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2009 National Symposium on Market Transformation

"The Changing Face of Market Transformation"

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ENERGY STAR® Programs



Emerging Technologies Session

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Fueling Green Power

Whole Foods Market Glastonbury is now able to generate about half of its electricity requirements on-site using UTC Power's fuel cell, which uses an electrochemical process that combines hydrogen and oxygen to produce electricity, heat and water. In traditional power plants, more than half the energy potential goes up the stack as waste heat, but the system at the Glastonbury store turns potential waste heat into usable energy by capturing the exhaust for cooling and heating.

This harnessed exhaust heat will provide heat and hot water year-round and help cool the refrigerated cases in the summer months.

Because the fuel cell operates without combustion, this electricity production is virtually pollution-free. With this installation, Whole Foods Market Glastonbury will prevent the release of more than 90 tons of CO₂ into the atmosphere per year. Additionally, the Glastonbury fuel cell will save 800,000 gallons of water each year that would otherwise be required by conventional electrical generation.



Whole Foods Market

- World's leading retailer of natural and organic foods
- We believe companies, like individuals, must assume their share of responsibility as tenants of Planet Earth.
- Fortune's "100 Best Companies To Work For" again in 2009 (12 years running and one of only several Companies on the list every year since its inception in 1998!)
- Average existing store size was ~32,000 sq ft but stores built over past several years were larger: 50,000 – 75,000 sq ft; multi-story, multi-use; moving forward will be somewhere in between!
- Custom design; community focused-no two stores are the same



The Whole Foods Market Business Model:

.....Holistic Interdependence.....

- Stakeholder community helps shape the purpose
- Who are our stakeholders?
 - Customers,
 - Team Members,
 - Investors,
 - SUPPLIERS,
 - Communities & the Environment



Background on Industry and WFM

- Typically thin margins and focus on operations and merchandising
- Most retailers (food and other) have corporate structure and some resources for engineering and facilities management
- WFM operates in a decentralized manner, and historically fewer resources in this capacity
- Grass roots, green mission representatives help drive programs
- Some store and regional team members are approached by vendors and may try a technology without complete due diligence or follow through by manufacturer/vendor
- Design and Engineering Community also on thin margins-not always able to innovate and be as up to speed on new technologies as we'd like (even with lighting, in some cases-more about architecture and retail offering).



What's an "In-House" Engineer to do?

- Embrace the culture
- Collaborate and Cooperate!
- Educate and get "buy in" and consensus
- Reach out to the community-suppliers, utilities, peers, trade associations and agencies, etc.
- At a NAPEE sector collaborative meeting, heard Dru Crawley of DOE's Building Technology Department on plans for Low/Zero Energy Buildings and knew there would be support and help for what I was envisioning!



Partnerships

- EPA NAPEE
- EPA Green Chill
- EPA Green Power Partners
- EPA Energy Star & Climate Leaders
- DOE Retail Energy Alliance
- DOE Commercial Lighting Solutions
- DOE Low Energy Buildings

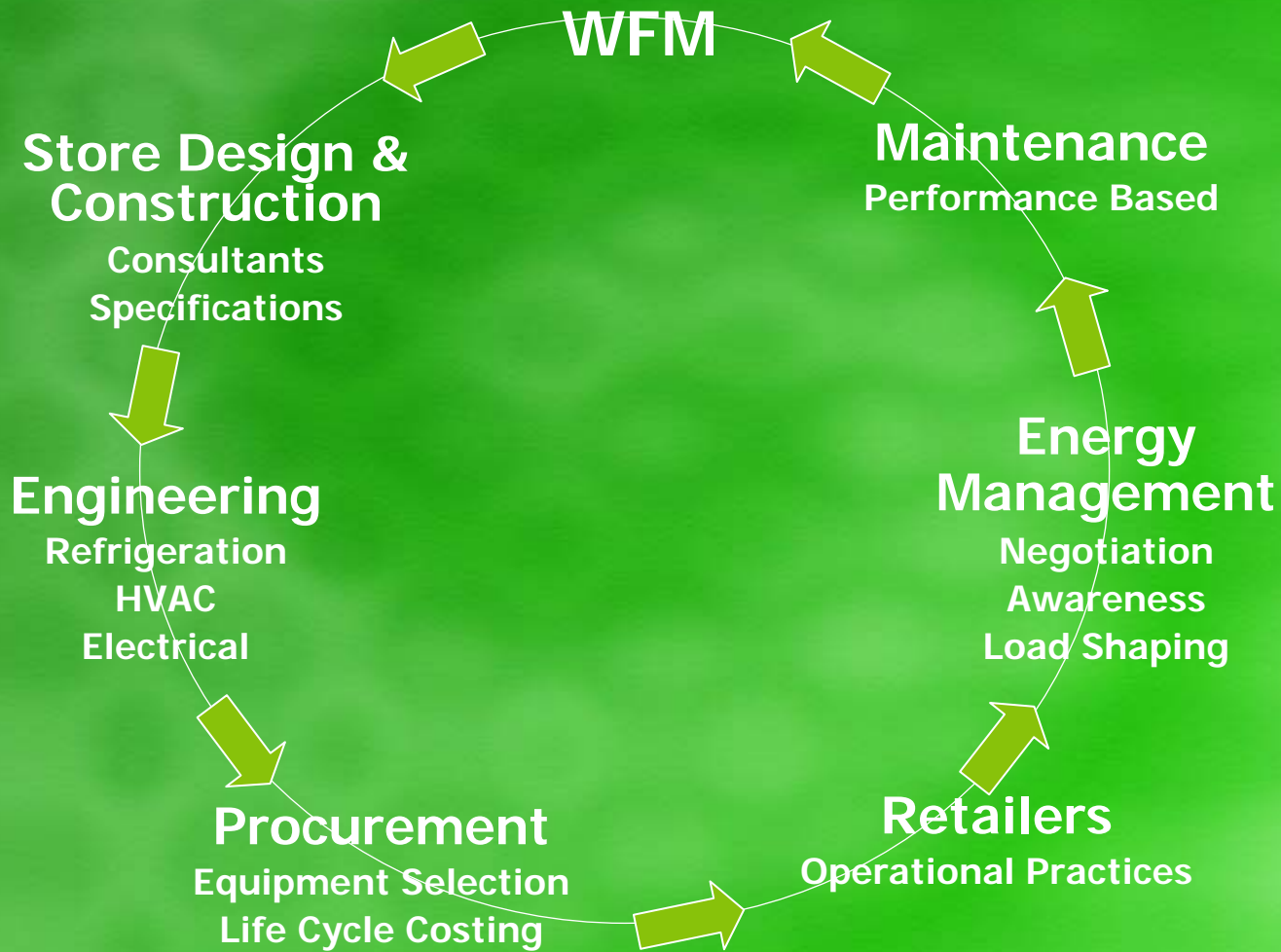


New Store Development Project Vision

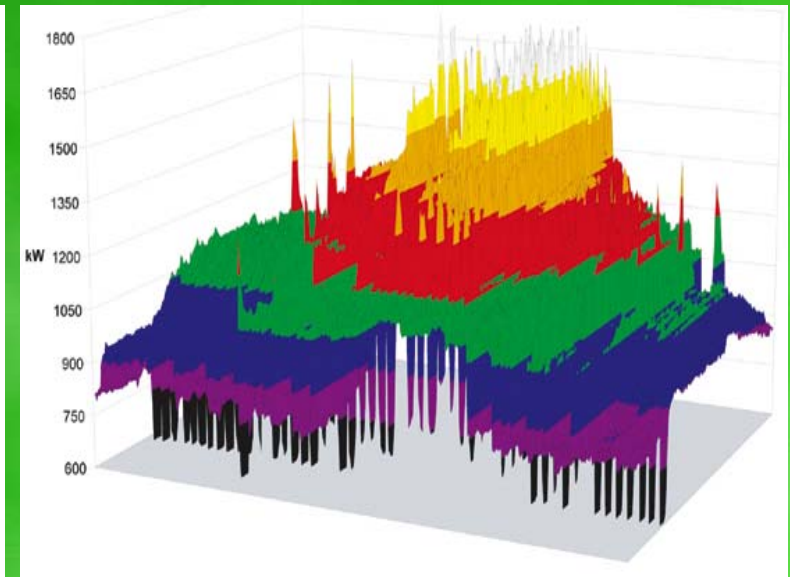
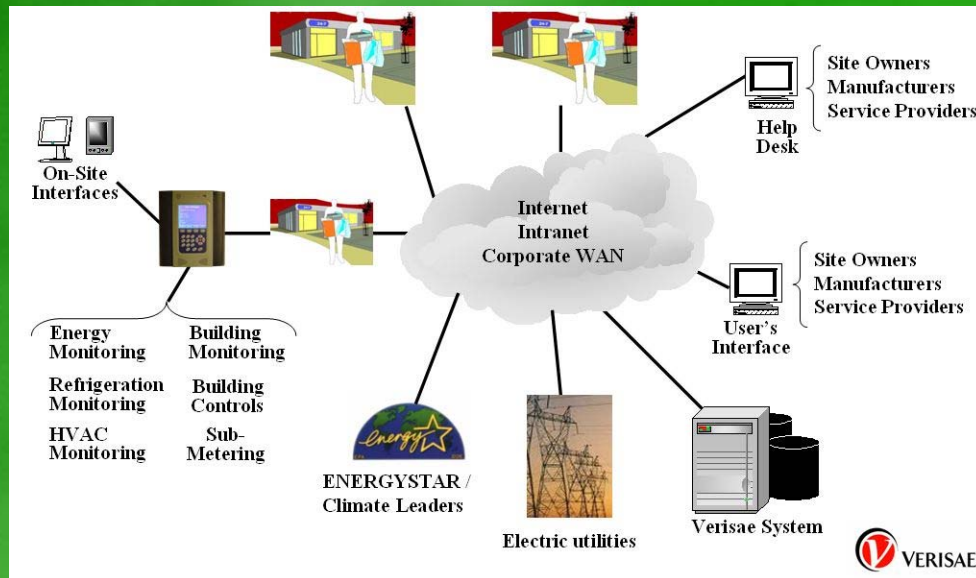
1. Total Life Cycle Planning –consider longer pay back periods for certain initiatives; broaden the IRR analysis to include less tangible benefits, for example team member happiness and excellence (and attraction), other triple bottom line considerations.
2. Lower energy consumption by 25-50%
3. First focus on integrated design, right sizing
3. Substantial reduction in raw building materials
3. Establish and enhance community- Educate customers
4. Restorative design-
 - Integrates site, shell, energy and water
5. Design for maximum building energy and operations efficiencies
6. Comprehensive Operations and Maintenance.
 - Comprehensive commissioning
 - Smart Building Technology Systems (controls and metering)
 - Educate team members on use of technologies



The Holistic Approach to Store Development and Operation



Resources and Tools for Optimum Efficiency



- Implementing a web-based, enterprise-wide tracking and reporting system to identify high-usage and high-cost stores and facilities
- Implementing equipment upgrades for savings
- Working with design and engineering teams to see that efficient systems, equipment, & control strategies are specified for new stores



“Smart metering, sub-metering and Controls”

- Will help identify best performing stores and energy end uses
- Feed back information to designers and engineers
- Tool for operators and facilities maintenance team members to identify equipment retrofit or end of life replacement opportunities for continuous improvement
- Can prove manufacturer's claims
- Identify load profiles based on weather and other factors and can help fine tune control systems for further usage savings (beyond equipment replacement; e.g. demand response, optimum start, stop, etc.)



Strategy

- Energy conservation through technology
 - new lighting, HVAC and refrigeration system technologies are much easier to adopt when introduced with strong support and service from mfrs along with incentives from utilities (feel like already somewhat vetted by utility engineers and consultants)
- Employ on site distributed energy (combined heating and power)
 - much tougher to adopt, engineers must be well versed and promoting this; have problems with incentives until decoupling approved
- Employ on site renewable sources (solar, fuel cells, waste cooking oil generators, wind)
 - significant due diligence required, much longer or an adoption process, much higher probability of success when mfr provides a turn key, purchase power or financing model with service included and work undertaken to ensure utility interconnection is possible



How are Emerging Technologies Identified?

- Individual Company approach
 - born of a need (sub-metering and enterprise wide monitoring, took brainstorming and willing partners and a really long time!)
- Manufacturer approach
 - Good examples: CES, UTC Power
- Turn Key Provider approach (manufacturer neutral but ends up influencing mfrs on buyers' behalf)
 - Good examples: SunEdison
- Trade Associations -
 - Pros-can be industry supported
 - Cons-annual meeting; can take too long to get completed; costs associated with marketing
 - Good examples-Seasons 4, Melink, Hill Phoenix (secondary refrigeration systems; Climate Keeper), Hussman (distributed systems)



How are Emerging Technologies Identified?

- Regional through Utility Partners, Renewable Energy Funds and ESCOs
 - Energy Smart Grocer; LED Power, Lifecycle Renewables, pre-qualified mfrs, ORNL-demand response audits, etc.
- Nationally through EEI, AGA and other workshops
 - expensive to attend; how to “verify”, etc.
- Nationally through EPA
 - NAPEE push could be especially helpful in driving consistent data acquisition and incentive program development “fuel blind” across all utilities as it ensures predictability for mfrs to increase market penetration



Best Options for Identifying and Evaluating Emerging Technologies

- Best options collaborate with all parties; a broad based coalition across many sectors-no more silos!
- One example is EPA's Energy Star Program
 - Assurance that experts have pre-qualified a technology
- A more comprehensive approach is DOE's Retail Energy Alliance
 - Inclusive, Programmatic Approach, relying on experts at the National Labs, Consultants to keep organized and ongoing action and follow up
 - Sub-Committees across end uses and retailers
 - Supplier Summits
 - Technology Screening Process
 - Once technology is "vetted"; also identifies ways to bring costs down and alternative procurement methods

