

Food Processing Industry Resource Efficiency

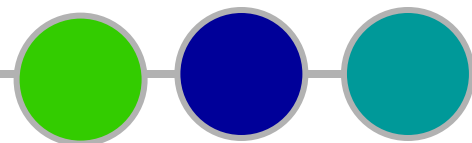
***STAC funded
multi-state collaborative***

ASERTTI Winter Meeting
Jake Fey, WSU Energy Program
February 12, 2007

Food Processing Industry in WA, OR, ID, CA

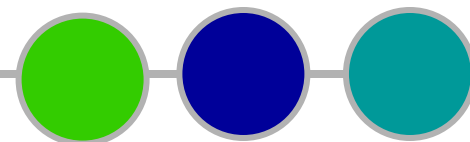


- **Approximately \$60 billion in product shipments each year**
- **Over 15 percent of the gross national product for industry**
- **Employs over 224,000, with payrolls exceeding \$7.7 billion**
- **Energy use cut in half by food processors over past 30 years, but energy costs have risen nearly tenfold**
- **Current energy usage ranges from 3 to 45 percent of production costs – a significant factor**



Opportunity Knocks

- In November 2002, NASEO, ASERTTI, and U.S.DOE came together to form STAC – *State Technologies Advancement Collaborative*
- STAC provided funding for projects focused on:
 - Efficient Transportation Technology Use
 - Building Technologies
 - Industrial Technologies
 - Distributed Energy Resources
- Representatives from CA, ID, OR, WA recognized their collective expertise could provide a value-added resource for food processing industry in the region and across the country

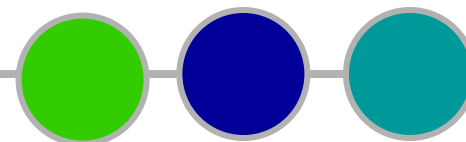


Food Processing Industry Resource Efficiency -- FIRE --



Public-Private collaboration

- *California Energy Commission*
- *California League of Food Processors*
- *Del Monte Foods*
- *Idaho Energy Division*
- *Lawrence Berkeley National Laboratory*
- *Northwest Energy Efficiency Alliance*
- *Northwest Food Processors Association*
- *Oregon Department of Energy (Contract Lead)*
- *Washington State University Energy Program (Project Lead)*

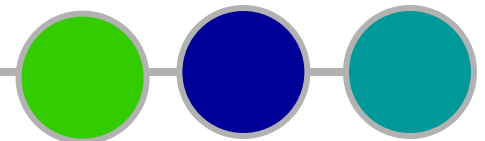




FIRE Project Goals

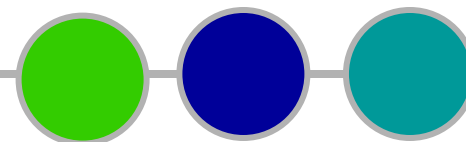
Overall aim of project – create an effective network to improve the energy and water use efficiency of the food processing industry in California, Idaho, Oregon, and Washington.

- 1. Planning: Identify specific needs of industry, and develop network for information sharing**
- 2. Best practices portfolio: Identify best processing practices for energy and water savings**
- 3. Emerging technologies: Identify new technologies showing promise for efficiency**
- 4. Prepare and deliver content: Implement a communication strategy**
 - Workshops**
 - Case Studies**
 - Satellite teleconference**
 - Website**
- 5. Project demonstration: Utility Enterprise Management**



A Summary of Results Industry Stakeholders

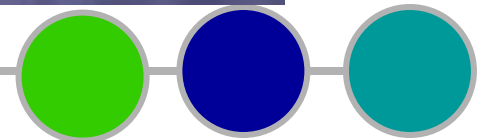
- Developed stakeholder network:
 - Trade associations
 - Universities
 - Industry leaders
 - State and regional agencies
 - Energy efficiency organizations
 - National laboratories
- Focused on identifying industry needs, and planning and implementation strategies for transferring best practices and emerging technologies within food processing sector
- NWFPA quarterly newsletter – *Energy Insider*



Best Practices Portfolio

Created portfolio of energy management and system optimization best practices resources for food processing industry:

- **Case studies**
- **Emerging and existing technologies information**
- **Industry best practices**
- **Web-based training video on steam system optimization**
- **Productivity resources**
- **Financial incentives information**
- **Publications and software tools**
- **Available services**
- **Trainings and conferences**

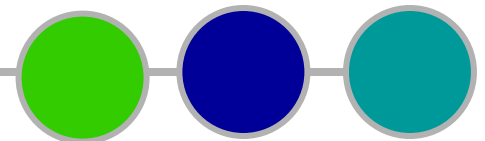




Emerging & Existing Technologies

- Created portfolio of emerging technologies sorted by end use and/or system type
- Existing technologies also featured

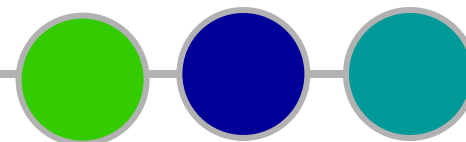
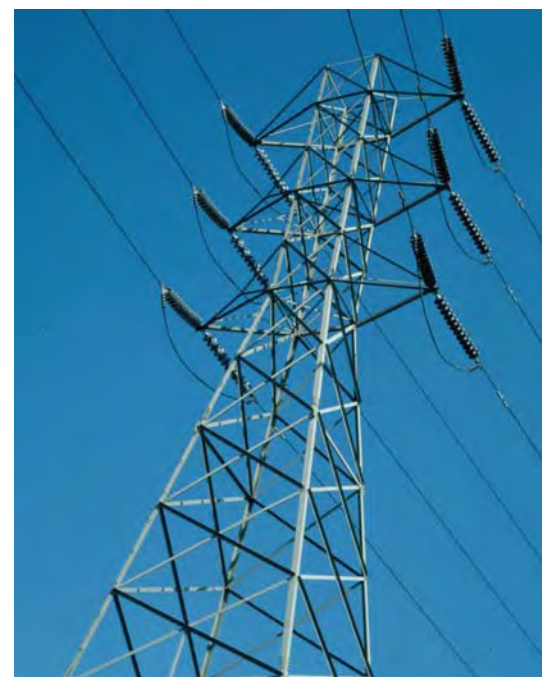
In total, 115 different emerging and existing technologies were profiled and indexed through this effort. The list represents the most comprehensive such collection currently available through any medium.



Voltage Sag Protection

FIRE team members developed a programmable logic-control system protection strategy encouraging food processors to specify and purchase equipment that would ride through most voltage sags.

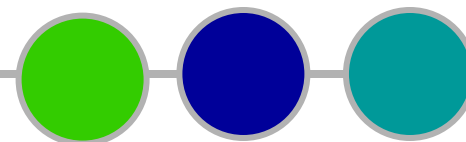
**Resulted in guidelines adopted by the NW Food Processors Association in September 2005 -
*“Voltage Sag Immunity Guidelines and Test Protocol for Automated Food Processing Systems”***



Case Studies – Demonstration Projects



- **Developed 7 case studies describing demonstration projects funded by California Energy Commission's Public Interest Energy Research (PIER) program:**
 - **Demonstration of electro dialysis technology in the wine industry**
 - **Demonstration of heat pump system at two poultry facilities**
 - **Demonstration of steam boiler burner control system**
- **Collectively, the case studies demonstrate savings of 3+ million kWh and 32,400 therms, along with nearly \$200,000 annually.**



ENERGY PORTAL

ESTABLISHED TECHNOLOGY
An emerging technology was defined as a technology that is already commercialized, represents a percentage of the market for energy-efficient applications in the food industry.
[» more](#)

OPPORTUNITY ASSESSMENT
Determine the steps necessary to use energy resources wisely and increase profits.
[» more](#)

EFFICIENCY PRACTICES
Detailed information on energy topics of interest to the food processing industry.
[» more](#)

EMERGING TECHNOLOGIES
Keep on the cutting edge of the latest energy technology advances affecting the industry.
[» more](#)

FINANCING / INCENTIVES
Where do we find the money to implement energy projects? Here are some answers.
[» more](#)

RESOURCES / ASSISTANCE
Links, publications, tools, software, and other resources to obtain additional information.
[» more](#)

TRAINING CALENDAR
Seminars, workshops, and training sessions to advance your energy efficiency expertise.
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WELCOME TO ENERGY PORTAL



The Energy Portal is your resource for energy efficiency information specifically tailored to the food processing industry. Within these pages you will find the most comprehensive collection of energy-specific web resources, electronic documents, downloadable materials, and links to additional information available to the food processing industry. Use the guide to your left to navigate to the information that you need. You will find information on technologies, processes, and practices to save energy, save money, and increase your company's profits.

This information has been compiled by the Food Industry Resource Efficiency team (FIRE), a partnership between the Northwest Food Processors Association (NWFPA) and the California League of Food Processors (CLFP) in collaboration with a number of public and private sector partners.

THESE PARTNERS INCLUDE:

- California Energy Commission
- Del Monte Foods
- Idaho Department of Water Resources' Energy Division
- Lawrence Berkeley National Laboratory
- Northwest Energy Efficiency Alliance
- Oregon Department of Energy
- U.S. Department of Energy
- Washington State University Energy Extension Program

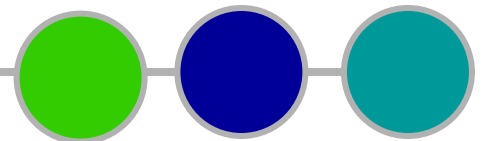
FUNDING:

Funding for this project from the State Technology Advancement Collaborative (STAC), a program administered by the National Association of State Energy Officials (NASEO) for the U.S. Department of Energy (DOE), is gratefully acknowledged.

Energy Portal

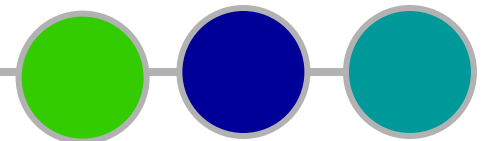
The most comprehensive resource for food processing energy efficiency information available from any source, and the only one of its kind in the country.

- **Searchable, user-friendly site**
- **Site went live in mid-July 2005**
- **As of February 2007, over 62,350 hits**
- **Tracking indicates those hits go deep into the site, not just the home page**



Satellite Teleconference

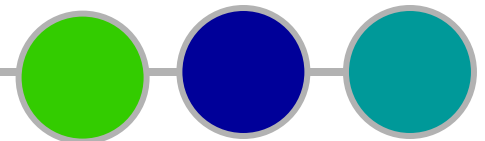
- 3-hour satellite teleconference broadcast live March 9, 2006
- Over 1150 participants from industry, trade associations, universities, state and federal agencies
- 85 host sites across U.S. and Canada, including:
 - utilities
 - energy and food processing organizations
 - 41 academic institutions (many of which were food science departments)
- Raised awareness on the link between energy efficiency and increased competitiveness of U.S. manufacturers.





Industrial Energy Best Practices Conference

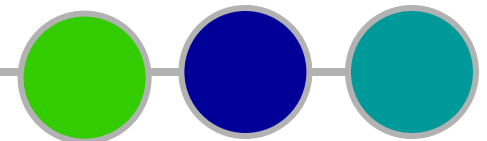
- Held in conjunction with NWFPA Annual Expo, Jan 2005
- Over 250 attendees from food processing and other industries, utilities, government agencies, energy services, and industrial resource providers
- Speakers from food processing, pulp & paper, and microelectronics industries - featured real life success stories of applied best practices in their plants





Industrial Best Practices Training

- **California Energy Commission implemented state-wide training program, featuring DOE BestPractices trainers and curriculum**
 - **Pump System Assessment – 2 sessions**
 - **Steam System Assessment – 3 sessions**
 - **Fundamentals of Compressed Air Systems – 6 sessions**
- **Resulted in savings of 124,650 mmBtu per year (based on USDOE’s “Estimated Energy Savings Criteria”)**

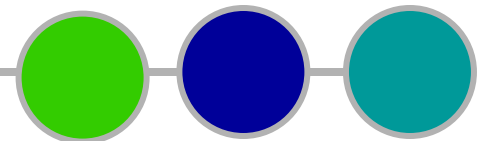




Utility Enterprise Management Demonstration Project

Objective: Provide real time operations data on key plant systems to evaluate effectiveness of improving energy efficiency

- **Install Enterprise Energy Management (EEM) system, and integrate with existing Enterprise Asset Management (EAM) system**
- **State-of-the-art monitoring and data management system to optimize plant usage of water, compressed air, gas, electrical, and steam systems (WAGES)**
- **EAM focused on energy efficient life cycle equipment operation**

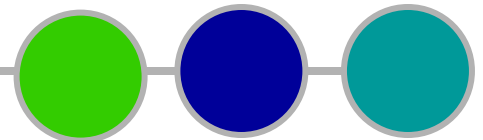




Plug-in Electric Forklifts

Demonstration project involved electric forklifts:

- Forklift driver plugs/unplugs electric forklift from fast charger
- Input energy data from charger into EEM, and forklift operating hour data into EAM for predictive and preventive maintenance per OEM requirements
- Ongoing energy data monitored (EEM), as well as hour meter data from forklift (EAM)
- Once specified forklift OEM maintenance hours are accumulated in EAM per hour meter infeed:
 - Work order generated in EAM
 - Store's inventory automatically searched for appropriate parts to complete work order for specified maintenance
 - If no parts available, purchase order automatically generated and submitted to appropriate vendor for parts replenishment

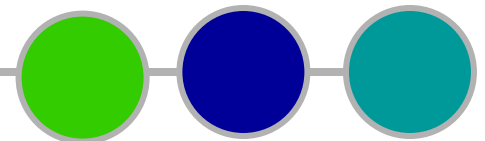




Project Success

- **Significant WAGES savings and efficiency benefits to manufacturing operations realized**
- **Plans for replication at 3-5 other Del Monte plants**
- **Other industries have begun three similar projects**
- **Project won California's 2006 *Flex Your Power Education & Leadership Award***

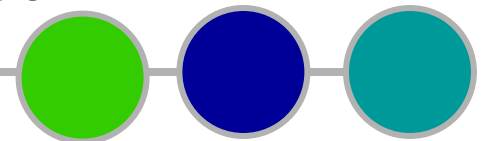
The success of Del Monte's demonstration project has prompted the transfer of industry Best Practices EEM-EAM to state government as part of Governor Schwarzenegger's Green Action Team efforts.

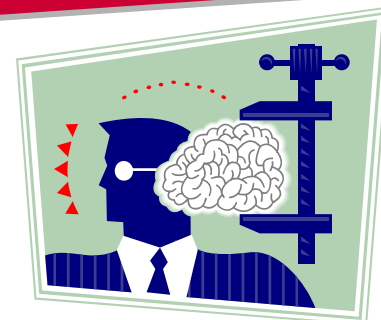




Wrapping Up

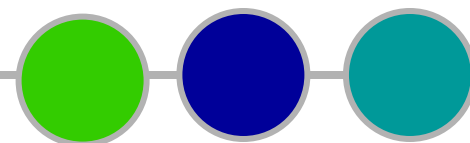
- **Clear understanding of industry technology and best practices needs, and practical way of filling those needs with cost-effective solutions**
- **Information delivered in coordinated, cost-effective way**
- **Industry feedback overwhelmingly positive**
- **FIRE team members continue to collaborate on variety of efforts**
- **Project legwork helped establish readiness of food processing industry for market transformation efforts through NEEA's Industrial Efficiency Alliance**

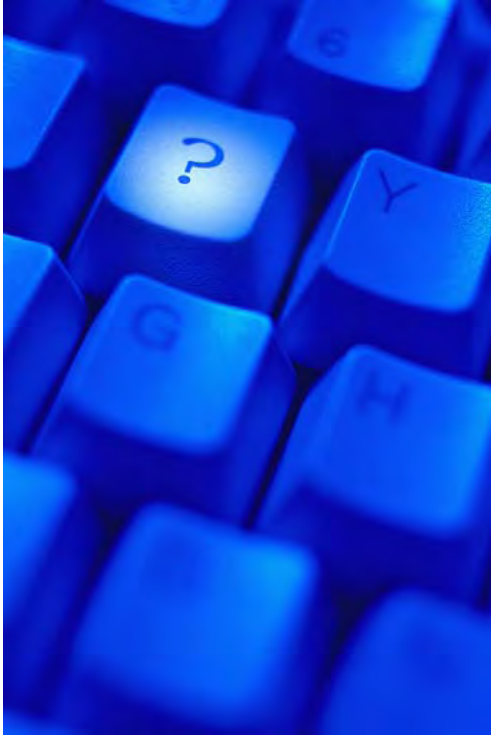




Lessons Learned

- **Well targeted and delivered information created specifically for an industry (food processing or other) will likely be well received**
- **Much work is required in the collection and packaging of information for specific industries (e.g. Energy Portal, best practices portfolio, emerging technologies report, etc.)**
- **The FIRE project successes are due in large part to the involvement of the NWFPA and CLFP trade associations. If you find a good trade organization willing to work with you, and your efforts are unified and organized, the impacts will persist over time**
- **The stronger the trade organization and member buy-in, the more likely you are to get results**





Q & A Session

