INDUSTRIAL ASSESSMENT CENTERS

Student and Alumni Newsletter

January 2011

Visit us at www.IACforum.org and iac.rutgers.edu

IAC Going Global?

Over the last year, I've read a number of articles about energy efficiency awareness and work being performed around the globe. Rapidly growing economies such as China and India recognize the challenges such growth places on infrastructure and resources. These countries are pursuing opportunities to identify 'green' solutions to address these issues. It is very encouraging that energy is receiving this attention and focus at an international level.

You may not realize, but there is great international awareness of our very own IAC program. Many countries are interested in replicating the IAC model as a means of building workforce capacity to address their energy challenges at home. China is leading on this forefront, but other Asian and South American countries are also looking to capitalize on the many successes that the IAC program has demonstrated year after year. It is extremely encouraging that the international community sees the value of the IAC model that our alumni have recognized for many years. Rarely will you find such a strong and long lasting government program that can consistently churning out top-notch talent, advanced energy science, and implemented energy savings.

This year's newsletter features a number of great articles from current students, alumni, and energy organizations. The IACs of the San Francisco State University, the University of Missouri-Columbia, the University of Illinois at Chicago, and the University of Dayton all provided articles covering topics from partnerships and assessments to interesting work being performed in the centers. Several alumni contributed articles discussing international work and corporate management. Also, we have again included a section highlighting organizations that actively recruit our graduates.

I encourage you to check out the career section of our IAC Forum webpage. For those looking for a job, the career section contains numerous job postings available for your perusal. You have everything to gain – you'll get more hits posting your resume on the forum than you will from other popular job posting sites. I'd also like to remind alumni who are working for growing companies that the job section of the webpage is a great way to reach out to IAC students.

As always, I encourage you to keep in touch and let me know of your whereabouts and your latest adventures. We are always looking for students and alumni to highlight in our published "Success Stories," so please stay in touch and let your stories and successes shine a light on the value of the program.

Thomas Wenning
IAC Student Activities Coordinator
R&D Staff, Oak Ridge National Laboratory
wenningtj@ornl.gov

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Join Our IAC LinkedIn Group!

An IAC group has been established within the LinkedIn professional networking website to promote and develop a network of IAC students and alumni. As of December 2010, the group had 226 members. Please take advantage of this network to share ideas, identify and pursue new opportunities, and make an impact. Joining the IAC Student and Alumni LinkedIn group is by invitation only. If you are interested in joining, please contact Thomas Wenning at wenningtj@ornl.gov or Susie Allen at allensc@ornl.gov.

Canadian Oil Sands

Will Randall, Georgia Tech IAC Alumni;
will_randall@hotmail.com

I practice energy and environmental regulatory law in Edmonton, Alberta, Canada. Recently Canada has been in American newspapers for more than its hockey teams and strong economy. Canada is the United States' largest supplier of energy resources. Northern Alberta is covered in bitumen – which is a mixture of sand and oil – that is one reason for the strength of the Canadian economy. However, the oil sands are sometimes described as an environmental disaster.

To access the oil, miners harvest trees over 3,000 km^2 of boreal forest, remove the bitumen like any other dirt, and then "upgrade" the bitumen to what is called synthetic crude oil. The by-product of the upgraded oil is placed in 80-meter-deep tailings ponds that cover 50 km^2. The labor-intensive process of upgrading the bitumen to crude consumes more energy than conventional oil resources and results in a greater carbon footprint. Another process called in situ oil sands mining injects steam into the earth to drain bitumen far below the surface. Companies use more water than a city of 2 million to make the steam.

The provincial government allows private firms to mine the oil sands in exchange for royalty payments. To determine whether new oil sands mines are in the public interest, companies seek approval from a Joint Review Panel of the provincial and federal governments. (Canadian federalism requires consultation of both level of government.) A panel inquires as to the sufficiency of the environmental impact assessment and overall mine application.

Recently, I represented a coalition of Canadian and international environmental groups opposed to an oil sands mine proposed by a subsidiary of France's TOTAL. Environmentalists argue that the environmental cost of developing the oil sand outweighs gains that bring some of the lowest taxes in Canada. Oil sands companies plan that the tailings ponds will eventually become self-sustaining lakes, but that has never been achieved on a commercial scale. The greenhouse gases emitted from the upgrading process result in Alberta having some of the highest per capita emissions in the world.

Fort McMurray, which is the center of oil sands mining, is under severe strain from the rapid growth of the oil sands. Nearby First Nations reserves – known as Indian Reservations in the U.S. – bear the brunt of oil sands developments because the actual mining takes place on their traditional lands.

To mitigate these issues, companies are developing new tailing technologies to eliminate the tailings pond. Mines and upgraders are employing cogen technology to reduce the carbon footprint. Impact benefit agreements aid local First Nations.

Nonetheless, the current regulatory regime in Alberta is inadequate since it relies on unproven tailings pond methods to reclaim sites after mining is complete. Mining companies could reduce their carbon footprints via offset purchases. Further research is required to reduce the water requirement. Despite these shortcomings, Asian counties are investing in the oil sands and new pipelines to the Pacific are under consideration. Competition between Asia and the U.S. for Alberta's oil is likely to squelch environmental concerns in the near term.

Thinking Big in Energy Conservation

Adam Knapp, OLP Associate, United Technologies and Syracuse University IAC Alumni
adam.knapp@oba.co.uk

In 1994 then-CEO George David challenged United Technologies, a $70-billion-dollar multinational manufacturing conglomerate, to transform itself by increasing energy efficiency across the board. Fifteen years later Mr. David's challenge has been met. As energy engineers we are all familiar with how to implement specific conservation measures; but how did George David drive down energy consumption across some 4,000 locations worldwide from a modest office building in Hartford, Connecticut? It wasn't a magic panacea, rather it was smart execution supported by metrics and incentives.

Metrics are the key performance indicators that measure success. George David created a culture of energy efficiency by first picking difficult but achievable stretch goals and defining them with clear metrics and baselines, which were established in 1997. David's stretch goal: cut normalized energy consumption by half in ten years (as measured in Btu consumption per dollar of revenue). The

result: by 2007 both normalized and absolute energy consumption had been slashed, with normalized consumption falling 56% from the baseline. The need for metrics may seem obvious, yet David's consistent use of clear metrics demonstrated strong execution and provided a steady goal to work toward.

In addition to creating a goal, David also gave his associates incentives to reach that goal through detailed annual performance reviews. United Technologies requires each salaried employee to agree on a host of annual goals with their manager, including an energy or safety-related goal. Performance to these agreed upon goals factors heavily into determining raises, bonuses, and promotions. Thus, David's execution provided a direct incentive for UTC employees to work toward the stretch goal.

In the end it wasn't technical knowledge or some mysterious cure-all that drove United Technologies to increase energy efficiency. Rather, it was a visionary and disciplined top-down execution that relied heavily on metrics and incentives.

US-IAC and Chinese-UAIEE Kickoff Partnership Activities

Michael B Muller, Rutgers CAES
mbmuller@caes.rutgers.edu

On May 26th, the first ever U.S.-China Energy Efficiency Forum was held in Beijing, China. The Forum brought together more than 150 U.S. and Chinese officials from

government, industry, academia and advocacy groups to share experiences and best practices in promoting energy efficiency in buildings, communities, industry and consumer products. As a public-private partnership, the forum convened industry representatives from both countries to unlock commercial opportunities in energy efficiency while meeting energy and environmental goals. U.S. Department of Energy (DOE) Assistant Secretary for Policy and International Affairs David Sandalow joined Vice Chairman Zhang Xiaoqiang and Deputy Director General Xie Ji of China's National and Development Reform Commission to co-host the event and highlight U.S.-China cooperation on energy efficiency.

One of the agreements developed during this meeting, was the "Memorandum of Understanding Concerning the University Alliance for Industrial Energy Efficiency Collaboration" signed by Lawrence Berkeley National Laboratory (LBNL), Oak Ridge National Laboratory (ORNL), and the University of Science and Technology Beijing (USTB), which currently manages the UAIEE. (The UAIEE is a relatively new Chinese program still under development that is their equivalent of the IAC program.) This MOU established an initial framework for partnership and collaboration between the U.S. IAC and the Chinese UAIEE.

In October a delegation of IAC representatives traveled to Beijing to kick off these partnership activities at a workshop with the UAIEE. The delegation included representatives from the DOE (James Quinn), ORNL (Michaela Martin), LBNL (Lynn Price, Lu Hongyou, Shen Bo), Rutgers University (Michael B Muller, Donald Kasten), and University of West Virginia's IAC (Dr. Bhaskaran Gopalakrishnan, Subodh Chaudhari, Fang Yi). The Chinese delegation was made up of experts from related ministries and commissions of China and representatives from all UAIEE members.

This initial UAIEE workshop was entitled "China-U.S. Universities Industrial Energy-Saving and Emission-Reducing Partnership Symposium." As the UAIEE program is still being developed, the workshop focused on presenting and discussing the IAC program's history, development, structure, and current activities. Presentation topics included conducting energy assessments, using software tools, selecting assessment equipment, operating an IAC, and management of the IAC program.

The Chinese University representatives expressed significant interest in the process of standardizing assessments, with a focus on specific industries, and developing a system to track assessments. Many of the

UAIEE centers have previous energy assessment experience in support of a state-mandated assessment requirement on most industries, though these assessments currently vary widely in quality and structure. One of the UAIEE's goals is to develop a benchmark for the most efficient use of energy for a given industry and set that as the standard for an energy assessment.

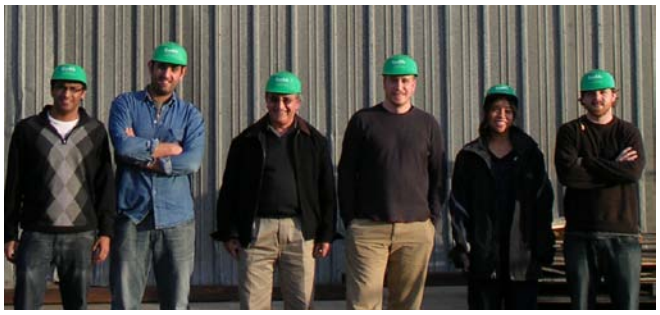
Discussions of collaboration focused on activities at the university level, including potential student exchanges, developing joint papers, and inviting representatives from both groups to participant in future energy efficiency forums. Several representatives from the UAIEE will be attending this year's directors' meeting. It is anticipated that a group of IAC directs will be invited to the UAIEE first official directors' meeting the following year.

San Francisco State University IAC Performs Assessment at Chocolate Factory

Dan Lake, IAC Student, SFSU
dplake1980@gmail.com

In the past year the SFSU-IAC team visited two full-scale chocolate manufacturing facilities, both with global

Left to right, Vish Ganti, Mohammad Ganji, Dr. Ahmad Ganji,



Daniel Lake, Lana Bonotan Agot, Michael Green

annual sales above $50 million and annual energy costs at or above $1 million. Due to the facilities' grandeur, scale, and complex processes they offered numerous opportunities for energy conservation. This was a great experience for our team, putting our analytical abilities to the test and providing an opportunity for the team to grow.

Both facilities process chocolate from raw cocoa bean to finished product. The process begins with passing the cocoa beans over a shaker table in order to remove small stones and other foreign objects. Next the beans are heated in large natural-gas roasters which develop the natural flavor compounds found in the cocoa beans by breaking down naturally occurring proteins. The cocoa bean shells are loosened and removed from the cocoa nibs (actual chocolate beans) through the winnowing process, which uses precision machinery that combines sieves and air streams.

Winnowing Process

Once separated from the shells the cocoa nibs are passed through a grinding mill which breaks them down into a warm paste consisting of particles of cocoa powder and cocoa butter (fat) referred to as chocolate liquor. If the chocolate liquor is not immediately molded into chocolate, the liquor and cocoa powder cake is separated by pressing the liquor through fine screens. The cocoa powder cake is either packaged and shipped or used to make other chocolate products. The next steps in the production of chocolate are the refining and conching processes. Typically treated as two separate steps in chocolate manufacturing, conching and refining have the same goal, which is to further break down and mix cocoa particles with other ingredients such as milk and sugar with a controlled application of heat. The conching

Conching Process

process also acts to further transform chemical precursors in the chocolate into compounds associated with chocolate flavor. Conching also aerates and homogenizes the chocolate, thereby mellowing the flavor and making its texture smooth and creamy. The final step in the production of chocolates is tempering. This controlled cooling of liquid chocolate allows small stable cocoa butter crystals to form, which give finished chocolates their appropriate color, gloss, and texture. This essential step in chocolate making also prevents fat blooms and increases shelf life. Finally the chocolate is deposited into plastic molds and allowed to completely cool, and then it can be packaged and shipped to clients around the world.

Our audit team was able to identify impressive energy saving measures at both of the facilities that were audited. Collectively the measures represented nearly 28,000 MMBtu in potential energy savings and $483,143 in potential cost savings. Respectively the savings represented a potential 26% reduction in annual energy consumption and a 19% reduction in annual energy costs at one of the facilities, and an 11% reduction in annual energy consumption and 8% reduction in energy costs at the other facility.

Some of the energy saving measures that were identified, common in many types of manufacturing facilities, included repairing air and steam leaks, installing daylight and occupancy sensors, installing high-efficiency lighting and motors, replacing standard v-belts with cogged type belts, insulating hot storage tanks, and replacing electric heaters with hot water heaters. Some of the measures identified that were more specific to chocolate process were to interlock parts of the chocolate process and reduce the operating hours of agitator motors on the conching tanks. One of the facilities has a noticeably higher percentage of potential reduction in annual energy consumption. This was due to the fact that a total of over 10,000 MMBtu in natural gas savings were identified for measures such as activating an economizer in place at the facility and insulating the ends of the boiler. A total of 30 recommendations were identified for the two facilities. One of the facilities has actually implemented close to half of the total recommendations.

Our audit team was able to learn a great deal about an intriguing process as well as identify substantial energy savings at both these facilities. We look forward to putting our knowledge to good use when we audit another chocolate facility on the island of Oahu in Hawaii.

University of Missouri-Columbia IAC Partnered with Columbia Water & Light

Chatchai Pinthuprapa, University of Missouri IAC Lead Student; cp2nf@mail.mizzou.edu

The MO-IAC partnered with Columbia Water & Light, a service provider in Columbia, MO, to conduct a motor assessment for Columbia Water Treatment Plant this summer.

Columbia Water Treatment is the largest water treatment plant in Columbia. It supports the daily water supply for Columbia. It includes a filter building, lime building and more than 20 wells outside the plant. There are more than 60 motors in the plant which burn a huge amount of energy every year.

Dr. Bin Wu climbing on the top of the well at Columbia Water Treatment well station

Our center produced a complete inventory and profiles of all motors at the site with a life-cycle analysis and assessment of replacement/improvement opportunities using MotorMaster+4.0. It was quite challenging for us to conduct the audit at this facility. Wells are approximately 10 minutes from the processing plant on a dirt road near the Missouri river. Pumps on each well are high above the ground so we had to climb to the top of the well, as

illustrated in the picture. More than 15 wells and 60 motors at the treatment facility were examined with current and voltage readings. It took our team and the Columbia Water & Light team three days to complete the data gathering due to the various operating hours and distance between wells. We also found that some nameplates were missing but we managed to use the spares for our baseline for the analysis. Through our recommendations, the savings opportunity is approximately $20,893 per year in electricity cost from replacing motors with more efficient models, replacing undersized motors, replacing belts, and installing soft-starters to reduce spikes.

During our partnership, our MO-IAC also co-hosted a motor assessment training that was opened to the public. The event was a success, with 50+ attendees from various manufacturing-related organizations including industrial plant managers/operators and other service providers.

University of Dayton Develops New Approaches to Assessments

Franc Sever, University of Dayton IAC Lead Student
francsever@gmail.com

Over the past year, the UDIAC has been developing a new approach to the assessment process, which we are calling the "Systems Workbook Approach." This method has resulted in "Best Practices" for all system categories, which have evolved from the application of engineering fundamentals and the "Inside-Out Approach." This method has increased the confidence of clients, as well as the UDIAC team, that a thorough energy assessment has been performed. In addition to energy assessments, the UDIAC has been hard at work advancing the research of industrial energy efficiency and has had numerous papers accepted for publication at national conferences.

Franc Sever has been developing a method of estimating HVAC savings in industrial buildings using an "inverse simulation" approach, which has been integrated into a computer program. Brian Abels has developed a method of calculating the compressed air storage requirement for optimum energy efficiency. Nathan Lammers has been developing a method to measure and track the energy intensity of industrial facilities. Dawit Ayele's work of summarizing the Lean Energy Analysis coefficients from the past 100 audits has added valuable information, which can be used to benchmark an industrial facility's energy consumption. Furthermore, team members Lammers, Sever, and Abels combined forces to develop a method to determine the variation in energy consumption related to occupant behavior in the student neighborhood.

This method was applied to the past five years of electricity and natural gas usage of approximately 500 houses and apartments. It was determined that energy use could be reduced by about 16% if occupant behavior could be improved. The group presented the method and findings to university administration members, which resulted in their decision to implement the method. Nathan Lammers is currently working directly with the UD Facilities department to implement this method, which will be used to automatically generate monthly reports of each residence's performance. The team is hopeful that communicating the energy cost and the relative occupant behavior to the students will have a positive impact on energy consumption.

Spotlight on West Virginia University IAC

The world speaks energy these days, so there is no wonder why the West Virginia University IAC has had its busiest and most educative year so far. A wide array of assessments at diversified facilities has introduced the students at WVU-IAC to new technologies and practices. It opened windows to better and greener energy conserving opportunities. This year has also seen several notable accomplishments.

The IAC team worked with the International Lead Zinc Research Organization (ILZRO) on enhancement of the Galvanizing Energy Profiling Decision Support System (GEPDSS). Improving energy efficiency in hot dip galvanizing lines was the DOE technology adopted by WVU-IAC. Students Senthil Sundaramoorthy and Subodh Chaudhari along with Director Professor Gopala visited SSAB Turnplåt in Borlänge, Sweden, to demonstrate, validate, and refine the GEPDSS Model. The IAC at WVU worked with ORNL and LBNL on developing workshop materials on IAC training and QuickPep software. IAC Director Dr. Gopala, Engineering Scientist Subodh Chaudhari, and graduate student Yi Fang presented this material in Beijing, China.

Subodh Chaudhari and Ruben Avagyan have achieved recognition as a Certified Energy Manager (CEM), and Nishit Banuri is certified as Energy Manager in Training (EMIT) by the Association of Energy Engineers. IAC

students Dayakar Devaru, Senthil Sundaramoorthy, and Ruben Avagyan successfully completed the training and examination to be Qualified Specialists of Process Heating Assessment and Survey Tool (PHAST). The IAC Engineering Scientist Subodh Chaudhari and Lead Student Nishit Banuri successfully completed training and examinations to be Qualified Specialists of the Steam System Assessment Tool (SSAT). Phani Guthula and Anne Mallow passed the Fundamentals of Engineering (FE) examination.

Nishit Banuri and Dayakar Devaru are the new Lead Students. Samhita Pidaparti, Seyed Jalali, and Kartik Ramamoorthy are the new hires this year. The Lead Student Ruben Avagyan successfully defended his Ph.D dissertation and accepted job with Honeywell. Senthil Sundaramoorthy and Phuong Quang successfully defended their M.S. Theses. Subodh Chaudhari accepted the position of Engineering Scientist at NRCCE, WVU. IAC student Anne Mallow did a summer internship with the buildings technologies program at Oak Ridge National Laboratory. She is currently doing a summer study at Salzburg, Austria.

From Left to Right: Samhita, Kartik, Nishit, Krishna, Anne, Ruben, Dr. Gopala, Dr. Iskander, Senthil, Phani, Seyed, Dayakar

The WVU-IAC conducted six enhanced assessments and two Technical Assistance Assessments. Unlike the standard IAC assessment protocol, which concentrates on the on-site visit and generating the assessment report, the enhanced assessment process emphasizes and provides services at varying stages of the assessment process, namely, pre-assessment, assessment, and post-assessment, with a strong focus on enhancing the implementation of energy efficiency measures. The program has generated considerable interest on the part of facility managers since it takes considerable time and expertise (not to mention capital) to bring in outside consultants who can advise the plant on improving operations. The center is currently working with TRACO Industries on an energy management demonstration project. A case study was developed on Miba Bearings US, LLC, for exceptional implementation.

Save Energy Now LEADER Initiative: Year-End Highlights

Lindsay Bixby; BCS, Incorporated; lbixby@bcs-hq.com

Through its Save Energy Now LEADER initiative, DOE's Industrial Technologies Program (ITP) provides domestic industrial manufacturers with premium access to tools and resources if they voluntarily pledge to reduce their energy intensity 25% over a 10-year period. As 2010 comes to an end, the opportunity presents itself to reflect on the year's accomplishments. This year, the initiative has welcomed a wide range of new companies from chemicals producers to industrial equipment manufacturers. ITP has helped these companies identify energy-saving opportunities and provided them with technical assistance to implement efficiency projects. In addition, the initiative employed a number of new outreach activities to engage a broader set of companies that would provide opportunities for LEADER Companies to interact and learn from one another.

New LEADER Companies

In 2010, ITP welcomed 65 new companies to the LEADER initiative, bringing the total number of participating companies to 105. These companies joined an elite group of industrial manufacturers in taking a crucial step toward achieving plant- and company-wide energy and cost savings. Through their partnership with ITP, they are now eligible to receive an array of tailored technical assistance including help with establishing a baseline and identifying energy-saving opportunities, as well as a number of other resources, including training and tools. Companies to join this year include Alcoa, Carlton Forge Works, Dexter Foundry, Johnson & Johnson, PepsiCo, Raytheon Company, and Tyco Electronics—to name just a few. A full list of LEADER Companies is available at http://www1.eere.energy.gov/industry/saveenergynow/leader_companies.html.

Energy Savings and Technical Assistance

The LEADER initiative began offering technical assistance (TA) to LEADER companies through Integrator Contractors (ICs) this year. Technical assistance allows ICs to transition from identifying opportunities to facilitating the implementation of energy-saving projects. This can be accomplished through direct engineering, feasibility studies, energy analysis support, cost sharing, or expansion of access to information. TA can often be the difference between meeting an implementation hurdle rate and foregoing a recommendation from an assessment. As an example, a Wisconsin-based paper manufacturer received TA through a study on energy-saving opportunities in hot water distribution and optimization techniques. The company did not have the in-house expertise required to implement the study, making the TA expecially beneficial for the company. The TA allowed the company to redefine how the remainder of the project could be completed. It helped the company make informed decisions regarding project financing and increased the company's overall energy savings. The estimated energy savings from this TA is approximately 85,000 million Btu.

Launched in December 2009, the LEADER Webinar series addressed topics associated with the implementation of energy efficiency projects, including accountability, motivation, recognition, measurement and verification, and financing. Each Webinar featured a different guest presenter from current and potential LEADER Companies, including 3M, CalPortland, Dow Chemical Company, General Motors, and PPG Industries. The LEADER Webinar series will continue in 2011 with a focus on replication. Slides from the implementation series are available at http://www1.eere.energy.gov/industry/saveenergynow/leader_webinars.html.

Finally, the LEADER initiative continued to help companies identify energy-reducing opportunities through Energy Saving Assessments (ESAs) offered by ICs. This year LEADER Companies participated in 36 ESAs which provided in-depth analyses on specific industrial processes such as steam, process heating, or pumping. These ESAs have led to the identification of 1,100,000 million Btu in potential energy savings and $12.7 million potential cost savings per year. Currently there are 46 ESAs in process.

Peer-to-Peer Learning

A major accomplishment this year was the hosting of more peer-to-peer learning events where LEADER Companies and other stakeholders learned best practices from one another. The first event—the Save Energy Now LEADER Industrial Sustainability and Energy Management Showcase—was hosted by Nissan North America on April 9, 2010, at the company's Smyrna, Tennessee, manufacturing plant. During the event, Nissan shared its energy management business practices so that other LEADER Companies could replicate similar success at their facilities. The second event took place at 3M's World Headquarters in St. Paul, Minnesota, on October 20, 2010. Titled Save Energy Now LEADER Showcase: Launching and Implementing Save Energy Now Corporate-Wide, this meeting's focus was on making the business case for energy efficiency and then implementing it corporate-wide. This event promoted an open exchange of information, enabling participants to walk away with additional ideas that they could apply in their facilities and/or companies. Presentations from the 3M event are available at http://3mdoeshowcase.govtools.us/.

2010 also featured the Learning from Success: Assessment-to-Implementation Best Practices Workshop, which convened a premier group of industrial energy assessment conductors and corporate energy managers from organizations such as the University of Illinois at Chicago and Saint-Gobain. The group discussed how to increase the implementation rates of recommendations made by assessors during energy assessments. This discussion will be included in a best practices implementation guide, which is scheduled for release in early 2011.

Outreach Materials

Several outreach materials were created in 2010. For instance, ITP developed eight case studies that showcased creative and easily replicable ways industrial manufacturers have saved energy and money. Topics included employee recognition, strategic partnerships, establishing a corporate culture for energy efficiency, and preparing for energy assessments. Other outreach materials, including brochures, were created to disseminate information about the LEADER initiative and its benefits to potential LEADER Companies.

Looking Ahead to 2011

In short, 2010 brought forth a number of accomplishments for the Save Energy Now LEADER initiative. The initiative will continue to provide LEADER Companies with technical assistance to equip manufacturers with the tools and resources needed to identify energy efficiency opportunities. In addition, planning is already underway for 2011 events and activities, including the first annual LEADER Exposition, which will feature interactive sessions where current and potential LEADER Companies can discuss corporate buy-in and other energy-management topics, one-on-one. The Exposition will also be the kickoff for a new recognition program that will formally recognize the success of LEADER participants. The initiative will also feature the development of additional case studies and materials to assist companies in identifying opportunities to save energy and replicate best practices within their own organization to continually reduce energy intensity. For more information on the Save Energy Now LEADER initiative, please visit http://www1.eere.energy.gov/industry/saveenergynow/leader.html.

The Society of Manufacturing Engineers Teams Up With the IAC

Pam Hurt, SME Work Force Development Program Manager; phurt@sme.org

The Industrial Assessment Centers have partnered up with the Society of Manufacturing Engineers (SME) in an effort to promote the work being performed by both organizations. The partnership will better integrate SME student members into the IACs while also promoting SME membership to the current IAC students. The collaboration will allow for SME's deep manufacturing knowledge to be combined with the IACs' extensive energy and engineering knowledge so that together they can help drive industry towards more plant-level process changes resulting in robust and sustainable energy savings.

SME is committed to collecting and distributing manufacturing knowledge among our members and the broader manufacturing community. **Energy usage** and **efficiency** are critical elements of successful manufacturing, and managing energy has become increasingly complex, requiring expertise and skills to realize the full potential of savings. By working together, manufacturing technologists and engineers and energy engineers identify savings opportunities and develop robust solutions to challenges on the plant floor. Collaborating as students leads to a best practices for industry knowledge and expertise as professionals.

SME publishes specialized annual yearbooks that target key manufacturing industries and initiatives. The SME Energy Yearbook chronicles the trends, technologies, and manufacturing processes being implemented in energy industry. In 2011, we will launch a quarterly e-newsletter dedicated entirely to energy that will provide cutting-edge technical information for the practitioner.
SME is a one-stop shop for busy students, offering everything from hard-to-find technical information on state-of-the-art manufacturing processes and applications to providing unparalleled networking opportunities to help you land that first job on your career path. Student membership is well worth the price at only $20 per year.

Connect with industry experts who can jumpstart your career: technical communities, local student chapters at 200 institutions, forums, blogs, SME Facebook, Twitter, and LinkedIn groups.

Know the latest trends, innovations and solutions: monthly webinars, SME librarian, SME Executive Briefing, technical papers, *Manufacturing Engineering* magazine.

Grow with education programs designed to help you define your career: Scholarships, online jobs connection, career coaches, and discounts on SME products.
Find out everything you need to know about what SME has to offer at www.sme.org.

Information Spotlight

Industrial Newsbriefs

Industrial Newsbriefs is a free, monthly review of energy-related information for industries. Selected and compiled by energy analysts from the Washington State University Extension Energy Program, each online edition provides information for a broad spectrum of professionals involved in energy-efficient manufacturing processes and plants. Each month, subscribers receive an email newsletter with brief reviews of emerging technologies,

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Alumni Case Studies and Success Stories

Over the past couple years, several case studies and success stories have been written that highlight the work and success of IAC alumni. The publications serve as a testament to the positive impacts that the IACs have on students' careers. During the past year, two case studies were published highlighting the careers of Matan Marom (SU-IAC alumnus) and Vitelio Silva (UF-IAC alumnus). Publications can be found on the IAC forum webpage (www.iacforum.org) and on the EERE website (www.eere.energy.gov). We are currently seeking nominations from students and alumni to put together more of these publications. If you know of an IAC alumnus who has significantly benefited from the IAC program, please nominate them and send their names to the IAC Student Activities Coordinator, Thomas Wenning (wenningtj@ornl.gov). We look forward to publishing another great round of case studies.

University Briefs

University of Alabama. During the past year, the AIAC has been performing assessments funded through regular IAC funding and two separate stimulus grants: one directly from DOE and another through the Alabama Department of Economic and Community Affairs (ADECA). The ADECA grant requires the AIAC to complete 12 medium assessments and 5 large energy user assessments this year. To date, AIAC has performed 12 of the required assessments. The AIAC has also been working closely with our manufacturing extension program partner, the Alabama Technology Network (ATN), for many of these state-funded assessments. The ATN follows up the AIAC's standard one-day energy assessment with a two-day lean manufacturing assessment of the plant. The AIAC has also been working with The University of Alabama in Huntsville, promoting a five-day Kaizen event for clients in the automotive industry. The AIAC also completed two LEU assessments this year for Lafarge North America and Maples Industries. Through these LEU assessments, students in the center have gained experience using the DOE software tools PHAST, SSAT, PSAT, and AIRMaster.

As part of the stimulus funding received through ADECA, the AIAC will be hosting a steam training course this fall. The course consists of a one-day steam workshop in November, followed by three days of qualification specialist training in December. The training course has been well received as several engineers from industry have signed up to take the course. The AIAC is also planning on sending several graduate students and its director to attend the course.

Receiving the stimulus grants has also allowed the AIAC to increase the number of students it employs. The AIAC now has 13 student employees, three of whom are graduate students. The AIAC is excited about having the opportunity to train more student engineers in energy efficiency and the impact this will have in industry. In just the past six months, three of the AIAC's students have accepted job placement in the energy industry including Joseph Chappell, Lindsey Horton for Johnson Controls, and Lauren Carter for Mississippi Power.

Bradley University. Three students at Bradley have met the requirements to receive IAC certificates.

Colorado State University. Daniel Fink will represent CSU at the 2011 IAC Lead Student Meeting.

University of Dayton. The University of Dayton IAC has had an exciting and productive year performing many regular IAC assessments, as well continuing work with the Columbus E3 program. Working with the E3 program has also led to collaboration with a delegation of engineers and professors from Brazil. UDIAC had the pleasure of leading an energy assessment with the delegation in a Columbus printing facility. The Brazilian delegation hopes to use the experience to help them develop a similar program to improve industrial energy efficiency at home.

Opportunities such as these continue to produce qualified energy engineers who are ready and able to provide sustainable solutions for the future of our society. Former Lead Student Steve Mulqueen and Dawit Ayele have graduated with M.S. degrees in Mechanical Engineering and are now employed at Cascade Energy Engineers and EMCOR Energy Services, respectively. Faizan Amad and Ritesh Nayyar are both graduating at

the end of 2010, with a wealth of knowledge and experience gained at the UDIAC.

Delaware. This year the University of Delaware center did its base complement of 12 assessments, plus 7 ARRA assessments (including two large plants). The usual range of plants and recommendations were found; while it's of course exciting to find those large energy savings recommendations that involve some complex restructuring (such as replacing CO^2 liquid-vapor preheating by steam with heat recovery from the ammonia compressors, at a soda plant), sometimes the most rewarding ARs are the ones that require "flipping a switch." An example was at a plant that had a typical lead-lag arrangement of two 100 HP compressors that switched every 12 hours to lengthen lifetime. From the data loggers installed on them, it was immediately apparent that while one compressor went completely off during its down time, the other remained on, unloaded. Well, they were not VFD-controlled, so in the unloaded state as you all know it was consuming 40% of its rating! In the words of the plant manager: "Thank you very, very much, for your insight concerning this equipment operational improvement and energy conservation and savings. ~ $13K per year!!!" The savings was rock-solid: simply read the logger for the unloaded current consumption. These simple insights that save plants money without much effort really earn you the love of plant personnel, especially in these hard times. And, maybe make them more amenable to implementing the big recommendations!

University of Florida. The University of Florida has had four students complete all necessary requirements for IAC certification.

Georgia Institute of Technology. Recently Director Bill Meffert and other GT faculty returned from the fourth meeting of PC 242, the ISO project committee charged with developing the new International Energy Management System Standard, ISO 50001. The meeting was held in Beijing, China, and attended by representatives from 24 countries. This critical meeting was to develop consensus to move forward to a final draft standard, the last stage where substantive changes can be made to the standard. This activity was not quite completed before this article was written, but all signs seem very positive that the standard will stay on a path to be published in 2011. The use of this standard by the international community of industrial organizations and commercial enterprises has the potential to be quite extensive.

In the United States DOE is developing the Superior Energy Performance Program, which will certify industrial organizations that implement ISO 50001 and meet certain energy performance criteria. GT IAC faculty are also playing a role in developing this program and demonstrating its applicability in both large organizations and smaller enterprises.

The University of Illinois at Chicago. Two IAC certificates have been awarded to students at UIC.

Iowa State University. The assessment team at Iowa State University took advantage of opportunities to establish new client relationships and advance learning through energy training seminars during the previous year. Additionally, the graduation of experienced undergraduate students allowed for new and energetic undergraduates to join the team and gain experience in energy conservation efforts.

Through alumni relationships, the center at Iowa State University was contacted by the utility provider in Hastings, NE, interested in energy assessments for two manufacturers in the city. This initial interest has created a multi-year energy assessment potential for the manufacturers in the community and areas surrounding Hastings. To date, two manufacturers have received assessments with a four-audit potential this year.

Graduate students: Anoop Alex and Justin Schomburg represented the IAC and Iowa State at the second annual Symposium on Sustainability hosted at Iowa State, where they introduced others in the sustainability community to a long standing IAC located on the campus of Iowa State and the services available.

Training in energy systems allowed for new exposure to strengthen the knowledge base for many team members. Eight ISU-IAC members attended training in combined heat and power provided by the Energy Resources Center and Clifford Haefke at the University of Illinois at Chicago. Anoop Alex completed a three-day IGSHPA-accredited course on design and installation of geothermal heat pump systems hosted by the Iowa Energy Center. Justin Schomburg attended a Lighting Technology Update seminar with Stan Walerczyk hosted by the Iowa Energy Center.

The assessment team at Iowa State University is motivated by a trend of increasing enthusiasm among clients served who are taking the initiative with energy and waste management implementations at their respective facilities while remaining dedicated to

searching for further opportunities through brainstorming conversations during audit visits.

Lehigh University. With the increase in the cost of energy, conserving energy has become more of a priority for many of the companies in Eastern Pennsylvania and New Jersey. Reducing the total cost of the energy bill is not only of great importance to environmentalists and engineers, but also to homeowners, commercial business owners, and most importantly to CEOs. A growing number of companies contact our office and are eager for us to visit and help them cut down on and improve their energy usage. This year alone the Lehigh University IAC team conducted 17 successful assessments at companies such as a vinyl film company, a dairy foods plant, a book printing factory, a fire-fighting-foam plant and even high-tech companies such as a ceramic injection molding company and an atomized aluminum powder plant.

Every plant is a new experience for our team; however, this year we have been to some impressive places. In July, Lehigh IAC director Dr. Neti along with a team of students revisited a company where the IAC office had previously conducted an energy audit. This company, which manufactures atomized aluminum powder, was so pleased with our previous visit that they asked us to come back and take a look at the improvements they had made and see if there was even more room for improvement. This is the first visit of this kind that the Lehigh IAC office has done and we hope more of our previous clients will be interested in this kind of service.

Lehigh University IAC Students (left to right): Robert, Valentina, Yijun, Kai, Jun, Ben

As always, training new students to become energy-conscious engineers and citizens is important to Lehigh University. This year the IAC office has had the honor of hiring three new students: a senior mechanical engineer, Ben Rosenzweig, and two graduate students, Jun Chen and Kai Jin. These individuals make our team more efficient and effective.

The Lehigh IAC office is happy to say that 2010 was a successful year. We conducted assessments in a variety of plants, gained experience in different fields, and helped spread the word that conserving energy is an important and necessary part of every company's work. With the growing concern about conserving energy and money, more companies are seeking our help and expertise. We looking forward to an even more productive year for our IAC and the challenges it will bring.

University of Louisiana–Lafayette. Louisiana Lafayette will be represented by Kelly Guiberteau at the IAC Lead Student Meeting in Washington, D.C.

University of Massachusetts. One student has received an IAC certificate. Sharon Suresh will travel to Washington, D.C. in February for the student meeting.

University of Miami. The University of Miami IAC (MIIAC) has had a productive year, completing several interesting assessments. We have been to plants of industries such as boating, aircraft, newspaper, and bottling facilities, allowing our team an excellent exposure to these different industries. We have added new faces to our team including a Ph.D student from the Department of Electrical Engineering and a Master's student in Industrial Engineering who has a B.S. in Mechanical Engineering. Three IAC members will be graduating this fall, and are training our new members on some of our specialized techniques and methods. They are already seeing their IAC experience pay off during their job seeking in the private energy management sector. The IAC exposure has been an invaluable addition to their experience, allowing them to use their expertise in manufacturing settings in interviews. Two members have applied and received their IAC certificates. We continue to add new equipment to aid our assessments. The team is now excited about our two-day assessment that will take place in January in the largest and most efficient juicing facility in the world. Our center continues a productive working relationship with our designated MEP in Puerto Rico.

Dr. Shihab Asfour, Director of the University of Miami IAC, was invited by the Southwest Regional Manufacturers Association (SRMA) to give a presentation on MIIAC's activities to SRMA members at their monthly dinner meeting on October 6th, 2010, at Edison State College in Fort Myers, Florida. Several members that

attended the meeting had already contacted us to conduct energy assessments at their facilities.

University of Michigan. Two students earned their IAC certificates in 2010.

University of Missouri. Barnett Bichen Zheng and Chatchai Pinthuprapa will attend the upcoming IAC Lead Student Meeting on behalf of University of Missouri-Columbia. Over the last year we have conducted more than 12 assessments for many manufacturing plants in Missouri including a car dashboard maker, foil paper printing plant, printing publisher, aluminum foundry, and tohers. We would like to congratulate to our past IAC member, Shuai Ding who graduated this May 2010. She was nominated as Masters Marshal, an honorary award from among all M.S. graduates with great academic excellence and contributions to graduate education at MU. We have partnered with Columbia Water & Light to conduct an energy audit for the Columbia Water Treatment plant in Columbia, MO. With this initiative, our center also co-hosted the motor assessment training at our school to provide skills and techniques to the public.

Mississippi State University. The 2011 IAC Lead Student Meeting will be attended by Amanda Myers.

North Carolina State University. NCSU will be represented by the team of William Buescher and Walter Bright at the upcoming student meeting.

Oklahoma State University. Nine students at Oklahoma State have been awarded IAC certificates.

Oregon State University. 2010 was another busy year for the Oregon State University IAC. The push for the center to move into the agricultural sector has been a big success, especially regarding renewable energy. In 2010, the Oregon State IAC received a second grant from the U.S. Department of Agriculture (USDA), enabling the center to perform 20 additional agricultural audits and eight Renewable Energy Development Assistance (REDA) projects. The center is already funded by USDA to perform 90 agricultural audits over two years, and this will allow the center to continue providing audits in the third year. The REDA projects will include preliminary design, vendor quotes, and implementation support. In addition to the USDA, the Oregon State IAC is also receiving support from the Oregon Department of Agriculture, Climate Friendly Nurseries, and the Oregon Dairy Farmers Association. With its favorable geographic location for agriculture, the Oregon State IAC is collaborating with both local and regional farms as well as agriculture-based businesses to perform audits. The center is pleased with the success of this divergence from typical industrial audits and will continue working to promote energy efficiency in the agricultural sector.

Regarding employee tenure, Michael Koch, the center's Operations Manager, graduated last spring with his M.S.M.E. Continuing his career in energy efficiency, he is now working at Cascade Energy Engineering in Portland, Oregon, as a project engineer. He is working with a number of industrial clients throughout the Northwest, helping to improve the energy efficiency of their facilities. The main focus is on identifying opportunities and creating plans to analyze and implement upgrades to reduce electricity consumption for clients. Nathan Keeley, who has been with the center for over two years, is following in Michael's footsteps as the current Operations Manager.

Outside of Oregon, the King County Department of Natural Resources and Parks in Seattle, WA, selected the Oregon State IAC to participate in an employee energy-training program. King County is using a portion of its Energy Efficiency and Conservation Block Grant to engage a select number of technically educated employees in a specialized training with industrial energy efficiency managers over the next two years. The goal of the program is to bridge the gap between theoretical training and practical experience for use in a future career in the rapidly growing field of energy management.

Internally, the Oregon State IAC is expanding its development of the "Energy Efficiency Reference," which it developed in 2009. This centralized technical resource for energy efficiency is continually bolstered with information referencing the energy audits and recommendations from the center. In fall 2010, a portion of funding was appropriated to expand the reference with an increase in breadth and technical composition. This resource continues to be an asset internally by increasing reporting efficiency, as well as serving as a public reference for those in the energy industry.

The Energy Efficiency Reference can be found at http://eeref.engr.oregonstate.edu

San Diego State University. Aman Khippal and Sepideh Shahinfard were awarded IAC certificates during the last year.

San Francisco State University. Three certificates were awarded to SFSU IAC students.

Syracuse University. The Syracuse University IAC had another exceptional year, full of learning experiences and successful energy assessments. Evan Beckerman received his B.S. in Mechanical Engineering and is currently employed in California. Chris Buttitta, a long-time employee of our center as an undergrad, began his M.S. in engineering management and will continue his duties as an employee of the center. Chris is also working to design a lift to assist disabled veterans with wheelchairs board charter fishing vessels at the Port of Oswego. Our center has also grown in size, adding new undergraduates Brian Granetz and Cole Tucker. Graduate students Brandon Peery and Phil Gwyther teamed with their director Fred Carranti to write a portion of a paper that is pending publication in *Bioscience*. The article looked at the effectiveness of combined heat and power installations on the carbon footprint of several counties in the Northeast.

Tennessee Tech. The Tennessee Tech University IAC is partnering with Schneider Electric Corporation in their efforts in the Save Energy Now LEADER program. As part of the program, Schneider has pledged to reduce their energy intensity by 25% over the next 10 years. TTU's IAC and Schneider are participating in the Southeast Energy Management Demonstration project to assist select companies in achieving these and other energy goals. TTU will be supporting Schneider in numerous ways including assisting with establishing an energy intensity baseline and creating an energy management plan, identifying energy savings opportunities, and assisting with procuring technical assistance or financial incentives for implementation of energy efficiency projects. The TTU IAC will also be consulting with Schneider on the development of their ISO 50001 Energy Management system and their certification in the Superior Energy Performance program.

Texas A&M University. Five Aggies have applied for and received IAC certificates.

University of Washington. In 2010 there were five certificates awarded to IAC students.

West Virginia University . The WVU-IAC conducted 12 regular assessments, and the reports focused on QuickPep, MotorMaster+, 3E Plus, SSST and other Best Practices Software tools. The assessments and reports were well-received by the facilities. The IAC directors along with students are working on many other energy projects that are supported by DOE, WV Industries of the Future, U.S. Environmental Protection Agency E3, and the West Virginia Division of Energy.

Recruiter's Corner

Because of their specialized and highly sought after training, knowledge, skills, and abilities, IAC students and alumni are heavily recruited throughout the energy sector. 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 prospective employers and opportunities, see the career section of the IAC Student and Alumni web site at http://www.iacforum.org/iac/app?service=page/RecruitersCorner.

ERS, Inc. is a progressive energy engineering consulting firm based in Haverhill, Massachusetts, with additional offices in New York, Maine, and Texas. Our areas of specialization include assessment and implementation of energy projects, energy analysis and utility program management, technology assessment, industrial process evaluation, efficiency lighting design, and energy code compliance.

ERS, Inc., has hired 5 IAC alumni.

Contact Recruiting, 978-521-2550

Cascade Energy Engineering is a consulting firm specializing in industrial energy efficiency projects. We are industry leaders in evaluating, implementing, and commissioning these projects. We work strategically with corporate clients to implement broad energy management plans focused on industrial energy efficiency. Cascade serves a broad array of industries, including food processing and distribution, oil and gas, pulp and paper, and chemical industries. We also serve a wide range of electrical energy efficiency demand-side programs wherein utilities or public agencies assist their industrial customers in implementing energy efficiency projects. Cascade is focused on providing excellent technical work and customer services. This emphasis, along with heightened awareness of energy and energy costs within industry, has allowed Cascade to grow steadily since its inception in 1993. We have a highly skilled and loyal engineering staff. Marcus Wilcox, president of Cascade and one of its founders, is an IAC alumnus. Cascade has offices in Portland, OR; the Salt Lake City, UT area; and Walla Walla, Washington.

Cascade Energy Engineering has hired 1 IAC alumnus.

Contact Dan Brown, 503.287.8488

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, public housing, and industrial customers. NORESCO hires and retains a highly skilled, multi-disciplinary team of energy engineers, project managers, sales executives, construction managers, and M&V engineers. Headquartered in Westborough, Massachusetts, we have offices located throughout the United States and currently have openings for engineers across the country. We recognize the great value of IAC energy auditing experience as we continue to look nationwide for talented engineers to join our growing team.

NORESCO has hired 1 IAC alumnus.

Contact Anthony Sclafani or Tina Boydston, Recruiter, 508-614-1049

The Cadmus Group is an environmental consulting firm headquartered in Watertown, Massachusetts. Our energy services team has engineering staff in Watertown, Massachusetts; Portland, Oregon; Boulder, Colorado; and Santa Monica, California. We assist clients including EPA and other government agencies, utilities, and private companies with energy efficiency and renewable energy projects throughout the United States and around the world.

The Cadmus Group has hired 2 IAC alumni.

Contact Lauren Mattison, 617-673-7107

Enovity, Inc. is a sustainability consulting firm that provides customized energy and operational solutions for high performance buildings. Based in San Francisco and with offices in Irvine, Seattle, and Phoenix, Enovity has provided California state and local governments, utilities, and school districts with functional solutions for energy efficiency. Our firm specializes in commissioning, energy engineering, sustainable design, facility operations and maintenance and energy efficiency incentive programs.

Enovity, Inc. has hired 3 IAC alumni.

Contact Pamela Boyes, 415-974-0390

CHA is an ENR Top-100 Engineering Firm and was recognized in 2008 among Zweig White's 100 Hottest Firms in North America. CHA is a highly diversified, full service engineering firm. One of our largest and fastest growing sectors is our Facilities & Energy Division, which houses the Mechanical/Energy Services Group. From our offices located throughout the Eastern, Southeastern, and Southwestern United States, CHA supports a variety of industrial, institutional, commercial and municipal clients with all aspects of energy and power projects. Our Energy Services are geared towards assisting our clients with identifying energy conservation measures and implementing the design of those measures for an overall benefit of reducing energy costs within a reasonable payback period. Our resume for Energy Services has been solid for the last ten years and our backlog of work in this area is tremendous. CHA is heavily involved in alternative energy design, performance contracting, and LEED/sustainable design projects. We offer both full-time positions and internships in the energy field. Please visit our website for more details.

CHA has hired 2 IAC alumni.

Contact Jennifer Schembari/Ann Devost, (518) 453-4500

Geo-Marine, Inc. Geo-Marine, Inc. (GMI) has more than 30 years of experience in delivering innovative, cost effective engineering and environmental services to our clients. GMI has successfully completed more than 3,500 projects ranging in value from a few thousand dollars to more than $32 million, in locations covering every state in the continental United States, and in Canada, Mexico, the Caribbean, South America, and Asia. Our Energy Services Group is dedicated to helping our clients maximize their utility budgets by achieving optimal levels of efficiency within their facility operations. Our staff of engineers includes multi-state licensed Professional Engineers, Certified Energy Managers, and LEED Accredited Professionals with the expertise and experience to provide comprehensive energy management services ranging from facility audit and analysis through design, construction and system commissioning.

Geo-Marine, Inc. has hired 1 IAC alumnus.

Contact Steve Silva, 817-226-8385

Energy Solutions Energy Solutions was founded in 1995 to tap the power of the California market to address climate change and sustainability issues through energy efficiency and renewable energy sources. As one of the leading consulting firms in our field, we specialize in energy efficiency program design, implementation, and marketing as well as solar feasibility studies and financing and water conservation programs. Energy Solutions currently has 55 employees and is rapidly expanding our client base as well as developing new services for clients. We are currently seeking full-time junior, mid-level, and full or part-time senior energy engineers to join our growing engineering group. More information is on our website under "Job Opportunities" www.energy-solution.com

Energy Solutions has hired 1 IAC alumnus.

Contact Kate Merrill, 510-482-4420 x223

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. The Building Technologies Division, based in Buffalo Grove, IL, provides a full range of services and solutions from more than 100 locations coast-to-coast. We have positions open each summer for entry-level energy engineers through our Operations Development Program. Position locations vary each year.

Siemens Building Technologies has hired 25 IAC alumni.

Contact Kristin Junia, 847-215-1000

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. Our focus is in construction retrofit projects of existing commercial buildings and campuses with concentration in energy-related heating, ventilation and air conditioning (HVAC). Many of our projects have been recognized by ASHRAE, LEED, and Energy Star for excellence in engineering and energy performance.

Elara Engineering has hired 2 IAC alumni.

Contact Caitlin Levitsky, (708) 236-0300

Ameresco, Inc. is an independent energy solutions company delivering long-term customer value through innovative systems, strategies, and technologies. We work with customers on both sides of the meter to reduce operating expenses, upgrade and maintain facilities, stabilize energy costs, improve occupancy comfort levels, increase energy reliability, and enhance the environment. Founded by George Sakellaris, one of the pioneers in the energy services business, Ameresco has offices throughout North America to better serve you. We have all the resources needed to successfully plan and execute a comprehensive energy management program that will create real, sustained economic and operating benefits.

Ameresco, Inc., has hired 6 IAC alumni.

Contact Trish Puopolo, 508-661-2200

Nexant, Inc. Nexant is a provider of intelligent grid software and clean energy solutions—pioneering, developing, and advancing electric power grid and alternative energy technologies and services. Since our inception in 2000, we have completed over 2,000 assignments in more than 70 countries, developing a thorough understanding of many of the complex issues facing public and private sector participants in the energy industry. Our clients include Fortune 500 companies, utilities, transmission and distribution system operators, petroleum and chemical majors, financial institutions, government agencies, and development banks. Nexant is headquartered in San Francisco, California and has 24 corporate, representative, and project offices located throughout the United States, Europe, the Middle East, Africa, and Asia.

Contact Human Resources.

CLEAResult Consulting CLEAResult is an energy efficiency consulting firm with expertise in utility program design, development, implementation, and evaluation. Our unique understanding of how markets act and react enables us to design and implement energy efficiency programs, peak reduction programs, and other efficiency and environmental programs that transform those markets and provide persistent, sustainable, and measurable results. We support our utility clients by developing cost-effective programs that target the residential, commercial, institutional and industrial sectors, leveraging our experience in energy efficiency, demand side management (DSM), emissions and greenhouse gas reductions, environmental conservation, renewable energy, and energy resource acquisition.

CLEAResult Consulting has hired 1 IAC alumni.

Contact James Hatheway, 512-259-2383

McKinstry Established in 1960, McKinstry is full service design, build, operate and maintain (DBOM) firm. McKinstry's professional staff and trades people deliver a variety of services including mechanical/electrical engineering, construction (HVAC, plumbing, fire protection, electrical), architectural metals, 24/7 service and maintenance, energy/LEED services and onsite facility management to our many clients. As an early adopter of the DBOM process, McKinstry advocates collaborative and sustainable solutions that create high performance buildings designed to ensure occupant comfort, improve systems efficiency, reduce facility operational costs and ultimately optimize client profitability for the life of their building.

McKinstry has hired 2 IAC alumni.

Contact Heidi Cunningham, 206-762-3311

Redfish Technology, Inc. We are Nationwide Executive Recruiters focused on Talent Scouting and Employment Opportunities in Clean, Green, Alternative Energy and High Tech. We have jobs in marketing, sales, engineering, and IT. We have offices in Silicon Valley, the East Coast, and the Intermountain West. Helping people build careers and companies find top talent since 1996.

Contact Rob Reeves, 208-788-8260

Honeywell Honeywell Building Solutions (HBS) is a strategic business unit in Automation and Control Solutions (ACS). HBS installs and maintains the systems to help keep buildings and facilities safe, secure, comfortable and cost-efficient, and is a leading providing of energy efficiency solutions worldwide. HBS specializes in service of critical building systems, including heating, ventilation and air conditioning (HVAC), building automation, fire, security and energy management.

Contact Ryan Smith, 763.954.5969

Schneider Electric As a global specialist in energy management with operations in more than 100 countries, 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. Focused on making energy safe, reliable, efficient, productive and green, the company's 114,000 employees achieved sales of more than $25 billion in 2008, through an active commitment to help individuals and organizations “Make the most of their energy.”

Schneider Electric has hired 8 IAC alumni.

Contact Michelle Rouley , 847-925-3694

Ecos Making a World of Difference - Ecos delivers proven results for clients looking to reduce their energy use, manage their carbon emissions and make their operations more environmentally sustainable. Leveraging the Power of the Market to Create a Better Environment – With over a decade of experience designing innovative ways to couple the power of ecology with the engine of our economy, Ecos performs the research, develops the plans and carries out the programs that make the most significant impact on the vitality of both our clients and our planet. Working Together - Ecos is about people, our clients and our employees. We hire team members who work hard to deliver the best possible product for our clients. Our employees are dynamic, creative and committed to Ecos and our mission.

Contact Kia Packard, 503-525-2700

IAC Program Contact Information

Newsletter Editor and IAC Student Activities Coordinator: Thomas Wenning, wenningtj@ornl.gov

IAC Student Activities Advisor: Michaela Martin, martinma@ornl.gov

IAC Student Activities Assistant: Susie Allen, allensc@ornl.gov

U.S. Department of Energy Golden Field Office, IAC Project Officer: Bill Prymak bill.prymak@go.doe.gov

Rutgers IAC Field Management

Director: Dr. Mike Muller, muller@caes.rutgers.edu

Manager of Technical Operations: Don Kasten, Kasten@caes.rutgers.edu

IAC Database: Mike B. Muller, mbmuller@caes.rutgers.edu , database location: http://iac.rutgers.edu

Calendar of Events and Training

- **2011 IAC Lead Student Meeting**, February 3-4, 2011, Washington, D.C. Past proceedings at www.IACforum.org
- **ASHRAE Winter Meeting (Zero Energy Design)**, January 29–February 2, 2011, Las Vegas, NV, http://www.ashrae.org/events/page/2650
- **DOE Industrial Technologies Program Qualified Specialists and End-User Training,** throughout 2011, http://www1.eere.energy.gov/industry/bestpractices/professional_development.html
- **ACEEE Summer Study on Energy Efficiency in Industry,** July 26 – 29, 2011, Niagara Falls, NY, https://www.aceee.org