



SETTING RENEWABLE ELECTRICITY GOALS

CERTs CONFERENCE

MARCH 29, 2018

ABBY FINIS, SENIOR ENERGY PLANNER



**GREAT PLAINS
INSTITUTE**

Better Energy.
Better World.



GREAT PLAINS INSTITUTE

Transforming the energy system to
benefit the economy and environment.



Communities Team

Cities and communities are critical to creating a better energy system because collectively they are big enough to matter and small enough to make changes quickly. GPI's programs are designed to assist communities in different ways with all the elements needed to drive change.

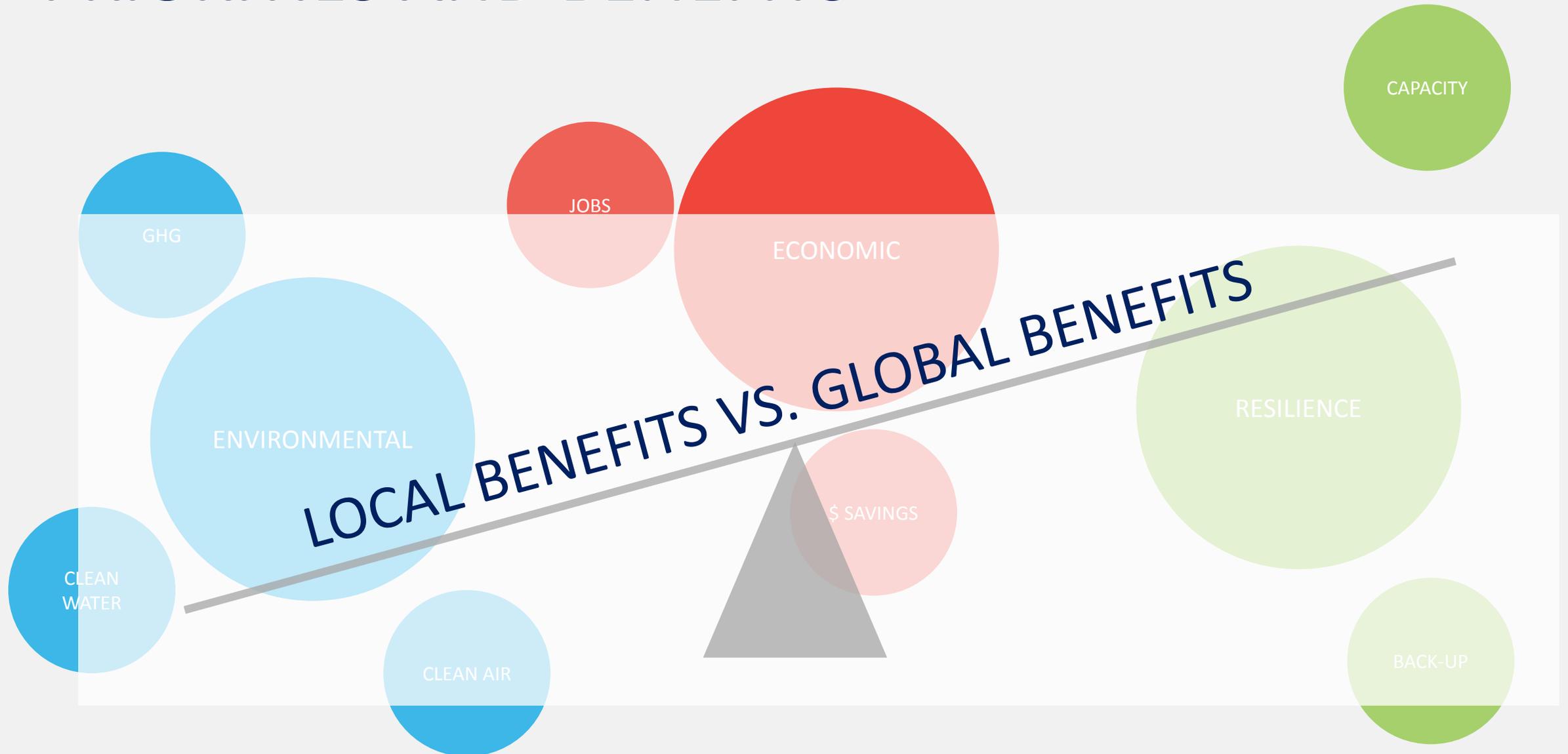
- Energy Planning Technical Assistance
- GreenStep Cities program partner
- Metro CERT
- SolSmart technical assistance
- Small business energy efficiency

SETTING RENEWABLE ELECTRICITY GOALS

- 1 Determine priorities and desired benefits
- 2 Complete an energy and emissions profile
- 3 Analyze available clean energy resources
- 4 Understand context of electric utility service
- 5 Pathways to desired outcome with examples
- 6 Hear from Rochester and Woodbury



PRIORITIES AND BENEFITS



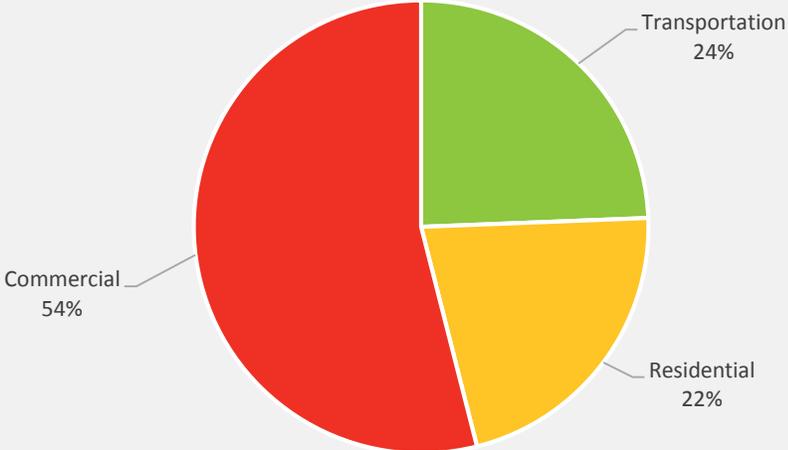
EXISTING CONDITIONS

Existing conditions help communities know where they are. In the case of energy, it is beneficial for communities to know their energy profile: how much energy they use and where it comes from. Compiling an inventory of existing programs, resources, tools, and projects can help a community understand its energy landscape and allows a more comprehensive understanding of these factors to better shape the energy future.

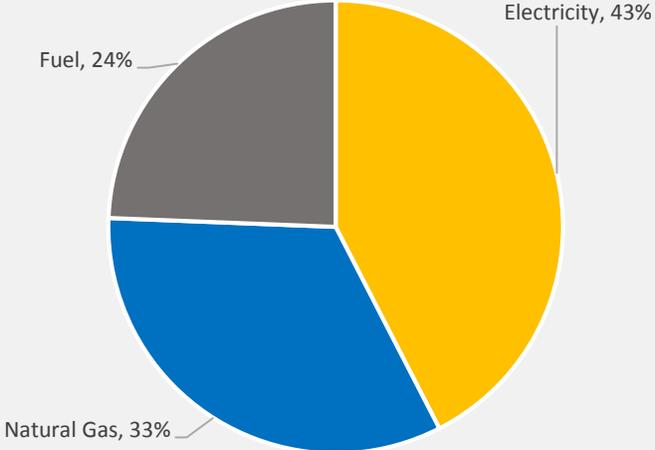
ENERGY USE PROFILE	CLEAN ENERGY RESOURCE	INVENTORY OF EXISTING PROGRAMS
<p>Assess what kind of energy is used and how it is used within city boundaries.</p> <ol style="list-style-type: none">Energy consumption by fuel<ul style="list-style-type: none">ElectricityNatural GasOther fuelsTransportation fuelsEnergy consumption by sector<ul style="list-style-type: none">Commercial & IndustrialResidentialCity OperationsTransportationCarbon intensity of electricity	<p>Determine what clean energy resources are available in your community and how much. Different tools are available to map and calculate solar and wind resources, while energy efficiency can be measured through benchmarking.</p> <p>Understanding these resources and where they exist can help cities set goals and prioritize development opportunities.</p> 	<p>Compile an inventory of existing government, community, and utility programs to help navigate the energy landscape. Programs can include:</p> <ul style="list-style-type: none">Incentives (e.g. Utility Rebate Programs)Technical Assistance (e.g. GESp)Financing Mechanisms (e.g. PACE) <p>Also document city efforts to support clean energy in your community.</p> 

COMMUNITY ENERGY USE PROFILE

GHG Breakdown by Sector
(Tons of CO₂), 2016

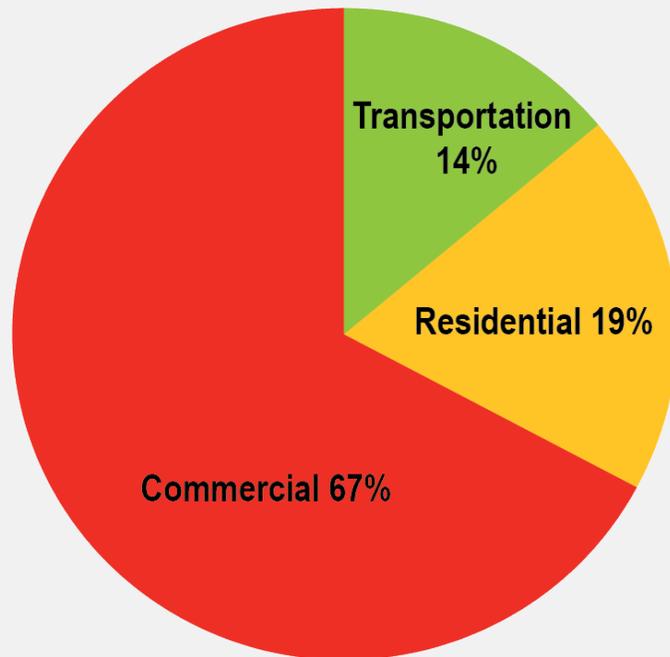


GHG Breakdown by Fuel Type
(Tons of CO₂), 2016

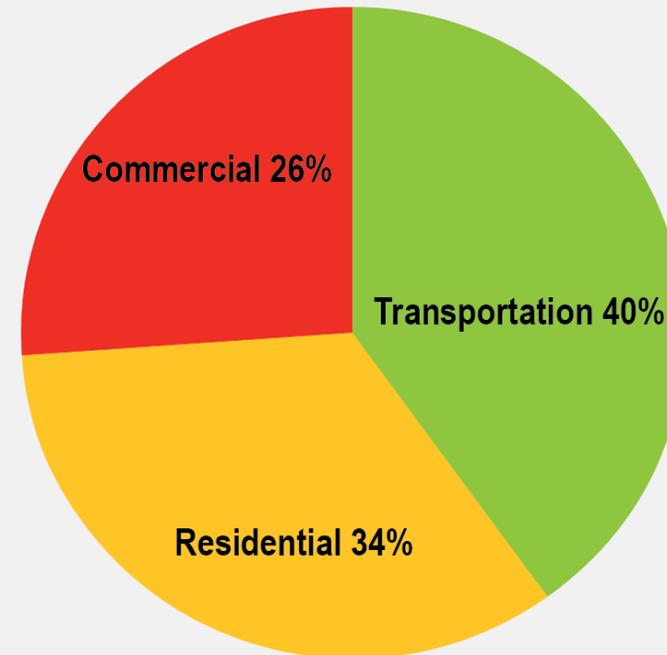


COMMUNITY ENERGY USE PROFILE

Energy profiles of different city types by greenhouse gas emissions



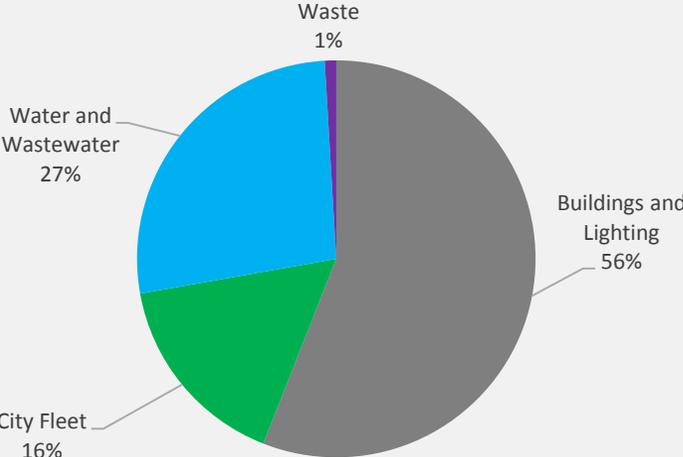
City A: Regional Center, heavy manufacturing



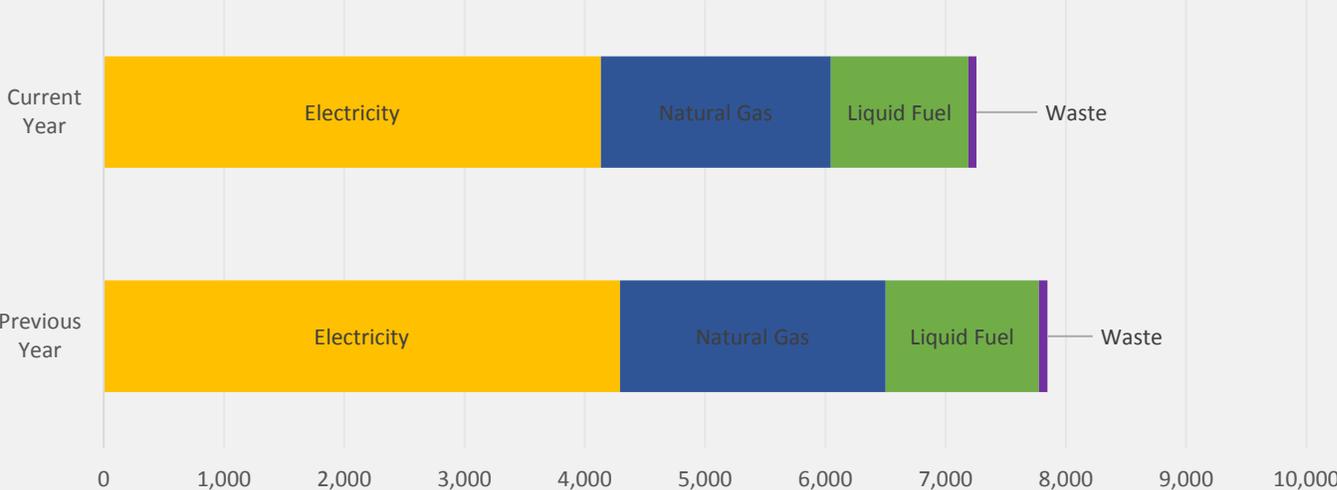
City B: Suburban community, primarily residential

CITY OPERATIONS ENERGY USE PROFILE

City Operations Emissions Summary
Previous Year (Tonnes of CO2)



City Operations Emissions by Energy Type



EXISTING CONDITIONS

CLEAN ENERGY RESOURCES

RESOURCE	WHAT IS IT?	HOW TO FIND IT	HOW TO MEASURE IT
Solar	A city's solar resource includes areas with access to sufficient direct sunlight for the production of energy. It can be found on the ground or on rooftops.	In Minnesota, cities have access to the Solar Suitability App developed by the University of Minnesota, which can help identify the solar resource at a 1 meter resolution.	Solar energy is measured megawatt-hours.
Wind	A city's wind resource includes areas that have access to sustained wind at sufficient speeds to produce energy. A quality wind resource is typically found at 30 meters and higher.	The Minnesota Department of Commerce has developed wind speed maps at 30, 80, and 100 meter heights, which at 500 meter resolution can give a city a general sense of its wind resource.	Wind speed is measured in meter/second at the various heights. A good wind resource is greater than 5 meter/second.
Biofuels	Biofuels are the conversion of organic material (biomass) into energy. The resources can include food and yard waste, tree debris, and other organic material generated in urban areas. These can be used to generate electricity, heat, or transportation fuels.	Because bio resources vary, there is not good information available to know the resource in a given location. Cities should measure organic waste generated within their community and in surrounding areas that they could access.	Biomass is measured in tons. If a community has a bioenergy plant, they would measure generation capacity in MW or cubic feet for biogas.
Efficiency	The existing energy efficiency resource is energy consumption that can be systematically reduced through conservation, more efficient operations and technologies, and systems such as combined heat and power and district energy.	Regional Indicators Initiative provides a community-wide assessment of energy use for electricity, gas, and transportation energy. B3 Benchmarking and Energy Star Portfolio Manager can help public and private buildings benchmark their energy consumption against historical data, national averages, and code-based benchmarks.	Energy efficiency is measured in MMBtu for buildings, and vehicle miles traveled for transportation energy use.

SOLAR RESOURCE

Community	Total Generation Potential	Rooftop Generation Potential	Rooftop Capacity	Top 10 Rooftop Potential
City	5,402,574 MWh/year	111,590 MWh/year	86 MW	30,195 MWh/year

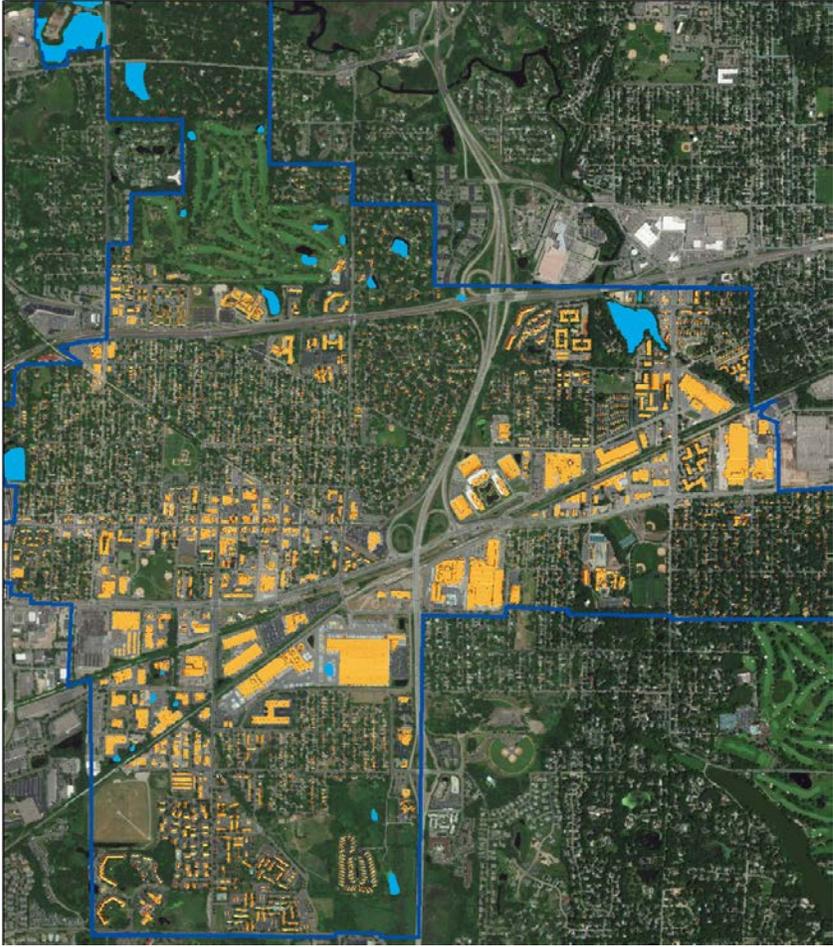


PHOTO CREDIT: MINNESOTA CLEAN ENERGY RESOURCE TEAMS VIA FLICKR

SOLAR RESOURCE

SOLAR ENERGY CALCULATOR

October 2017

City Name: Hopkins

Date: October 16, 2017

User Input

Electricity Use	MMBtu/year	tCO2e/year	Statewide Electricity Goals	MMBtu/year	MWh/year
Total Electricity Use	680,613	72,809	State Solar Goal of 1.5% by 2020	10,209	2,992
Xcel, Connexus (need connexus data)			State Solar Goal of 10% by 2030	68,061	19,948
			25% Renewables by 2025 RES	170,153	49,869

Solar Generation Potential	MW	MWh/year	Local Government Goals
Total Generation Potential	4,156	5,402,574	Renewable Electricity Share <input type="text" value="20"/> %
Total Rooftop Generation Potential	86	111,590	Renewable Electricity Generation 39,895 MWh/year
Top 10 Buildings Generation Potential	23	30,195	Renewable Electricity Capacity (Solar) 30.69 MW
Public Buildings Generation Potential	-		Greenhouse Gas Reduction 14,562 tonnes CO ₂ e

Results



36% of the total rooftop solar resource is utilized, providing enough local renewable electricity to serve the equivalent of 5,253 households and resulting in a 20% reduction in greenhouse gas emissions from electricity use.

Instructions

1. Use Regional Indicators Initiative data to enter electricity consumption and greenhouse gas emissions data under "Electricity Use."
2. Use the Solar Resource Calculation provided by the Metropolitan Council on your Community Page, the Minnesota Solar Suitability App, or Google Project Sunroof to determine your solar resource and enter this into the "Solar Resources" section. Cities may need to conduct further GIS analysis to determine the solar resource of the top 10 buildings and public buildings.
3. Review Minnesota's clean electricity goals in the "Statewide Electricity Goals" section in comparison to your city's solar resource.
4. Set a citywide renewable electricity goal in the "Local Government Goals" section based on your city's solar resource and the statewide goals.
5. View the results.

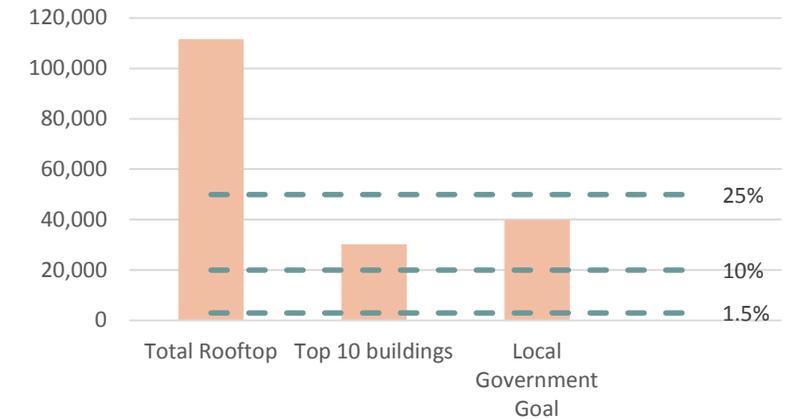
Assumptions

MWh / MMBtu Conversion	0.293	MWh / MMBtu
MMBtu / MWh Conversion	3.412	MMBtu / MWh
Solar MWh/MW Conversion	1,300	MWh / MW
Average Electricity Use per Household	26	MMBtu / year

Resources

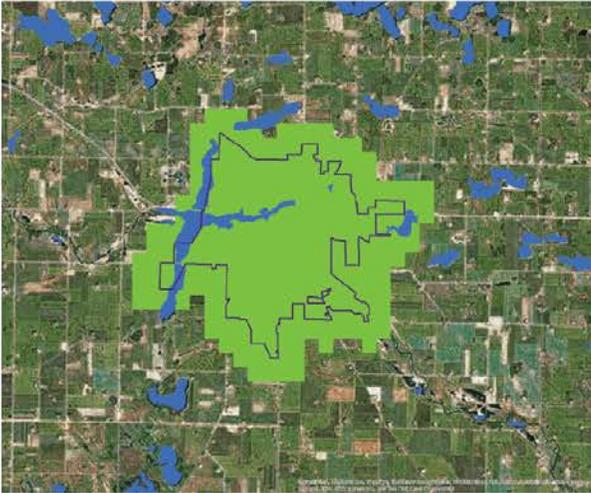
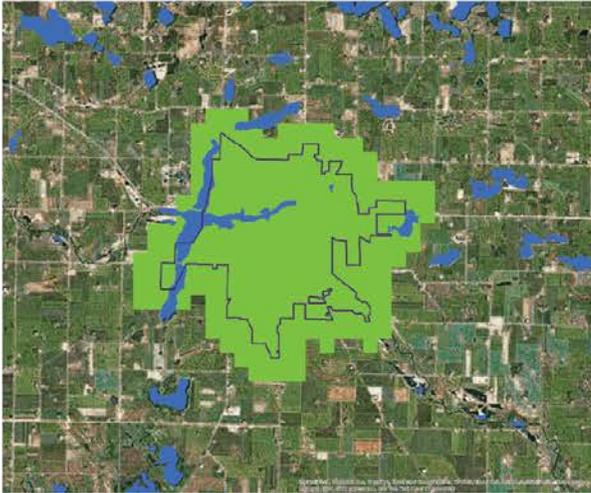
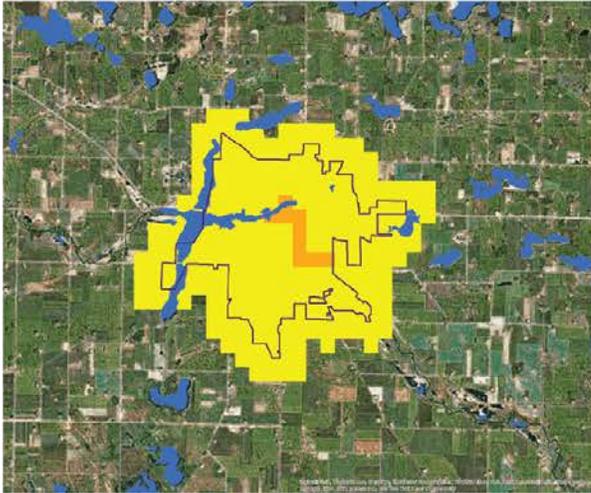
- [Regional Indicators Initiative](#)
- [Met Council Community Page](#)
- [MN Solar Suitability App](#)
- [Google Project Sunroof](#)

Solar Generation Potential (MWh/yr)

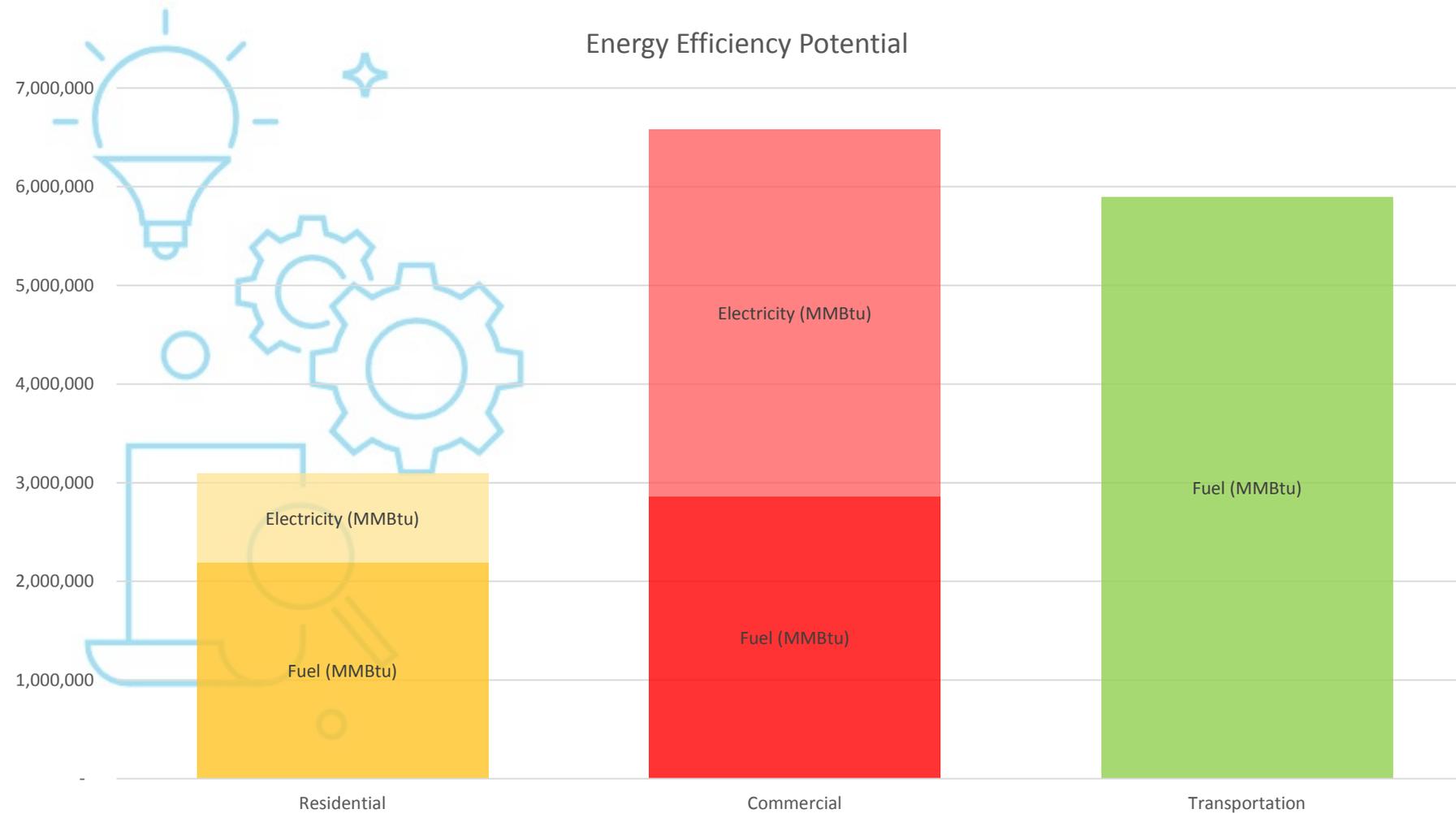


WIND RESOURCE

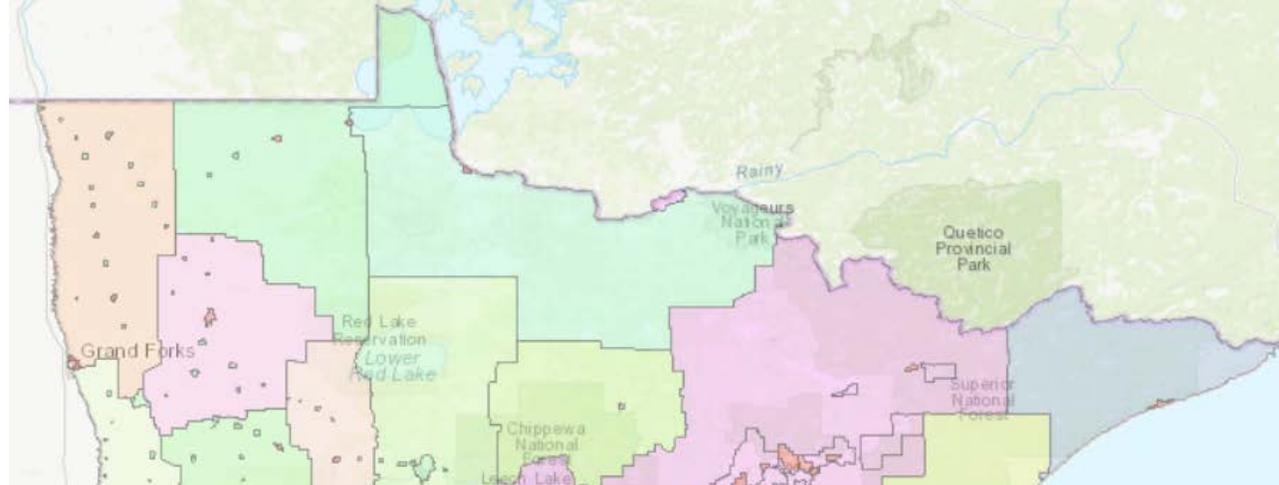
- 6.7-8.9 mph
- 8.9-11.1 mph
- 11.1-13.4 mph
- 13.4-15.6 mph
- +15.6 mph



ENERGY EFFICIENCY



UTILITY



Investor-owned

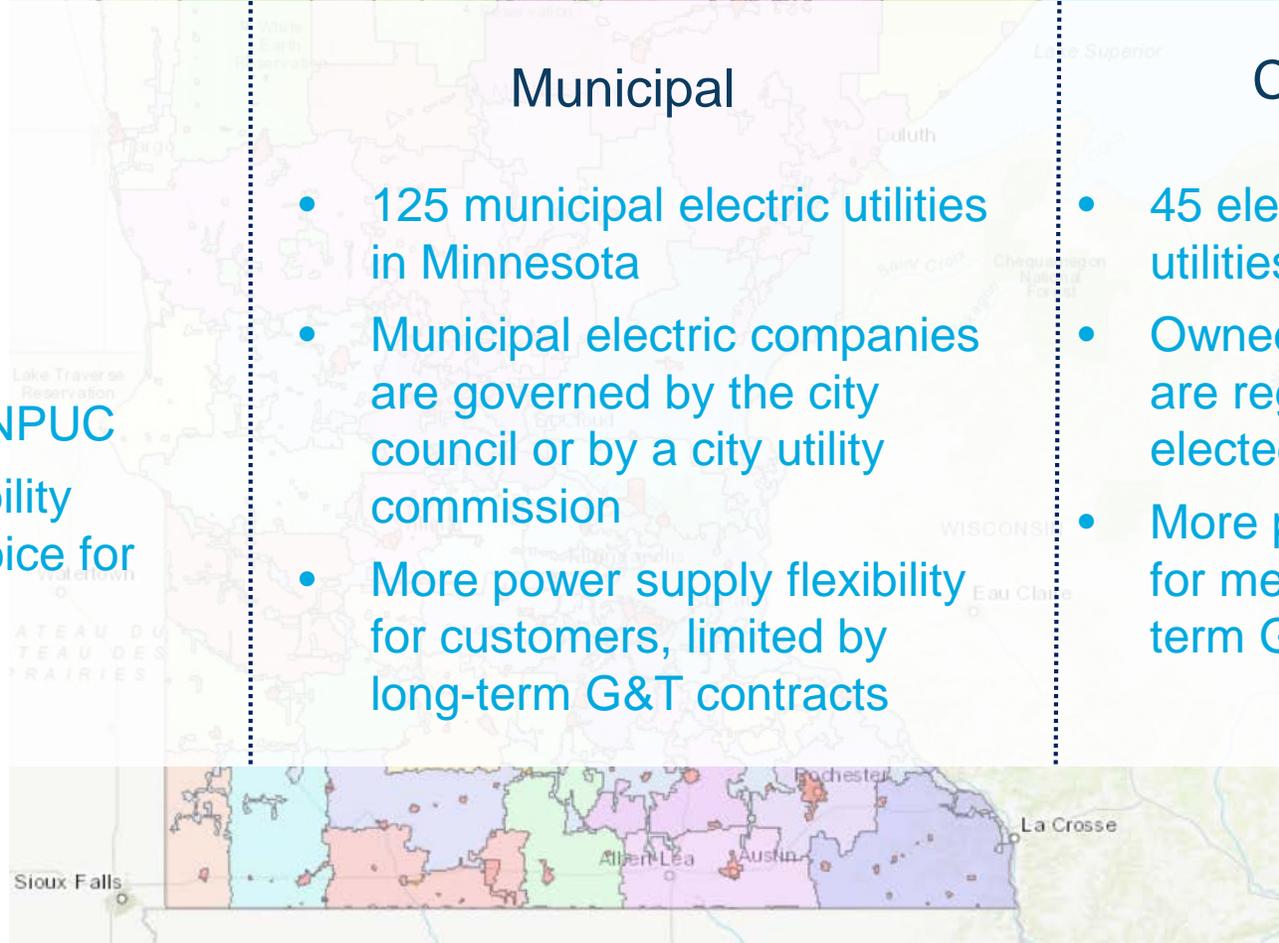
- Xcel Energy
- Otter Tail Power
- Minnesota Power
- Regulated by the MNPUC
- Generally, less flexibility on power supply choice for customers

Municipal

- 125 municipal electric utilities in Minnesota
- Municipal electric companies are governed by the city council or by a city utility commission
- More power supply flexibility for customers, limited by long-term G&T contracts

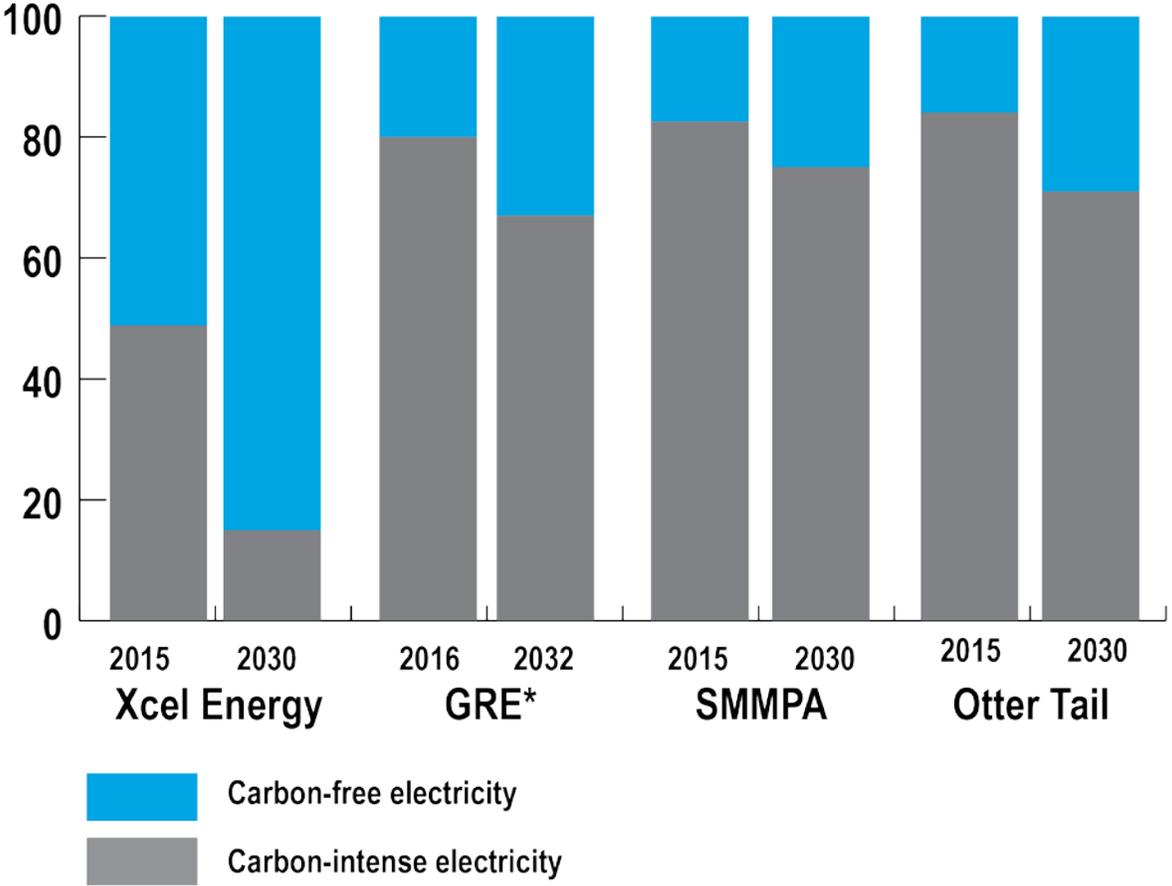
Cooperative

- 45 electric cooperative utilities in Minnesota
- Owned by their members and are regulated by a member-elected board of directors
- More power supply flexibility for members, limited by long-term G&T contracts

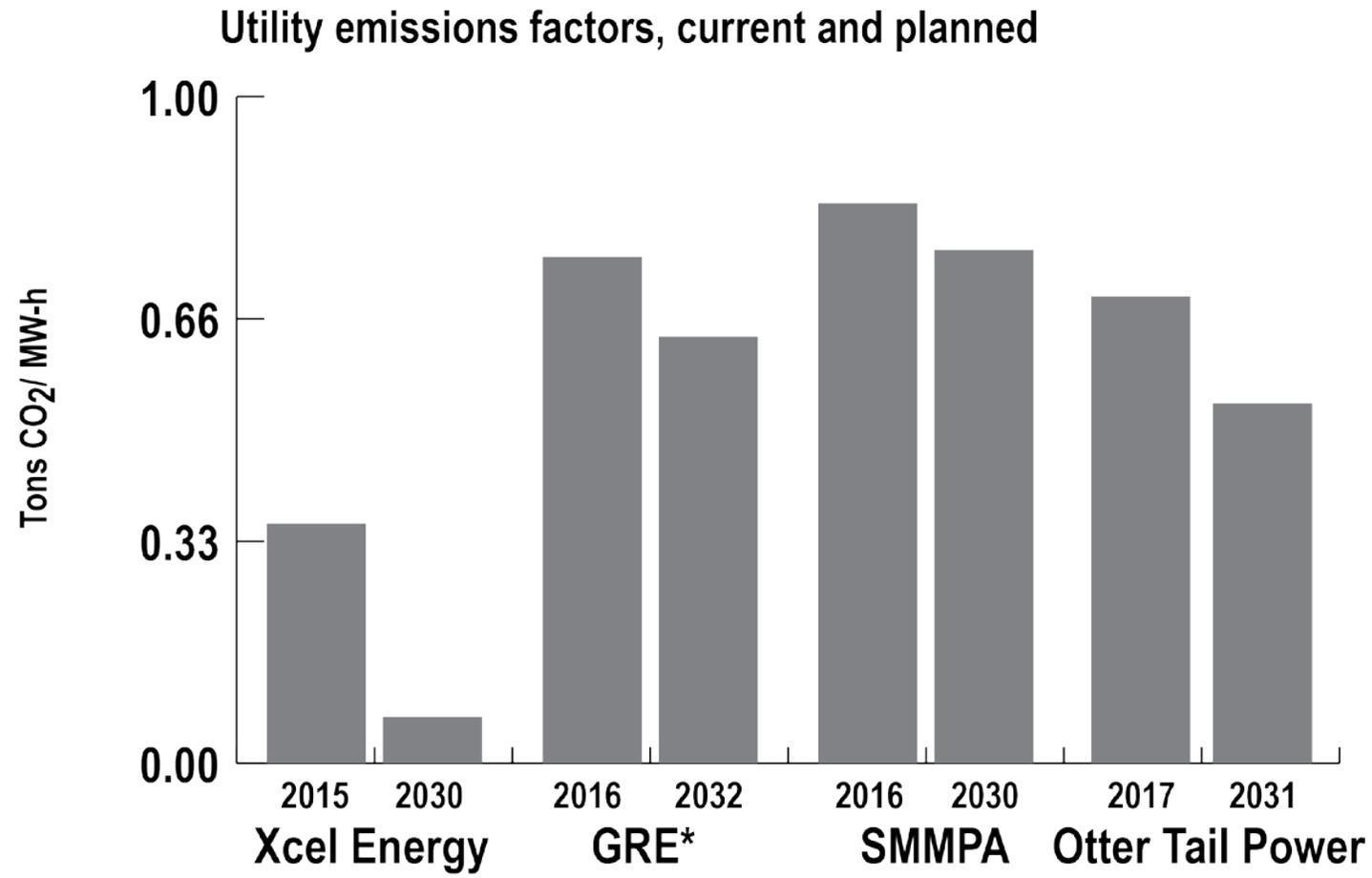


GENERATION MIX

Percent of electricity generated from carbon free energy, current and planned

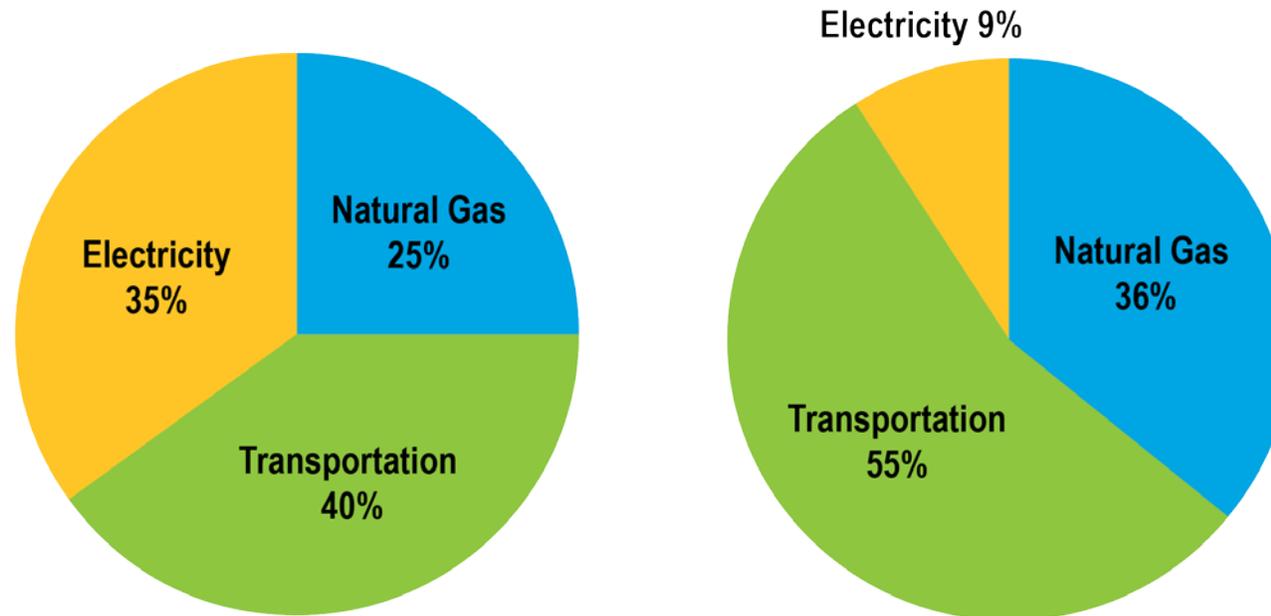


EMISSIONS FACTOR



PLANNED PORTFOLIO

Emissions comparison of Community B in Xcel Territory, current and planned
(Tons of CO2)



SETTING GOALS

STATE GOALS

- Reduce carbon 80% below 2005 levels by 2050
- Achieve 25% renewable electricity by 2025
- 1.5% solar by 2020 mandate
- 10% solar by 2030 goal

MINNEAPOLIS CAP

- Reduce carbon 30% by 2025
- Generate 10% of electricity from local, renewable sources

Alternative Goals (\$, Jobs impact)

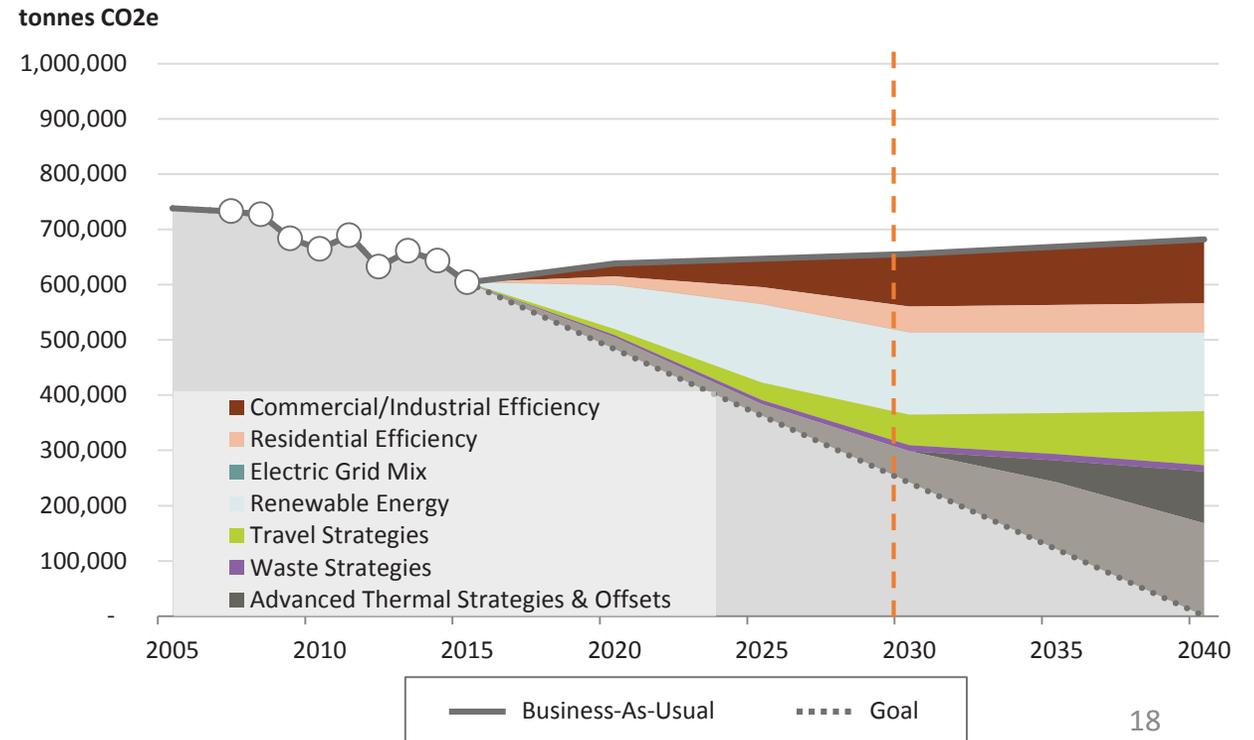
- In boundary solar (wind, efficiency) goal based on resource relative to consumption or rooftop percentage (tie to jobs)
- CSG subscription goal based on population, income, or some other metric

ST. LOUIS PARK CLIMATE ACTION PLAN

100% Renewable electricity
by 2025

Carbon neutral
by 2040

PLANNED EMISSIONS REDUCTIONS BY SECTOR



OPTIONS FOR RENEWABLE ENERGY

- **On-site renewable:**
 - Purchase
 - Finance
 - Lease
- **Community Solar Gardens**
- **Purchase renewable energy credits**
 - WindSource[®]
 - Renewable*Connect[®]
 - REC Market
- **Virtual power plant**



FALCON HEIGHTS – ROOFTOP PPA

ROOFTOP SOLAR ENERGY SYSTEM ON CITY HALL

- Third-party power purchase agreement
- City leases panels with the option to buy
- Allows city to take advantage of tax credit
- 40kW system
- ~60% of total electricity use



PHOTO CREDIT: CITY OF FALCON HEIGHTS

EDINA – ROOFTOP CSG

COMMUNITY SOLAR GARDEN

- 618 kW rooftop community solar garden
- City leases space on rooftop of Public Works and Park Maintenance facility
- 25-year lease
- CSG is fully subscribed with 66 households

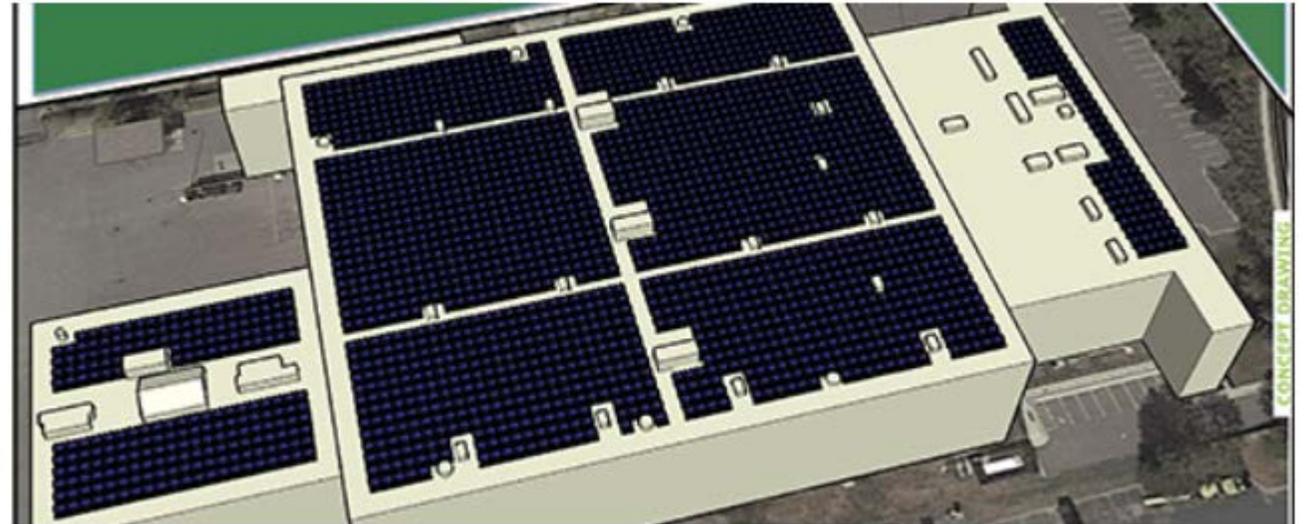


PHOTO CREDIT: CITY OF EDINA

COMMUNITY SOLAR GARDEN

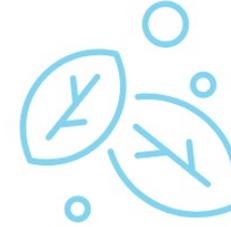
Xcel Energy	Wright-Hennepin
58 projects in operation	4 projects in operation
Total capacity: 211 MW	Total capacity: 370 KW
Most subscribers are residents; only 10% of electricity	85 member participants

Cologne	Woodbury
Subscription equivalent to 100% of electricity use	Subscription equivalent to 30% of electricity use
Annual savings: \$44,000	Annual savings: \$67,000
25-year savings: \$1.1 million	25-year savings: \$1.69 million



RENEWABLE ENERGY CREDITS (RECS)

- Need to own RECs to claim attributes of clean electricity
- Can be purchased through the REC market (TerraPass, clean energy broker)
- Xcel Energy green power purchase:
 - WindSource
 - Renewable*Connect
- Great River Energy
 - WellSpring®
 - Revolt (power your EV with 100% wind energy)



MINNEAPOLIS – PRIVATE SECTOR SOLAR

- **GREEN BUSINESS COST-SHARE SOLAR INCENTIVE**
 - Funded by the franchise fee
 - Up to \$75k available per project
 - \$.25 production incentive for one year of estimated annual production
 - \$.35 production incentive for businesses located in a Green Zone
 - Priorities given to businesses located in Green Zones



PHOTO CREDIT: MINNESOTA CLEAN ENERGY RESOURCE TEAMS VIA FLICKR

STRATEGIES

Accelerate installation of solar energy systems

ENCOURAGEMENT

- Include information about solar energy on city website
- Host solar bulk-buy events
- Provide educational opportunities in public spaces
- Recognize businesses or groups that have installed solar systems or have set renewable electricity goals
- Promote participation in community solar gardens

REGULATION

- Remove regulatory barriers in zoning ordinance; allow rooftop solar as a permitted use in all zones
- Require solar within PUD ordinance or other optional path to basic zoning
- Provide clear and predictable permitting process
- Regulatory incentives from model ordinance

INCENTIVES

- Offer production incentive for solar on small commercial buildings (e.g. Green Business Cost Share)
- Solar or solar-ready is an option with the PUD (or other regulatory flexibility) ordinance
- Host CSG, and dictate terms to benefit residents, businesses, and low-income households

PUBLIC DEMONSTRATION, LEADERSHIP

- Add solar to publicly-owned facilities
- Participate in a community solar garden for city operations
- Purchase RECs to cover remaining usage
- Achieve SolSmart certification
- Install solar on brownfields

RESOURCES

ENERGY USE PROFILE

Regional Indicators Initiative:

Measured energy and emissions data for Minnesota cities

<http://www.regionalindicatorsmn.com>

Xcel Community Energy Reports:

Measured energy, emissions, and program participation data for enrolled cities in Xcel's service territory

https://www.xcelenergy.com/working_with_us/municipalities/community_energy_reports

DOE City Energy Profiles:

Estimated city energy and emissions data for U.S. cities

<https://apps1.eere.energy.gov/sled/#/>

CLEAN ENERGY RESOURCES

Metropolitan Council Community Pages

Solar resource data for communities within the metro region

<https://lphonline.metc.state.mn.us/commportal>

Solar Suitability App:

Map of solar potential in Minnesota

<https://solarapp.gisdata.mn.gov/solarapp/>

Grow Solar Toolkit:

Resources to assist communities in addressing barriers to solar energy installations

http://www.betterenergy.org/sites/default/files/MinnesotaToolkitFeb2018_Award%20Banner_Web%20Version_0.pdf

Minnesota Wind Speed Maps:

Maps of Minnesota wind resource

<https://mn.gov/commerce/industries/energy/technical-assistance/maps.jsp>

ENERGY PLANNING AND ACTION

LoGoPEP Energy Planning Tools

<http://www.regionalindicatorsmn.com/energy-planning>

- A brief guide on how to incorporate energy and/or climate resilience in a city's request for proposals
- An energy planning guide and workbook
- An example analysis of energy existing conditions
- A solar energy calculator to assist in setting solar energy development goals
- A wedge diagram tool for energy and greenhouse gas reduction planning with an associated menu of feasible city actions

GreenStep Cities

Best practices to help cities achieve their sustainability and quality-of-life goals

<https://greenstep.pca.state.mn.us/>

Discussion

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afinis@gpisd.net



**GREAT PLAINS
INSTITUTE**



DMC
Destination Medical Center

In the middle of
EVERYWHERE



Energy Efficiency and Renewable Energy

City of Rochester – Renewable Energy Goals

1. Mayoral Proclamation – 100% renewable by 2031

2. Energy Action Plan

1. Goals

- NextGen Goals
 - 1.5% retail energy savings
 - 25% renewable energy by 2025
 - GHG emissions reduction of 30%-2025 / 80% - 2050

2. Actions

- Generate electricity from renewable resources
- Increase supply side efficiency – utility
- Reduce electric demand through community education and programs
- Increase community power generation – district energy generators
- Expand behind the meter generation – private and public



City of Rochester – Renewable Energy Limitations

1. Rochester is a member of the Southeast Minnesota Municipal Power Association

- Rochester Public Utility (RPU) – local municipal generator is required to purchase electricity at contracted rate of demand (CROD) until 2030
- Municipal facilities can generate but are offered a wholesale electric rate (~\$0.03 / kWh)



City of Rochester – Progress

1. Measurement

- B3 Benchmarking
- Voluntary Energy Benchmarking Program

2. Performance

- Energy Efficiency Projects
 - Guaranteed Energy Savings Program at Recreation Center and Mayo Civic Center
 - MN BioBusiness Center – EBCx light (2017-18)
 - City Hall Existing Building Commissioning (2018-19)
- Energy Management Program
 - Past EDF Interns – personnel, projects
 - 2017 – Project identification
 - EDF Interns in 2018 to focus on larger program financing strategy and implementation



City of Rochester – Progress (cont.)

1. Renewable Development

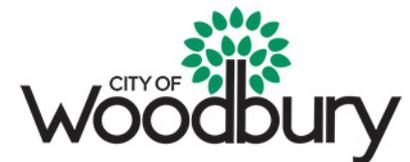
- SolSmart Certification
- Solarize Campaign - 2018
 - Partnership with United Solar Neighbors and community entities
- Community Solar – offered through SMMPA / RPU
 - Residential sign-ups in 2017 for almost 1 MW
 - Commercial likely in 2018
 - Other possibilities?



A Practical Approach for Managing Energy Costs

March 29, 2018

Bob Klatt, Parks and Recreation Director
City of Woodbury



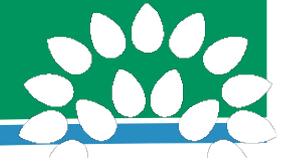
Energy Goals



Goals for city projects:

- Minimize energy costs, and maximize user comfort
- Maintain consistent electrical and gas use, when adding square footage, staff, and equipment.
- Follow the Minnesota B3 standards
- Utilize the Xcel Energy Design Assistance Program, when applicable
- Utilize the B3 database for recommissioning

Minnesota B3 Database



Index Ratio –
The farther the ratio gets above 1.00, the better potential for energy savings through recommissioning

B3 Benchmarking - Microsoft Edge
mn.b3benchmarking.com/Application?v=7.3.1.7311

B3 BENCHMARKING Welcome Eric Gager | Sign Out
Energy Mode | Water Mode | Meter Search

City of Woodbury

SEARCH (All Organizations)
 Demo
 GreenCorps Copy of Woodb...
 Minnesota Public
 City
 Woodbury
 Afton Fire Station
 Bielenberg Sports Cen...
 Central Park
 City Hall
 Eagle Valley Club Hous...
 Fox Run Fire Station
 Public Safety
 Public Works 2300
 Public Works 2301
 Thames Fire Station

SUMMARY | BENCHMARK | PEER COMPARISON | ENERGY STAR | BASELINE | REPORTS | IMPROVEMENTS

The B3 Benchmark is an engineering model that predicts how much energy a site would use if it were built to current energy code. The B3 Rating is a measurement of a site's actual consumption to its predicted benchmark.

(All Energy Sources) | SF Normalize

Actual Meter Total 77.95 kBtu/SF
 Benchmark 115.46 kBtu/SF
 Index Ratio 0.68
 Potential Savings 3,636,000 kBtu/Year | 9% | \$37,000

Actual: 4 stars
 Benchmark: 5 stars

Sites (10 of 10 sites are benchmark-complete)

Site Name	Status	Building Type	Square F...	Actual	Benchmark	Index Ratio	Potential S...	Potential S...	Benchmark Rating
City Hall	✓	City Hall	41,045	93.69	85.36	1.10	868,000	\$11,000	★★★★☆
Afton Fire Station	✓	Fire Station	8,671	125.51	118.02	1.06	318,000	\$2,000	★★★★☆
Fox Run Fire Station	✓	Fire Station	8,671	121.12	117.95	1.03	276,000	\$2,000	★★★★☆
Thames Fire Station	✓	Fire Station	7,591	98.56	118.71	0.83	79,000	\$1,000	★★★★☆
Central Park	✓	Library	92,964	104.36	136.82	0.76	1,671,000	\$10,000	★★★★☆
Bielenberg Sports Ce...	✓	Community/Recr...	187,157	70.51	95.45	0.74	424,000	\$11,000	★★★★☆
Eagle Valley Club Ho...	✓	Park/Recreation	10,744	63.55	89.21	0.71	0	\$0	★★★★☆
Public Safety	✓	Police Facility	66,960	83.12	116.96	0.71	0	\$0	★★★★☆
Public Works 2300	✓	Maintenance Re...	27,268	46.22	169.95	0.27	0	\$0	★★★★★
Public Works 2301	✓	Maintenance Re...	78,086	52.58	136.23	0.39	0	\$0	★★★★★

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City Buildings Recommissioned

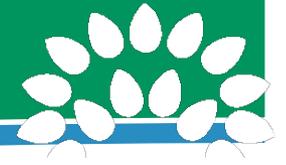


City Hall

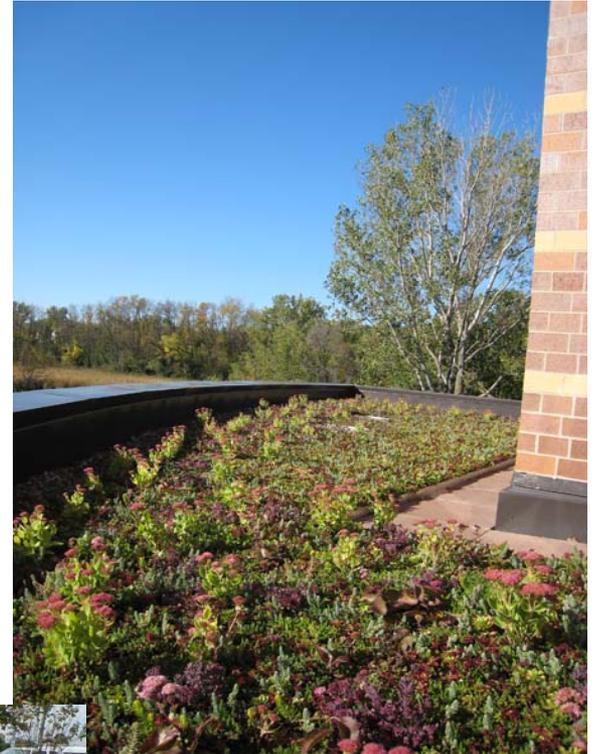
- Energy Star Certified
- 13,841 square foot addition
- Geothermal system
- Energy management system
- South facing glass façade
- Green roof
- Energy efficient lighting and occupancy sensors
- Energy Efficient Boiler



City Hall Stormwater Features



- Green Roof
- Rain gardens
- Grass pave
- Advanced turf
- Porous paver parking stalls



City Buildings Recommissioned

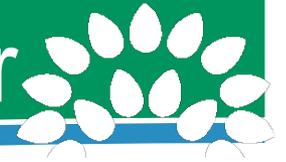


HealthEast Sports Center

- Integrated energy management system
- Geothermal heating and cooling for building and ice arenas
- Solar Thermal
- LED Sports field lighting
- Stormwater reuse for irrigation
- High efficiency pumps and motors



HealthEast RFP for rooftop solar



City staff worked with CERTs to develop an RFP process for evaluating proposals from solar developers.

- City and CERTs staff interviewed five companies
- Finalist selection expected Spring/Summer 2018



City Buildings Recommissioned



Public Safety

- 20,000 square-foot addition to current building
- Parking garage added for up to 57 vehicles
 - Cut down idling time in cold weather
 - First year savings of 7,797 gallons of gasoline with continued annual savings
 - Reduced staff time clearing snow and moving cars



Public Safety Building



- 35.2 kW solar array installed in 2012
- Annual savings of \$3,800/year
- Geothermal heating and cooling system
- Green Roof



City Buildings Recommissioned



Afton and Fox Run Fire Stations

- Energy management system
- LED lights in parking lots and bay areas
- Occupancy sensors
- New VFDs on AHU-1



Community Solar Subscriptions



Geronimo Energy – 7,194,770 kWh (Credits in 2017)

- Estimated annual savings of \$67,000/year
 - **25-year savings of approximately \$1,690,000**

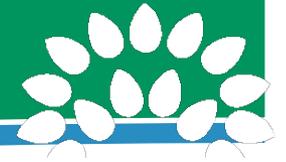
U.S. Solar - 8,500,000 kWh (credits expected in 2018)

- Estimated annual savings of \$80,090/year
 - **25-year savings of approximately \$2,002,256**

Nearly $\frac{3}{4}$ of electricity from City facilities is subscribed to Community Solar!



Efficient City Fleet



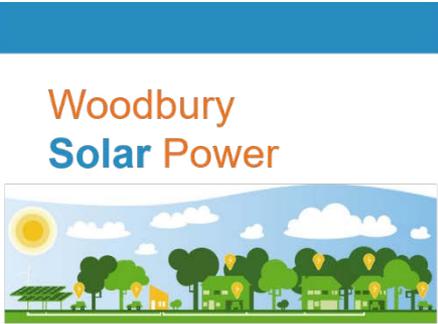
- Two Chevy Volt plug-in hybrids
- Three Ford Fusion hybrids
- Six electric utility carts used by the Parks Department
- Two electric ice re-surfacers



Solar Utility Stuffer



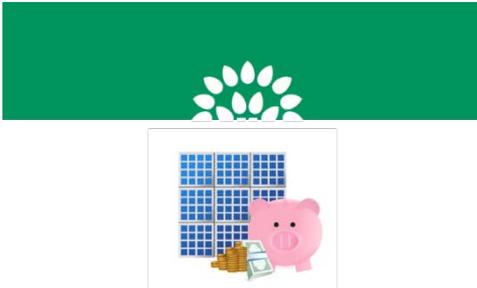
Solar pamphlet sent to all residents in water bill



**Woodbury
Solar Power**

Did you know?

1. Residential solar power has never been more affordable than it is right now.
2. Federal, state and utility incentives can reduce the cost of a system by more than half.
3. Solar systems require minimal maintenance and will usually continue to operate for more than 30 years.
4. Solar currently powers approximately 3,500 homes in Minnesota.
5. Solar power is not the energy of the future, it is the energy of today!



Financial Resources

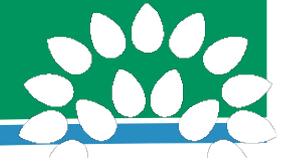
- Federal income tax credit (30 percent of qualified expenditures)
- Made in Minnesota Solar Incentive
- Xcel Energy Solar Rewards Program
- Center for Energy and Environment Solar Financing
- Minnesota solar sales tax exemption
- Woodbury Home Improvement Fund

Woodbury residents are encouraged to check with their homeowners association on rules regarding solar panels.

Find more information and links to the financial resources at www.woodburysolar.com



Woodbury Solar Outreach



Woodbury Solar website: www.woodburysolar.com

Woodbury solar events for residents

Community Solar Garden Workshop & Developer Fair

COMMUNITY SOLAR GARDENS

Solar PV panels are installed in many locations to produce renewable electricity.

Individual entities can subscribe to enough solar to cover up to 100% of their annual electricity usage.

Each subscriber's utility bill is credited with the electricity created by their share of the solar garden.

Wondering what community solar gardens are all about and how one might work for you? Join us at a free workshop to learn more!

DATE & LOCATION
Thu, Oct 27, 7:00-8:30pm
Woodbury City Hall
8301 Valley Creek Rd
Woodbury, MN

AGENDA OVERVIEW

- City of Woodbury welcome & intros
- NEC on energy-saving programs
- CERTs on community solar gardens
- Network with solar developers

DETAILS & RSVP
This free event is open to the public, and friends and family are welcome! RSVP at www.woodburyscg.eventbrite.com

EVENT PARTNERS



Grow Solar Funding provided by Grow Solar, a Midwest partnership to move markets

WOODBURY SOLAR POWER HOUR

Solar Power Your Home, Business, or Farm.
JANUARY 12, 2016

SOLAR POWER HOUR™
THIS FREE ONE-HOUR SEMINAR WILL EDUCATE, HOMEOWNERS, SMALL BUSINESS OWNERS, AND FARMERS ON THE BENEFITS OF SOLAR ENERGY. SOLAR POWER HAS NEVER BEEN MORE AFFORDABLE OR EASIER TO INSTALL. THIS SEMINAR WILL HELP YOU NAVIGATE THE PROCESS OF GOING SOLAR AND HELP YOU UNDERSTAND ALL OPTIONS.

FREE & OPEN TO THE PUBLIC!

HERE'S WHAT WE'LL COVER:

- Basics of a solar photovoltaic (PV) system
- Market trends
- Step-by-step process to determine if solar is right for you
- Economic benefits
- Meet with the highest quality local solar installers

January 12, 2016
7:00 - 8:00 PM

Woodbury City Hall | Woodbury, MN 55125 | 7:00 PM | January 12, 2016
RSVP at WOODBURYSOLAR.EVENTBRIGHT.COM

Power Pack
Building a sustainable solar market

Brought to you by:



In Woodbury

- FREE workshop
- Learn the basics of solar energy
- Hear from a panel of people who have had solar installed on their home or business
- Find out about incentives and rebates for installing solar
- Get resources to start your solar energy project

What: Solar Works in Woodbury Workshop

When: Thursday, March 1, 2012
6:30 to 8:00 p.m.

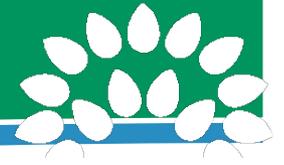
Where: City Council Chambers
Woodbury City Hall

Sponsored by: Metro Clean Energy Resource Team
In partnership with: The Woodbury Environmental Advisory Commission

For more information, contact:
Diana McKeown, Metro Clean Energy Resource Team
dianam@eurekarecycling.org, 612-455-9172



Solar in Woodbury

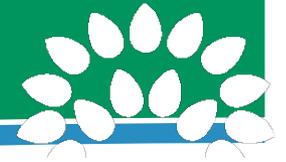


Since 2015...

- 15+ commercial installations
- 30+ residential solar installations
- Public Safety building – 35.2 kW solar array
- HealthEast Sports Center – Solar thermal array

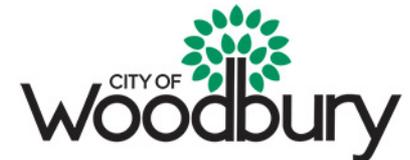


Solar production in Woodbury



Total Solar Production within the City boundary, in addition to community solar gardens in Chisago and Dakota Counties, to which the City is a subscriber.

User /Generator	Generation (kWh)
Commerical Property	321,626
Residential Property	190,738
City Rooftop	52,000
City Community Solar Garden Subscriptions (located in Chisago and Dakots Counties)	7,194,770
Total	7,759,134
Electrical Usage (kWh)	502,947,600.94
Percent of Total	1.54%



Community Solar in Woodbury



GreenMark Solar project in Woodbury

- 3-Megawatt solar garden
- 25-year lease
- 39 acres of property
- Currently zoned R-2, Single Family Estate
- Site will be screened with berming and planting

Questions?



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Sustainability Specialist

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