From the Factory to the Boardroom: Connecting Midwest Industry with Energy Efficiency Opportunities

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ABSTRACT

With the heavy concentration of industry in the Midwest, there is a tremendous need for industrial energy efficiency program coordination the current economy. In response to this need, the Energy Foundation has provided resources to the Midwest Energy Efficiency Alliance (MEEA) to address this. A combination of outreach to manufacturers and utility contacts, collecting and evaluating current and potential programs, coordinating training & workshops, developing marketing and outreach materials, advancing energy efficiency policy and best practices, coordinating utility program efforts with industry they serve, a regional voice for DOE/EPA & ENERGY STAR, evaluating & promoting emerging technologies, partnership development and a comprehensive web presence is currently in progress. The goal of this effort is to become a resource whose primary goal is encouraging the pursuit of energy efficiency in industry to all stakeholders while assuring a consistent handoff from each stage of interaction to the next.

Introduction

In recent years, industry, and in particular, energy-intensive manufacturing sectors (steel, aluminum, glass, paper, etc.), have experienced a downturn in many respects as global competitiveness, increasing costs, unpredictable fuel prices and the economy eat away at profits and available resources. Companies are forced to choose cost savings opportunities based often on extremely short payback periods, reducing the attractiveness of implementation of more long-term energy efficiency and renewable energy investments. To complicate things even more, loan programs for implementation of new efficiency technologies are currently deemed extremely risky from a financial institution standpoint, and the Department of Energy has shifted gears slightly away from the network they previously funded for partnership development and regional efforts.

On the flip side, utility industry energy efficiency programs are increasing annually. In addition, the upcoming passage of the ISO 50001 Energy Management standards has spurred additional interest in energy management, and there are still resources available on a limited basis for plants to get processes assessed for efficiency opportunities. Finally, there are Manufacturing Extension Partnerships and some universities that can offer technical assistance where available, as well.

Given that the Midwest states (addressed herein as IA, IL, IN, KS, KY, MI, MN, MO, OH, ND, NE, SD and WI) collectively account for approximately 28% of all energy used and nearly 50% of coal consumption for industry in the United States (Figure 1), an opportunity for partnerships and awareness within this area seems appropriate. In response to the need for coordination of resources and outreach, MEEA was chosen by the Energy Foundation to initiate an industrial energy efficiency program in October of 2010, and is currently funded for 2 years to accomplish these tasks. MEEA is a regional nonprofit covering the above-mentioned Midwestern

states to advance energy efficiency to support sustainable economic development and environmental preservation. MEEA, like the other regional associations (Southwest Energy Efficiency Program-SWEEP, Southeast Energy Efficiency Alliance-SEEA, and the Northwest Energy Efficiency Program-NEEA), is a membership organization consisting of all facets of energy efficiency organizations, including manufacturing, industry, utilities, NGOs, state/local government, energy service companies, consultants, academic/research organizations, retailers and other professionals. MEEA also has robust program and policy areas to promote best practices and good policy decisions.

The following activities are expected to be addressed with this effort, and will be detailed below:

- Outreach to Industrials and Utility Contacts
- Collecting and Evaluating Current and Potential Programs
- Coordinating Training & Workshops
- Advancing Energy Efficiency Policy and Best Practices
- Coordinating Utility Program Efforts with Industry They Serve
- Regional Voice for DOE/EPA & ENERGY STAR
- Evaluating & Promoting Emerging Technologies
- Developing Marketing and Outreach Materials

A Midwest Opportunity

The current competitive market climate can sometimes force facilities to downsize or even close. Energy efficiency and technology improvements can often reduce expenditures to swing the balance of a potentially closing facility back to competitiveness. For industrial customers, energy efficiency is not their primary business. The limited time and resources of in-house engineering is typically production focused, not energy efficiency focused. In addition, searching through the myriad of potential efficiency resources can sometimes be daunting, and there exists within the Midwest an opportunity for both education and planning assistance by an informed third party. The Midwest Energy Efficiency Alliance (MEEA) is launching the following activities that will target many Midwestern facilities, as well as their suppliers and customers, in hopes of preserving and perhaps even growing the industrial base located here while reducing the energy used per unit of manufacturing. It should be clarified that while MEEA will focus on the advancement of energy efficiency measures, at a very minimum, it will serve to educate manufacturers of their options, regardless of the outcome.

Current Midwest Industrial Energy Market Conditions

Energy efficiency, long thought the resource of California and the Northeast, is growing exponentially in the Midwest. As recent as 2005, total investment in energy efficiency through public benefit funds and EERS totaled less than $200M per year. However, with the explosion of investment in energy efficiency through legislative action and adoption of energy efficiency requirements, MEEA estimates that in 2012, almost $1B will be spent annually on energy efficiency programs; over a 200% increase since 2005. In addition, MEEA projects by 2015 that over $1.5 billion will be spent annually on efficiency. Furthermore, the passage of the American Reinvestment and Recovery Act (ARRA) placed >$3 Billion into the Energy Efficiency

Community Block Grant Program to be used in local and regional energy efficiency efforts within the past 2 years, with results yet to be determined (Figures 2 and 3).

Last year, the following Midwest entities: Chicago Metropolitan Agency for Planning, Greater Cincinnati Energy Alliance, City of Indianapolis, Kansas City, State of Missouri, Omaha, Nebraska, Toledo-Lucas County Port Authority, Ohio, and Wisconsin Energy Conservation Corporation were awarded a total of $122M of Recovery Act funding to "ramp-up" energy efficiency building retrofits. By MEEA's estimates, the total investment in energy efficiency in the Midwest by 2012 will conservatively be almost $3.9B – an unprecedented amount of funding for the Midwest.

Given the trying economic times, the addition of millions of dollars of efficiency funding and the ARRA influx of capital, the Midwest Region has undergone a tremendous amount of flux with respect to industrial jobs and state and local incentives. It is an excellent time and opportunity for partnership development using energy efficiency, with the side benefit of carbon-reduction, as a method of reducing production costs, training workers and installing new technologies. This will enable stakeholder facilities to both remain competitive and reduce lay-offs. There also exists a need for coordination of the available resources to accomplish these tasks, the main focus of what MEEA hopes to address herein.

Need For Activity

For close to a decade, the US Department of Energy (DOE) had a Regional Office network to organize and coordinate local EE resources. However, budget cuts and strategic re-alignment all but dissolved that network. Funding still exists for industrial EE from many sources, however, and not only are they available from many sources, one of them, the Recovery Act, has given awards to thousands of organizations around the country, with very little coordination between awardees. In addition, there is predicted to be sizable growth in utility funding & targets for EE (Table 1).

Core Strategies

Energy is used throughout many aspects of an industrial facility. Much like residential or commercial property, the building shell and infrastructure (lighting, heating, cooling, etc) are opportunities to reduce energy. For industrials also, the energy used to produce or transform materials may also be an opportunity for savings. MEEA's effort will target both aspects and will work with existing utility, state and Federal incentives as well as look at cutting edge, emerging technologies. The following activities are meant to target different energy concerns. In reality, however, they are intimately related by certain core concepts: outreach, education, partnership development, technical assistance and follow-up.

Although they are not listed by priority, it should be noted that all of these opportunities will proceed at different rates and, at any given time, will increase or decrease in importance depending on necessity and opportunity. The primary process areas targeted for these initiatives include (but are not limited to):

- Process energy
- Advanced lighting
- Compressed air

- Distributed generation
- Steam
- Waste heat recovery
- Fans
- Pumps
- Motors
- Chilled water systems
- Building envelope

For each of the above areas, MEEA will seek out available training, software or available technical assistance of benefit to industrial users and organize these opportunities on their website, or link to the sites which promote these activities natively, in addition to referring to them in face to face or conference call meetings with stakeholders.

Evaluation of Current and Potential Programs

Since most regional efforts which were funded by DOE in the past have now transitioned to more localized activities with the Recovery Act, MEEA will evaluate the current activities for alignment opportunities and confluences of influence in reaching out to stakeholders. The methods for this evaluation vary on a case-by-case basis, but objectivity will remain the most important criteria.

Regional Input/Allies Group

A critical component of MEEA's regional effort is having a regional communication network featuring representatives from around the targeted area to provide more detailed information regarding local needs and opportunities and represent the best interests of their states/communities. Many of these individuals have already been identified, but the final group(s) will feature utilities, industry, NGOs, state agencies and other service providers. Industrials will be recruited as well. The primary modes of engagement will be to participate in regular calls or webinars to communicate existing and upcoming initiatives/focus areas and solicit needs assessments, as appropriate. Some of the key issues to address with this group include:

- Facilitate discussions with industrials on what would increase participation of EE programs
- Work through sticky policy or technology issues as they arise
- Seek to make efficiency an executive commitment
- Establish scheduled meetings (phone, web)
- Assist in promoting message to industrials
- Help organize and mobilize local resources to aid in efficiency and program goals

Enrollment and Support of Manufacturers in the Save Energy Now (SEN), Climate Leaders and Environment, Energy and Economics (E3) Federal Initiatives

Given that The Recovery Act awarded over $3 Billion to states and local entities to pursue energy efficiency programs, that DOE annually awards multimillion dollar grants to states, as well as new and existing DOE, Utility and EPA initiatives (including regulatory), the number, types and amount of assistance available to Midwest industry often makes it often difficult for industrial facilities to best take advantage of these opportunities without some external guidance. An excellent opportunity exists with the regional network being proposed herein to both educate and link companies with resources and voluntary programs. MEEA's resources and regional presence are ideal for organizing and presenting these efforts to industry so that they can make informed decisions on how to proceed and get involved. The following steps are proposed for achieving this goal:

- Identify Energy Efficiency Community Block Grants, Save Energy Now and other Federal Energy Efficiency Programs and what industrial resources they have available for local manufacturers.
- Partner with trade associations and other existing stakeholder organizations locate and target appropriately-sized businesses that would necessarily benefit from involvement in these programs and follow-up with them to gauge feasibility and interest.
- On a case-by-case basis with favorable companies, determine the best approach for technical assistance, training, assessments and implementation follow-up, the goal being to create seamless transition from one step to the next.

Encouragement of Long Term Energy Management Strategies, such as Superior Energy Performance or ISO 50001

Although ISO 50001 is still unpublished at this writing, MEEA's program will seek to promote the long term pursuit of energy goals with plants that are engaged. However, while the long term goal of any effort is to increase the implementation of voluntary, long term energy management programs, the primary strategy of the MEEA effort is to begin the dialogue and to start companies along the path of energy efficiency with the intent to make efficiency not just a factory by factory decision but also a corporate wide executive, strategic decision.

Expansion/Maximization of Existing Regional Resources

The Midwest has a good network of Industrial Assessment Centers (IAC), Manufacturing Extension Partnerships (MEP), Regional Application Centers (RAC), and other resource providers that are underfunded. These could be used more effectively, and hopefully more often with additional funding if it becomes available in the future. Some possibilities for this funding include utility-based subsidies, other state/federal funding or even private or foundation funding. These additional resources would be used to encourage more companies to develop internal energy management programs. MEEA's program will also seek to better coordinate some of these resources to better pursue and attain funding.

Regional Clearinghouse for Information

Being a regional association, MEEA is also well-suited to be a repository of information for contacts, programs and information. MEEA is currently developing a webpage for all of this information to be located (or to at least be linked) in one place. The page will have:

- Utility, Industry and other resource contacts
- Links to all relevant programs or direct links to local websites detailing such programs
- Efficiency best practices and case studies highlighting regional and national successes
- Links to state and federal agencies who manage these efforts
- Links to other programs, such as loans, tax incentives and others.

In addition, a newsletter will be created with timely information for companies in the region.

Midwest Industrial Emerging Technology (ET) Council

Only a few Midwestern utilities and/or energy efficiency programs offer well-organized industrial ET programs. Most ET programs offer some incentives for demonstrations of technologies and a few offer comprehensive commercialization services. There is a need for more widespread sharing of information on demonstrations to avoid duplication, possibly through webcasts or similar facilities within a corporation in different locations. There is also a need for existing ET programs to be able to offer wider multi-state marketing to ET vendors so they will spend the resources needed to get demonstrations and multiple installations of their technology in the Midwest.

- Identify existing ET programs and providers and gauge their interest
- Develop and refine a proposal for a Regional ET Council, including draft mission and operating rules
- Agree upon M&V protocol to be used by all participants and how information exchanges will take place
- Develop methods of cost-sharing demonstrations where feasible and appropriate

Expand Utility Penetration

MEEA is in a unique position to connect interested industrial decision makers with the utility programs in their area. MEEA could not be an administrator of utility programs or come between the utility and their strategic accounts but would use its network and strategic connections to encourage more industry to get involved in programs that they may not otherwise entertain as long as they are feasible. This will be accomplished at first by referrals from service providers with potential opportunities which may need assistance, but then may expand to other roles. MEEA being the ‘source on energy efficiency’ would utilize its contacts and place in the region to be a connector for the industrial sector, no matter where their facilities are located.

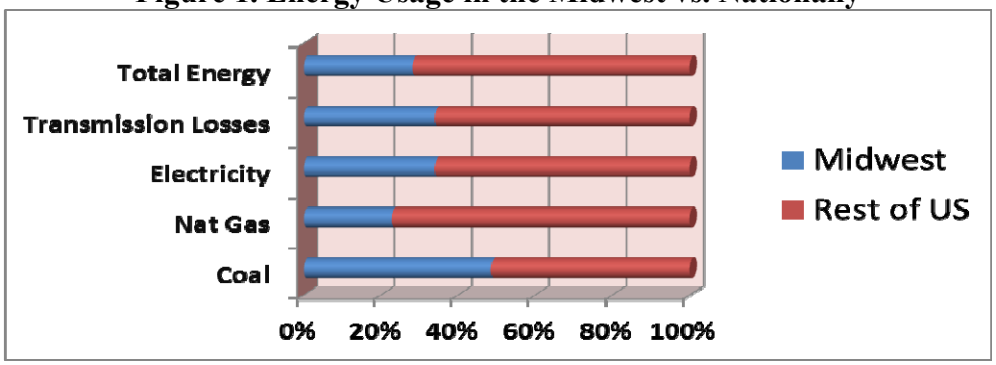
Evaluation Criteria

MEEA's Industrial Initiative's success will depend on a multitude of factors, many of which are listed below.

- Creation of the regional network is solidified and has active participation
- Heavy enrollment in DOE's SEP program or other long term energy management plan (ISO 50001, etc.)
- Development of quality case studies with measurable savings
- Cataloging of best practices to promote efficiency programs
- Heavy traffic to MEEA's industrial page
- Interest and support in emerging industrial technologies
- Increased uptake of utility and state EE funding
- Increased industrial participation in the program
- Attaining sustainable, long term funding for the Initiative
- Executive level support across industrial plants (corporate buy-in and support)

Figures and Tables

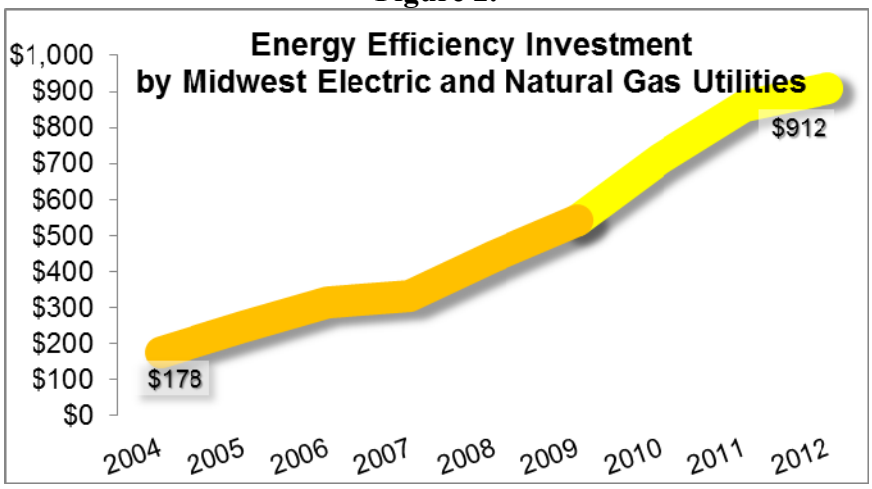
Figure 1. Energy Usage in the Midwest vs. Nationally



Source: http://www.eia.gov/emeu/states/hf.jsp?incfile=sep_sum/html/sum_btu_ind.html

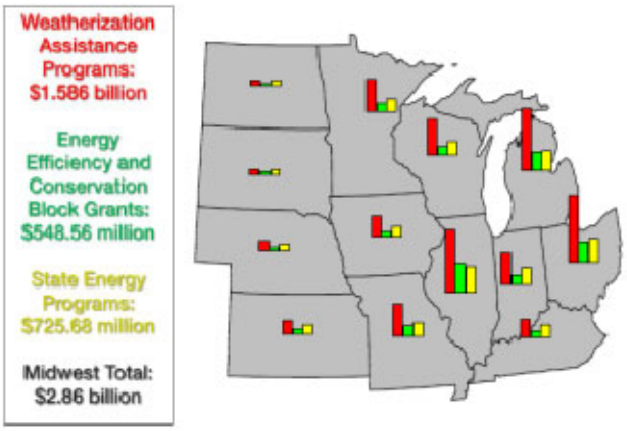
This bar chart shows MEEA's service territory industrial energy usage vs. the entire US. Of greatest interest is the fact that although the Midwest only uses 28.3% of the major, non-renewable industrial energy, the electricity and transmission losses for this region are noticeably higher, an indication that a sizable savings potential is available through energy efficiency and potentially local energy production, such as CHP,. Also of note is the tremendous percentage of coal used in the Midwest vs. elsewhere, indicating that energy savings in the Midwest may positively impact coal combustion-related air emissions more effectively than in other areas of the country, and may be a key area of interest for the upcoming Maximum Achievable Control Technology (MACT) standards being promulgated by EPA (air emissions standards for Mercury, Dioxin, Particulate Matter (PM), Hydrogen Chloride (HCl) and Carbon Monoxide (CO))[1]

Figure 2.



MEEA, 2009. "Energy Efficiency Investment by Midwest Electric and Natural Gas Utilities (Staff Estimate)". Presented at 2009 Midwest Energy Solutions Conference. January 7, 2009. Chicago, IL: Midwest Energy Efficiency Alliance

Figure 3. Increase in Annual Investment in Energy Efficiency Investment in the Midwest from 2010 to 2015



Source: DOE, 2009. Recovery and Reinvestment. Web. Washington, DC: United States Department of Energy. Accessed at http://www.energy.gov/recovery/data.htm, as of 3/12/2009

Also: DOE (2009). Energy Efficiency and Conservation Block Grant Program, State and Local Grant Allocations. Web. Washington DC: United States Department of Energy, Office of Energy Efficiency and Renewable Energy. Accessed at http://www.eecbg.energy.gov/GrantAlloc.html; link is retired, data was migrated to http://www1.eere.energy.gov/wip/eecbg_state_allocations.html

Table 1. Projected Total MW Electric & Natural Gas EE Budgets

State	2010	2013
IA	$ 151,864,207	$ 196,097,488
IL	$ 175,105,135	$ 309,888,951
IN	$ 31,000,000	$ 65,733,285
KS	$ 5,400,000	$ 6,997,727
KY	$ 29,000,000	$ 34,482,657
MI	$ 95,750,832	$ 250,275,342
MN	$ 152,912,628	$ 167,138,000
MO	$ 40,500,000	$ 38,245,504
ND	$ 200,000	$ 200,000
NE	$ 12,987,000	$ 9,345,853
OH	$ 163,800,000	$ 239,028,467
SD	$ 1,460,046	$ 1,675,570
WI	$ 199,368,218	$ 381,100,000
TOTAL\	$ 1,039,348,166	$ 1,717,204,842

MEEA, 2011. "Estimated Annual Investment in Energy Efficiency Investment in the Midwest (Staff Estimate)". Presented at 2011 Midwest Energy Solutions Conference. January 12, 2011. Chicago, IL: Midwest Energy Efficiency Alliance.

References

[1] http://www.epa.gov/airquality/combustion/