

# Health Impacts of Gas-fired Electricity

PREPARED FOR:  
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Disclosures: None

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- ▶ Fossil fuels are the single greatest driver of the climate crisis
- ▶ This includes “natural” gas which is primarily methane, a highly potent fossil fuel 85x worse than CO<sub>2</sub> as a greenhouse gas (GHG)
- ▶ The impact of gas is comparable to coal when massive methane leaks through its entire life cycle are factored in
- ▶ **Human health harms and deaths worldwide in 2020 due to gas were comparable to coal** [Ref: C40 Cities]

- ▶ Ontario's coal phase-out completed in 2014 was the single largest GHG reduction ever achieved in North America
- ▶ Smog days went from 53 days in 2005 to ONE single day over 5 years after phaseout (2014-2019)
- ▶ The most important pollutants from gas-fired electricity generation are particulate matter (PM's) and nitrogen oxides (Nox), both of which are components of smog
- ▶ **Gas expansion risks reversing much of the huge and hard won gains of getting off coal**



Gas-fired electricity harms human health by 2 pathways:



**Carbon Pollution**



**Air Pollution**



▶ ***“Climate change is the biggest threat to health in the 21<sup>st</sup> century and our very survival is at stake”***

▶ - Dr Vanessa Kerry, 2023

▶ WHO Director-General Special Envoy for Climate Change & Health

## IMPACTS ON AVAILABILITY OF TRADITIONAL FOODS<sup>2</sup> AND MENTAL HEALTH<sup>3</sup> IN THE NORTH

Due to arctic warming (3x Global Rate)<sup>4</sup>.

# CLIMATE CHANGE ITS IMPACT ON HEALTH IN CANADA

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

— Lancet<sup>1</sup>




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-Kelley, C, et al, 2015



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

An aerial photograph showing the aftermath of a severe storm. The scene is characterized by extensive destruction of residential property. In the upper center, a house with a green roof is partially destroyed, with its structure exposed. To the right, a large pile of debris, including wooden planks and insulation, is scattered across a grassy area. In the lower center, another house is almost completely destroyed, leaving a large mound of rubble. A dirt road winds through the area, and a paved road with a red car is visible in the bottom right corner. The overall atmosphere is one of devastation and loss.

Housing & food are social determinants of health. The climate crisis is deepening housing and food insecurity.



# 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%**

# Air pollution Related Deaths & Health Costs

Total premature deaths globally due to air pollution:

**6.7 million / year** (impact > US\$5 trillion in 2013)

Ref: WHO 2022

**15 300 premature Canadian deaths annually**

(impact \$114 billion nationally)

**6600 premature Ontarian deaths annually**

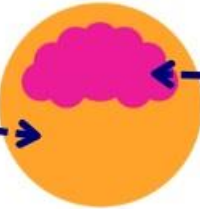
(impact \$49 billion provincially)

Ref: Govt of Canada 2022 (2016 stats)

# The health harms of air pollution



Skin ageing



Stroke

Brain development

Mental health

Dementia



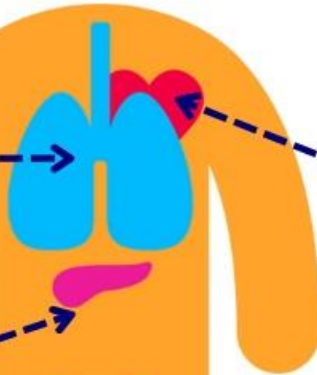
Lung diseases

Asthma

Lung cancer

Lung development

Pneumonia

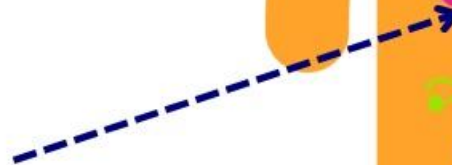


Heart disease

High blood pressure



Insulin resistance  
and diabetes



Premature birth

Low birthweight

Decreased sperm quality

Illness during pregnancy



Blood clots



# 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 #<sup>1</sup>, Wanzhou Wang #<sup>1</sup>, Xuelin Gu #<sup>1</sup>, Furong Deng<sup>1</sup>, Xueqin Wang<sup>2</sup>,

Huiling Li<sup>3</sup>, Yixian Gu<sup>1</sup>, Guojun Wang<sup>4</sup>

# ▶ 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







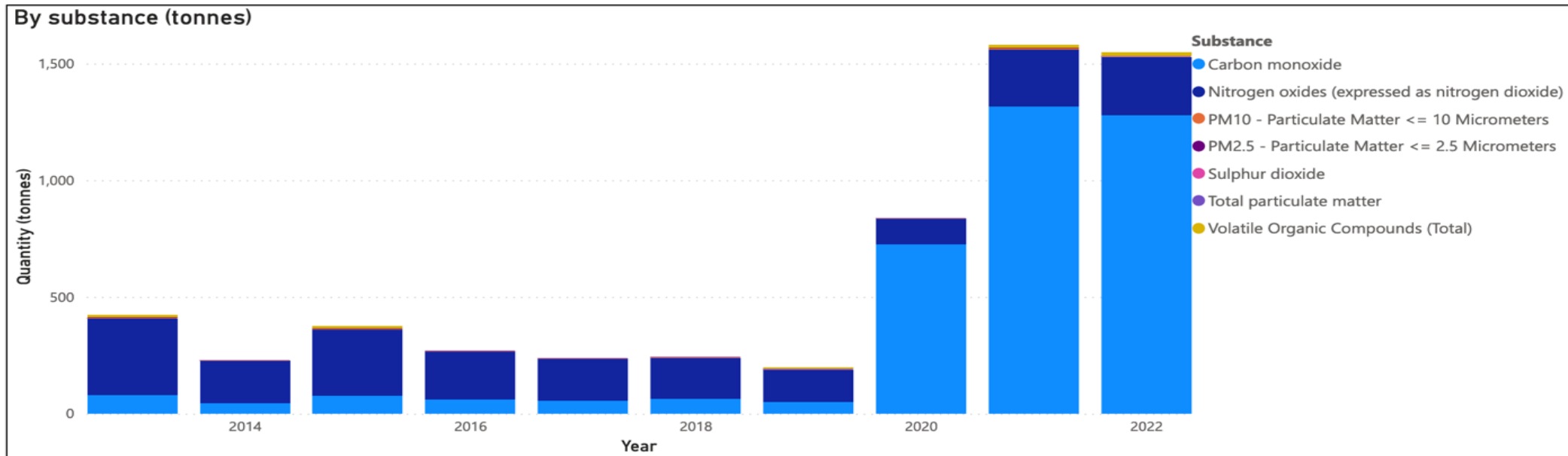
People living near gas plants have increased health risks such as:

- emergency room visits by the elderly
- preterm deliveries for pregnant women
- restricted activity days
- chronic bronchitis

Data is limited & still being validated, but modelling of 2019 health impacts for gas-fired electricity for Toronto estimates:

- 286 new asthma cases in children & 1319 children (total) suffering asthma due to gas pollution exposure
- 9696 sick leave days amongst workers
- 215 premature deaths causing 3419 years of life lost

# Halton Hills Generating Station National Pollutant Release Inventory (NPRI): All Pollutants Plot



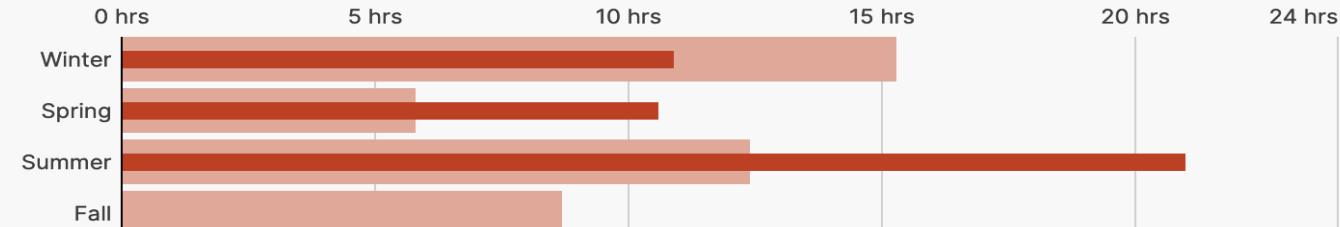
While we can measure the recent increase in pollutants from the existing plant, the extent of resulting local and distant health impacts anticipated with the proposed Halton Hills expansion is largely unknown.

## GTA gas plants meant to operate only at peak times run almost all the time

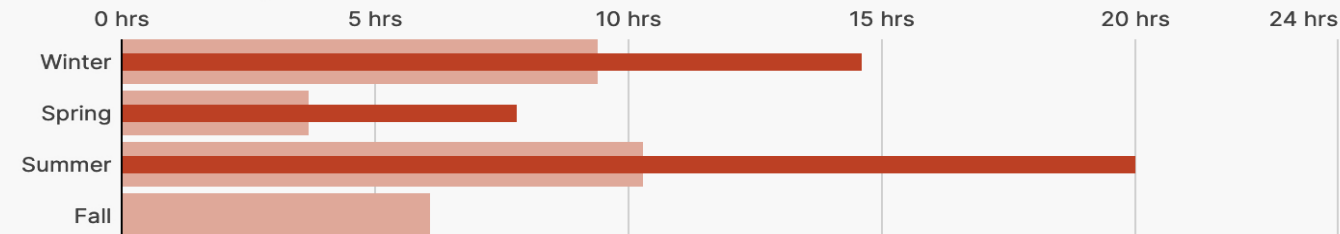
In the last five years the three gas plants in the GTA have ramped up the number of hours per day they operate.

● 2019 ● 2023

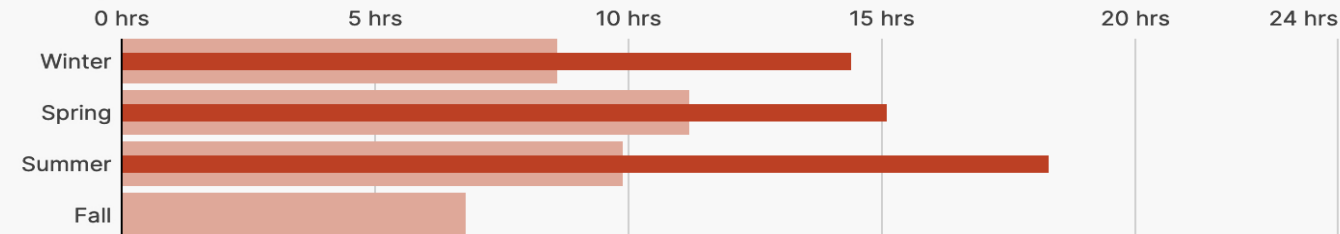
### Portlands Energy Centre



### Halton Hills Generating Station



### Goreway Power Station



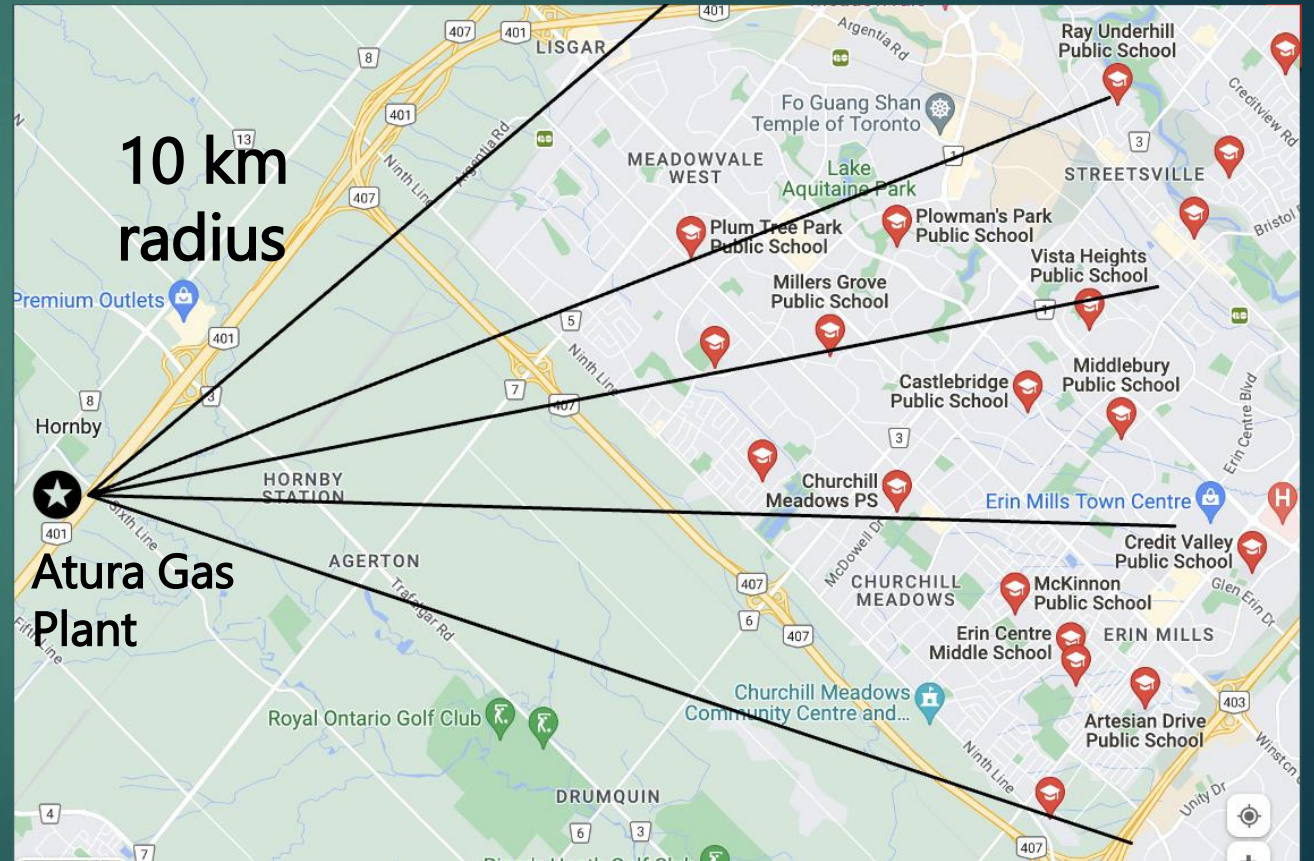
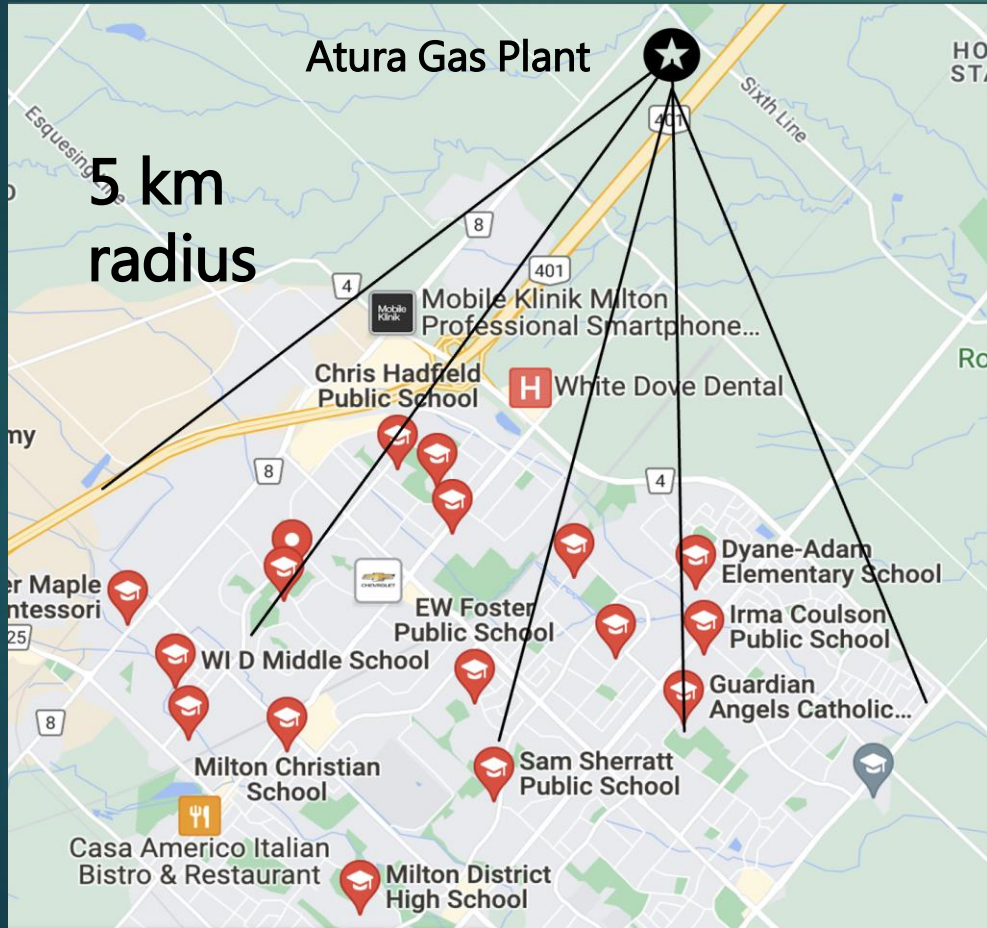
SOURCE: INDEPENDENT ELECTRICITY SYSTEM OPERATOR

TORONTO STAR GRAPHIC

## Halton Hills Generating Station: Hours of Operation

- The existing HH plant ran 20 hours/day this summer, far more than originally intended & amplifying health impacts
- This is important to pause and study to consider in decision-making.


# Multiple schools, communities & populated areas are nearby Halton Hills Atura Generating Station within 5-10 km



# There are better solutions...renewables will protect human health, save lives & money

- While the volatile cost of gas has hit record highs & is projected to keep rising, renewables recently became the cheapest energy sources globally and will become even cheaper with larger scale uptake
- Every dollar invested in the green energy sector may generate several times more jobs than equal investment in gas, and will attract more investment in future from businesses increasingly looking for a clean energy base
- Many jurisdictions worldwide have transitioned to large scale renewables without significant brownouts using an energy mix, conservation, storage, & smart grid management eg Germany~47% national energy grid renewable & Denmark ~61%
- **Renewables will save the massive costs of fossils induced human health & public infrastructure damage (eg \$50 billion annually due to air pollution related deaths)**





*"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."*

*Our response to climate change can also be "the greatest health opportunity of this century"*

*- Cdn Public Health Assn.*

**Thank you**