Assessment Information Package
Technical Assistance for Small and Medium Sized Manufacturers

As part of Save Energy Now, the Industrial Assessment Centers (IAC) provide energy, waste, and productivity assessments at no charge to small and mid-sized manufacturers. The assessments are performed by teams of engineering faculty and students from more than 26 participating universities across the country. Your company may be eligible for a IAC assessment, if your total energy bills are less than $3.0 million and your plant meets other qualifying conditions.

The university-based IAC team conducts a 1-day site visit and performs an assessment to identify energy and cost savings opportunities. Within 60 days, a report detailing the analysis, findings, and recommendations is sent to the client. In 6 months, follow-up phone calls are placed to the plant manager. Centers are funded through the U.S. Department of Energy (DOE), Industrial Technologies Program (ITP).

Training for Students from America’s Best Engineering Schools

The use of students in the IAC program has the added benefit of exposing and training gifted graduate and undergraduate students in industrial assessment and energy system management techniques. Often, this results in those students pursuing careers in this vitally important field. Currently, more than 250 students are being trained at centers around the country.

IAC Database

The IAC database is recognized as one of the most comprehensive industrial energy databases in the world. Information from 11,000 assessments conducted over the last 20 years is available free of charge, including:

- Typical savings for assessments in different industries
- Individual recommendations made for each assessment
- Rates of adoption of various recommendations
- Sorting by company size, geographical area, or cost of energy
- Implementation costs and paybacks for industrial energy projects
- Manuals and other technical documents.

Visit the database at www.iac.rutgers.edu/database.
Universities Operating IACs

University of Alabama
Boise State University
Bradley University
Colorado State University
University of Dayton
University of Delaware
Indiana University
  -Purdue University Indianapolis
Iowa State University
University of Kentucky
Lehigh University
University of Massachusetts
University of Miami
University of Michigan
University of Missouri-Columbia
North Carolina State University
Oklahoma State University
Oregon State University
San Diego State University
San Francisco State University
Syracuse University
Tennessee Technological University
Texas A&M University
West Virginia University
University of Wisconsin Milwaukee

For complete details on the IAC program, visit the Web site at
http://www1.eere.energy.gov/manufacturing/tech_deployment/iacs.html
What is an Industrial Assessment Center and What Can It Do for You?

Industrial Assessment Centers provide energy, waste, and productivity assessments at no charge to small and mid-sized manufacturers. Centers are funded through the U.S. Department of Energy Advanced Manufacturing Office. Assessments help manufacturers maximize energy efficiency, reduce waste, and improve productivity. On average, recommended actions from an assessment result in annual cost savings of about $60,000.

Assessments are performed by teams of engineering faculty and students from one of the 24 participating universities across the country. After some preparatory exchange of information, the IAC team conducts a one day site visit and performs an assessment. Within 60 days, a report detailing the analysis, findings, and recommendations is sent to the client. In six to nine months, follow-up phone calls are made to the plant manager to obtain feedback on the quality of the report and implementation status of the recommendations.

Features of the IAC Program

- Assessments are provided at no direct cost to clients.
- Experienced engineering faculty and trained students.
- The client has no obligation to act on any recommendations.
- Proprietary information of the client is protected.

What are the Program Benefits?

- Objective information is provided to help make the plant less wasteful, more productive and more energy efficient.
- Engineering students receive hands-on industrial experience.
- Universities build valuable local industry relationships that help to maintain a practical focus in their engineering curriculum.
- Manufacturers can assess the latest technologies and practices.
- Technical assistance is available through the Advanced Manufacturing Office.

IAC Assessments Deliver Objective, Results – Orientated Input

There are numerous products on the market offering improvement energy efficiency. Plant managers are often wary that claims are inflated and payback periods are exaggerated and are therefore reluctant to implement new technologies.

The IAC assessment offers objective information to help companies make well informed decisions. Participating faculty and students offer carefully prepared recommendations without bias. IAC faculties are restricted from consulting for pay with the client companies they advise for a period of two years after the assessment.

What are the Company Eligibility Requirement for an IAC Assessment?

IAC clients are small and medium-sized manufacturers within the Standard Industrial Codes 20-39. They should reside within 150 miles of a host university campus and must meet the following criteria:

- Gross annual sales below $100 million.
- Fewer than 500 employees
- Annual energy bills more than $100,000 and less than $2,500,000
- Lack of in-house technical staff to perform the assessment themselves.
IAC – Recommended Actions
Lower Costs and Raise Productivity

On average, recommended actions from an assessment visit identify annual energy savings of about eight billion Btu and cost savings of about $60,000.

Experience shows that about half of the IAC recommendations are implemented. They typically range from shifting electricity usage to lower rate time periods to installing radiant heaters in place of forced air heating systems to changing lighting. Such deceptively simple efficiency measures deliver substantial returns in terms of cost savings and enhanced productivity.

Getting More Effective All the Time

The experience and expertise developed though the IAC program will soon be more broadly available through workshops and publications disseminated to manufacturers. First to be published will be waste assessment case studies by the Environmental Protection Agency (EPA) Risk Reduction Engineering Laboratory in Cincinnati, Ohio. Next scheduled is a manual with software that will support life cycle analysis and planning. This will be followed by a best practices manual distilling the lessons learned from the thousands of assessments conducted to date.

A Remarkable Record of Success

Since 1976, more than 16,000 small and mid-sized manufacturing companies were visited and energy assessment recommendations were made that exceeded a total of 200 trillion British Thermal Units (Btu). What does this mean? If all the recommendations were implemented, it would account for a decrease in harmful greenhouse gas emissions equivalent to 400,000 tons of carbon. To date, the government has spent $125 million on the program, and the industry cost savings exceed $700 million.

By their implementation of IAC recommendations, companies in 49 states and from all industrial manufacturing sectors have significantly improved their operations. At the same time, through their participations, these manufacturers have supported the national goals of reducing the threat of global climate change, retaining skilled jobs, and increasing U.S. manufacturing competitiveness in the global market.

Controlling Waste:
A Low-Cost, High-Yield Investment

The DOE Industrial Technologies Program (ITP) concentrates its programs on the nation’s most energy-intensive industries. ITP’s Industrial Assessment Center (IAC) program helps manufacturers in many of these industries find ways to prevent or control waste, in many cases by taking simple steps.

Pollution prevention often has a higher rate of return than most investments in your company is already making. IAC recommended investments in waste control measures present little or no risk, and many require little capital. Furthermore, implementing new manufacturing processes to reduce waste and pollution can often boost productivity and reduce disposal fees.

Contact Information

To inquire about a company’s eligibility for a no-charge IAC assessment, return the attached Pre-Audit Information form, or call today - and start saving energy and money.

D. Paul Mehta, Ph.D., Director
Industrial Assessment Center
Ameren Illinois Professor and Chair,
Department of Mechanical Engineering
Bradley University
1501 W. Bradley Ave.
Peoria, IL 61625
(309) 677-2754
mehta@fsmail.bradley.edu
To schedule an assessment, please complete the following form, and return it, along with copies of your utility bills and a plant layout or floor plan, to the address above.

**PRE-AUDIT INFORMATION**

<table>
<thead>
<tr>
<th>Company Name:</th>
<th>Company Address:</th>
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<tr>
<th>City:</th>
<th>County:</th>
<th>State:</th>
<th>Zip Code:</th>
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<tr>
<th>Name of Company Contact:</th>
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<tr>
<th>Phone:</th>
<th>Fax:</th>
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<tr>
<th>e-mail:</th>
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<table>
<thead>
<tr>
<th>Company Website:</th>
</tr>
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<table>
<thead>
<tr>
<th>Principal Products:</th>
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<table>
<thead>
<tr>
<th>S.I.C. Code:</th>
<th>Annual Sales:</th>
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</table>

Please send copies of your electric, gas, water, and sewer bills for the most recent twelve months.

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<tr>
<th>Number of Employees:</th>
<th>Number of shifts and operating hours (production):</th>
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<table>
<thead>
<tr>
<th>Number of buildings in the plant and approximate floor areas:</th>
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</table>

Please include a plant layout or floor plan, if available.

**Circle the process equipment that you have in your plant:**

- Air Compressors
- Cooling Towers
- Refrigeration
- Ovens/Furnaces
- Washers
- Painting Booths
- Spot Welders
- Boilers
- Other (please list) ___________________________________________________________________

**Circle the uses of water in your plant:**

- Sanitary
- Washing
- Cooling Equipment
- Other (please list) ___________________________________________________________________

**Circle the waste streams produced in your plant:**

- General Refuse
- Cardboard
- Wooden Pallets
- Metal Scrap
- Paint Waste
- Other (please list) ___________________________________________________________________

Please list safety equipment required for a tour of the plant?

Is there a conference room that the audit team may use on the day of the visit? Yes No

Please provide directions to the plant from Peoria: ________________________________________
VISIT DAY ACTIVITIES

During the visit day, the focus will be on cost savings opportunities related to Energy Conservation, Waste Minimization and Productivity Enhancement.

Items that the team will be considering during the visit are based on the information distilled from the utility bills (Electricity, Gas, and Water) and the information on the pre-audit form, regarding:

- Lighting
- Air Compressors
- Furnaces/Ovens
- Boilers
- HVAC
- Waste Streams

Visit Procedure:

- The team will need a tour of the facility, starting from the point at which the raw materials arrive and following the production process to the point where the final product leaves.

- After the tour, our team will have a brainstorming session at this time, the team will identify all possible areas upon which they will focus attention.

- After identifying areas of attractions, team members will return to the facility and gather pertinent data form relevant equipments and processes.

- At the end of the audit, the team will return to Bradley University and begin developing the report. Within one week, the company will be contacted to request further information that is needed or could not be obtained on the day of the visit. The final report will be available within 60 days.

- Finally, approximately three to six months following delivery of the report one final contact with the company will be made to determine how well the report has served the company and how many, if any, of the assessment recommendations (ARs) have been implemented.

The visit usually requires 6-8 hours (depends on the plant size)
**Spartech Plastics: North American Thermoplastic Extruder Implements Industrial Assessment Findings and Saves More Than $100,000 Per Year**

**Summary**

Bradley University’s Industrial Assessment Center (IAC), in Peoria, Illinois, performed an energy audit of Spartech Plastics’ Richmond, Indiana facility that helped the company save about $113,000 per year. The IAC, sponsored by the U.S. Department of Energy (DOE) Industrial Technologies Program (ITP), is one of 26 across the nation in which faculty and students provide eligible small- and medium-sized manufacturers with no-cost energy assessments. This assessment project was sponsored by ITP and The Society of the Plastics Industry, Inc. (SPI), a DOE Allied Partner.

The assessment showed that Spartech’s Richmond plant could save money by improving waste heat recovery, insulating pipes, and installing high efficiency motors. By implementing many of the recommendations, the company cut energy consumption by more than 7,200 MMBtu, which led to cost savings of nearly $57,000 annually. Additional recommendations, including selling old equipment or pallets, will save another $56,000.

**Company Background**

Spartech Plastics, headquartered in Clayton, Missouri, has 22 other plants that are strategically positioned throughout the United States and Canada. The company is the largest extruder of custom thermoplastic sheet and roll stock in North America. Spartech has about 100 production lines, two-thirds of which have multilayer extrusion capabilities. In addition, Spartech serves other markets, including transportation, packaging, building, construction, recreation, and leisure.

The Bradley University team assessed eight of the Spartech plants; the results for the Richmond plant are discussed here. Some of the eight assessed plants had much higher savings in comparison to those of this plant. However, this plant implemented a high percentage of the recommendations. The Richmond facility has one building that measures 93,000 square feet, and uses approximately $487,000 worth of energy per year. Most of the costs are for electricity and a small portion for natural gas.

**Assessment Approach**

A team of students and staff from Bradley University’s IAC performed an assessment of Spartech’s Richmond facility on July 18, 2003. The assessment was led by
Dr. Paul Mehta, IAC Director at the Bradley University IAC. The assessment team met on site with plant personnel, toured the facility, and collected data. After reviewing potential energy saving opportunities, the assessment team presented their findings to plant managers.

**Recommendations**

The assessment team made 16 recommendations to Spartech with potential to improve energy efficiency and reduce waste at the plant. Projects to improve energy efficiency included waste heat recovery, insulation, motor upgrades, and lighting efficiency. Selling old equipment will clean up the facility by reducing clutter, and will generate revenue for the plant. In addition, recycling waste wood and selling pallets will have a positive impact on the environment.

**Results**

The Richmond plant’s management team implemented 14 recommendations from the assessment, as described in the table below. The implemented energy efficiency measures account for half of the annual cost savings for the plant, while waste and productivity improvements account for the other half. Besides saving almost $113,000 per year, the changes will help this Spartech plant cut energy use by more than 15%.

<table>
<thead>
<tr>
<th>Project Category/Recommendation</th>
<th>Annual Resource Savings</th>
<th>Annual Cost Savings</th>
<th>Implementation Cost</th>
<th>Payback Period</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Energy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Recover compressor waste heat</td>
<td>1,636 MMBtu</td>
<td>$13,627</td>
<td>$1,000</td>
<td>Less than 1 month</td>
</tr>
<tr>
<td>• Insulate extrusion lines</td>
<td>2,553 MMBtu</td>
<td>$13,156</td>
<td>$8,080</td>
<td>7 months</td>
</tr>
<tr>
<td>• Install high-efficiency motors</td>
<td>1,007 MMBtu</td>
<td>$8,345</td>
<td>$35,510</td>
<td>4.3 years</td>
</tr>
<tr>
<td>• Install radiant heaters</td>
<td>889 MMBtu</td>
<td>$7,407</td>
<td>$5,000</td>
<td>1 year</td>
</tr>
<tr>
<td>• Install photosensors</td>
<td>253 MMBtu</td>
<td>$5,082</td>
<td>$1,500</td>
<td>4 months</td>
</tr>
<tr>
<td>• Replace metal halide lamps</td>
<td>494 MMBtu</td>
<td>$3,389</td>
<td>$9,225</td>
<td>2.7 years</td>
</tr>
<tr>
<td>• Use synthetic lubricants</td>
<td>247 MMBtu</td>
<td>$2,306</td>
<td>$500</td>
<td>3 months</td>
</tr>
<tr>
<td>• Delamp lighting</td>
<td>63 MMBtu</td>
<td>$1,343</td>
<td>240</td>
<td>2 months</td>
</tr>
<tr>
<td>• Use outside air for compressor intakes</td>
<td>65 MMBtu</td>
<td>$606</td>
<td>$500</td>
<td>10 months</td>
</tr>
<tr>
<td>• Install occupancy sensors</td>
<td>92 MMBtu</td>
<td>$1,611</td>
<td>$4,125</td>
<td>2.6 years</td>
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<tr>
<td><strong>Waste</strong></td>
<td></td>
<td></td>
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<tr>
<td>• Sell wooden pallets</td>
<td>11,664 pallets</td>
<td>$8,829</td>
<td>$336</td>
<td>Immediate</td>
</tr>
<tr>
<td>• Recycle wood scrap</td>
<td>210,000 lbs wood</td>
<td>$1,890</td>
<td>$240</td>
<td>1.5 months</td>
</tr>
<tr>
<td><strong>Productivity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Sell unused equipment</td>
<td></td>
<td>$34,400</td>
<td>$10,000</td>
<td>3 months</td>
</tr>
<tr>
<td>• Automate time clock system</td>
<td>780 labor hours</td>
<td>$10,920</td>
<td>$5,000</td>
<td>5.5 months</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>7,299 MMBtu/yr; 210,000 lbs wood; 780 labor hours</td>
<td>$112,911</td>
<td>$84,256</td>
<td></td>
</tr>
</tbody>
</table>

Project Partners:
Spartech Plastics
Richmond, IN
The Society of the Plastics Industry, Inc.
Washington, DC

For Additional Information:
Industrial Technologies Program
Energy Efficiency and Renewable Energy
U.S. Department of Energy
Washington, DC

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1-877-EERE-INF (1-877-337-3463)
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