

The Role of the U.S. Department of Energy's Industrial Assessment Centers in Meeting the Energy and Environmental Demands of America's Industrial and Commercial Enterprises in the 21st Century

Written Testimony Of

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The Role of the U.S. Department of Energy's Industrial Assessment Centers in Meeting the Energy and Environmental Demands of America's Industrial and Commercial Enterprises in the 21st Century

Chairman Lampson, Ranking Member Englis, and Distinguished Members of the House Subcommittee on Energy and Environment:

I thank you for the opportunity to testify on the U.S. Department of Energy's (DOE) Industrial Assessment Centers (IACs), which provide technical assistance for small and medium-sized manufacturers and industrial facilities utilizing university faculty and students. My name is Malcolm Verdict and I appear before you today representing the Texas Engineering Experiment Station in College Station, Texas.

The Texas Engineering Experiment Station (TEES), within the Texas A&M Engineering Program, is a statewide engineering research agency of the State of Texas, serving industry in our region while educating over 9,000 undergraduate and graduate engineering students annually. TEES has a long history of partnering with industries, communities, and other academic institutions to provide practical solutions that help improve the quality of life, promote clean economic development, and enhance the nation's educational systems. We also promote new technology education and investigate problems in energy, renewables and the environment.

Texas A&M Engineering's strong commitment to energy efficiency is voiced at all levels, especially at the top. The Vice Chancellor for Engineering, Dr. G. Kemble Bennett, recently remarked that efficient energy use must be a national priority and that university educated energy engineers have a major role to play. Programs like the IAC produce highly qualified energy engineers with a conservation mindset who can hit the ground running to save energy for the nation's manufacturers and others.

Congress showed much forethought and wisdom in creating this program in 1976 after the first oil supply disruption, which some of us in this room can still vividly remember. The IAC concept embraced at that time is still relevant today as the nation faces even greater energy and environmental challenges. The good news is that with today's clean energy technologies, combined with the expertise and dedication of the graduate engineers from the IAC program, our nation is even better equipped to meet these challenges than when this program first began. The IACs have been a critical component in improving energy efficiencies and providing cost savings to thousands of industrial firms, while at the same time, training hundreds of new, dedicated energy efficiency experts. In fact, the IAC program is a perfect *trifecta* – Energy, Environment and Education.

My testimony draws on my personal experience in energy management programs and policy since 1978 at the state and federal levels, the 21 years of field experience of the Texas A&M IAC Center Director, Dr. Warren Heffington, and the 14 years of experience of Mr. Jim Eggebrecht

as our IAC Assistant Director. As you can see, our personnel represent significant experience and knowledge in this area and are strong advocates for its importance. I will address three key points this afternoon:

- The many valuable contributions that IACs have made to industry and to the education of one of America's most valuable natural resources – engineering students,
- Current limitations to the IAC program, and
- Recommendations to build upon the successes of the IAC program to help meet the energy and environmental needs of industrial facilities and others during the 21st century.

Industrial Assessment Centers within the U.S. Department of Energy's (DOE) Industrial Technologies Program (ITP) have made significant, long-term contributions to industry and to the education of participating engineering students since its inception in 1976.

The IAC program is unique within DOE as it directly involves engineering students in a significant manner in partnership with industry. Using standardized procedures, engineering faculty and undergraduate and graduate students from accredited universities provide onsite assessments and written recommendations for energy saving and pollution prevention opportunities. This small but highly effective DOE program conducts 500 - 600 energy assessments each year and provides educational opportunities for 250 new energy-efficiency engineers.

The many valuable benefits to industry and to the participating IAC universities include:

- Providing objective recommendations for reducing energy and pollution and increasing industrial productivity, using the latest technologies and techniques,
- Enabling small and medium-size manufacturers and industry to compete in a highly competitive global economy,
- Facilitating real-world experience for students analyzing industrial processes who are highly sought after upon graduation, and
- Creating valuable new industrial partnerships for participating universities in their energy engineering programs.

According to DOE, 38 different universities have participated in the IAC program since its inception and 26 are currently participating. The program name was changed from the original Energy Analysis and Diagnostic Centers (EADCs) to the current name to reflect its broader mission. The DOE field manager, Rutgers University, maintains a wealth of program and applied energy conservation technology information available online in a searchable database by technology, location, paybacks, and types of participating facilities (www.lac.rutgers.edu).

Illustrative examples of notable IAC program successes include [Source DOE website]:

- 13,550 assessments have been conducted as of mid-September 2007.
- Participating facilities have saved \$55,000 per year on average. Payback on implementation averages only 12 months, and the savings keep adding up, year after year.
- Texas A&M recommendations have resulted in local manufacturers spending over \$21 million to implement projects saving \$26 million annually.
- U.S. companies have saved more than \$700 million through efficiency and productivity improvements.
- Enough energy has been saved to power the city of Boston, MA for one year.
- More than 1.5 million industry jobs have been created and maintained in the United States.

The Texas A&M Industrial Assessment Center has performed over 500 assessments in companies such as bakeries, print shops, machine shops, light manufacturing, and chemical, petroleum and wood product industries. The Texas Tile Manufacturing Company in Houston, Texas is a good, recent example of the many benefits this program provides its clients. With high energy prices, inefficient energy practices, increased foreign competition and a location within an EPA-designated non-attainment area, this vinyl floor manufacturer was a prime IAC candidate.

In 2006, a team from the Texas A&M Industrial Assessment Center identified over \$250,000 in energy savings and enabled the firm to find an additional \$100,000 in savings while implementing the team's recommendations. In all, the majority of recommendations were implemented within six months of the Texas A&M visit. The remainder is scheduled for completion this year. Equally important, the energy savings will reduce critical air emissions and help Houston meet the EPA Clean Air standards.

Illustrative examples of the significant program benefits to engineering students include:

- Approximately 3,000 students nationwide have participated in the program with over 200 from Texas A&M University and Prairie View A&M University.
- Real-world engineering experience is provided students in an industrial setting.
- Long-term energy-related careers are frequently launched upon graduation.

It bears repeating that the IAC program educates students with highly critical engineering skills needed in the nation's next engineering workforce. Participating students have done remarkably well after graduation in helping solve our nation's energy problems. In fact, the program produces some of the best energy-educated engineers in the world. Most IAC graduates go on to energy-related jobs in industry, national laboratories, U.S. DOE, and engineering teaching careers. One of A&M's successful graduates is now the Director of the Industrial Assessment Center at the University of Dayton in Ohio. And, our assistant director, Jim Eggebrecht was an IAC student engineer as well. A University of Tennessee study on the

careers of IAC graduates found 73 percent of those surveyed held a position at one time related to energy-efficiency and 58 percent have remained in energy efficiency throughout their career. (B. Tonn & J. Peretz, Univ. of Tennessee, 2002)

These are just a few examples demonstrating how IACs successfully help industry save energy and money, while educating students. The program has constantly received high praise from assessment recipients and others familiar with its impact. As noted recently by one senior former DOE official, the IAC program was one of the most successful he had seen in his 24-year career dealing with energy efficiency at the Department.

Although the Industrial Assessment Centers have made significant, long-term contributions to industry by reducing energy use, pollution and energy costs, and providing critical energy engineering skills, it has not achieved its full potential.

Program limitations include:

- Program management continuity and resources have been inconsistent.
- Participation of only 26 universities leaves some areas of the nation underserved.
- The program fails to address other viable target audiences such as medium-size commercial buildings and federal buildings and industrial processes.
- The program does not include an energy research component, which limits opportunities for university faculty and student educational activities.
- There is no clear charter to leverage resources through cost-sharing for assessments and for partnering with others.
- The program does not require the distribution of information on financing resources and local engineering expertise required to implement more complex recommendations.
- Program success metrics do not incorporate the importance of the intrinsic, long-term value of training our nation's future energy engineers.

Although it has been very successful, the IAC Program is not achieving its full potential. Having been around 32 years, it has naturally gone through numerous re-organizations and managers within DOE. Within the last 10 years, the original IAC program managers have all retired and new internal champions have not emerged. Also, no official mechanism exists for external feedback on the IAC program.

The small number of participating universities leaves some areas of the nation underserved. Existing resources do not come close to meeting demand. For example within the first four weeks, the Texas A&M IAC had applications for all its available assessment slots for the coming year. Also, there is no mechanism for leveraging IAC funds with other resources such as utility efficiency and state energy programs which also target industrial end users.

The industrial sector has proven to be a wise choice for targeting energy inefficiencies. The IAC model would also work quite well for commercial building owners. Buildings represent over 34 percent of our electricity use in the U.S. [E.IA. 2004] and most buildings need upgrades or operational improvements. Mid-size buildings [25 – 50,000 square feet] are good candidates for IAC-like assessments. Likewise, process energy consumption in the federal sector is over 7 percent of the energy use in federal facilities [Alliance to Save Energy, *Leadership by Example*]. The ITP program has no charter to assist the Federal Energy Management Program even though expertise resides in the Industrial Technologies Program and the IACs.

The demand for motivated, skilled energy engineers has never been greater. The one DOE mechanism designed to increase the educational opportunities is very limited in its approach. The program does not have an educational charter beyond student participation in industry assessments which restricts valuable opportunities. Faculty and students could greatly benefit from participating in industrial research already funded by U.S. DOE. Internships are also excellent programs for students and industry but are rarely provided.

In addition, the usefulness of the assessment reports is somewhat limited as the focus is primarily on the energy efficiency recommendations. Adding a program requirement of providing other implementation information such as qualified engineering firms, state and utility industrial programs and financial resources would help smaller firms with limited staff.

The IAC program effectiveness could be enhanced by improving program continuity, expanding the target audiences and geographic coverage, increasing the educational value and leveraging federal program dollars.

Based on the limitations described previously, the IAC program effectiveness could be improved by the following actions:

- Creating an IAC industry/university advisory group within the Office of Industrial Programs for enhancing program responsiveness and ensuring continuity,
- Expanding the target audience to include medium-size commercial buildings and federal facilities,
- Expanding the geographic coverage by authorizing centers in all 50 states and territories where practical and increasing field management resources,
- Providing an information clearinghouse on qualified engineering firms, utility programs and rebates, state energy office industrial programs and financial resources as part of the assessment reports,
- Increasing the educational effectiveness through applied research activities such as regularly involving IAC students as summer interns at national laboratories and involving IAC faculty and students in other DOE funded industrial and commercial building research initiatives, and
- Authorizing adequate resources to implement an expanded IAC scope.

We are aware of a draft Subcommittee bill entitled the “Industrial Energy Efficiency Act of 2007”, which addresses many of the items covered in this testimony. We applaud your efforts to improve upon the IAC program which has served our country extremely well.

In conclusion, the IACs have been highly successful at helping reduce industrial inefficiencies, pollution and providing cost savings while providing critical education to the nation’s engineering students. However, the program is not without its limitations. After 32 years of success, it is now time for improvement to meet tomorrow’s energy needs. The current DOE program and the required information provided to industry should be expanded, student educational opportunities should be increased, and the intrinsic, long-term value of the educational benefits should be more fully recognized.

Mr. Chairman and distinguished members, I thank you again for the opportunity to highlight the importance of the IAC program to our nation’s energy future and to share some ideas to increase its energy, environment and education impacts. I would be glad to respond to any questions you may have.

Biography for Malcolm E. Verdict, C.E.M.

Texas Engineering Experiment Station

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Mr. Verdict is Associate Director of the Energy Systems Laboratory, a division within the Texas Engineering Experiment Station and the Texas A&M University System. Mr. Verdict has over 29 years of energy management program and policy experience at the state and federal levels. He is currently project manager for numerous building commissioning projects in large public and private buildings, and works closely with the Laboratory team that created the innovative emissions reduction calculator for energy and renewables.

From 1992 to 2001, he was a senior program manager at the Alliance to Save Energy in Washington, DC and was responsible for their energy efficiency financing, Home Energy Rating, Federal Energy Productivity, Habitat for Humanity, and Energy Star Home initiatives. He worked closely with DOE to help develop the Presidential Executive Order 13123 “Greening the Government Through Efficient Energy” and drafted many of the Federal Agency energy management requirements in the Energy Policy Act 2005. He also served on DOE’s Financial Advisory Subcommittee for the International Performance Measurement and Verification Protocol (IPMVP) and the Greening of the White House (1994) sustainability initiative. In 2004, he was appointed as the Texas State representative to the Western Governor’s Energy Efficiency Task Force for Clean and Diversified Energy.

Prior to joining the Alliance in 2001, Malcolm was Deputy Director of the Texas State Energy Conservation Office where he helped create the award-winning \$98 million LoanSTAR energy retrofit loan program. Still going strong today, LoanSTAR has saved Texas taxpayers over \$215 million since 1990. Before entering the energy efficiency field in 1978, Malcolm was a commercial banker in Louisiana.

He holds a Bachelor of Science (BS) from the U.S. Air Force Academy in Colorado and a Masters in Business Administration (MBA) from Louisiana Tech University. He is a Certified Energy Manager (C.E.M.) and was selected the “2005 Energy Manager of the Year” by the Association of Energy Engineers. He holds a commercial pilots license and was a former Air Force fighter pilot in Vietnam.