INDUSTRIAL ASSESSMENT CENTERS

IAC Quarterly Update

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Message from the IAC Program Manager

Welcome to the inaugural edition of the *Industrial Assessment Centers (IAC) Quarterly Update* from the Advanced Manufacturing Office (AMO) at the U.S. Department of Energy (DOE). As the IAC Program Manager, I am excited to announce the inaugural *Update* that shares successes and highlights from the IACs and our manufacturing partners.

The IACs continue to be a resource to America's small and medium-sized manufacturing enterprises (SMEs), helping them save millions of dollars in energy and water use expenses. The IACs provide recommendations to our SME partners that lead to increased competitiveness and productivity through process improvements. In addition to supporting the manufacturing community, the IACs also train engineering students to become tomorrow's energy saving professionals.

In this *Update*, you will learn about the new initiatives the IACs are launching this year. These include the first-ever IAC Student and IAC Alumni of the Year Awards, as well as the IAC student summer internship program. The IACs will also play an important role in the Better Plants supply chain initiative—a focused effort to assist DOE's Better Plants partners by expanding the program to support their suppliers. The next *IAC Quarterly Update* will introduce a new recognition program for IAC plants that achieve exceptional energy savings.

On behalf of DOE, I want to thank the IACs for their service and participating SMEs for understanding the value of energy efficiency to maintaining a robust manufacturing industry in the United States. For more information about the IAC program, please contact me at john.smegal@ee.doe.gov or at 202-287-6225.

> *"We're taking a step that will make it easier for companies to save money by investing in energy solutions that have been proven here at the University of Miami—new lighting systems; advanced heating and cooling systems that can lower a company's energy bills and make them more competitive."*
>
> *—President Obama, while visiting the University of Miami IAC*

About the IAC Program

Since 1976, the IACs have provided SMEs with site-specific recommendations for improving energy efficiency, reducing waste and water, and increasing productivity through immediate changes in manufacturing processes and equipment. Since 2006, IAC assessments have identified nearly $542 million in energy savings and nearly 3.6 million metric tons in carbon dioxide (CO_2) emissions reductions. A typical IAC plant will receive more than $47,000 in annual benefits from each assessment.

Currently located at 24 of the nation's top engineering schools, the IACs combine a traditional engineering curriculum with a unique blend of hands-on experience gained through conducting assessments. More than 60 percent of IAC students pursue careers in energy-related fields.

President Barack Obama tours the University of Miami Industrial Assessment Center

In This Edition

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IAC Program: Quarterly Results

During the first quarter of FY 2014, the IACs conducted 97 assessments—well on their way to meeting the annual goal of 350 assessments (see Table 1, below). As a result, the IACs made 819 recommendations for increasing energy efficiency, reducing water use and waste, and improving productivity, which identified more than $11 million in potential cost savings.

Table 1. Fiscal Year 2014 Quarter 1 Results

Total Assessments	97
Total Recommendations	819
Total Recommended Annual Savings	
Energy Savings	11.9 M Therm
Electricity Savings	81,558,043 kWh
(approx) Generation Reduction	9.31 Megawatts
Natural Gas Savings	300,000 Therms
CO_2 Reduction	0.08 Tons
TOTAL Cost Savings	$11.09 Million
- Energy Related Savings	$10.51 Million
- Productivity Savings	$0.43 Million
- Waste & Water Savings	$0.14 Million

Plants assessed were located in 30 states (see Figure 1, below). The assessed plants represent a broad range of industries, with food, plastics and rubber, metals, and transportation equipment manufacturing being the most common (see Table 2). During the remainder of the fiscal year, the IAC program will conduct assessments of plants in nearly all of the remaining states.

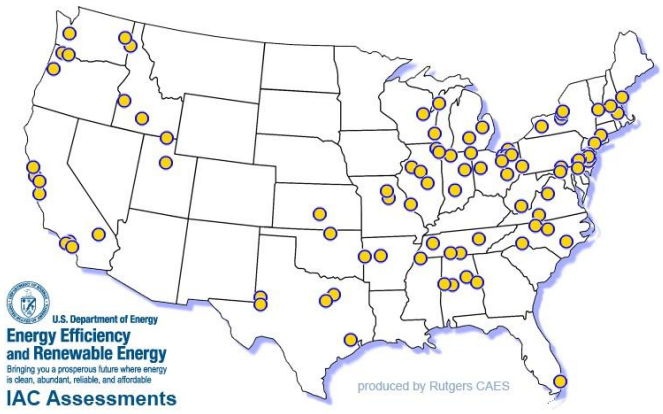

Figure 1. IAC Assessments Nationwide, Fiscal Year 2014 Quarter 1

Kicking off the academic year, a total of 212 engineering students participated in the IAC program across the 24 centers; nearly one-quarter of the students were new to the program. The IACs issued 29 certificates to students meeting all of the certification requirements—exceeding the quarterly goal of 25. These requirements include mastering a number of core skills and participating in at least six assessments.

Table 2. Fiscal Year 2014 Q1 Assessments by NAICS Industrial Category*

Industrial Category	Assessments
Food Manufacturing	13
Plastics and Rubber Products Manufacturing	13
Fabricated Metal Product Manufacturing	13
Transportation Equipment Manufacturing	12
Chemical Manufacturing	6
Primary Metal Manufacturing	4
Beverage and Tobacco Product Manufacturing	4
Wood Product Manufacturing	4
Printing and Related Support Activities	4
Machinery Manufacturing	3
Computer and Electronic Product Manufacturing	3
All Other Manufacturing	12

**Six assessments were conducted at wastewater treatment facilities and other facilities outside of the manufacturing NAICS codes.*

Historically, the number of certificates issued increases significantly during the 2nd and 3rd quarters; therefore, the IAC program anticipates meeting its annual goal of 120 certificates issued. Since 2010, there has been a steady increase in the number of students achieving these standards and earning certification each year (see Figure 2, below).

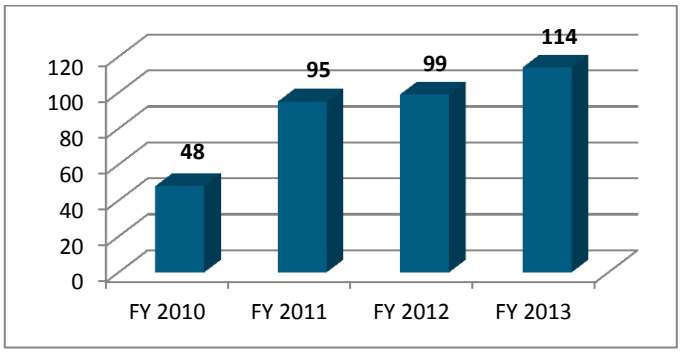

Figure 2. Student Certificates Awarded by Year

After graduation, IAC students use their training to make a significant impact on energy efficiency in the business world. More than half of all IAC alumni serve in the workforce as Project Engineers and nearly 7 in 10 address energy or energy efficiency in their professional employment responsibilities.

For more detailed IAC metrics and reports, please visit the IAC Forum website located at www.iacforum.org.

IAC Program Highlights

Outstanding Student and Distinguished Alumni Awards

DOE is pleased to announce the winners of the first ever IAC Outstanding Student and Distinguished Alumni Awards. The Awards are designed to recognize students and alumni who are excelling in the IAC program or in their careers in energy efficiency. This year's winners are:

Sandra Chow, Senior Mechanical Engineer for BASE Energy, named one of five Distinguished IAC Alumni

Outstanding IAC Engineering Student Awardees

- Dayakar Devaru (graduate student, University of West Virginia)
- Daniel Borgnakke (undergraduate student, University of Michigan)

Distinguished IAC Alumni Awardees

- Kyle Rademacher (early career category, University of Michigan, 2008)
- John Seryak (University of Dayton, 2001 & 2004)
- Dr. Darin Nutter (Oklahoma State University, 1986 & 88, Texas A&M University, 1994)
- Sandra Chow (San Francisco State University, 2000)
- Adam Selvin (San Francisco State University, 2002)

Bringing the IAC Success to the Military

Army Materiel Command

As part of a broader Memorandum of Understanding between the U.S. Department of Defense (DOD) and DOE, a number of IACs provided their assessment services to Army Materiel Command (AMC) facilities, including the Iowa Army Ammunition Plant, the Scranton Army Ammunition Plant, and the Lima Army Tank Plant—now known as the Joint Systems Manufacturing Center—at Fort Detrick, located near Frederick, Maryland.

In accordance with Executive Order 13423, these facilities are required to reduce their energy intensity by 3 percent per year through the end of 2015, or by 30 percent by the end of 2015, relative to a baseline of 2003. IACs from Iowa State University, Lehigh University, Dayton University, and the University of Delaware conducted the assessments.

Coordination between the facilities and the IACs was exceptional—DOD encouraged the IACs to be aggressive in identifying energy savings opportunities. The Scranton facility, for example, committed to implementing more than 20 IAC recommendations—a typical assessment includes 7 to 10 recommendations. At the Lima plant, the IAC team identified more than $1 million of potential savings, and the facility is actively working to implement the recommendations.

Better Plants Supply Chain Pilot

Expanding its commitment to energy efficiency, Legrand North America recently partnered with DOE to recruit eight of its suppliers to join the Better Plants Supply Chain Pilot. The suppliers currently are: Chapco, Complete Design and Packaging, Durex Incorporated, Giering Metal Finishing, Lynam Industries, Magnetic Metals, Rowley Spring and Stamping Corporation, and Stanley Spring and Stamping Corporation. The new pilot will improve supply chain energy management by providing Better Plants Partners with an established, national program they can direct their suppliers to that features clear goals, targeted technical assistance, and proven methods for tracking progress. Selected IACs will be providing their assessment services to help these suppliers—many of which are small to medium-sized manufacturers—to achieve their energy goals.

IAC Summer Internships

The relationship between the IAC program and industry has always been strong. Hiring personnel and managers have long recognized the exceptional knowledge and ability demonstrated by IAC students and sought program graduates to fill key positions. This relationship has now expanded to include a formal summer internship program. ICF International, Schneider Electric, Siemens Building Technologies, and ERS, Inc. will offer internships to IAC students this summer. All four companies have a long history of supporting the IAC program and consistently recruit IAC alumni.

> *I felt the word "student" is a misnomer for your team. I have a bachelor's and master's degree with lots of experience. Many times, I found I was the student asking them to explain to me. These younger folks may be students—in terms of we are all students, always learning—but these folks are TRUE SKILLED PROFESSIONALS.*
>
> *—SME Client*

The summer internship program promises challenging and meaningful opportunities for students. Though the application deadline for this summer has already passed, the application period will open again in the fall of 2014 for the 2015 internships.

More information about the IAC summer internship program is available on the IAC Forum website: http://www.iacforum.org.

SME Spotlights

IAC Assessments in Alabama Help Sawmills Comply with Boiler MACT Regulations

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In March 2011, the U.S. Environmental Protection Agency (EPA) issued legislation that imposes stricter regulations on industrial, commercial, and process heaters. This rule is known as the Boiler MACT (Maximum Achievable Control Technology) Regulation. This new regulation states that existing oil, biomass, and coal-fired boilers with a design heat input capacity of 10 MMBtu/hr or greater must conduct a one-time energy assessment, performed by a qualified energy assessor, by March 21, 2014. Currently, natural gas-fired boilers are exempt from the Boiler MACT regulation.

The Boiler MACT regulations specify seven activities that must be completed during the specified energy assessment:

- A visual inspection of the boiler system
- An evaluation of operating characteristics of the affected boiler systems, specifications of energy use systems, operating, and maintenance procedures, and unusual operating constraints
- An inventory of major systems consuming energy from affected boiler(s) and which are under the control of the boiler owner or operator
- A review of available architectural and engineering plans, facility operation, and maintenance procedures and logs, and fuel usage
- A list of major energy conservation measures that are within the facility's control
- A list of the energy savings potential of the energy conservation measures identified
- A comprehensive report detailing the ways to improve efficiency, the cost of specific improvements, benefits, and the time frame for recouping those investments.

IAC students and alumni will recognize that many of these required elements are standard components of IAC assessments and reports. As a result, with some additional care in reporting, IACs can perform Boiler MACT assessments.

The regulations delineate three levels of boiler energy heat input and specify inspection requirements for each category. The smallest category is boilers of total annual energy input less than 0.3 TBtu/yr (1TBtu=10^{12}Btu). For boilers operating year-round (8,760 hrs/yr), this translates into a boiler capacity of 34 MMBtu/hr input. For boiler systems of this size, the regulations require not more than eight hours of on-site technical assistance and review of at least 50 percent of the boilers' end uses. The next level of energy use is up to 1.0 TBtu/yr (about 114 MMBtu/hr input) which requires not more than 24 hours of on-site technical assistance and review of at least 33 percent of the boilers' end-use applications.

The IAC program interprets "on-site technical hours" as hours expended on-site by qualified assessors on the visiting team. The regulations stipulate the qualifications of assessors, which are descriptive of a person that has significant experience with boiler operation and assessments. These qualifications are also very similar to those of a DOE Steam Systems Qualified Specialist. Several of our IAC students, graduates, and professors have earned this DOE certification.

The University of Alabama IAC recently completed two assessments of sawmills located in Alabama to help the facilities comply with the Boiler MACT regulation. During the assessments, Alabama IAC students observed the facility's operation and main energy consumers, and also acquired detailed notes about the boilers and associated steam systems. Both sawmills utilize wood-fired boilers that use scrap sawdust and waste wood materials obtained onsite to produce steam.

The size of the two facilities vary dramatically. The first facility, located in Northport, Alabama, is 100,000 sq. ft. in size and includes one wood waste-fired boiler whose fuel consumption was determined to be approximately 19 MMBtu/hr. The steam produced by the boiler is used to service two drying kilns. The Alabama IAC developed three fuel saving recommendations, which included adding insulation to the boiler shell, insulating

the condensate return pipes and condensate tank, and reducing combustion air flow in order to reduce the oxygen content in the combustion exhaust air.

The second sawmill assessed by the Alabama IAC, located in Moundville, Alabama, is 250,000 sq. ft. in size and includes two wood waste-fired boilers and one natural gas-fired boiler. The total fuel consumption of these boilers was determined to be approximately 170 MMBtu/hr. The steam produced by these boilers is used to service seven drying kilns and one condensing turbine, which produces electricity that is sold back to the power company. The Alabama IAC developed fuel savings recommendations for this sawmill, including: installing an economizer on the natural gas boiler, installing a condensing economizer on the wood fired boiler, insulating steam pipes, and using more of the steam produced by the wood waste-fired boiler to power the condensing turbine.

The implementation of the new Boiler MACT regulations has resulted in more assessment opportunities for the Alabama IAC. These regulations should provide other Industrial Assessment Centers with similar opportunities to reach out to industrial facilities that utilize oil, biomass, or coal-fired boilers and help them attain energy and cost savings.

West Virginia University IAC Gains New Experience through an Energy Assessment in a Casino

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The West Virginia University (WVU) IAC recently conducted an energy assessment of a casino in West Virginia. The assessment provided the team with a unique experience as they learned to adapt to the different type of energy demands and constraints in the casino environment.

The casino has a built area of approximately 14 acres and an open area of nearly 30 acres. It features a gaming area, hotel, racetrack, and event centers with total HVAC capacity of more than 1,000 tons. The IAC team first met with facility personnel to gather insight and collect basic information. This information was then used to narrow the focus on the main energy systems. The team set out to tackle upgrading the facility's two largest energy uses—HVAC and lighting—to improve energy efficiency.

Presently, the casino has many gaming areas and convention centers that are not fully occupied at all times. However, the HVAC systems in these buildings are set to circulate conditioned air at a rate to meet the ventilation requirement of maximum occupancy. This was resulting in unnecessary cooling or heating of the air which can be avoided if demand controlled ventilation is used. The WVU IAC recommended a demand-controlled ventilation system using CO_2 sensing. The system employs sensors to monitor CO_2 levels in the air inside a building, and an air-handling system uses data from the sensors to regulate the amount of ventilation air admitted. This recommendation offered a cost savings of $80,000 with less than a one year payback.

The casino has many areas with ceiling heights of around 25 feet or more, which require large volumes of air to be cooled in summer and heated in winter. The energy used for cooling and heating can be reduced by lowering the ceiling height. The IAC recommended lowering the ceiling height by building a false roof at 15 feet. This will reduce the volume of air that has to be either cooled or heated, and hence will result in energy savings. This recommendation offered a cost savings of $60,000 with a payback of 4.5 years.

There was significant high intensity discharge (HID) lighting in the casino. The existing lighting system in the race track area of the casino had 900 metal halide (MH) fixtures with 1,500W bulbs, and the parking area had 200 high pressure sodium (HPS) fixtures with 1,000 W bulbs. The WVU IAC recommended a lighting upgrade to replace the MH fixtures with LED fixtures of 720W bulbs and to replace the HPS fixtures with LED fixtures of 400W bulbs. This recommendation offers a cost savings of $55,000 for MH fixtures and a cost savings of $33,000 for HPS fixtures. Replacing the incandescent lamps with LED lamps saves $9,500 with a payback of 1.5 years, and replacing the incandescent exit lamps with LED exit lamps offers a cost savings of $3,500 with a payback of 2.5 years.

The facility currently has four diesel generators with a 2 MW capacity each. The casino currently uses 6 MW of power; hence, the WVU IAC recommended the company enroll in a demand response program to reduce its demand by at least 2 MW when the utility company calls for it. Demand response programs involve shutting down some of the non-critical equipment or generating power in-house using electrical generators to reduce demand from the utility. This recommendation gave a cost savings of $20,000 with a payback of 0.25 years.

Another interesting recommendation was to replace conventional propane boilers used for water heating with electrical instantaneous water heaters. Instantaneous water heaters provide hot water only as it is needed. They heat the water directly without the use of a storage tank, avoiding the stand-by losses associated with storage water heaters. Also, the efficiency losses that occur in fuel fired heaters can be reduced by using electrical instantaneous water heaters. This recommendation offered a cost savings of $13,500 with a payback of less than two years.

The team provided 20 energy recommendations for the facility's HVAC, lighting and hot water heating energy systems with a total recommended savings of more than $350,000. The casino management was very much impressed by the report and is planning to implement most of the recommendations. The team also arranged a post-assessment presentation with the key decision makers of the facility. The casino assessment offered the team a welcome opportunity to explore new energy efficiency methods that are uncommon in the team's more than twenty years of experience with industrial energy assessments.

IAC Alumni Spotlights

Software Tools Could Speed Site Assessments

Sajda Nuriddin, Syracuse University IAC Alumni
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Desk work might not always be glamorous; there may even be a few days when you think you are the living, breathing embodiment of Peter Gibbons from *Office Space*, and you wonder why you feel like you have "a case of the Mondays"…every day. Not so with a site audit. From the moment we wake up and slip on that same lucky pair of khakis, polo shirt, and steel-toed boots, until the last mechanical room on the outskirts of the floor plan, we are in our element. With a site audit, we can truly set our brain free; let it run amok with ideas for assessment recommendations and energy conservation measures. Site assessments are where we shine, and that's exactly where our focus should be at the onset of an audit.

Unfortunately, it's not always as cut and dry. Sometimes our attention is drawn to the less adventurous aspects of an energy audit. You know what I refer to—nameplate data, equipment counts—pretty much all of the typical data entry that we associate with a clipboard and pencil. An energy auditing software that could aid in making our site visit more about the audit and less about frantically writing down every digit associated with a model number might be just what we need.

Recently, the National Renewable Energy Laboratory (NREL) announced that they've been working to develop such software. Of course, auditing tools of this type have previously been developed and used for many years. In fact, while I was working at the IAC at Syracuse University six years ago, one of the major controls companies in the industry was already using a tablet to aid in data collection during their site visits. Nonetheless, it may be useful to compare NREL's highly anticipated simuwatt Energy Auditor, with major auditing software currently on the market, kWhOURS' kW-Field.

Although I could not test the simuwatt software, as a finalized version is not yet available for release, software representatives did recently sit down with members of my company to discuss some of the functionality of the program. One thing that I found especially interesting about this tool is that it is based on OpenStudio modeling software, which may present a hurdle for some companies that use eQuest, or anything else as their primary modeling tool. Additionally, there seem to be a number of adjustments, including the integration of standard weather data that may delay release, making it more difficult for energy service companies (ESCOs) and IAC engineers alike to begin use in the near future. Overall, it still sounds like a promising tool that might just be worth the wait.

Lastly, it should be noted that there is a lot to be learned by walking a site with a clipboard, paper, and a pencil. Young engineers tend to learn the most this way, and I encourage your company to evaluate the pros, cons, and costs associated with building an in-house tool using brute force and a good old Excel spreadsheet. You will likely discover, as I have, that this method tends to be the most effective at addressing the specific needs of your team. Not to mention, its ability to grow that burning desire to walk a site that we engineers covet so much. After all, Mondays aren't so bad when you've got a trusty pair of khakis, boots, and a willingness to let your brain run free on site.

You can access kWhOURS'kW-FIELD at www.kWhOURS.com under the "Products" tab, and you may find more information regarding the release and purchase of the simuwatt Energy Auditor at www.simuwatt.com.

Keep those Heat Exchangers Clean!

Tim Johnson, University of Illinois IAC Alumni
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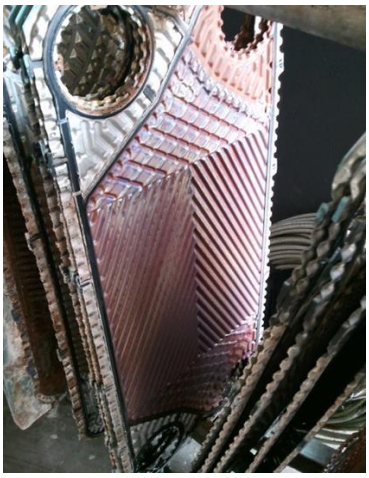
Energy recovery systems sit alongside production lines, quietly saving energy and money. It is a cold reality that plant operators and engineers often ignore them to focus on production equipment, and take an "it just works" mentality.



Inside of a plate and frame heat exchanger

Unsurprisingly, after a few years of neglect, an energy recovery system can severely underperform. The easiest way to protect an investment in recovery

equipment is to routinely clean the system heat exchangers. It is tempting to overlook heat exchangers to save time, but quickly noting the flows and temperatures will allow the analysis to take place back at the office. Heat exchanger health is easy to determine and should be part of every assessment.

Well water is commonly used because it is cheap, readily available, and long-term water rights are relatively easy to secure. The downside is that, if untreated and heated, minerals will plate onto the interior of heat exchangers and then onto downstream pipes and process vessels. Even if frequently cleaned, insufficient cleaning procedures will allow the plating to build over time. Eventually, not only will recovery suffer but the heat exchanger may also be nearly plugged, and the facility may have no idea it is happening. A well-maintained system will perform near design levels for its lifetime, and the design specification should be used to judge a system's current health. If this is unavailable, then heat exchanger family efficiencies can be used, especially if a manufacturer offers a "dirty" or "service" efficiency rating.

Sanitation and maintenance teams are experienced at cleaning process-related items, such as organic buildup in food plants, but they often have little experience with hard-water plating. In addition, the minerals in the water are unique to the water source, so a facility needs to consult with a chemical supplier for proper cleaning chemicals. Boiler chemical suppliers typically have experience in this area, and will have testing capabilities to determine proper chemicals and concentrations. Often, the supplier will even write the cleaning procedure; a good recommendation needs only to point the facility in the proper direction to seek further help.

Maintaining and protecting energy recovery systems has a payback. Facilities should be encouraged to inspect any heat exchangers that are at risk of fouling. After all, a value-add, savings recommendation never hurts.

IAC Spotlights

University of Alabama: The Alabama IAC has been performing assessments for a broad range of industrial plants during the past year. Some of these plants included steel, food processing, automotive, and saw mills. Total recommended cost savings were about $1.9 million during the last year. This IAC has also been working closely with our Manufacturing Extension Partnership (MEP) partner, the Alabama Technology Network (ATN), for most state funded assessments.

Boise State & University of Idaho: This summer, Boise State and the University of Idaho launched an Industrial Efficiency Course series. Three one-credit courses, one offered each semester, focus on Process Heating and Refrigeration; Motors and Air Compressors; and HVAC, Lighting, and Building Envelope. These courses are taught by both University of Idaho and Boise State faculty, and students from both schools participate through videoconferencing systems. Faculty review the engineering principles involved in these systems and then delve into equipment operation and energy usage. Students review past assessment recommendations and have the opportunity to develop new ones—or at least recommendations that are new to the team.

University of Dayton: For two days in June 2013, the University of Dayton IAC in Ohio teamed up with the University of Kentucky IAC in Kentucky for a joint energy assessment. The IACs divided into three teams based on the plant's energy systems, with 2–3 individuals from each IAC per team. This proved to be an effective way to distribute the large task at hand and effectively work together. At the end of the assessment, the teams briefed the plant and each other on the energy saving opportunities found and current best practices.

University of Dayton and University of Kentucky IAC teams working together with plant personnel

Indiana University—Purdue University Indianapolis (IUPUI): IAC student Arash Edalatnoor has been working on designing a steam leak apparatus to test the ability to use a ultrasonic leak detector to estimate the leak rate in steam pipes, with the supervision of the center's director. This data will enable the students to measure decibel readings due to a steam leak, and then convert this reading to a leak rate.

Lehigh University: In FY 2013, the Lehigh University IAC conducted 20 assessments at a wide variety of facilities. These included visits to a meat processing facility, a commercial printing plant, a precision weights manufacturer, and a two-day visit to an ammunition plant. The recommendations made by the Lehigh IAC in 2013 offered annual savings of 590,000 MMBtus and $3.5 million. The IAC at Lehigh continues to grow, with more than 25 new students joining the center this year.

University of Miami: The University of Miami IAC (MIIAC) has had an exciting past year. MIIAC was covered by two news channels, Telemundo and Gable News. In the news segments,

members of the center discussed the objectives of the IAC program, the importance of industrial energy efficiency, and displayed the center's capabilities.

The MIIAC team now consists of seven Ph.D. students, one Master's student, and ten undergraduate students. Three Ph.D. students at MIIAC have been working on their dissertation research: real-time energy monitoring with peak-demand prediction, optimization of air compressor location in manufacturing facilities, and advanced control strategies for HVAC systems in buildings. MIIAC completed several interesting assessments this past year, including four companies in the Commonwealth of Puerto Rico in conjunction with Primex (MEP of Puerto Rico).

Team Members at the Miami IAC with the 2013 Center of Excellence Award

North Carolina State University: The NCSU IAC hosted a three-day compressed air workshop for IAC students and staff. Frank Moskowitz and Tom Toranto presented the Compressed Air Challenge's Level 1 and Level 2 classes to 15 student and staff participants. The course provides the basics of managing compressed air systems and the instructors tailored the class to the demands of evaluating compressed air systems in a one day survey. The class has already paid dividends: the IAC team was able to identify several compressed air issues during plant visits after the class that probably would not have been considered before the class.

Oregon State University: 2013 was a year of collaboration for Oregon State University's (OSU) IAC. The OSU IAC and the Society of Manufacturing Engineers (SME) Partnership Program took a more definite form as we incorporated SME students into IAC operations.

IAC-SME Student Liaison and OSU IAC Operations Manager, Alex Cimino-Hurt, and SME Chapter Faculty Advisor (and OSU IAC Assistant Director), Dr. Karl Haapala, traveled to Baltimore, Maryland, to represent the IAC-SME Partnership at the SME Annual Conference. While at the conference, they presented on OSU's form of IAC-SME integration. This integration involved hiring and training SME students as energy analysts. Outreach to the local SME chapter produced numerous connections and a few energy audits. IAC-SME analysts brought a process design-centered perspective to the traditional energy- and waste-focused work, which has benefited the entire Partnership.

Tennessee Tech University: Past Tennessee Technological University (TTU) lead student, Jim Leverette, is conducting energy assessments for CHA in Rochester, New York. Other former TTU students George Gulas and Nathan Payne are working in energy-related positions at Chattem, Inc and at Nissan, respectively. Robert Griffin has enrolled in the Master's program at Virginia Tech University. University of Memphis IAC alums Sara Gordon and Ian Brown are employed at Memphis Light, Gas, and Water as Energy Engineers. These lead students were hired largely because of their experience with industrial energy assessments, which they gained through the IAC program.

Lacy Robbi, a freshman IAC student at Tennessee Tech University

Texas A&M University: The Texas A&M IAC had another successful year with many interesting and compelling industrial audits. In additional to its normal activities, the center participated in several unique events. The center hosted several trainings, including one on renewable power generation. Also, several of the graduate students at the center attended the Certified Energy Manager seminar and took the certification exam, allowing the students to become Energy Managers in Training.

University of Wisconsin at Milwaukee: The University of Wisconsin-Milwaukee (UWM) IAC continues to improve and expand, due in large part to the efforts of its team of undergrad and graduate students. In 2013, the second year of operation, 19 assessments were completed throughout Wisconsin and northern Illinois. With each energy assessment representing a new industry, the UWM IAC was fortunate to see a little bit of everything. A few of the notable industries evaluated included cheese manufacturing, animal milk replacers, ceiling tiles, ice cream cones, and armored trucks.

West Virginia University: The Industrial Assessment Center at WVU (WVU-IAC) had a wide variety of energy assessments, technical assistance activities, and trainings, as well as several notable accomplishments this past year. The WVU IAC had a three-fold impact: successful assessments with demonstrated savings opportunities, assessments-related research publications, and training a new generation of energy engineers to undertake real-world challenges. WVU-IAC conducted 20 regular assessments, with focus on ePEP, MotorMaster+, 3E Plus, AirMaster, PHAST, and other software tools. WVU-IAC also successfully conducted 12 training assessments, and the team is working on many other energy projects that are funded by DOE, EPA, Industries of the Future—West Virginia, West Virginia Division of Energy, and the U.S. Department of Agriculture.

Recruiter Spotlights

Listed below are corporate profiles of several companies that routinely post positions on the IAC web site and actively recruit IAC students and alumni. For more information on these and other opportunities, see the career section of the IAC Student and Alumni web site:
http://www.iacforum.org:8080/iac/recruitersCorner.jsp

Ameresco, Inc. is an independent energy solutions company delivering long-term customer value through innovative systems, strategies, and technologies.
Contact Trish Puopolo, 508-661-2200

Cascade Energy Engineering is a consulting firm specializing in industrial energy efficiency projects. Cascade has offices in Portland, Oregon; the Salt Lake City, Utah area; and Walla Walla, Washington.
Contact Dan Brown, 503-287-8488

CHA is an Engineering News-Record (ENR) Top-100 Engineering Firm and was recognized in 2008 among Zweig White's 100 Hottest Firms in North America.
Contact Jennifer Schembari/Ann Devost, (518) 453-4500

Ecova delivers proven results for clients looking to reduce their energy use, manage their carbon emissions and make their operations more environmentally sustainable.
Contact Kia Packard, 503-525-2700

Elara Engineering ELARA Energy Services, Inc. is a 9 year old Mechanical, Electrical, Plumbing, Fire Protection and Information Technology (MEPFPIT) consulting engineering firm located in Hillside, Illinois.
Contact Caitlin Levitsky, 708-236-0300

Energy Solutions is one of the leading consulting firms in the field, specializing in energy efficiency program design, implementation, and marketing, as well as solar feasibility studies and financing, and water conservation programs.
Contact Kate Merrill, 510-482-4420 x223

EnerNOC is transforming the way the world uses energy. We help commercial, institutional, and industrial organizations use energy more intelligently, pay less for it, and generate cash flow that benefits the bottom line.
Contact Derek Popek, 617-692-2538

Enovity, Inc. is a sustainability consulting firm that provides customized energy and operational solutions for high performance buildings.
Contact Pamela Boyes, 415-974-0390

ERS, Inc. is a progressive energy engineering consulting firm based in Haverhill, Massachusetts, with additional offices in New York, Maine, and Texas.
Contact Recruiting, 978-521-2550

Geo-Marine, Inc. (GMI) has more than 30 years of experience in delivering innovative, cost-effective engineering and environmental services to our clients.
Contact Steve Silva, 817-226-8385

Honeywell Building Solutions (HBS) is a strategic business unit in Automation and Control Solutions (ACS).
Contact Ryan Smith, 763.954.5969

Johnson Controls is a global diversified technology and industrial leader serving customers in over 150 countries. Our 130,000 employees create quality products, services and solutions to optimize energy and operational efficiencies for our diverse client base.

KEMA, an international company headquartered in Arnhem, The Netherlands, is a technical leader in the way power is supplied and electricity is used around the world.
Contact Recruiting, 781-273-5700

McKinstry is a full service design, build, operate and maintain (DBOM) firm established in 1960.
Contact Heidi Cunningham, 206-762-3311

Nenni and Associates is a leading resource in retained and permanent placement recruiting and consulting in the HVAC, energy services, and renewable industry.
Contact David Kelley, 815-899-9421

Nexant, Inc. is a provider of intelligent grid software and clean energy solutions—pioneering, developing, and advancing electric power grid and alternative energy technologies and services.
Contact Tami Cusi

NORESCO is one of the nation's most experienced energy service companies, building self-funding energy-efficient infrastructure improvements and renewable energy installations for a wide range of educational, government, commercial, correctional, and industrial customers.
Contact Anthony Sclafani or Tina Boydston, Recruiter, 508-614-1049

Schneider Electric offers integrated solutions across multiple market segments, including leadership positions in energy and infrastructure, industrial processes, building automation, and data centers/networks, as well as a broad presence in residential applications.
Contact Michelle Rouley, 847-925-3694

Siemens Building Technologies As a leading provider of energy and environmental solutions, building controls, and fire safety and security systems solutions, we make buildings more comfortable, safe, secure, and less costly to operate.
Contact Kristin Junia, 847-215-1000

The Cadmus Group is an environmental consulting firm headquartered in Water-town, Massachusetts.
Contact Lauren Mattison, 617-673-7107