

# ENERGY EFFICIENCY DISCUSSION PAPER

## RELIGHTING THE MIDWEST:

*An initiative for regional cooperation to create jobs, reduce carbon emissions, save money and increase competitiveness of Midwest businesses*

*Prepared by:*



Center for Energy and Environment  
212 3rd Avenue North, Suite 560  
Minneapolis, MN 55401  
[www.mncee.org](http://www.mncee.org)

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## Summary

This discussion paper outlines a concept for “Relighting the Midwest,” a regional commercial lighting initiative intended to support utility efforts to achieve rapid and substantial energy savings throughout the region. Recently Midwestern states have enacted aggressive legislation requiring utility investment in energy efficiency. This has created an opportunity for regional collaboration to promote information sharing on best practices among utilities, enhance the visibility of energy efficiency efforts, and ensure early successful implementation of ambitious state goals. The commercial lighting sector is an attractive low-hanging fruit for focusing this collaboration. Relighting the Midwest would have substantial energy, environmental and employment benefits. Our estimate, based on data from Xcel Energy, ACEEE and our own experience, is that by the end of 2016<sup>1</sup> Relighting the Midwest would have the following benefits:

- **1,300 direct jobs**
- **1,860 indirect jobs**
- **2,000 MW demand reduction (equivalent to energy produced by several coal plants)**
- **1.2 million tons CO<sub>2</sub> emissions avoided annually**

## Introduction

Commercial lighting is typically the least expensive and most scalable market segment for utility efficiency programs. As such it should form the backbone of any utility’s commercial efficiency efforts. The experience of lighting programs in Minnesota suggests that in untapped markets very high levels of savings can be achieved for 5 to 7 years before market saturation begins to impact program participation. Even after an initial period of high savings lighting programs can continue to achieve significant savings at a steady state. In Xcel Energy’s Minnesota service territory in 2007 two lighting programs together saved 1.5% of commercial lighting energy consumption.<sup>2</sup> These savings come a decade after a period of even higher savings by Xcel’s prescriptive lighting program. In the early 1990’s Xcel Energy’s prescriptive lighting program achieved very high levels of savings (~2% reduction in commercial lighting consumption each year) for about 5 years until savings levels began to taper off. This was all achieved solely in the large commercial market. During this period there was not a small commercial lighting program. Our estimate is that a simultaneous focus on large and small commercial lighting markets can lead to at least 2.5% annual savings of commercial lighting energy consumption.

We suggest that the Upper Midwest (specifically, Illinois, Iowa, Michigan, Minnesota, Ohio and Wisconsin) work together to apply the lessons learned by successful existing programs in the region to the untapped markets. This represents a best-bet opportunity for utilities to achieve their new savings requirements in the early years. Other more complicated programs in additional markets will take more time to develop, launch and scale-up. If we extrapolate Minnesota’s experience to the untapped markets in the region

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<sup>1</sup> Note that a previous version of this paper assumed a 7 year implementation and associated annual benefits; based on feedback from reviewers, we determined that a 5 year implementation was realistic, and modified the annual benefits over a 5-year instead of 7-year period.

<sup>2</sup> The 2003 CBECs end-use data shows that 39% of commercial electricity consumption in the Midwest region is due to lighting. In 2007 Xcel’s prescriptive lighting program and CEE’s One-Stop Efficiency Shop together saved 85 million generator kWh. This is 1.52% of Xcel’s commercial lighting sales (assuming 39% of Xcel’s commercial sales in 2007 is lighting demand).

utilities could achieve at least 2.5% of annual commercial lighting sales for 5 years. Advances in lighting technology could extend the period of high savings by several years.<sup>3</sup>

For these reasons we recommend the development of Relighting the Midwest, a regional effort supported initially by the Midwestern Governors Association (MGA) for the purpose of quickly ramping up commercial lighting programs in those areas where they do not currently exist. Relighting the Midwest's initial task will be the development of a regional network of commercial lighting programs. The primary functions of the program will be network development, and convening an annual meeting where regional programs can learn from successful programs, and keep up to date on emerging technology. In the long run Relighting the Midwest could pursue a more ambitious agenda similar to that of Northeast Energy Efficiency Partnership's (NEEP) High Efficiency Commercial Lighting Initiative. This initiative has developed and supported a regional network of lighting programs, but has also pursued market research and market transformation goals.<sup>4</sup> If successful in helping utilities achieve savings in the commercial lighting sector, the effort could also be expanded into other energy efficiency program areas.

### Relighting the Midwest Program Activities

The program would work well if led under the umbrella of an entity such as the Midwest Governors Association (MGA) with supporting help and coordination from other organizations. It would involve the following activities:

**Information-sharing:** All utilities in participating states will be asked to sign on to the program. Joining the program will require a commitment to implement an aggressive commercial lighting program within their service territory. Member utilities will have access to program materials detailing best practices, and will be invited to an annual conference which will focus on lighting program best practices, and updates on technological advances. Participating utilities will submit their results annually to the program to track regional progress. Initial support by the MGA could support this level of activity through 2014. The program implementer could pursue other revenue sources to provide additional support services. These could include market research, market transformation activities, and marketing materials that would be available to all participating utilities.

**Enhanced visibility of energy efficiency efforts:** The MGA and supporting organizations would conduct a publicity campaign to promote the energy efficiency efforts generally of participating states, and Relighting the Midwest specifically.

**Ensuring successful implementation of state goals:** Tracking of program success could be conducted by the MGA. This would provide a convenient benchmark for individual states to measure the success of their individual utilities against the efforts of other utilities in the region. Utilities that were not keeping up could be targeted for additional assistance and encouragement. Overall, this increased visibility, benchmarking and technical assistance would help ensure the early success and continued progression of aggressive state conservation goals.

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<sup>3</sup> CEE's One-Stop Efficiency Shop has seen technological advances continue to open new opportunities even as existing markets become saturated.

<sup>4</sup> NEEP's High Efficiency Commercial Lighting Initiative is funded by the DOE, and several foundations. We suggest that the MGA fund the initial, limited, network development and conference activities. Any additional work would come from additional funding sources.

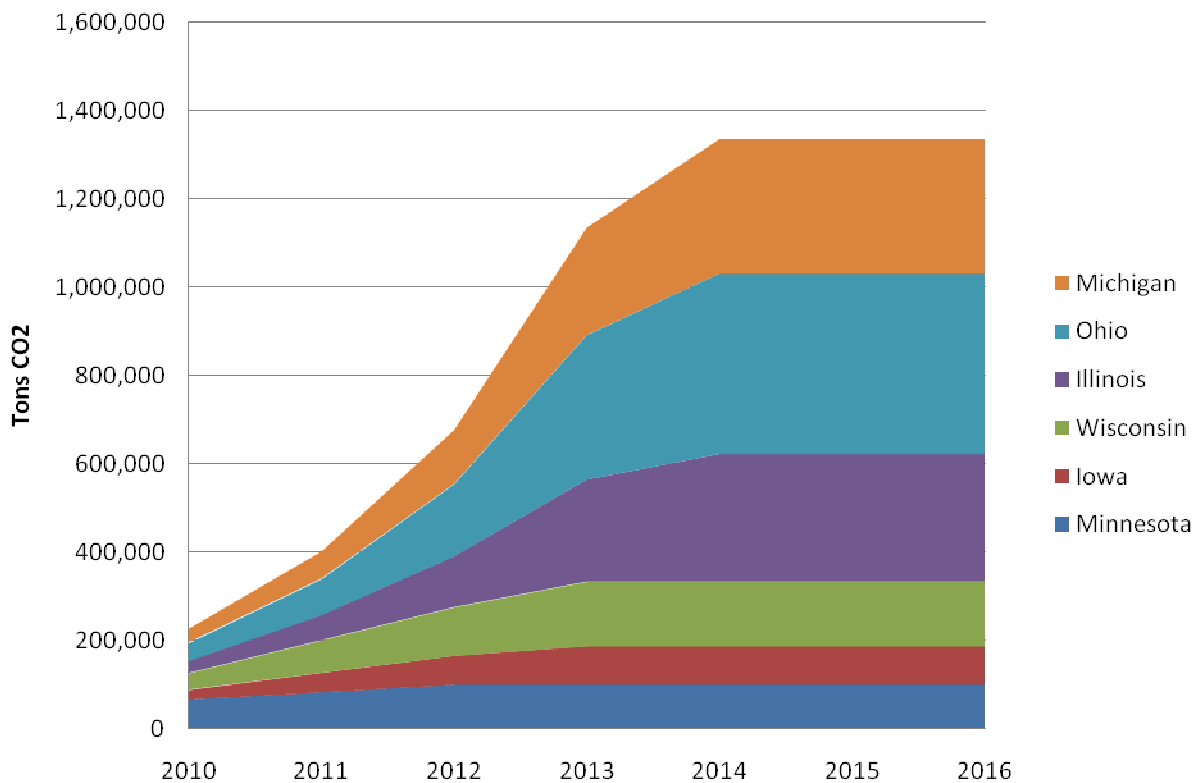
Should the Relighting the Midwest program be successful, the cooperation engendered through the program could be spread to encourage best-practices sharing with other, more complicated programs.

### Savings Estimates

These program performance estimates are just that. We take the savings rates achieved by Xcel Energy’s lighting programs and extrapolate those across the region, assuming the program runs from 2010 to 2016. This is a rudimentary analysis, but we believe that it provides a reasonable approximation of what can be achieved.

Our analysis suggests that Minnesota has the most aggressive lighting programs in the region (largely due to Xcel Energy’s success), followed by Wisconsin and Iowa. We assume that Ohio, Illinois and Michigan are achieving much lower savings. We believe that an aggressive effort to ramp up program participation in the region can lead to 10% annual market penetration, which can be held for several years before the market is saturated. With an average lighting energy savings of 25% this provides 2.5% annual savings in the commercial lighting sector, Figure 1.

Figure 1. Annual CO2 Emissions Reductions



The program could save as much as 1 million tons of CO<sub>2</sub> per year mid-way through the program in 2013. Between 2010 and 2016 cumulative capacity savings could equal 2000 MW, and cumulative energy savings could equal 8.4 million MWh.

## Costs

In Minnesota, one utility's recent experience with commercial lighting programs resulted in costs between \$500/kW and \$1,200/kW.<sup>5</sup> We assume these costs are representative, and that 80% of participation will come from prescriptive programs that cover all classes of commercial customers, and 20% from programs that target hard-to-serve small commercial customers. This leads to annual expenditures of \$46 million in 2010 rising to \$278 million when the program reaches full capacity. Between 2010 and 2016 utilities will spend \$1.3 billion, while saving over 2000 MW of capacity (\$640/kW). Assuming a 15-year measure life this equates to a cost of \$0.011 per kWh, or \$13.13 per ton CO<sub>2</sub>.

## Job Creation

Based on CEE's experience this effort will directly employ approximately 1,300 people. These jobs will include lighting contractors, lighting auditors, and program administrative staff. According to ACEEE an even larger source of job creation from efficiency comes from money spent on goods and services that would have otherwise been spent on utility bills. The utility industry uses much less labor per dollar spent than virtually any other sector in the economy, therefore diverting money away from the utility industry towards more labor intensive sectors will increase the overall level of employment. Using ACEEE's methodology, we estimate the creation of approximately 1,860 new jobs due to these indirect impacts.<sup>6</sup>

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## Contact

Carl Nelson, Program and Policy Manager  
Center for Energy and Environment  
612-335-5871  
cnelson@mncee.org

## About CEE

The Center for Energy and Environment (CEE), a non-profit based in Minneapolis, conducts research, designs, implements and provides financing for programs, and supports policy to preserve our natural resources, focusing on energy efficiency. CEE has provided energy, environmental and housing rehabilitation services to utilities, private corporations, neighborhood organizations, municipalities and public agencies for over twenty-five years. As one example, CEE's low-cost, no-cost Neighborhood Energy Workshop (NEW) program achieved measured savings of 7.2% of annual gas use in 28,000 households.

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<sup>5</sup> Based on Xcel Energy's 2007 CIP Status Report. The lower cost is for simple prescriptive programs, the higher cost is for full-service programs for harder to serve market segments.

<sup>6</sup> Total estimate is for 13,000 indirect job-years from implementing Relighting the Midwest, averaged over 7 years. Kushler John A. "Skip" Laitner, More Jobs and Greater Total Wage Income: The Economic Benefits of an Efficiency-Led Clean Energy Strategy to Meet Growing Electricity Needs in Michigan, (ACEEE, December 2007).