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Minnesota Municipal Utilities Association: Electric Utility Service Area Analysis

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Center for Small Towns (UMM)

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Minnesota Municipal Utilities Association

Electric Utility Service Area Analysis

November 26, 2007

Data Analysis Report
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**Center for Small Towns**

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The Question

In the spring of 2007, the Minnesota Municipal Utilities Association (MMUA), approached the Center for Small Towns (CST) for a demographic analysis for electric utility service areas, including: How does the per-capita income of customers of municipally-owned electric systems compare to those of other utilities? This central question and others related to demography were answered using a combination of data together with a preliminary dataset of geographic information systems (GIS) boundaries of electric service providers.

Methodology

The state of Minnesota, in response to a 1974 law, was divided into exclusive electric service territories. The major exception to these exclusive territories is the right of municipally-owned electric utilities to grow along with the cities they serve, as the cities themselves grow through annexation. Territory boundary adjustments occur infrequently. This allows the question to be answered with even greater certainty, as it would be inherently time-consuming and costly to survey each individual household – together with the inability to access non-MMUA subscribers.

In May of 2007, the Land Management Information Center, a program of the Minnesota Department of Administration, released a preliminary Electric Utility Service Area (EUSA) geographic layer for the state of Minnesota. This layer was examined for validity and a few corrections were made. ¹

A total of 118 municipal utilities are identified in the EUSA. Seven municipal systems were missing: Ceylon, Dundee, Dunnell, Kasota, Nielsville, Round Lake, and Rushmore. Also, Alpha was combined with Jackson which makes it more

¹ A full description of the modifications can be found in Appendix 1.
difficult to examine their individual service area traits. Two EUSAs were identified as municipal systems, when they were not: Huntsville and McKinley.

Figure 1: EUSA Boundaries.
The primary jurisdiction in this study will be the minor Civil Division (MCD) level. The MCDs are composed of the cities, townships, and unorganized territories across the state. The MCDs provide the smallest unit of analysis within which we can capture data from the U.S. Census Bureau. These MCDs do not directly overlap with the EUSAs and a statistical approximation was created.

In this example, two electric providers offer service within Swan Lake Township, located in Stevens County. These two are Runestone Electric Association and Agralite Cooperative. A geostatistical analysis found that of the 36 square miles contained in the township, 17.7 sq. mi. (49.1%) is served by Agralite and 18.3 sq. mi. (50.9%) is served by Runestone. This percentage attributable to each EUSA becomes the basis for estimates from other data sources. Utilizing this methodology, if the total payroll for the township were found to be $1,000, $491 would be attributable to Agralite and $509 to Runestone. This methodology has been used throughout the United States as an estimator for sub-levels of analysis.
and references can be provided upon request. This project was a great challenge for the staff and we believe that the results of the following section are reported with the greatest level of accuracy possible.

The U.S. Census Bureau provides the data for this analysis. This data will populate the geographies.

- P001.001 Total Population
- P008.001 – P008.079 Population by Age
- P053.001 Median Household Income
- P082.001 Per-Capita Income
- P085.001 Median Value of Home

**Results**

The results below are factual by nature. The objectivity imbued within the analysis will continue within this section of the report without unnecessary commentary. Three variables were adjusted utilizing the methodology described earlier: Per-capita income, age distribution, and median home value.

1. Income in 1999

This section will examine two variables with regards to income. The first variable is per-capita income utilizing the most recent reliable data for this geography from the U.S. Census Bureau in 2000. The per-capita income is calculated by aggregating the total income within each EUSA and dividing by the number of people within these same areas.

<table>
<thead>
<tr>
<th>EUSA Type</th>
<th>Per-Capita Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xcel Energy</td>
<td>$25,519</td>
</tr>
<tr>
<td>Cooperatives</td>
<td>21,919</td>
</tr>
<tr>
<td>Municipal Systems</td>
<td>20,108</td>
</tr>
<tr>
<td>Minnesota Power</td>
<td>18,260</td>
</tr>
<tr>
<td>Misc. Privately Held</td>
<td>17,707</td>
</tr>
<tr>
<td>Otter Tail Power</td>
<td>16,586</td>
</tr>
</tbody>
</table>
The second variable examined is median household income. This variable has its limitations that will be described more fully below, and the Center for Small Towns does not believe this interpretation provides a valid measure to compare these aggregate geographies. However, given the extent to which this variable is cited, it is worthwhile to explore and interpret statistically.

<table>
<thead>
<tr>
<th>EUSA Type</th>
<th>Average Median Household Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xcel Energy</td>
<td>$48,734</td>
</tr>
<tr>
<td>Municipal Systems</td>
<td>44,132</td>
</tr>
<tr>
<td>Cooperatives</td>
<td>40,436</td>
</tr>
<tr>
<td>Misc. Privately Held</td>
<td>40,360</td>
</tr>
<tr>
<td>Minnesota Power</td>
<td>37,221</td>
</tr>
<tr>
<td>Otter Tail Power</td>
<td>36,644</td>
</tr>
</tbody>
</table>

This variable represents the income level of the middle household whereby 50% of households fall below this level and 50% of households fall above. The comparison of household income itself “requires judgment about the relationship between real income and family size.” This makes the interpretation of comparative data difficult as there is no information regarding the actual size of the households. A household of size 2 receiving $30,000 in income is in a significantly different situation that a household of size 6 receiving the same.

The comparison of per-capita income with the median income indicates that MMUA systems serve larger households than cooperatives. That is, there are more people living in each household that have a need to survive on the income coming into the household. It is for these reasons that per-capita income represents a stronger measure of the financial support that is provided to each member of a household.

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2. Demographic Age Structure

![Demographic Age Structure Graph]

3. Median Home Value

<table>
<thead>
<tr>
<th>EUSA Type</th>
<th>Average Median Home Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xcel Energy</td>
<td>$117,244</td>
</tr>
<tr>
<td>Municipal Systems</td>
<td>98,844</td>
</tr>
<tr>
<td>Cooperatives</td>
<td>90,561</td>
</tr>
<tr>
<td>Misc. Privately Held</td>
<td>84,062</td>
</tr>
<tr>
<td>Minnesota Power</td>
<td>82,860</td>
</tr>
<tr>
<td>Otter Tail Power</td>
<td>69,088</td>
</tr>
</tbody>
</table>
Considerations
There are some demographic trends that impact the future of MMUA electric service providers.

1. People living in the township. As recreational growth continues, we are finding more and more people moving outside of cities and into townships. This makes it difficult to rely on county-level data to describe growth within the county. In the case of counties across north-central Minnesota, the county may indicate population gains but these gains will be primarily in the open country (township) areas surrounding lakes. For this reason, county level data must be situated into a context.

2. Influx of people moving to rural areas, especially those aged 35-44 with children. More and more people are moving to rural places. Between 1990 and 1999, 2.2 million more Americans moved from the city to the country, than the reverse. Yes, the 18-25 age cohort tends to move to the large metropolitan areas. Yes, the older population continues to die. However, in many cases the population is stabilized by people choosing to move to a small town and rural environment during their prime earning years.

3. Additional MMUA data can be tied to these EUSA maps. This can include internal MMUA data or other trends that are identified by the individual members.
Appendix 1: Notes on EUSA boundary file

Issues with Municipal Boundaries in state shape file
Alpha – combined with Jackson
  - southern
Ceylon – no service area in state file
  - southern
Dundee – no service area in state file
  - southern
Dunnell – no service area in state file
  - southern
Kasota – no service area in state file – within St. Peter service area
  - southern
Nielsville – no service area in state file
  North of Fargo
Round Lake – no service area in state file
  - southern
Rushmore – no service area in state file
  - southern
Mountain Iron – listed twice in state file, once under Mt. Iron

Huntsville – listed incorrectly as municipal in state file. Per Dan Boyce (E. Grand Forks) list as Red River Valley Electric Cooperative Power Assn.

McKinley – listed incorrectly as municipal in state file. They should be listed with Minnesota Power.

Number of polygons after dissolve
Minnesota Power – 47
Municipals – 120
Cooperatives – 53
Ottertail Power – 120 cities covered
XCEL – 1 area