

Climate Change Mitigation Opportunities for Saskatoon

Outlined below are a number of greenhouse gas reduction opportunities that will be refined and examined in more detail in the City of Saskatoon's climate action plan. Additional opportunities may be identified as engagement is conducted with City Divisions, residents, the Industrial, Commercial and Institutional (ICI) sector, and key stakeholders in our community.

This list represents program, policy, pilot and educational initiatives that have been implemented in other jurisdictions, as well as initiatives that are currently being explored by the City of Saskatoon (City). Further details will be provided in the climate action plan in order to support City Council's decision making process on the specific initiatives the City will implement. In particular, the plan will identify which opportunities provide:

- significant impact on emissions;
- cost-effectiveness;
- operational efficiency;
- response to community 'readiness';
- maximize benefits; and
- minimize 'trade-offs' or other negative implications.

The climate action plan will directly outline how Saskatoon can meet its short- and long-term emissions reductions targets through a variety of initiatives, which will require:

- Reducing emissions generated by the City of Saskatoon's operations by 42,500 tonnes of carbon dioxide equivalents (CO₂e) by 2023, plus additional mitigation to offset new greenhouse gases generated by expanded operations;
- Reducing community emissions by 580,000 tonnes by 2023, plus additional mitigation to offset new greenhouse gases generated by growth; and
- Reducing overall emissions in Saskatoon from 3.85 million tonnes to 770,000 tonnes by 2050.

Programs

Programs have the potential to encourage the community to reduce emissions by providing information, service convenience, or incentives. The range of emissions impact varies, with a variety of factors affecting the outcome. For example, approx. 530 tonnes of greenhouse gases can be removed from the residential building sector annually if 15% of homes add a small-scale solar panel system to their rooftops. Additionally, adopting a city-wide organics program that diverts 78,000 tonnes of food and yard waste from landfills is estimated to reduce between 85,000 and 120,600 tonnes annually.

Current & In-Progress Initiatives:

- Continue to offer the Net Metering Program to Saskatoon Light and Power Customers*¹
- Expand the usage of City compost in public parks and new developments
- Storm Water Utility credits for Industrial, Commercial and Institutional (ICI) customers
 - Owners are credited for the equivalent amount of runoff that would be diverted during a storm event, due to the improvement.

¹ An asterisks (*) indicates that the initiative responds to a Saskatchewan Environmental Society recommendation from report CK 375-4 and CP 7540-001 (SPC Environment, Utilities and Corporate Services. January 11, 2016).

- Rain barrel and compost bin rebates
 - The City offers \$20 rebates to Saskatoon residents who purchase a rain barrel or compost bin from a Saskatoon retailer. Each household is eligible for one rebate per item per year.
- Environmental cash grant
 - The City of Saskatoon annually allocates \$20,000 to local non-profit organizations implementing initiatives that relate to the protection of the environment; conservation of natural resources; protection of our water resources; and/or environmental communications, education or research.

Future Opportunities:

- Support solar opportunities*
 - Assistance for solar panels, passive solar design, and solar-ready buildings. Benefits include reductions in heating and cooling loads, water heating, and electricity use, as well as renewable energy generation.
- Encourage ultra-low and zero-emission vehicles*
- Encourage electric vehicle charge stations for residents and businesses
- Carpooling and car sharing programs
- Third-party building certification processes
 - Support local industry to certify local projects through third-party certification programs (e.g. LEED, Passive House, BOMA, Living Building Challenge, SITES).
- Incentivize innovative buildings and new forms of development
- Incentivize energy efficiency measures in residential buildings and ICI facilities
- Provide ICI sector audits and retrofit incentives for energy and water improvements
- Provide residential audits and retrofit incentives for energy and water improvements
- Incentivize indoor water efficient fixtures
- Incentivize outdoor water conservation methods
- Encourage ground source heat pumps (geothermal) and air source heat pumps in buildings
- Encourage replacement of once-through cooling equipment
- Improve storm water incentives for residential and ICI customers
 - A larger storm water credit can drive storm water improvements and there are also opportunities to provide tax reductions for residential customers.
- Expand waste diversion initiatives
 - Phase out the subscription Green Cart program and implement a more efficient city-wide organics program.
 - Continue to offer city-wide residential recycling.
 - Expand public space recycling.
 - Continue to operate the compost depots.
 - Expand household hazardous waste management options.
 - Continue to plan the Curbside Swap program.
 - Continue to support the Home Composting program.
 - Construct Recovery Park.
- Increase the value of the Vacant Lot & Adaptive Re-Use Incentive to stimulate low-impact, dense development
- Provide additional support for community projects through the City of Saskatoon's environmental cash grant

Policy Tools

Policy tools influence emissions by encouraging investment in carbon-friendly solutions (e.g. products, services, approaches) and setting standards and guidelines necessary to achieve emissions reductions goals. For example, if an anti-idling program were developed to reduce idling ten minutes each week, approx. 7,500 tonnes of greenhouse gas emissions could be saved per year for every 200,000 vehicles. This is the equivalent of removing 1,585 vehicles from our roadways and would begin to address emissions resulting from the transportation sector.

In addition to the full evaluation of each policy opportunity, further analysis of policy tools will be done to identify the legal implications and authority of the City in the context of Federal and Provincial Acts and Regulations.

Current & In-Progress Initiatives:

- Tracking emissions for the community and corporation
 - Produce annual GHG inventories in order to monitor emissions reduction progress.
 - Update the community on milestones achieved on reaching the reduction targets.
 - Develop energy intensity maps identifying where energy consumption is highest in the community.
- Complete the development of a Sustainable Building Policy for the City of Saskatoon
- Develop a Community-Wide Solar Strategy
- Brownfield Renewal Strategy
 - Emissions reductions are possible from both the management of contaminated soils and the facilitation of low-impact, dense development.
- Adopt the North Downtown Masterplan, a sustainable infill neighbourhood design
- Incorporate more specific environmental and climate change provisions into the Official Community Plan
- Incorporate more specific environmental and climate change provisions into the City's Environmental Policy (C02-036)
- Design Sustainable Procurement Guidelines to correspond with the Corporate Purchasing Policy (A02-027)
 - The City of Saskatoon is developing new procurement policies, procedures and tools that will include a full range of sustainable purchasing activities and reflect best practices in Canada. Beginning with a new Supplier Code of Conduct and Supplier Leadership Questionnaire, the new policy will apply broadly across the corporation using tools such as Total Cost of Ownership and eco-labelled product specifications.
- Actively enforce the Civic Vehicles Policy (A07-020)
 - This policy includes a section that restricts civic vehicle and equipment idling after more than three consecutive minutes, between -5 and 27 degrees Celsius (°C).
- Create stronger development guidelines to correspond with the Wetland Policy (C09-041)
 - This policy provides guidance to landowners, developers and municipal staff on achieving responsible integration of wetlands into the urban environment.
- Continue to create new land use planning policies through the Growth Plan to decrease reliance on automobiles and maximize efficiency of public services
 - Adopt and implement development patterns that utilize existing infrastructure, enhance non-automobile transportation, and reduce the need for new roads, utilities, and other public works.
- Continue to create improvements to transit under the Growth Plan

- Improvements could include more bus frequency, lower bus fares, better snow maintenance around bus shelters, a system that gets people to their destination more efficiently, new development standards that support the transit system and infrastructure, programs to increase safety and accessibility, expanded bus rapid transit (and/or light rail) systems, higher transit ridership targets*, and earlier bus rapid transit targets*.
- Implement traffic and roadway management strategies to improve mobility and efficiency, and reduce associated emissions
- Prioritize active transportation infrastructure and implementation of the Active Transportation Plan
 - Set higher targets for active transportation*, develop comprehensive bicycle and pedestrian networks, preserve neighbourhood characteristics that encourage active forms of transportation, and create educational programs to improve attitudes and perceptions towards active transportation (i.e. regarding sense of safety, convenience, road rules).
- Work with Regional Partners to identify environmental partnership opportunities
 - Develop integrated plans in the areas of transportation, green infrastructure, climate mitigation and adaptation, building and construction, amongst others.
- Study the environmental benefits that could result from the Employment Areas Study
 - The relationship between where people live and work can have significant impacts on land use and transportation patterns, including the number of automobile, pedestrian, cycling, and transit trips. This study includes a number of policy recommendations centered on achieving employment areas that are well-designed, located closer to where people live, accessible by all transportation modes, and maintain a strong City Centre.
- Ensure the environmental recommendations identified in all current and future Local Area Plans (LAPs) are resourced and implemented
- Expand Community, Allotment, Vacant Lot, and Boulevard Gardening opportunities
- Continue to Develop the Green Infrastructure Strategy
 - The project will identify where natural ('green') infrastructure could be used as an alternative to built ('grey') infrastructure, resulting in emissions reductions and carbon sequestration potential, as well as biodiversity, green space, storm water, and recreational benefits.
- Promote the City's Low Impact Development (LID) Guidelines
- Continue to support the efforts of the Meewasin Valley Authority
 - Meewasin helps protect our watershed through conservation management, recreation, and education.
- Require quality control programs and environmental standards for contractors working on civic initiatives
- Continue to review the effectiveness of civic utility conservation pricing mechanisms
 - Change the City's business model for utilities to ensure conservation is supported. Avoid block rates.

Future Opportunities:

- Civic Plan Alignment
 - Ensure that the City of Saskatoon's climate, land use, housing, transportation, asset management and other plans are aligned so that environmental and climate change objectives are met in an integrated way.
 - Enhance any regional plans that have been developed and work with regional partners to encourage consistency between jurisdictions and support emissions reporting and planning.
- Establish building energy efficiency policies for new construction*
 - Policies/codes could include mandatory performance measures, the removal of barriers that impede the construction of green buildings, and incentives for green building practices (e.g. in the form of training, technical assistance, guidelines, financial support, and expedited permit processing).
 - The City should anticipate the federal step code of net-zero energy buildings by 2030.
- Establish energy efficiency policies for existing buildings
- Require deconstruction and material-reuse from municipal, residential and ICI buildings
- Develop Community Energy Plans (CEPs)
 - Create CEPs for new growth areas and regional centres to detail energy use requirements, establish a plan to reduce energy demand, consider alternative forms of energy generation, and improve building efficiencies and siting.
- Utilize financial policy tools for green innovations and improvements
 - Reduce financial barriers to green improvements using, for example, Property Assessed Clean Energy (PACE) financing, grants, rebates, property tax abatements, utility incentives, subsidized loans, cost-sharing programs, capital investment offsets, and incremental payments on property taxes.
- Make improvements to the Zoning Bylaw to support sustainable development
 - Make amendments that advance green improvements, sustainable buildings, and renewable energy within the city by removing regulatory barriers and clarifying existing language that is currently ambiguous.
- Fast track green improvements and green buildings through the City's permitting process
- Waive building permit fees for green buildings and improvements
 - Waive fees for green construction, including energy-efficient buildings and retrofits, solar panel installations, greenhouses, and green roofs.
- Waive Offsite Levies for green buildings and infill
- Allow floor space exclusions from property taxes for exterior wall thickness
 - Currently, adding greater levels of insulation to buildings leads to higher property taxes (because property taxes are linked with a property's square footage and greater levels of insulation increase wall thickness). Providing wall thickness exemptions would remove the disincentive to improve building envelopes and building energy performance by adding insulation.
- Set higher densification and Infill Targets
 - Maximize land use efficiency by incentivizing infill, mixed-use, and higher density development.
- Develop Urban Design Guidelines to reduce heat island effect
 - Reduce heat gain from pavement and other hardscaping by shading streets and buildings, using paving and roofing materials with a high Solar Reflective Index, using

covered parking, creating cool roofs and green roofs, utilizing permeable pavement, and installing natural/green infrastructure and landscaping.

- Create design standards for new neighbourhoods and guidelines for infill development in existing neighbourhoods to utilize solar energy*
- Develop a Solar-Ready Building Policy*
 - Require new construction to be designed and wired for future potential installation of solar photovoltaic systems.
- Create a Feed-In-Tariff Program*
 - A feed-in-tariff policy allows customers who install renewable power (i.e. solar) to receive a price for the electricity they produce that reflects actual installation costs plus a modest profit.
- Establish a Renewable Energy Target to reduce reliance on carbon intense power from the Provincial grid
- Offer a tax exemption for green power facilities
 - Provide property tax exemptions for green power facilities that are developed on vacant land.
- Develop Alternative Energy Siting Policies
 - Establish policies and programs that facilitate the siting of new renewable energy generation, such as site designation, removal of barriers, and zoning flexibility.
- Create a Green Energy Policy
 - Require renewable energy generation and co-generation projects in new developments and re-developments (where feasible and appropriate). This could include on-site renewable energy generation, co-generation projects, and green utilities.
- Implement Green Energy Procurement measures
 - Implement measures to support the purchase and use of renewable energy, including green electricity purchasing.
- Incorporate environmental metrics into the City's Business Licensing requirements
- Create restrictions to discourage the unnecessary use of electricity for outdoor lighting purposes
 - Bylaw to regulate illuminated signs.*
 - Guidelines for compliance with principles of Dark Sky.
- Adopt an Idle-Free Bylaw*
- Develop industrial standards for space heating and electrical efficiency*
- Require scheduled energy efficiency improvements for industrial facilities*
- Expand naturalized parks
 - Naturalized parks sequester carbon, provide habitat, and have lower mowing, watering, fertilizer, and pesticide requirements than conventional parks.
 - Naturalized parks also act as 'green' infrastructure alternatives to 'grey' infrastructure networks, and can reduce emissions from avoiding the construction of built infrastructure.
- Expand Saskatoon's urban forest
 - The urban forest reduces heat island effect, provides shading, and sequesters carbon.
- Set Biodiversity and Green Space Targets
- Develop Sustainable Landscaping Policies and Guidelines
 - Create policies for municipal, residential, and ICI sectors that ensure landscaping is optimized for current and future climate scenarios, as well as provide climate benefits such as sequestration, shading, and water efficiency.
- Design a Green Roof Policy

- Develop a City of Saskatoon Food System Strategy that identifies the climate mitigation, climate adaptation, and co-benefit potential of municipally-supported food initiatives
- Create a Paperless Office Strategy for the City of Saskatoon
- Prohibit the use of personal electric heaters in civic buildings
- Develop a Green Fleet Policy
 - A green fleet policy would consider capital and maintenance costs, resale costs, fuels costs, and lifecycle emissions.
- Create Civic Employee Commuting and Travel Policies
 - Implement measures to reduce employee vehicle trips, including bicycle transportation facilities and support, discounted transit passes, municipal parking management, carbon offsetting, and transit/shuttle access between municipal facilities.
- Develop parking policies that reduce traffic
 - Increase parking rates for private vehicle use, develop strategies to ensure new and existing parking spaces are used efficiently, and provide reduced parking fees to green vehicles, carpoolers, and car-shares.
- Reduce parking requirements for developments if viable alternative transportation options are provided
 - Encourage new developments to provide car-sharing, transit incentives, and cycling facilities in lieu of parking.
- Conduct an Integrated Transportation Study
 - Examine the interaction between parking, active transportation, and public transport networks, policies, and infrastructure to find solutions that reduce automobile usage.
- Set Water Conservation Targets for the community and for City operations
- Develop Water Conservation Strategies for the community and for City operations
 - Identify water conservation and water recycling opportunities, including policies, programs and outreach.
- Research opportunities to incorporate “circular economy” policies into the City’s procurement processes and services
- Create a Civic Energy Efficiency Plan
 - Outline efficiency requirements for new and existing facilities, including training and support for staff.
- Develop an Environmental Management System (EMS) for the City of Saskatoon

Projects and Pilots

Projects, whether investments in infrastructure or pilot initiatives that lead to ongoing programs, have the potential to significantly reduce emissions through a phased implementation approach. Pilots are often used to assess financial viability, develop an understanding of the operational requirements of new programs, and evaluate emissions reductions potential. For example, the Weir Power Project will generate 5.5-6.1 megawatts of clean power, which will reduce greenhouse gas emissions by approx. 21,120 tonnes per year.

Current & In-Progress Initiatives:

- LED street lighting for all neighbourhoods*
 - New areas in Saskatoon already install LED street lighting. Plans for actively converting existing neighbourhoods to LED lighting are still being developed.
- Implement the Weir Hydro Power Project
- Continue exploring efficiencies in Saskatoon’s Water System

- Develop a water demand management strategy to address water losses in the distribution system, detect leaks, use metering and sub metering to improve efficiency, implement energy management software, create performance/procurement standards for buildings and equipment, optimize use of available digester gas, utilize control systems to optimize pumping, and conduct energy audits of the water and wastewater treatment processes.
- Implement the Combined Heat and Power (CHP) System at St Paul's Hospital
- Continue to find alternative uses for existing buildings (e.g. Mendel Building Reuse as a Children's Discovery Museum) to avoid the emissions associated with building demolition
- Expand Landfill Gas Facility
 - The system collects methane gas from the landfill, improves air quality and reduces odours at the landfill. Expansion options are currently being pursued.
- Continue to Operate the Solar Panels at the Landfill Gas Facility
 - The Saskatoon Solar Power Demonstration Site is a collaboration between Saskatoon Light & Power, the Saskatchewan Environmental Society Solar Co-operative, and Saskatchewan Polytechnic.
- Energy Performance Contracting
 - The City of Saskatoon is making green improvements in approx. 20 civic facilities. Energy Performance Contracting is a unique form of procurement, whereby an Energy Services Company performs energy and water audits, retrofits civic buildings, and guarantees savings. The loan for the capital costs is repaid from avoided utility expenditures, which are measured, verified and guaranteed.
- Continue to operate existing Combined Heat and Power (CHP) Units
 - The City of Saskatoon installed natural gas CHP units at two swimming pools in 2014 to provide supplemental heating of pool water, space heating, and domestic hot water. The City has also operated two CHP units at its Landfill Gas Collection & Power Generation facility since 2014.
- Continue to trial waste compaction systems for public waste and recycling receptacles (e.g. in parks)

Future Opportunities:

- Design and develop a model low carbon neighbourhood*
 - Develop a neighbourhood similar to Vauban (Freiburg, Germany) or West 5 (London, Ontario) that includes renewable energy generation, public and active transportation networks, mixed-use zoning, urban agriculture, green buildings, district energy, and green space. It could also provide a sufficient economy of scale for infrastructure investments and opportunities for integrated planning.
- Create a "Smart City" pilot on a neighbourhood level
 - Include the integration of a smart grid, smart metres, battery storage (including electric vehicles), and smart transport networks.
- Pilot a District Energy neighbourhood
 - Develop a District Energy system in a specific pilot neighbourhood that provides energy for space heating and hot water to a variety of building types (i.e. multi-family residences, commercial, institutional and industrial).
- Explore opportunities to generate power using wind*
 - Work with SaskPower to build a wind generation station outside Saskatoon's city limits (within 50 km).

- Research micro-wind opportunities that could be applied in Saskatoon.
- Develop energy storage systems for renewable energy
- Use native prairie species along roadways and right-of-ways
- Create commuting-efficient lanes for specific locations and times of day
- Develop 'no-car zones' in key areas of the city (i.e. Business Improvement Districts)
- Pilot the use of bike trailers for Parks Maintenance Crews
- Transition civic equipment and vehicles to electric
- Install waterless urinal equipment in civic facilities
- Expand Automated Irrigation Management System to ensure new and existing public parks include moisture-sensors and timers
- Explore alternative fuel and/or electric fleet options for Transit
- Construct satellite buildings for Parks operations to reduce vehicle/equipment travel
- Provide more field offices for development initiatives to reduce vehicle/equipment travel
- Develop a Route Optimization Strategy for all civic equipment and vehicles
 - Design efficient transportation routes for municipal services to reduce fuel usage, mileage, and maintenance needs.
- Reduce "phantom" energy loads in civic buildings through education and smart plugs
- Pilot a corporate telework / flex-work program for civic staff to reduce travel
- Design Recovery Park to meet Third-Party Certification (e.g. Living Building Challenge, SITES, or LEED)

Education

Education, training and outreach activities have the potential to reduce emissions by enabling residents of all ages to understand the affect their actions have on the climate and environment, build capacity for action, and encourage more informed decision-making. For example, the Student Action for a Sustainable Future program currently partners with students from 12 schools each year to undertake environmental action projects. Each year, the program reduces emissions by approx. 28 tonnes.

Current & In-Progress Initiatives:

- Expand public education campaign on climate change*
- Continue to offer recycling education
 - The Rolling Education Unit engages residents of all ages using fun and interactive waste activities. It is free and bookable for festivals, events, and community groups. It builds awareness, generates enthusiasm, and ensures that residents receive the information they need to effectively manage their household waste.
 - The City of Saskatoon works with the Open Door Society to facilitate recycling workshops and educational opportunities for New Canadians.
- Continue the Saskatoon Light & Power (SL&P) Energy Education Programs
 - SL&P's In-Home Display Program allows customers to borrow an electricity monitor for a one-month period to learn when and how much electricity they use.
 - SL&P offers 20-30 school tours annually that align with Saskatchewan's science curriculum. Students learn how our electricity system can be safe, smart, and sustainable.
- Continue to offer the Student Action for a Sustainable Future (SASF) program
 - The SASF program engages teachers and students in learning, action, and inquiry in areas of energy, waste, water, food, biodiversity, and transportation. Projects lead to

measurable greenhouse gas reductions, as well as other sustainability benefits in students' classrooms, schools, households, and the community.

- Continue to offer the Healthy Yards Program
 - The Healthy Yards partnership offers information and hands-on education on sustainable gardening practices for the prairies. It focuses on water conservation, home composting, pesticide reduction, biodiversity, local food, and storm water.

Future Opportunities:

- Organize events and workshops for residents and businesses to promote GHG-reducing activities
- Develop recognition programs
 - Sponsor awards, recognition events, and friendly competitions to encourage GHG reductions and recognize success.
- Provide training for civic staff and industry on Net Zero Energy Buildings*
 - Sponsor training for architects, home builders, carpenters, electricians, plumbers and other relevant building trades to learn about energy-efficient construction techniques and design.
- Provide training for civic staff and industry on Third-Party Standards being used in Canada
 - Build capacity in the areas of, for example, LEED, Passive House, Net-Zero, BOMA, Living Building Challenge, and SITES.
- Develop a Home Owner and Home Builder Education Program
- Create an educational program that corresponds with the Advanced Metering Infrastructure (AMI) for electricity and water
 - Smart meters are electronic meters that measure and record actual power and water usage by time intervals throughout the day. That data will be used to quickly and easily communicate with customers about their energy and water use, encourage conservation, and detect leaks and other high-usage variances. Most of the meters have now been installed and options to deliver an online customer platform are being explored.
- Provide civic equipment and vehicle operators with "Smart Driver" training
 - Training will inform drivers of how to optimize the flow of people and goods around the city, reduce idling, ensure proper maintenance, and reduce mileage.
- Develop mandatory environmental awareness training for civic staff
- Develop mandatory environmental awareness training for contractors working on civic initiatives
- Provide training for civic staff and industry on carbon pricing implications
- Provide training for civic staff and industry on grey water recycling
- Develop and implement a civic Green Teams program for City staff