Setting up the Next Generation for Success: Transition Planning for Energy Managers
Department of Energy
2018 Better Buildings Summit
Transition Planning for Energy Managers

Matthew Pekar
UTC
EH&S Senior Manager
1. UTC at a glance
2. Energy manager requirements
   • Basics
   • Intro to UTC
   • On the Job Training
   • Formal Training
   • Partnerships
UNITED TECHNOLOGIES
2017 revenue $60.2B

Heating, ventilating, cooling & refrigeration systems

Security & fire protection services

Elevators, escalators, moving walkways, people movers & horizontal transportation systems

Industrial & aerospace systems

Aircraft engines, gas turbines & space propulsion systems

No technical data subject to the EAR or the ITAR
GLOBAL PRESENCE

Manufacturing sites

Key manufacturing sites  Other manufacturing sites

No technical data subject to the EAR or the ITAR
2020 SUSTAINABILITY GOALS

Greenhouse gas reduction

United Technologies

2020 SUSTAINABILITY GOALS
MOVING THE WORLD FORWARD

- Reduce greenhouse gas emissions: 15%
- Reduce water consumption: 25%
- Implement global water best practices: 100%

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ENERGY MANAGEMENT

Traditional topics:
Lighting, HVAC, Compressed air, Process energy use,
Supply management, Building automation

Advanced topics:
Renewable energy, GHG management and accounting,
Distributed generation, Virtual net metering, Real time
data management, Energy procurement

Future concepts:
Advanced manufacturing processes, Utility scale
energy storage, Robots in manufacturing, Digital factories

No technical data subject to the EAR or the ITAR
UNITED TECHNOLOGIES
Career entry

Internships opportunities

EH&S Leadership Program (ELP)

No technical data subject to the EAR or the ITAR
A systematic approach to formulating and implementing an effective energy management plan
UTC ENERGY MANAGEMENT

Best management practices

#1 Complete UTC Energy Handbook review
#2 Create a site energy team
#3 Shut-it-off Program
#4 Lighting
#5 Compressed Air
#6 HVAC
#7 Boilers
#8 Building Automation System
#9 Process Energy Management
#10 Motor Management
#11 Utility Review
#12 Fleet Management

No technical data subject to the EAR or the ITAR
# ENERGY AUDITS

Required every 3-5 years

10% to 15% of audits conducted by UTC

No technical data subject to the EAR or the ITAR
DOE support

Dallas, TX: Energy Treasure Hunt “Train the Trainer I” Oct 2016

Collierville, TN: Energy Treasure Hunt “Train the Trainer II” Mar 2017

Riverside, CA: Compressed Air Workshop, April 2017

Springdale, AR: Motor Master Energy Audit, January 2018
UNITED TECHNOLOGIES

On the job training

2017 and 2018 Global In-house “Energy Treasure Hunt”
training conducted in the U.S., Canada, France and Mexico

No technical data subject to the EAR or the ITAR
UNITED TECHNOLOGIES

Certifications

AEE Certified Energy Manager (CEM) In-house training classes in CT and FL

Over 100 CEM’s working in Facilities Departments and as Carrier application engineers

Accreditation & Recognition

U.S. CEM® & CEA® Programs ANSI Accredited and Recognized by DOE

No technical data subject to the EAR or the ITAR
SUCCESSION PLANNING

Skill set

1. Energy interest
2. Technical background
3. Willingness to travel
4. Factory experience
5. Certifications
6. Degrees and diplomas

Energy Management Fundamentals

Capacity  Consumption
Cost  Controls

No technical data subject to the EAR or the ITAR
Q&A

United Technologies

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No technical data subject to the EAR or the ITAR
Setting up the Next Generation for Success: Transition Planning for Energy Managers

Leslie Marshall
Corporate Energy Engineering Lead
General Mills
Introduction

• Corporate Energy Engineer for General Mills
  • 2% energy intensity reduction goal
  • 8% GHG emissions reduction goal by the year 2025

• Professional Experience
  • 20+ years spent in manufacturing
  • 17 years supporting various production lines
  • 3+ reducing energy

• Understand business/production constraints that make reducing energy difficult
• Be more empathetic and accommodating to people impacted by energy projects and initiatives
Optimization is the Next Big Thing

- Capital projects
  - are cool and we should still do them

- Optimization
  - Allows the business to invest money in what’s most important (the consumer)
    - Saves energy
    - Saves maintenance costs
    - Avoids essential, unnecessary capital costs
    - Reduces ongoing operating costs on supporting utility equipment
  - Empowers the team and strengthens their technical ability

- Real time monitoring and data-driven decision making
Block Deployment is the Other Next Big Thing

- Corporate sponsored in-depth training on a specific utility for plants
  - DOE INPLT Compressed Air, Steam
- Provide a detailed task list of next steps to optimize/improve utility
- Coach plant through the action items and provide resources when necessary
- All plants implement tasks together before advancing to the next step
  - Return system to basic conditions
  - Baseline key metrics
  - Look for cost savings opportunities for capital projects
Strategy’s value

• Awareness of how much utilities/facilities can impact the business

• Business growth
  • Energy team has saved over $12 million in 6 years
  • Invest in product innovation and growth

• Appreciation
  • Everybody loves the people who save them money

• Technical expertise
  • Sense of pride
  • Empowerment
Hurdles

• An established culture
  • People like how they do things and don’t want to change

• Making sure energy stays a priority in a very dynamic business environment
Take-aways and Suggestions

• Team management skills are AS IMPORTANT AS technical expertise
  • Spend time developing leadership skills
  • Spend time developing presentation skills – understanding what data/information is relevant to specific audiences

• Assess the team’s passion for energy and change as a first step
  • Identify any gaps between team’s ability/skill set and the strategy/goal
  • Understand each team member’s motivation and ensure that the strategy caters to it in some way

• Reward the Team
Take-aways and Suggestions

- Don’t get frustrated
- Be persistent
- Practice empathy
Contact

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General Mills
Corporate Energy Engineering Lead
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Setting up the Next Generation for Success: Transition Planning for Energy Managers

Better Buildings Summit
August 2018
Ryan Spies – Saint-Gobain

Background

- Mechanical Engineer – Lehigh University
- MBA – Washington University in St. Louis
- 6 Years in Engineering/Strategy Roles
- 9 Years in Corporate Sustainability for 3 Fortune 500 Companies
- (Former) President – Net Impact Philadelphia Professional Chapter
Topics Covered

- Background on Saint-Gobain
- Goals and Leadership
- Engagement & Communications
- Programing
- Award Recognition
Who Is Saint-Gobain?
WHERE WE COME FROM: SAINT-GOBAIN'S HISTORY
AT THE BEGINNING OF SAINT-GOBAIN

The Hall of Mirrors in Versailles

The Louvre’s Pyramid
SAINT-GOBAIN’S INTERNATIONALIZATION IN THE 19th CENTURY

1830: Warehouse in New York

1848

1852: Glass Factory in Stolberg, Germany

1858

1865

1889: Glass Factory in Pisa, Italy

Façade of Budapest’s Station, Hungary
THE GROUP’S ORGANIZATION

Compagnie de Saint-Gobain

170,000 Employees

14 General Delegations

Finance
R&D
Marketing
Human Resources
Legal/Tax
Communications

Innovative Materials
Construction Products
Building Distribution

About 50 Activities
More than 1,000 consolidated companies
FLAT GLASS

Glassolutions walkway for Tower Bridge

Glassolutions Lite-floor glass for the Eiffel Tower

Glassolutions and Vetrotech for Emporia Mall, Sweden

SageGlass for the Kimmel Center, Philadelphia

Diamant glass for the National Centre for the Performing Arts, Beijing

Sekurit glass for Tesla

Thermalbond structural glazing for the Ciftp Towers, Istanbul

Sekurit glass for Chinese high-speed train
WE CAN TRANSFORM SPACES WITH SAGE GLASS
HIGH-PERFORMANCE MATERIALS

Sheerglass aerospace radomes for Airbus

Solargard paint protection for BMW

Ceramic catalytic products for the petrochemical industry

SG Crystals, Ceramic Materials, on 10,000 year clock project in the Texas Mountains

Sheerfill plastic membrane for Xining Stadium, China

Norton Abrasives for sanding wind generation blades

ADFORS Glagrid for landing runway, Honduras

Performance Plastics in Burj Al Arab, Dubai
CONSTRUCTION PRODUCTS

CertainTeed Ceilings in Calgary International airport

Multicomfort house in Norway

Ecophon ceiling in Moscow City Hall

Isover glass wool in Kyocera Dome, Osaka

Placo, Isover and Weber dry constructions in Brazil

Weber mortar in Mohammed VI university, Morocco

Habito wallboard in Wuzhen Conference Center, China

PAM pipe to transport water in Abu Dhabi
SAINT-GOBAIN INNOVATIVE INTERIOR AND EXTERIOR SOLUTIONS

1/ Cedarboard Insulated siding

2/ Optima Blow-in-Blanked Glass Wool Insulation

3/ Apollo II Roofing Integrated PV Shingle

4/ SilentFX Noise Reducing Gypsum Board
Sustainability and Energy in North America
CSG Goals – Short Term & Long Term

**CSG: 2025 Goals**  
2010 Baseline

- Energy consumption: -15% (MWh/NSP)
- Total CO$_2$ emissions: -20% (MTCO$_2$/NSP)
- Water discharge: -80% (M$^3$/NSP)
- Long-term: Zero industrial water discharge in liquid form
- Non-recovered waste: -50% (Ton/NSP)
- Long-term: Zero non-recovered waste

**CSG: 3 Year Goals 2017-2019**  
2016 Baseline

- Energy consumption: -5% (MWh/NSP)
- Total CO$_2$ emissions: -7% (MTCO$_2$/NSP)
- Water Withdrawal: -20% (M$^3$/NSP)
- Water Discharge: -20% (M$^3$/NSP)
- Non-recovered waste: -15% (Ton/NSP)
With over 130 manufacturing locations in North America, connecting resources internally has become a primary driver for sustainability at the Delegation.
Programs for North America

**Energy Management**
- Data Analysis
  - Moving from Annually to Quarterly
  - Broad Development for Leadership Consumption
- Program Development:
  - Lighting as a Service
  - Metering as a Service
  - Energy Service Contracts
- Training:
  - Monthly webinars
  - DOE In-Plant Training
  - Regional Kaizan’s
- Networking / Best Practices
  - Global Energy Managers Meeting (2x annually)
  - North America Sustainability Summit

**Carbon Management**
- Internal Price of Carbon Program
- Climate Change and Cap & Trade Committee
- Renewable Energy
  - On-Site
  - Off-Site

**Water Management**
- Priority Sites
- Water Balance Help (DOE)
- NALCO Partnership
SGNA Sustainability Champions Network

- Each Site has identified a site “Sustainability Champion”
- Some have designated multiple for the fields of Water, Waste, Energy and CO2 Emissions.
- In addition, the Network also includes:
  - Regional EHS Managers
  - Business Unit Energy Managers
  - CertainTeed Marketing Managers
  - Other interested parties

Over 270 members now make up the network
Sustainability Champion

We've received many questions on what the title of a Sustainability Champions entails, so we've come up with this brief role description to answer your questions!

Sustainability Champions were created to spearhead the continuous improvement of our operations on a site level basis, answering a public directive from executive management to reduce our environmental impact with regards to energy, water, waste and greenhouse gasses.

The efforts of champions will save money for our sites, reduce our short- and long-term risk, and help North America to meet the company’s 2025 reduction goals.

Roles and Responsibilities

The Sustainability Champion role can be fulfilled by an employee that has intimate knowledge (or desire to learn) of the plant’s processes, and is committed to continuously looking for opportunities for improvement. This is neither a full-time role nor necessarily a singular role; multiple people can be Sustainability Champions for a site covering different areas of expertise for water, waste, and energy. As the point person, your peers can come to you with ideas on how to make a process or system more efficient. The responsibility of this role is typically assigned by the Plant Manager, but being involved in the network can additionally be voluntary.

Role of the Sustainability Network

- Connecting sites to resources and vendors
- Providing training on energy/water efficiency measures
- Recognizing achievement through WWE Awards, Featured Sustainability Champion
- Conducting monthly webinars on sustainability topics
- Providing networking opportunities at the annual Sustainability Summit
- Providing market insights on product, technology, and manufacturing trends
- Providing resources and guidance on reducing environmental risks
- Expanding your leadership and expertise in a growing field of importance for Saint-Gobain worldwide

The SGNA Sustainability Network is here to support you and provide you resources to improve your site’s operations. Talk with your Plant Manager if you know anyone who would be interested in this role.

What should you do now? Get involved, take advantage of the resources, and promote your Sustainability Champion role in your email signature!

Define their roles! Even if that definition has fluidity.
Network Webinars

- **Webinar Series**
  - Monthly Webinar on variety of topics (Technical, best practices, success projects)
  - Most are by internal presenters (Case Studies)
  - Some are external presenters (Best practices/resources/vendor opportunities)
  - Q&A Sessions afterwards and a recording available offline
  - Webinar invites have been forwarded outside of the network on multiple occasions!
The Newsletter Highlights:

- Achievement at the Sites
- Successful sustainability projects
- Product Stewardship updates
- Upcoming Events/webinars/training opportunities (both internal and external)
- Relevant external news and guides on energy, water, waste and emissions.
<table>
<thead>
<tr>
<th>SITE</th>
<th>PROJECT</th>
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<tbody>
<tr>
<td>Bristol, RI Performance Plastics</td>
<td>MELDIN® Solvent Waste Reduction</td>
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<tr>
<td>Soddy-Daisy, TN NorPro</td>
<td>Panoramic Power Electrical Submetering</td>
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<tr>
<td>Avery/Milan, OH CertainTeed Roofing</td>
<td>Core Splitter Project</td>
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<tr>
<td>Faribault, MN Sage Glass</td>
<td>Waste Reduction</td>
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<td>L'Anse, MI CertainTeed Ceilings</td>
<td>Project Lake Dixon</td>
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<td>Moundsville, WV CertainTeed Gypsum</td>
<td>Fan Speed Reduction Project</td>
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<td>Brownsville, TX Abrasives</td>
<td>Water Reduction in Cooling Towers</td>
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<tr>
<td>Norwood, MA CertainTeed Roofing</td>
<td>Landfill Site to Solarfield</td>
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<tr>
<td>Albion, NY ADFORS</td>
<td>Plant Make Up Air Upgrades</td>
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CAPEX Free Lighting

Retrofit Overview

- Current Electrical Consumption (kWh): 2,502,775
- Post-Install Electrical Consumption (kWh): 628,531
- Annual Consumption Savings (kWh): 1,874,244
- Current Utility Rate: $0.061
- Utility Rebate: $45,123

- Gross Annual Lighting Savings: $114,411
- Estimated Annual Maintenance Savings: $35,050
- Estimated Annual Payment to Redaptive: $104,114
- Term Length: 9
- Saint Gobain Retained Lighting Savings: 9%
- Saint Gobain Retained Maintenance Savings: 100%

Customer Cash Flows Over Contract Length

<table>
<thead>
<tr>
<th>Year</th>
<th>Maintenance / HVAC Savings</th>
<th>Customer Retained Savings</th>
<th>Payment To Redaptive</th>
<th>Utility Payment</th>
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<tr>
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$45,347 / $149,462
Ann. In-Term Utility Savings / Ann. Post-Term Savings

$695,267
Saint Gobain 10-Year Total Savings Including Maintenance Savings and Utility Rate Inflation
Panoramic Power Energy Monitoring Technology

**DIFFERENTIATORS:**
- Low cost
- Clip-on instead of wired
- Online analysis tool
- Real-time, continuous monitoring
- Site insights reports by experts

**BENEFITS:**
- Monitor run hours and trends in energy consumption of individual loads
- Predictive equipment maintenance based on actual run hours
- Predictive equipment maintenance based on accumulated energy usage data
- Identify equipment issues proactively
2017 Sustainability Summit

Topics Covered
Goals for 2018 Summit

- Network with Peers
- Engage with the speakers
- Learn Something
- Teach Something
- Share Best Practices
- Award Achievement
- Network with Peers
- Solve Problems
- Help us improve
- Network with Peers
Representation at the 2018 Sustainability Summit
Water – Waste - Energy

WWE
The Goal of the Awards is to encourage sustained achievement in North America.

The objective is simple: creatively inspire competition among sites to reduce their environmental impact (waste, water, energy & CO2) and to sustain those reductions and attitudes.
Awarding Achievement
Smack Talk – YouTube Videos
2018 Awards
Our Communities Should also Recognize this Achievement