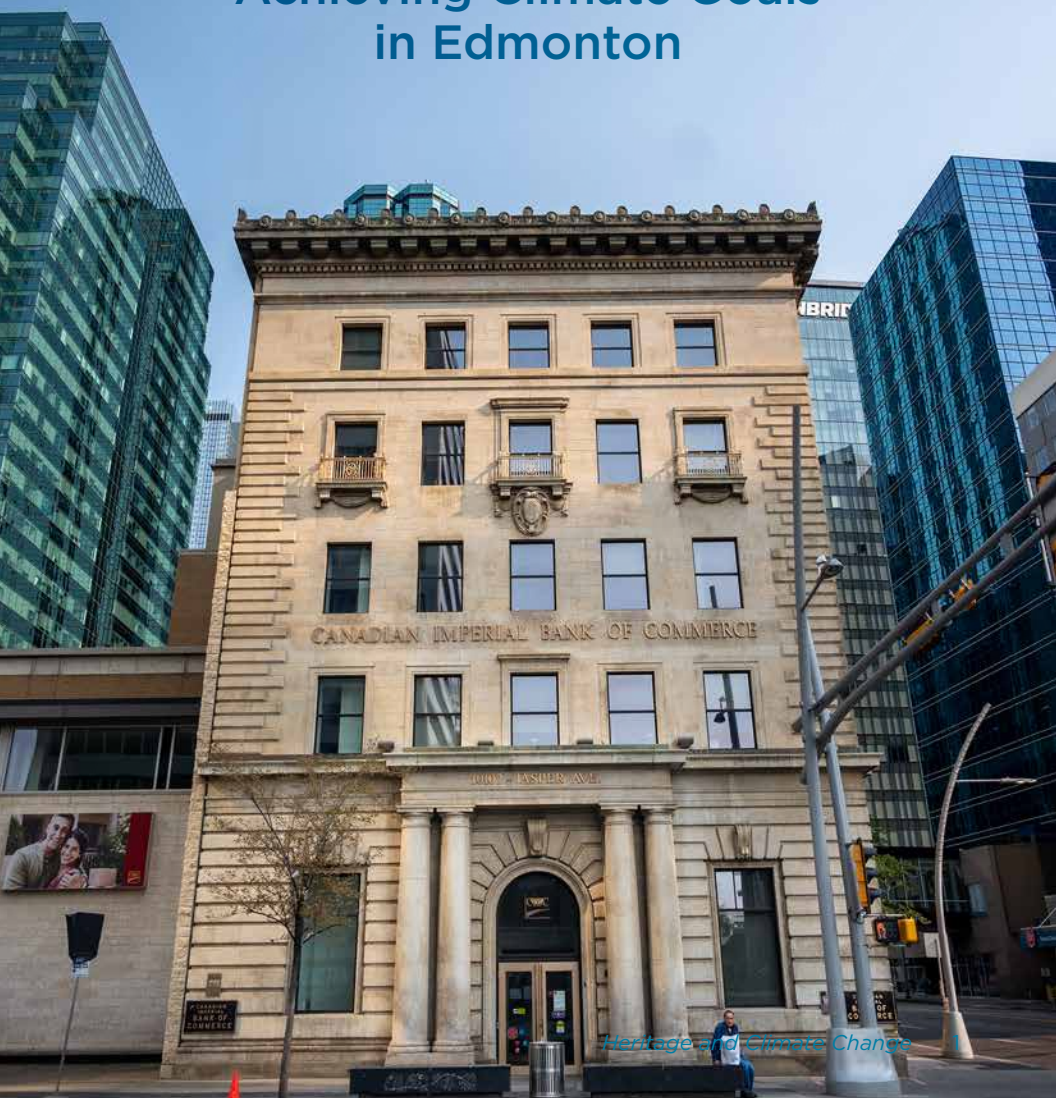




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HERITAGE AND CLIMATE CHANGE:

Achieving Climate Goals in Edmonton



“The greenest building is the one that already exists”

- Carl Elefante

Local landscapes are embodied in heritage buildings from through the local labour and materials used in their construction. Preserving heritage buildings also continues the local histories of the materials, laborers, skilled craftspeople and others involved in their construction. Heritage preservation is essentially cultural perpetuation of a community.

Although at first glance it may not be obvious, but heritage preservation and climate change are inextricably linked. Heritage preservation mitigates climate change creating a smaller carbon footprint compared to new buildings.¹

1 <https://heritagebc.ca/resources/advocacy/making-a-case/making-a-case-for-heritage-building-conservation>

Impacts of Building Construction on Climate Change

The industries in the building and construction sector are one of the leading causes of climate change. The building and construction sector alone accounts for over 36% of global final energy consumption.² Locally, nearly 38% of total community greenhouse gas emissions in Edmonton are from buildings.³



50% of global carbon emissions come from the construction sector



37% of energy related carbon dioxide emissions come from the construction sector

Of the 37% of global carbon dioxide emissions, 9% are from direct emissions sources that burn fossil fuels, like gas stoves, gas fired boilers and gas hot water tanks.⁴

Another 18% of the building and construction sector emissions are from indirect sources like rooftop chillers, heat pumps and lighting.⁵

There has been much effort from policy makers, government and building owners to increase the energy efficiency of building operations to reduce these direct and indirect emissions. However, the remaining 10% of emissions from the sector are from the construction industry.⁶

As a boom and bust city, the economic conditions in Edmonton have influenced the replacement of aging buildings with more modern buildings. New buildings may require 50 years, if not more, for the initial emissions from construction to outweigh the effects of lower in-use energy consumption.⁷ This is impactful in the context of Edmonton, in that many buildings constructed over the last 50 years are already being demolished with the intention for replacement.

² F Wise et al 2019 IOP Conf. Ser.: Earth Environ. Sci. 329 012002

³ City of Edmonton, Community Energy Transition Strategy - Annual Update, Council Report, Attachment 3, June 15, 2022 Executive Committee

⁴ Carl Elefante, October 21, 2022

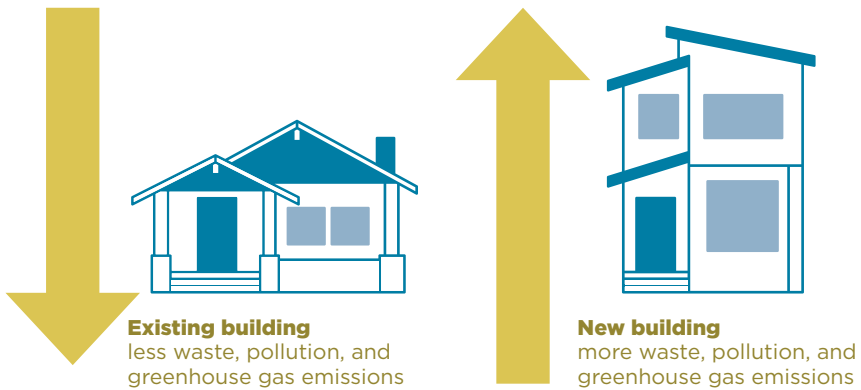
⁵ Carl Elefante, October 21, 2022

⁶ Carl Elefante, October 21, 2022

⁷ Fredrik Berg & Mie Fuglseth (2018) Life cycle assessment and historic buildings: energy-efficiency refurbishment versus new construction in Norway, Journal of Architectural Conservation, 24:2, 152-167, DOI: 10.1080/13556207.2018.1493664

Heritage Preservation - What are the benefits?

As coined by architect Carl Elefante, **‘the greenest building is the one that already exists’**. This is true for heritage buildings, that have the least impact on climate change and the environment. Additionally, heritage buildings are an embodiment of a place’s history with a physical link to materials, people and events from the past. Without heritage buildings, a place loses its unique character and material connection with its past.



Heritage preservation protects the environment. It does not consume resources like energy for demolition of existing buildings and the construction of new buildings in their place. It also contributes to a reduction in waste and pollution, and greenhouse gas emissions.⁸

In fact, many cities across the country, such as Victoria, British Columbia, are using deconstruction ordinances to regulate demolished material from entering landfills. Victoria uses their deconstruction bylaw to regulate, prohibit, and impose requirements for demolished material and avoid sending excess material to mainland landfills.⁹

⁸ Environmental Benefits of Heritage Conservation. Saskatchewan Government. Source: <https://www.saskatchewan.ca/residents/parks-culture-heritage-and-sport/heritage-conservation-and-commemoration/conservation-advice-and-information/research-and-publications>

⁹ Construction Waste. City of Victoria. Source: <https://www.victoria.ca/EN/main/residents/waste-reduction/construction-waste.html>

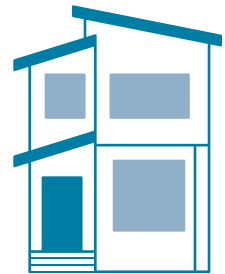
Linking Heritage Preservation and Climate Action

New buildings inherently contain more embodied energy than existing buildings. It takes the energy to extract and process materials required for new construction, and to transport those materials to the construction site to assemble the building. This embodied energy is wasted when an existing building is demolished.

Buildings that already exist, and especially those that have existed for a long time, like heritage buildings, avoid these climate-warming and polluting emissions by simply existing. They contain embodied energy used in their construction, which would be wasted if the buildings were demolished.¹⁰

Buildings that already exist, and especially those that have existed for a long time, like heritage buildings, avoid these climate-warming and polluting emissions by simply existing.

Even if a new building is constructed to be net zero to meet energy efficiency standards, there is still considerable energy embodied in the building materials and construction process which cannot be eliminated even if the building no longer needs to consume energy to operate.



+ New building
+ transport of materials
+ extraction and processing of materials
+ waste materials
+ demolition
Existing building



Existing building

¹⁰ Better Buildings for a Low-Carbon Future, Report of the Standing Committee on Environment and Sustainable Development, House of Commons, June 2018



What can we do?

We should consider the climate change impacts of embodied energy in our buildings. Typically, buildings older than 50 years are viewed as needing to be replaced even though they were built to last much longer.¹¹

- Adopt a 'retrofit first' approach when determining the next steps in a building's life cycle
- Support new ways of thinking about what a sustainable and green building looks like, and the value of including built heritage in discussions about climate change.

¹¹ Enlai Hooi, October 22, 2022

We should also focus on:



Research and metrics

to measure and analyze the sustainability of built heritage;



Education and training

different groups on the importance of built heritage and climate change; and



Increased collaboration

with local, municipal, national, and international organizations with the heritage sector and other stakeholders¹²

These actions collectively can help Edmonton transform into a low carbon city.

Heritage preservation is mistakenly viewed as not being aligned with the planning and development of cities, where you have to choose one or the other. Heritage preservation supports the growth and the need to increase density in Edmonton.

¹² Building on the Past to Sustain the Future, Canadian Association of Heritage Professionals, 2021



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