

Northfield Roadmap to Carbon-Free Electricity

September 2021

Climate Action Plan - Our Goals

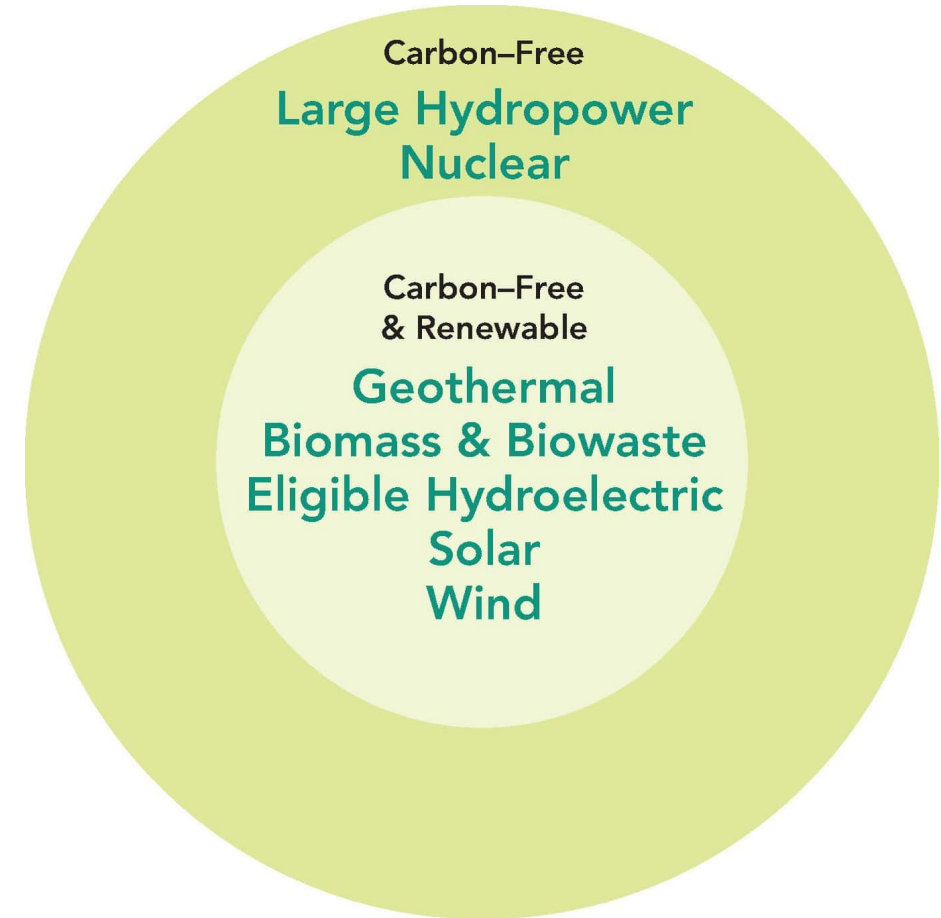
The City of Northfield
is committed to **100%
carbon-free
electricity** by 2030
and being a **100%
carbon-free
community by 2040.**



The Climate Action Plan was adopted by City Council on November 5, 2019

Carbon-free and Renewable

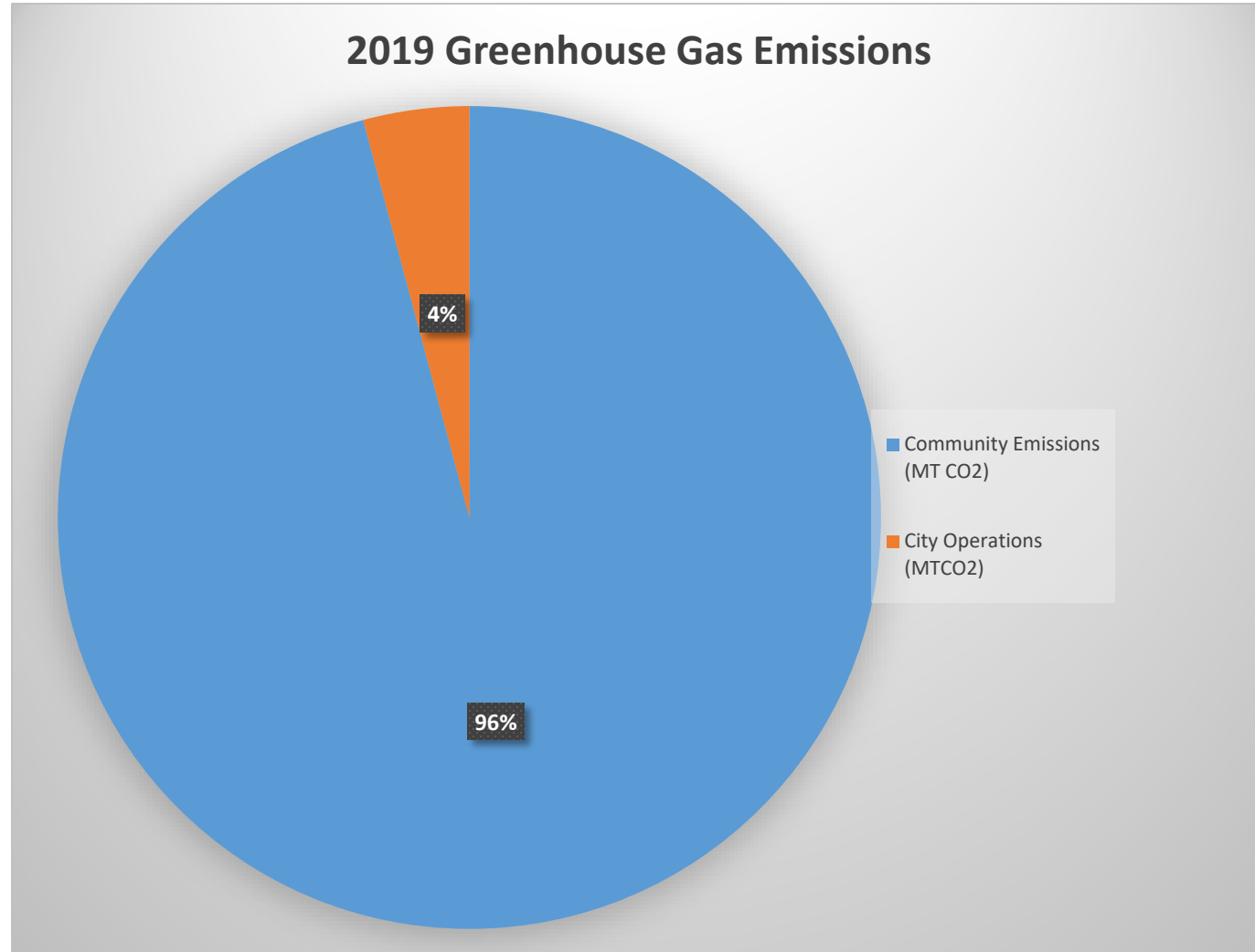
- Carbon-free electricity is produced by a resource that generates no carbon emissions
- Renewable energy is classified as a naturally replenishing resource that produces zero emission.



Role of Large Energy Buyers in Energy Transition

- Demand for clean energy
- Ability & resources to decarbonize energy supplies
- Energy storage and demand flexibility
- Influence transmission and grid upgrades
- Rapid acceleration

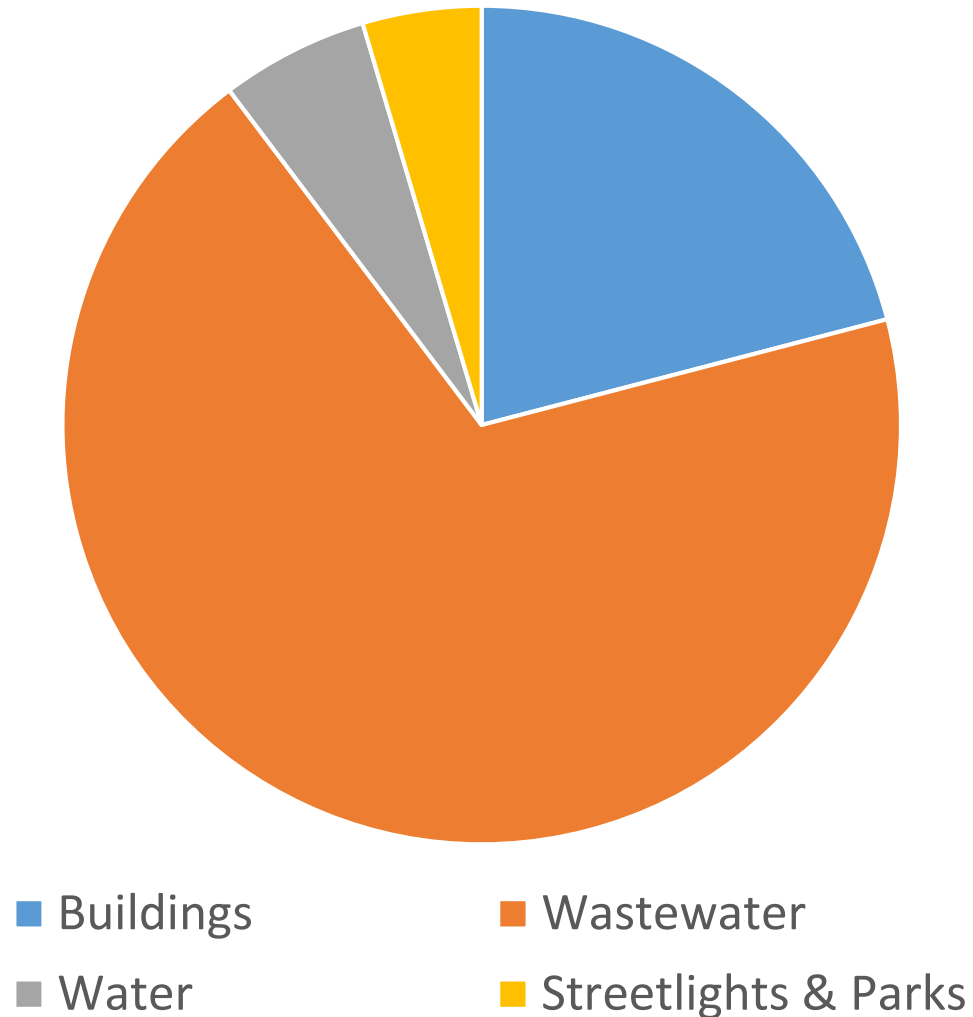
Greenhouse Gas Emissions in Northfield



- Community Emissions = 92,224.98 MT CO2
- City Operations = 3,997.23 MT CO2

2020 Electricity Usage for City Operations

2020 City Operations - Electricity (kWh/Year)



Buildings = 1,047,108 kWh/Yr

Wastewater = 3,439,360 kWh/Yr

Water = 285,021 kWh/Yr

Streetlights & Parks = 229,315 kWh/Yr

Total = 5,000,805 kWh/Yr

**The greenest watt
is the one that
doesn't have to
be produced**



Upcoming Electric Efficiency Efforts

- WWTP
 - Equipment changes as part of facility renovations (2023-24)
- City Hall
 - Lighting convert to LEDs (2022)
 - Variable Frequency Drives (VFDs) on Rooftop Unit (RTU) Fans (over time as need replacing within next 10 years)
- Some miscellaneous lighting and HVAC at other sites (2022- 2024)
- Evaluate Outdoor Pool, Library, and possibly Liquor Store and Ice Arena depending on Facility decisions. (by 2024)

Getting to 100% Carbon-Free Electricity by 2030

- Xcel grid mix
- On-site solar
- On-site wind (not explored yet, site feasibility)
- Green Power Purchase (offsite)
 - Community Solar Gardens
 - Windsource/Renewable Connect (Xcel)
- Battery Storage
- Others TBD



City Community Solar Garden Subscription

- 2018 - City subscribed to the Brase community solar garden in Waseca
- 1,909,113.97 kWh through solar production in 2020
- Approximately 38% of our electricity use for all City operations
- Do not currently own the Renewable Energy Certificates or Credits (RECs) to make the renewable energy claim for this power
- REC purchase needed by 2030



What are RECs?

- Each REC represents 1 megawatt-hour (MWh) of electricity generated and conveys the environmental and social attributes of the generated electricity to consumers.
- We can claim carbon-free energy if we own RECs.
- Based on current CSG we need to purchase ~ 1,909 MWh or RECs
- Cost – it depends on source, \$5/REC?
- Use savings from CSG or on-site solar to purchase
- Future on-site or off-site solar may or may not include depending on financing method and structure
- Purchase RECs that are from new sources of solar/wind (additionality?)

Priorities?

When the City considers options for purchasing electricity for **our operations**, there are some higher level priorities to consider.

Please use paper provided to rank in terms of your priorities

- Reduce carbon emissions as soon as possible
- Lowest total cost (lifetime)
- Low/No upfront costs
- Balance cost with reducing carbon emissions
- Retain RECs
- Predictable cost of electricity
- Visible commitment to renewable energy in community

Priorities for RECs (rank choice on paper)

- Lowest cost (source not a concern)
- Flexibility with commitment (short term vs long term)
- Generated from new sources of clean energy (additionality)
- Generated very locally if possible (projects sited on our grid)
- Generated in MN or Midwest

Supporting 100% carbon-free electricity in community

Grid/Transmission issues

- Policy process – Xcel/PUC
- Battery storage – demonstration sites, coordination with large consumers
- Better monitoring of grid by Xcel?

Clean Energy Transition Options (Nokomis Energy study)

- Phase 1 – Confirm the City's goals, objectives and priorities
- Phase 2 – Assess the Electricity Grid
- Phase 3 – Evaluate the Energy Transition Options and Finalize the Clean Energy Transition Plan
- Phase 4 – Implement the Clean Energy Transition Plan

Next Steps

- Work with consultant on clean energy transition options for community/city operations
- Use options to inform implementation decisions and start to include in budget for the next five year CIP/CEP
- Monitor annually and bring recommendations through budget process
- Participate in PUC Interconnection issues stakeholder process to try to address grid congestion issues
- Continue to explore innovation/demonstration options with large energy consumers and Xcel.