#14: RENEWABLE ENERGY

CORE METRIC FOR CATEGORY **A** & **B** & **C** COMMUNITIES

Bold, green font indicates metrics that must improve to be recognized at Step 5

METRICS

14.1 Number of government owned and private renewable energy generation sites (# of sites)
14.2 **Generation capacity of government and private renewable energy generation sites** (kW)
14.2a **Storage and off-grid capacity of renewable energy, generated by government-owned and private renewable energy sites** (kW)
14.4 **Annual renewable energy purchases for local/tribal government operations** (MWhr/year)
14.5 Number of non-government entities participating in renewable energy purchasing/green power programs (# of entities)
14.6 Percent of total local/tribal government operations energy use that is generated & purchased renewable energy (%)
14.7 Percent of total local/tribal government operations energy use that is purchased from a community solar garden (%)

See CO2e Guidance Document for Metrics **M**

METRIC DEFINITION

- **Renewable energy sources** includes power from wind (turbines) and water (hydroelectric), from the sun (powering photovoltaic panels, hot-air and hot-water panels), from biofuels, from biomass (burning wood, and biogas produced by anaerobic digestion of organic matter such as at a waste water plant), and from trash incineration and landfill gas.
- **Resource recovery** (incineration of trash) and landfill gas recovery is not considered renewable energy under some definitions, but they are defined in Minnesota law as renewable and should be included in your metrics.
- **Ground-sourced geothermal** heating/cooling, while accessing a huge thermal mass, is technically not renewable energy but rather the efficient use of an electric motor to move energy between a building and the subsurface.
- **Off-grid storage** includes battery backup, pumped hydro, thermal storage and off-grid solar and other energy production that can be used without connection to or availability of grid-connected power. Additional information at https://www.eesi.org/papers/view/energy-storage-2019 (Metric 14.2a)
- **Government sites** include renewable energy generation sites inside and outside city/tribal nation limits, such as at a waste water treatment plant, owned or leased by local/tribal government. Include sites owned by a municipal utility. (Metric 14.1 – 14.3; 14.6; 14.7)
- **Private sites** include private, non-profit, governmental (other than city), residential, commercial, institutional and industrial sites within city or reservation limits owned or leased by an entity other than local/tribal government. Include community solar gardens and gas stations selling ethanol or biodiesel blends above the state mandated 10%. (Metric 14.1 & 14.2)
- **Generation capacity** is the rated (or "nameplate") theoretical generation capacity in kilowatts (kW) and includes generation in facilities at city/tribal (public) sites, and at private sites such as solar arrays, landfill gas, etc. (Metric 14.2)
- **Annual production** counts megawatt hours (MWh/yr.) generated by local/tribal government-owned sites in the year prior to the GreenStep reporting year. (Metric 14.3)
- **Local/tribal government and private purchases** include renewable energy amounts above the amounts already in the baseline mix from the electric utilities supplying power and gas, and above the mandated 10% biofuels mix from

liquid fuel stations in the city. Include voluntary "green power purchases" or REC (renewable energy credit) purchases by the local/tribal government, and by residents, businesses and other governmental units. Among these amounts are purchase agreements with renewable energy facilities owned by another provider. Note that sometimes such purchases may be from generators such as community solar gardens where the renewable energy credit may not be purchased/held by the entity using the energy. While ideally purchases should be documented with renewable energy credits (RECs) held by the user and be Green-E certified, it can be hard to know just who holds the RECs (as, for example, a city might hold them but only for the first 10 years). (Metrics 14.4 - 14.7)

- **Community Solar Gardens** allow the local/tribal government to purchase solar electricity without hosting the infrastructure; rather a centrally located solar PV system provides the electricity to subscribers. Learn more at https://www.cleanenergyresourceteams.org/solargardens (Metric 14.7)

DATA SOURCES

- City/tribal and local utility records for permitted sites and capacities, and for the number and size of green power purchases (Metrics 14.1-14.7)
- The MN Solar App allows a view of existing solar installations at https://solar.maps.umn.edu/app/. In the "base layer" tab, turn the "existing solar installations" button to "on". (Metric 14.1)
- For cities **in Xcel Energy territory**, their Community Energy Reports include number of solar installations, total capacity, energy produced, and number of solar gardens and subscribed capacity and energy produced, at https://www.xcelenergy.com/community_energy_reports (find your city and use the most recent data available; previous year data is not available until June) (Metrics 14.1, 14.2, 14.5)

METRIC CALCULATION AND PUBLIC REPORTING

- **Number of sites and generation capacity**, from local/tribal records, is measured on December 31st before the reporting year. (Metrics 14.1, 14.2, and 14.2a)
  - Metric 14.1 and 14.2 information for cities **in Xcel Energy territory**, can be found using the Community Energy Reports (use most recent year available).
  - **14.1**: Combine "Total Installations" from "On-site Solar (Solar*Rewards)" and "On-site Solar (non-Solar*Rewards)" for both "Community – Business Total" and "Community – Residential Solar"
    - In the example below, this is: 16 + 144 + 9 + 7 = 176
  - **14.2**: Combine "Total Capacity (kW)" from "On-site Solar (Solar*Rewards)" and "On-site Solar (non-Solar*Rewards)" for both "Community – Business Total" and "Community – Residential Solar"
    - In the example below, this is: 541 + 1112 +15024.349 + 34.23 = 16,711.57
  - NOTE: This information should also include public installations. Typically, a city's solar projects would be included in these Xcel figures but if you know they are not, add those totals in as well.

14.1 **14.2**

On-site Solar (Solar*Rewards) [11]	Total Installations	Installations During Reporting Year	Total Capacity (kW)	Capacity Installed During Reporting Year (kW)	Total Energy Produced (kWh) [11]	Total Incentives Paid ($) [12]	Customers Removed from Dataset
Community - Business Total	16	0	541	0	15,973,031	$0	10
Community - Residential Total	144	15	1,112	141	488,772	$0	0
Minnesota - Business Total	2,704	116	71,910	4,027	840,624,365	$272	2
Minnesota - Residential Total	11,968	1,245	94,969	10,662	45,371,153	$2,047	0

On-site Solar (non-Solar*Rewards)	Total Installations	Installations During Reporting Year	Total Capacity (kW)	Capacity Installed During Reporting Year (kW)	Total Energy Produced (kWh)	Customers Removed from Dataset
Community - Business Total	9	0	15,024.34	0	0	5
Community - Residential Total	7	5	34.23	30	0	2
Minnesota - Business Total	497	74	267,749.76	17,895	938862846	1
Minnesota - Residential Total	795	513	15,523.6	4,042	3725034	0

- **Annual production** amounts are for the calendar year before the reporting year. If the city or tribal government owns or leases a portion of a renewable energy facility it should count the percentage share of that facility's generation allocated for use by government operations.
- **For energy conversions** see http://www.eia.gov/Energyexplained/index.cfm?page=about_energy_conversion_calculator (Metric 14.3, 14.4)
- **The amount of annual renewable energy purchases** by city/tribal operations are for the calendar year before the reporting year and include purchases from community solar gardens and other third-party solar installations, and biofuel purchases above the mandated 10% biofuels mix. (Metric 14.4)
- **Number of non-government entities participating in renewable energy purchasing/green power programs** includes individuals, businesses, institutions and other units of government within the city or reservation that have signed up for programs such as green tags, green power pricing, RECs, Community Solar Gardens. (Metric 14.5)
    - Metric 14.5 information for cities **in Xcel Energy territory**, can be found using the Community Energy Reports (use most recent year).
    - Combine "Number of Customers" from "Windsource", "Renewable*Connect", and "Solar Gardens (PV)"
        - In the example below, this is: 8 + 773 + 0 + 34 + 5 + 151 = 971

14.5

Programmatic Data [10]

Windsource	Number of Customers	Subscribed Energy (kWh)	Customers Removed from Dataset
Community - Business Total	8	183,714	8
Community - Residential Total	773	2,726,533	0
Minnesota - Business Total	783	238,914,430	1
Minnesota - Residential Total	75,024	229,928,582	0

Renewable*Connect	Number of Customers	Subscribed Energy (kWh)	Customers Removed from Dataset
Community - Business Total	0	0	0
Community - Residential Total	34	201,704	0
Minnesota - Business Total	158	160,747,106	0
Minnesota - Residential Total	2,912	22,267,203	0

On-site Solar (Solar*Rewards) [11]	Total Installations	Installations During Reporting Year	Total Capacity (kW)	Capacity Installed During Reporting Year (kW)
Community - Business Total	16	0	541	0
Community - Residential Total	144	15	1,112	141
Minnesota - Business Total	2,704	116	71,910	4,027
Minnesota - Residential Total	11,968	1,245	94,969	10,662

On-site Solar (non-Solar*Rewards)	Total Installations	Installations During Reporting Year	Total Capacity (kW)	Capacity Installed During Reporting Year (kW)
Community - Business Total	9	0	15,024.34	0
Community - Residential Total	7	5	34.23	30
Minnesota - Business Total	497	74	267,749.76	17,895
Minnesota - Residential Total	795	513	15,523.6	4,042

Solar Gardens (PV)	Number of Customers	Subscribed Capacity (kW)	Subscribed Energy (kWh)	Customers Removed from Dataset
Community - Business Total	5	1,172	743,652	5
Community - Residential Total	151	643	607,730	0
Minnesota - Business Total	6,947	987,820	1,225,589,253	0
Minnesota - Residential Total	24,100	170,329	183,972,782	0

- **Report the ratio** of renewable energy generated and purchased by city government to total energy used by city/tribal government, using data for the calendar year prior to the GreenStep reporting year. (Metric 14.6)

METRIC RATIONALE

Minnesota is almost completely dependent on energy sources outside state borders. Annually we spend over $18 billion on coal, natural gas, uranium, petroleum, and electricity produced from a variety of these non-renewable (and a small proportion of renewable) sources. Adding renewable energy generation capacity that is owned by local/tribal government, residents, businesses and educational institutions:

- Develops underused local energy resources, keeping dollars available for re-spending in the community
- Increases a community's resilience to energy supply and price shocks
- Cuts greenhouse gas emissions in support of the state's Next Generation Energy Act goals
- Decreases health care costs to individuals and the state by eliminating air emissions from the burning of coal

Annual tracking of renewable energy generated/purchased within the community provides a moving baseline measure, facilitating decisions on what actions to take to increase these amounts. While city/tribal government generation and purchasing of renewable energy will always be a small portion of total energy used within city or reservation limits, the example and experience of these actions helps propel residents and businesses to invest in renewable energy.

Stored energy that can be used without relying on the grid may be essential to communities undergoing a natural or other disaster and to prepare for climate change impacts such as excessive heat or flooding. Accessible energy is necessary for governments to keep their public safety, community centers, hospitals, and other critical infrastructure functioning. Learn more about the benefits of solar+storage at https://www.energy.gov/sites/prod/files/2018/03/f49/Valuing-Resilience.pdf.

STEP 5 METRIC TARGETS

The State of Minnesota set a carbon-free electricity standard in 2023. The bill establishes a standard for utilities to supply Minnesota customers with electricity generated or procured from carbon-free resources, beginning at an amount equal to 80% of retail sales for public utility customers in Minnesota in 2030 and increasing every 5 years to reach 100% for all electric utilities by 2040. The bill also requires that, by 2035, an amount equal to at least 55% of an electric utility's total retail electric sales to customers in Minnesota must be generated or procured from eligible energy technologies.

LEED FOR CITIES & COMMUNITIES

https://www.usgbc.org/leed/rating-systems/leed-for-cities-communities

EN Prerequisite: Power Access, Reliability and Resiliency

- Case 2. Commitment to Electricity Access
    - Power Surety and Resiliency
        - Identify critical loads and essential services/facilities owned and/or operated by the city, that require backup power during widespread outages or disasters and determine their minimum daily runtime requirements. Demonstrate that the city can supply back up power to all identified critical loads, and essential services in meeting their minimum daily runtime for at least one day.
        - Off-grid developments or micro-grids are eligible if they independently meet the above requirements and are supported by the city development plans or policies.

EN Credit: Renewable Energy

- Option 1. Renewable Energy in Electricity Supply
    - Cities may choose one or more strategies for procuring renewable energy (such as solar PV, wind, geothermal, micro or small-scale hydro*, or biomass) from the categories below. Points are based on total electricity supply met by renewable energy. 5%-60%
    - Categories for renewable energy:
        - Local renewables
            - Power generated from locally installed renewables (by the city, utility, consumers, or prosumers such as community solar PV, wind, geothermal, micro or small-scale hydro, biomass
        - Off-site/imported renewables
            - Off-site renewable electricity that is procured or contracted by the city or utility.
            - Green-e Energy certification or equivalent is required for delivery of EACs.
            - Environmental benefits of all procurement must be retained by the city, or utility. All off-site qualifying resources must be contracted, owned, or leased for at least 15 years.
- Option 2: Renewable Energy in Total Energy Consumption (1 point)
    - Measure and report the share of renewable energy (such as solar PV, wind, geothermal, micro or small-scale hydro*, or biomass) as percentage of total energy (thermal and electricity) consumption of the city. Report data available for most recent year within the last five years.

NS: Resilience Planning

- Option 1. Vulnerability and Capacity Assessment (1 point)
    - Identify the local environmental context and conduct a vulnerability and capacity assessment for climate change risks, natural and human induced hazards and extreme events as listed in Table 1. Classification of impacts for Vulnerability and Capacity Assessment and include the following steps:
        - Risk Identification – Identify the impacts from which an area is at risk. Use national/state level maps and historic data of occurrence to identify the potential threats.
        - Risk Assessment – Estimate the probability of occurrence of the extreme events. Study their characteristics, frequency, and potential severity. Conduct a socio-economic and environmental assessment of the impact.
        - Vulnerability and Capacity Assessment – Assess the most exposed and affected sections, strengths and weaknesses of the city.
        - Priority Identification - Identify significant threats based on trends and future predictions, critical infrastructures, and population at risk from the threats. The city must identify top two natural and human induced hazards each.
- Option 3: Improve Resilience (2 points)
    - Achieve Option 1. Vulnerability and Capacity Assessment.
    - AND
    - Demonstrate that the city has reduced vulnerability to at least 2 significant threats and for at least 1 at-risk population group as identified under Option 1. Vulnerability and Capacity Assessment over time. Reductions can be shown using any one of the following three strategies:
        - Reduction: Demonstrate that the occurrence of significant threats has reduced from a baseline year no more than five years prior to the most recent reporting year.
        - Addressal: Demonstrate that at-risk communities, threatened wildlife or critical infrastructures have been moved out of harm's way resulting in reduced risk.
        - Adaptation: If an impact cannot be avoided or addressed, demonstrate an increase in adaptive capacity, or the ability to rebound from an impact.

RELATED BEST PRACTICE ACTIONS

- 15.2 Purchase energy used by city government - via the municipal utility, green tags, community solar garden, 3rd party - with a **higher renewable percentage** than required by Minnesota law.
- 26.2 Promote **resident/business purchases and/or generation** of clean energy by:
  - a. Promoting a local utility's green power purchasing program that allows residents/businesses to order/buy new renewable energy.
  - b. Creating and sharing a map of the community's solar resource and/or linking to the Minnesota Solar Suitability App.
  - c. Connecting residents/businesses with the Solar Directory for potential installers.
  - d. Hosting a community-wide solar bulk-buy program or campaign (also called "solarize" programs).
- 26.3 Promote **financing and incentive programs**, such as PACE, for clean energy:
  - a. PACE for commercial property owners to install renewable energy systems, energy efficiency measures and EV charging infrastructure for existing or new construction.
  - b. Local, state and federal financial incentives for property owners to install renewable energy systems.
  - c. Local utility renewable energy production incentives and rebates.
- 26.4 Support a **community solar garden** or help community members participate in a community solar project by:
  - a. Serving as a host site for a community solar garden.
  - b. Facilitating development, by the municipal utility or other entity, of a community solar garden for residents.
  - c. Participating in a community solar garden to ensure accessibility and availability to low-income residents.
- 26.5 Install a **public sector/municipally-owned** renewable energy technology, such as solar electric (PV), wind, biomass, solar hot water/air, or micro-hydro.
- 26.6 Report installed **private sector-owned** renewable energy/energy efficient generation capacity with at least one of the following attributes:
  - a. Fueled by sun, wind, or biogas.
  - b. Fueled in part or whole by manure or woody (EAB) biomass, optimized for minimal air and other environmental impacts and for energy efficiency and water conservation.
  - c. Distributing heating/cooling services in a district energy system.
  - d. Producing combined heat and power; using a microgrid.
  - e. Energy storage integrated into a renewable energy installation.

NEED HELP? CONTACT

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