Public Health Benefits of Green Development Standards

PREPARED FOR:

TOWN OF CALEDON PLANNING & DEVELOPMENT COMMITTEE

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CAPE
Canadian Association of Physicians for the Environment
Association canadienne des médecins pour l'environnement
ACME
Ontario Regional Committee

Disclosures: None

Introduction to CAPE (Cdn Assn of Physicians for the Environment)

- The **Canadian Association of Physicians for the Environment** (CAPE) is a physician-directed non-profit organization, working at the **unique intersection of health and environment** to enable health for all through environmental protection. CAPE engages with governments and policy work, campaigns, education, media, and research

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Implementing strong mandatory GDS is critical to maintaining public health

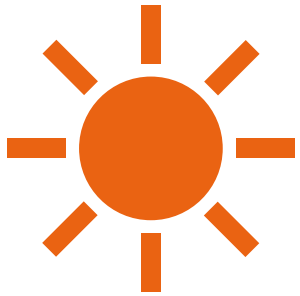
- Driven by escalating global GHG emissions, we are now in the hottest period in recorded human history
- The built infrastructure already contributes 30% of Caledon's entire GHG emissions, primarily due to fossil gas use in buildings
- This will rise steeply as the population is projected to nearly triple by 2050

Implementing strong mandatory GDS is critical to maintaining public health

- Mandatory Green Development Standards (GDS) are essential to meeting our climate targets culminating in all new buildings being net zero emissions by 2030
- Caledon's progressive record on climate policy & declaring climate emergency are commendable
- CAPE Ontario is looking to Caledon's adoption of a strong updated GDS
- "Optional" GDS is no longer an option!

What's at stake if we don't get GDS right?

There are 2 primary environmental pathways to human health harms associated with our built infrastructure that must be controlled through GDS:



Carbon Pollution

GHGs/Planetary heating

Climate Change

Air Pollution

Particulate matter (PMs)

Toxic gases – especially NOx

Escalating GHG's fuel Climate Change

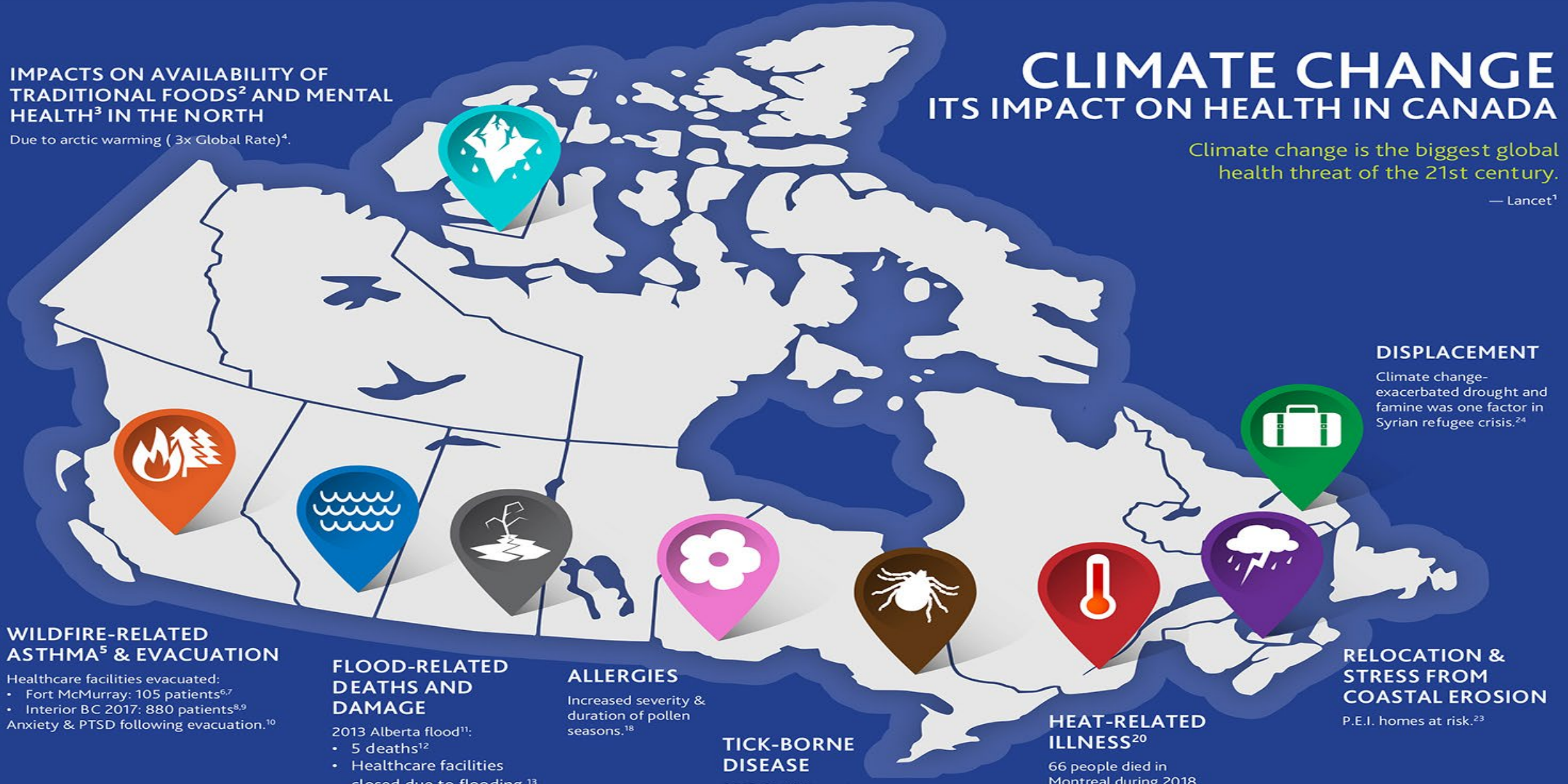
- ***"Climate change is the biggest threat to health in the 21st century and our very survival is at stake"***

- - Dr Vanessa Kerry, 2023
- WHO Director-General Special Envoy for Climate Change & Health

CLIMATE CHANGE
ITS IMPACT ON HEALTH IN CANADA

Climate change is the biggest global health threat of the 21st century.

— Lancet[1]



IMPACTS ON AVAILABILITY OF TRADITIONAL FOODS[2] AND MENTAL HEALTH[3] IN THE NORTH

Due to arctic warming (3x Global Rate)[4].

WILDFIRE-RELATED ASTHMA[5] & EVACUATION

Healthcare facilities evacuated:

- Fort McMurray: 105 patients[6,7]
- Interior BC 2017: 880 patients[8,9]

Anxiety & PTSD following evacuation.[10]

FLOOD-RELATED DEATHS AND DAMAGE

2013 Alberta flood[11]:

- 5 deaths[12]
- Healthcare facilities closed due to flooding.[13]

DROUGHTS[14,15]

Uneven impact on crops.[16]
Socioeconomic stress.[17]

ALLERGIES

Increased severity & duration of pollen seasons.[18]

TICK-BORNE DISEASE

2017: 3x higher rate Lyme Disease in Ontario than 2012-2016 average.[19]

HEAT-RELATED ILLNESS[20]

66 people died in Montreal during 2018 heat wave.[21,22]

DISPLACEMENT

Climate change-exacerbated drought and famine was one factor in Syrian refugee crisis.[24]

RELOCATION & STRESS FROM COASTAL EROSION

P.E.I. homes at risk.[23]

ASSOCIATION MÉDICALE CANADIENNE
CANADIAN MEDICAL ASSOCIATION

1-Costello, The Lancet, 2009; 2-Rosol R, IJCH, 2016; 3-Cunsolo A, Ellis N, Nature CC 2018; 4-Canada's Changing Climate 2019; 5-Yao J et al, 2016; 6-Hampshire, G, CBC 2016; 7-Kirchmeier-Young M 2017; 8-BC Int Health 2017; 9-Kirchmeier-Young M et al, Am Geo Un, 2018; 10-Alberta Health, 2016; 11-Teufel B et al 2017; 12-CBC Alberta Flood 2013; 13-United Nurses of Alberta 2013; 14-Yusa A, et al, Int J Env Res P H, 2015; 15- Smoyer-Tomic KE, et al. Ecohealth 2004; 16- Agriculture and Agri-Food Canada, 2015; 17-Cryderman K, 2018; 18- Ziska LH, The Lancet PH 2019; 19- Nelder MP, 2018; 20-Howard, C et al. The Lancet Countdown Policy Brief for Canada 2018; 21-Montreal PH, 2019; 22- Vogel MM et al, Am Geo Union, 2019; 23-Fenech, A, 2014; 24-Kelleya, C, et al, 2015

The 2021 BC heat dome was the single deadliest weather event in Canadian history with over 600 deaths


The climate crisis is harming housing and food security, which are both social determinants of health.

Climate change is escalating infectious diseases

- Climate change may **aggravate nearly 60% of all human pathogenic diseases**

- Risks of **Lyme, West Nile, pandemics** such as COVID, & more, have already increased [Source: Health Canada]

- Ontario may be at risk for **malaria, yellow fever, Zika** & more in near future [Source: Cdn Public Health Assn]

- Climate change is **increasing antibiotic resistance**

Climate change impacts mental health – disproportionately among youth

Canadian study post Fort McMurray fires:

- Depression, addictions, suicide

Global Study of 10,000 Youth:

- Climate anxiety affects daily life & functioning ~45%
- Hesitant to have children ~40%
- **Governments betray current & future generations ~60%**

Ref: Lancet Planetary Health, 2021

Escalating Air Pollution is Toxic & Deadly

Total premature deaths globally due to air pollution:
6.7 million / year

Ref: WHO 2022

15 300 premature Canadian deaths annually

(impact $114 billion nationally)

6600 premature Ontarian deaths annually

(impact $49 billion provincially)

Ref: Govt of Canada 2022 (2016 stats)

Escalating Air Pollution is Toxic & Deadly

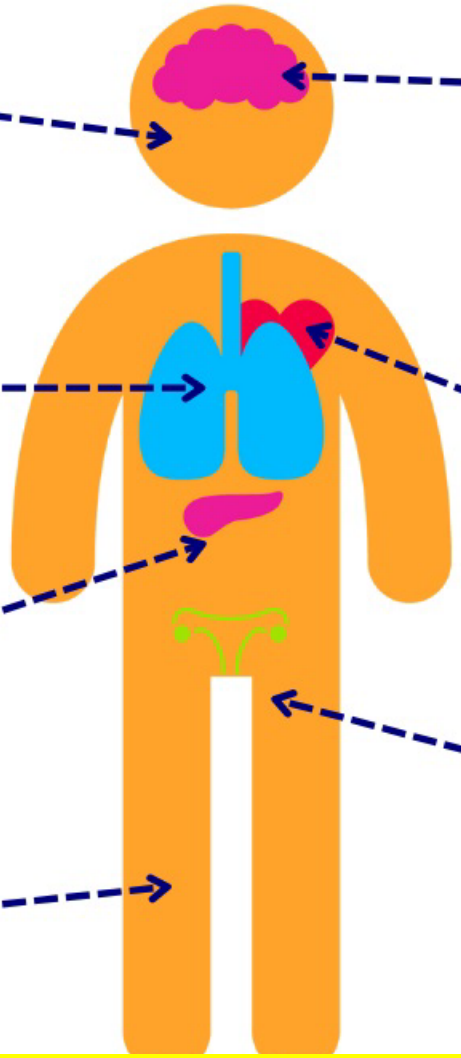
The health harms of air pollution

Skin ageing

Lung diseases
Asthma
Lung cancer
Lung development
Pneumonia

Insulin resistance
and diabetes

Blood clots



Stroke
Brain development
Mental health
Dementia

Heart disease
High blood pressure

Premature birth
Low birthweight
Decreased sperm quality
Illness during pregnancy

PM 2.5's and Nox gases enter our blood streams via the lungs and cause disease in multiple body systems.

16 June 2022
CleanAirDay

Air Pollution Causes Multiple Types of Cancer

- Lung
- Leukemia
- Breast
- Other

Air Pollution Risks to Pregnant Women & Infants

- Low birth weight
- Premature births
- Still births
- Birth defects

Air Pollution impacts Mental Health Independently of Climate Change

- Anxiety
- Depression
- Stress
- Suicide

Review > Environ Sci Pollut Res Int. 2021 Feb;28(8):9029-9049.
doi: 10.1007/s11356-021-12357-3. Epub 2021 Jan 22.

Association between particulate matter air pollution and risk of depression and suicide: a systematic review and meta-analysis

Qisijing Liu [# 1], Wanzhou Wang [# 1], Xuelin Gu [# 1], Furong Deng [1], Xueqin Wang [2],

- Recent research shows air pollution is increasing antibiotic resistance
  - every 10% rise in PM 2.5 increases antibiotic resistance by 1.1% → By 2050 could lead to 840,000 premature deaths annually unless air pollution is curbed

Health Impacts of indoor gas use

- In-home gas appliances contribute to both indoor & outdoor air pollution and to climate change
- Gas stoves significantly increase childhood asthma risks by 42%, equivalent to secondhand smoke
- Gas stoves release several harmful chemicals like carbon monoxide, nitrogen dioxide (NO_2), formaldehyde & benzene, some even while stoves are switched off. These are linked to serious health issues including multiple lung diseases and cancer
- Gas furnaces release pollutants directly into our backyards

How is Caledon's GDS essential for public health?

Caledon Green Development Standard:

Metrics Overview

Theme 1: Community Design and Mobility

Objective: Create complete, connected communities that enable active and sustainable modes of transportation and enhance well-being for Town residents.

Metrics:

- 1.1 Housing Diversity
- 1.2 Connection to Parks and Open Space
- 1.3 Light Pollution Reduction
- 1.4 Active Transportation
- 1.5 Public Spaces
- 1.6 Mixed Use Neighbourhoods
- 1.7 Electric Vehicle (EV) Charging

Theme 2: Green Infrastructure

Objective: Improve stormwater management, reduce urban heat island, and enhance habitat

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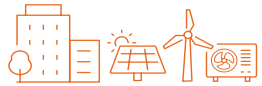
Metrics:

- 2.1 On-Site Green Infrastructure
- 2.2 Healthy Soils
- 2.3 Plant Species
- 2.4 Urban Heat Island
- 2.5 Stormwater Quantity and Quality
- 2.6 Bird-Friendly Design



Theme 3: Buildings and Energy

Objective: Support low carbon, energy efficient and resilient buildings and renewable energy systems.

Metrics:

- 3.1 Operational Energy and GHG Emissions
- 3.2 Building Resilience
- 3.3 Solar Readiness
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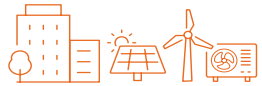

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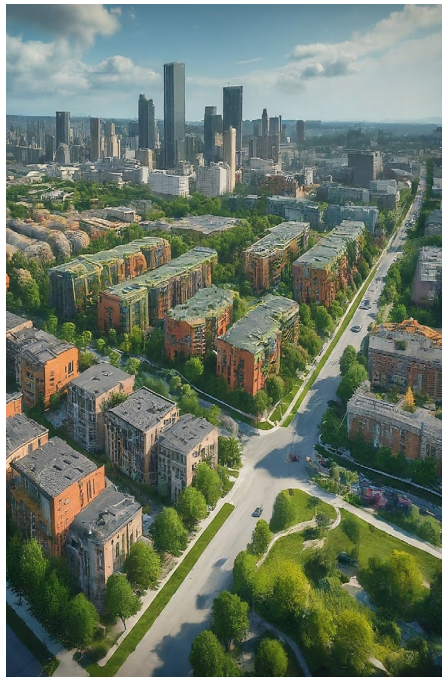
Housing Diversity

- Housing is a fundamental social determinant of health
- Diverse housing options to increase equitable supply, affordability and accessibility for all is a basic tenet of public health



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Active Transportation

- Facilitating active transport such as cycling and walking has multiple direct & indirect health benefits
- Increased physical fitness reducing obesity, hypertension, heart disease & diabetes
- Decreased carbon & air pollution from fossil fuel powered transportation yields additional largescale health benefits
- Decreased motor vehicle associated trauma

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Promoting EV's

- An EV transition addresses both the massive health harms of burning fossil fuels & proven equity issues of TRAP (traffic related air pollution) exposure

- TRAP is a health equity issue: lower socioeconomic & racialized Canadians have higher TRAP exposure

- Higher TRAP levels occur within 500m of major roads → 33% of Canadians live within 250m of major roads

Ref: CAPE TRAP Report, 2022.

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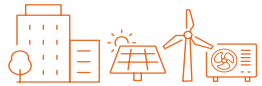

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Green Infrastructure, Parks & Natural Systems

Evidence proving the multiple human health benefits of urban nature systems is rapidly accumulating:

Student performance and high school landscapes: Examining the links. Landscape and Urban Planning, 2010.

Urban Nature Experiences Reduce Stress in the Context of Daily Life Based on Salivary Biomarkers. Front. Psychol. 2019

The Association between Lifelong Greenspace Exposure and 3-Dimensional Brain Magnetic Resonance Imaging in Barcelona Schoolchildren. Environ Health Perspect. 2018

The role of neighbourhood greenspace in children's spatial working memory. Br J of Educational Psychology. 2018

Health Benefits of GDS Natural Systems

- Improved mental health, happiness and creativity
- Improved memory, test scores in students including in ADHD, graduation rates and intent for college/university in students
- Larger brain size in schoolchildren
- Improved high blood pressure, heart disease and diabetes
- Decreased stress & stress hormone levels
- Improved longevity in seniors near walkable greenspaces
- Reduced social isolation & improved social cohesion

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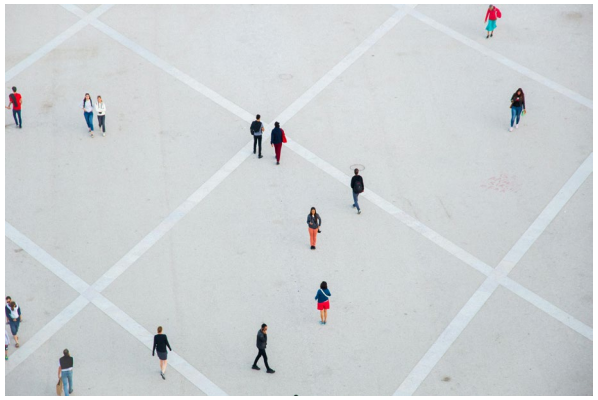
Urban Heat Islands



- Addressing urban heat islands yields multiple public health and other benefits
- Also an equity issue as lower socioeconomic status is linked with greater exposure to heat islands
- Heat islands amplify human health risks of extreme heat, already one of the greatest hazards of climate change
- Increase risks of flooding by paving over land
- Increase GHGs through embodied carbon in concrete & decreased land available for greenspaces which function as carbon sinks

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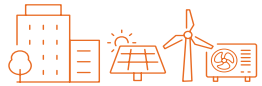

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Energy Use, GHG Emissions & Embodied Carbon

- Reducing energy use, GHG emissions & embodied carbon in buildings disrupts both the carbon & air pollution pathways to human health harms
- The public health benefits are massive along with economic & environmental co-benefits
- These are some of the most powerful impacts of GDS

The ways in which we live, move & power our buildings today are critical to our sustainability. A strong updated GDS is a powerful tool to achieve a healthy and thriving future for all…

"We are running out of time…We are the last generation that has the opportunity to make the changes needed to avoid catastrophic climate change. Climate change must be treated like the public health emergency that it is."

- Cdn Public Health Assn.

Questions welcome

Thank you