - One floor at $1,700 /Yr to 28 floors at $1,700 every 2 weeks
- After-Hours Minimum Chiller Load
  - 2 X savings potential when applied 24/7
- Measures were ready to be implemented on a widespread basis immediately
Some Buildings were Prepared to Quickly Unlock the Treasure Chest
Pirates and Pandemics Part 3: Avoiding Davy Jones’ Locker
Not an Audit – and No Audit Report

• Energy Audit typical result:
  • Report becomes buried treasure, never to be found

• ENERGY STAR Treasure Hunt result:
  • Discussion among those who can take action
    • What can be done immediately
    • What can be done in the very near term
    • What can be incorporated in longer-range plans
## Implementation to Date

<table>
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<th>Opportunity</th>
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<tr>
<td>Unoccupied Floor Setback Mode</td>
<td>Complete (expanded to all floors)</td>
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<tr>
<td>Lighting Control Repairs</td>
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<td>OA AHU Scheduling Adjustment</td>
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<td>T-12 Fixture Replacement</td>
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<td>Fitness Center Lighting Occupancy Sensor</td>
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<td>Stairwell LED Lighting</td>
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<td>Lobby LED Lighting</td>
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<td>Garage LED Lighting</td>
<td>Under Consideration</td>
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Questions & Comments

▶ Please submit your questions in the chat box

▶ We will try to address as many questions as we can in the time we have

▶ If your question was not addressed, please feel free to contact us via at tunnessen.walt@epa.gov
Treasure Hunts require advance planning

**Tip:** Give yourself of time to:

- Secure permission to conduct hunt at host site
- Confirm site’s management will attend report-out meeting
- Form teams & get approval for people’s time
- Gather energy information, data, site plans, etc.
- Train teams on TH approach, tools, etc.
- Finalize logistics for event

Flow chart from the treasure hunt guidebook
Start Planning Your Treasure Hunt

www.energystar.gov/TreasureHunt
Find the Treasure Campaign

1. **Conduct an Energy Treasure Hunt**
   - Organize a treasure hunt
   - Identify potential savings

2. **Add your energy savings to the Treasure Chest!**
   - Share treasure hunt findings at [www.energystar.gov/treasurehunt](http://www.energystar.gov/treasurehunt)

3. **Get EPA Recognition for participating**
   - Be featured on [www.energystar.gov/treasurehunt](http://www.energystar.gov/treasurehunt) webpage
   - Receive a printable certificate noting their contributions
   - Be included in an EPA communications about the campaign
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