Hamilton
Public Health

Factsheet: Air Quality

CleanAir HAMILTON

Air Quality Concerns

- There are two broad categories of air pollutants:

  - The key air pollutants associated with Smog; and

  - The key pollutants such as benzene or polycyclic aromatic hydrocarbons (PAHs) that can affect health in a more direct way.

- The word "smog" is usually used to describe the air pollution experienced on hot days when air levels of ozone are high, but can also be applied to poor air quality that results from high levels of particulate matter (PM) that can be experienced all year round.

Six Key Air Pollutants

- Nitrogen dioxide (NO_2)
- Ground-level ozone (O_3)
- Inhalable particulate matter (PM_{10})
- Respirable particulate matter ($PM_{2.5}$)
- Sulphur dioxide (SO_2)
- Carbon monoxide (CO)

- The key pollutants contribute to about 186 premature deaths, 395 respiratory hospital admissions and 322 cardiovascular hospital admissions each year.
- The air pollutants nitrogen dioxide, ground-level ozone and inhalable particulate mater (PM_{10}) - are responsible for the greatest share of these air-related health impacts in Hamilton.
- Ground-level ozone is a secondary air pollutant that is created in the atmosphere by a reaction between nitrogen oxides and volatile organic compounds in the presence of sunlight.
- Inhalable particulate matter (PM_{10}) and respirable particulate matter ($PM_{2.5}$) can be emitted directly or formed in the atmosphere from a reaction between air pollutants such as SO_2 and NO_2 with other chemicals in the air.




Sources of Air Pollution

Transportation Sector	●Is an important source of nitrogen oxides, volatile organic com pounds and carbon monoxide within Hamilton.
Industrial Sector	●Is an important source of particulate matter, sulphur dioxide, volatile organic compounds and nitrogen oxides within Hamilton
Urban Area Sources	●Homes, businesses and institutions can emit nitrogen oxides when burning oil and natural gas in furnaces an boilers ●Commercial operations that use solvents for cleaning and painting can emit volatile organic compounds.
Road Dust	●Roads can accumulate particulate matter from construction sites and industrial properties that can become airborne when disturbed.
Electricity Sector	●Large quantities of sulphur dioxide and nitrogen oxides can be emitted from coal-fired electricity generating stations. (Phased out in Ontario in 2014). ●Air pollutants released from U.S. sources contribute in a significant way to air levels of ozone and particulate matter in Hamilton.

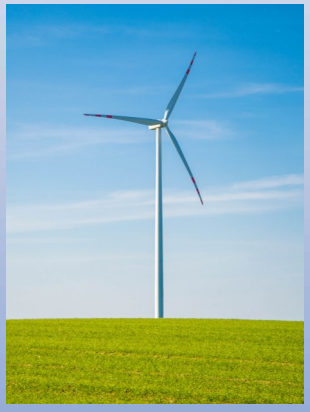
Climate Change is Likely to Worsen Air Quality

Air quality is expected to worsen in Ontario with climate change because:

- Hotter temperatures predicted for summer months are associated with higher levels of ozone;
- Humid weather conditions predicted for summer months are associated with higher levels of particulate matter; and
- Heat waves encourage greater use of electricity which increases emissions that contribute to air pollution.

Actions Needed to Improve Air Quality

Transportation Sector	- Increase the use of alternative modes of transportation (e.g. public transit, biking and walking);
	- Increase the use of low emission & alternative vehicles (e.g. electric vehicles, hybrid electric vehicles, and alternative fuels such as biodiesel.)
Planning Sector	- Encourage compact urban development and mixed use, pedestrian-oriented urban design.
Industrial Sector	- Reduce air emissions from industrial processes;
	- Reduce tract-out of dirt onto roads.
Electricity Sector & Urban Area Sources	- Increase the energy efficiency of existing and new buildings;
	- Increase the energy efficiency of appliances and equipment that use electricity;
	- Encourage the development and use of renewable energy (e.g. wind & solar powered generators) and cogeneration facilities
Road Dust	- Reduce the accumulation of PM on roads.
Transboundary Air Pollution	- Reduce emissions from coal-fired power plants in the U.S.



Co-Benefits of Actions to Improve Air Quality

Actions taken to improve air quality & reduce negative impacts in Hamilton can produce the following health, environmental and economic co-benefits:

- Reduce emissions that contribute to climate change;
- Reduce toxic emissions that harm human health directly or indirectly (e.g. benzene from cars, PAHs and diesel-fuelled trucks, mercury from coal-fired power plants);
- Produce cost savings by reducing electricity use;
- Produce cost savings by reducing fuel use;
- Create local jobs in new industries directed at increasing energy efficiency;
- Create new jobs producing locally generated renewable or co-generated energy;
- Reduce air pollution that can damage agricultural crops
- Reduce air pollution that can harm trees, soil and living organisms in the ecosystem;
- Reduce haze that may negatively impact on tourism; and
- Reduce damage to buildings, tires and rubber products.