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## Corrugated Solutions recycles to success

by Derek Thompson, Verl Anders, and Mike Willett, CIRAS

Marybeth Gardam, owner of Corrugated Solutions, LLC, located in Des Moines, wanted input on running her manufacturing business. Her company collects and recycles used corrugated cardboard into a standalone protective packing material. "Last year we diverted over 71,000 pounds of corrugated material that would have been in the landfill," Gardam said.

Though production was in full swing, thanks in part to a Solid Waste Alternative Program or SWAP grant from the Iowa Department of Natural Resources, something wasn't right at the plant. No matter how fast her staff worked to bring the cardboard to the middle step of production (the slitter), they could not seem to keep up with the last phase, the shredder. Labor costs were gaining on her. She followed a suggestion of another manufacturer and contacted Derek Thompson, CIRAS account manager, for assistance.

"I had never run a manufacturing operation before," Gardam admitted. "There were so many small details to consider. Even variables that affect just a half-minute of the process mean dollars long term. Projecting our actual costs depended a lot on timing and schedules. We were collecting lots of information on production, timing, scheduling, and speeds of machines and operators, but I had no clue how to balance and analyze all of that data. I knew I'd be ahead if I could analyze it correctly, but it was all very confusing. I found myself wishing I had taken at least one business or manufacturing course in college!"

Thompson initially visited with Gardam to review scheduling and production line improvements that would make just-in-time inventory work for the start-up company. CIRAS industrial specialist Verl Anders was brought in to work with Gardam on product costing, cash flow analysis, and predicting accurate, real-time production rates for every step of her process. "After visiting with the Gardams, seeing their



Left to right: Verl Anders, Marybeth Gardam, Derek Thompson, and Bill Gardam

enthusiasm and commitment, and learning about the benefit of the product and the market potential, I knew the company had an excellent chance for success," Anders said.

Working with Marybeth Gardam, Anders put together several spreadsheets to model different cost and price scenarios. With the spreadsheets, Gardam could test the impact on prices of various employment levels, production rates, and other expense increases. The spreadsheets also enabled her to test the impact of expanded capacity, that is, the prices of increased production from increased output. Finally, they permitted testing of price and volume strategies. Armed with this information, Gardam has been able to offer reasonable discounts and secure new customers.

"Realizing our actual costs and what kind of volume we would need to break even and make a profit was critical to help us determine selling prices and schedule production," said Gardam. "This may seem very basic to experienced manufacturers, but I started out not knowing what 'throughput' really meant!"

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The mission of CIRAS is to enhance the performance of Iowa industry through education and technology-based services.

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The Center for Industrial Research and Service (CIRAS) provides education, research, and technical assistance to Iowa industry through partnerships with Iowa's universities and community colleges, government agencies, and professional associations. Assistance is supported in part by the DoC/NIST Manufacturing Extension Partnership, the DoD Procurement Technical Assistance Program, and the DoC/EDA University Center Program.

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## Brownells taps into PTAC for success

by Dennis Smith, Engineering Communications and Marketing

**B**rownells Inc. is a family-owned catalog distributorship that sells firearms accessories and gunsmithing tools from its headquarters in Montezuma, Iowa. But while the firm markets numerous proprietary products—several of them patented—virtually all its stock is manufactured by outside contractors.

So when Brownells bid on a contract to supply the U.S. government with 30-round magazines for the military's M16 and M4 rifles, it made perfect sense for the company to turn once again to an outside contractor—only this time one a little closer to home: Brownells Manufacturing, a wholly independent corporation spun off from the parent company last January.

“The design work, prototype R&D, initial production, quality programs, the actual production and packaging and shipment—it's a different beast from what folks in Brownells have experienced over 67 years,” says general manager John Feeley. “To do it correctly, we had to create something that marched to a different drumbeat.”

Part of finding—and keeping—the rhythm of that beat comes through the Procurement Technical Assistance Program, administered by the Department of Defense using local partners such as CIRAS to help businesses market products and services to federal, state, and local governments. Iowa's Procurement Technical Assistance Center (PTAC), operated by CIRAS, offers help with contractor registration and certification, bid preparation, marketing, and post-award assistance, including electronic commerce and radio frequency identification (RFID).

### **A winning combination**

While many firms might take advantage of the full range of PTAC services, Feeley was already familiar with government procurement procedures before joining Brownells in 2002. Indeed, some of that experience came through service on the CIRAS advisory board, which he chaired in 2000. Moreover, Brownells was already familiar with the M16 magazine, having long contracted and overseen the manufacture of its equivalent for the civilian market's AR15 rifle.

That combination allowed Brownells to take what for other firms might be a leap into the unknown and still land squarely on its feet, winning a nearly \$3-million contract to produce more than 336,000 M16 magazines over the course of a year and an option for up to two additional years of production. Still, Feeley notes, PTAC offers valuable assistance even for more experienced firms and plays a key role as a facilitator for Brownells Manufacturing's military contracts.

“Because of our awareness of PTAC,” Feeley says, “I knew we'd have an ace in the hole. Once the award came, we got into certain areas of government regulations—quality



*Brownells manufacturing facility in Montezuma, Iowa*

programs, packaging, RFID, what have you. We could turn to the folks at CIRAS for guidance on which particular department of the government or direction we should look at next to find our answer.”

More than an “ace in the hole” for contingencies, PTAC has also furnished support as Brownells transitions from its previously exclusive focus on the consumer market to the demands of government contracting. For instance, CIRAS has sponsored several seminars in the central Iowa area featuring industry professionals from the military procurement community.

“We use PTAC not only for advice, but for the educational value of the programs they present,” says Feeley, who has been accompanied to CIRAS-sponsored events by other Brownells staffers. “There is a group of about four of us who frequents these opportunities. We also plan to add on-site procurement training in the very near future to broaden our understanding of the solicitation submission process.”

### **A partner for future success**

According to Feeley, this initial foray into government contracting is a platform from which the firm plans to launch even greater expansion. Brownells Manufacturing foresees markets beyond the U.S. government, with an anticipated 40% or more of its domestic production eventually supplying Brownells and other OEM accounts.

Still, military procurement remains central, with solicitation opportunities arising not only from the federal government but also from U.S. allies in other NATO countries. That, says Feeley, is another area where PTAC assistance can be critical.

“A number of the solicitation opportunities—especially those coming out of NATO countries—require security clearances,” Feeley observes. “Getting the clearance isn't especially difficult, but you need sponsoring agencies in order to present yourself to the government for consideration. So I'm working with CIRAS to understand how we can accomplish this.”

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# Creating an energy-wise enterprise

by Alexandre Kisslinger, CIRAS

When looking for ways to cut costs or increase profits, few manufacturers consider energy usage or projects that could improve energy efficiency. As energy costs continue rising, however, that attitude is changing: more and more companies are realizing the link between profits and energy use.

In hopes of encouraging manufacturers to make energy-wise decisions, the National Association of Manufacturers (NAM), in partnership with the Alliance to Save Energy, published a booklet<sup>1</sup> titled *Efficiency and Innovation in U.S. Manufacturing Energy Use*. The publication uses case studies of enterprises that have experienced changes to demonstrate ways that manufacturers can become more energy efficient.

## Getting Started

The NAM publication cites recent surveys that indicate potential savings of 10 to 20% of energy expenditures. Costs to run an energy management program (excluding capital expenses) are generally given as only 1 to 2% of total energy expenditures.

A corporate energy management (EM) strategy is needed to capture and sustain savings. An energy assessment is a good starting point for learning where system improvements can be made. Among other outcomes, an assessment will detect areas of potential improvement, which may, in turn, qualify the company for a different rate plan. It may also identify some areas of improvement that will require little or no cost investments.

Contrary to what some people might think, an EM program will not conflict with other management principles already in place. In fact, by improving the ratio of product output and energy usage, a strategic EM program will complement management principles such as lean, total quality, and theory of constraints.

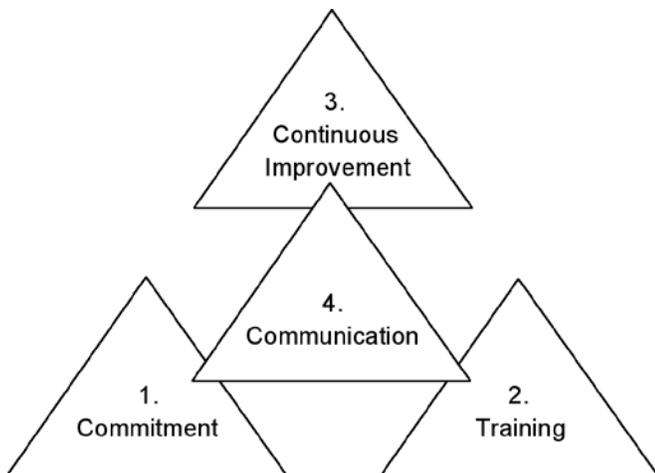


Figure 1. Energy management diagram.

A strategic approach to energy management can result in significant energy savings for all types of businesses. The management model, diagrammed in Figure 1, requires (1) commitment from leadership, (2) training, (3) continuous improvement through strategic goals and action plans, and (4) communication. This model draws on ideas from several existing programs, including the Energy Star<sup>2</sup> program developed jointly by the U.S. Department of Energy and the Environmental Protection Agency.

A well-developed EM program will integrate energy strategies into daily operations of all employees. This will minimize waste and improve the acceptability of energy-related projects.

## Commitment

Company leaders must be strong advocates for an EM program. They must commit resources, including time, talent, and money, on an ongoing basis. If initial attention and enthusiasm turn to complacency, the energy management program will become ineffective. In addition to supporting a corporate energy policy, company leaders should do the following:

- make EM part of the corporate strategic plan
- tie EM to corporate financial goals
- tie EM to corporate environmental goals

Once energy management is truly on the corporate radar screen, an initial assessment of energy performance is necessary. This effort should include evaluating the energy cost structure and current usage and trends.

Utility companies generally determine the energy cost structure. Most utilities have multiple rate plans. Customer service representatives work with businesses to ensure that the most favorable plan has been assigned. An onsite visit from the energy provider is one way to facilitate a discussion on energy needs and cost structures.

Understanding current energy usage and trends goes hand in hand with understanding energy cost structures. Usage patterns dictate the choice of rate plan, and the rate plan greatly influences cost-saving strategies. As much as feasible, energy usage should be tracked by both end use (e.g., processes and equipment) and fuel type (e.g., electricity and natural gas).

## Training

After top leaders in the organization have made a commitment to an EM system and after current energy performance has been assessed and standards are set, it is time to provide training for all company personnel. Sharing information and increasing the knowledge level of employees is a prerequisite to a successful EM system. The opportunity to express personal opinions, ask questions, and get answers generally increases the

level of engagement for individuals. Feeling engaged is a prerequisite to being motivated.

Initially, every employee will need some training on topics such as awareness of the corporate energy policy, current usage and trends, basic EM terminology, and energy measures. More specific topics such as “Boiler Management,” or “Assessing Return On Investment in Energy Projects” will be targeted to smaller groups. Be sure to take the time to identify the general and specific needs of the entire staff.

Good intentions don’t move an EM program forward. A training calendar should be established, and all staff should be scheduled for the training that they need. Follow-through is critical in demonstrating to employees that energy management is truly important to the organization. Training is best delivered during regular working hours, in a facility that is conducive to learning and that is free of work interruptions.

### **Continuous Improvement**

Start the process of continuous improvement by setting a goal. Set a high-level goal that can be measured and obtained. Avoid arbitrary numerical targets such as “reducing energy costs by 10%.” Instead, if possible, benchmark the cost in specific areas for other companies in your industry and identify where your costs are above the benchmark. Then set a specific goal such as “reduce refrigeration costs by \$15,000 over the next 12 months.”

Also needed is a systematic approach to continuous improvement. The steps to achieving improvement should be carefully planned and, at a minimum, should include the following:

- clear statement of desired outcomes and success measures
- list of resources that are and are not available
- sequential list of steps involved
- list of key milestones or intermediate indicators of success
- expected completion date
- clear explanation of reporting requirements (frequency and scope)
- rewards if successful (if applicable)

Be sure to consider the potential negative impacts on product flow and peak energy demand. It is usually advisable to test proposed changes at the pilot level, if possible. For example, if you have four air compressors, make changes on one and measure the impact.

Follow-through is the key to success. Execute the plan step by step. Monitor progress regularly. If progress is made, implementation should continue. Or, if the evaluation indicates a problem, adjustments should be made to the action plan.

Evaluate the success of implementation against the initial

goal. If a pilot project is successful, then changes should be institutionalized and implemented across the larger system. This may need to be done in phases, depending on the number of pieces of equipment and the capital costs involved. Data collected during the pilot phase should make the computation of financial return easier and justify the additional investment.

As a project is completed, begin the next pass through the continuous improvement cycle. Select, implement, and evaluate the next project.

### **Communication**

The centerpiece of the EM model is communication. Good communication is the essence of a successful EM initiative. If energy management is not a regular topic of discussion in the company, it will soon be devalued as another fad.

Success starts at the top, and it must stay there. Energy should remain prominently on the “radar screen” of company leaders, and data should always be used to demonstrate results. Company leaders rightfully expect and need the data that will help them make better decisions.

Recognizing and celebrating the achievements of the EM initiative will bolster employee morale and continue motivation. Employees need to see that their efforts are appreciated and that they make a difference.

Everyone in the organization should be aware of the current facts and figures on energy performance. Communicate regularly using a standard, easy-to-understand, and accessible format. Provide the appropriate information in the most understandable format to each level throughout the company. For example, senior management will probably require different information in a different format than engineers in the boiler room.

Information on energy performance should also be shared with those responsible for planning training. This will help them identify ongoing training needs.

*For more information on how your company can create an energy-wise enterprise, contact your local CIRAS account manager. *

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- 1 National Association of Manufacturers, Efficiency and Innovation in U.S. Manufacturing Energy Use, June 2005, [www.nam.org](http://www.nam.org).
  - 2 For more specific information on the Energy Star for Industry, refer to <http://www.energystar.gov>.

# Changing Faces/Facing Changes: The future of advanced manufacturing

by Del Marks, Extension Communications and Marketing



Ted C. Fishman

Competition from China is likely to affect how Iowa manufacturers do business in years to come, according to noted journalist and author Ted C. Fishman, keynote speaker at the Changing Faces/Facing Changes conference held in Cedar Rapids in May.

China's transition from an agricultural economy to a manufacturing economy has doubled the world labor supply in the last decade. The explosive growth of the Chinese workforce has caused worldwide changes in the production of consumer goods. Chinese manufacturers have become expert at reproducing products designed in the United States and elsewhere at a fraction of the original cost, Fishman said. The demand for these products continues to escalate as big retailers in developed countries are pressured to buy goods for resale at the lowest possible price.

Fishman, whose comments were a highlight in a discussion on "The Future of Advanced Manufacturing in Iowa," is a Chicagoan who has traveled extensively in China and is published frequently in *The New York Times Magazine*, *Money*, *Harper's*, *Worth*, *Esquire*, and *USA Today*. He was a commodities broker before turning to journalism in 1992 and is author of the bestselling book *China, Inc.: How the Rise of the Next Superpower Challenges America and the World*.

Low-cost labor and a "single-minded focus on the future" by the government of China has resulted in the rapid construction of manufacturing plants in all of China's urban population centers, Fishman said, as well as the development of many new cities. "China now has 200 cities with populations of 1 million or more," and Shanghai, the country's financial center, has grown to 17 million. China's national economy is growing at a rate three times faster than that of the U.S.

According to Fishman, China is poised to dominate the world economy in the 21st century in the way that the United States dominated in the 20th century. The trends that moved the U.S. from an agricultural to manufacturing economy in the last century—including the migration of the labor supply from the rural areas to the cities—are now taking hold in China.

The Chinese migration is driven, in part, by the desire to save family farms by supplementing farm income with off-farm income. Fishman said the transition in the 1980s from collective farming to individual plots that allowed farmers to keep part of their production opened the way to the entrepreneurial efforts that now drive manufacturing.

The cultural pull of the rural areas in China is similar to the desire in the U.S. to preserve the lifestyle in places such as Iowa, Fishman said. The world economy also can expect that China will move into agricultural exports as aggressively as it has into manufacturing.

"China will leverage its labor force to produce ag products cheaply for the world market," Fishman said. Iowa can benefit from that effort by providing technical expertise. He cited an example that involved meatpacking officials from Postville, Iowa, whom he met in China while they were there to consult with their Chinese counterparts. The Chinese plant wanted to market its products to Japan and was asking for help from the U.S. on meeting the high sanitation standards demanded by Japanese customers. According to Fishman, the sanitation standards imposed by U.S. inspection agencies do not exist in China; the experts from Postville, who work with a kosher processing plant, were able to advise the Chinese on how to achieve even higher standards.

Designs and production methods developed in the United States will find a large market in China, and Iowa manufacturers must find ways to work with parallel industries there, Fishman said. China offers challenges in valuation of its currency and in protection of intellectual property that must be overcome to establish a mutually beneficial working relationship.

Fishman noted that the audience of advanced manufacturers attending the Cedar Rapids conference can benefit from the Chinese challenge if they are willing to follow their suppliers in importing components of their products from China, and in continuing to support the advanced research and development that takes place in western industrial countries.

About 180 representatives of Iowa's industries and development groups attended the one-and-a-half-day conference held on the Kirkwood Community College campus. Keynote speakers in addition to Fishman included Leo Reddy, CEO of the Manufacturing Skill Standards Council; Willis Goudy, sociology professor emeritus at Iowa State University and census expert; Kwan Rim, executive advisor of the Samsung Advanced Institute of Technology in Suwon, Korea, and founding chairman of the Department of Biomedical Engineering at the University of Iowa; Clay Jones, chairman and CEO of Rockwell Collins; and W. David Williams, director of information solutions and services at Sandia National Laboratories.

Topics for the breakout sessions included Innovative Workforce Strategies; Attracting Iowa Youth to Advanced Manufacturing; Best Practices in Diversity, Recruitment, and Retention; Global Supply Chains; Competing in a Price-Driven Economy; State of the Practice Technologies; and Future Technologies.

*The Center for Industrial Research and Service (CIRAS) at Iowa State University was a major sponsor of the conference. More information on Fishman's book is available online at [www.chinainc-book.com](http://www.chinainc-book.com).*

# Industrial targeting assistance for southern Iowa

by Dave Swenson, Department of Economics, Iowa State University

Iowa's southern two tiers of counties have struggled to stem reductions in their combined economies, their populations, and the vitality of their communities. By every major economic and demographic measure, the area lags behind the rest of the state, a situation that has confounded economic development and political leaders for decades.

The six counties of Adams, Clark, Decatur, Ringgold, Taylor, and Union are representative of the range of experiences borne in this region. Combined, during the last decade when the state as a whole grew by 5.2 percent, they could only muster 0.6 percent population growth. In just the first four years of this decade, while the state grew by 1 percent, the region declined by 2.1 percent.

The problems of the region are daunting and worrisome to community leaders. The area suffers from what demographers call "natural decline," where deaths outnumber births. In addition, it has witnessed a persistent outmigration of its younger workforce members—persons that fill entry-level trade and professional jobs and who start families. The ripple effect of this loss in younger workers is the region's combined school enrollment decline of 3.3%, representing a reduction in future population potential.

The Center for Industrial Research and Service (CIRAS), a U.S. Economic Development Agency (EDA) University Center, combined resources with the Department of Economics at Iowa State University to develop and deploy research and technical services to assist Iowa's economically distressed regions. South Iowa is the second area of the state receiving assistance from this partnership. The first project was in the southeast part of the state.

The organizing process for the research and assistance involved two initial meetings with community economic development leaders in the fall of 2005 to explain our approach to providing technical assistance, to answer questions, and, more importantly, to learn more about their concerns and expectations for the region.

Research on the region began in February after the procurement of industrial data that provided the most recent characterization of the regional economy. Information was gathered describing a range of regional characteristics, including population, education levels, mobility, characteristics of workers, and the amounts and compositions of income in the area. These data helped provide the foundation for our conclusions about the performance of the region's physical and human capital.

An exhaustive evaluation of the area's combined industrial structure allowed researchers to hone in on the region's economic strengths. First and foremost, the area's agricultural strength, which accounts for nearly 18% of jobs, was acknowledged. In the non-agricultural economy, industries that fit into our industrial targeting screening criteria were

identified and labeled as: (1) competitive—industries that are important to the region and show signs of growth compared to national trends; (2) stable—industries that tend to track near national rates of change; (3) declining—industries that are important to the region but are losing jobs; (4) emerging—industries that might not be important from a competitive standpoint, but are showing faster than expected rates of growth; or (5) support—industries that have a discernible competitive advantage but exist primarily to serve only local demand, not export demand.

In addition, the region was assessed and evaluated for the presence of industrial clusters, which are beneficial groupings of like industries, and additional research was conducted to identify both its import substitution potential and its export sales potential. Its import substitution potential was determined by assessing the kinds of commodities that the region must import annually to determine whether the volume of imports was sufficient to target new producer firms. The export potential identified all of the imports made by the two major metropolitan areas influencing the region, Omaha and Des Moines, and then matching those volumes up with the industries that exist in the south Iowa region.

Among the major findings and concerns for the region:

- The workforce is older; many younger workers have relocated to other areas.
- A much lower percentage of the region's residents are college graduates than in the state as a whole.
- The region's shares of state income, jobs, and people are all trending downward.
- The region has discernible industrial strengths, most notably in agriculture and agriculture product processing. In non-agriculture sectors, the research identified four competitive industries, sixteen important yet stable industries, six important industries in decline, and three emerging industries.
- All but one of the industries that demonstrated industrial cluster characteristics was in agricultural production.

A preliminary report of the major findings was presented at the annual meeting of the South Iowa EDA planning region in late March 2006, and the final report was issued in August 2006. This team will work with the southwest part of Iowa for its next targeted industrial research project and anticipates finishing that effort by mid-fall of 2006.

*The complete report can be viewed at <http://www.ciras.iastate.edu/publications/TIGOIinSEIowa.pdf>. For more information, please contact Dave Swenson, 515-294-7458; [dswenson@iastate.edu](mailto:dswenson@iastate.edu).*

# EDA assistance extends to companies and research projects

by Mark Reinig, College of Engineering, and John Roberts and John Van Engelenhoven, CIRAS

In fiscal year 2006, 31 Iowa businesses received technical assistance in product design, product testing, productivity, and quality management from the Iowa Economic Development Administration (EDA) University Center, operated by CIRAS. Many EDA projects are ongoing, but work that has been completed thus far has generated positive feedback. In surveys, average client satisfaction level was 8.4 on a 10-point scale. Below are examples of recent EDA projects and their potential to reduce costs, increase sales, and create new opportunities for Iowa manufacturers.

**Hawkeye Steel Products Inc.**, located in Houghton, Iowa, manufactures a wide range of agricultural products including grain bins; swine, cattle, and poultry production equipment; and feed storage and delivery systems. Hawkeye Steel contacted CIRAS for help with their model WPO1E and WPO6E heated animal drinkers. CIRAS located a water valve that would meet their requirements, assisted in fitting the new float in the animal drinker, and successfully tested a prototype float. Hawkeye Steel expects to increase sales on the two models of animal drinkers by 20% and retain 30–40% of their current sales.

**The Original Saw Company**, located in Britt, Iowa, manufactures wood and metal cutting radial arm saws, horizontal panel saws, and saw accessories. In an effort to reduce machining requirements, Original Saw was considering changes to a large casting for one of their radial arm saws. With CIRAS' assistance, the company can implement changes in the casting and machining processes to reduce the cost of producing the part.

**The Plastic Professionals**, located in Atlantic, Iowa, manufactures rotational molded thermal plastic products and parts as well as custom rotational mold building components. CIRAS helped the company evaluate the performance of their Connect-A-Dock floating rotational molded dock section connection. They expect annual savings of \$70,000 over the next five years.

In addition to providing technical assistance to Iowa businesses, CIRAS has partnered with the Iowa State University Department of Economics to conduct regional economic studies on manufacturing. Economic developers will use the information to improve their regional economy. The current study involves 10 Southwest Iowa counties: Adams, Cass, Fremont, Harrison, Mills, Montgomery, Page, Pottawattamie, Shelby, and Taylor.

Two studies, titled *Targeting Industrial Growth Opportunities in Southeast Iowa* and *Industrial Growth Opportunities in South Iowa*, have been completed. Copies of the report are being provided to the organizations of individuals who participated in the meetings. The reports can be viewed on the CIRAS Web site at [www.ciras.edu](http://www.ciras.edu).

[iastate.edu/library.asp?spec=Publications under Economic Development](http://iastate.edu/library.asp?spec=Publications%20under%20Economic%20Development).

The studies have five objectives:

- Provide an overview of the regional economy and the forces affecting it
- Assess regional industrial structure, examining strengths and weaknesses
- Identify regional key industries with an eye toward assisting industrial development, recruitment, and retention
- Promote the use of research-based criteria for justifying public economic development spending
- Link local organizational structures and needs with Iowa State University research, extension, and continuing education professionals

Preliminary impact from the Southeast Iowa study includes:

- Enhancing a unified regional effort to improve economic conditions in Southeast Iowa
- Generating additional awareness of the deteriorating industrial conditions in Southeast Iowa
- Promoting action to address the industrial conditions
- Providing quantifiable research data to show the needs of the region

A total of 12 economic development organizations have been assisted by the study, and preliminary results indicate an increase in economic activity within the region. In fact, as of June, the Iowa EDA University Center has measured almost \$4.5 million in local and state investment coinciding with over \$100 million in private capital investment. These investments have led to 144 jobs created or retained, with future employee growth expected.

“The Industry Cluster Analysis for Southeast Iowa conducted by the EDA University Center was extremely beneficial to our region,” says Jennifer Daly, executive vice president, Mount Pleasant Area Chamber Alliance. “We are using the data to develop marketing materials and a persuasive sales pitch based on the numbers to entice targeted industries to our region.”

Lowell Junkins, executive director, Lee County Economic Development Group, concurs on the impact of the efforts: “In the competitive business of economic development, succinct and valid research data is fundamental for our retention and attraction efforts. LCEDG is using the ISU *Targeting Industrial Growth Opportunities in Southeast Iowa* report to encourage business development in the

Continued on page 11

# CIRAS 2006 ANNUAL REPORT

University Extension

IOWA STATE UNIVERSITY

College of Engineering

**CIRAS Mission Statement:** *The mission of CIRAS is to enhance the performance of Iowa industry through education and technology-based services.*

## From the Director

The loss of manufacturing jobs in Newton underscores the precarious position of manufacturing in this country. China has over 100 million manufacturing workers, and the number is growing. The U.S. has 14 million, and the number is declining. It is projected by some that over one million manufacturing jobs will be lost in the U.S. when the Iraq war ends. Newton just lost 2,000 jobs—2,000 high-paying jobs for Iowa engineers, lawyers, accountants, and factory employees.

Manufacturing jobs have a greater effect on the economy than any other business sector. When the job of building washing machines leaves the state, we also see a loss of jobs in other sectors, including transportation, services, utilities, construction, and insurance. This loss will affect more than Newton. Suppliers to Maytag from across the state are likely to lose business, and that will have a trickle-down effect on their communities.

It is critical that we use this recent negative circumstance to rally the state—to take this loss and somehow find a way to leverage an economic recovery in Newton and continue to build the economy of the entire state. If we cannot stop the loss of manufacturing jobs, how will we stop the loss of jobs in the biosciences sector or the IT sector?

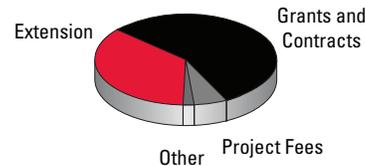
A shortage of qualified workers remains a top concern for many Iowa companies, and demographic projections indicate that this is likely to remain a key issue for much of the Midwest for years. This is an area that Iowa must pay attention to, but we cannot stop there. Many developing countries can throw millions of workers at manufacturing problems, so the ability to be innovative will be a key differentiator.

Innovation is the process in which new market knowledge and technology are applied to create business value. This may be directed to a product, process, service, or business model. We must become more innovative in all aspects of our business to compete in the global economy. We must continue to look at what will help us in the short term but be courageous enough to invest in ideas that may not pay dividends for 5, 10, even 20 years.

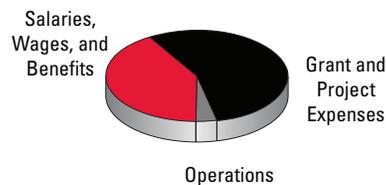
The latest Bureau of Economic Analysis data show that Iowa has climbed to second in the country in the state's dependency on manufacturing. Other states and countries want our manufacturing jobs. Now is the time to be proactive—to aggressively look beyond the boundaries of our companies, agencies, cities, and the state and work together. CIRAS staff and Iowa State University stand committed to helping you grow your company and the state economy—an economy and resultant quality of life that are very dependent on industry.

*Ronald A. Cox*

**CIRAS Income**  
Total Income = \$5,656,580



**CIRAS Expenses**  
Total Expenses = \$5,525,898



## Iowa Manufacturing Profile

Iowa is home to 5,804 manufacturing establishments. The three areas below reflect how the manufacturing sector plays out as a portion of the state's total economic activity:

Labor Force .....	15%
Work Earnings .....	18%
Gross State Product .....	21%

And justice for all... Iowa State University does not discriminate on the basis of race, color, age, religion, national origin, sexual orientation, gender identity, sex, marital status, disability, or status as a U.S. veteran. Inquiries can be directed to the Director of Equal Opportunity and Diversity, 3680 Beardshear Hall, 515 294-7612.

## CIRAS Staff

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- Kathleen Bryan
- Bob Coacher
- Ronald Cox
- Steve Devlin
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- Paul Gormley
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- Carol Smith
- Timothy Sullivan
- Chris Thach
- Derek Thompson
- Eric Thompson
- Karen Tucker
- John Van Engelenhoven
- Steven Vanderlinden
- Ruth Wilcox
- Michael Willett
- Steven Winter

# 2005–2006 Highlights

## Bioeconomy

- CIRAS continues working with USDA to implement the Federal Biobased Products Preferred Procurement Program (FB4P) authorized by the 2002 Farm Bill. The first of a series of rules designating biobased items for preferred procurement was published in the Federal Register in March 2006. Items included diesel fuel additives; mobile equipment hydraulic fluids; roof coatings; penetrating lubricants; water tank coatings; and bedding, bed linens, and towels.
- Over 420 people attended the 2005 Biobased Industry Outlook Conference, which featured speakers that discussed new discoveries in bioprocessing and new business models and capitalization strategies for biobased businesses.

## Energy

- Energy Related Best Practices: A Sourcebook for the Food Industry has been published and distributed to Iowa's food processing companies, the largest manufacturing sector in Iowa. The report, funded in part by a grant from the Iowa Energy Center, contains hundreds of best practices for saving money by reducing energy consumption.

## Engineering

- Shaver Manufacturing in Graettinger, a manufacturer of fencing equipment, post drivers, stump grinders, and log splitters, requested assistance with the development of a new log splitter. CIRAS provided input on testing and design that resulted in a product that could be quickly brought to market, thus increasing revenues for the company.
- T. L. Fabricators, LTD, a small start-up company located in Victor, is developing a parking lot lighting system that would better secure light bulbs and make replacing them easier by eliminating the need for a lift mechanism. CIRAS staff worked with the College of Design to analyze light intensity and distribution using lighting-level simulation software. The company is currently conducting field tests on a selected design.
- The Schebler Company in Bettendorf, which specializes in stainless steel fabrications, recently introduced a new high-heat cooling tunnel to rapidly cool baked products, such as cookies, snack bars, and candies. CIRAS staff and mechanical engineering faculty worked with Schebler to develop a computer model of the tunnel. Schebler estimates that they have retained sales of \$2.5 million and that they have the potential to gain \$3 million per year in additional sales.

## Procurement

- Blue Wave Ultrasonics in Davenport requested assistance in competing for government contracts. CIRAS provided help with bid preparation, term definition, interpretation of FAR regulations, and GSA schedules. The company's government contracts for the past year have grown to over \$660,000.
- Capital City Boiler & Machine Works in Des Moines recently had a change in ownership and structure. They were concerned with maintaining relationships with federal and local governments that had been cultivated by the previous owner. CIRAS provided classes and counseling on government contracts, marketing, and processes. The company reported an increase of \$290,000 in government contracting in the first half of 2006.

## Productivity

- CIRAS partnered with eight states to assist OEMs in reducing manufacturing critical-path time for key suppliers. Value Stream Maps, critical paths, and implementation plans were developed for 11 suppliers to John Deere, Oshkosh Truck, and Bobcat.
- Corrugated Solutions in Des Moines contacted CIRAS for assistance with production capacity. Staff helped the company build a simulation model of their operation to determine the capacity constrained resource and suggest improvements, which resulted in a 34% increase in throughput.

## Quality

- West Central requested internal auditor training to become certified to the new national biodiesel industry quality standard. CIRAS staff provided training for internal audits, a pre-certification audit, and advice on implementing the standard. The plant became the second company in the industry to achieve certification. As a result, sales are expected to increase 30% with cost savings of \$200,000, 12 jobs saved, and 5 new jobs created.
- Sioux Rubber & Urethane in Sioux City specializes in the application of rubber and urethane to industrial parts and components. The plant contacted CIRAS for assistance in implementing an ISO 9001:2000 Quality Management System. They became certified in July 2005.

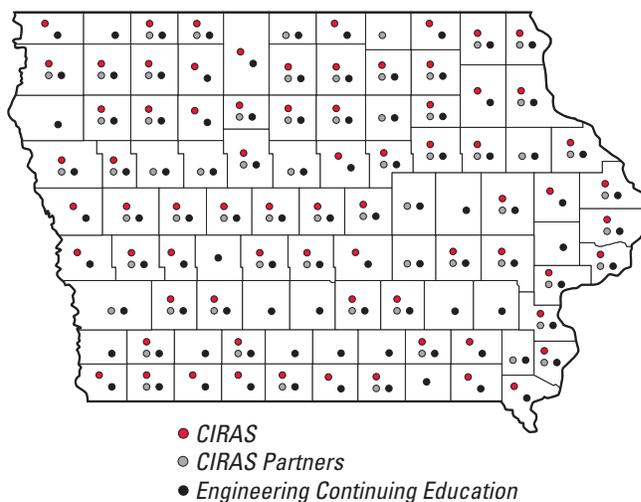
## Industrial Research

- CIRAS and the Iowa State Department of Economics partnered with the Economic Development Administration to conduct a regional study of the industrial structure of six Iowa counties: Adams, Clarke, Decatur, Ringgold, Taylor, and Union. The report identifies challenges for the region, such as out-migration and an aging workforce, as well as opportunities in regionally competitive manufacturing industries.

## Continuing Education

- Nearly 500 people attended a continuing education conference in Des Moines that covered quality design, material selection, construction, and operation of asphalt pavements in Iowa. The conference drew paving contractors, consultants, and county, city, state, and federal engineers. Attendees were able to obtain professional development hours toward retention of their Iowa Engineering Licenses.

## Project Activity



## Corrugated solutions

Continued from page 1

As this portion of the project was being finalized, Mike Willett, another CIRAS industrial specialist, was contacted to look at the production flow process. To understand the process, Willett built a dynamic simulation model of the operation using ProcessModel software and shared it with the client over the Internet using Microsoft Windows Messenger. With this model, they were able to determine the company's current capacity-constrained resource and then evaluate ideas on how to exploit it and subordinate to it to get various production rates. Willett said, "The ability to share the solutions over the Internet from my office in Cedar Falls with the client while they were in Anders' office in Ankeny provided a quick, efficient, effective way to help a customer with an immediate need."

This allowed Corrugated Solutions to focus their workforce in the appropriate areas, increasing throughput by roughly 34%. "It was amazing to see in real time what the actual process and workload looked like, where there were delays, where people were waiting for the previous step instead of operating in concert. I've always known that production of any sort is a dance between people at every step of the process, but seeing it on the computer screen made that real and showed clearly where there were delays."

Increasing production rates helped avoid additional equipment expenditures and reduced inventories, resulting in cost savings in excess of roughly \$27,000 in equipment and another \$20,000 in additional staffing time. An additional benefit was improved staff scheduling and equipment utilization.

Marybeth Gardam said, "Anders' assistance was like having an experienced mentor looking over my shoulders. He made me confident that we could produce what we wanted in the time we needed it, with the staffing we had already on hand...and he made me see that volume increases offer challenges and opportunities, affecting our costs and our profitability—new concepts for this former marketing and communications person!"

Thompson and Anders continue to assist Gardam; the next project is a review of the company's salesman compensation plan and a redesigned marketing plan.

The partnership between Corrugated Solutions and CIRAS is an example of how Iowa State University Extension services can help Iowa companies. "I can't say enough about how helpful the CIRAS staff has been. They let me know they are there for me. I call on manufacturing customers who are a lot more sophisticated than I am who also have nothing but praise for their partnership with CIRAS," Gardam adds. "As a start-up small business person, it means everything having someone knowledgeable to be able to bounce ideas off of. CIRAS has been that for me."

*For more information on how CIRAS can assist your company, please contact Derek Thompson at 515-419-2163; [thompson@iastate.edu](mailto:thompson@iastate.edu), Verl Anders at 515-231-4497; [vanders@iastate.edu](mailto:vanders@iastate.edu), or Mike Willett at 319-433-1286; [mwillett@iastate.edu](mailto:mwillett@iastate.edu). ■*

## Brownells

Continued from page 3

Brownells stands on the cusp of a major reconfiguration of its traditional business model, one that promises greater profitability and an even higher profile for a firm with an already solid reputation in the consumer marketplace. With resources such as PTAC backing it, Feeley says, Brownells is ready for the challenge—and more than up to the competition.

"There are only two other firms in America that produce this particular magazine for the government," he notes. "For a third one to be a firm that's never been engaged in manufacturing speaks volumes about the homework we did up front to get this right."

*For more information on how CIRAS can assist your company, contact Kathy Bryan at 515-289-0280; [kathyb@iastate.edu](mailto:kathyb@iastate.edu). ■*

## EDA assistance

Continued from page 8

import and export areas identified in the analysis. The ISU findings are the foundation on which we can support our companies as they strive to remain competitive in the global marketplace."

The Iowa EDA University Center was established at CIRAS in 1989 to provide technical assistance to Iowa industry and assist with the transfer of university technology. The center also provides guidance, information, and design assistance to entrepreneurs in their efforts to develop new products.

*For more information contact Mark Reinig at [mreinig@iastate.edu](mailto:mreinig@iastate.edu); 515-294-7883, John Roberts at [jrobert@iastate.edu](mailto:jrobert@iastate.edu); 515-294-0932, or John Van Engelenhoven at [jve@iastate.edu](mailto:jve@iastate.edu); 515-294-4475. ■*

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## CIRAS' new staff



Haiyan Li, who joined the group in June, will manage the accounting activities of several grants, including the USDA FB4P. Formerly an accountant in Iowa State's Department of Agronomy, Li says she's pleased to be associated with a unit that plays such a strong role in the economic development of the state.

Li has been in Ames for nearly eight years. She has earned two degrees at Iowa State, a BS in management information systems in 2001 and an MS in accounting in 2004. In her leisure time, she enjoys reading, playing tennis and Ping-Pong, and jogging.



Joseph Papp is the new CIRAS account manager for south central Iowa. In his new role, he will help businesses identify and utilize the resources needed to better compete in today's markets. Papp brings 40 years of experience to his position—20 years in manufacturing,

15 in consulting, and 5 years in education. Industry experience includes positions ranging from manufacturing engineer to materials manager to vice president of manufacturing. In the mid-1980s, Papp formed a consulting company that focused on helping clients improve manufacturing operations. His experience in education includes a position as professor and chair of the Rader School of Business at the Milwaukee School of Engineering.

Papp earned a BS in mechanical engineering from the University of Iowa and an MS in engineering management from the Milwaukee School of Engineering. He is a registered professional engineer and has earned CPIM certification (certified in production and inventory management) through APICS.



Jessica Riedl returns to CIRAS to continue work begun as an undergraduate. "I actually started working at CIRAS on the USDA Biobased Products Program as an undergraduate student back in 2003," she explains. "My first project was to collaborate with

staff members Steve Devlin and Verl Anders to complete development of our business plan." She worked for the Biobased Products Program until completing her BS in mechanical engineering at Iowa State in 2004.

After spending a year as an AmeriCorps volunteer with Habitat for Humanity, Riedl returned to Iowa State and CIRAS as a graduate student staff member. "When the full-time job opened up, I was very excited about the opportunity to start my career at CIRAS working with biobased product manufacturers," says Riedl. As a biobased product specialist, she provides program expertise and links manufacturers to Iowa State, the federal government, and other resources.

Riedl plans to continue working toward her master's degree and black belt in taekwondo.

**CIRAS' new staff contact information is Haiyan Li at 515-294-1316; [hli@iastate.edu](mailto:hli@iastate.edu), Joseph Papp at 515-231-1452; [jpapp@iastate.edu](mailto:jpapp@iastate.edu), and Jessica Riedl at 515-294-5416; [jesriedl@iastate.edu](mailto:jesriedl@iastate.edu).**