

RESILIENCE | EFFICIENCY | HEALTH

Minnesota GreenStep Cities

MIDWEST ENERGY SOLUTIONS CONFERENCE | FEBRUARY 20, 2019

Abby Finis, Senior Energy Planner
afinis@gpisd.net

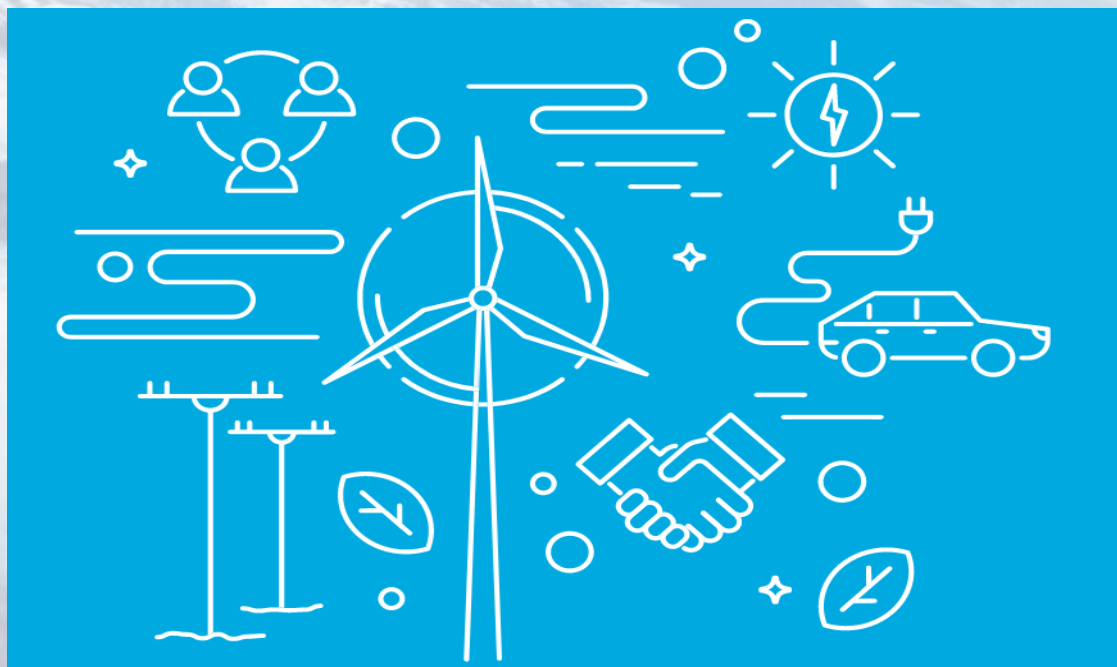


**GREAT PLAINS
INSTITUTE**



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

Presentation Overview

- Minnesota GreenStep Cities background
 - National Network
 - Participation
 - Steps
 - Best Practices
- Energy Programs (RII & PiE)
- Met Council Coordination
- City Example: Golden Valley

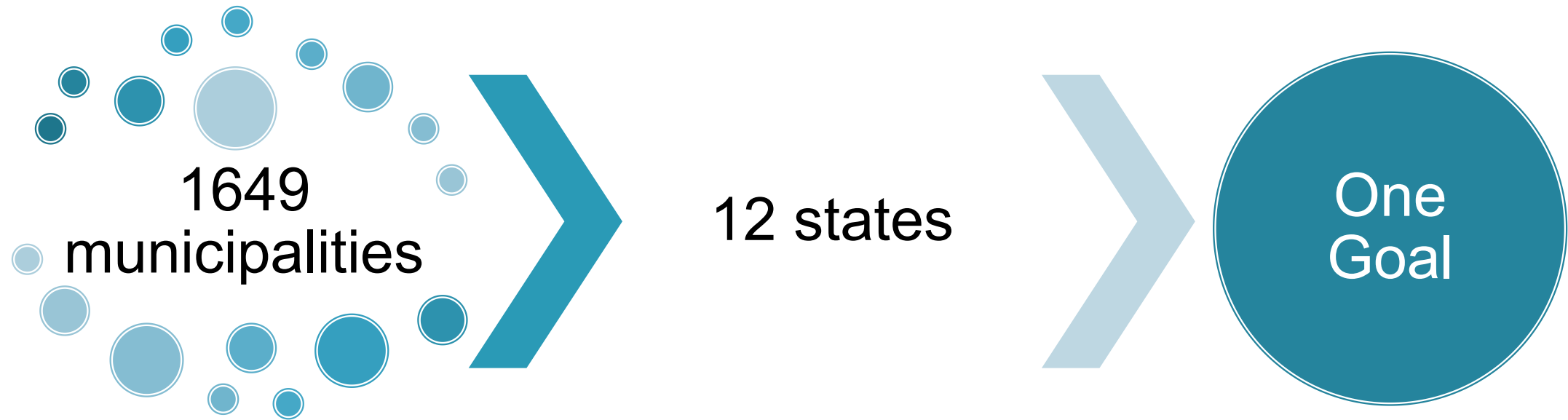




Minnesota GreenStep Cities

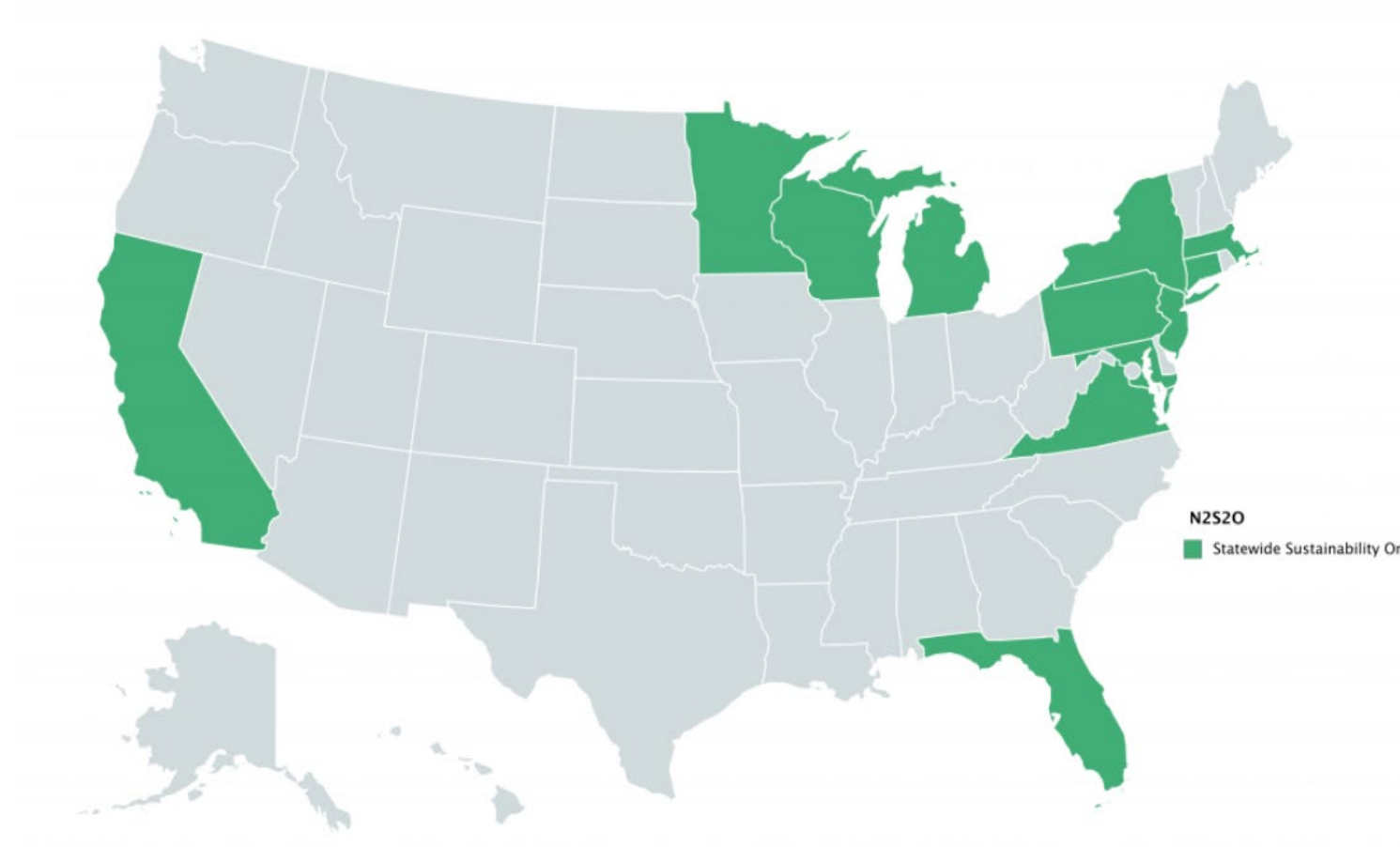
A voluntary challenge, assistance and recognition program to help cities achieve their sustainability and quality-of-life goals.

Sustainable States Network



Through our collective work, our vision is to build a future where sustainability is the norm for every community.

Where We Are



- Florida Green Building Coalition's Green Local Government
- Go Green Virginia
- Green Cities California
- Massachusetts Green Communities
- Minnesota Green Step Cities
- Michigan Green Communities
- New York:
 - Climate Smart Communities
 - Clean Energy Communities
- Sustainable Jersey
- Sustainable Maryland
- Sustainable Pennsylvania
- Sustainable CT
- Wisconsin-Green Tier Legacy Communities

GreenStep Partners

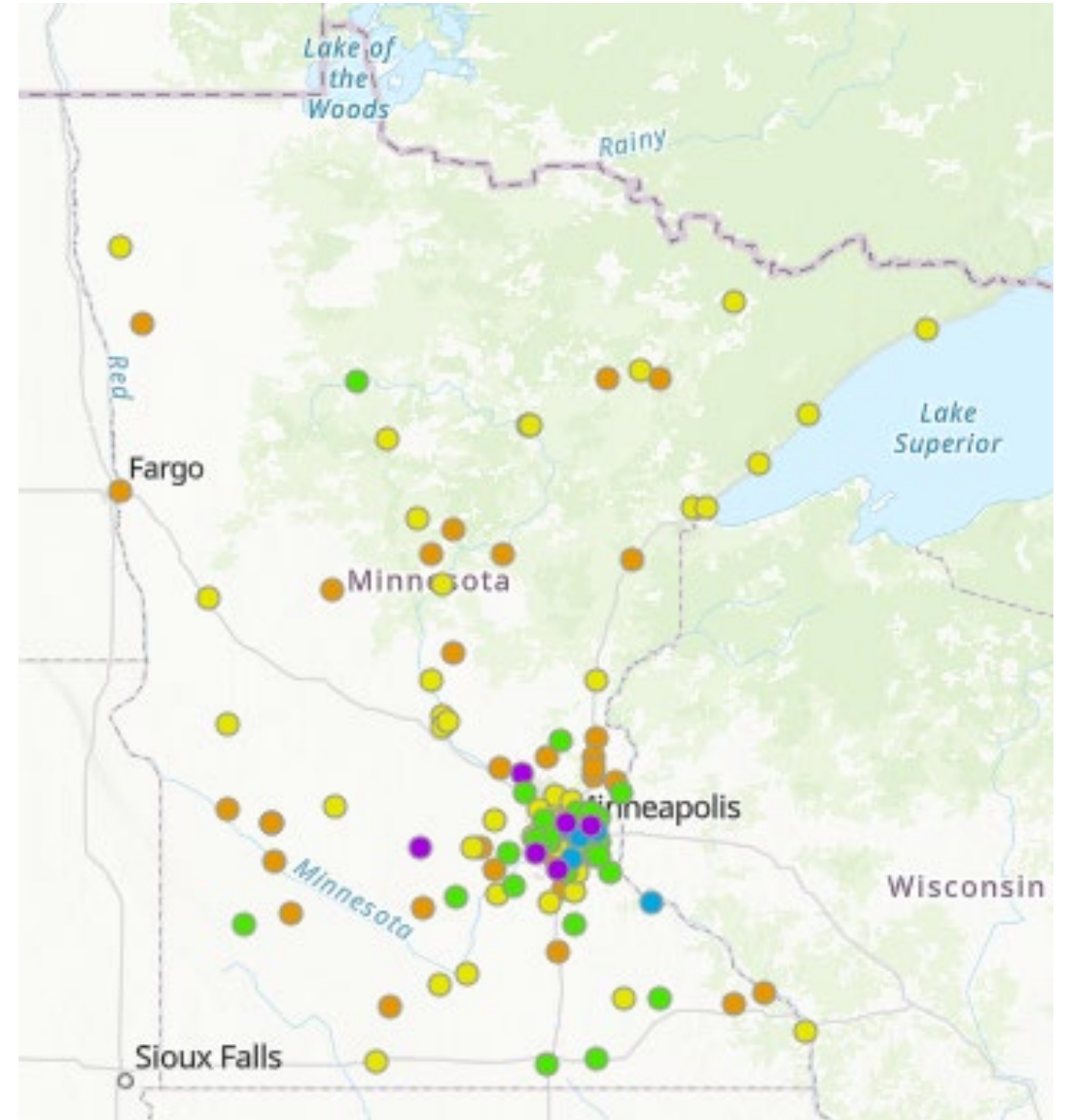


**GREAT PLAINS
INSTITUTE**



Participation Snapshot

- 122 Cities, 3 Tribal Nations
- 45% of MN's population
- Population size: 260 – 300,000
- Urban and rural
- 3,400 best practice actions recorded



Steps: 5 4 3 2 1



Best Practices by Category

Buildings and Lighting

1. Efficient Existing Public Buildings:

Benchmark energy and water usage, identify savings opportunities in consultation with state programs, utilities and others to implement cost-effective energy and sustainability improvements.



2. Efficient Existing Private Buildings:

Provide incentives for energy, water and sustainability improvements in existing buildings/building sites.

3. New Green Buildings: Construct new buildings to meet or qualify under a green building framework.

4. Efficient Outdoor Lighting and Signals: Improve the efficiency and quality of street lighting, traffic signals and outdoor public lighting.

5. Building Redevelopment: Create economic and regulatory incentives for redeveloping and repurposing existing buildings before building new.

Land Use

6. Comprehensive, Climate and Energy Plans:

Build public support and legal validity to long-term infrastructural and regulatory strategy.



7. Resilient City Growth: Increase financial and environmental sustainability by enabling and encouraging walkable housing and commercial land use.

8. Mixed Uses: Develop efficient and healthy land patterns that generate community wealth.

9. Efficient Highway- and Auto-Oriented Development: Adopt commercial development and design standards for auto-oriented development corridors and clusters.

10. Design for Natural Resource Conservation: Adopt development ordinances or processes that protect natural systems and valued community assets.

Transportation

11. Living Streets: Create a network of green complete streets that improves city quality of life and adds value to surrounding properties.



12. Mobility Options: Increase active transportation and alternatives to single-occupancy car travel.

13. Efficient City Fleets: Implement a city fleet investment, operations and maintenance plan.

14. Demand-Side Travel Planning: Implement Travel Demand Management and Transit-Oriented Design in service of a more walkable city.

Environmental Management

15. Sustainable Purchasing: Adopt environmentally preferable purchasing policies and practices.



16. Urban Forests & Soils: Add city tree and plant cover that conserves topsoils and increases community health, wealth, quality of life.

17. Stormwater Management: Minimize the volume of and pollutants in rainwater runoff by maximizing green infrastructure.

18. Parks and Trails: Increase active lifestyles and property values by enhancing the city's green infrastructure.

19. Surface Water: Improve local water bodies to sustain their long-term ecological function and community benefits.

20. Efficient Water and Wastewater Systems: Assess and improve city drinking water and wastewater systems and related facilities.

21. Septic Systems: Implement an environmentally sound management program for decentralized wastewater treatment systems.

22. Solid Waste Prevention and Reduction: Increase waste prevention, reuse and recycling, moving to a more cyclical, biological approach to materials management.

23. Local Air Quality: Prevent generation of local air contaminants to improve community health.

Resilient Economic & Community Development

24. Benchmarks and Community Engagement:

Adopt outcome measures for GreenStep and other city sustainability efforts, and engage community members in ongoing education, dialogue, and campaigns.



25. Green Business Development: Expand a greener, more resilient business sector.

26. Renewable Energy: Remove barriers to and encourage installation of renewable energy generation capacity.

27. Local Food: Strengthen local food and fiber production and access.

28. Business Synergies: Network/cluster businesses to achieve better energy, economic and environmental outcomes.

29. Climate Adaptation and Community Resilience: Plan and prepare for extreme weather, adapt to changing climatic conditions, and foster stronger community connectedness and social and economic vitality.

176 Actions | 29 Best Practices | 5 Categories

Step Achievements

Minnesota GreenStep Cities continues to grow and reach higher levels of achievement.



Steps:

1. Pass resolution to join
2. Report Actions
3. Report additional Actions
4. Report metrics
5. Demonstrate improvement

Efficiency | Health | Resilience

Minnesota GreenStep Cities continues to grow and reach higher levels of achievement.

Buildings and Lighting

1. Efficient Existing Public Buildings:

Benchmark energy and water usage, identify savings opportunities in consultation with state programs, utilities and others to implement cost-effective energy and sustainability improvements.



2. Efficient Existing Private Buildings: Provide incentives for energy, water and sustainability improvements in existing buildings/building sites.

3. New Green Buildings: Construct new buildings to meet or qualify under a green building framework.

4. Efficient Outdoor Lighting and Signals: Improve the efficiency and quality of street lighting, traffic signals and outdoor public lighting.

Step 4 Metrics (Click links to view metric sheets)	Step 5 Eligible Metric Elements Demonstrate improvement in 3 or more metric elements.
1. City Buildings and Lighting (CORE)	1.1 kBtu per square foot, per year 1.4 Percent LED street lights
2. Green Buildings	2.1 Number of city-owned green certified buildings 2.5 Number of private green certified buildings

Efficiency | Health | Resilience

Minnesota GreenStep Cities continues to grow and reach higher levels of achievement.

Climate Adaptation and Community Resilience

no. 29



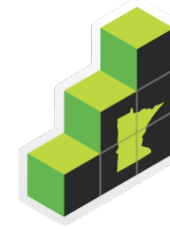
Plan and prepare for extreme weather, adapt to changing climatic conditions, and foster stronger community connectedness and social and economic vitality.

Best Practice Actions [See action tools, guidance, city reports]

1. Prepare to **maintain public health and safety** during extreme weather and climate-change-related events, while also taking a **preventive approach to reduce risk** for community members.
2. Integrate climate resilience into city or tribal **planning, policy, operations, and budgeting** processes.
3. Increase **social connectedness** through engagement, capacity building, public investment, and opportunities for economically vulnerable residents to improve their economic prosperity.
4. Encourage **private sector action** and incentivize investment in preventive approaches that reduce risk and minimize impacts of extreme weather and the changing climate for human health and the built environment.
5. Protect **public buildings and natural/constructed infrastructure** to reduce physical damage and sustain their function during extreme weather events.
6. Reduce the **urban heat** impacts of public buildings, sites, and infrastructure and provide resiliency co-benefits.
7. Protect **water supply and wastewater treatment** facilities to reduce physical damage and sustain their function during extreme weather events.
8. Improve **local energy resilience** by minimizing fuel poverty, installing distributed renewable energy systems, and developing microgrids that can improve energy system resiliency.



GSC is a Platform for Other Programs



Minnesota
GreenStep Cities

GSC a Platform for Other Programs

Partners In Energy



PARTNERS IN ENERGY
An Xcel Energy Community Collaboration

Empowering community energy planning

- **Energy Action Plans**
- **Community Energy Reports**



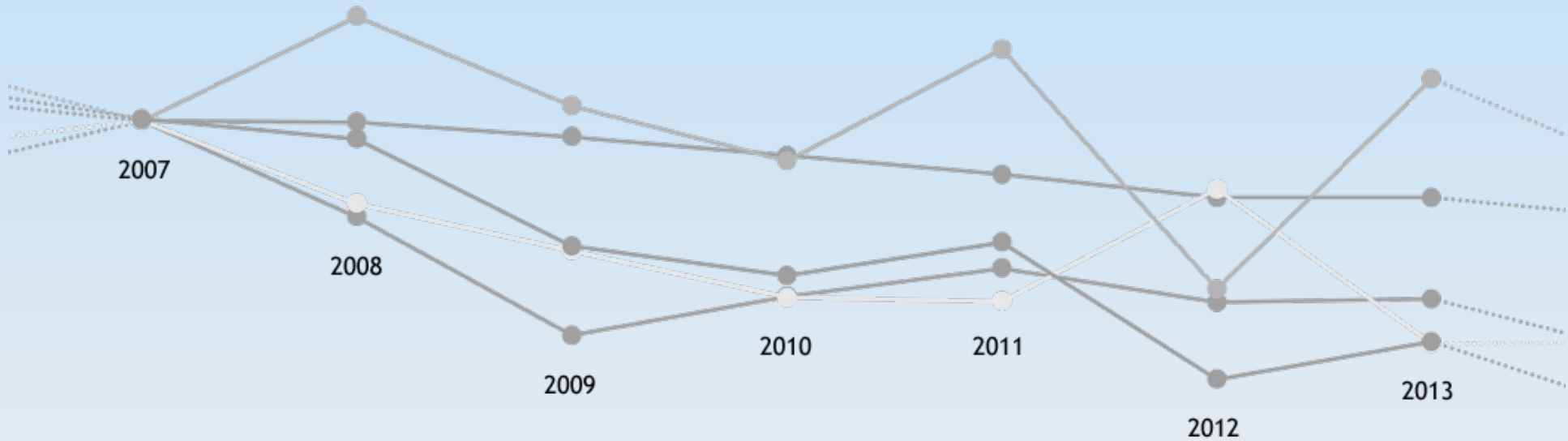


REGIONAL INDICATORS INITIATIVE

City of Northfield



An Inventory of Energy, Potable Water, Travel, Waste, and Greenhouse Gas Emissions from 2007 to 2013.



REGIONAL INDICATORS INITIATIVE



METRICS



ENERGY (IN BTUS): electricity, natural gas, and district energy consumed citywide (subdivided into residential and commercial/industrial)



WATER (IN GALLONS): potable water consumed citywide (subdivided into residential and commercial/industrial)



TRAVEL (IN VEHICLE MILES TRAVELED): on-road distance traveled within city limits



WASTE (IN POUNDS): citywide municipal solid waste managed via recycling, composting, combustion, and landfilling (prorated from countywide data)

COMMON METRICS



GREENHOUSE GAS EMISSIONS (IN TONNES CO₂E): citywide greenhouse gas emissions associated with each of the four indicators



COST (IN DOLLARS): cost estimates associated with each of the four indicators

DEMOGRAPHICS

All data is reported both as a total as well as in units/capita. Residential data is reported in units/household, and Commercial/Industrial data is reported in units/job

AREA

City Area (sf)

WEATHER

Heating Degree Days
Cooling Degree Days
Precipitation (in)



TOOLS AND BEST PRACTICES FOR LOCAL ENERGY PLANNING

- Energy Planning Guide
- Energy Planning Workbook
- Example Goals
- Existing Conditions Reports
- Wedge Diagram Tool

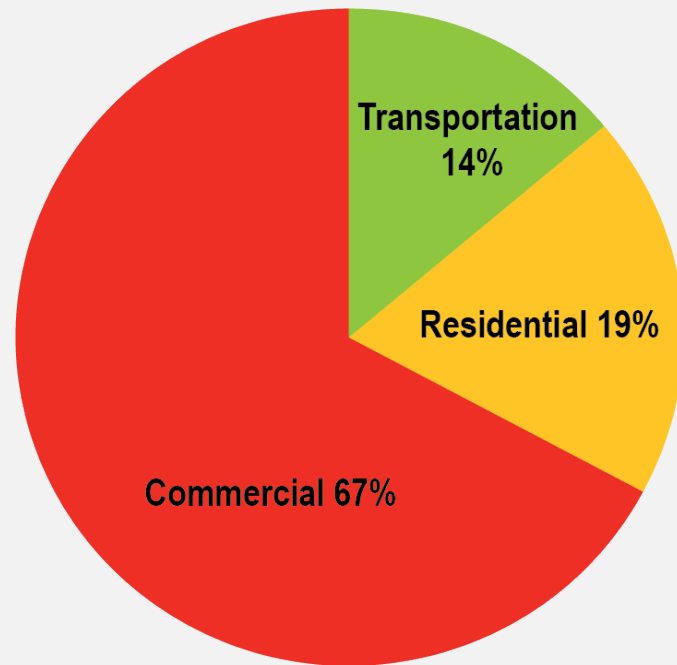
MINNESOTA



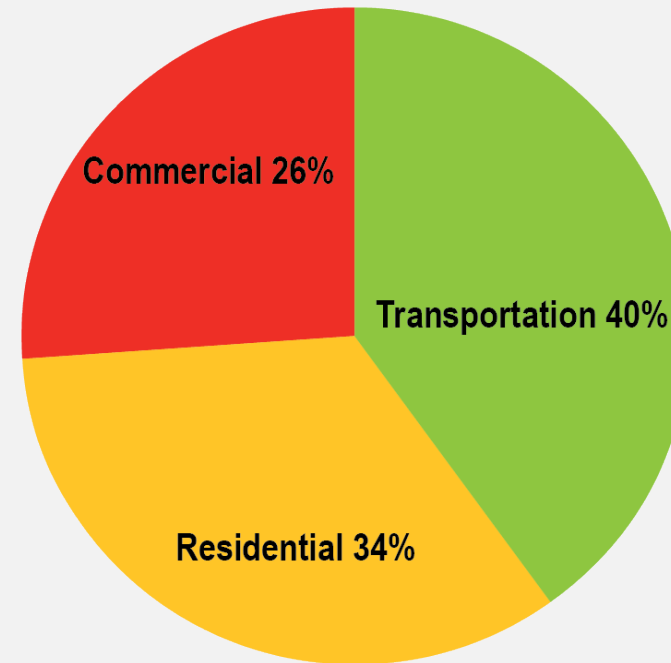
The development of this presentation is supported by the Department of Energy, Office of Energy Efficiency and Renewable Energy (EERE), under Award Number DE- DE-EE0007229. This project was made possible by a grant from the U.S. Department of Energy and the Minnesota Department of Commerce. The team includes LHB, Great Plains Institute, and the University of Minnesota's Energy Transition Lab and Center for Science, Technology, and Environmental Policy.

COMMUNITY ENERGY USE PROFILE

Energy profiles of different city types by greenhouse gas emissions



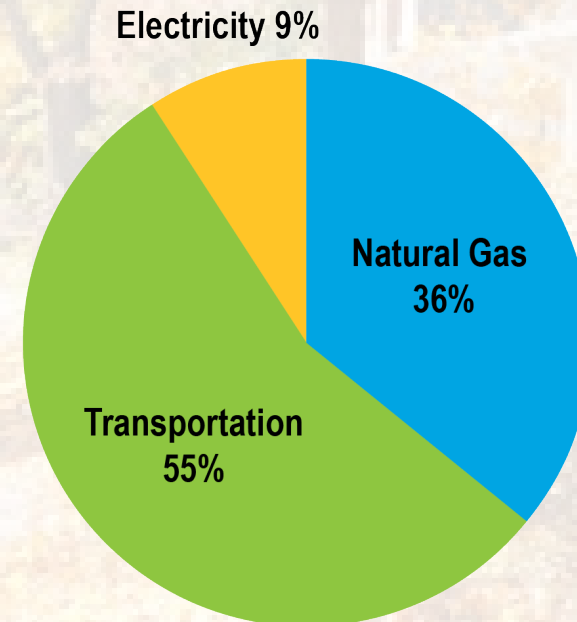
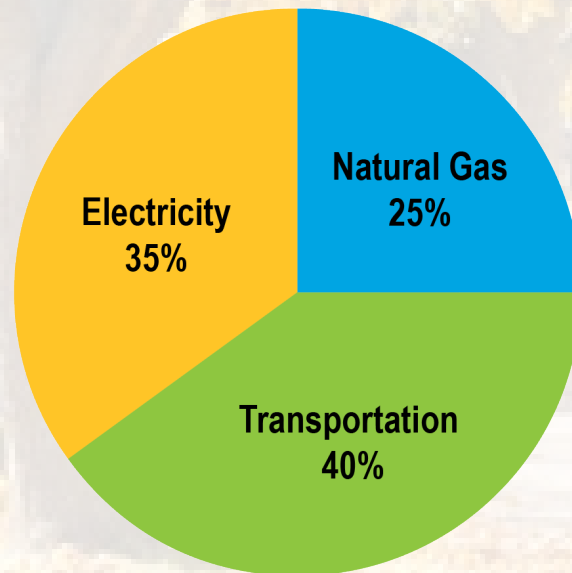
City A: Regional Center, heavy manufacturing



City B: Suburban community, primarily residential

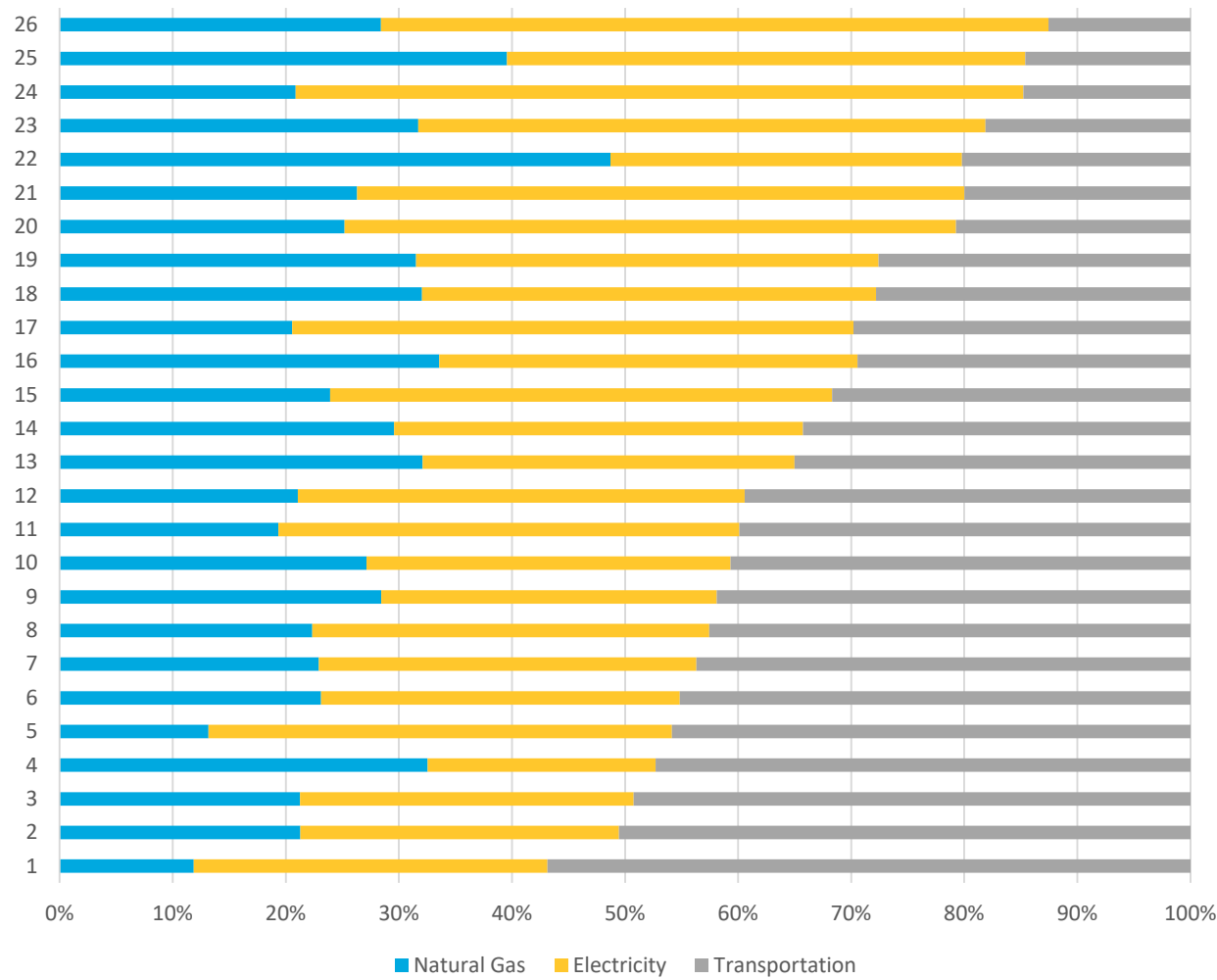
COMMUNITY IMPACT

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

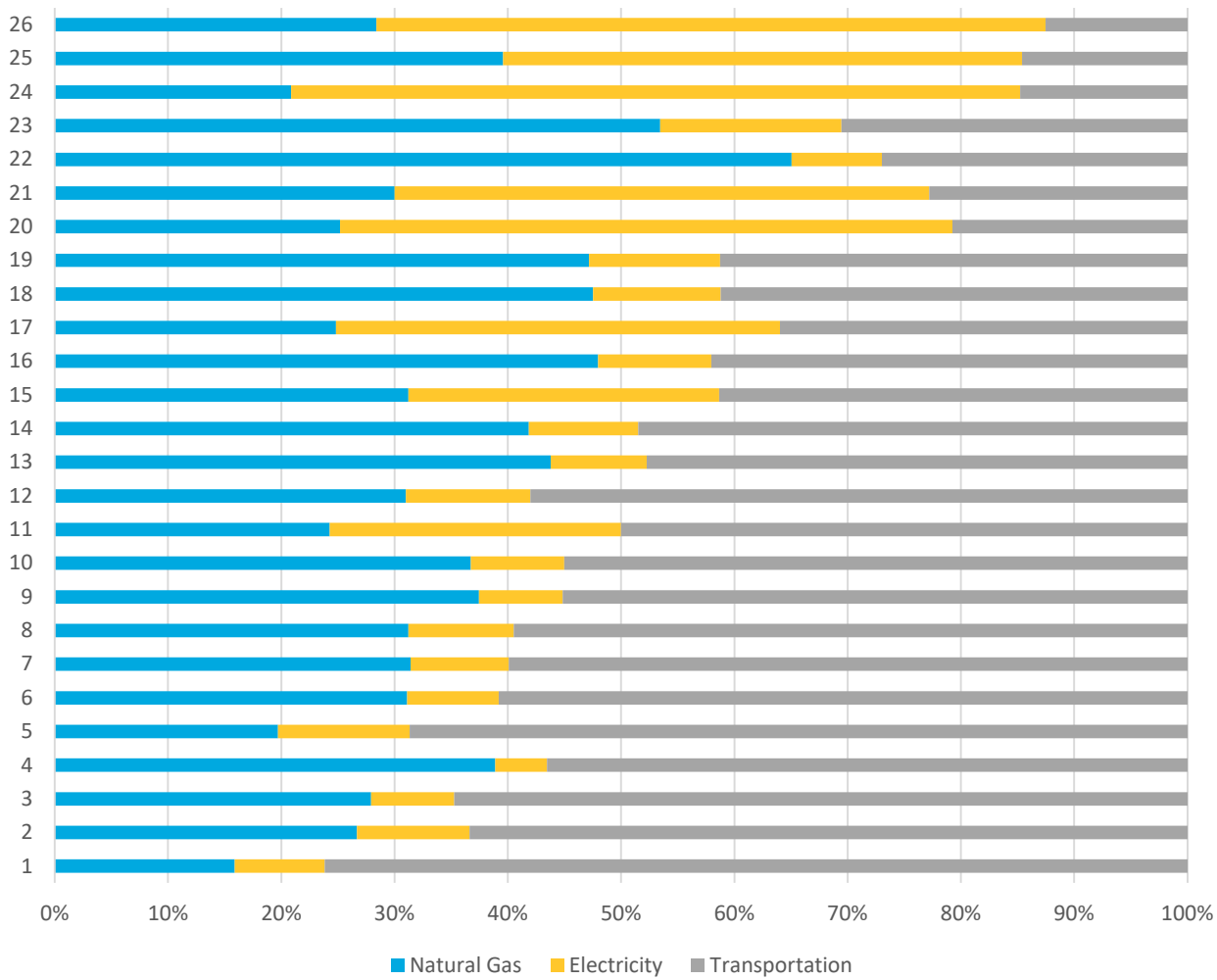


COMMUNITY IMPACT

Emissions by Energy Type, Tons of CO2



2030 Emissions by Energy Type, Tons of CO2



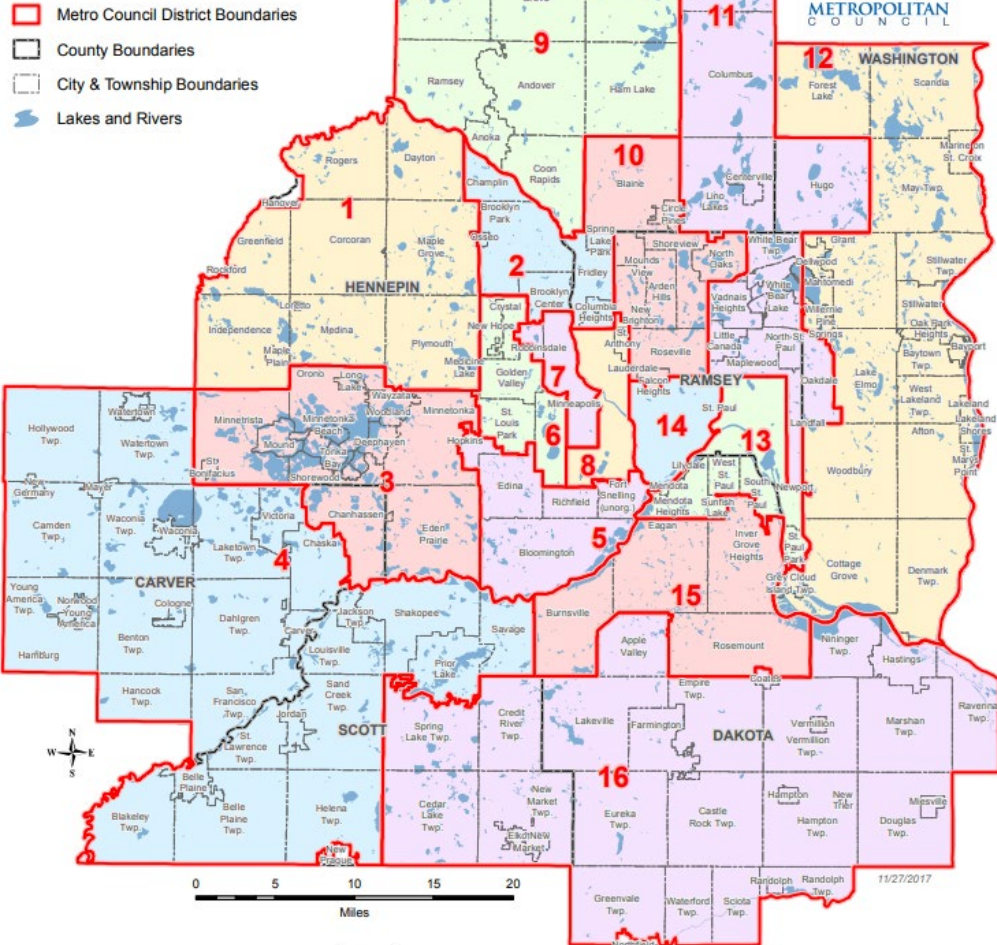
CREATE A TRAJECTORY

WEDGE DIAGRAM TOOL



Metropolitan Council

Metropolitan Council Districts



RESILIENCE

This section provides resources for communities working to integrate strategies into local comprehensive plans to be more resilient in the face of a changing climate. As communities adjust to increasingly extreme weather events, stress on public facilities, and higher costs of services, there is growing need to not only plan for these events, but to also reduce the impacts through conscious climate adaptation and resilience planning. Moreover, resiliency also considers reducing green house gas (GHG) emissions so that the extent of climate change does not exceed the capacity to adapt and become resilient.



Thrive MSP 2040 encourages planning for climate change as part of your comprehensive plan update. Climate **mitigation** strategies such as promoting land use and development patterns will contribute toward achieving Minnesota's adopted greenhouse gas emissions goals. Climate **adaptation** strategies such as recognizing changing rainfall patterns that require additional storm water management capacity acknowledge the new and growing risks associated with climate change.

Not all consequences of climate change are environmental; societal and economic challenges will need to be addressed as well. Resiliency is having the capacity to respond, adapt, and thrive under changing conditions. Consideration of vulnerabilities - and responses to those vulnerabilities - will strengthen your community's ability to prepare for and respond to climate impacts. Resiliency includes planning for more severe weather and prolonged heatwaves, for improved health of your residents, and planning for economic strength and diversity. As you may recognize from these examples, many elements that your community already includes in its plan and in actions it has already undertaken, address some resiliency issues.

Resilience Plan

- ❖ INFRASTRUCTURE & ENVIRONMENT
- ❖ ENERGY INFRASTRUCTURE AND RESOURCES
- ❖ HEALTHY COMMUNITIES
- ❖ ECONOMY & SOCIETY

Resilience Resources



Plan Examples



Fact Sheets



Mapping



FAQs



Best Practices



Forms & Templates

Chapter 7

Resilience And Sustainability

Key Points

-  Golden Valley has many resources to protect and sustain for future generations
-  The community has the capacity to respond, adapt, and thrive under changing and unexpected conditions
-  The age and condition of the City's underground infrastructure is a major vulnerability that will be addressed in coming years
-  There is significant opportunity to reduce energy consumption and waste production

Golden Valley



Promote And Develop Clean, Renewable Energy

Remove barriers and increase renewable energy use to strengthen and diversify the energy grid and mitigate climate-related impacts



Improve Energy Efficiency In Buildings, Lighting, And Infrastructure

Energy efficiency improvements will decrease costs and lower energy-related emissions over time



Plan For Resilient And Sustainable Infrastructure

Ensure the stability and reliability of constructed systems through long-term planning and consideration of weather and climate trends



Increase Community Resilience And Preparedness

Enable communities to withstand and adapt to weather- and climate-related impacts



GreenStep City + Met Council + RII/LoGoPEP + PiE

DISCUSSION

Abby Finis, Senior Energy Planner
afinis@gpisd.net



**GREAT PLAINS
INSTITUTE**