

#14: RENEWABLE ENERGY

CORE METRIC FOR CATEGORY A & B & C CITIES

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

METRICS

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

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)
- **City sites** include renewable energy generation sites inside and outside city limits, such as at a waste water treatment plant, owned or leased by city 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 limits owned or leased by an entity other than city 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 (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 city-owned sites in the year prior to the GreenStep reporting year. (Metric 14.3)
- **City 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 city, 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 city 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 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) (Metrics 14.1, 14.2, 14.5)

METRIC CALCULATION AND PUBLIC REPORTING

- **Number of sites and generation capacity**, from city 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).
 - **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				
66	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
67	Community - Business Total	16	0	541	0	15,973,031	\$0	10
68	Community - Residential Total	144	15	1,112	141	488,772	\$0	0
69	Minnesota - Business Total	2,704	116	71,910	4,027	840,624,365	\$272	2
70	Minnesota - Residential Total	11,968	1,245	94,969	10,662	45,371,153	\$2,047	0
71								
72	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	
73	Community - Business Total	9	0	15,024.34	0	0	5	
74	Community - Residential Total	7	5	34.23	30	0	2	
75	Minnesota - Business Total	497	74	267,749.76	17,895	938862846	1	
76	Minnesota - Residential Total	795	513	15,523.6	4,042	3725034	0	
77								
78								

- **Annual production** amounts are for the calendar year before the reporting year. If the city 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.

Minnesota GreenStep Cities
Performance Metrics for Recognition at Steps 4 and 5

- 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 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-city entities participating in renewable energy purchasing/green power programs includes individuals, businesses, institutions and other units of government within the city 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

54	Programmatic Data [10]					
55	Windsource	Number of Customers	Subscribed Energy (kWh)	Customers Removed from Dataset		
56	Community - Business Total	8	183,714	8		
57	Community - Residential Total	773	2,726,533	0		
58	Minnesota - Business Total	783	238,914,430	1		
59	Minnesota - Residential Total	75,024	229,928,582	0		
60						
61	Renewable*Connect	Number of Customers	Subscribed Energy (kWh)	Customers Removed from Dataset		
62	Community - Business Total	0	0	0		
63	Community - Residential Total	34	201,704	0		
64	Minnesota - Business Total	158	160,747,106	0		
65	Minnesota - Residential Total	2,912	22,267,203	0		
66						
67	On-site Solar (Solar*Rewards) [11]	Total Installations	Installations During Reporting Year	Total Capacity (kW)	Capacity Installed During Reporting Year (kW)	
68	Community - Business Total	16	0	541	0	
69	Community - Residential Total	144	15	1,112	141	
70	Minnesota - Business Total	2,704	116	71,910	4,027	
71	Minnesota - Residential Total	11,968	1,245	94,969	10,662	
72						
73	On-site Solar (non-Solar*Rewards)	Total Installations	Installations During Reporting Year	Total Capacity (kW)	Capacity Installed During Reporting Year (kW)	P
74	Community - Business Total	9	0	15,024.34	0	
75	Community - Residential Total	7	5	34.23	30	
76	Minnesota - Business Total	497	74	267,749.76	17,895	
77	Minnesota - Residential Total	795	513	15,523.6	4,042	
78						
79	Solar Gardens (PV)	Number of Customers	Subscribed Capacity (kW)	Subscribed Energy (kWh)	Customers Removed from Dataset	
80	Community - Business Total	5	1,172	743,652	5	
81	Community - Residential Total	151	643	607,730	0	
82	Minnesota - Business Total	6,947	987,820	1,225,589,253	0	
83	Minnesota - Residential Total	24,100	170,329	183,972,782	0	
84						

- Report the ratio of renewable energy generated and purchased by city government to total energy used by city 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 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 city provides a moving baseline measure, facilitating city decisions on what actions to take to increase these amounts. While city government generation and purchasing of renewable energy will always be a small portion of total energy used within city limits, the example and experience of these city 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 cities 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, as part of the Next Generation Energy Act, has a goal of generating 25% of electricity used in 2025 from renewable sources. In addition, the state has set a solar standard for achieving an additional 1.5% of electric energy generation from solar energy systems by 2020 and 10% by 2030.

NEED HELP? CONTACT

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