

June 5, 2017

TO: DER and Advisory Committee
FROM: CEE Project Team
RE: **Proposed Underserved or Emerging Market Sector Focus Areas**

This document was prepared to collect input from the MN Department of Commerce, Division of Energy Resources (DER) and members of the Advisory Committee for the MN Statewide Energy Efficiency and Carbon Saving Potential Study being conducted by a project team led by the Center for Energy and Environment (CEE). The scope of the project team's work includes providing a detailed look at up to three currently underserved or emerging market sectors. We are seeking input from the DER and the Advisory Committee on which three market sectors to include. Ultimately, it will be up to the DER to decide which markets are included in for the underserved markets task; the project team will need to finalize which market sectors are included by the end of June 2017.

The underserved market task is meant to provide more detail about selected market sector focus areas than will generally be provided in the report for other markets. The overall goal of including this task in the potential study is to identify program and policy options to increase CIP achievements in these focus areas. The selected focus areas will be researched in more detail than other sectors for the potential study report, to make recommendations regarding:

- applicable measures;
- achievable potential with each sector; and
- program and policy barriers and opportunities.

The project team is proposing to include the following three sectors:

- Low-income
- Rural utilities / agriculture
- Small business

The project team has also identified the following additional options that could potentially replace any of the above sectors:

- Grocery stores
- In-patient health care
- Data centers

Each of these sectors are discussed further below.

Proposed sectors to include:

1. Low-income

Definition: Using the eligibility criterion used by the federal Weatherization Assistance Program, we would propose that low-income be defined as a household income that is at or below 200 percent of the federal poverty guideline. For multifamily properties (5 or more units), current DER guidance for CIPs establishes that properties can be classified as low-income if 66 percent or more of tenant units are income qualified, or if the property is pre-certified based on certain other criteria. Based on these criteria, we

estimate that 15 to 20 percent of single-family households in Minnesota are low-income, as are 20 to 30 percent of multifamily properties.

Rationale for inclusion: Different programmatic approaches are needed for households of limited means. Also, there may be opportunities for coordination among utilities and the state low-income weatherization program that could be explored through the potential study.

Data collection: Census data provide some ability to distinguish low-income and non-low-income households in terms of housing type and heating fuel. Recent CARD housing characterization studies provide low-income breakouts for multifamily and manufactured housing. The State of Minnesota maintains a large database of energy-audit data for low-income households treated under the Weatherization Assistance Program, as is likely the case for some utility low-income programs. These audit data can provide valuable details about low-income housing. Additionally, if there is determined to be a general need for new primary data on single-family homes via survey or on-site visits, demographic questions about household size and income can be used to separately analyze low-income households. We will also leverage the upcoming Apprise low-income report, to inform the low-income policy discussions in the study.

2. Rural Utilities / Agriculture

Definition: We would propose that “small utility” be defined as the 42 cooperative electric utilities with fewer than 50,000 customers and the roughly 80 municipal electric utilities with fewer than 2,000 customers.¹ This effectively eliminates the suburban/exurban cooperative utilities in the Twin Cities region (Connexus, Dakota Electric, East Central Energy and Wright-Hennepin), and limits the municipal utilities to smaller towns. By this definition, 20 percent of electric utility customers and 16 percent of electric sales would be included in this focus area. Cooperative utilities account for about 85 percent of the customers and electric sales within this definition of rural utilities. Per the most recent Minnesota Utility Data Book, much of the load for rural utilities is in the Agricultural and Residential sectors:

Table 1. Fraction of rural-utility electricity sales, by sector and type of rural utility.

Sector	Co-op	Municipal	Total
Farm	34%	0%	28%
Residential	43%	44%	43%
Commercial	14%	28%	16%
Industrial	9%	27%	12%
Total	100%	100%	100%

(Source: The Minnesota Utility Data Book)

Also, rural electric co-ops account for more than 90% of all Minnesota farm electricity use, and farms account for about a third of all rural electric co-op electric use. Thus we would also conduct an in-depth look at the agricultural sector, including agricultural operations related to animal husbandry and crop

¹ We note that the Minnesota Jobs and Energy Omnibus bill that recently passed the legislature will exempt cooperatives with fewer than 5,000 customers, of which there are 12 in Minnesota, and municipal utilities with fewer than 1,000 customers, of which there are 38. While it is not known how many of these utilities will completely discontinue customer efficiency programs, we may wish to re-visit our cut-off sizes in light of this change.

production. We would exclude off-farm agricultural-product processing operations, such as dairies and grain-storage facilities from this analysis.

Rationale for inclusion: As noted above, small, rural utilities have a different customer composition than other utilities. They also typically lack the resources for estimating energy-efficiency potential and CIP program planning. Farms also involve unique end-uses and energy-efficiency opportunities not encountered in other sectors. Providing insight about these utilities could help spur additional program activity among this class of utilities.

Data collection: Census data can provide some secondary information about home and business characteristics in rural-utility service territories. The in-progress small-commercial characterization study will provide some additional detail data about businesses in small towns. Additional primary data collection under the potential study could include surveys or on-site visits to collect more detailed data for farms and homes in the service areas of these utilities. There have been some CARD-funded projects that have looked at specific energy-savings opportunities for Minnesota farms (mainly dairy and poultry). Some utilities and other organizations may have farm energy audit data that could be leveraged for the potential study. The U.S. Department of Agriculture's Census of Agriculture contains detailed data about types of farms, planted acreage of crops, number of head of livestock and other statistics that can be used to produce geographically specific estimates of agricultural energy use by type of farm.

3. Small Commercial

Definition: We would propose that small commercial be defined as non-residential (ie. excluding apartment buildings) commercial-rate-class customers with fewer than 50 employees. Using an employee-count screen (versus, e.g., square footage or energy consumption) allows for cleaner classification vis a vis Census data. By this definition, about 95 percent of all businesses and about 55% percent of commercial electric sales and about 58% percent of commercial gas sales would fit within this definition.

Rationale: This sector has traditionally been underserved, both because of the diversity of small businesses, and the fact that programs targeting small businesses cannot support the high-touch interventions that are often deployed for larger commercial enterprises.

Data collection: Two in-progress CARD projects will provide valuable data for the potential study: a statewide small-commercial characterization study; and, a small/medium business behavioral potential study. Additional primary data collection may not be needed, unless it is to bolster the existing statewide sample for certain sub-populations, such as rural utilities. Including this sector as a focus area would mainly serve to better explicate how Minnesota utilities could achieve more savings in this underserved area.

Additional options for sectors to include:

In addition to the three sectors above, the project team also identified three additional sectors, as potential alternatives to any of the three above.

4. Grocery Stores

Definition: We propose that this market sector include grocery and specialty food stores, liquor stores and gas stations with food sales (convenience stores). There are about 5,000 such businesses in Minnesota, and we estimate that they account for about 18 percent of electricity sales and 10 percent of natural gas sales among small and medium-size businesses in the state.

Rational for inclusion: Supermarkets are the third most energy intensive segment in commercial buildings in Minnesota, and have unique refrigeration loads.

Data collection: National and regional data on grocery stores are available through the federal Energy Information Agency's Commercial Building Energy Consumption Survey (CBECS), though these data are not Minnesota specific, and sample sizes are small at even the regional level. Grocery stores are included in the in-progress CARD small-commercial characterization and commercial behavior potential studies mentioned above—though they make up only about a third of the on-site sample for the former. Additional primary data collection for the potential study could include supplementing the survey and on-site samples for these studies to increase statistical precision, as well as characterizing the larger mainstream grocery stores not included in those studies. The potential study could also implement a survey of supermarket trade allies, primarily targeting refrigeration contractors that conduct supermarket maintenance and retrofit to determine program reach, penetration rates, cost-effectiveness of measures, technical feasibility, and more.

5. Inpatient Healthcare

Definition: This market sector includes buildings that are used as diagnostic and treatment facilities for inpatient care. These would include both hospital and inpatient rehabilitation, but excludes nursing homes, assisted-living facilities and other residential-care facilities. There are about 2,600 facilities in Minnesota that fit this definition.

Rationale: Inpatient healthcare is a complex building segment, and in Minnesota also represents the second most energy intensive segment in the state. Applications range from a number for very large destination medical centers to a larger number of moderate-sized inpatient facilities throughout the state. And unlike other energy intensive segments, for example lodging and outpatient healthcare, inpatient healthcare has not been the subject of broad CARD research in the recent past.

Data collection: As with grocery stores, CBECS data are available on a regional and national basis, but are not specific to Minnesota. Additional primary data collection could include interviews with major healthcare providers in Minnesota to determine program reach, penetration rates, cost-effectiveness of measures, and technical feasibility. Primary data collection could also include site visits to detail technical characterization of systems at the site, including information about energy upgrades, past commissioning exercises, and retrofit and addition projects.

6. Data Centers

Definition: This focus area is facilities that contain networked computers and storage used to organize, process and store digital data. Data centers can be stand-alone facilities, or can be embedded in buildings housing offices or other businesses where the primary function is something other than data

processing and storage. They are one of the fastest growing end uses of electrical energy in commercial buildings, estimated to account for about 2% of the total electricity use in the US.

Rationale for inclusion: Data centers present unique loads and energy-saving opportunities, and are an area of growth in an increasingly digital economy. In most individual data centers as much as one third of the usage is unnecessary, and over half of all data center energy is used in embedded data centers (EDCs) that are not identified in building space use surveys.

Data collection: CBECS data for data centers do not include are of limited value because they are based on primary space uses and exclude over half of the data center energy consumption which is in small embedded data centers. A recently-completed CARD project will provide useful information about embedded data centers (webinar and final report due out by June). Additional primary data collection under the potential study could include a census of dedicated data centers in Minnesota, as well as interviews, surveys or on-site data collection. The improved characterization would include:

- Configuration, management, and size of data centers and EDCs
- Improved estimates of potential for energy savings for data centers of all sizes
- Identification of outreach channels and program design practices