Minnesota Utility Energy Registry
State Data Protocol

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Glossary

The following glossary defines terms that are used throughout the Minnesota Utility Energy Registry State Data Protocol.

Term	Definition	Source
Actual Peak Demand Savings	Demand reduction actually achieved by demand response activities and is measured at the time of the company's annual system peak hour.	US Energy Information Administration (EIA)
Conservation Improvement Program (CIP)	CIP is a utility-administered program with regulatory oversight by MN Department of Commerce. CIP programs promote energy efficient technologies and practices to residential, commercial, and public customers through various means including marketing, incentives, and technical assistance.	Adapted from *Minnesota Conservation Improvement Program: Energy and Carbon Dioxide Savings Report for 2013-2014*
Consumer	Any individually-metered dwelling, building, establishment.	EIA
Customer	Same as "ultimate consumer."	
Demand Response	Demand response programs are procedures that encourage a temporary reduction in demand for electricity at certain times in response to a signal from the grid operator or market conditions. Examples are the dimming of lights, turning on backup generators, or shutting down industrial processes.	EIA
Green Power Purchase or Green Pricing	Some power companies are now providing an optional service, called green pricing, which allows customers to pay a small premium in exchange for electricity generated from green power resources. The premium covers the increased costs incurred by the power provider (i.e., the electric utility) when adding green power to its power generation mix.	US Department of Energy
Load Profile	The variation in the electrical load versus time.	
Peak Demand	"Peak demand" means the highest megawatt demand during a designated period recorded on a one-hour integrated reading basis.	MN Dept. of Commerce
Potential Peak Demand Saving	Refers to the total demand savings that could occur at the time of the system peak hour assuming all demand response is called.	EIA
System	"System" means that combination of generation, transmission and distribution facilities that make up the operating physical plant of the utility, whether owned or non-owned, for the delivery of electric energy to ultimate consumers, and includes the geographic area where the utility's ultimate consumers are located.	MN Dept. of Commerce
Ultimate consumer	Consumers purchasing electricity or natural gas for their use and not for resale.	Adapted from MN Department of Commerce

Abbreviations

CIP: Conservation Improvement Program
CO$_2$: Carbon dioxide
CO$_2$e: Carbon dioxide equivalent
EIA: Energy Information Administration
GIS: Geospatial information system
IOU: Investor-owned utility
NAICS: North American Industry Classification System

Introduction

This document provides a Minnesota-specific protocol for users entering data into the Utility Energy Registry, which will be a voluntary online platform to provide public access to community-scale utility energy demographic data. The protocol has been created after a robust stakeholder engagement and considering the technical input of energy utilities.

The protocol describes a list of metrics that are considered valuable to stakeholders in Minnesota. To the extent possible, these metrics have been kept consistent with current reporting requirements of utilities to state and federal agencies. Each metric in the registry can be reported for one or more geographic scales, sectors, and time intervals. These dimensions are explained below:

- **Geography**: The protocol enables utilities to report metrics at different geographic scales (e.g., cities, census tracts, and zip codes). Since local governments benefit from localized data about their communities, utilities are encouraged to report metrics by smaller geographies.
- **Sectors:** Energy data is often more useful to stakeholders—like local governments and research institutions—if it is classified by sectors of the economy (e.g., residential vs. non-residential). Most metrics described in this protocol can be segregated by sectors. However, it is not always feasible from the reporting utilities to break down data into different sectors. Hence, different levels of aggregation are provided as options.
- **Time Interval:** The protocol allows utilities to report either monthly or yearly data for each metric. Utilities are encouraged to provider shorter reporting intervals when possible. However, not all metrics can be reported monthly by a utility.

Geography

Table I shows the geographic layers by which metrics can be reported. Utilities are encouraged to provide smaller geographies to increase the resolution of data when possible.

 The following metadata is included:

- *Geographic Layer:* The Minnesota Utility Energy Registry State Data Protocol gives the option to utilities to identify the level of reporting that is best suited to their capabilities for each metric. Utilities are encouraged to select the geography for each metric that is both technically feasible and satisfies any privacy protocols.
- *Source:* This field specifies the source of the geography layer. Most layers come from the US Census Bureau.
- *Detail:* This field contains specific information about the geographic layer.

Table I. Geographic layers

Geographic Layer	Source	Detail
Statewide (Minnesota service territory)	Census.gov	*Consistent with National Data Protocol.*
Counties	Census.gov	*Consistent with National Data Protocol.*
Cities and Townships	gisdata.mn.gov/	*Minnesota specific layer.* The Minnesota Geospatial Commons provides a GIS map with the boundaries of every city, township, and unorganized territory of Minnesota.
Census tracts	Census.gov	*Consistent with National Data Protocol.*
Census blocks	Census.gov	*Consistent with National Data Protocol.*
Zip Codes		*Consistent with National Data Protocol.*

Common issues with classifying data into geographic boundaries
There are a couple of issues that may arise when utilities classify data based on geographic boundaries. For examples, utilities that rely on customer billing addresses—rather than meter location—to determine geolocation may run into errors when the energy use occurs in a different location than the billing address. Additionally, if utilities have previously identified the accounts belonging to a specific community, they may encounter challenges if the geographic boundaries change (e.g., for cities annexing new land).

Another issue is that, due to lack of funding, the Minnesota Geospatial Commons Layer with data for cities boundaries might not be recently updated, which could mean that it misses changes in the boundaries of cities.

Sectors

Table II shows the sectors by which metrics can be reported. When possible, utilities are encouraged to provide detailed sector breakdown to increase the resolution of data.

The following metadata is included:

- *Level:* The Minnesota Utility Energy Registry State Data Protocol enables utilities to identify what level of reporting is best suited to their capabilities for each metric. Utilities are encouraged to select the highest level of reporting for each metric that is both technically feasible and satisfies any privacy protocols.
- *Sector:* A sector is a distinct part or branch of the economy or society.
- *Definition:* This field specifies the definition of the given sector.

Table II. Sectors

Level	Sector	Definition
Level 0	**Total**	No disaggregation by sector.
Level 1	**Residential**	An energy-consuming sector that consists of living quarters for private households. Common uses of energy associated with this sector include space heating, water heating, air conditioning, lighting, refrigeration, and cooking. The residential sector includes mobile homes and apartment building and excludes institutional living quarters. (From EIA)
	Non-Residential	Any sector that is not residential as defined above.
Level 2	**Residential**	Same as in Level 1.
	Commercial	An energy-consuming sector that consists of service-providing facilities and equipment of: businesses; federal, state, and local governments; and other private and public organizations, such as religious, social, or fraternal groups. The commercial sector includes institutional living quarters. It also includes sewage treatment facilities. Common uses of energy associated with this sector include space heating, water heating, air conditioning, lighting, refrigeration, cooking, and running a wide variety of other equipment. Note: This sector includes generators that produce electricity and/or useful thermal output primarily to support the activities of the above-mentioned commercial establishments. (From EIA)

	Industrial	An energy-consuming sector that consists of all facilities and equipment used for producing, processing, or assembling goods. The industrial sector encompasses the following types of activity: manufacturing (North American Industry Classification System (NAICS) codes 31-33); agriculture, forestry, and fishing and hunting (NAICS 11); mining, including oil and gas extraction (NAICS 21); and construction (NAICS 23). Overall energy use in this sector is largely for process heat and powering machinery, with lesser amounts used for facility heating. Natural gas is also used as raw material inputs to manufactured products. Note: This sector includes generators that produce electricity and/or useful thermal output primarily to support the above-mentioned industrial activities. (From EIA)
	Street and highway lighting (if available) divided into city-owned and non-city-owned.	An energy-consuming sector consisting of street and highway lighting. If this sector cannot be reported separately, please include this sector under commercial.
	Transportation (if available)	An energy-consuming sector consisting of the propulsion of vehicles. (From EIA). Example: Electric railroads, railways, and vehicles. Compressed (CNG) or liquified natural gas (LNG). If this sector cannot be reported separately, please include this sector under commercial.

Common issues with classifying data into sectors

In practice, the easiest way for utility companies to group customers into different sectors is based on rate classes and tariffs, which are provided in utility documentation such as rate books. There are similar rate class categories across the state, such as residential, small/medium/large general, and large industrial. However, these categories do not have standardized definitions and are typically based on energy load rather than type of activity occurring on the site.

Most utilities are able to use rate classes to separate residential from non-residential customers, though multi-family customers are often mixed between categories depending on how the energy is metered (e.g., at the unit or building scale). In order to separate commercial from industrial customers, utilities may make assumptions based on rate class. Although the resulting data can be used to consistently compare sector-based energy metrics over time, they are likely to result in sector designations that are inconsistent between utilities. For example, some customers that are mixed-use would be reported under a single rate class, which would not accurately reflect the different activities occurring at a premise.

Metrics

Table III contains the metrics to be included in Minnesota's Utility Energy Registry data. When possible, utilities are encouraged to provide as many metrics from table III as they can. Stakeholders have identified deliveries to ultimate consumers as the highest priority metrics.

The following metadata is included in the table below:

- ***Metric Type:***
  - Deliveries to ultimate consumers: This type of data is important because it allows tracking changes in energy usage for a given geopolitical boundary.
  - Programs: Utilities often run a series of programs to increase energy efficiency. Tracking these programs allows stakeholders to understand their effectiveness and impact for a given geographic boundary.
  - Generation: Data regarding distributed electricity generation allows stakeholders to understand the deployment of renewable resources in communities.
  - Emissions: Electricity generation is one of the main causes of greenhouse gas emissions. Local governments and other groups are interested in tracking the greenhouse gas emissions from energy.
  - Data Privacy.
- ***Metric Name***
- ***Energy Type:*** Both electricity and natural gas utilities participate in the registry. Some metrics are applicable only to one of these two types of utilities.
- ***Units/Data Type:*** This field indicates the reporting units of the requested metric.
- ***Minimum Sector:*** Indicates the sector breakdown that provides value for users of the platform. (Data can be reported by more complex sectors as shown in table II).
- ***Minimum Geospatial:*** Data can be reported at different geography levels. This field indicates the largest geography that provides value to stakeholders.
- ***Description:*** This field provides a description of the metric requested. Where possible, the definitions of metrics are consistent with state and nationally mandated reporting requirements.

Table III. Metrics

Metric Name	Energy Type	Units	Minimum Sector	Minimum Geospatial	Description	Comments
DELIVERIES TO ULTIMATE CONSUMERS						
Deliveries and sales to ultimate consumers						
Energy delivered to ultimate consumers	Electricity Natural Gas	MWh or Therms *Numeric*	Residential vs Non-Residential	City County Statewide	The amount of energy that is delivered to ultimate consumers.	This metric is reported to the MN Department of Commerce (Form 7610).
Energy cost to ultimate consumers	Electricity Natural Gas	US Dollars *Numeric*	Residential vs Non-Residential	City County Statewide	The US dollar amount that ultimate consumers pay to the utility for energy, including consumption and demand charges, but excluding other fees and taxes.	
Number of ultimate consumers	Electricity Natural Gas	Count *Numeric*	Residential vs Non-Residential	City County Statewide	The average number of ultimate consumers over the reporting period.	This metric is reported to the MN Department of Commerce (Form 7610).
PROGRAMS						
Conservation Improvement Programs (CIP)						
Number of CIP projects	Electricity Natural Gas	Count *Numeric*	Residential vs Non-Residential	City County Statewide	The number of projects implemented through Conservation Improvement Programs.	IOUs report information on CIP directly to the MN Department of Commerce. Cooperative and municipal utilities submit data regarding CIP through the Energy Saving Platform (ESP) of the Minnesota Department of Commerce.
Energy saved through CIP	Electricity Natural Gas	kWh or Therms *Numeric*	Residential vs Non-Residential	City County Statewide	An estimate of the amount of energy savings from Conservation Improvement Programs implemented during the reporting period. Savings must be calculated using the most recent version of the CIP	IOUs report information on CIP directly to the MN Department of Commerce. Cooperative and municipal utilities submit data regarding CIP through the Energy Saving Platform (ESP) of the Minnesota Department of Commerce.

					[Minnesota Technical Reference Manual](#) or the utility's own technical manual.	
CIP electricity demand savings	Electricity	kW *Numeric*	Residential vs Non-Residential	City County Statewide	An estimate of the amount of electricity demand saved from Conservation Improvement Programs implemented during the reporting period. Savings must be calculated using the most recent version of the [CIP Minnesota Technical Reference Manual](#) or the utility's own technical manual.	IOUs report information on CIP directly to the MN Department of Commerce. Cooperative and municipal utilities submit data regarding CIP through the Energy Saving Platform (ESP) of the Minnesota Department of Commerce.
Incentives Paid for CIP	Electricity Natural Gas	US Dollars *Numeric*	Residential vs Non-Residential	City County Statewide	The US Dollar amount of incentives paid to consumers in Conservation Improvement Programs.	IOUs report information on CIP directly to the MN Department of Commerce. Cooperative and municipal utilities submit data regarding CIP through the Energy Saving Platform (ESP) of the Minnesota Department of Commerce.
Green Power Purchase (GPP)						
Name of GPP program(s) + Description	Electricity	*Text* *2 Fields* *This field is unlikely to change from one year to the next one.*	Residential vs Non-Residential	City County Statewide	The name or type of each Green Power Purchase program that the utility provides and a brief description of the program.	This metric is reported to the Minnesota Department of Commerce.
Number of GPP program participants	Electricity	Count *Numeric*	Residential vs Non-Residential	City County Statewide	The number of ultimate consumers participating in each of the utility's Green Power Purchase programs.	This metric is reported to the Minnesota Department of Commerce.
Subscribed energy to GPP	Electricity	kWh *Numeric*	Residential vs Non-Residential	City County Statewide	The amount of energy sold through each Green Power Purchase program.	This metric is reported to the Minnesota Department of Commerce.

Demand Response						
Number of demand response program participants	Electricity	Count *Numeric*	Residential vs Non-Residential	Statewide	Number of customers participating in demand response programs.	Some metrics about demand response are reported to the EIA (Form 861).
Potential Peak Demand Savings	Electricity	MW *Numeric*	Residential vs Non-Residential	Statewide	The <u>potential peak demand savings</u> for demand response programs. (available capacity)	Some metrics about demand response are reported to the EIA (Form 861).
Rebates or Incentives Paid for Demand Response	Electricity	US Dollars Numeric	Residential vs Non-Residential	Statewide	The US dollar amount of rebates or incentives paid for participation in demand response programs for the reporting period.	Some metrics about demand response are reported to the EIA (Form 861).
EMISSIONS						
CO_2 emissions factor	Electricity	Pounds of CO_2 per kWh delivered to ultimate consumers *Numeric*	Total	Statewide	The carbon dioxide emission factor per unit of energy delivered.	A utility's emission factor might be available through its power supplier agency.
CO_2e emissions factor by greenhouse gas	Electricity	Pounds of CO_2e for CO_2, CH_4 and N_2O per kWh delivered to ultimate consumers *Numeric*	Total	Statewide	The carbon dioxide equivalent by greenhouse gas emission factor per unit of energy delivered.	A utility's emission factor might be available through its power supplier agency.
Protocol for estimating CO_2 emissions factor	Electricity	Text			Name of the protocol used for estimating CO_2 or CO_2e emissions factor.	The Climate Registry is the recommended protocol for estimating CO_2 emission factors.
DISTRIBUTED GENERATION						
Distributed renewable energy generation: Number of facilities by energy source	Electricity	Count *Numeric*	Total	City County Statewide	Number of facilities by energy source of no more than 10 MW of interconnected capacity that are not owned by the utility.	This metric is reported to the Minnesota Department of Commerce (Information Docket E999/PR-18-10).

Distributed renewable energy generation: Capacity of all facilities by energy source	Electricity	kW *Numeric*	Total	City County Statewide	Capacity of facilities by energy source of no more than 10 MW of interconnected capacity that are not owned by the utility.	This metric is reported to the Minnesota Department of Commerce (Information Docket E999/PR-18-10).
DATA PRIVACY						
Data privacy rules	Electricity Natural Gas	*Text*	N/A	N/A	A text description the utility's privacy protocol.	Refer to Minnesota Department of Commerce (Information Docket 12-1344)