

A Case Study of Danville Utilities:

Utilizing Industrial Assessment Centers to Provide Energy Efficiency Resources for Key Accounts



U.S. Department of Energy
Industrial Technologies Program
Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable

Prepared by BCS, Incorporated for
the American Public Power Association

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Introduction

Danville Department of Utilities (DU) provides electricity, gas, water, sewer, and telecommunications services to customers in south central Virginia. Within its 500 square mile service territory, DU has identified 70 key accounts that consume a significant amount of the electric, natural gas, or water services that DU sells on the retail market each year. These 70 key accounts include schools, government agencies, large commercial businesses, and industrial manufacturers.

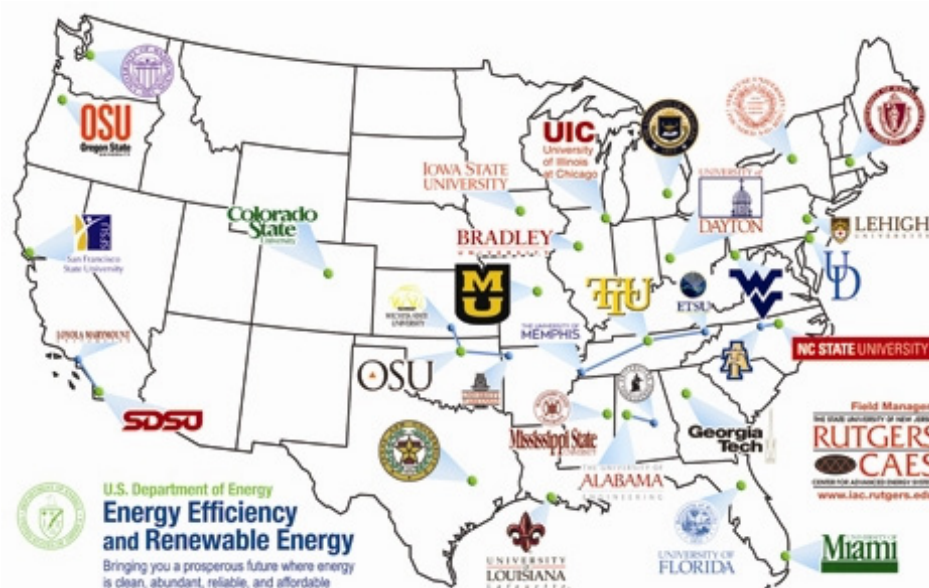
DU became concerned about its key accounts customers because of electricity market deregulation in Virginia. Virginia Senate Bill (SB) 1269 called for the phasing in of electricity deregulation between 2002 and 2005. The legislation associated with deregulation allowed many electricity consumers to purchase the generation portion of their electricity from a supplier other than their utility.^{1*} While DU was not vulnerable to losing customers to competing energy suppliers because the deregulation legislation protects municipal utilities, the deregulation caused wholesale power costs to skyrocket.

Along with deregulation, the expiration of an existing long-term contract led to an 80-percent increase in the cost of DU's electricity. For its key accounts customers, this meant significant increases in operating costs, which could put key accounts customers at risk for going out of business. In 2005, key accounts customers saw a 40-percent increase in their energy costs. These higher costs threatened to push key accounts to move their operations to other locations outside of Danville's service area.



The prospect of losing its key accounts customers concerned DU, as it relies heavily on key accounts for revenue. These customers had been enjoying very low public power electricity rates that DU had historically provided. DU needed to hedge the price increase to ensure that its customers would be able to stay competitive and purchase their energy from the city-owned utility.

** Electricity market deregulation in Virginia has been halted because of concerns with the effect of market deregulation on electricity prices. Instead of lowering prices through competition, some analysts argue that deregulation has increased electricity prices. Other experts claim that the price increases are due to recent energy market price volatility.*



Location of DOE's IACs - http://www1.eere.energy.gov/industry/bestpractices/industrial_assessment_center_locations.html

Solution: Industrial Assessment Centers

DU found help in the U.S. Department of Energy’s (DOE) Industrial Technologies Program (ITP). ITP provides assistance to utilities and industrial customers through a variety of programs, one of which is the university-based Industrial Assessment Center (IAC) program.

The IAC program helps businesses that are located within 150 miles of an IAC and spend between \$100,000 and \$2 million on energy annually. IACs perform one- or two-day energy audits where data is collected at each manufacturing site as a basis for assessment recommendations. After identifying potential savings opportunities, plans are developed to help the consumer reduce energy usage. IACs have helped DU’s customers improve their facilities’ energy efficiency through lean manufacturing, improved process management, and switching to batch production runs, among other methods identified by the North Carolina State University and West Virginia University IACs. IACs take a systems approach to energy efficiency, looking at ways to save energy in motors, boilers, and compressed air systems, along with exploring ways to reduce energy loss through various heat-transfer or exchange strategies. In addition to energy efficiency, IACs also identify ways to improve plant productivity, minimize wastewater, and prevent pollution.²



Danville Utilities, the Industrial Assessment Center, and Non-Electric Energy Sources

DU provides both natural gas and electricity service to many customers. Natural gas did not present a significant cost issue compared to electricity because natural gas markets in Virginia had been deregulated for years. Natural gas prices also tend to be relatively volatile; therefore, customers have come to expect increasing prices. Additionally, the ability to store natural gas for times of peak demand reduce capacity constraints compared to electricity.

Nonetheless, DU has leveraged IAC resources to focus on a variety of customer energy sources, in addition to electricity. These include natural gas, fuel oil, and propane. DU has found that customers are not necessarily interested in the energy form being addressed, but rather they want to see the biggest return on investment for whatever energy efficiency measures are implemented in their plants.

ITP leverages student and faculty resources at IAC universities to minimize assessment costs. This allows ITP to provide the assessment service at low- or no-cost to utilities and industrial energy consumers. In addition to utility and industry improvements, the IACs provide training to help students become energy management professionals.

DU discovered the IAC program in 2004 during its search for resources that would help mitigate the looming rate increase. Despite its discovery of these resources, DU was unsure of the level of expertise the IACs had to offer. Kevin Martin, DU’s key accounts manager, said there were initial concerns about the lack of practical experience from an academic provider and wariness about potential hurdles created by government bureaucracy. However, those fears were quickly abated when the first IAC report was produced. The report demonstrated a high-level of knowledge and savvy, practical solutions to energy reductions.

However, DU recognized the value of the IAC resource because the utility did not have an audit program and the IAC resources were free. The ability to utilize a

free, turn-key audit program convinced DU that partnering with the IAC at North Carolina State University would help the utility provide an additional service to its key accounts industrial customers. In the first year, 20 of DU's customers asked for an energy assessment. Although there was not enough time for a full assessment to be completed at each of the 20 plants within the first year, the utility and IAC collaborated to obtain important energy use information from each plant and implement some energy savings recommendations. These immediate results further convinced DU that the IACs were the right resource to help its industrial energy customers address increasing energy costs. Additionally, the majority of plants that were not able to have an assessment completed in the first year have had the opportunity to work with the North Carolina State University IAC in subsequent years.

Benefits and Challenges

The synergistic effect of combining IAC, utility, and industry resources are evident to DU. If an IAC is successful in identifying ways to save energy at a plant, the utility and industrial customer are also successful in their respective businesses. The utility receives important information about energy consumption sources and, consequently, can work better with industry to reduce energy demand and consumption in many cases. The industrial energy consumer is successful through improved operations and reduced operating costs, potentially improving both profitability and competitiveness. The IAC benefits from the successful implementation of projects, which the students and center can mention in their success portfolios. The IAC also benefits from the feedback received regarding the implementation of energy saving recommendations.

Enhancing the relationship between the utility and its industrial customers is another significant benefit of partnering with an IAC. Because the utility can establish a channel of communication with a customer by offering cost-saving services for free, the customer becomes interested in working with and interacting with the utility on a consistent basis. The utility can put itself forward as the local energy efficiency expert and the best organization to go to when a customer is facing energy problems. Meanwhile, the utility can better understand the needs of its customers and the challenges they face and can then continuously enhance the service it provides to all of its key accounts customers.

DU has found the IAC component very easy to integrate into its operations. Initially, DU plays the role of a marketer for the IACs. After the utility receives interest from an industrial customer, the IAC is contacted to provide the assessment service. Once the assessment is complete, DU helps its customers implement the energy saving measures identified by the IAC. DU's follow-up role ensures that the energy consumer's assessment questions are answered and that the IAC remains informed of the energy savings recommendations that were implemented. By keeping in regular contact with an industrial plant, DU also serves as an ongoing communication link between industry and the IAC, even if plant personnel changes occur.



Convincing a business to implement the suggested energy efficiency measures is the most difficult step in the audit process. Although DU finds it easy to convince plant-level staff that the energy efficiency improvements should be made, DU struggles to convince corporate decision-makers to get involved. Unfortunately, plant managers often do not have the time or resources to effectively present an efficiency project to corporate decision-makers. To help with this challenge, the utility and

IACs package energy efficiency information for plant managers to provide to their corporate decision-makers. The first component of these resources is the in-depth report provided by the IAC, which details a number of energy efficiency recommendations for a plant. The utility steps in to help digest these IAC reports. Because these reports can cover many years of energy efficiency improvement projects, breaking them down into priority items is essential. Allowing plant managers to present the highest priority items from these reports increases the success that plant managers have in obtaining corporate buy-in to implement the energy efficiency measures outlined in the report.

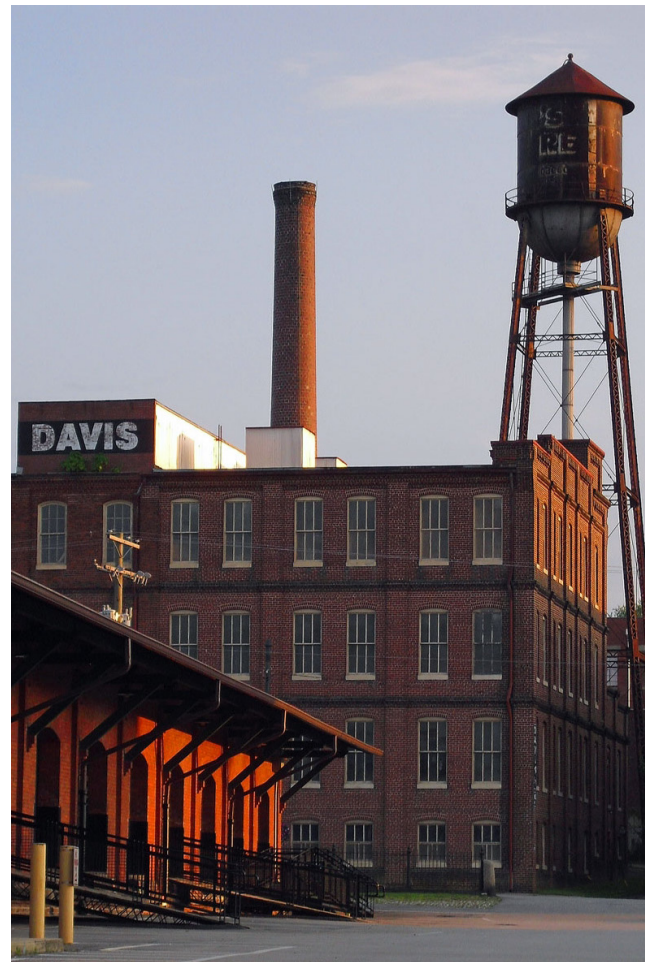
Another challenge for DU is lost revenue. As businesses become more efficient, they consume less energy and pay less money to their energy utility. Utilities often provide financial support to their customers to make these energy efficiency upgrades on top of this loss of revenue. Many utility managers would argue that spending money to lose revenue is a poor business model.

DU, however, found that although it may lose some revenue through its energy efficiency program, it experienced significant reductions in variable costs, such as fuel and maintenance. DU also sidestepped a large portion of the efficiency program's costs by leveraging federal resources through the IAC. Furthermore, because the IAC does such a thorough job in identifying potential energy efficiency measures, especially low- or no-cost measures, DU does not need to offer rebates or financial incentives to get its customers to implement the identified measures.

Protecting and Growing Danville's Economy

An important and challenging issue many towns are facing across the United States is how to protect their economies. As businesses become more mobile, moving from state to state and country to country, this challenge becomes increasingly difficult. DU has taken steps to help protect and grow its economy through energy efficiency, and is working to balance its utility interests with local business interests to support local economic sustainability.

Even with the price increases faced by DU in 2005, the utility remains competitive with other area utilities and energy providers. Regarding competition, Kevin Martin, DU's key accounts manager, stated:



"Our prices are competitive. We are about the same as others in our region, but our reliability and service are still at the top. I think [the threat of losing customers due to higher prices] exists for every energy supplier, but price is not always the only factor. Each customer has to be evaluated individually. For example, reliability to some customers is their primary concern. What good are low costs if outages cost you \$65,000 per hour and your power goes out every month? Especially if your business model is based on reliability, like the data centers."

Danville, as a city, is also very interested in maintaining its business base. Danville lost a large employer over a time period that spanned from 1996 to 2002. The employer was Dan River, Inc.—a textile manufacturer that employed 12,000 in Danville at the height of its success in the 1960s and 1970s. When the business began closing its doors in 1996, employment dropped to 2,000 people. Those 2,000 jobs were eliminated by 2007.

To help the community rebound, Danville's Office of Economic Development worked on solutions to alleviate Danville's employment woes. The Office of Economic

Development started to gain significant traction in 2004 and has since added 4,600 manufacturing jobs, 1,000 commercial jobs, and attracted \$1.5 billion in capital investment.

Danville is repositioning itself to be the region's business hub and is partnering with Pittsylvania County, by which the city is surrounded, to provide businesses with easy access to services. Virginia is unique among all of the states because counties and independent cities are treated as completely separate entities. This separation often leads to an adversarial relationship between the jurisdictions, and city-county cooperation for economic development in Virginia is often nonexistent. Since 2001, however, Pittsylvania County and the City of Danville have partnered in purchasing land for business development and have prepared the land to have immediate access to city services of electricity, gas, sewer, water, and broadband. The City of Danville and Pittsylvania County are developing a 3,500-acre business/

industrial park to attract a large manufacturer that would employ thousands and invest more than \$1.0 billion in capital. For each of these city-county projects, costs and revenues are shared on an equal basis between the two jurisdictions, and management oversight of the properties is done by a joint city/county authority.

Businesses are encouraged to locate in Danville as a result of state and local financial incentives, including employment bonuses and technology grants. Danville's Office of Economic Development also commented on the business community's response to the DU/IAC assessment partnership, stating that businesses are open to the assessments and grateful for them. The partnership of the City of Danville, the Danville Department of Utilities, the North Carolina State University and West Virginia University Industrial Assessment Centers, and Pittsylvania County is a prime example of how organizations can team up to create attractive opportunities for manufacturing businesses. Thus far, the partnership has proven to be an effective model for success in the Danville area.

Local Businesses Helping Danville Utilities to Save Energy

The Advanced Vehicle Research Center (AVRC) conducts research on alternative-energy sources and applications for vehicles, and receives utility services from DU. One of the specific services AVRC offers is the conversion of conventional gasoline or diesel internal combustion engine vehicles into fuel-electric hybrid vehicles.

Although it may seem a role reversal, DU is leveraging AVRC's expertise to help the company save energy. DU utilizes AVRC's technology to help the company convert a number of its service vehicles to gas-electric hybrids. This conversion will help DU save money on fuel costs and will lead to the more effective use of the electric grid, as DU charges its vehicles overnight. As an added bonus, AVRC will be able to apply what it has learned from converting DU vehicles to fuel-electric hybrids and ensure the successful deployment of future products.

For More Information

Advanced Vehicle Research Center
<http://www.avrc.com>

Danville Department of Utilities
<http://www.danvilleutilities.com>

Danville Office of Economic Development
<http://www.discoverdanville.com/>

Industrial Assessment Center Program
<http://iac.rutgers.edu>

North Carolina State University IAC
<http://www.mae.ncsu.edu/Centers/IAC/>

West Virginia IAC
<http://www2.cemr.wvu.edu/~wwwiac/>

Special thanks to Kevin Martin, Key Accounts Manager at Danville Utilities, and Jeremy Stratton, Director of Economic Development for the City of Danville, who provided the majority of information for this case study.

¹State of Virginia Legislative Information System, SB 1269 Electric Utility Restructuring Act, April 1999.
<http://leg1.state.va.us/cgi-bin/legp504.exe?991+sum+SB1269>

²EERE-ITP, Industrial Assessment Centers, March 2007.
<http://www1.eere.energy.gov/industry/bestpractices/iacs.html>

