



**INDUSTRIAL
ASSESSMENT
CENTERS**

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 site-specific recommendations for improving energy efficiency, reducing waste, and increasing productivity through changes in processes and equipment.

WINTER NEWSLETTER 2020

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LETTER FROM THE DEPARTMENT – IACS’ GROWING WATER-RELATED EFFORTS



As we kick off a new calendar year, I’m excited about the IACs’ excellent work identifying opportunities for industrial facilities to improve productivity and competitiveness, reduce waste, and save energy around the country.

Most IAC clients are small and medium-sized manufacturers – entities categorized as operating within SIC codes 20 to 39 or NAICS codes 311 to 339. Wastewater treatment facilities, or Water Resource Recovery

Facilities (WRRFs) as they are more commonly referred to now, are not classified as manufacturers. Therefore the IACs conducted relatively few assessments at these facilities for the first three decades of the program.

Beginning in FY 2015, the Advanced Manufacturing Office (AMO) encouraged the IACs to provide technical assistance to WRRFs, since these facilities operate a significant number of industrial systems (e.g., motors, pumps, fans, compressed air) also used in manufacturing.



Blue Plains Advanced Water Resource Recovery Facility, Washington, D.C.

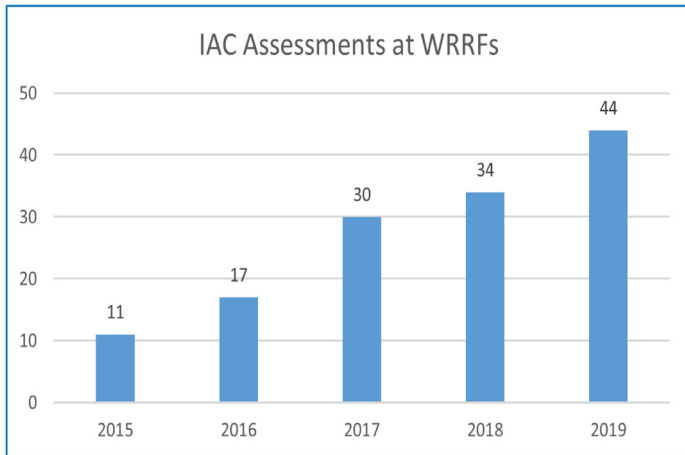
IACs have proven an effective resource to WRRFs, making more than 1,100 recommendations on opportunities to save energy, improve operations, and reduce waste. To date, the average value of these recommendations for an individual facility is more than \$230,000 per year. Participating WRRFs implemented more than 40% of the recommendations during the first year after the assessment, resulting in average savings of almost \$100,000 per year – approximately 10 percent of the average WRRF’s annual energy expenditures. In September 2019, Congress formally recognized the “great potential for energy savings in municipal, industrial and agricultural wastewater



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

treatment systems” and directed AMO and the IACs to expand technical assistance activities in this area.

Since water-related technical assistance became a priority in 2015, and in particular during the last two years, IACs have conducted 141 assessments – nearly 10% of all activity – at WRRFs. In contrast, for the 34 prior years of operations, IACs conducted only 44 such assessments, approximately 0.25% of activities, at WRRFs.



I look forward to IAC assessments continuing to grow at WRRFs in 2020. It's clear that the IACs' expertise offers great benefits for these facilities as they seek to improve energy and material efficiency. ■

John Smegal

IAC Coordinator
U.S. Department of Energy

CENTER HIGHLIGHTS

CELEBRATING NATIONAL MANUFACTURING DAY AT THE UNIVERSITY OF ILLINOIS AT CHICAGO



On Friday, October 4, 2019, Deputy Director Valri Lightner of DOE's Advanced Manufacturing Office (AMO) visited the University of

Illinois at Chicago (UIC) to celebrate National Manufacturing Day. The day included tours of UIC industrial manufacturing laboratories; presentations by DOE, IAC students, and representatives of the Central and Midwest Combined Heat and Power Technical Assistance Partnerships (CHP TAPs); and a tour of the UIC combined heat and power plant.



AMO Deputy Director Valri Lightner (second from right), IAC Director Dr. Lin Li (third from right), and IAC students

The student-led tours began with the Sustainable Manufacturing Systems Research Laboratory (SMSRL). Established by IAC Director Dr. Lin Li, the SMSRL works on various aspects of sustainable manufacturing systems research, including modeling, electricity demand response, electric vehicle battery manufacturing, cellulosic biofuel manufacturing, and intelligent manufacturing systems. The second laboratory toured was the Additive Manufacturing (AM) Laboratory, overseen by Dr. Yayue Pan. The laboratory's research objective is to advance AM through exploring the science in physics and materials, to develop and apply novel technologies in a wide range of applications, including multi-material additive manufacturing, additive manufacturing of electronics, soft robots, medical devices, and thermal energy management devices.



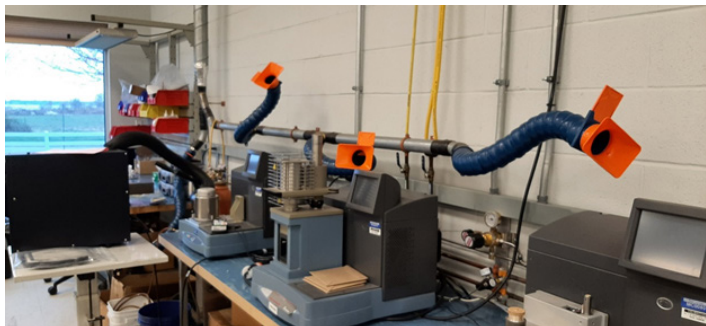
AMO Deputy Director Valri Lightner visiting UIC's Sustainable Manufacturing Systems Research Laboratory and Additive Manufacturing Laboratory

The event was capped with a tour of UIC's East Campus Combined Heat and Power (CHP) plant. The tour was led by UIC Chief Plant Operating Engineer Kevin Casserly. The tour provided an up-close look at the plant's equipment, including two Cooper-Bessemer 20-cylinder engine generators and two Wartsila engines. The tour also included the East Campus Chilled Water Plant, which operates with an installed rated capacity of 8,500 tons of electrically based chilled water generation. The facilities are responsible for supplying the UIC East Campus with power, hot water, and chilled water. ■

CLIENT SPOTLIGHT

TA INSTRUMENTS PARTNERS WITH UNIVERSITY OF DELAWARE IAC

TA Instruments, Inc., a New Castle, Delaware-based electronics manufacturing firm that ships approximately 2,500 scientific instruments annually to clients across the county, recently collaborated with the University of Delaware IAC on an assessment to identify opportunities for energy efficiency improvements, productivity enhancements, and reductions in waste generation. Led by Dr. Keith Goossen, this assessment resulted in several recommendations that the firm intends to pursue, including heat recovery for space heat from air compressors, calculated to save \$3,500 per year in offsetting gas heat. The assessment also quantified savings of \$4,500 per year for placing fume collector systems on a variable drive in conjunction with closures of system ports.



The University of Delaware IAC team estimated TA Instruments personnel can close up to one-quarter of the ports shown above at any given time, resulting in a 58% energy savings based on the cubic dependence of power for these air exhaust systems.

Dr. Goossen and his students explored every part of the TA Instruments facility looking for energy-saving opportunities, both inside and out. In fact, management was especially interested in the IAC's thorough evaluation of the roof-top air conditioning units (RTUs) and their electricity consumption (see photo below). Currently the RTUs are operated with the fans running continuously for air circulation. The IAC team recommended they be placed in fan-automatic mode during unoccupied time.

Overall the assessment identified seven recommendations calculated to save nearly \$100,000 per year, all of which are being considered by the facility in an effort to reduce its carbon footprint and increase overall competitiveness. ■



Based on a comprehensive evaluation of RTU fan consumption, current continuous fan operation results in consumption of a little over 1,000,000 kilowatt hours per year, almost 20% of the facility's electric bill. By placing the RTUs in fan-automatic mode during unoccupied time, the facility should save nearly \$32,500 per year in electricity costs.

CLIENT TESTIMONIALS

University of Missouri

“ I have been going through the report. It is very comprehensive! The audit team from University of Missouri Columbia did a fantastic job of learning our operation and identifying some key projects for our facility to become more sustainable. The knowledge they bring is invaluable. Although some of the projects identified have not been completed to date, they are still being investigated for costs versus budget available to implement. I really enjoyed working with [the team] and would recommend their services to anyone interested in sustainability and reducing your carbon footprint. ”

- Chris Heisterberg, Facilities Manager, Silgan Dispensing

Texas A&M University

“ The service provided by the IAC team was excellent. Personally, I would recommend that every plant should do an energy study annually to reduce their energy usage to make tomorrow a better day. As far as the evaluation is concerned, we are already very impressed with the IAC team. They come up with new ideas and that is what we really liked about this study. Moreover, Mr. James guided us really well regarding policies that are very useful for a company from the financial point of view. All and all, it was a great work performed by IAC team and we would love to see them again after a year. Thank you. ”

- Operations Manager, Texas A&M

IAC Program Quarterly Results

Between April and June of 2019, IACs conducted 152 assessments (Table 1). As a result, IACs made 1,072 recommendations that identified nearly \$29.2 million in potential cost savings.

IDENTIFIED SAVINGS

Table 1. April - June 2019

	Total Recommended Annual Savings	YTD
Total Assessments	152	
Total Recommendations	1,072	
Energy Savings	35.2 M Therms	70.2 M Therms
Electricity Savings	273,956,237 kWh	552,137,078 kWh
Generation Reduction (approx.)	31.27 MegaWatts	63.03 MegaWatts
Natural Gas Savings	5.9 M Therms	11.6 M Therms
CO₂ Reduction	0.21 Tons	0.42 Tons
TOTAL Cost Savings	\$29.18 Million	\$62.19 Million
- Energy Related Savings	\$23.92 Million	\$49.15 Million
- Productivity Savings	\$4.35 Million	\$10.85 Million
- Waste & Water Savings	\$0.91 Million	\$2.18 Million

LOCATIONS

Plants assessed were located in 34 states (Figure 1). The assessed plants represent a broad range of industries, with fabricated metals and food being the most common (Table 2).

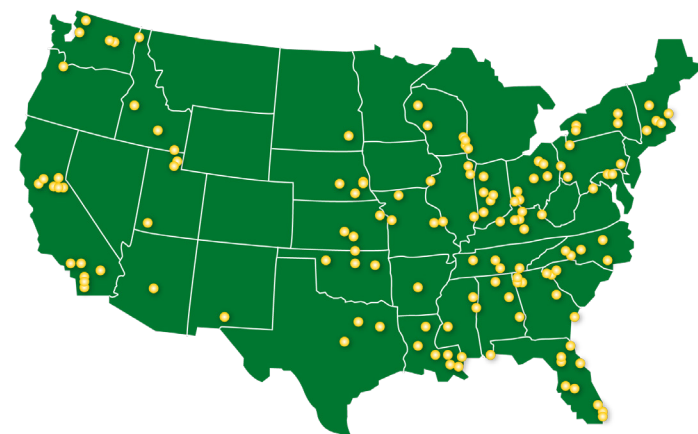


Figure 1. IAC Assessments Nationwide, April - June 2019

PARTICIPATION

A total of 330 engineering students were active during the quarter in the IAC program across the 31 centers; and more than 25% were new to the program.

Table 2. April - June 2019 Assessments by NAICS Industrial Category

INDUSTRIES

Industrial Category (NAICS #)	Assessments
Fabricated Metal Product Manufacturing (332)	20
Food Manufacturing (311)	19
Transportation Equipment Manufacturing (336)	16
Plastics and Rubber Products Manufacturing (326)	13
Chemical Manufacturing (325)	10
Machinery Manufacturing (333)	9
Computer and Electronic Manufacturing (334)	8
Nonmetallic Mineral Product Manufacturing (327)	7
Wood Product Manufacturing (321)	5
Primary Metal Manufacturing (331)	4
Electrical Equipment, Appliance and Component Manufacturing (335)	4
Printing and Related Support Activities (323)	3
Apparel Manufacturing (315)	3
Textile Mills (313)	3
Beverage and Tobacco Product Manufacturing (312)	2
Paper Manufacturing (322)	2
Petroleum and Coal Products (324)	2
All Other Manufacturing	7
Others	15