

Alabama Leverages Funding for Industrial Energy Efficiency

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ABSTRACT

The state of Alabama is using a number of federal and state grants to successfully bring local industry into a closer working relationship with state organizations that have the resources to help them improve their efficiency and strengthen their competitiveness, thereby bolstering the local economy. Alabama is using a 2009 *Save Energy Now* State Award from the U.S. Department of Energy's (DOE's) Industrial Technologies Program (ITP) along with grants from the U.S. Department of Labor, the Tennessee Valley Authority, and DOE American Recovery and Reinvestment (ARRA) funds to jumpstart a robust industrial energy efficiency effort that includes supporting an Alabama E3 initiative.

Alabama's E3 program, one of the first E3 pilot programs in the nation, is managed by the Alabama Technology Network (ATN), which is funded by the State of Alabama and the U.S. Department of Commerce's National Institute of Standards and Technology (NIST) Manufacturing Extension Partnership (MEP). ATN is collaborating with the Energy Division of the Alabama Department of Economic and Community Affairs, which is leveraging its ITP State Award, and the Alabama Industrial Assessment Center (AIAC). ITP funding is critical for enabling Alabama to provide 66 trainings, 32 industrial energy assessments, and support for eight demonstration projects over the duration of the Award period. Twenty-nine of the assessments have already been completed, identifying \$2.3 million in potential annual energy cost savings (as of March, 2011). This paper highlights the success that Alabama has achieved in promoting industrial energy efficiency through the strategic use of funding from varying sources. These efforts encourage investment in local communities that helps overcome energy and sustainability challenges and facilitates economic growth.

Introduction

Public and nonprofit stakeholders in Alabama have been providing energy assessments to local industries to reduce energy consumption in the state since 2005. As Alabama's industrial sector has grown, the Energy Division of the Alabama Department of Economic and Community Affairs (ADECA) has realized the increasing importance of industrial energy efficiency. To that end, ADECA has leveraged both state and federal resources in recent years to support local industrial companies in their efforts to reduce energy consumption. ADECA was awarded a three-year *Save Energy Now* State Award in 2009 by the U.S. Department of Energy's (DOE) Industrial Technologies Program (ITP) to jumpstart a self-sustainable energy efficiency program for the industrial sector at the state level.

ADECA is collaborating with the University of Alabama in Huntsville (UAH), the Alabama Industrial Assessment Center (AIAC), and the Alabama Technology Network (ATN),

which is Alabama's Affiliate of the NIST / MEP, to provide energy and lean assessments¹ to Alabama manufacturers, one of the primary objectives of the Alabama *Save Energy Now* program. ADECA and its partners are also using the grant to support the Alabama E3 (Economy, Energy, Environment) initiative, which aims to boost local economies through improved manufacturing processes through a partnership between federal, state, local, and industrial entities. Through E3, businesses receive customized hands-on assessments of production processes to reduce energy consumption, minimize carbon footprints, prevent pollution, increase productivity, and drive innovation. Alabama's E3 program is one of the first E3 pilot programs in the nation and is focusing initially on "greening" the automotive supply chain.

ATN is an important partner in Alabama's E3 efforts to work with manufacturers to help them become more competitive. ATN recognizes that the best solutions often arise from the integration of key services, such as economic, environmental, and energy services. The close partnership between ADECA, ATN, and AIAC—and their involvement in Alabama's *Save Energy Now* and E3 programs—are allowing complementary energy and environmental principles and practices to thrive, and leverage their resources to reach more Alabama manufacturers.

Background on Industry in Alabama

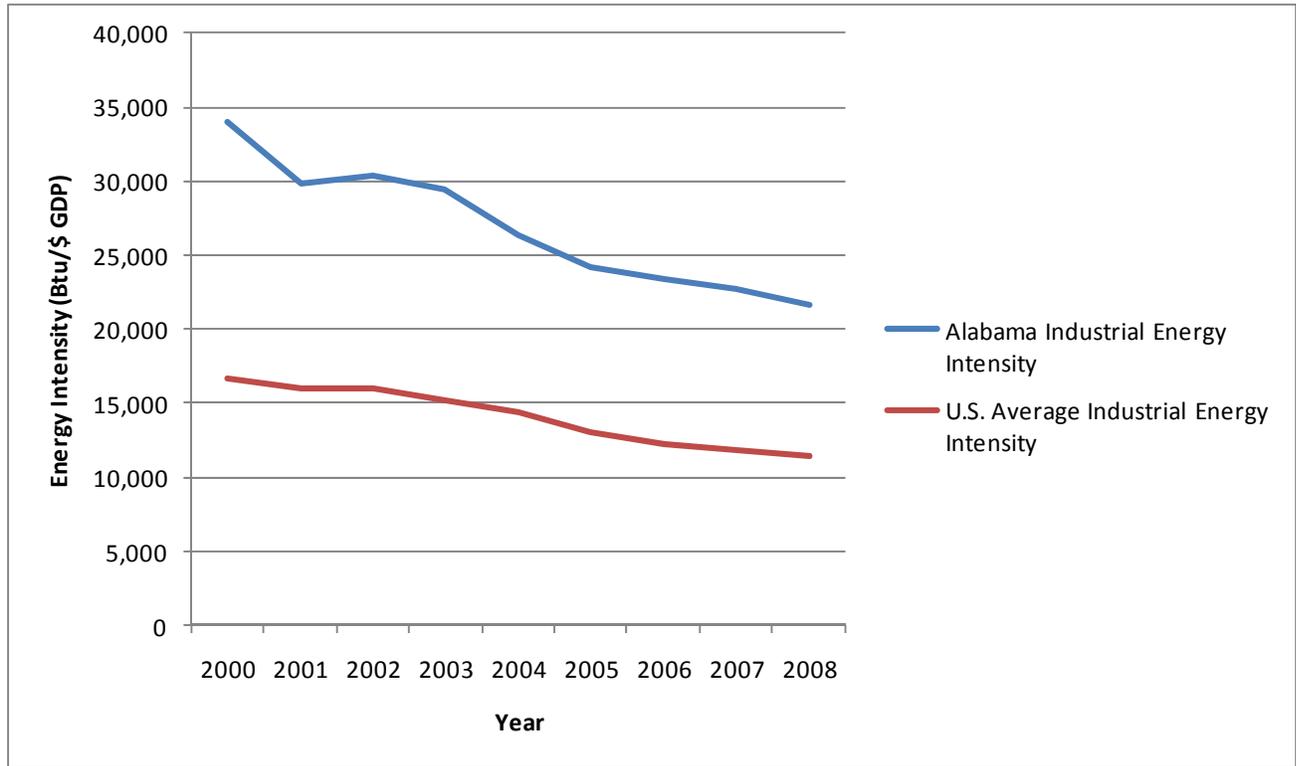
The industrial sector in Alabama employed nearly a quarter of a million people in 2009, with a total value of shipments at more than \$90.5 billion (Census Bureau 2010). The top five manufacturing sectors in the state in 2009, based on their value of shipments, were Transportation Equipment, Chemicals, Food, Primary Metal, and Paper Manufacturing. The value of shipments of the Transportation Equipment sector (\$22.2 billion) led by more than double that of the next largest sector, Chemical Manufacturing (\$10.3 billion) (Census Bureau 2010).

In 2008, Alabama's industrial sector consumed 905.1 trillion Btu, equaling 2.9% of total U.S. industrial consumption and ranking 8th among all the states (EIA 2010). At the same time, industry's large presence in Alabama, coupled with the fact that the state is home to four of the most energy-intensive industries worldwide (steel production, paper and pulp mills, petroleum refining, and chemical production) indicates that the state has significant potential to capture savings through greater energy efficiency (Boyle & Chasnow 2010, 3).

Figure 1 shows Alabama industrial energy intensity from 2000-2008 compared to the U.S. average industrial energy intensity. Despite steadily declining since 2002, Alabama's energy intensity was still almost double the U.S. average in 2008 (BEA 2010; EIA 2010). Although, the larger presence of energy-intensive manufacturing can account for part of this difference, there is still significant room for Alabama to lower its industrial energy intensity closer to the national average. (As 2010 data becomes available from the U.S. Census Bureau's 2010 Manufacturing Energy Consumption Survey, which is released every four years, a more detailed analysis could be performed on how the energy intensity of each sub-sector of Alabama's industry has changed since the start of the E3 and *Save Energy Now* programs).

¹ A lean assessment is designed to assist companies in achieving "lean manufacturing," which EPA defines as "a business model and collection of tactical methods that emphasize eliminating non-value added activities (waste) while delivering quality products on time at least cost with greater efficiency." More information is located at <http://www.epa.gov/lean/leanenvironment.htm>.

Figure 1: Alabama Industrial Energy Intensity Compared to the U.S. Average (2000-2008)



Source: EIA 2010; BEA 2010

Partnering to Leverage Federal Grants

In pursuing each of their economic, energy, and/or environmental goals, a number of Alabama agencies and organizations realized the benefits of teaming together through efforts such as the *Save Energy Now* program and the E3 initiative. Table 1 shows many of the partners involved in the E3 and *Save Energy Now* programs. Forming a strong collaboration of partners with different, complementary strengths and capabilities has allowed Alabama’s efforts to move faster and farther than they could have if performed in isolation.

Table 1: Alabama E3 and *Save Energy Now* Partners

Leading Partners of Alabama’s E3 and <i>Save Energy Now</i> Efforts		
<ul style="list-style-type: none"> Alabama Department of Economic and Community Affairs Alabama Technology Network 	<ul style="list-style-type: none"> University of Alabama in Huntsville 	<ul style="list-style-type: none"> Alabama Industrial Assessment Center
Additional Partners		
<ul style="list-style-type: none"> Alabama Office of Workforce Development Tennessee Valley Authority Alabama Power Company 	<ul style="list-style-type: none"> Alabama Gas Corporation Other states agencies Non-profits Local municipalities 	<ul style="list-style-type: none"> Associations Manufacturers Federal agencies

The Energy Division at ADECA has a mission to “increase energy-efficiency, reduce energy consumption, and promote market acceptance and deployment of energy-efficiency and renewable-energy technologies” (ADECA 2011). Through ATN, the “Alabama Community College System links two-year colleges, the University of Alabama System, Auburn University, and the Economic Development Partnership of Alabama together to solve the needs of the state’s existing manufacturing industry” (ATN 2011). ATN strives to provide technical assistance and customized trainings that will significantly increase the profitability, productivity, and sustainability of Alabama’s manufacturing companies.

The AIAC, which began operations in 2006, is sponsored by ITP along with 26 other IACs administered through universities around the country. Operated by the University of Alabama, the AIAC assists small- and medium-sized manufacturers in Alabama with energy conservation, waste reduction, and productivity improvements (AIAC 2011). The AIAC typically has 8 to 14 students in training each year, totaling 41 students so far (Woodbury 2011). Since its inception, the AIAC has performed 78 assessments—60 assessments through direct funding from DOE, 15 through ADECA’s current ARRA funds, and 3 performed two years ago under a DOE State Energy Program grant. DOE’s State Energy Program provides grants to state energy offices in all states to design and carry out renewable energy and energy efficiency programs (Grants.gov 2010).

Leveraged Funding

In an attempt to enhance their efforts, the partners in Alabama have identified a number of federal and state funding opportunities to leverage more energy savings in a shorter period of time. In fact, securing financial support from other sources was integral to the establishment of Alabama’s E3 program, especially from sources within the state. Table 2 below shows the various funding opportunities identified and secured through sources such as the Tennessee Valley Authority (TVA), DOE, U.S. Department of Labor (DoL), and U.S. Department of Commerce (DoC).

Alabama is not only utilizing its *Save Energy Now* State Award to launch an industrial energy efficiency program, its working to expand the program by leveraging state, federal, and local funding. ATN’s UAH center secured \$140,000 in funding from TVA to provide Practical Energy and Lean/Green training programs for TVA utility clients. In addition, ADECA has been able to secure State Energy Program ARRA funding to support UAH and ATN in a program that will provide 40 lean/energy kaizen implementation events, focusing on the improvement of a manufacturer’s productivity and the reduction of energy intensity. In addition, the funding will support a \$60 million Alabama Energy Revolving Loan Program, which was launched in December 2010. The loan program will allow manufacturers to implement energy efficiency projects following the assessments performed through Alabama’s *Save Energy Now* and other programs. To date, \$2.5 million in loan funds have been approved, with an additional \$29.5 million currently in various stages of the application process. ATN also recently received State Energy Sector Partnership (SESP) funding from a DoL grant program designed to teach workers the skills required in emerging industries, including energy efficiency and renewable energy. ATN will use the grant to support Practical Energy training programs for manufacturers in the Tuscaloosa region. AIAC also received SESP funding to support sustainability workforce training programs in energy efficiency and waste reduction for manufacturers in Alabama, and

funding to support DOE Qualified Specialist (QS) Training in conjunction with the Alabama Power Company (APCo). The QS Training will be offered under Alabama’s *Save Energy Now* program.

Table 2: Alabama’s 2009 Grant Funding Secured for Industrial Energy Efficiency

Grant	Description
2009 TVA Grant	Provides Practical Energy trainings for TVA clients
2009 DOE State Energy Program – ARRA Grant	\$25 million in DOE leveraged funds, and another \$35 million in private funds to establish a \$60 million Energy Revolving Loan Program for industry
	Provides 40 lean/energy kaizen implementation events ² for automotive manufacturers
2009 DoL State Energy Sector Partnership (SESP) – ARRA Grant	Will provide “sustainability” workforce training and education for Alabama manufacturers including Practical Energy, DOE End User, Lean/Green, Energy Efficiency and Waste Reduction training programs
	Provides DOE Qualified Specialist Training
2009 DOE/ITP <i>Save Energy Now</i> Award (Phase I using ARRA funds)	Will provide Practical Energy training programs for 15 manufacturers and 1 energy efficient demonstration
	Will provide 32 ATN and AIAC assessments (29 of 32 are completed)
2009 DOE/ITP <i>Save Energy Now</i> Award (Phase II using non-ARRA funds – awaiting funding confirmation)	Will provide Practical Energy training programs for 35+ manufacturers and 3 energy efficient demonstrations; will provide 60+ energy and lean assessments for manufacturers
DoC NIST MEP Grant	Will expand the E3 program to 16 additional manufacturing industry sectors

Alabama’s *Save Energy Now* Program

ADECA received a three-year *Save Energy Now* grant in 2009 to start a state program that would become self-sustaining and thrive after the grant period. Through the strong network of support built by ADECA for delivering industrial energy efficiency savings, Alabama’s *Save Energy Now* program has been able to hit the ground running. Table 3 outlines the main objectives of Phase I of the program, during which ATN will perform 15 Practical Energy Assessments for Alabama manufacturers, primarily automotive suppliers, and the AIAC will complete an additional 17 energy assessments under the grant. The ATN will provide a lean assessment in conjunction with each of these 32 energy assessments. Phase I began in September 2009 and, although originally scheduled to end in March 2011, will continue through September 2011. Phase II will begin immediately after Phase I ends and will last for an additional 24 months.

² According to EPA, an “energy kaizen event” will last around 3-5 days during which “a cross-functional team of employees identifies and implements process changes to reduce wastes such as idle time, inventory, and defects. Kaizen events create important windows of opportunity to consider ways to eliminate energy waste.” Additional information is located at <http://www.epa.gov/lean/energytoolkit/ch3.htm#E>.

Table 3: Alabama *Save Energy Now* Objectives – Phase I

Assessments, Tools & Trainings, and Technology Demonstrations
<ul style="list-style-type: none">• Perform 15 Practical Energy Assessments (ATN)• Perform 17 energy assessments (AIAC)• Perform 32 lean manufacturing assessments concurrently and in conjunction with each AIAC and ATN assessment (ATN)• Establish training for DOE Best Practices and end-user training programs• Offer Practical Energy savings training seminars• Highlight successful energy projects such as the Biomass program managed by UAH• Publicize lower technology projects perceived as impractical to encourage the high-payback projects• Recognize clients' successes under the program with awards and publicity

Phase II plans include 63 lean and energy assessments provided by ATN and AIAC, Practical Energy Training programs for 36 companies, high technology energy demonstrations, and DOE Qualified Specialist training.

Alabama E3 Program

The E3 initiative, which launched its pilot programs in 2009, harnesses the existing resources of five U.S. federal agencies to enhance sustainability and competitiveness in local and regional economies, and to spur job growth and innovation. The five federal agencies comprising the E3 initiative are DOE, DoC, the Small Business Administration (SBA), DoL, and the Environmental Protection Agency (EPA). The E3 initiative benefits manufacturers by helping them increase their productivity and energy efficiency, and minimizing environmental wastes, resulting in reduced production costs and increased profits (ADECA 2009).

Alabama's E3 program is one of the first E3 pilot programs in the nation, along with those of Texas and Ohio. The Alabama E3 program, officially launched by Governor Bob Riley in May 2010, is managed by ATN, a state entity under the Alabama Community College System, which is funded by the State of Alabama and DoC's NIST/MEP. The program offers clients integrated solutions that ensure sustainable manufacturing through traditional lean assessment offerings, in addition to the consideration of energy use and environmental wastes, which can make up 40% of cost savings for a company. Alabama has engaged more than 25 partners from federal, state, and local agencies, all critical to the success of the program. These partners offer a tactical advantage for long-term program stability in terms of service delivery and political support. ATN's success in receiving funding for the workforce component of the initial program and the expansion of the program was impacted by the unique strength of the partnership, a marked feature of the Alabama E3 program.

As a comprehensive program, E3 includes the following five components:

- 1) Lean, energy, and environmental assessments
- 2) Lean and green implementation projects based on the results of assessments
- 3) "Green" skills training

- a. Level one “green” skills training introduces all employees to sustainability and makes them aware of their roles and responsibilities in regard to saving energy and reducing waste within their companies’ operations
- b. Level two “green” skills training is based on the individual needs of the companies (Practical Energy, Waste Reduction, certifications, ISO 14001, etc.)
- 4) Counseling and assistance from the SBA and Small Business Development Centers (SBDC) to help eligible companies access affordable funding/financing (such as Alabama Energy Revolving Loan, SBA loans, etc.) for new systems/equipments needed to reduce energy use and associated costs
- 5) The E3 Expansion program includes Innovations Engineering to assist manufacturers in identifying new “green” processes, products, and/or markets to grow their businesses.

The Alabama E3 program is currently focused on improving energy efficiency among suppliers for Alabama’s three main auto manufacturers: Mercedes, Hyundai, and Honda. This is a logical focus as transportation equipment manufacturing is Alabama’s largest industrial sector (Census Bureau 2010). To date, the E3 program has successfully completed three lean and energy projects with several manufacturers, including ZF Industries (a gearbox manufacturer), Electrofil (electrical components), and Fleetwood Metals (a metal stamping and welding company). Improving these companies’ productivity and cost competitiveness benefits both the suppliers and the manufacturers. By becoming more competitive, automotive manufacturers are able to become more profitable, thereby strengthening Alabama’s economy and auto manufacturing in the United States. By making an effort to help automotive suppliers, the E3 program will improve Alabama’s entire economy, in addition to supporting state energy and environmental goals.

The initial energy and lean assessment and implementation project funds for the E3 program, focusing on automotive manufacturers, totaled more than \$900,000, and this. These funds include DOE funds secured through the ADECA Energy Division. ATN has also secured a \$578,000 grant for the workforce component of E3 through DoL’s SESP program.

Save Energy Now and E3 Project Results to Date

The Alabama *Save Energy Now* and E3 programs have already served 32 clients, including completing 29 energy assessments that have resulted in 22 implementation projects; 12 more implementation projects were scheduled for March and April of 2011. These 29 energy assessments represent approximately 90 percent of the planned *Save Energy Now* Phase I energy assessments, with ATN having completed 13 of the 15 Practical Energy Assessments and AIAC 16 of the 17 annual energy assessments that were anticipated in Phase I. In conjunction with these 29 completed energy assessments, ATN has also completed 9 of the accompanying lean assessments. In all, the assessments have identified \$2.3 million in energy cost saving opportunities. Actual energy cost savings resulting from the initial implementation of energy efficiency projects totals \$346,980.

In December 2010, a “BestPractices Qualification Training” and a DOE/ITP end-user training were held, both focusing on Steam Systems. A utility/MEP representative training is currently being scheduled for spring 2011. In addition, AIAC and APCo were successful in securing a supplemental award that will provide a broader range of training courses.

Since being launched in December 2010, the Alabama Saves program, a loan program designed to save energy and reduce operating expenses, has yet to issue any loans. However, the program has already secured \$31 million to fund industrial projects that are currently in various stages of the application process for the Alabama Energy Revolving Loan Fund.

Conclusions

The partnership of ADECA, ATN, and AIAC in identifying available funding resources and using them toward common goals has tremendously benefited the State of Alabama. First, the increased collaboration among Alabama organizations (such as ADECA, ATN, and AIAC) has facilitated a multipronged, thorough approach in bringing resources to industry. For instance, where a manufacturing plant assessment may have previously only included a lean assessment, it may now also involve an assessment focusing on energy systems, equipment processes, and carbon footprint. In addition to increasing collaboration among organizations within the state, Alabama has leveraged funding and resources from many federal agencies (such as DOE, DoL, DoC/NIST, EPA, and SBA) through the *Save Energy Now* and E3 initiatives. Second, these Alabama organizations have realized that by partnering together they can increase statewide emphasis on and understanding of energy efficiency and its impact on the competitiveness of Alabama's manufacturing sector. Third, ADECA, ATN, and AIAC have discovered that the E3 initiative fits well with Alabama's focus on aligning organizations and resources to better serve both citizens and companies. Through their efforts, these organizations came to realize that companies succeed in implementing energy efficiency projects if services are provided in a comprehensive way. The close partnership between ADECA, ATN, and AIAC, as well as their involvement in Alabama's *Save Energy Now* and E3 programs, are helping their efforts to have a greater impact on Alabama industry. E3 and *Save Energy Now* also provide an effective structure to support the federal government's interests and focus on promoting job growth, workforce development, emissions reduction, and energy efficiency improvement across the United States.

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