

Institutional Considerations for Greenhouse Gas Reductions: Survey and Assessment of Conservation Improvement Programs in Minnesota

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In order to stabilize atmospheric concentrations of greenhouse gases at twice pre-industrial levels (~500ppm) the 'business as usual' emissions trajectory will need to be reduced by roughly 50% by 2050¹. One key technology available for reducing greenhouse gas emissions is energy efficiency and conservation. The most prominent policy mechanism for energy efficiency has historically been mandated utility demand-side management². Under demand-side management (DSM), utilities do not treat customer demand as a fixed quantity, but seek to encourage customers to reduce demand through marketing, financial incentives, and technical assistance. Most state mandates for energy efficiency, while offering important contributions for moving towards a carbon managed economy, neglect a significant fraction of the electricity system: Municipal utilities and rural electric co-operatives. These consumer-owned utilities are important purveyors of electricity and emitters of greenhouse gas emissions.

The Minnesota counts among the handful of states that includes consumer-owned utilities in its utility-based energy efficiency policy, the Conservation Improvement Program (CIP). Thirty-two percent of the state's electricity is sold by co-operatives and municipal utilities. CIP implementation, however, is not subject to the same level of scrutiny for consumer-owned utilities as for investor-owned utilities. An assessment by the office of the Legislative Auditor found that not all cost-effective energy efficiency is pursued and that current implementation is not effective in all aspects³. Given the wide disparity of avoided generation costs and the potential for future savings, the purpose of this research project was to investigate the factors that lead to these discrepancies; examining the consistency of the technical assumptions underlying the calculated energy savings and exploring how institutional and structural factors (both within and outside the utility) facilitate and constrain effective energy efficiency efforts.

To this end, data from the electronic filing of CIP, combined with Environmental Protection Agency data on emissions, sales and fuel use, were analyzed. In addition, a number of explorative interviews and an electronic survey of all consumer-owned utilities in Minnesota were conducted. A review of consumer-owned utilities in Minnesota revealed that they diverge in size,

¹ Pacala, S. and R. Socolow (2004). "Stabilization Wedges: Solving the Climate Problems for the Next 50 Years with Current Technologies." *Science* 305(13 August 2004): 968-972.

² Geller et al. (2006).

³ Program Evaluation Division (2005), *Energy Conservation Improvement Program*, Office of the Legislative Auditor Report, Report No. 05-04, p. 62.

governance structure, customer composition and load growth, suggesting that program diversity is driven by external environments as well as institutional constraints.

A series of interviews was conducted with consistent themes emerging: utilities rely on local partners (such as CAP agencies, retailers and local trades people) to levy implementation ability beyond their organization. Cooperation with power producers and other distribution level utilities is an important pathway for getting new program ideas and technical know-how about program implementation. Finally, smaller utilities in particular seem to face limitations regarding available staff resources for and know-how about conservation.

The survey stage tested the generalizability of these issues across the entire population of consumer-owned utilities in Minnesota. It also provided an opportunity to evaluate perceptions of intended program changes and state program administration to-date. The survey received responses from 32 cooperatives and 56 municipal utilities, equating to an excellent response rate of 72.7% and 50.0%, respectively.

One of the more important findings is the importance municipal utilities and rural electric cooperatives place on energy conservation programs as tools for building positive customer relationships and public images for their organizations. The survey confirmed the significance of local partners and of the cooperation with power generators and other distribution utilities for learning about innovative conservation measures and obtaining information about savings calculations and technical implementation. Both groups indicated that they face a multitude of challenges in implementing conservation programs, including acquiring the necessary know-how to implement effective programs. In terms of the calculation of savings, it is apparent, that a multitude of calculation methods are used, some more, others less rigorous. Reported costs per kilowatt-hour saved should therefore be regarded with caution, at least until a standardized calculation method is introduced with the up-coming changes to CIP. Finally, the survey results did highlight some differences between cooperatives and municipal utilities, in particular the closer cooperation of cooperatives with their power-providers for conservation.

This study has yielded insight into how cooperate and municipal utility personnel view the Conservation Improvement Program and the biggest challenges their organizations face under the policy. It is apparent that the goal of serving customers through DSM programs is compatible with the ideals of local control and customer-ownership embodied by public power and electric cooperatives. It also apparent that while many of these organizations have developed innovative practices and programs, others, especially the smallest utilities, are struggling.

Two manuscripts are ready for submission and we are seeking funding to expand this exploratory research effort to a national audience.