

IN THIS ISSUE

EPAct 2005 Impacts Outdoor Lighting Service - Pages 1 and 3

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Section 135 of the **EPAct 2005** provides many incentives for energy efficiencies in lighting; however, it has a detrimental impact on people utilizing mercury vapor lights. The Act will increase energy efficiency, but there will be an increase cost for lighting fixtures. How will this impact users of MV lights?

The AG-LINE: Energy Efficiency on the Farm - Page 2

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Regular readers of **TransActions** may not be aware of GDS' role in the development of energy efficiency auditing and program implementation services for the agricultural industry. This article details how Daleiden Farms benefited from an independent energy audit.

CODE CORNER: Locating Padmounted Transformers - Page 3

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NESC Rule 350F and **380D** - Considerations to keep in mind when working and designing around transformers.

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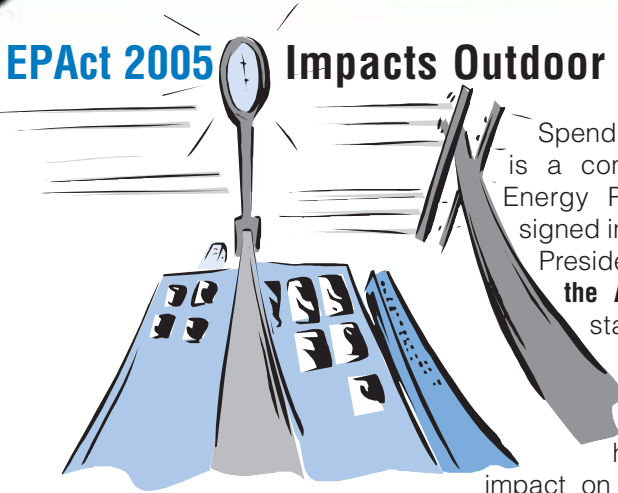
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EPAct 2005 Impacts Outdoor Lighting Service



Spending money to save energy is a common theme within the Energy Policy Act (EPAct 2005) signed into law August 8, 2005, by President Bush. **Section 135 of the Act**, Energy conservation standards for additional products, provides many incentives for energy efficiencies in lighting; however, it has a detrimental

impact on people utilizing mercury vapor lights. The Act will increase energy efficiency, but there will be an increase cost for lighting fixtures.

New standards for light ballast efficiency have been set in EPAct 2005. **Effective January 1, 2008, no mercury vapor (MV) lamp ballasts can be manufactured or imported.** Currently, the industry is seeking clarification as to whether this applies to ballasts incorporated as part of the fixture. Given the intent of energy efficiency in the EPAct 2005, it is doubtful an exemption will be allowed.

What does this mean for users of MV lights? If exclusion cannot be secured, no more MV fixtures can be purchased or installed. Additionally, as existing MV lights fail, these fixtures must be replaced, probably at a higher cost. Some states, such as Arizona, have taken the EPAct 2005 one step further. They have set a deadline for the removal of all MV fixtures by January 1, 2011.

One strategy some utilities may consider in response to the new law is the "delay" approach, whereby the utility will purchase a stockpile of spare parts for MV lights, in the hopes of delaying the inevitable obsolescence of the MV fixture.



A second, more reasonable long-term option is to develop a program to systematically change out the inefficient MV ballasts with more efficient lighting products. This approach will result in higher plant investment since the high pressure sodium (HPS) or metal halide (MH) fixtures that replace the MV fixtures will be more costly, and because many of those replacements may be made prior to the end of the existing MV fixture's useful life.

Another consideration is the potential for adverse reaction from outdoor lighting service customers. Many customers prefer the "white light" from the MV fixture and will expect a comparable replacement. Most often, however, the standard replacement will be a HPS fixture that, though very efficient, provides a "yellowish" light. Since customers may not be satisfied with that color of lighting, either a color corrected HPS bulb or a MH fixture may be required. The color corrected HPS lamps have lower life and are less efficient in lumens output and represents added cost and still may not satisfy the customer. The MH fixtures are efficient, but cost more than HPS fixtures, and their components do not last as long.

An interesting aside is that research conducted in 2004 concluded that the color of the light does affect a person's ability to see, especially in their peripheral vision. The blue-green spectrum of light, which is missing in the yellowish HPS

The AG-LINE

Energy Efficiency on the Farm

Regular readers of *TransActions* may not be aware of GDS' leading role in the development of energy efficiency auditing and program implementation services for the agricultural industry. As the program administrator for the **Wisconsin Focus on Energy - Agricultural and Rural Business Program**, more than 1400 Wisconsin farm producers have benefited from energy efficiency services and have received incentives totaling approximately \$2 million dollars. Over the course of Focus on Energy's program life, the Agriculture and Rural Business Program has verified annual savings exceeding 57.3 million kWh and 13.4 MW of demand. The GDS team of energy auditors lend expertise in dairy, live-stock, and crop production. The team provides independent auditing services for a variety of operations including dairy milking facilities, grain drying, irrigation, greenhouses, and crop tillage and harvest.

In the fall of 2005, GDS' Madison, Wisconsin office was contacted by local **U.S. Department of Agriculture - Natural Resource Conservation Service (NRCS)** personnel on the ability of the firm's services to meet the needs of their **Conservation Security Program (CSP)**. The National program provides an incentive package to qualifying agricultural producers to complete a professional comprehensive farm energy audit and summary report. The GDS team worked hard to develop an auditing package to accommodate the **CSP** program needs. The comprehensive farm energy audit must include traditional electrical, propane, and natural gas consumption. However, it also required in-depth analysis of fossil fuel consumption which can account for as much as 60% to 80% of crop production energy needs. As a Certified Crop Advisor and Nutrient Management Planner, GDS energy analyst, Joe Schultz, had an extensive background to build and develop this portion of our services. **The most important objective of this service is the production of a professional and useful energy audit report for its farm clients. The report provides baseline energy consumption estimates, energy efficiency recommendations with estimates of energy and cost savings, and implementation feasibility in a professional and understandable manner.**

When Ed Daleiden of Daleiden Farms contacted GDS in early March of 2005, Joe Schultz was prepared to provide the needs of this customer. Daleiden Farms is a 1750 acre corn and soybean crop farm located on the Mississippi River Bluffs of St. Croix, Wisconsin. A walk through energy audit completed on the farm found that many energy efficiency and best management practices had already been incorporated into the farm's operations. The farm utilizes no-till farming practices which minimize tillage and travel over fields, minimizing fossil fuel consumption. The farm also recently installed a new grain drying facility with exceptional climate controls and a very energy efficient continuous air flow system. However, the comprehensive energy audit did provide some insight to benefit Ed and the

farms' energy consumption and potential renewable energy production opportunities.

As a farm producer, Ed was very interested in learning about the opportunities to incorporate bio-diesel consumption into his current farm operations. As an added service to the energy efficiency audit, GDS provided a renewable energy investigation to lay out some of the renewable energy use and production opportunities for these producers. Consuming almost 6,000 gallons of diesel fuel annually, the farm could have a small, but significant influence on the development and promotion of the use of bio-diesel, a soybean and oil seed based renewable fuel. The analysis found that switching to a

B-2 or B-20 bio-diesel fuel mixture would have only a marginal cost difference of \$140 and \$1180 annually. With further incentives offered by the **NRCS-CSP** program to incorporate



bio- diesel fuel, this fuel switching cost could be reduced even more. The greatest renewable energy opportunity for Daleiden Farms may come from wind energy. After GDS' investigation of the renewable energy opportunities of the farm, it was found that the area yielded some of highest wind based energy potential for the state. The farm's location is on a wind corridor along the bluffs of the Mississippi River where the estimated wind speeds average 15 to 17 mph.

After one year of farming operations, following the energy audit, Ed implemented several of the audit reports recommendations. He adjusted the dry-down moisture content of his corn drying process to reduce over-drying. Ed also switched to a B-2 soy diesel fuel mixture. The interest of building wind farms in the area has started and Ed is closely following the developments of this opportunity as it arises. Overall, Ed is very happy with the results of the report and the measures he has implemented. GDS is happy with the outcome of this project and the other **CSP** projects developed in the area. Working in close partnership with **Pierce-Pepin Electric Cooperative** and local **NRCS** offices has also benefited the development of these services and the agricultural producers we all serve.

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continued from Page 1

light, is essential for good peripheral vision. A person has the ability to "see" or detect peripheral objects better under a MV or MH light than a HPS light. So, even though a HPS is more energy efficient, the MH provides more light for off-axis visibility, giving an impression of superior lighting.

The EAct 2005 requirements will accomplish the desired reduction in energy use, but in the short-term there will be an increase in fixture costs. Thus, a review of the outdoor lighting service rates and policies may be in order. It is always best to address the rate and customer service issues in a proactive manner, so that both the utility's financial position and its public relations will remain in good standing.

For more information, contact John Pasierb or Kevin Mara at 770-426-0819 or email: john.pasierb@hi-line-engineering.com or kevin.mara@hi-line-engineering.com



CODE CORNER

Locating Padmounted Transformers

According to **NESC Rule 350F**, above ground metallic equipment separated by less than six feet should be bonded together to reduce the chance of dangerous touch potentials. The bonding is typically the responsibility of the communication companies because they install their equipment after the electric utility. However, the bonding is not always installed, which creates a risk for the electric utility since the public perception is that the voltage differential must be the fault of the electric utility. Each of the metallic communication pedestals needs to be bonded to the neutral or ground rod of the transformer, but the ground rod is locked inside the padmounted transformer. Some utilities put the ground rod outside of the pad area to make it accessible to the communication companies, while other utilities will run a jumper from the ground rod to some common point outside the transformer.

Another conflict is fire hydrants. In 2002, the **NESC** added a requirement to maintain four-foot separation between padmounted equipment (**Rule 380D**) and fire hydrants.

This is to provide adequate space for the operation of the hydrants by firefighters. Generally, it is not advisable to place a transformer on the same lot



line as a fire hydrant. When designing electric service to a new subdivision, it is advisable to review the construction drawings of the water system to identify the proposed locations of fire hydrants prior to designing the electric service. If an existing transformer is to be replaced that is in close proximity to a fire hydrant, the designer should check the applicability of this new rule.

(excerpt from Hi-Line Engineering, LLC's seminar entitled, "Designing Underground Distribution for Small and Large Subdivisions")

For more information, contact Kevin Mara at 770-426-0819 or email: kevin.mara@hi-line-engineering.com



Preparations Underway for Pandemic Flu

GDS has assisted clients in meeting their Homeland Security needs, Katrina response, and other risk management plans. GDS can assist you with your **Pandemic Flu preparation plans**.



Federal agencies and industry associations are recommending plans be put in place.

More to come in the next issue of **TRANSActions**.

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GDS Associates, Inc.
Engineers and Consultants

Mission Statement:

To help our clients succeed by anticipating and understanding their needs, and by efficiently delivering quality services with confidence and integrity.

GDS Associates, Inc. is a multi-service consulting and engineering firm formed in 1986 and now employs a staff of over 100 in five locations across the U.S. Our broad range of expertise focuses on clients associated with, or affected by, electric, gas, and water utilities. In addition, we offer information technology, market research, and statistical services to a diverse client base. The size and depth of our firm permits us to offer clients multiple sources of assistance, ensuring complete, competent, and timely service. Some of the consulting areas in which **GDS** has specialized skills are:

- | | |
|--------------------------------------------------------|---------------------------------------------------------------------|
| 1. Power Supply Planning Services | 9. Electric Planning and Design Services (Hi-Line Engineering, LLC) |
| 2. Financial Analysis and Rate Services | 10. Environmental Management Services (GreenLine Environmental) |
| 3. Generation Services | 11. Deregulation and Retail Energy Procurement Services |
| 4. Regulatory and Restructuring Services | 12. Utility Privatization Services |
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| 8. Risk Management Services | 16. Information Technology Services |

GDS consultants are recognized leaders in their respective fields, dedicated to their clients, innovative in their approach to meeting unique challenges, and known for consistently being available when needed. **GDS** strives to develop long-term client relationships. Our goal is to be a wise investment in consulting services for our clients.

Hi-Line Engineering, LLC is a wholly owned subsidiary of **GDS Associates, Inc.** Hi-Line specializes in providing safe, reliable, and efficient planning and design for electric cooperatives, investor owned utilities, municipal electric systems, and the military in all types of terrain and all three NESC loading districts. Hi-Line's areas of expertise include:

- | | |
|--------------------------------------------------|---------------------------------------|
| 1. Overhead Distribution Line Design and Staking | 6. Right-of-Way Vegetation Management |
| 2. Underground Distribution System Design | 7. GIS/GPS Mapping and Inventory |
| 3. Inspection and Inventory | 8. Training Services |
| 4. Contract Administration | 9. Specialized Design Services |
| 5. System Planning and Analysis | |

Hi-Line uses the latest technology to increase efficiency and accuracy. Our commitment to client satisfaction and diversity of expertise ensures that we provide the highest quality of service.

GreenLine Environmental, a division of **Hi-Line Engineering, LLC**, provides environmental services specially geared to the electric utility industry. GreenLine's staff is composed of registered foresters and ISA certified arborists. Our experience in both power line design and operation complement our expertise in vegetation management on right-of-ways. GreenLine offers the following services to utilities, municipals, developers, industry, and the military:

1. Right-of-Way Vegetation Management
2. GIS/GPS Mapping and Inventory
3. Environmental Assessments
4. Urban Forestry Consulting

Our goal is to use our technology and experience to provide efficient long-term control of trees and brush in harmony with the biological ecosystem.



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