

Building Industries of the Future in Our Own Backyard

*Kevin Grabner, Energy Center of Wisconsin
Preston Schutt, State of Wisconsin, Division of Energy*

ABSTRACT

Wisconsin, through a variety of state-level initiatives, has a strong commitment to achieving the vision of the U.S. Department of Energy's (US DOE) Industries of the Future (IOF) strategy. In mid-2000, the US DOE, Wisconsin Division of Energy, and Energy Center of Wisconsin (ECW) sponsored Industry of the Future roundtables for the state metalcasting and forest products industries. The roundtables were cornerstone events in a broader state effort to address energy, environmental, and competitiveness issues with state industry. Those issues are central to the federal Industries of the Future strategy, and by leveraging national resources, Wisconsin has a strong structure from which to build. This paper focuses mainly on the role of the industry roundtables in this building process.

The roundtables, along with follow-up activities, met four objectives: 1) bring together experts from Wisconsin industry, research organizations, and government to discuss how to make Wisconsin industry more competitive, 2) create brainstormed lists of industry needs on energy, environmental, and production issues, 3) translate needs into potential R&D and demonstration projects, and 4) support formation of collaborative teams to implement projects.

Results of the roundtables were summarized in state roadmaps – an outline of R&D and demonstration areas that would benefit state industry. Many stated needs had related projects ongoing, either at the state or national level. With the addition of state assistance for projects under a new state public benefits charge, and continuing support from the US DOE, the state roadmaps serve as a planning tool for generating partnerships to implement the projects.

Introduction

Background on the National Industries of the Future Strategy¹

The Energy Policy Act of 1992 provided the U.S. Department of Energy (DOE) with a mandate to work with the largest energy users in the industrial sector to create a “meaningful, five-year research program”. The purpose: encouraging those industries to adopt more energy-efficient practices and technologies, thereby reducing the Nation's use of fossil energy and its emissions of greenhouse gases.

The US DOE's Office of Industrial Technologies (OIT) leads the response to this challenge through an initiative called the Industries of the Future (IOF) Strategy. Through this customer-driven initiative, industry has greater influence in setting public R&D priorities and improved access to a wide array of technical expertise and facilities. The bottom-line

¹ Extensive information on the IOF strategy is available on the OIT website at <www.oit.doe.gov>.

goals for the initiative are savings in energy and materials, cost-effective environmental compliance, increased productivity, reduced waste, and enhanced product quality.

Catalyzed by this initiative, nine industries that together consume about 75 percent of industrial energy in the United States have produced technology visions and research agendas for the future. These nine industries are: forest products, metalcasting, chemicals, steel, glass, petroleum refining, agriculture, mining, and aluminum. Research agendas are expressed through an industry-specific document called a "roadmap". Roadmaps outline industry R&D needs and identify ongoing and future activities to achieve the industry vision. The process of creating the industry roadmap helps to galvanize support for the industry, and brings together key industry, academic, and government resources to pursue common goals.

The Industries of the Future Strategy at a State Level

Even with the substantial commitment of the US DOE to achieving industry vision through Industry of the Future partnerships, the needs and opportunities are greater than the resources available to that Federal agency. In an effort to expand the national IOF strategy, the US DOE established the States Industries of the Future strategy.

States IOF builds upon the national IOF strategy and the national industry-developed visions and roadmaps, and brings together industry, government, and others to identify and organize around state priorities. States IOF is a vehicle for facilitating industry solutions locally and enhancing economic development. The idea is not to recreate national efforts, but rather expand these opportunities to a larger number of partners both from industry and from State agencies, universities, and local research organizations.

Wisconsin's Efforts to Link Energy, Environmental, and Productivity Improvements

The State of Wisconsin, through a variety of state-level initiatives, has a strong commitment to improving energy efficiency, environmental performance, and competitiveness of state industries. Recognizing the natural fit between IOF programs and their own strategic vision, the state has leveraged the resources of the States IOF program to expand its own efforts to work with industry.

The State and the Energy Center of Wisconsin pursued and received separate grants through the States IOF program to work with the forest products and metalcasting industries. The State and ECW leveraged other federal dollars to help expand the public-private collaborating infrastructure to support industry, through projects such as hosting the annual Governor's Business Roundtable, establishing the Consortium for Industrial Efficiency to assist access to non-profit energy and environmental service providers, and producing the seminar series "Making Sense of Energy and Environmental Programs". The Energy Center of Wisconsin managed implementation of these projects.

Wisconsin's State IOF project with the metalcasting industry began in December 1999, while the forest products work began in April 2000. There are three primary goals of the States IOF Initiatives for the Wisconsin forest products and metalcasting industries that were addressed through these efforts:

- *Goal 1: Identify the needs of Wisconsin industry.* The needs of Wisconsin forest products and metalcasting industries were gathered at industry roundtable events, where industry, researchers, and other interested parties identified common needs and goals to remain

competitive and viable into the year 2020. The resulting products of those efforts², the Wisconsin Paper Industry Roadmap and the Wisconsin Metalcasting Roadmap, list industry needs and identify R&D, demonstration, and other activities to address those needs. Although the Wisconsin roadmaps parallel the national roadmaps, they also identify unique needs of Wisconsin industry that must be addressed to insure each industry's long-term viability. As additional funding becomes available, Wisconsin intends to expand the roadmapping process to include other industries.

- *Goal 2: Facilitate technical and financial partnerships between industry, government, and researchers who seek to implement projects.* The Wisconsin metalcasting and forest products industries have a strong infrastructure in the state from which to conduct R&D and create partnerships. Several needs identified in the Wisconsin roadmaps already have related R&D projects ongoing at the state or national level. What was needed were ideas and strategies to maximize the potential of this infrastructure to deliver solutions to state industry. Through public benefits funding, industry contributions, continuing US DOE support, and other resources, Wisconsin is exploring several options for expanding partnership activities and delivering the IOF visions.
- *Goal 3: Identify resources to address these needs, and help make them accessible to project implementation teams.* There are many resources available to assist the Wisconsin forest products industry. The difficulty is in knowing where they specialize and how to contact them. Resource resources guides were compiled and provided to roundtable participants and other parties.

This paper discusses the Forest Products effort in detail, and then highlights the successes of the metalcasting project.

Working with the Wisconsin Forest Products Industry

Wisconsin has led the nation in papermaking for over 43 years. More than 4.9 million tons of paper and over 1 million tons of paperboard are produced annually. The value of shipments from Wisconsin's paper companies tops \$12.4 billion annually, while combined shipments of paper, lumber and wood products are valued at nearly \$16.8 billion. The forest products industry is the backbone of Wisconsin's economy, employing more than 102,000 people (WPC, 2000).

Recognizing the importance of the Wisconsin forest products industry, the US DOE and the Energy Center of Wisconsin provided funding for a States IOF initiative³ to help Wisconsin industry implement Agenda 2020. Participation in the initiative is voluntary. The initiative is guided by a steering team including industry, research, and forest products association representatives from Wisconsin. Although the initial focus has been the Wisconsin paper industry, the initiative is anticipated to expand over time to encompass sustainable forestry, lumber, and wood products through additional funding.

² Available from the Energy Center of Wisconsin. Contact <www.ecw.org>.

³ This project was funded by the US DOE and the Energy Center of Wisconsin, facilitated by Oak Ridge National Lab, and managed by the Energy Center of Wisconsin, a private non-profit energy research and education organization, and ASERTII member.

The Wisconsin Paper Industry Roadmap

The Wisconsin Paper Industry roadmap provides the Wisconsin perspective on the needs of papermakers operating in a global market, as well as needs that are unique to the paper industry in Wisconsin. Those needs derive from targets set by the industry vision of Agenda 2020. To meet industry needs in Wisconsin, the roadmap identifies a progression of activities from R&D to delivery of solutions.

Following the approach used to create the national forest products roadmap, Agenda 2020, Wisconsin began a state-based roadmapping initiative in April 2000. The needs presented in the roadmap have been identified by papermakers, researchers, and other interested parties who volunteered their time at a forest products roundtable on October 11, 2000. Additional input was provided through a follow-up mailing to Wisconsin industry stakeholders.

A steering team led by ECW and staffed by industry volunteers designed the roundtable. The Energy Center of Wisconsin managed the project, including running the roundtable, handling event and speaker logistics, overseeing production of the follow-up report. ECW also facilitated steering team meetings, and produced event marketing brochures. The intention was to allow busy industry experts to use their time and experience where it provided the most value – setting the agenda, fine-tuning the marketing message to the target audience, recommending speakers, recruiting their colleagues, and facilitating at the event.

The October 11, 2000 roundtable was designed to meet four objectives: 1) bring into one room a good (not statistical) sample of key experts from Wisconsin industry, research organizations (public and private), and government to discuss how to make Wisconsin industry more competitive, 2) create a brainstormed list of industry needs in the areas of energy performance, environmental performance, and production issues, 3) translate needs into potential R&D and demonstration projects, and 4) describe the technical and financial resources available to encourage formation of collaborative teams that will implement projects.

With administrative help from ECW, steering team members and local industry associations promoted the event by sending brochures to their colleagues under a personal cover letter or delivering them in-person. This attracted plant managers, R&D staff and directors, and environmental and energy managers. The roundtable drew 39 participants: 15 from 9 different papermakers, 16 from public and private R&D organizations, and 8 from Wisconsin and Federal industrial programs.

The actual “roadmapping” process worked as follows: Participants at the roundtable first received context on national research priorities and the IOF strategy. Afterwards, they each wrote down their list of paper industry needs in a silent session, and then broke into three groups - Energy, Environment, and Production - for facilitated discussion of key issues faced by their industry⁴. Individuals presented their needs, and, as a group, discussed them, categorized and refined them, and reached agreement on key topics, for report back to the larger group. The full group received an overview of the technical and financial resources

⁴ Chris Arenas of Sedona Consulting was the professional facilitator hired for this event, and he conducted the overall facilitation for the session and advised in its design. The challenge was fitting a process that Chris advises should take two days into the half-day that was available. The breakout groups were facilitated by steering team members who were industry experts on the issues. The combination allowed for insider/outsider control of groups on a task which needed a combination of focus and creativity.

available to implement these projects, and were encouraged to form project teams. Results were summarized by ECW in a draft Wisconsin Paper Industry roadmap that was sent back out to industry for review and revision.

Within the three focus areas, roundtable participants identified 8 to 12 categories of needs, which are shown in Table 1. Any number of specific needs may be associated with each category. Roundtable participants and follow-up reviewers identified 2 to 13 needs within each category, as also indicated in Table 1.

Table 1. Categories of Wisconsin Paper Industry Needs Within the Focus Areas

1. Energy		2. Environmental		3. Production	
Category	Needs	Category	Needs	Category	Needs
1.1 Process	13	2.1 Process Pollution Prevention	3	3.1 Workforce, Education, Training	2
1.2 Heat Recovery and Low Grade Heat Utilization	2	2.2 Solid Waste	11	3.2 Process Water	4
1.3 Cogeneration	4	2.3 Water Reuse	7	3.3 Recycle Pulp	4
1.4 Biomass	5	2.4 Fiber Supplies and Minimizing Fiber Use	10	3.4 Capital Improvement and Process Effectiveness	6
1.5 Policy and Pricing	5	2.5 Recycle	5	3.5 Fiber Raw Materials	3
1.6 Education	4	2.6 Waste Water	8	3.6 Pulping	3
1.7 Energy Markets	4	2.7 Regulatory	12	3.7 Marketing and Public Relations	3
1.8 Alternative and Renewable Fuels	4	2.8 Public Relations/ Communications	3	3.8 Paper Production	2
1.9 Coal	2	2.9 Hazardous Air Pollutants	3		
1.10 Fiber Sources	3	2.10 Odor Reduction	3		
1.11 General	3				
1.12 Miscellaneous	6				
TOTAL:	55	TOTAL:	65	TOTAL:	27

Table 1 was expanded into three tables (Energy, Environmental, Production) with three columns each, to create the full roadmap. The first column in each table lists all the specific needs identified by roundtable participants and roadmap reviewers. Some of the need statements were noted as priorities by roundtable participants. The second column in each table identifies R&D, demonstration, or other activities to respond to each need statement. The third column characterizes the status of the responsive activity within the research pathway. The status is expressed by categories, described in Table 2:

Table 2. The Status of the Activity Within the Roadmap

Abbreviation	Status of Activity
Concept	Concept stage, including proposed ideas and theories. The next step could be R&D or demonstration.
LT R&D	Longer-term R&D effort, includes medium and long term R&D over 3 years to demonstration stage.
ST R&D	Short-term R&D effort within 3 years to a demonstration stage.
Demo	Demonstration projects, including pre-commercial trials at host mills/companies.
Bus. Dev.	Business development, including evaluate demonstration results, refine product or service, establish technical performance, business planning, and commercialization. Also includes market assessments and other studies.
Deliver	Deliver the solutions, including outreach such as showcase events, case studies, workshops, training, and fact sheets; technical assistance; and financial assistance to spur implementation.

An example of an Energy Performance need statement under the Process category is “Improved and energy efficient process for mechanical pulping”. One responsive activity is “Biopulping”, the use of lignin degrading fungi to soften wood chips prior to mechanical pulping. The status of Biopulping is “Business Development”. Recently, Biopulping International of Madison, Wisconsin received a \$200,000 grant from DOE’s Invention & Innovations program which funds projects in that stage of development. That project is titled “Development and Commercialization of Biopulping”.

The Wisconsin Forest Products Roundtable was evaluated through post-seminar evaluation forms, and received generally positive feedback from 23 of 39 attendees who completed the form. Of note, 78% left feeling that their company would benefit from future involvement in Agenda 2020 activities. Also, 83% said they will inform others in their company about the issues discussed at the roundtable, and 74% said they would participate in a follow-up roundtable.

The largest and most prominent complaint was that about 40% felt that there was not enough time for group discussion of needs and next steps. Attendees spent 2 to 2.5 hours brainstorming and discussing their list of needs, and many worked through lunch. It is a lesson learned in that once the group does get engaged on the issues, they need to feel that they’ve had sufficient time to discuss them to their satisfaction.

In summary, the roadmapping approach began with industry considering their vision and then identifying their needs to meet that vision. Those needs are then addressed by creating and following a strategic plan, or roadmap, which identifies a logical progression of activities from R&D to delivery of the technology at industry facilities. Other than the project champions, no assistance program, agency, or funding partner is likely to stay engaged in the effort at every stage of the pathway. The roadmap is expected to be useful for communicating the status of an activity to arrange partnerships and ensure a smooth transition at each step of the process to delivery.

Working with the Wisconsin Metalcasting Industry

In December of 1999, the Wisconsin Metalcasting Roadmap Initiative was started. This initiative is funded by the US DOE and the Wisconsin Department of Administration's Focus on Energy Program, and managed by the Energy Center of Wisconsin⁵. The initial goal of the initiative was to develop a Wisconsin Metalcasting Roadmap that builds on the National Roadmap. It would identify specific needs of Wisconsin metalcasters.

Wisconsin has approximately 235 metalcasters in the state, forming a microcosm of the national metalcasting industry. As an initial step, the Energy Center of Wisconsin interviewed fourteen metalcasters from a variety of firms (size and type) to find out their views on many issues facing the industry.

At the first Wisconsin Metalcasting roundtable on June 1, 2000, fifty-nine Wisconsin metalcasters, representatives from their associations, and allies attended. The breakout of industry attendees is shown in Table 3. They were facilitated by ECW, Chris Arenas, Pradeep Rohatgi (professor in metals at the University of Wisconsin-Milwaukee), and industry steering members. Together, they identified 375 needs of Wisconsin metalcasters to remain competitive and viable into the year 2020. The list was consolidated down to about 150 needs.

The resulting product of that effort, the Wisconsin Metalcasting Roadmap, identifies those needs along with recent or ongoing research and demonstrations that addresses those needs, is now available from ECW.

Table 3. Metalcasting Industry Attendees at the June 1, 2000 Wisconsin Metalcasting Roundtable

43 were metalcasters
15 gray and ductile iron
10 steel
7 aluminum foundries
11 copper foundries
5 die casters
2 investment casters
2 non ferrous non-aluminum or copper foundries
(numbers add to more than 43 due to multiple operations in one foundry)
9 were metalcasting suppliers
3 were government representatives involved with metalcasting programs
2 were from metalcasting trade associations
2 were from University and High School metalcasting programs

On September 14, 2000 Wisconsin metalcasters met a second time to 1) learn of resources available to help them address their needs and 2) to form action teams to address these priority needs. The U.S. DOE – Office of Industrial Technologies, Wisconsin Department of Administration, Wisconsin Department of Natural Resources, Wisconsin Manufacturing Extension Partnership, Milwaukee Industrial Assessment Center, and the Energy Center of Wisconsin presented resources currently available to Wisconsin

⁵ Doug Presny, now with SAIC and formerly with ECW, managed the metalcasting initiative. Doug deserves considerable credit for his contributions to the format and approach followed in these roundtable events.

metalcasters. Additional resources are identified in the Consortium for Industrial Efficiency document: “A Resource Guide for Wisconsin Industries”, available online from <www.ecw.org>.

Wisconsin metalcasters and other interested parties formed 14 action teams within 5 broad categories to address the following priority needs:

1. Manufacturing
 - Improve efficiency of small run production
 - Reduce cost of heat treating
 - Process flow improvement
2. Human Resources
 - Attract and retain skilled labor
 - Attract and retain unskilled labor
 - Labor supply
3. Energy
 - Supply reliability, education and strategy development, and energy cost and cost predictability
4. Environmental
 - Regulation permitting
 - Use and reuse of foundry waste
5. Materials Technology
 - Cost effective composites
 - Develop improved cast iron alloys
 - Develop alloys free from toxic materials
 - Develop metal matrix composites
 - Understanding filling/solidification characteristics to increase yield of cast iron, aluminum, and steel alloys

Three of the action teams have seen strong interest from industry and outside funding sources – the foundry sand re-use action team, supply reliability, and the cost-effective composites action team.

Delivering the Industry Vision: Next Steps

Delivering the vision of statewide industry roadmaps requires advancing beyond successful R&D to achieve adoption of technologies by industry. The path from vision to R&D to delivering technologies through an Industries of the Future strategy can be summarized as follows:

1. **Set the industry vision** (IOF 2020 vision documents)
2. **Identify industry needs and activities to achieve the vision** (technology roadmaps)
3. **Concept stage**, including proposed ideas and theories. The next step could be R&D or demonstration.
4. **Longer-term R&D efforts**, includes medium and long term R&D needing over 3 years to reach a demonstration stage.

5. **Short-term R&D efforts** within 3 years to a demonstration stage.
6. **Demonstration projects**, including pre-commercial trials at host mills/companies.
7. **Business development**, including evaluate demonstration results, refine product or service, establish technical performance, business planning, and commercialization. Also includes market assessments and other studies.
8. **Deliver the solutions**, including outreach such as showcase events, seminars, training, and fact sheets; technical assistance; and financial assistance to spur implementation.

To achieve adoption of technology by industry, some lessons have been learned in the national Industries of the Future effort⁶:

- Early clarity of your missions and goals
- Define work focus
- Identify stakeholders and develop means to engage them
- This is a partnership – engage all necessary partners. Suppliers are engaged.
- Focus on highest impact areas
- Shifted from longer-term fundamental research to home-run opportunities
- Requires substantial time commitment
- Don't underestimate the difficulty in funding
- Industry needs to support recommended projects
- Host mills/companies needed for technology demonstrations
- Need effective review process
- Understand “funding cycle” and “graduate student” cycle
- Measurable criteria to determine success

The Wisconsin metalcasting and forest products industries have strong infrastructures in the state from which to conduct R&D and create partnerships. What is needed are ideas and strategies to maximize the potential of this infrastructure to deliver projects. Following are the approaches being explored, and current progress.

Wisconsin Focus on Energy Program –Major Markets: Program for Energy Intensive Industries

The utilities in Wisconsin will transition their energy efficiency and renewables programs over the next 3 years to a statewide public benefits program titled Wisconsin Focus on Energy, overseen by the Wisconsin Department of Administration. The Major Markets portion of this program will target large commercial and industrial businesses, schools, production agriculture, and water.

The DOA has awarded a contract to the Milwaukee School of Engineering to administer this program on behalf of the State. The Major Markets program is funded at an estimated \$10,133,961 to \$15,200,941 in 2001; an estimated \$13,169,175 to \$19,753,762 in 2002 and an estimated \$19,671,812 to \$29,507,718 in 2003. The statewide program initiated final planning in April 2001 prior to roll-out in Summer 2001.

⁶ Presentation by Dan Sjolseth, Weyerhaeuser, Wisconsin Forest Products Roundtable, October 11, 2000, Appleton Wisconsin.

The DOA outlines what is expected from programs targeting energy intensive industries within the Major Markets area:

Wisconsin Focus on Energy Program – Major Markets RFP (excerpt):

“The program must research, develop and deliver advanced energy efficiency, renewable energy and pollution prevention technologies to industrial customers.”

The emphasis on partnerships, similar to DOE’s IOF strategy, has been echoed by the DOA in their request to administrators of the public benefits program:

Wisconsin Focus on Energy Program – Major Markets RFP (excerpt):

“...a targeted, state-wide approach that creates partnerships among industry; trade groups; government; supporting laboratories; universities; and non-governmental organizations.”

With the addition of state assistance for projects under the state public benefits charge, the state roadmaps – and the awareness and consensus building process that created them, will serve as a planning tool for generating partnerships to implement the projects. Implementation will expand as the public benefits dollars are released in 2001.

Action Teams Focused on an Industry Need

Starting with highest priority needs identified by Wisconsin industry in the roadmap, form action teams led by an “industry insider” to champion the implementation process. The implementation process includes identifying the industry need, clarifying the project mission and goals, defining the work focus, identifying stakeholders and the means to engage them, coordinating funding, and committing the time to facilitate ongoing meetings.

The metalcasters established 14 action teams at their September 14, 2000 roundtable. Two of the action teams have seen early success – the foundry sand re-use action team, and the cost-effective composites action team.

List-Serve to Announce Opportunities

A list-serve would send email or hard copy announcements of funding and project partnership opportunities to subscribers. List-serves for Federal grant solicitations are common. This service would include Federal and State opportunities, and focus on the appropriate Wisconsin industry.

The Division of Energy sends Federal solicitation announcements to the 39 resource contacts of the Consortium for Industrial Efficiency.

Web-Based Clearinghouse

A primary function of the web site would be to facilitate partnerships between industry, research, and potential project stakeholders by providing a central listing place for opportunities. The site would list industry needs, provide description and contact information for relevant R&D and demonstration projects, and list funding opportunities. It could serve as

a recruitment tool for existing partnerships looking for additional funding, or demonstration sites. Another function of the web site would be to function as an information clearinghouse, with links to relevant organizations and resources. The information listings would serve as an aid for parties wishing to undertake their own search for a collaborating partner.

An Information Clearinghouse is under development at the Energy Center of Wisconsin.

Wisconsin Industry Technology Transfer Offices

Experience in Wisconsin and other states indicates that Industry of the Future projects are more likely to succeed when an “industry insider” can champion the implementation process (BCS, 2001). The implementation process includes identifying the industry need, clarifying the project mission and goals, defining the work focus, identifying stakeholders and the means to engage them, coordinating funding, and committing the time to facilitate ongoing meetings. This project champion must have credibility and contacts with state industry and the research community.

One option for establishing a champion to focus on Industry of the Future projects in Wisconsin would be to establish a “forest products technology transfer office”, and a similar office for metalcasters. Technology transfer offices have been tried in other states, and are an option that will be considered as part of the Wisconsin public benefits program.

Using potential funding from the public benefits program, and matched with other sources, the Major Markets Administrator could work with industry stakeholders to develop a proposal to establish Wisconsin Technology Transfer Offices. The proposal would need to address the mission, goals, major activity areas, funding strategy, and operating structure, reflecting research on existing successful models. The proposal would be presented to industry and other stakeholders to get their input.

Initially, this could be a full-time or near full-time position, established in affiliation with a university or lab, which would leverage the substantial resources and expertise available at those institutions. Stakeholders and funding partners would be recruited from industry, government, universities, and other interested parties.

The Technology Transfer Office would not need to own laboratory space or conduct research directly, but could rely on the resources of its stakeholders and the existing forest products research infrastructure. These resources are located within Wisconsin (e.g. USDA Forest Products Lab) and throughout the nation. The Technology Transfer Office would be a facilitator with industry expertise, capable of matching needs with R&D resources, and engaging the necessary parties to get projects implemented. Information transfer and outreach would be an essential role of the office.

Partnership-Building Events

- Under a grant from the US DOE and through a contract with ECW, the Wisconsin Division of Energy offers a seminar called “Making Sense of Energy and Environmental Programs to Assist Wisconsin Industry”. “Making Sense”, offered twice in 2001 and three times in 2002, is a half-day event to connect industry leaders with many different government, utility, and private programs that can help improve industrial efficiency. The format involves bringing in half a dozen speakers to provide a brief, 15 minute

overview of the services they offer, and how to take advantage of them. Every Fall for the past 6 years, the Governor's Business Roundtable is held, which is another good partnership building event.

- After developing their state roadmap, Wisconsin metalcasters held a second roundtable to form action teams on a dozen of the highest priority issues. This process could be repeated for the forest products industry.
- Lake States TAPPI holds 5 to 6 meetings each year that feature day-long technical seminars focused on a priority papermaking topic. Membership in TAPPI includes a mix of industry, suppliers, and researchers. It provides a good forum for building partnerships.

Conclusions

The State of Wisconsin is in the midst of assuming energy efficiency program responsibilities from electric utilities. This creates a challenge and an opportunity. The opportunity is a chance to integrate energy, environmental, and industry competitiveness issues that are seen as public benefits into programs that support industry. State government has a broad range of regulatory and financial incentives to leverage in securing a broad range of public benefits. State government also has a special link with the "carrots and sticks" of Federal government. The DOE's Office of Industrial Technologies offers many forms of technical and financial assistance, although these carrots may be less well known to industry than the sticks.

To capitalize on those incentives, Wisconsin has recognized the challenge that it must build an inter-agency, public-private collaborative infrastructure to effectively implement industrial programs. Up-front, that requires meetings, roundtables, working groups, information clearinghouses, and the like. Time must be spent getting different parties together to determine who needs what and figuring out who can help get things done – the first step in creating partnerships. Industry roundtables and technology roadmaps, approaches adapted from the National and States IOF initiatives, appear to be one effective means to begin a state-based approach for building industries of the future.

References

Wisconsin Paper Council, 2001. <www.wipapercouncil.org/paperfacts.htm>

BCS Incorporated, 2001. "States - Industries of the Future". Spiral bound document providing a state-by-state summary of OIT activity and opportunities. Prepared for the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Office of Industrial Technology.