

Concept for Building Training and Assessment Center (BTAC) Program at DOE

Prepared by ACEEE
February 2009

Recommendation: Authorize a new Building Training and Assessment Center (BTAC) program, based loosely on DOE's very successful Industrial Assessment Center program, to help train new building engineers and technicians who can provide energy-saving assistance to owners and operators of commercial and institutional buildings with energy-saving technical assistance.

Today's commercial and institutional buildings have increasingly sophisticated controls and need a well-trained workforce to help design and operate them with optimal energy efficiency. This required workforce is comprised of a number of disciplines: the architects and engineers who create the buildings and equipment; the builders and installers of equipment; and the technicians that service and maintain the buildings and equipment over time. An aging current workforce presaging large-scale retirement of technicians, combined with the rapidly growing need for professionals well-trained in building energy efficiency, has created the need for a comprehensive approach to improving the education and training of professionals in each of these fields:

- : Universities need to provide an avenue for training architects, building and equipment engineers, and building scientists in the skills to design and execute efficient buildings and equipment.
- : Community colleges, trade schools, and apprenticeship programs must train technicians conversant with modern building energy systems and equipment.
- : In addition, as a second step, it is important to provide training for building operators, including continuing education for those who currently hold these jobs.

The Building Training and Assessment Center (BTAC) program will utilize three groups of higher education institutions to develop the energy efficiency workforce:

1. University-level BTACs will educate building engineers and building scientists, creating opportunities to train these professionals in designing and operating buildings with optimal efficiency. Universities will support work with satellite BTACs at community colleges and trade schools.
2. Satellite BTACs designed to train building technicians will be based in community colleges and trade schools (including continuing education programs) in a program emphasizing troubleshooting building operations.
3. The last tier of universities will be "Centers of Excellence," BTAC universities that are already established leaders in the field of buildings energy efficiency. They will serve as resources to the other BTACs, with a budget to travel in order to provide mentoring and maintain the network of educators creating a better trained and qualified workforce.

A key component of each BTAC program will be free energy performance assessments of individual commercial and institutional buildings, providing energy-saving suggestions to building owners and operators while providing practical hands-on experience to trainees. This combination has been a key for success in the Industrial Assessment Center program.

Impacts:

The BTAC program would support training of building scientists, engineers, and technicians in order to develop the buildings and equipment skilled workforce. The program will combine classroom instruction with hands-on field experience in building assessment through free audits and internship programs. The free building assessments each BTAC provides in their local communities will create the potential for significant energy savings. These energy savings result in direct jobs installing energy-efficiency measures and in manufacturing the energy-efficiency equipment installed at the buildings, while helping building owners keep a major operating cost in check, improving their economic viability and the number of people they employ.

Funding:

We recommend funding levels of \$400,000-600,000/year to run each of the university BTACs, \$250,000/year to create and maintain each community college/trade school BTAC, and \$750,000/year to manage each of the Centers of Excellence BTACs. About 25 university centers should be established, with an effort to engage many of the existing academic centers with leading building programs. Each university center would eventually serve 2-3 satellite BTACs.

Initially, the program would start with perhaps 10-12 university-based centers, each with a satellite center. Ultimately, 75 more university or satellite centers would be established throughout the nation, each selected through a competitive solicitation. To serve these needs, legislation should authorize \$5 million in start-up funding in FY 2010, \$10 million in FY 2011, \$20 million in FY 2012, and \$40 million/year thereafter. Establishing long-term, sustained funding is necessary to convince schools to commit to developing or expanding a program and to ensure the program will continue to get renewed best practices information into the field.

Background:

Commercial buildings account for nearly 20% of U.S. energy use annually (AEO 2009), but ACEEE's studies show opportunities for cost-effective energy savings in existing buildings of up to 30%. Higher performance buildings that save energy by operating with greater energy efficiency are readily attainable today. These buildings are dependent on well-trained technicians, designers, and contractors to perform optimally. The effort and resources to properly train, recognize, and reward these individuals can yield enormous benefits given high and unpredictable energy costs. By carefully designing new commercial and institutional buildings to be more energy-efficient, up to 50% of the energy costs can be eliminated for owners. However, even well-designed commercial buildings may run 10-15% below expected energy performance levels because of poor installation, poor commissioning, and operational errors. Improving building energy efficiency is a cost-effective way to make buildings more affordable, improve comfort, and reduce costs for building owners.

Consequently, it is essential to create a vibrant workforce of engineers and technicians trained to reduce energy costs through efficiency. There is a staggering shortage of skilled energy engineers in the building industry and among energy efficiency programs and consultants. As energy efficiency becomes more of a priority for economic, security, and environmental reasons, there will be significant need for more building engineers and technicians with the knowledge and training to design, operate, install, and maintain building equipment.

The Building Training and Assessment Center (BTAC) program concept is based on the model of the Industrial Assessment Center (IAC) program that has operated since 1976. This program has been one of DOE's most effective programs, training industrial engineers and providing them with practical hands-on experience by providing free energy audits to industrial firms. The program has trained more than 2,500 engineers and reduced energy use at more than 14,000 factories. Trainees from the program are in high demand and receive multiple job offers with a majority of IAC graduates taking jobs in the energy efficiency field.

While there are existing building engineer and building and equipment technician training programs throughout the country, there is a fundamental need for more students trained in these skills. The BTAC program will focus on leveraging existing programs at universities, community colleges, vocational-tech schools (secondary level), and apprenticeship programs, and developing new programs to expand and accelerate the numbers of qualified individuals with these skills and capabilities. BTACs would serve as an important source of new workforce for the field, and its graduates would likely be in high demand for their experience and expertise, as have the graduates from the IAC program. Graduates from the programs will be prime candidates for high-paying, high-skilled jobs.

In the BTAC program, engineering students in universities across the country will work closely with professors to provide free building energy assessments, capturing the results of the recommendations in a database similar to the one established for the IAC program. The audits performed for commercial and institutional buildings will emphasize easy-to-execute, inexpensive energy saving measures for the buildings. The BTAC program will improve the operational efficiency and performance of thousands of buildings across the country, creating energy and dollar savings for owners and tenants. In addition, the technicians and building operators trained in the program will have the skills needed to maintain these energy savings and will be guaranteed practical experience in real buildings. By providing continuing education for building technicians, BTACs can work with local firms and technicians to improve capacities already in the market.

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ACEEE is a nonprofit organization dedicated to advancing energy efficiency as a means of promoting economic prosperity, energy security, and environmental protection. For more information, see <http://www.aceee.org>.

BTAC (Building Training and Assessment Centers)

Potential Legislative Language:

INSTITUTION OF HIGHER EDUCATION-BASED BUILDING TRAINING AND ASSESSMENT CENTERS. – The Secretary shall provide funding to institutions of higher education for building training and assessment centers, whose purpose shall be –

- (1) to identify opportunities for optimizing energy efficiency and environmental performance in buildings;
- (2) to promote applications of emerging concepts and technologies in commercial and institutional buildings;
- (3) to train engineers, architects, building scientists, and building technicians in energy-efficient design and operation;
- (4) to assist local community colleges, trade schools, registered apprenticeship programs and other accredited training programs in training building technicians;
- (5) to promote research and development for the use of alternative energy sources to supply heat and power, for buildings, particularly energy-intensive buildings;
- (6) to coordinate with and assist State-accredited technical training centers and community colleges, while ensuring appropriate services to all regions of the United States.

AUTHORIZATION OF APPROPRIATIONS. –

- (1) IN GENERAL. – There are authorized to be appropriated to the Secretary to carry out this section—
 - a. \$5,000,000 for fiscal year 2010;
 - b. \$10,000,000 for fiscal year 2011;
 - c. \$20,000,000 for fiscal year 2012;
 - d. \$40,000,000 for fiscal year 2013;
 - e. such sums as are necessary for fiscal year 2014 and each fiscal year thereafter.
- (2) COORDINATION AND NONDUPLICATION.—The Secretary shall coordinate efforts under this section with other programs of the Department and other Federal agencies to avoid duplication of effort.