

A Program of the U.S. Department of Energy

Beginning in 1976, the Industrial Assessment Centers (IACs) have provided small- and medium-sized manufacturers with sitespecific recommendations for improving energy efficiency, reducing waste, and increasing productivity through changes in processes and equipment.

# WINTER NEWSLETTER

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SIGN UP for an assessment at <a href="http://iac.university">http://iac.university</a> or contact your nearest center.

## LOOKING FORWARD

# WELCOME TO MESC!

Established in 2022, the Office of Manufacturing and Energy Supply Chains (MESC) is responsible for strengthening and securing manufacturing and energy supply chains needed to modernize the nation's energy infrastructure and support a clean and equitable energy transition. As part of this critical mission, MESC is pleased to announce that the IAC Program joined the office in November 2022.

For more than four decades, the IAC Program has offered hands-on experience to engineers-in-training while recommending concrete ways that manufacturers can save energy, reduce costs, and increase productivity. In 2022, the Bipartisan Infrastructure Law (BIL) allocated \$550 million to expand the Program and implement centers' recommendations to support the Biden Administration's goals of creating pathways to high-quality jobs with the free and fair choice to join a union, reducing industrial emissions, and enhancing American manufacturing competitiveness in a net-zero economy.

Through the expansion, the IAC Program will:

- Continue to support engineers-in-training and Small- and Medium- Manufacturers (SMMs) nationwide, including through the program's growing emphasis on decarbonization and resiliency planning alongside efficiency and performance
- Provide grants to manufacturers to hasten implementation of IACs' expert recommendations *stay tuned for more soon*!
- Establish five Regional Centers of Excellence among existing IACs to connect and amplify the enormous impact of centers across the IAC network
- Build a clearinghouse of expertise, tools, and resources to support IACs, SMMs, and like-minded leaders nationwide
- Create new IACs at community colleges, trade schools, and union training programs to expand access to energy- and manufacturing-related career pathways while providing hands-on support to SMMs
- **Support related internship and apprenticeship programs** to invest in the next generation of workers who will lead the clean energy transition Establishment of Regional Centers of Excellence within existing IACs

Meanwhile, the Program's new home within MESC creates unprecedented opportunities for collaboration with other DOE programs to bolster American manufacturing while accelerating the U.S.'s transition to a carbon-free future.

The IAC Program has thrived through consistent adaptation and innovation. This transition to MESC and historic expansion of the Program builds on that tradition, and we're thrilled to have the Centers as partners in this crucial work.



Read the Notice of Intent: Establishment of Industrial Assessment Centers (IACs) at Trade Schools, Community Colleges, and Union Training Programs and Establishment of Building Training and Assessment Centers (BTACs)

## PROGRAM HIGHLIGHTS

# EXPANSION OF THE IAC COMMERCIAL BUILDINGS PILOT

In November of 2022, the U.S. Department of Energy (DOE) announced \$3.2 million in supplemental funding to expand the IACs program. Eight current IACs will expand their programs to also include commercial building assessments. This latest investment in the IAC program will help remove barriers to decarbonization across the manufacturing and commercial sectors and advance the Biden Administration's goal of achieving net-zero emissions by 2050.

Earlier this year, DOE announced the latest expansion of IAC universities growing the program to 37 university programs, each focused on enhancing cybersecurity, promoting resiliency planning, and providing training to manufacturers located in disadvantaged communities.

Now, DOE has selected eight of those universities to receive \$100,000 per year over four years to expand their assessments to include small- to medium-sized commercial buildings. These eight universities will join nine other IACs already conducting commercial building assessments, thereby bringing the total number of Centers participating in the commercial buildings pilot to 17 (see map below). IAC personnel at the selected universities will work with community colleges and technical training programs to provide continuous learning for students and professionals while also providing assessments and recommendations to small and medium-sized commercial buildings and businesses. The eight selected universities are:

- The University of Utah (Salt Lake City, UT)
- Oklahoma State University (Stillwater, OK)
- The University of Missouri (Columbia, MO)
- Louisiana Tech University (Ruston, LA)
- Indiana University Purdue University Indianapolis (IUPUI) (Indianapolis, IN)
- The University of Dayton (Dayton, OH)
- The University of Louisville (Louisville, KY)
- The University of North Carolina, Charlotte (Charlotte, NC)



A total of 17 IACs (shown in green) and their satellite Centers (shown in blue) are actively working with community college partners to conduct commercial building assessments of small- and medium-sized clients to identify energy savings opportunities. The goal for this pilot project is to expand the workforce of building efficiency professionals with technical expertise ranging from space heating and cooling/ventilation to water heating and plug and process loads associated with equipment.

# IACS AND PARTNER PROGRAMS RETURN TO AEE WORLD

After more than a two-year hiatus, the IAC program rejoined its traditional Department of Energy manufacturing technical assistance (TA) programs – Better Plants and the Combined Heat and Power Technical Assistance Partnerships (CHP TAP) – in attending and sponsoring the annual Association of Energy Engineers (AEE) World conference in Atlanta, GA in late September 2022.

AEE is a nonprofit professional society whose mission is to promote the scientific and educational interests of those engaged in the energy industry and to foster action for sustainable development – and AEE World is the organization's premier event for AEE-sponsored workshops and technical training and certificate program sessions, as well as forums for a wide range of industry-leading companies and organizations to present energy-efficient products, energy management services, and solutions.

In addition to providing the IACs and other TA program staff an opportunity to engage face-to-face with their numerous stakeholders, AEE has traditionally offered free registration to all IAC students to attend its events – an opportunity which nearly 30 existing IAC students and faculty from centers including the University of Florida, Georgia Tech, Clark Atlanta University, Kennesaw State University, Mississippi State University, West Virginia University, and Oklahoma State University availed themselves of at AEE World in 2022.



Over the course of the three-day event, IAC students and faculty took turns staffing the IAC exhibit; attended technical training sessions on energy management, performance monitoring and verification, smart manufacturing, energy storage systems, and a variety of other topics; and led or participated in panel discussions – all the while networking, engaging with stakeholders and exploring professional development and/or employment opportunities. On a separate note, the IAC program's Women for Energy Efficiency Network (WE2) or "we squared" was featured as a new sponsor of the AEE Council on Women in Energy & Environmental Leadership. The IAC program aims to aid in career development and diversity within the energy sector, and the WE2 network strives to enhance women's experience in the IAC program by creating a comfortable, inviting environment to share their work experiences, build a network of mentorship, provide opportunity for leadership development, and to facilitate the exchange of ideas with other brightminded women in the Energy Industry.

One of the main initiatives is the WE2 Mentorship Program where women currently working in the Energy Industry have the oppor-



tunity to mentor current IAC students. For more information on the WE2 program, or If you are interested in becoming a mentor, please the website at <u>iac.university/we2</u>.

## CENTER HIGHLIGHTS

# EIGHTH ANNUAL STUDENT RESEARCH AWARDS

The U.S. Department of Energy's (DOE's) Office of Manufacturing and Energy Supply Chains sponsors an annual applied research awards competition to honor exceptional students participating in the IAC program. The program provides students at IACs with hands-on training and real-world experience in energy engineering and management.

Each winning IAC student/faculty team will receive \$25,000 in program funds. The research awards are designed to create incentives for undergraduate and graduate students to pursue assessment-inspired research projects in the areas of manufacturing and industrial energy efficiency. The awards are intended to enhance traditional student-led research efforts and to recognize research proposals that stand out as being exceptional and particularly innovative.

Information about this year's eight winning student projects is below:

- Lehigh University: Abhinay Soanker and Justin Casper, IAC Students; Dr. Alparslan Oztekin, Advisor – Solar Powered Membrane Distillation for Desalination Applications
- **Mississippi State University:** McKenna Patterson, IAC Student; Dr. Heejin Cho, Advisor – Impact Analysis on Implementation of Electric and Thermal Energy Storage Systems at Industrial and Commercial Facilities

- University of Wisconsin, Milwaukee: Ahmad Abdel Hadi and Omar Habash, IAC Students; Dr. Ryo Amano, Advisor
   Photovoltaic Cover for Treatment Tanks in Wastewater Treatment Plants
- **Tennessee Technological University:** Spencer Jones, IAC Student; Dr. Ethan Languri, Advisor – Field Validation Study of an In-house Developed Cooling Tower Efficiency Model
- University of Dayton: Scott Eardly, IAC Student; Dr. Jun-KI Choi – Decarbonization and Energy-Saving Potential of Pure Oxygen Aeration for Wastewater Treatment Plant
- University of Nebraska: Md Rasel Uddin, IAC Student; Dr. Robert E. Williams, Advisor – Automated Fault Detection and Diagnostics (AFDD) for Packaged Rooftop Units Using Data-Driven Approach and Impact of Fault Elimination on Energy and Cost Savings
- **Michigan State University:** Behlul Kula, IAC Student; Dr. Kristen Cetin, Advisor – Developing a Virtual Assessment Process for More Efficient Student Training and Post-Assessment Analysis
- University of California, Irvine: Meraf Amare, Jasmine Glover, and Jason Kim, IAC Students; Dr. G.P. Li, Advisor – Mixing Hydrogen with Natural Gas as an Alternative for Fuel Switching in Manufacturing for Decarbonization/ Reducing GHG Emission

#### **Oklahoma State University**

- 66 I have used the OSU Industrial Assessment Center for multiple locations to help identify and calculate energy savings for our facilities. The Teams are always professional and do a great job at identifying ways we can reduce energy and waste. One thing I like most is when they identify a way to reduce energy, they are also able to provide energy savings R.O.I's to help when requesting capital for the projects. We have been able to implement several projects that have reduced our energy consumption by over two million K.W.H annually. I really appreciate this service that they offer and plan on using them in the future as our business grows. ??
  - Lewis Chambers, EHS Manager, Georg Fischer Central Plastics

#### **University of Missouri**

- 66 This report has been very comprehensive and an interesting read on my part as one of the suggestions was hydropower that I have not heard about at a Wastewater Treatment Facility. I am very impressed with the report. ??
  - Lynden Lawson, Assistant Director of Public Works for Operations, Turkey Creek Wastewater Plant

#### **Tennessee Tech University**

- **66** Thank you, Tennessee Tech for the excellent report you have produced. I scanned the document and will review, in detail, all the measures and expect that they will be added to our 'Roadmap' for the near future to be implemented.
  - Mike Skroski, Energy Engineer, Chromalox

# IAC Program Quarterly Results

Between July and September of 2022, IACs conducted 142 assessments (Table 1). This represents a decrease of approximately 16 percent over the previous quarter – although the 3rd Quarter of FY 22 was an exceptionally busy one in terms of assessment activity. On an annual basis, the number of assessments has returned to that experienced prior to the COVID-19 pandemic. IACs made 935 recommendations that identified nearly \$26 million in potential cost savings.

### **IDENTIFIED SAVINGS**

Table 1. July – September 2022

Total Assessments	142	
Total Recommendations	935	

	Total Recommended Annual Savings	YTD
Energy Savings	24.0 M Therms	93.6 M Therms
Electricity Savings	213,833,369 kWh	771,525,189 kWh
Generation Reduction (approx.)	24.41 MW	88.08 MW
Natural Gas Savings	2.0 M Therms	19.2 M Therms
CO <sub>2</sub> Reduction	0.14 M tons	0.54 M tons
TOTAL Cost Savings	\$25.92 million	\$86.70 million
- Energy Related Savings	\$19.01 million	\$65.41 million
- Productivity Savings	\$6.31 million	\$17.89 million
- Waste & Water Savings	\$0.59 million	\$3.38 million

## LOCATIONS

Plants assessed were located in 33 states (Figure 1). The assessed plants represent a broad range of industries, with fabricated metals and food being the most common (Table 2).

Figure 1. IAC Assessments Nationwide, July – September 2022



## PARTICIPATION

A total of 314 engineering students were active across the 32 centers; and more than 25 percent of these were new to the program, which may appear to be a relatively high percentage, but is fairly typical for the beginning of the academic year.

 Table 2. July – September 2022 Assessments by NAICS

 Industrial Category

#### **INDUSTRIES**

#### Industrial Category (NAICS #)

Assessments

Fabricated Metal Product Manufacturing (332)	17
Food Manufacturing (311)	13
Transportation Equipment Manufacturing (336)	12
Machinery Manufacturing (333)	11
Plastics and Rubber Products Manufacturing (326)	10
Chemical Manufacturing (325)	8
Beverage and Tobacco Product Manufacturing (312)	4
Electrical Equipment, Appliance & Component Manufacturing (335)	4
Wood Product Manufacturing (321)	3
Primary Metal Manufacturing (331)	3
Paper Manufacturing (332)	3
Computer and Electronic Product Manufacturing (334)	2
Nonmetallic Mineral Product Manufacturing (327)	2
Printing and Related Support Activities (323)	2
Petroleum and Coal Products Manufacturing (324)	2
All Other Manufacturing	7
Others	39



For more information contact: John Smegal Manufacuring & Energy Supply Chains Office, U.S. Department of Energy (202) 287-6225 john.smegal@hq.doe.gov

#### Visit us at:

https://www.energy.gov/mesc/ industrial-assessment-centers-iacs

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