

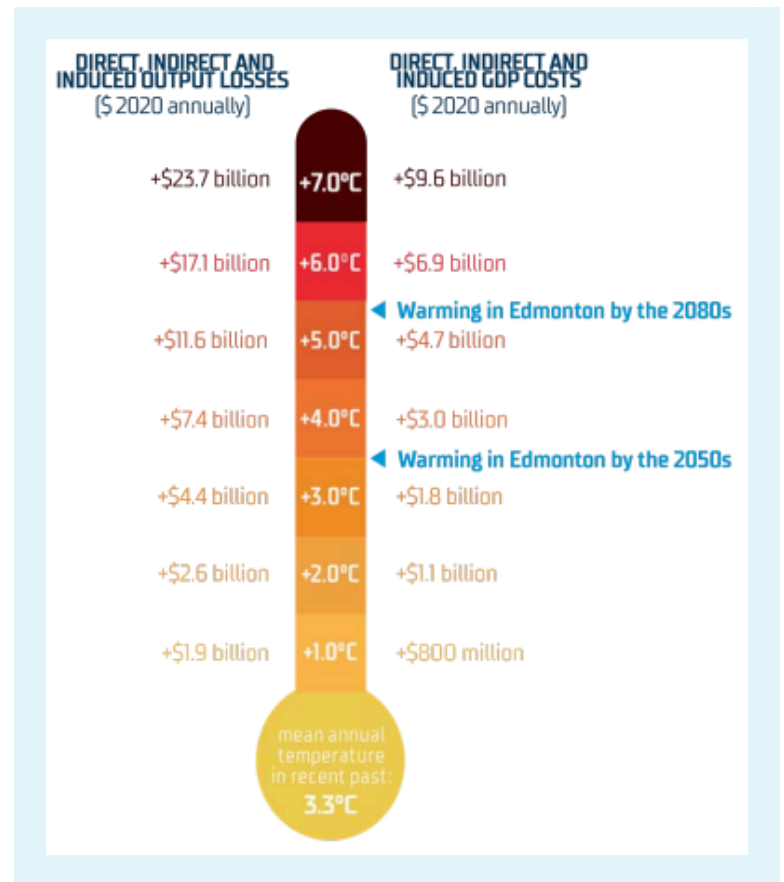
CLIMATE CHANGE IN EDMONTON

EDMONTON AND CLIMATE CHANGE

Edmonton's climate is changing. These changes are disrupting the social, economic, and environmental systems that support our quality of life. Observations indicate that changes to temperature, precipitation, and extreme weather events are already occurring. In fact, Edmonton is warming at a rate faster than the global average, with 2023 standing as the hottest year on record. When looking to the future, scientists predict that Edmonton will see higher temperatures, more drought and flooding events, more extreme weather events, and the transformation of local ecosystems.

As global temperatures continue to warm, the decisions made today about how we plan, build, and operate the city will set the course for Edmonton's resilience over the coming decades.

The image to the right shows that for every degree of warming, there are significant local economic and social costs. Growing climate risks have clear implications for City resources and assets, the local economy, and the safety and well being of residents. Proactive climate action not only strengthens resilience, but also promotes economic growth, improves public health, and enhances the quality of life for Edmontonians.



WHAT IS CLIMATE RESILIENCE?

Climate resilience is about Edmonton's capacity to respond to the impacts of climate change and protect people, businesses and infrastructure from those impacts. By reducing our energy use and transitioning to low carbon energy sources, we can mitigate climate change. The other piece of resilience is adapting our city

to a climate that is already changing. Risks related to climate change include challenges posed by severe weather events such as heavy rain or heat waves. When we get mitigation and adaptation right, we become climate resilient.

Climate mitigation refers to efforts that slow climate change by reducing or preventing the release of greenhouse gases to the atmosphere. Examples include using renewable energy, improving energy efficiency, and walking, biking and taking public transit.

Climate adaptation involves minimizing negative impacts, reducing risks and embracing potential opportunities associated with climate change so that communities and ecosystems are prepared to cope with new or changing climate conditions.

For definitions of more terms related to climate change, visit [Climate Change FAQs](#).

LOCAL IMPACTS IN EDMONTON

While the temperature trend is the most obvious impact of climate change, Edmonton is experiencing other changes that are already affecting daily life in the city, including ecological systems, energy consumption, infrastructure performance, and health and safety during extreme weather. A summary of these [observed changes](#) are on the next page.

EDMONTON IS WARMER THAN BEFORE



- » **Edmonton's climate has become warmer over time.** Over the past 140 years, the city's average temperature has risen by 2.3°C, which is more than twice the global average increase over the same period.
- » **From 2001 to 2024, only two years—2009 and 2019—were cooler than the 1961–1990 baseline.** This means that 92 per cent of recent years were warmer than the baseline.
- » **Warming has occurred in all seasons, but winter temperatures have increased the most.** Spring, summer, and fall have also become noticeably warmer.
- » **There are now more 'very hot days' in summer,** with temperatures reaching 32°C or higher, occurring more often than in the past. These conditions can be dangerous, especially for young children, older adults, marginalized individuals and people with certain health conditions.
- » **Air conditioning demand has also increased sharply,** with cooling needs now far higher than in previous decades.
- » **Extreme heat events have become longer and more intense,** with years like 2021 and 2024 seeing record-breaking heatwaves.
- » **Winters are no longer as cold as they once were.** Although extremely cold days still occur, they are becoming less frequent, and long stretches of deep cold are now rare due to the overall warming trend.
- » **In 2023, Edmonton recorded its warmest year ever,** with annual temperatures reaching 2.8°C above the long-term average.
- » **Built-up urban areas tend to stay warmer at night** due to the urban heat island effect—a phenomenon in which buildings, pavement, and other infrastructure absorb and retain heat, causing cities to be warmer than surrounding rural areas. This increases heatwave risk in some neighbourhoods.

SMOKE AND AIR POLLUTION



- » Although Edmonton's overall air quality has remained fairly stable since 2010, wildfires and winter temperature inversions can cause poor air quality days to occur.
- » In recent years, wildfire smoke has become a major cause of summer air pollution.
- » In 2023, Edmonton recorded 34 high-risk air quality days, the most on record, with 24 of those days linked to wildfire smoke.
- » In winter, cold air can trap pollution (especially from traffic and home heating) near the ground. These events, known as temperature inversions, lead to a buildup of harmful pollutants such as nitrogen dioxide (NO₂) and fine particulate matter (PM2.5), increasing their concentration in air.
- » Hot weather can also worsen air pollution by increasing levels of ground-level ozone, which affects lung and heart health.
- » The number of smoke days and heat-related pollution spikes has grown in recent years.
- » While poor air quality affects everyone, it is especially harmful to children, seniors, people with respiratory conditions such as asthma and marginalized individuals.

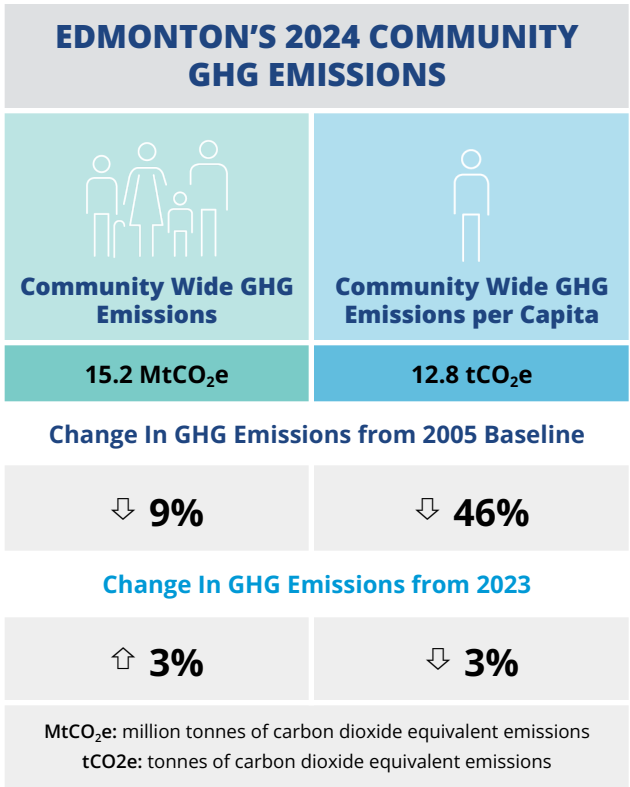
PRECIPITATION IS BECOMING LESS RELIABLE



- » Over the past three decades, Edmonton has received less precipitation overall compared to the past.
- » Annual precipitation has declined by about 14 per cent, with winter showing the largest drop (31 per cent, mostly due to reduced snowfall).
- » Summer and fall have also become noticeably drier, with growing implications for water availability during key growing periods.
- » Although heavy rain and snow events still happen, dry years are now more common than wet ones.
- » Seven of Edmonton's 12 driest years on record have occurred since 2000, and the city has seen more long stretches without rain, especially in spring and summer.
- » Shifting precipitation patterns add pressure on water resources.

EDMONTON'S GREENHOUSE GAS (GHG) EMISSIONS

Edmonton's most recent Community GHG Inventory (2024) shows that total community wide GHG emissions have decreased by nine per cent from the 2005 baseline. Our 2024 emissions increased three per cent compared to 2023 levels, continuing a stable trend over the last three years that requires attention despite overall reductions since the 2005 baseline.



Since 2005, Edmonton's per capita GHG emissions have decreased by 46 per cent. However, Edmonton's population has increased approximately 60 per cent during that same period. This means that while our per capita emissions have decreased by 46 per cent, the community wide emissions have not seen the same intensity of reductions due to our growing population. Based on our current trajectory, Edmonton is not on track to meet the 2025, 2030, and 2050 emissions targets. To achieve the goal of net-zero emissions by 2050, there must be a significant downward trend in total community-wide GHG emissions. Transportation emissions comprise the largest proportion (34 per cent) of the total community emissions with industry (25 per cent) and non-residential buildings (19 per cent) being the next largest sources of emissions for 2024.

