

EXECUTIVE SUMMARY

The Low Emissions Community Plan is a toolkit for climate change decision-making which enables the City of Saskatoon (City) to shape our community for the next thirty years. The Low Emissions Community Plan (LEC Plan) describes the co-benefits of action in addition to the costs of inaction, in order to help citizens and decision-makers understand how the choices we make impact our climate, community, economy, and quality of life.

The Low Emissions Community Plan is a long-term roadmap for achieving the City of Saskatoon's established greenhouse gas (GHG) reduction targets through changes to policy and investments in projects, programs, and partnerships.

Our Vision for a Low Emissions Community: Saskatoon is a connected community where every citizen and organization takes pride in prosperous, resilient and low-carbon solutions to realize a clean and healthy city.

Our Mission: To enable a sustainable Saskatoon through an integrated and actionable climate change approach.

Local & Global Commitments

The City established the need for a Climate Action Plan in the *Strategic Plan: 2018-2021* through the Strategic Goal of Environmental Leadership. Specifically, a key stride includes that “the effects of climate change on civic services are proactively addressed.” Consistent with the Strategic Goal of Environmental Leadership, the City signed an agreement with the Global Covenant of Mayors for Climate and Energy in November 2015. This is an international pact that requires the City of Saskatoon to take action on both the causes and effects of climate change by reducing emissions and building resiliency plans for our infrastructure and services.

City of Saskatoon GHG Reduction Targets

On June 26, 2017, City Council set greenhouse gas reduction targets for Saskatoon based on the City's 2014 GHG emissions inventory. They include:

- Reducing the City of Saskatoon's emissions by 40% below 2014 levels by 2023; and 80% by 2050.
- Reducing the community's emissions by 15% below 2014 levels by 2023; and 80% by 2050.

The actions in the Low Emissions Community Plan aim to meet and exceed these targets.

*“The effects of widespread warming are evident in many parts of Canada and are projected to intensify in the future. The rate and magnitude of climate change under high versus low emission scenarios project two very different futures for Canada.” -
Changing Climate Canada Report 2019*

Our Current Emissions

Results from the City of Saskatoon's greenhouse gas inventories show that Saskatoon's emissions have remained relatively consistent since 2014, but are projected to increase over the long term without dedicated action on emissions reduction. Below are Saskatoon's city-wide (corporate and community) emissions over the past 5 years:

- 2014: 3,850,000 tonnes CO₂e
- 2016: 3,690,000 tonnes CO₂e
- 2017: 3,710,000 tonnes CO₂e

Saskatoon's Climate Future

If we do not meet our targets and achieve meaningful emissions reductions, Saskatoon's future is projected to be warmer, wetter, and wilder.

- **Warmer** temperatures may appear desirable but this means more drought, extreme heat, larger pest populations, and increased risk of heart conditions, diseases, and cancers.
- **Wetter** conditions provide increased opportunity for flooding and freezing rain in winter months.
- **Wilder** trends speak to conditions that create intense storms, such as thunderstorms, blizzards, hail, and tornadoes, occurring more often and causing damage to public and private property on a regular basis.

A warmer, wetter, and wilder future comes at costs that are likely to far outweigh the investments required to create a low emissions community.

The Low Emissions Community Plan

The CityInSight Model was used to forecast the actions required to meet the City's GHG emission reduction targets over the next 30 years, compared to the Business as Planned scenario. The model was used to analyse the GHG and financial impact of each action and follow the principles of:

- **Reduce** – energy load by improving efficiency and conserving energy and water in our homes, buildings, and vehicles;
- **Improve** – operations, land use, and transportation networks to optimize functionality, reduce waste, use land more sustainably; and
- **Switch** – to renewable, low and zero-carbon fuel sources

The Low Emissions Community Plan (LEC Plan) proposes the following forty actions to meet Saskatoon's GHG reduction commitments:



Buildings & Energy Efficiency



Energy Generation



Transportation



Water Conservation



Land Use



Waste Management

Co-Benefits

The plan is a whole-city plan, whose policies and actions achieve multiple community benefits.

- **Our Health is improved** due to more active lifestyles, cleaner air, and improved water and soil quality. These factors can significantly reduce rates of hospitalization, illness and disease, and mortality for everyone in our community.
- **Our Economy is diverse and resilient to both local and global changes.** Our community can capitalize on new and existing sectors of business, for example, in the renewable energy, building, construction and Cleantech sectors.
- The Low Emissions Community Plan is estimated to generate approximately 100,000 person years of employment otherwise known as Full Time Equivalents between 2020 and 2050.
- **Reduced expenses for residents, businesses and the municipality.** Investments in technology, conservation and efficiency, and clean energy generation reduces operating and maintenance costs, provides new revenue opportunities, and protects our community from volatile energy and fuel prices.
- **Improved equity and quality of life** is achieved through improved accessibility, housing quality, food security, and poverty alleviation. Destinations become more accessible and all residents have access to healthy food and natural spaces.

Building Resiliency and Modelling Success

This LEC Plan looks to create co-benefits for both emissions reductions (mitigation) and resiliency (adaptation) activities.

High level financial analysis was undertaken for each action in the LEC Plan Scenario to identify the investment required, the net present value, the return on investment, marginal abatement costs, and employment impacts.

While there are significant benefits of adopting the actions set out in the LEC Plan the risks of doing nothing require consideration. In the context of this analysis, risks include the following:

- A slower response to mitigation and therefore more severe impacts of climate change;
- A missed opportunity to transition to low carbon urban systems and therefore an increased burden on the City of Saskatoon, households and the private sector to support the transition;
- A missed opportunity for leadership in the public and private sector; and
- A missed opportunity to acquire co-benefits in improved health outcomes, economic development, a more resilient energy system, and improved quality of living that are synergistic with the LEC Plan energy and emissions outcomes.

To be successful, the actions require investments now and over time. Starting immediately, implementation would result in savings and, in the case of local energy production, in revenues. Incremental expenditures in buildings, vehicles, and other energy-related equipment and infrastructure increase costs in the short-term but result in long-term savings. Accelerated investments have the added benefit of contributing toward prevention of further degradation of the environment and slowing the degradation-increased cost cycle.

The Low Emissions Community Plan vs. Business as Planned

Lower Energy Costs

The modelled LEC Plan actions results in lower energy costs when compared to the Business as Planned scenario.

Under the LEC Plan total energy use in Saskatoon is 36 million GJ in 2050. This is just over half of what is expected in the Business as Planned (BAP) scenario, where energy climbs from about 38 million GJ in 2016 to almost 70 million GJ in 2050.

Figure 1: Total Emissions BAP vs. LEC Plan

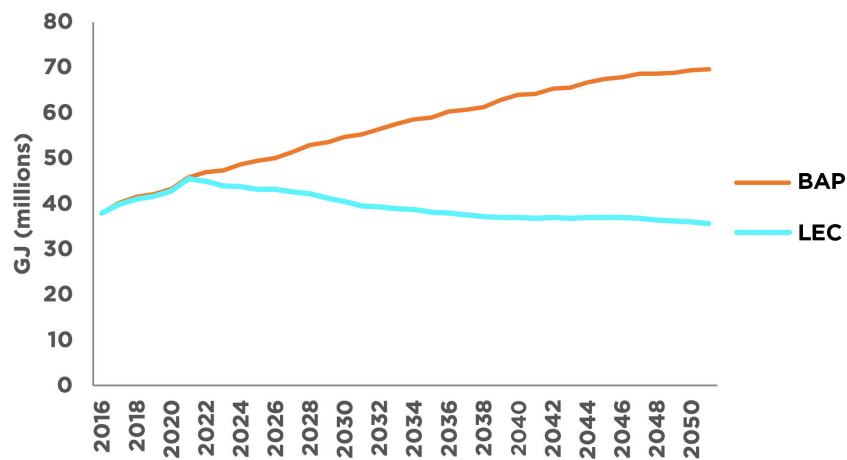


Photo courtesy of Tourism Saskatoon

Meeting Commitments

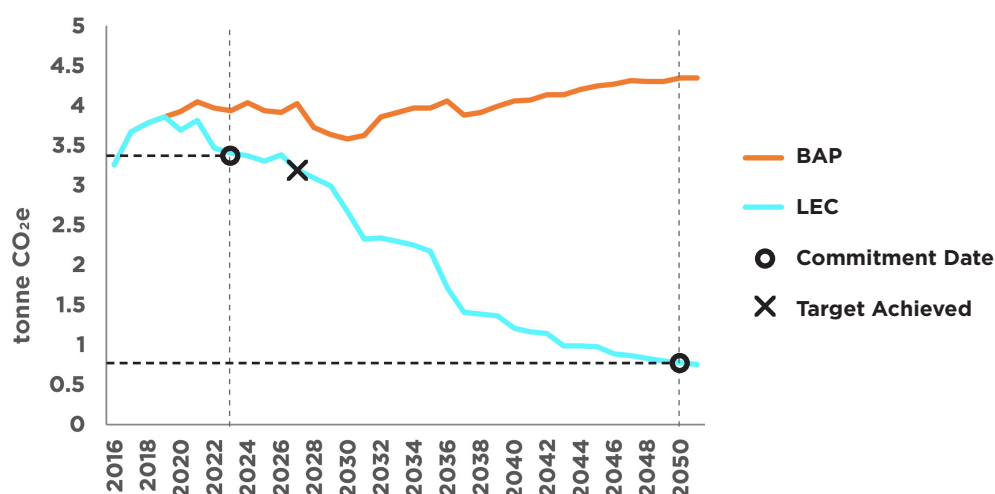
In relation to the emissions reduction targets, implementing the full suite of 40 actions in the recommended timeframe will result in the reductions: Refer to Table 1.

Table 1: Target Status and Modelled Projection Summary

| Item | City of Saskatoon | Community | Total |
|--|-------------------|-----------|-----------|
| 2014 | | | |
| 2014 GHG Baseline (tonnes CO ₂ e) | 106,300 | 3,743,700 | 3,850,000 |
| 2023 | | | |
| 2023 GHG Reduction Target (%) | 40% | 15% | |
| 2023 Modelled performance (%) | 49.63% | 11.61% | |
| 2050 | | | |
| 2050 GHG Reduction Target (%) | 80% | 80% | |
| 2050 Reduction target (tonnes CO ₂ e) | 85,000 | 2,995,000 | 3,080,000 |
| 2050 Target Emissions (tonnes CO ₂ e) | 21,300 | 748,700 | 779,000 |
| 2050 Modelled performance (%) | 89.39% | 79.71% | |
| 2050 Modelled performance (tonnes CO ₂ e) | 10,630 | 748,700 | 759,330 |

The 40 actions can achieve emissions reductions of 3,310,000 tonnes CO₂e in the year 2050, meeting commitment of the City's total emissions to 779,000 tonnes CO₂e. 3% of emissions reductions is achieved by municipal corporate actions and 97% is achieved by community actions. Corporate reductions are more easily achieved than community wide reduction as the municipality has more control over its own operations, whereas community reductions require broader scale education efforts and behavioural changes over time.

Figure 2: Modelled LEC Plan Results in relation to the targets



The success of the plan lies in the City and the community's ability to follow the roadmap outlined in this report and implement every action. In following this plan, the corporate target of **40% emissions reductions could be met by 2023**. While the Plan begins to move the needle with Community emissions, even with the plan in place the Community target would not be met in 2023, with modelling showing a 12% GHG reduction. The **15% community reduction target** is projected **to be met by 2027**. If fully executed, the LEC Plan actions for both the community and the City as a corporation successfully meet the **80% reduction target by 2050**.

The Path to 80% Reductions by 2050. Low Emissions Community Actions Summary

| Action | | Cumulative Emissions Reductions 2020-2050 (tonnes CO ₂ e) | Municipal Action (M) Community Action (C) | Action Phase |
|--|---|--|---|--------------|
| Buildings & Energy Efficiency | | | | |
| 1 | Apply energy efficiency standards (build to Passive House) to all new municipal buildings. | 28,000 | M | P2 |
| 2 | Perform deep energy retrofits on municipal buildings. | 175,000 | M | P2 |
| 3 | Upgrade plugged appliances and energy conservation behaviours in municipal buildings. | 4,000 | M | P2 |
| 4 | Update all municipal building lighting systems. | 5,000 | M | P1 |
| 5 | Retrofit municipal heating and cooling systems with ground-source or air source heat pumps. | 204,000 | M | P2 |
| 6 | Create an electric and thermal energy consumption cap for new home construction by utilizing a municipal step code. | 1,130,000 | C | P2 |
| 7 | Require new homes to include roof solar Photovoltaic (PV) installations in the final year of a municipal step code. | 5,049,000 | C | P4 |
| 8 | Create an electric and thermal energy consumption cap for new ICI construction by utilizing a municipal step code. | 6,660,000 | C | P2 |
| 9 | Require new ICI buildings to include roof solar PV installations. In the final year of a municipal step code. | 28,000 | C | P4 |
| 10 | Incentivize and later mandate homeowners to perform deep energy retrofits. | 2,013,000 | C | P2 |
| 11 | Incentivize and later mandate ICI owners and operators to perform deep energy retrofits. | 3,469,000 | C | P2 |
| 12 | Require energy efficiency improvements residential and ICI building lighting systems. | 147,000 | C | P3 |
| 13 | Incentivize and later mandate homeowners to upgrade household appliances to energy and water efficient models | 582,000 | C | P4 |
| 14 | Retrofit home heating and cooling systems with ground-source or air source heat pumps. | 2,120,000 | C | P3 |
| 15 | Retrofit ICI heating and cooling systems with ground-source or air source heat pumps. | 658,000 | C | P3 |
| 16 | Increase the efficiency of industrial processes. | 232,000 | C | P4 |

Action Implementation Timeline Legend

| | |
|-----------|---|
| P1 | Phase 1 Projects: Action is already in planning or drafted strategy phase |
| P2 | Phase 2 Projects: Action planning and implementation to be started in the next 4 years |
| P3 | Phase 3 Projects: Action planning and implementation to be started in the next 5-8 years |
| P4 | Phase 4 Projects: Action planning and implementation to be started in the next 12+ years |

| Transportation | | | | |
|--------------------|--|-----------------|---|----|
| 17 | Electrify the Municipal fleet over the near-term. | 77,000 | M | P2 |
| 18 | Electrify the Municipal transit fleet. | 55,000 | M | P2 |
| 19 | Implement a vehicle pollution pricing program in high traffic areas. | 698,000 | M | P3 |
| 20 | Increase transit routes and frequency through future updates to the Transit Plan. | 942,000 | M | P1 |
| 21 | Electrify personal vehicles through incentive programs, education, and automotive dealer partnerships | 2,756,000 | C | P2 |
| 22 | Electrify commercial vehicles through incentive programs, education, and automotive dealer partnerships | 6,860,000 | C | P3 |
| 23 | Fund and implement improved cycling and walking infrastructure to encourage active transportation. | 287,000 | M | P1 |
| Waste | | | | |
| 24 | Improve and expand waste management programs and services to increase reduction and diversion. | 1,303,000 | M | P2 |
| Water Conservation | | | | |
| 25 | Decrease water use through efficiency, monitoring, and leak reduction. | 25,000 | M | P2 |
| 26 | Reduce residential and ICI water use through education programming and water efficiency incentive programs. | 147,000 | C | P2 |
| Land Use | | | | |
| 27 | Build complete, compact communities through infill development, mixed-use buildings, and compact housing. | 3,353,000 | M | P4 |
| 28 | Focus development on densification in previously developed areas, increasing the number of multi-family buildings. | Included in #27 | M | P4 |
| Energy Generation | | | | |
| 29 | Install solar PV systems on municipal buildings. | 236,000 | M | P2 |
| 30 | Install solar PV systems on municipal lands | Included in #34 | M | P2 |
| 31 | Increase Landfill Gas Capture from the Saskatoon Landfill | 1,891,000 | M | P2 |
| 32 | Encourage existing residential building owners and mandate new buildings to install solar PV system through programming and bylaw. | 195,000 | C | P2 |
| 33 | Encourage existing ICI building owners and mandate new buildings to install solar PV systems through programming and bylaw. | 1,147,000 | C | P3 |

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| | | | | |
|----|---|------------|---|----|
| 34 | Install new solar PV utility-scale facilities within or adjacent to city boundaries. With areas within city boundary to be prioritized first. | 1,626,000 | M | P2 |
| 35 | Install a CHP facility at St. Paul's Hospital. | 40,000 | M | P2 |
| 36 | Implement district energy systems in the downtown and north downtown areas. | 1,079,000 | M | P4 |
| 37 | Construct a hydropower plant at the weir. | 218,000 | M | P3 |
| 38 | Install renewable energy storage over time. | 3,435,000 | M | P2 |
| 39 | Procure renewable electricity from third party producers. | 54,119,000 | M | P4 |
| 40 | Procure Renewable Natural Gas from third party producers. | 40,607,000 | M | P4 |

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