

# Peak Power Profiling

Data Driven Customer Segmentation for Reducing Peak Power Energy Consumption

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## Objectives

- Provide a methodology to identify best practices and share them with other utilities.
- Develop a methodology to collect and analyze data to determine how to leverage data to better segment their customers.
- Provide best practices for communication technology that can be used on how to influence customer behavior based on the shared attributes of each segment.

## Boone, NC

Town Area: 6.07 square miles  
 Population: 18,565  
 Median Household Income: \$24,146  
 Median Household value: \$214,773



## Methodology

Line building characteristic data from the Boone (ToB) GIS website to meter data from New River Light and Power (NRLP). Segment data by building characteristics and explore for correlations in consumption. Analyze historical consumption data for each segment and explore for correlations between building characteristics and consumption. Analyze correlations in NRLP customer data to develop an effective feedback program.

## Initial Data Combination

Segment NRLP customers based upon building characteristics such as heating systems, year built, and square footage in addition to individual demographics.

| Meter Number | FUEL | HEATSYS | YRBLT |
|--------------|------|---------|-------|
| 45246779     | 3    | 1       | 1958  |
| 33833245     | 3    | 1       | 1969  |
| 26758959     | 3    | 1       | 1962  |
| 54482438     | 2    | 4       | 2000  |
| 38816877     | 2    | 2       | 1994  |
| 38816878     | 2    | 2       | 1994  |
| 44294437     | 3    | 3       | 1975  |
| 48275171     | 1    | 1       | 1987  |
| 83684037     | 1    | 1       | 1988  |
| 46797607     | 2    | 2       | 1986  |
| 69702249     | 2    | 2       | 1986  |
| 55802910     | 3    | 1       | 1988  |
| 68605375     | 2    | 4       | 1985  |
| 84661866     | 1    | 1       | 1989  |

| FUEL     | % Population |
|----------|--------------|
| Gas      | 14%          |
| Electric | 30%          |
| Oil      | 54%          |
| Coal     | 0%           |
| Solar    | 0%           |
| None     | 1%           |

| HEATSYS   | % Population |
|-----------|--------------|
| Warm Air  | 47%          |
| Electric  | 18%          |
| Hot Water | 13%          |
| Heat Pump | 21%          |
| Solar     | 0%           |
| None      | 1%           |

| YRBLT        | % Population |
|--------------|--------------|
| 1900-1930    | 6%           |
| 1931-1940    | 5%           |
| 1941-1950    | 9%           |
| 1951-1960    | 20%          |
| 1961-1970    | 21%          |
| 1971-1980    | 17%          |
| 1981-1990    | 9%           |
| 1991-2000    | 4%           |
| 2001-2010    | 8%           |
| 2011-present | 2%           |

## Household Income



## Age Distribution



## Willingness To Pay (WTP)

Across all age groups and income levels, NRLP customers are willing to pay, on average, 10% more for electricity that comes from renewable energy sources

## Customer Preferences in Feedback Mechanisms

- 70% of customers want information on individual electric usage and want to save money on electric bills.
- 40% of customers are interested in receiving mobile updates daily, weekly, or monthly on their individual consumption rates.
- 50% of customers are at least somewhat interested in receiving text messages about their consumption.

## Moving Forward

The next steps for this project include:

- Adding historical consumption data for each meter to the combined NRLP and ToB data set
- Building analytical models to predict individual household power consumption based on building characteristics and weather data
- Using the customer survey responses to develop a customer outreach program.

## Contact Information

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