

Local Government Energy Planning Template Workbook

A tool to help Minnesota communities integrate energy into city planning.

Developed by the Great Plains Institute

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MINNESOTA
LoGoPEP

Energy Planning

What is energy planning?

Energy planning involves thinking about energy as a development resource. Cities can use energy planning to examine how energy is used and what resources are available for development in their community. Energy plans involve inventorying existing conditions, identifying goals, and laying out a plan for action.

Who should use this template?

This template is designed for communities in Minnesota who are either updating their comprehensive plan or have intentions to develop a stand alone energy plan. Communities in the Metropolitan Council seven county area required to update their comprehensive plans every ten years – this template can serve as a guide for metro communities to plan for energy.

How should I use this template?

This template is intended to provide a framework for communities, guiding them through what should be included in an energy plan. However, each community is unique and has different resources available to them and varying goals related to energy. This template should be used as a guide for decision-making, not as prescribed recommendations.

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

A city's energy profile includes a clear assessment of what kind of energy is used and how it is used within its jurisdiction.

1. Energy Consumption by fuel
 - Electricity
 - Natural Gas
 - Other fuels
 - Transportation fuels
2. Energy Consumption by sector
 - Commercial & Industrial
 - Residential
 - City Operations
3. Generation Mix of your electric utility provider

Clean Energy Resource

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.

Understanding these resources and where they exist, can help cities prioritize where to develop them and what goals to set.



Inventory of Existing Programs

Compile an inventory of existing government, community, and utility programs to help navigate the energy landscape. Programs can be:

- **Incentives:**
 - Utility Rebate Programs
- **Technical Assistance:**
 - GESP
- **Financing Mechanisms**
 - PACE

Cities will also want to document everything they are doing related to support clean energy in their community.

Existing Conditions

Energy Use Profile

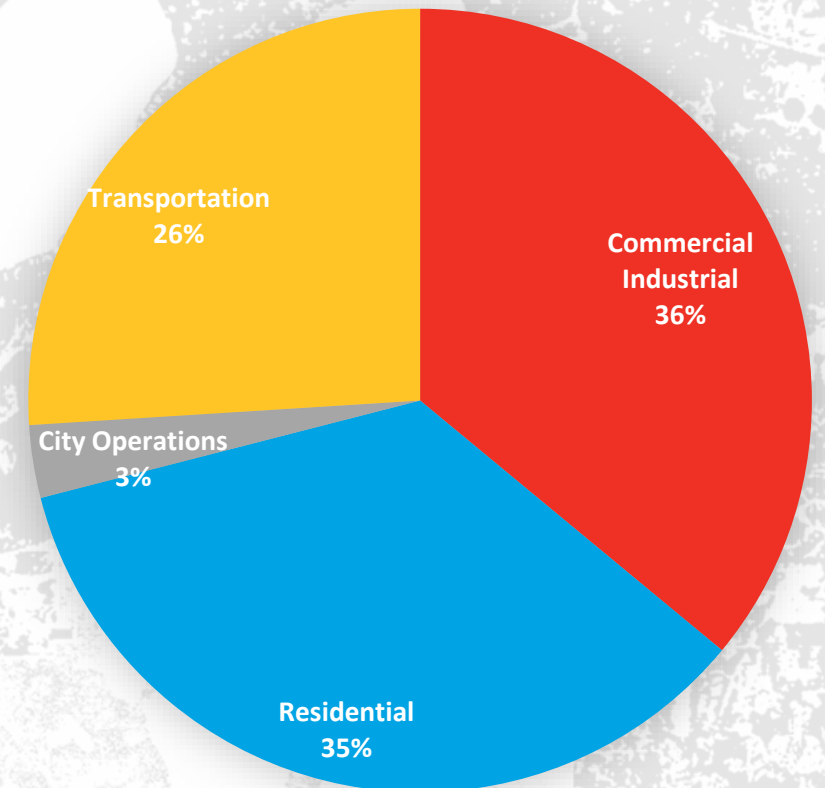
In order to establish a baseline to be able to set goals and measure progress, cities will need to assess their current energy consumption. This is done by gathering data for the Commercial and Industrial, residential, city operations, and transportation sectors. Much of this data can be collected from the Regional Indicators Initiative (**NOTE: city operations is not included as a separate sector & transportation is provided as vehicle miles traveled**).



Sector	MMBtu	GHG (Tons)	% of Total
Residential	1,326,000	101,600	35%
Commercial/Industrial	1,129,000	103,000	36%
City Operations	125,000	10,000	3%
Transportation	N/A	75,000	26%

* These numbers are not real. They are meant to serve as an example.

Greenhouse Gas Emissions By Sector



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 include areas that have access to sustained wind at sufficient speeds to produce energy. 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 create electricity, heat for thermal load, or transportation fuels.	Because bio resources vary, there is not good information available to know the resource in a given location. Cities would need to measure organic waste material in their community and any in surrounding areas that they may have access to.	Biomass is measured in tons. If a community has a bioenergy plant, they would measure in MW or cubic feet for biogas.
Energy Efficiency	The existing energy efficiency resource is energy consumptions that can be systematically reduced through conservation, more efficient operation, and through technology like combined heat and power, or district energy systems.	Regional Indicators provides a community-wide assessment of energy use for electricity, gas, and transportation energy. Understanding the use can help communities understand energy efficiency opportunities. B3 Benchmarking and Energy Star Portfolio manager can help public and private buildings benchmark their energy consumption.	Energy efficiency is measured by MMBtu for buildings, and vehicle miles traveled for transportation energy use.

Existing Conditions

Clean Energy Resources

Using the information on the previous page, cities can collect the appropriate information to get a better sense of their clean energy resources. This information can provide the basis for goal setting and community decision-making around clean energy resources. Cities can prioritize action based on location, opportunity, and support. For resources that need to be sited like solar and wind, communities can use the maps to identify locations for development with minimal land use conflicts. The table below is an example of what a city can use to document its clean energy resources.

Resource	Measure	Prioritize	Identify Potential Issues
Solar	<ol style="list-style-type: none">1. Map the city's resource2. Total rooftop in MWh3. Total practical ground in MWh	Identify at least top sites for potential solar development on public and private buildings as well as public land.	Identify potential land use conflicts that may include: alternative development priorities, agriculture practices, urban forests, etc.
Wind	<ol style="list-style-type: none">1. Map the city's resource2. Identify resources at 30, 80, 100 meter hub heights in meters/second	Use the wind speed maps to determine potential areas for wind energy.	Wind turbines often have to be built at considerable heights; engage community to determine feasibility of wind installations.
Biofuels	<ol style="list-style-type: none">1. Inventory existing organic material waste	Determine the quantity of available organic material waste and the feasibility of using it for electricity and/or heat, or transportation fuel.	Identify barriers and opportunities to use organic waste material for energy purposes.
Energy Efficiency	<ol style="list-style-type: none">1. Benchmark public buildings, kBtu/square foot2. Enter Regional Indicator results for community-wide energy and vehicle miles traveled	Identify poorest performing public buildings and prioritize those for energy improvements. Use energy information to prioritize energy programs for private buildings and transportation.	Efficiency improvements will require various financing mechanisms. Research existing programs and include them in the city's inventory. More information is available on the next page.

Existing Conditions

Energy Calculator

User Input

Energy Use			Clean Energy Goals		
Fuel	MMBtu	GHG	Goal	MMBtu	MWh/yr
Total Electricity Use	664,446	92,744	State Solar Goal of 1.5% by 2020	9,967	2,921
Total Natural Gas Use	1,129,425	63,193	State Solar Goal of 10% by 2030	66,445	19,474
Total Utility Energy Use	1,793,871	155,937	25% Renewables by 2025 RES	166,112	48,684
Solar Resources			GHGs from Energy Use		
	MW	MWh/yr			
Total Solar Resource	909.00	1,182,048	Xcel Generation Mix (Current)	226,540.79	metric tons GHGs
Total Rooftop Solar Resource	113.00	147,067	MISO Electric Grid Mix (Current)	358,008.22	metric tons GHGs
Top 10 buildings Solar Resource	-	-	Xcel Generation Mix (2030)	182,888.74	metric tons GHGs
Public Buildings Resource	-	-			
Transportation			Local Government Goals		
	VMT/yr	GHG			
Transportation	221,560,110	97,089	Renewable Electricity Share	50%	%
City Fleet			Renewable Electricity Generation	97,369	MWh / year
	MPG	GHG	Renewable Electricity Capacity (Solar)	74.90	MW
City Fleet Fuel Economy			Greenhouse Gas Reduction (GHGs, Xcel Mix)	113,270.40	metric tons GHGs
			Greenhouse Gas Reduction (GHGs, MISO Mix)	179,004.11	metric tons GHGs
			VMT Reduction	5%	%
			VMT GHG Reduction	4,854.45	metric tons GHGs

Existing Conditions

Inventory Existing Programs

Federal, state, local, and utility programs and resources can shape how energy technology is used. Familiarity with these policies and programs can help cities determine their energy future. Cities should compile an inventory of existing programs that can be useful in supporting local energy initiatives. Below are a list of various programs available in Minnesota. The table below can be used by cities to create their own inventory.

Energy Source	What	Who	Type	When	Where	Notes
Solar	Solar*Rewards	Xcel Energy	Production Incentive	On-going	Xcel Territory	Incentives available for projects <20kW
Energy Efficiency and Solar	PACE	St. Paul Port Authority	Financing	On-going	In participating counties	Available for commercial properties
Renewables	Investment Tax Credit	Federal Government	Tax Credit	Through 2020	Nationwide	Scales down after 2020, ends 2023
Efficiency	GESP	Commerce	Assistance	On-going	Statewide	Public buildings
Wind	Windsorce®	Xcel Energy	Green Purchasing	On-going	Xcel Territory	Xcel Customers
Solar	Solar Installation	Example City	Installation	May 2012	City Hall	20 kW system

Desired Conditions

Desired conditions are forward-looking aspirations that are determined through a public engagement process to reflect the community's priorities. Using the existing conditions as a baseline, communities can develop goals and policies that are aspirational, yet achievable.

Setting Goals

- Set broad **energy** or **climate protection** goals
- Address specific **energy resources** that are available in your community
- Set **development** goals to improve energy efficiency of new buildings
- Consider specific **technologies**, such as goals for alternative fuel vehicles, and public charging stations.
- Set goals that capture **co-benefits**: improving equity, creating local jobs, and improving habitat or water quality.

Examples of Community Goals

Our community will:

- Reduce **greenhouse gas emissions** to match the State's reduction goals of 30% by 2025 and 80% by 2050.
- Secure 50% of the community's energy from **renewable energy sources** by 2030.
- Identify potential opportunities for **bioenergy** development.
- Install **electric vehicle charging stations** in every public and private parking lot and ramp by 2030.
- Increase participation in utility **energy efficiency** programs for residents so that 80% of homes have made improvements by 2040.

Strategies

Strategies are the tools in the local toolbox that communities use to achieve desired outcomes: programs, regulations, operational procedures, and public investments. The following are examples of the types of strategies cities can include in their comprehensive plans.

Encourage

- Promote Windsource® on city website
- Promote utility rebate programs through city communications
- Encourage net zero energy development
- Engage community in energy goal setting exercise

Regulate

- Require energy efficiency and renewable energy within PUD ordinance
- Adopt an energy benchmarking ordinance
- Remove zoning barriers to renewable energy
- Adopt an energy stretch code (SB 2030)

Incentivize

- Enable PACE financing
- Offer regulatory incentives within zoning
- Expedite permitting for clean energy projects
- Offer technical assistance for private sector developments to incorporate net-zero and or solar-ready designs.

Lead by Example

- Participate in the Guaranteed Energy Savings Program
- Install solar on rooftops of public buildings
- Adopt net-zero energy standards for public facilities
- Sponsor a community solar garden for community residents and businesses