

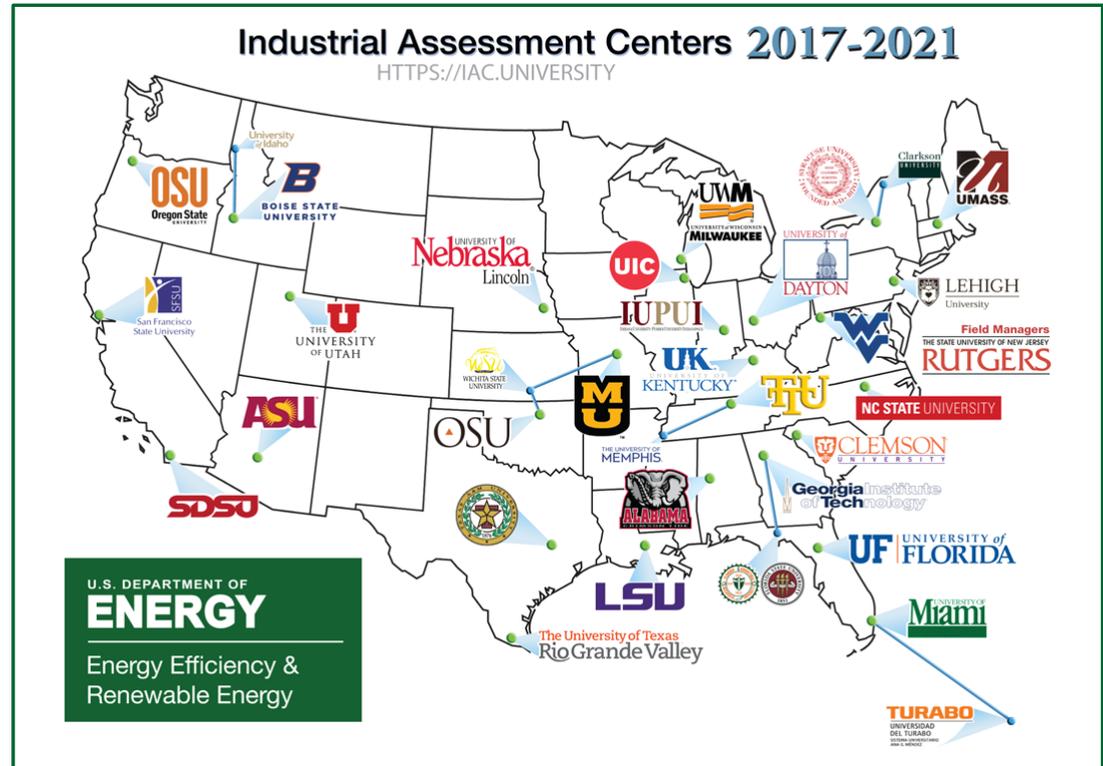
Industrial Assessment Centers

John Smegal, Program Lead

June 13, 2017

IAC Program Overview

- DOE provides Financial Assistance to Engineering Universities to use engineering students to provide field validation of new technologies for smaller industrials
- 28 universities and 6 satellite centers serving manufacturers in 50 states
- IAC program is a public/private partnership to improve energy productivity of small manufacturers and support student-led research



IAC Program Structure



- The IAC program focuses on generating energy savings, productivity improvements, and water use and wastewater reductions at small and medium-sized manufacturers
- The program also provides significant workforce development benefits:
 - Goal is to create the next generation of energy engineers
 - IACs conduct hands-on assessments of small and medium-sized manufacturing firms, emphasizing a practical application of engineering principles
 - IACs foster a specialized energy engineering curriculum at their respective host universities
- Created in 1976
- Currently there are 28 IACs (with 6 satellite centers)
 - Located at accredited engineering schools
 - Selected through competitive solicitation for a five-year period

IAC Administration

- DOE funds current Centers at \$300K - \$350K per year
- Universities provide approximately 20 percent additional cost-share
- Center Directors are tenured engineering faculty members with an interest in practical engineering applications
- Assessments are a teaching tool and represent the backbone of the IAC experience
- Report preparation (60 days) and implementation follow-up (9 – 12 months)



IAC Clients

- Clients served
 - Program concentrates on industrial operations (Standard industrial classification codes 20 through 39)
 - Plant normally located within a 150 miles (242 kilometers) of an IAC
- Directed at small and medium sized manufacturers – primary customers:
 - Have gross annual sales of \leq \$100 million
 - Consume energy at a cost between \$100,000 and \$2.5 million/year
 - Employ no more than 500 people
 - Have no technical staff whose primary duty is energy management



Program Merit

AMO Mission

- AMO activities are addressing the skills gap manufacturers are currently facing because of retirement of trained workers and a lack of workers trained in the latest technologies and energy management skillsets
- AMO objective is to provide educational resources for students as well as mentoring and on-the-job training opportunities to increase the number of qualified technical employees in advanced manufacturing

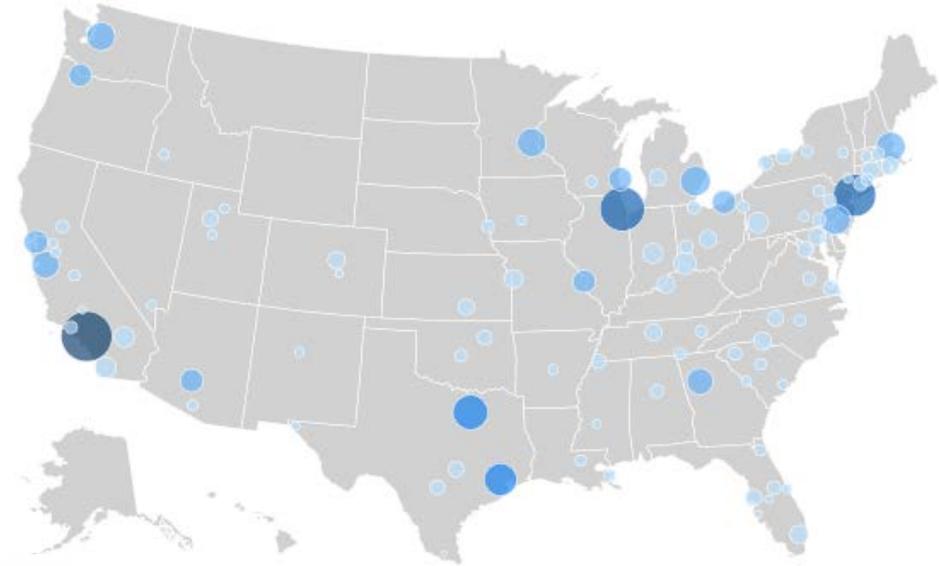
Addressing appropriate barriers

- AMO is developing skillsets in energy management and emerging technologies
 - Develop or advance 15 workforce curricula focused on manufacturing energy systems and advanced technologies
 - Train at least 3,000 individuals per year in advanced manufacturing technologies and solutions, including energy management practices

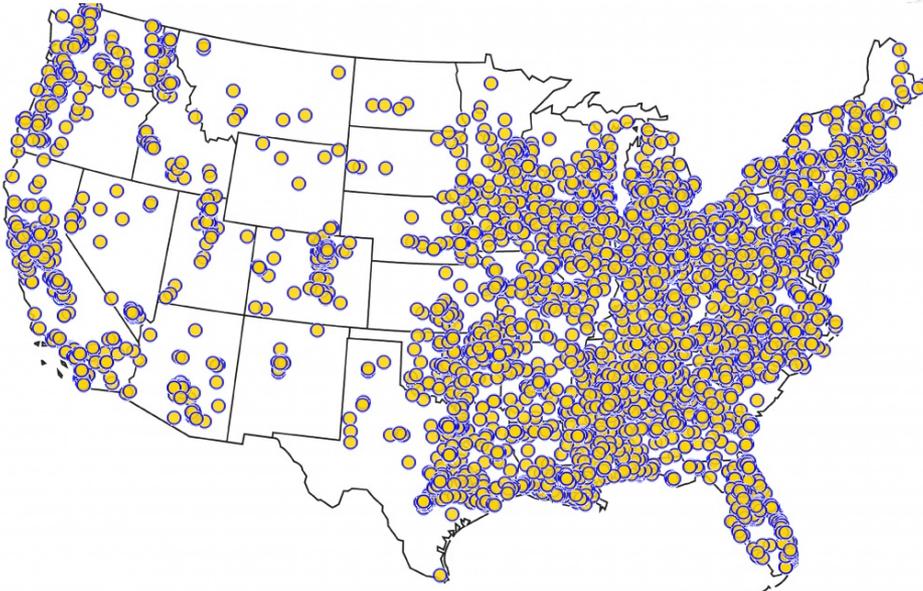
Energy and Market Impacts

- IACs have conducted nearly 18,000 assessments and provided more than 135,000 recommendations
- Average recommended yearly savings is \$135,989

U.S. Manufacturing Jobs – Top 100 Locations



IAC Assessments Since 2000



- For every \$1 invested in the IACs between 1997 and 2013:
 - \$5 were invested in energy efficiency improvements by participating firms

Objectives and Approach – IAC Contribution

- Workforce Curricula

- Lead the establishment of a B.S. in energy efficiency engineering at 50 universities
- Contribute to the conversion of AMO energy system tools for pumps, fans, compressed air, steam, and process heating to open-source platform
- Participate in the expansion of In-Plant Trainings offered to Better Plants partners – especially their supply chains -- for energy systems and energy management

- Training

- Help train at least 50 educators per year in advanced manufacturing technologies for clean energy, including energy management practices
- Provide advanced manufacturing and energy management training to 400 engineering students per year at ABET (Accreditation Board for Engineering and Technology) accredited universities
- Help train 500 individuals per year in manufacturing energy system optimization and energy management online and in classroom

IAC Accomplishments

- On average, an IAC client saves more than \$47,000 in energy savings, productivity enhancements, and water use and waste reduction per assessment in one year
- Costs to DOE are less than one-fourth of energy savings
 - Savings do not account for persistence
 - Savings do not account for activities associated with IAC graduates
- More than 50 percent of IAC graduates initial job includes energy efficiency as a primary responsibility

Impact on Workforce – 2015 SRI Study

- Graduates have an average of 8.9 specific, applicable skills in energy efficiency, as opposed to 5.5 or 4.3 for peer control groups
- Graduates have a skill mix estimated to be \$6,210 more valuable than the skill mix of an energy peer control group
- Graduates spend 42% of their career in EE, as opposed to 28% for an energy peer control group

