



Energy Efficiency in Industrial Manufacturing: DuPont's *Bold Energy Plan*

Bill Bailey: Leader of the DuPont Engineering's Energy Center of Competency
Mark Gleva: Site Energy Champion at DuPont's Richmond, VA Facility

VCU Energy and Sustainability Conference
January 31, 2013

Presentation Overview

- **Purpose:**
Exemplify the roles of energy efficiency, energy conservation, and sustainability in the manufacturing sector.
- **Process:**
PowerPoint Presentation and Q&A session.
- **Product:**
Strategic insight on building up successful site energy programs.
Raised awareness on the business value of energy efficiency.

DuPont in Richmond, VA: *Spruance Plant*

- * Founded in 1929
- * Protection Technologies & Performance Polymers
 - Kevlar® Body armor, Tires, Sails, etc.
 - Nomex® Fire-retardants, Electrical laminates, etc.
 - Tyvek® House-wrap, Medical packaging, etc.
 - Mylar®(JV) Flexible films, food packaging, etc.
 - Zytel® Light plastics, Auto parts, etc.
- * ~2,500 Employees
- * 400 acres along the James River (Rt. 150 & Rt. 1)
- * Annual utility expenditure ~\$50MM



2012 in Review

Site Energy Team delivered ~\$650M variable energy savings

Certified Energy Auditor Training completed by 17 employees

3rd Party Energy Assessments

HVAC

Compressed Gas Leaks (Ultrasonic)

Process Areas

Initiated site-wide recycling effort; raised \$200M+

Completed front-end loading for 44 energy opportunities



Primary Impediments

1. Where is the **money** coming from?
2. **Who** is going to do the work?
 - Resource limited – Fewer people as a result of business realities
 - Increasing reliance on contractors
 - Baby-Boomers retiring: High turnover and less-experienced resources
3. Competing **Priorities** / Political Capital
 - Safety, Reliability, Yield, Uptime, Cost, Labor Negotiations, etc.
4. **Stabilized Energy Prices**
 - i.e. very low electricity rate due to low-cost natural gas
5. **Work Process Management**

Keys to Success

1. Generate Political Capital

Network extensively: Discover key players who can & will get objectives done
 Demonstrate unified effort: **Integrate energy into safety, reliability, yield, uptime, etc.**
 Utilize **Corporate resources** (engineering, sourcing, legal, etc.) and **3rd Party Assessments**
Recognition: Victory correspondences, night-on-the-town awards, milestone updates

2. Ensure Contractors/Vendors are Serving Company's Best Interests

Challenge assumptions and findings as needed

“What would you do if this problem was in your house?”

“What can this software program do that Excel can not?”

“What will this survey uncover that I don't already know?”

3. Piggy-Back Financial Benefit of Eliminating Rentals

Total **rental expenditure** typically neither tracked nor included in energy spend

Keys to Success

4. Use Influence to Get/Keep Important Resources

5. Seek to Understand the Root Causes of Poor Energy Efficiency

Leaving valves wide open to avoid threshold alarms

Easy to use compressed air for unnecessary applications

Reluctance to tinker on night/weekend shifts because support is not on-hand

Tendency to replace-in-kind vs. proper updated installation (i.e. blowers)

Reluctance to turn lights out because of convenience / safety

What happens at your site on nights/weekends?

Bill Bailey



- Engineering Fellow – DuPont Engineering Research & Technology (Energy Engineering Group, Charlotte NC office)
 - Leads the Energy Center of Competency
 - Oversees the Bold Energy Plan
- BSME from Virginia Tech in 1978
- 34+ years with DuPont
 - Power Engineer, Waynesboro VA (1978-1980)
 - DuET Energy Engineering Consultant (1980-present)

Sustainable Growth and Energy Efficiency in

DuPont

VCU Energy & Sustainability
Conference

January 31, 2013 | Richmond, VA
Bill Bailey, Engineering Fellow and
Energy Center of Competency
Leader



The miracles of science™

DuPont Today

- A global science company solving problems in ways that makes people's lives better, safer and easier
- 200 plants and 80 R&D facilities in 70 countries
- A significant user of energy
 - ~150 Trillion Btu/year (
 - ~\$1 Billion annual spend



DuPont Tyvek® Housewrap



DuPont's Mission is "Sustainable Growth"

- We define "Sustainable Growth" as
 - Increasing shareholder and societal value...
 - While decreasing the footprint[†] of our operations...
 - Along the value chains in which we operate
- We view energy use as part of our footprint...

†Footprint = injuries, illnesses, incidents, waste, emissions, and depletable forms of raw materials and **energy**



DuPont's Original Commitment on Energy

- We announced our first energy goals at the Pew Center Conference on Global Climate Change in 1999
 - Hold total energy use flat versus a 1990 baseline
 - Reduce GHG emissions by 65% versus 1990
 - Supply 10% of total energy from renewable resources
- All were to be accomplished by year-end 2010
- Having measurable, public goals put teeth  into our commitment to improve our energy efficiency

We Delivered On Our Initial Commitments

- We achieved the GHG emissions goal 6 years early
 - By 2004, we had reduced emissions 72% versus 1990
 - We set a new goal to reduce GHG emissions 15% versus a 2004 baseline by the year 2015
- In 2010, we used 6% less energy than in 1990 while production increased over 40% (i.e., 6% **below** flat)
- Renewable energy provided ~6% of our  total needs

We Now Have a New Energy Goal

- Sustainability is a journey, not a destination!
When you achieve one goal, you must set a new one!
- Our new goal: by 2020, reduce non-renewable energy use per \$ of revenue by 10% versus a 2010 baseline
- As a milestone, by 2015 we will have reduced our energy use per \$ revenue by at least 3%
 - Energy use per \$ of revenue was down 1% in 2011
- I want to share our challenge and what



Our Challenge: “Grow While Shrinking”

- To achieve Sustainable Growth, we must **grow** shareholder value **while shrinking** energy use
- This is a difficult challenge for many reasons...
 - Energy efficiency is not a product quality variable
 - Energy use is broadly dispersed
 - Energy inefficiencies are frequently invisible
 - Expertise to make improvements is limited
- The remaining slides show our approach 

Our Response to the Challenge

- CEO called for a strategic plan for energy in late 2007
- This mandate resulted in the “Bold Energy Plan” (BEP)
- The BEP includes these key elements
 - Senior Leadership oversight...with financial objectives
 - Dedicated leadership for site efficiency programs
 - Provision of capital for improvement
 - Local plant improvement objectives
 - Tracking of site performance versus targets



Senior Leadership Commitment/ Oversight

- Chairman and CEO: “Enthusiasm for sustainability inside DuPont has grown because it is now directly tied to the company’s growth.”
- Senior VP of Operations: Commissioned 5-year strategic plan (“Bold Energy Plan”) at behest of CEO
- Operations VP: Oversees Plan progress and drives accountability for results versus goals
- Financial goal: Save \$230 million over 5 years
- Belief: We can meet Btu goals by focusing



Dedicated Site Leadership

- Improving energy efficiency is everyone's job...
- But without dedicated leadership, it is no one's job
- Over 120 plants now have a "Site Energy Champion"
- The Champions lead site energy efficiency programs
- The programs strive to meet annual savings targets based on known improvement opportunities



Local Objectives and Targets

- Our plants are fairly autonomous
- A Site Manager is responsible for all aspects of operations and sets priorities for the workforce
- His/her performance is judged by annual metrics
 - Safety: “Did you meet the goal of 0 injuries?”
 - Environment: “Did you meet the goal of 0 incidents?”
 - Fixed cost: “Did you meet your budget?” 
- We’re putting energy on the Manager’s

Tracking Performance vs. Target

- Having a target is useless unless you “keep score”
- We have an online database that tracks performance
- Progress is measured by the savings achieved from individual improvement projects at each plant
- The database currently tracks over 1,400 projects
- Since 2008, these projects have delivered year-over-year cost savings of \$230MM
- Tracking project results helps everyone

Availability of Capital for Improvement

- Setting public goals will not drive improvement unless you “put your money where your mouth is”
- If employees see that you won’t invest capital in good energy projects, they’ll stop looking for improvements
- We have implemented over 100 energy capital projects and have committed to invest as necessary to meet the 2020 Energy Goal



Networking Among Peers

- We have over 120 plants with annual BEP targets
- Although each plant is unique, they all use energy and have similar efficiency objectives
- We want our Energy Champions to talk to each other to rapidly replicate successful projects
- We conduct monthly Champions conference calls and bi-annual corporate energy conferences
- The Champions are now part of a



Leveraging of Technical Expertise

- DuPont has world-class energy experts
- The problem: there aren't enough to go around
- We recognized we must “leverage” our expertise so that the plants learn how to help themselves
- We're using technology to accomplish this objective
 - Comprehensive website disseminates best practices
 - Downloadable energy engineering assessment tools



We Have Been Recognized for Our Success

“DuPont's achievements in energy efficiency represent true leadership, and demonstrate what business can accomplish when it brings the interests of its shareholders, the environment and its neighbors together in setting business goals. We applaud DuPont's long-term dedication to sustainable business practices and in addressing challenges posed by climate change.”



Jonathan Lash
President, World Resources
Institute



Recognition for Success - Continued

- Our efforts have garnered external recognition
 - 40+ awards from the American Chemistry Council
 - Ranked No. 1 in US by Ceres on climate change
 - Named “Top Green Company” by Business Week
- This is all very gratifying, but...
- “We don’t see recognition as a victory. We see it as confirmation that we’re moving in the right direction and as encouragement to continue.”



Some Questions for You to Ponder

- What is your organization's "top floor" commitment to energy efficiency and sustainability?
- What energy and sustainability goals have you set? Are they public? Do you track and publish?
- Are you putting your money where your mouth is?
- How are you motivating **everyone** in your organization to drive improvement in energy efficiency?
- Our conclusion: Improving energy efficiency





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