LOCAL GOVERNMENT
ENERGY PLANNING GUIDE
APRIL 2017

MINNESOTA
LoGo
PEP

Prepared by:
Great Plains Institute

ENERGY ACTION IN MINNESOTA

Minnesota's Local Government Project for Energy Planning (LoGoPEP) builds upon existing efforts to engage local governments in committing to actionable strategies for energy and greenhouse gas emission reductions. LoGoPEP provides communities with planning tools and actual results to measure progress toward their goals. This energy planning guide will facilitate the integration of energy planning into local government comprehensive plan updates.

PLANNING FOR ENERGY

Planning for energy at the local level is not commonly practiced, and many local governments are unfamiliar with the planning concepts and best practices. Local governments need to address energy in their comprehensive plan, or as a standalone energy plan for several reasons:

1. Ongoing transformation in energy markets is allowing consumers new options in how they use and even how they might produce energy.
2. Local governments are now understanding that they can influence how the energy system functions in their communities.
3. Climate change requires that carbon emissions be reduced and this necessarily needs to happen at the local level.

Planning for local energy resources, infrastructure, and energy-related development is essential to achieving community goals for growth, change, and development. Energy use and development affect the community's character, economic vitality, and environmental footprint. A community can no more ignore energy in its plan than it can ignore housing, natural resources, or commercial development. A comprehensive plan that does not address energy resources is, today, an incomplete plan.

This guide, along with the Energy Planning Workbook and the LoGoPEP wedge analysis tool, provides a basic framework for addressing energy use, energy resources, and energy development in the comprehensive plan. Cities will need to decide how best to use the document for their purposes. Some cities may wish to integrate energy throughout the plan while others will include it as its own section. Either way, including energy in comprehensive plans uses the same three step approach:

1. Identify Existing Conditions
2. Set Desired Conditions
3. Select and Prioritize Strategies

In the context of energy, this guide, the accompanying workbook, and the wedge analysis tool provide Minnesota communities guidance for addressing resources, consumption, and technologies for each of the three steps:

1. **Categories of energy resources and energy use** found in Minnesota communities and the types of energy development that should be addressed in comprehensive plans.

2. **Examples of desired conditions** (vision and goals) for energy use and development for both the public and the private sector.
3. **Possible strategies** that local governments can use to achieve an energy vision and community energy goals.

Often, communities seek professional services to assist in the development of the Comprehensive Plan update. When developing the RFP, incorporate energy into the scope to ensure you work with a firm with experience and knowledge that align with the community's energy goals. Use the document, Incorporating Energy and Climate Resilience into the City RFP Process, as a guide to include energy-related language in the City's RFP.

Step 1: Identify Your Community's Existing Conditions
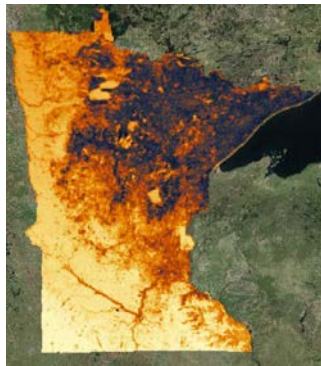
Before setting goals or identifying strategies, communities need to know their existing resources, level of energy consumption, and portfolio of strategies. The Existing Conditions assessment should include an energy profile of the community. The energy profile can identify current energy consumption, type and quantity of local, developable energy resources, and an inventory of existing energy programs and market transformation tools.

What are your energy resources?

Imagine that your community discovered oil and gas reserves within city boundaries. Would it make sense to plan for how those oil and gas reserves would be developed? To enable landowners to develop their energy reserves in a manner consistent with the community's character and desired future?

Minnesota communities are now faced with exactly these questions, albeit not for new oil resources. Distributed energy resources that Minnesota communities need to address in local plans include:

> **Energy Resources**
>
> Fuel or feedstock that can be used to produce energy for use or sales in the market. Minnesota's energy resources include direct sunlight, wind power, organic matter (wood, crops, waste) that can be burned or converted to another fuel, and opportunities to reduce energy or power use and free up for existing energy capacity for new uses.

1. **Solar resources** – areas with access to sufficient direct sunlight for the production of energy
2. **Wind resources** – areas that have access to sustained wind at sufficient speeds to produce energy
3. **Biomass resources** – plants and organic matter that can be converted to useable energy
4. **Efficiency resources** – existing energy consumption that can be systematically reduced

All of these resources are developed or used at the community scale. Property owners will request local building and zoning permits for solar and wind installations. Biomass (solid waste, organics, tree trimmings, agricultural products) is collected, stored generated and used in the community. Building improvements use local contractors, need local permits, and affect local property values when they are improved to incorporate energy efficiency.

Where do you find information on your energy resources?

Solar Energy

The University of Minnesota developed a state-wide solar resources map at a 1-meter resolution that maps solar resources; those areas that have suitable access to direct sunlight for solar energy production. The data is now being maintained by the Department of Commerce. The Metropolitan Council will provide GIS data and additional assistance on quantifying metro-area communities' solar resources. The Minnesota "Solar Suitability App" can be found at: https://solarapp.gisdata.mn.gov/solarapp/.

A. Include a solar resource map of your community in the land use or natural resources section of the Comprehensive Plan.
   o Minnesota Solar App data can be acquired from the Department of Commerce and clipped to your city's footprint. Communities in the metropolitan region will be provided this data by the Metropolitan Council.
B. Identify your community's "solar reserve," including the total (gross) reserve and the rooftop reserve.
   o Calculate the solar reserve on rooftops in your community by clipping the solar data to building footprints. The rooftop reserve will help to identify the buildings with the best solar resource and allow businesses and residents to better understand their solar resource.
   o Use the calculator accompanying the workbook to set realistic goals for how much energy could be generated from rooftop solar in your community.
   o Technical assistance may be available to communities who don't have the GIS ability to conduct their own analysis. Communities in the metropolitan region can obtain this information from the Metropolitan Council. GreenStep Cities can contact the Great Plains Institute.
C. Identify how many existing solar energy installations are in your community, and the total capacity of the installations in kilowatts (KW).

Wind Energy

The Minnesota Department of Commerce has developed wind speed maps at 30, 80, 100 meter heights. These maps have approximately a 500-meter resolution, which in not accurate enough for specific site analysis but does show in broad terms the wind resource in a community. The Department of Commerce can provide GIS

data for communities to use in identifying wind resource areas and the likelihood of wind energy development.

A. Include at least the 30-meter wind energy resource map of your community in the land use or natural resources section of the Comprehensive Plan. For rural communities, consider including the 80-meter wind resource map. This can be downloaded from the Minnesota Department of Commerce.

B. Identify those areas of the community that may have a distributed wind resource (30-meter height). For rural communities, identify if there are utility scale (80-meter height) resources.

C. Identify how many existing wind energy installations are in your community, and the total capacity in kilowatts (KW).
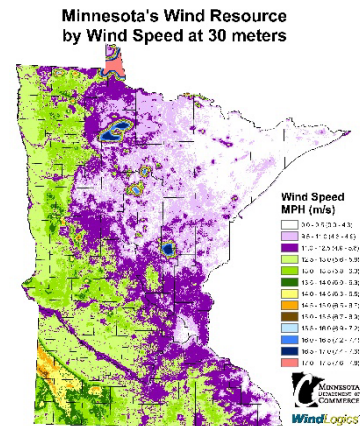
Bioenergy

Biomass or bioenergy resources are quite varied, and sources of information depend on the type of biomass that may be in the community or region. Biomass development opportunities range from agricultural products used to produce ethanol, to the wood waste and tree trimmings to power district energy systems. District Energy St. Paul's combined heat and power plant in downtown Saint Paul uses biomass, produces 33 MW of electricity and 65 MW of heat (http://www.districtenergy.com/technologies/combined-heat-and-power/).

A. Describe the type of biomass resource that exists in your community, and include in the economic competitiveness or public utilities section of the Plan. Examples include agricultural products used for ethanol or biodiesel, agricultural waste products, wood waste.

B. Identify industrial or utility operations that use process heat (potential biomass users).

C. Inventory gas stations that offer E85 or biodiesel, anaerobic digesters in rural communities, or any other business that uses biomass for energy.

Energy Efficiency

The Regional Indicators Initiative (RII) provides a community-wide assessment of energy use (gas and electric) and vehicle transportation energy. Electric and natural gas use are broken into residential, commercial, and industrial categories. The RII also provides total vehicle miles traveled within the community's borders (and the equivalent GHG emissions), allowing the community to evaluate transportation energy efficiency. Communities within Xcel Energy electric service area can request a "community energy report" that will provide customer class breakdowns of electric energy use and participation rates in renewable energy and efficiency programs.

A. Identify total community's total energy use, and energy use broken down into energy types (electric, natural gas, gasoline) in the public utilities or economic competitiveness sections of the Comprehensive Plan.
B. Identify the community's residential, commercial, and industrial energy use for at least electric and natural gas. Include these data in the housing or economic competitiveness sections of the Plan.
C. Develop and include energy efficiency metrics, such as electric energy use per square foot of building space, per job, or per resident, depending on availability of information.
D. Inventory the energy efficiency incentive, financing, or technical assistance programs available to residents and businesses.

Existing Programs

The initial strategies for achieving local energy goals can leverage or co-promote existing programs and incentives. The availability of these programs depends on which energy utilities serve the community, which county the community is in, and what actions the community has already taken. All utilities in Minnesota are required to reduce energy use by 1.5% every year, and have a variety of incentives that local governments can use to capture local efficiency resources. Check with your local utilities, the Minnesota Department of Commerce, and the DSIRE website to inventory local energy programs.

Step 2: Set Your Community's Desired Conditions

Once the community has identified its resource and development existing conditions, the next step is to set desired conditions. Where does the community want to be regarding energy development and use at the end of the 20-year planning horizon? Desired conditions are forward-looking aspirations, informed by a public engagement process, that reflect the community's priorities on particular issues. Using the existing conditions as a baseline, communities should develop goals that are aspirational, yet achievable.

Use the clean energy calculator in the LoGoPEP Energy Planning Workbook and the wedge analysis tool (coming soon) that accompany this document to help set goals for renewable energy and energy efficiency development. The calculator and wedge tool allow cities to input energy consumption and local energy development to determine what they could reasonably achieve through efficiency and clean energy development.

Desired conditions will vary greatly depending on the type of community, the type of local energy resources, and existing energy use patterns. Communities should consider setting energy goals in the following categories:

- Broad energy or climate protection goals
- Goals for specific resource use or development, such as renewable energy resource goals or goals for development of particular resources; solar, wind, biomass, efficiency
- Development or technology-specific goals, such as a goal to increase the use of alternative fuel vehicles or improve multi-family housing energy efficiency

- Energy goals that capture co-benefits of clean energy use: improving equity, creating local jobs, improving habitat or water quality

---

State of Minnesota Energy Goals

Many communities adopt the Minnesota energy or greenhouse gas (GHG) reduction goals. Minnesota has set a mandatory **80% GHG** emission **reduction target** by **2050**, from a 2005 emission baseline.

The **interim 2025 GHG target** is a **30%** reduction, including a 25-30% required renewable energy fuel mix for electric utilities.

For renewable energy, Minnesota set an aspirational solar energy target equal to **10%** of electric retails sales **by 2030**.

Source: MN Dept. of Commerce, MN Pollution Control Agency

What are examples of community desired conditions for energy?

Some examples of desired conditions (goal language) include:

- Reduce the community's greenhouse gas emissions 80% by 2050, from a 2007 baseline, to match the State of Minnesota GHG reduction goals.
- Secure 50% of the community's electric energy from renewable energy sources, including 10% of its electricity from local renewable energy resources.
- Secure 100% of municipal facility electricity from renewable energy sources by 2025.
- Identify the community's potential industrial combined heat and power (CHP) opportunities in existing businesses and proposed industrial sites, and encourage development of CHP in industrial development and large-scale redevelopment efforts
- Increase fuel economy of city vehicle fleet 20% by 2025, and 40% by 2040.
- Make the community "EV-ready" with electric vehicle charging stations in every public and private parking lot or ramp by 2030.
- Substantially increase participation of low- and moderate-income housing, (single- and multi-family) in energy efficiency programs, so that 80% of low- and moderate income buildings having completed deep energy efficiency retrofits 2040.
- Assess critical public facilities for potential for "renewable energy plus storage" installations to improve the resiliency of these facilities.

Step 3: Select and Prioritize Your Community's Strategies

After the community identifies existing conditions and selects desired conditions, the third and final component of including energy in the comprehensive plan is identifying how to get from where you are, to where you want to be.

What are the strategies for realizing your desired goals?

Strategies are the tools in the local toolbox that communities use to achieve desired outcomes: programs, regulations, operational procedures, and public investments. Contrary to common belief, local governments have many opportunities to affect energy use and renewable energy development. Fortunately, local governments don't have to create new kinds of tools; local government merely have to adapt existing tools to energy goals. The following framework provides a decision-making process for understanding and prioritizing local energy strategies:

	Tool Description	Energy Strategy Examples
ENCOURAGEMENT	Public engagement and educational efforts to encourage private sector residents and businesses to take action consistent with the desired goals.	• Co-promotion of utility energy efficiency (EE), renewable energy (RE) incentives • Creation and dissemination of EE/RE educational/promotional materials • Engage community in energy goal setting exercise, such as Xcel's Partners in Energy (PIE) program
INCENTIVES	Financial or regulatory inducements to encourage private sector actions consistent with the desired goals.	• Enabling PACE financing • Regulatory incentives for RE or EE within zoning (such as PUD standards) or economic development programs • Expedited permitting for EE/RE projects • Technical assistance for private sector developments to incorporate Zero-net-energy (ZNE) or solar-ready designs
REGULATION	Zoning, ordinances, licensing, permitting standards that are designed to require actions consistent with the desired goals.	• Energy benchmarking ordinance • Removing zoning barriers to RE, such as rooftop solar, solar gardens, wind energy in rural areas • Adopting energy stretch code (SB 2030) • Require pollinator ground cover on all solar gardens/farms • Use rental licensing to move multi-family buildings into utility EE programs
PUBLIC DEMONSTRATION, LEADERSHIP	Public investment in and demonstration projects using local energy resources	• Participation in GESP • Installing solar on public buildings • Adopting zero-net-energy standards for public facilities • Sponsoring a community solar garden for community residents and businesses