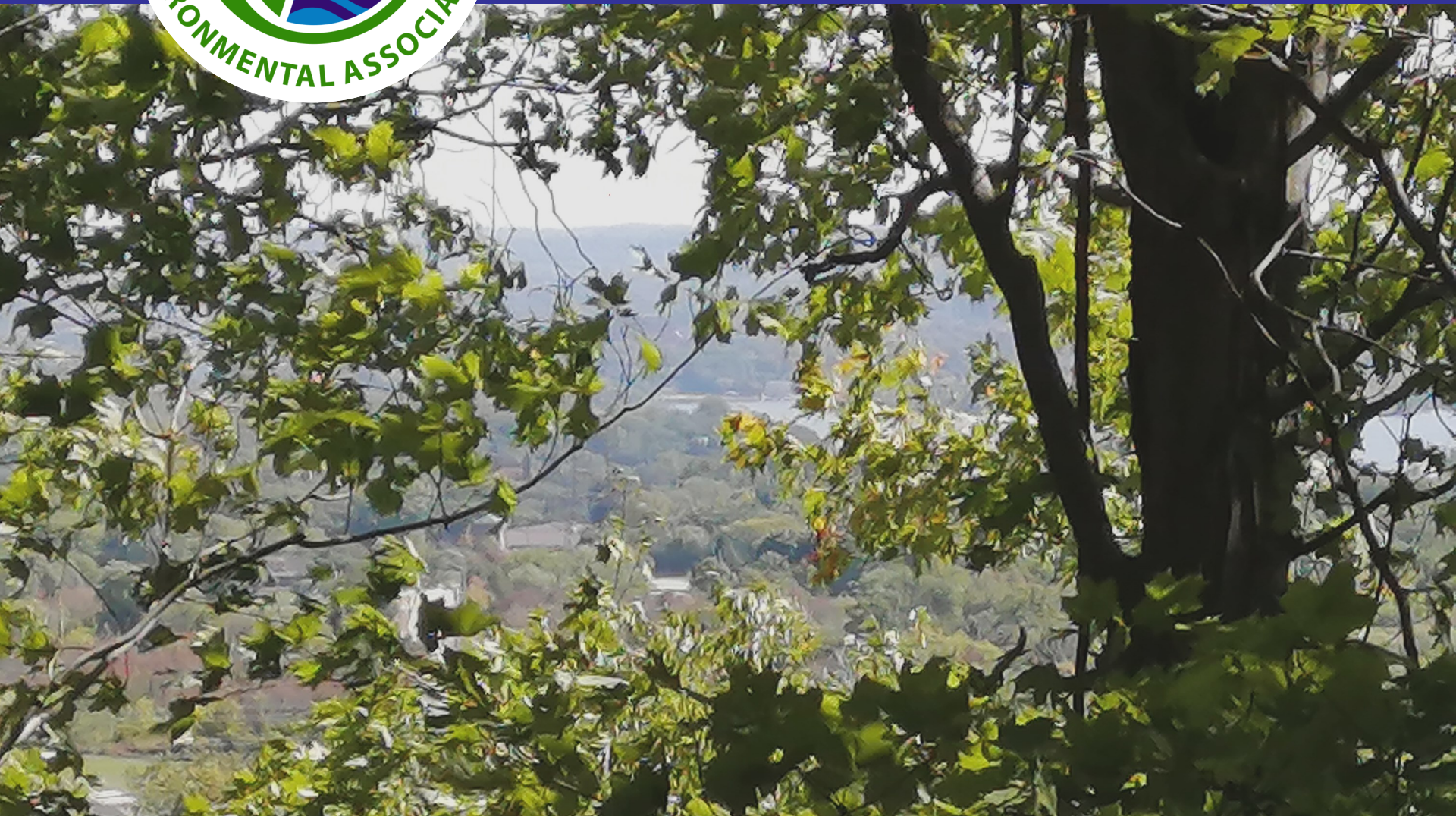




2020 Report to the Community



HIEA ~ Mission



**“To improve the local environment
~ air, land and water ~**

**through joint and individual activities, and by
partnering with the community to enhance
future understanding of environmental issues
and help establish priorities for action.”**

HIEA members achieve our mission by:

- Operating our facilities in a safe, responsible, and sustainable manner;
- Investing in the stewardship of our shared environment through minimizing the ecological impacts of our operations;
- Partnering with the City of Hamilton and key stakeholders to support a decarbonized future;
- Monitoring and communicating our environmental performance in a transparent and open manner;
- Supporting conservation and preservation of the natural environment through local community partnerships;
- Engaging with the community regarding enquiries and concerns;
- Working together to promote environmental awareness of local and global issues.

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Message from the Chair



Looking back at 2020, it has been a year unlike any other bringing with it unprecedented challenges and changes. Throughout, HIEA has maintained its focus on community outreach initiatives, and the conservation and protection of the environment in which we live and operate. This is made possible because of our partnerships and by closely engaging with our neighbours, community initiative and not-for-profit environmental sector groups, local

representatives from the City, and the Ministry of the Environment, Conservation and Parks.

Our 14 member companies remain a strong, dedicated group working to fulfill our mandate: *“to improve the local environment – air, land and water – through joint and individual activities, and by partnering with the community to enhance future understanding of environmental issues and help establish priorities for action.”*

We saw some significant changes for HIEA in 2020 as we welcomed a new Treasurer, Todd Brien of ArcelorMittal Dofasco replacing Roy Collins of Stelco, and a new Public Relations Coordinator, Heidi Levitzky, who replaced HIEA’s long-time Communications Coordinator, Karen Logan. Our Board of Directors also underwent adaptation as Jim Kruchka of Air Liquide retired and Gabriel Panaccio stepped forward to take his place. I wish Roy, Jim and Karen all the best and look forward to collaborating with all members as we continue working towards a more environmentally sustainable future.

HIEA highly values its connection to the community and by merging resources, we can jointly contribute to environmental education programs for Hamilton’s youth. This is accomplished through direct

financial sponsorship and also via the utilization of volunteers from our member companies to deliver the programming. The local environmental initiatives that HIEA supported in 2020 included The Bay Area Restoration Council, The Hamilton Conservation Foundation, The Royal Botanical Gardens, the Hamilton Naturalists’ Club, the City of Hamilton, and McQuesten Urban Farms. Details about the specific programs that were funded can be found later in this report.

HIEA also believes that post-secondary environmental studies are a primary focus for financial support and awards students with our own scholarship fund at Mohawk College. Since the endowed fund was established in 2006 it has provided \$27,075 in total support to 30 recipients enrolled in Environmental Diploma Programs.

Community engagement and transparency is of utmost importance to HIEA members, and we welcome Hamiltonians twice per year to attend our public meeting. Here, residents learn about HIEA’s activities and progress in an open forum while expanding the dialogue about environmental issues in our communities which helps HIEA meet their organizational values. Although these meetings typically take place in a live setting, the 2020 fall annual meeting was successfully held virtually and meetings will be conducted similarly in 2021.

Our member companies are proud of the impact they have made in the Hamilton community over the past 23 years. As a neighbour to industry, your input is integral to HIEA’s on-going success. We welcome your involvement. For more information about our meetings and other current initiatives, visit www.hiea.org or contact us at 905-662-2131 or prcommunications@hiea.org.

A handwritten signature in dark ink, appearing to read 'John Lundrigan', written in a cursive style.

John Lundrigan
Chair of the Board - Hamilton Industrial Environmental Association

Message from the General Manager



In 2020, HIEA was able to advance our activities and fulfil our mandate under challenging conditions due to COVID-19 restrictions. For example, some of our community partners could not fulfil their projects in 2020. HIEA was able to add the unspent funds to 2021 initiatives. Along with other surpluses we were able to increase our funding commitment to \$44,000 in 2021. This one-time funding increase includes a new endowed scholarship fund for the Sustainable Chemistry program at

McMaster University for \$26,000. We are very proud to be partnering with McMaster and supporting students in this new program. We will continue to enhance our programs in the coming years.

COVID-19 restrictions resulted in many initiatives being curtailed, stopped or changed. HIEA responded by going to on-line virtual meetings and electronic correspondence to move our programs forward. In addition, HIEA resources were utilized to advance Clean Air Hamilton initiatives on the Dust Sub-Committee and Annual Report at a time when Hamilton Public Health staff was committed to the COVID-19 effort.

HIEA companies remain committed to compliance with applicable air standards having spent almost \$600 million on air and other environmental improvements over the last 5 years. HIEA has worked with our government and community stakeholders by highlighting the emission reductions of our members, and by finding innovative new solutions. For example, HIEA and our members have supported the Waste Heat Recovery initiative led by the Hamilton Chamber of Commerce, as well as our continuing participation on Clean Air Hamilton and the Hamilton Air Monitoring Network throughout 2020. Our members continued to make environmental improvements while

becoming more efficient, such as, AM Dofasco's new state-of-the-art boiler facility that also generates electricity. (see page 14 for more detail on this project)

In 2020, HIEA continued its pro-active advocacy campaign although opportunities were limited due to COVID-19 considerations. We advised interested parties on the challenges Hamilton faces so that new policies or proposals might be more effective and equitable for our city and our members as stakeholders. These include:

- ⇒ Clean Air Hamilton and Dust Management Sub-Committee
- ⇒ The External Working Group on Regulation 419,
- ⇒ The Iron and Steel Technical Standards Working Group,
- ⇒ Bay Area Climate Change Council,
- ⇒ Hamilton Chamber of Commerce, Waste Heat Recovery Project.

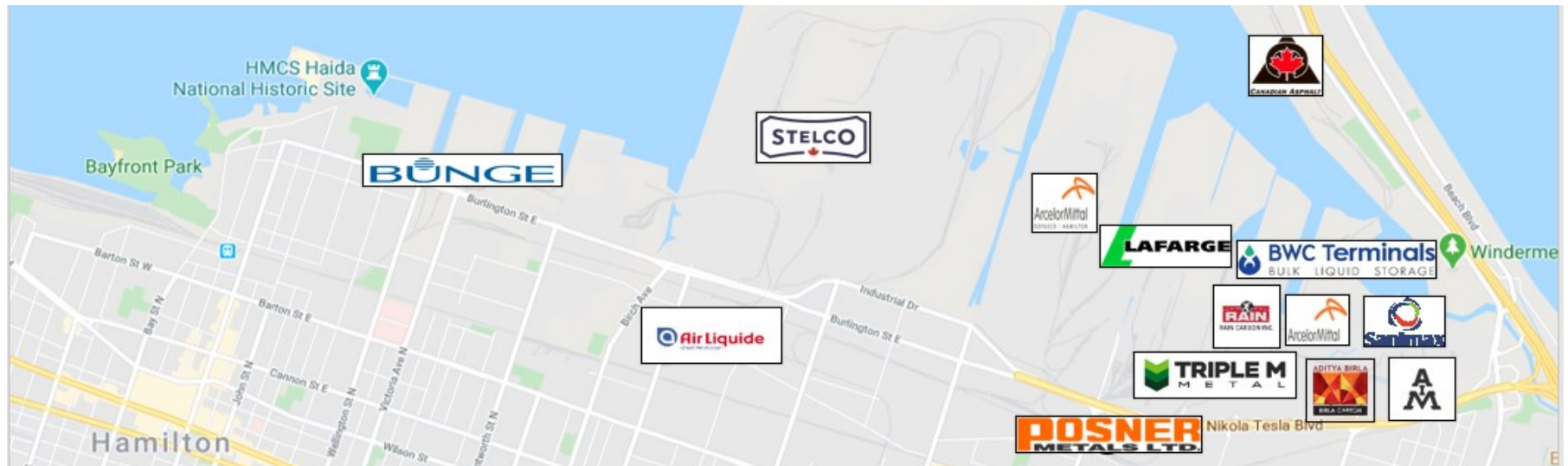
Hamilton industries are resilient through the integration of our product and by-product flows resulting in a prosperous industrial ecosystem. The concentration of industry make HIEA members globally competitive providing good jobs, and also creating opportunities for long-term emission reductions, like greenhouse gases and particulate matter.

HIEA will continue to work together with our community stakeholders and government leaders to support prosperity and improve the environment for all Hamiltonians. This is how HIEA fulfils its mandate to improve the local environment.

A handwritten signature in cursive script, reading "Ed Cocchiarella".

Ed Cocchiarella
General Manager—Hamilton Industrial Environmental Association

2020 HIEA Members ...



Air Liquide - www.airliquide.com - is a global provider of industrial and medical gases and related services. Founded in 1902, Air Liquide has 125 subsidiaries in 75 countries and has 40,000 employees, including 2,000 in Canada.

American Iron and Metal - www.aim-recycling.com has roots in the world of metal stretching back over 80 years, American Iron & Metal (AIM) is a family-owned company, recognized as a world leader in the metal recycling industry. From humble beginnings, AIM has evolved into a multi-faceted firm with multiple facilities and over 2,000 employees located throughout the world. Thanks to its global reach and personalized local support, AIM provides customers with unsurpassed service and support.

ArcelorMittal Hamilton East Inc. - www.arcelormittal.com is a major North American steel wire producer servicing the automotive, OEM, and construction markets.

ArcelorMittal Dofasco - www.dofasco.arcelormittal.com is a leading North American steel solutions provider. The corporation's steel products include hot rolled, cold rolled, galvanized and tinplate steels

as well as tubular products and laser welded blanks. ArcelorMittal Dofasco's wide range of steel products are sold to customers in the automotive, construction, energy, packaging, manufacturing, pipe and tube and steel distribution markets.

Birla Carbon Canada Ltd. - www.birlacarbon.com is the world's leading sustainable manufacturer and supplier of carbon black additives. Our global presence ensures that our carbon black is of the highest quality worldwide, delivering a consistent product wherever our customers are. Whether an established formulation or a custom solution, Birla Carbon is the right partner with the right product for superior performance in any application for tires, specialty blacks and mechanical rubber goods. Birla Carbon has 16 manufacturing sites worldwide and employs 110 people at the Hamilton site.

Bunge Canada - www.bungecanada.com is the country's largest processor of oilseeds. At its Hamilton facility, which employs more than 120 people, Bunge processes oilseeds into protein meal and edible oils.

Canadian Asphalt Industries Inc. - www.canadianasphalt.com employs 30 employees at the Hamilton plant where they produce and blend many different grades of paving and roofing asphalt, respectful of the environment in the process.

Birla Carbon Canada Ltd. - www.adityabirla.com The Columbian Chemicals Hamilton plant employs approximately 100 people producing carbon black for a variety of industrial uses.

BWC Terminals - www.bwcterminals.com is a premier provider of bulk liquid storage and related services throughout Canada and the United States. BWC Terminals is committed to maintaining zero injuries, illnesses, and incidents within their organization. We believe in providing the highest standard of performance and business excellence by continuously improving processes, practice, and products through management and employee commitment and accountability.

Lafarge - A member of LafargeHolcim” - www.lafarge.com employs approximately 40 employees who process blast furnace slag for grinding into cementitious cement, lightweight aggregate use as well as road base and Rockwool Insulation markets.

Posner Metals - www.posner.ca were recyclers long before the idea of recycling began. In some ways, we consider ourselves to be ‘pioneers’ of environmentalism. When we entered this business over 40 years ago the environment was not a major social concern and the idea of ‘recycling’ was virtually unheard of. We got into the business because it seemed practical and profitable to collect and use scrap metal. Today, environmental concerns are among the major forces that drive our business. Landfills cannot accommodate the massive quantities of metal being consumed by society. In addition, the savings in energy costs and environmental impact by reducing mining are a substantial benefit of recycling metal. As it was 40 years ago, our solution is to gather metals and deliver it to organizations that can reuse it. Naturally, our approach to metal recycling operations has evolved to meet the highest environmental standards in all aspects of our operations. For four generations, from Hans Posner to the current

management to the next generation, we have continued as a family-run business.

Rain Carbon Canada Inc. - www.raincarbon.com employs 72 people involved in the distillation of coal tar.

Sanimax/ABP - www.sanimax.com employs over 1,000 people across North America and is a values-driven organization which transforms by-products from the food and meat industries into useful materials for other services.

Stelco - www.stelcocanada.com operations consist of Lake Erie Works, a fully integrated steelmaking facility that has the capability of producing approximately 2.6 million tons of steel annually and Hamilton Works, home to coke making and steel finishing facilities including the Z-Line, one of North America’s premier zinc-coating lines. Together these facilities employ approximately 2,000 people. Stelco produces high quality steel that is used primarily in the North American automotive, construction, infrastructure, appliance, manufacturing and pipe and tube industries.

Triple M Metal LP - www.triplemmetal.com has a home-grown innovative approach to the sourcing and sale of scrap metal products and grades, evolving from modest beginnings to become one of North America’s largest, privately-held, fully integrated recyclers of ferrous and non-ferrous scrap metal.

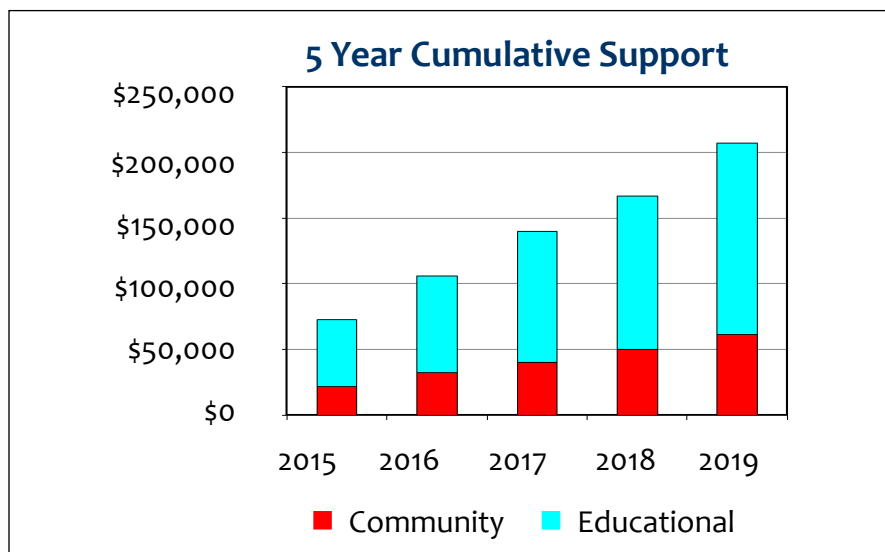
Our growing enterprise operates 27 facilities across North America, including Canada, the United States and Mexico, with additional interests in Europe.

Locally, Triple M Metal LP employs more than 200 people at four facilities.

From local or community-based peddlers to the largest international companies, we strive to build confidence and value by providing customized solutions that deliver on all metal recycling and process needs.

HIEA in the Hamilton Community

Collaborating with residents and community associations, HIEA provides financial support to initiatives that enhance and protect our local environment.



Over the past two decades HIEA has provided environmental education opportunities to Hamilton's youth. Through direct financial sponsorship and volunteer efforts of its member companies, HIEA is able to connect with and give back to the community.

Organizations interested in receiving funding are encouraged to **submit applications before September 30th** each year to ensure consideration. Application forms and criteria for funding can be found on our website www.hiea.org. Our contribution level varies according to the need, our opportunity to make a difference, and our budget. The budget is established annually and approved by the Board of Directors.

In 2020 HIEA was pleased to support several local organizations including the [**Bay Area Restoration Council \(BARC\)**](#) for their [**Yellow Fish Road**](#) program. This premier water education program helps Hamilton's youth to protect its watershed, and merges hands on learning with civic action. Painting yellow fish symbols on the road next to storm drains, this program reminds Canadians of the negative impacts of runoff pollution through storm drains.

In 2020 BARC staff delivered 5 Yellow Fish Road events to 29 youth and 20 adult volunteers. After learning about the program these individuals painted a total of 87 storm drains with bright yellow fish.

The students also delivered pamphlets to nearby neighbours with the message "Only Rain Down the Drain!" They offer information about the Yellow Fish Road™ program, ways to properly dispose of hazardous materials, and BARC contact information.

The flyer and other materials provide residents with the tools and information they need to make more conscientious decisions. BARC has been facilitating this program since 2005 to encourage members of the community to make behavioral changes to protect Hamilton Harbour and its watershed. For more information about BARC and the work it does check them out at www.HamiltonHarbour.ca.



HIEA in the Hamilton Community

The **Royal Botanical Gardens** Green Angels Program was created so that all children, regardless of their family's financial disposition, have the opportunity to fall in love with nature.

HIEA's award to the Green Angels Program typically helps us to meet our overall goal of providing disadvantaged, special needs and new Canadian children in the Hamilton area with free access to week long summer camps, school and other outdoor nature education programs at Royal Botanical Gardens .

Throughout 2020, RBG supported children's education during this unprecedented time by offering their new *RBG at Home* content which includes materials for students, teachers, families and lifelong learners about the environment, biodiversity, gardening, and environmental stewardship.



HIEA's contribution helped make this programming available to thousands of users as they downloaded activity sheets, viewed original video content, or participated in live and interactive video conferences. 471

families who participated reported being from Hamilton.

To learn more about the Green Angels program check their website: www.rbg.ca/subsidy.

The **McQuesten Urban Farm**, located on an unused parcel of City-owned land, is a partnership between the City, the Social Planning and Research Council of Hamilton (our charitable partner) and the McQuesten Community Planning Team. This project is part of the Neighbourhood Action Plan as a key action to promote greater food security for residents and to improve the overall parks and green space within the neighbourhood.

With HIEA's support in 2020 they focused on enhancing the existing corridor of native plants that runs along the eastern side of McQuesten Urban Farm. They planted an additional 250 native shrubs and perennials with another 100+ plants in the fall. This brings the total to over 550 native shrubs and 4500 native perennials since the start of the McQuesten Urban Farm in 2016.

This undertaking has increased the biodiversity of the site which previously had no other vegetation besides turf grass. It also improves the overall aesthetics and makes it a more welcoming place for the community. Some of the native plants and trees also provide food, medicinal and agricultural products that are useful for the urban farm. We encourage you to check out their website - www.mcquestenurbanfarm.ca to learn more about this project.



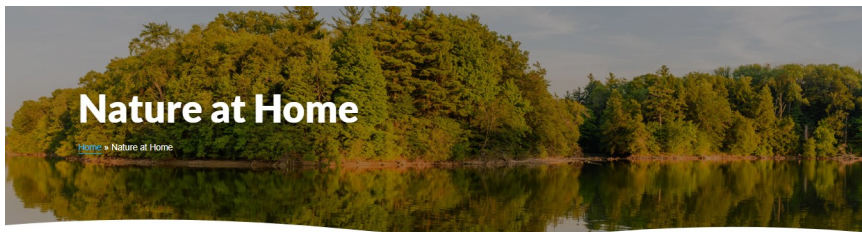
HIEA in the Hamilton Community

The **Hamilton Conservation Foundation** directs funding to support the Hamilton Conservation Authority (HCA) enabling it to run their Outdoor Environmental Education Program and allow additional needs based funding for transportation subsidies. The donations raised through the Foundation for outdoor educational programs in the Dundas Valley Conservation Area (DVCA) are vital to keeping the program alive and help to augment fees paid by school boards and ensure the program is accessible to all students.

Although the number of participants were significantly reduced due to the closure of schools in March, they were able to offer on-site programming and busing until that time. Then, Education staff quickly adapted and put new programming in place. Staff were able to develop and provide a combination of learning resources, activities and games for teachers, parents and students to access on the HCA website through a new Nature at Home program, allowing it to be widely available and successful.

With the support of HIEA, the HCA has been able to complement student learning as schools continued to adapt to a new world order. You can learn more about the different aspects of this program on their website:

<https://conservationhamilton.ca/environmental-education-home/>



The **Hamilton Naturalist Club (HNC)** in partnership with Environment Hamilton implemented the Trees from Seeds initiative as part of the Trees Please program. Together they increased the number of native trees across Hamilton by educating and engaging the community in growing trees from seed and then planting the trees in suitable locations. The HNC



volunteers identified seed sources for local native trees and worked with organizational staff to deliver seed collection and propagation workshops for residents,

homeowners, and families who planted the tree on their property or donated the seedling to others to plant. This allowed anyone to participate, even those with balconies or small yards.

Through the series of workshops, residents were able to receive support and guidance along the way. The goal was to have community members caring for trees until they are big enough to be planted in their forever homes.

They also developed a Hamilton specific activity book focused on native trees that will be distributed to families who adopt the trees to help further the education about the importance of trees. Please visit <https://hamiltonnature.org/> to learn more about their Trees Please project.

HIEA in the Hamilton Community

The City of Hamilton Neighbourhood Development office works throughout Hamilton supporting resident-led initiatives to improve the overall health of neighbourhood residents, including the physical environment in their neighborhoods. They work collaboratively with resident volunteer planning teams and neighbourhood associations to assist them in realizing the improvements they have identified for their neighborhoods. The Sustainable Neighbourhood Action Plan (SNAP) Program is a new initiative aimed at improving neighbourhood-level resilience and adaptation to climate change and the North End will be the pilot neighbourhood.

Due to the pandemic, this program will be fully implemented in 2021. In October 2020, the community was able to participate in the sustainable neighbourhood action planning where 60 native trees were given to Hamilton residents.



Since 2008, HIEA has supported the **City of Hamilton - Water and Wastewater Division, Public Works**, and the Children's Water Festival. This three day event offers 30 activities geared to water conservation, water science and technology, water awareness and water protection. It brings 2,400 Grade 4 students, 200 secondary students and 100 volunteers together to

enjoy hands-on educational activities that support the Ontario Curriculum including the 2007 Ontario Science and Technology curriculum. Completing activities through hands-on activities ensures that students learn to respect water and the environment while having fun.

This festival did not take place in 2020. For more information about this project visit: www.hamilton.ca/childrenswaterfestival.

Community Engagement ... is very important for HIEA members. In addition to our support for Hamilton area youth environmental education, every spring and fall HIEA members invite all individuals to meet with them to exchange information, discuss environmental issues and further develop the association by expanding our dialogue between industry and the community.

In 2020 the spring and fall meetings were combined into one Annual General Meeting that was held virtually in October. The theme incorporated the United Nations declaration of the next decade, 2021 – 2030, the decade of 'Ecosystem Restoration'.

Ecological Restoration is the practice of renewing and restoring degraded, damaged, or destroyed ecosystems and habitats in the environment by active human intervention and action. This level of restoration effort could potentially remove up to 26 gigatons of greenhouse gases from the atmosphere, while offering opportunities for job creation, food security, and addressing climate change.

Continued on page 12....

HIEA in the Hamilton Community Continued

Members of the Hamilton community have already taken action through various restoration efforts, including the work of HIEA supported organizations, the Royal Botanical Gardens (RBG), the Hamilton Conservation Foundation (HCF), and the Hamilton Conservation Authority (HCA). The RBG has been working towards strengthening the protection of Cootes Paradise, a biodiversity hotspot, and the HCA and HCF have been educating the next generation on the importance of protecting ecosystems and preserving biodiversity.

HIEA Partners with Niagara College's Environmental Management & Assessment Post-Graduate Program

From January to April 2020, HIEA engaged an intern from Niagara College's Environmental Management and Assessment, Post-Graduate program to examine air quality in steel producing cities around the world for comparison to Hamilton. The purpose of the study was to raise awareness for the Hamilton community with respect to local air quality relative to other steel manufacturing cities outside of Canada.

The data was derived from air quality monitoring sites closest to each respective city's industrial sector. The air quality parameters considered in this study were: Sulfur Dioxide (SO₂), Particulate Matter PM_{2.5} and PM₁₀, Benzene and Benzo (a) pyrene

The cities were chosen according to their degree of manufacturing output in order to best contrast to Hamilton.

Presentations were given by our special guests Dr. David Galbraith, the head of science at RBG and Grace Correia Executive Director of the HCF and Sandy Root, the Outdoor Environmental Education Specialist for the HCA.

These meetings are open to everyone. For information, please check our website at www.hiea.org or contact us at prcommunications@hiea.org to register to attend.

The cities included:

- East Chicago (USA)
- Gary (USA)
- Port Talbot (UK)
- Jamshedpur (India)

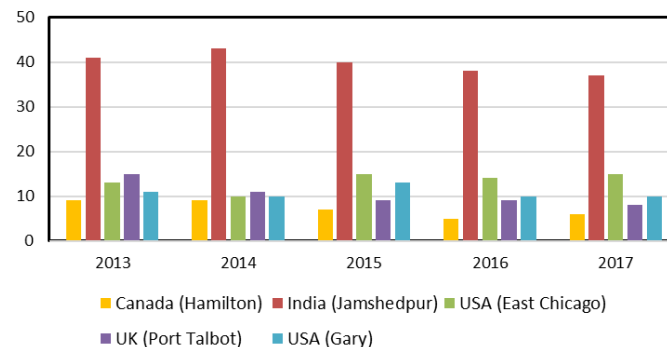
The study revealed that while Regulations for air quality parameters for the USA and Canada were very similar, the UK had much stricter regulations, while in contrast India had the most liberal regulations for its air quality. These regulatory differences are evident when looking at the study results. Hamilton's air emissions are on par or better than the other comparable cities studied for all of the parameters analyzed.

Hamilton industries strive to continually improve their emissions through innovations and investments while maintaining compliance with provincial and federal regulations. In 2021, another intern will expand this comparison study to provide an increased sample for evaluation and to consider additional factors such as steel output, technology used and other sources of emissions.

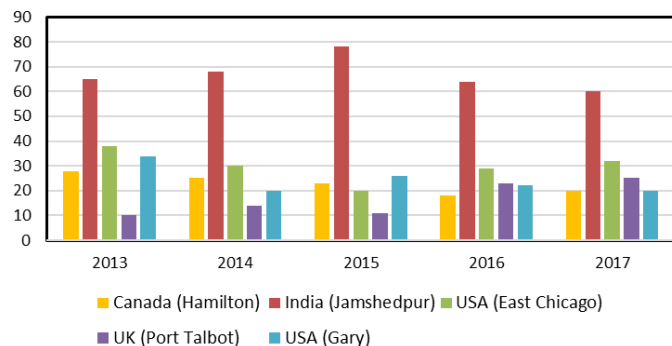
HIEA in the Hamilton Community Continued

Country	City	Population	Steel Production Million Tonnes/Year
Canada	Hamilton	544,989	6
India	Jamshedpur	629,659	6.7
U.S.	East Chicago	29,698	9.5
U.K.	Port Talbot	142,906	5
U.S.	Gary	80,297	4

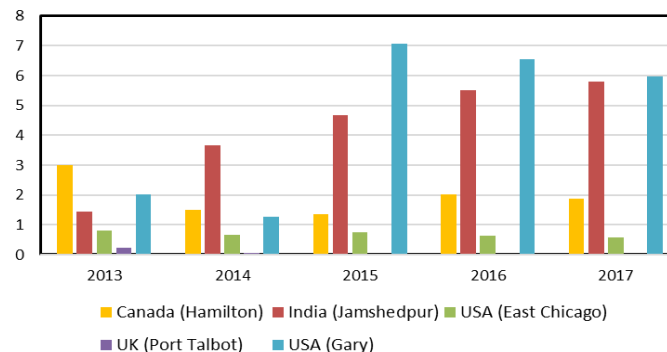
SO₂ ppb



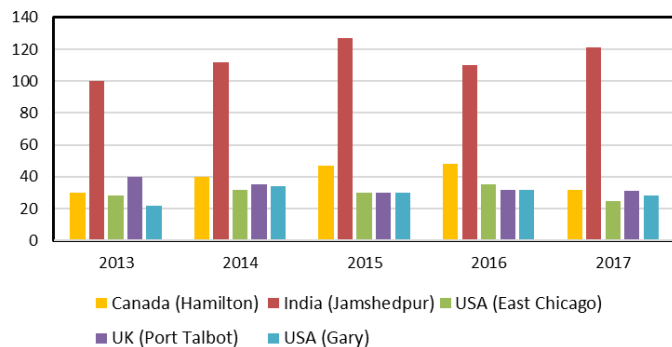
Particulate Matter Emissions PM 2.5



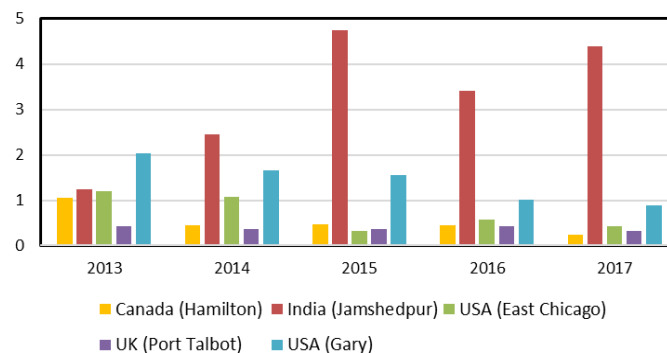
Benzene $\mu\text{g}/\text{m}^3$



Particulate Matter Emissions PM 10



Benzo (a) Pyrene ng/m^3



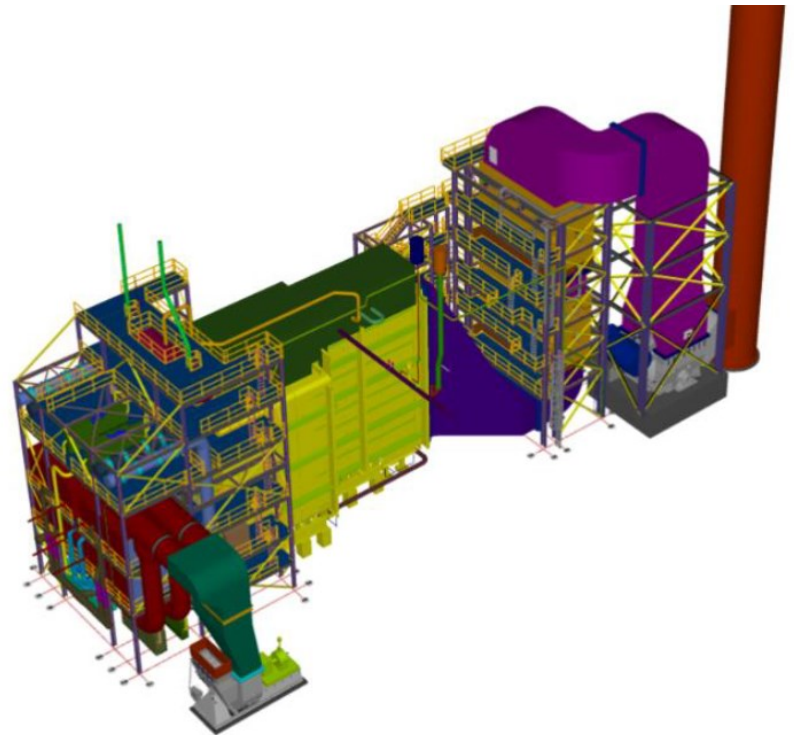
Boiler Power Generation Project

ArcelorMittal Dofasco's Boiler Power Generation Project - A Step Towards Climate Change Mitigation

In May 2016 ArcelorMittal Dofasco embarked on an ambitious project to replace aging boilers, with a new high pressure boiler, water purification system, and steam driven turbine with electrical generation. In June 2020, the project was fully commissioned. The new equipment can produce 450,000 pounds of steam per hour and up to 20 megawatts of electrical power for use inside the plant. A first for the site, the steam driven turbine uses 1,200 PSI high pressure steam to generate electricity and discharges 300 PSI steam back into the plant steam grid for other process and heating users. The project involved thousands of hours of employee and contractor effort to bring the project to a successful completion.

Highlights include:

- Safe removal of 3 non-operational boilers and construction of a new operator work station inside the No.1 Boiler house;
- Design of the new facility used advanced 3D models and virtual reality walk-throughs for improved operability and maintenance;
- A 1.4 million gallon per day demineralized water system (ultra filtration, double pass reverse osmosis and electro deionizing, with condensate polishing);
- A 20 megawatt backpressure steam turbine and electrical generator;
- Supply and installation of the new steam drum that is 6 feet in diameter, 25 feet long with a 6 inch thick steel wall;
- Startup of the new by-product fuel fired high pressure boiler complete with air pre-heating, economization, new fans, pumps and associated equipment which operates at high efficiency and improved environmental performance.



... Working Together for a Better Hamilton

As Ontario's most diversified economy, home to world-class post-secondary institutions, a wide range of industries, and at an opportune location for national and international trade, Hamilton is a key contributor to Ontario's economy. Further, HIEA member companies directly provide 7,285 manufacturing jobs - almost all of them full time and well paying. These jobs support approximately 56,000 spin-off jobs through indirect and induced effects playing a critical role in Hamilton's economy.

HIEA is dedicated to reducing the environmental footprint of its members, and by fostering a connection between industries we promote economic and environmental improvement using the principles of circular economy, and specifically, industrial ecology. This in turn generates employment, fulfills environmental improvements, meets legislation, sustains businesses and grows the overall local and regional economy.

HIEA and its members not only work together to support each other but also work with other local environmental groups to encourage improvement in the Hamilton community. An active member at Clean Air Hamilton (CAH), HIEA has participated in several committees including: The Dust and Particulate Matter Committee; the Committee established to review the CAH Annual Report, and the Upwind/Downwind Organizing Committee. HIEA is proud to also be part of the Bay Area Climate Change Council - a partnership between the cities of Hamilton and Burlington - working together to address climate action in the bay area.

HIEA member companies also continue to make major financial contributions to the economic well-being and environmental protection of Hamilton. Collectively, since 1997 HIEA member

companies have: invested \$1.1 billion on environmental capital expenses; paid approximately \$718 million in municipal property taxes; and contributed over \$1 million to community and educational initiatives in the Hamilton community.

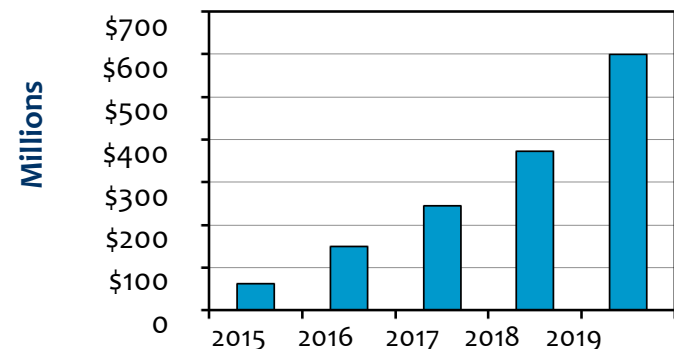
5 Year Cumulative Environmental Capital Spending

HIEA member companies continue to make major financial contributions to the economic well being and environmental protection of the City of Hamilton and its residents.

Collectively, HIEA member companies have invested almost \$600 million on

environmental capital improvements in the last 5 years - an average of almost \$120 million per year.

In 2019 HIEA member companies employed 7,285 people and paid over \$15 million in municipal taxes while occupying 725 hectares of land.



HIEA's Industrial Ecology Gains Notoriety

In past reports we have written about the unique industrial ecology that HIEA members have shaped along the Hamilton bayfront over time due to their 'spatial clustering' or geographic proximity to one another. In July 2020, we were approached by the U.S Director of Education for the Institute for Sustainable Infrastructure for permission to use the HIEA industrial ecosystem graphic for a new course called 'An Introduction to Circular Economy'. The course features HIEA as a key illustration of industrial ecology who have created a system-wide circular economy model that minimizes the extraction of raw material resources and waste generation. The course also points out that scrap metal is the material that moves the most between companies suggesting that the steel industry is one of the most critical components of this system.

Launched in August 2020, 441 students have completed the course as of January 2021. The course is reported to be well received among students. It is also in the top 3 courses overall out of 37 on-line courses offered, as well as being the most highly rated "elective" offering out of 30 elective online courses.

The HIEA diagram represents how its members work together (not necessarily with HIEA only companies) to improve their financial, social, and environmental performance through symbiotic relationships. For example, one of the by-products Stelco and ArcelorMittal Dofasco provide to Lafarge is blast furnace slag, which was once considered waste. Lafarge processes it into high grade cement products for the construction industry. The steel industries also provide light oil to Rain Carbon,

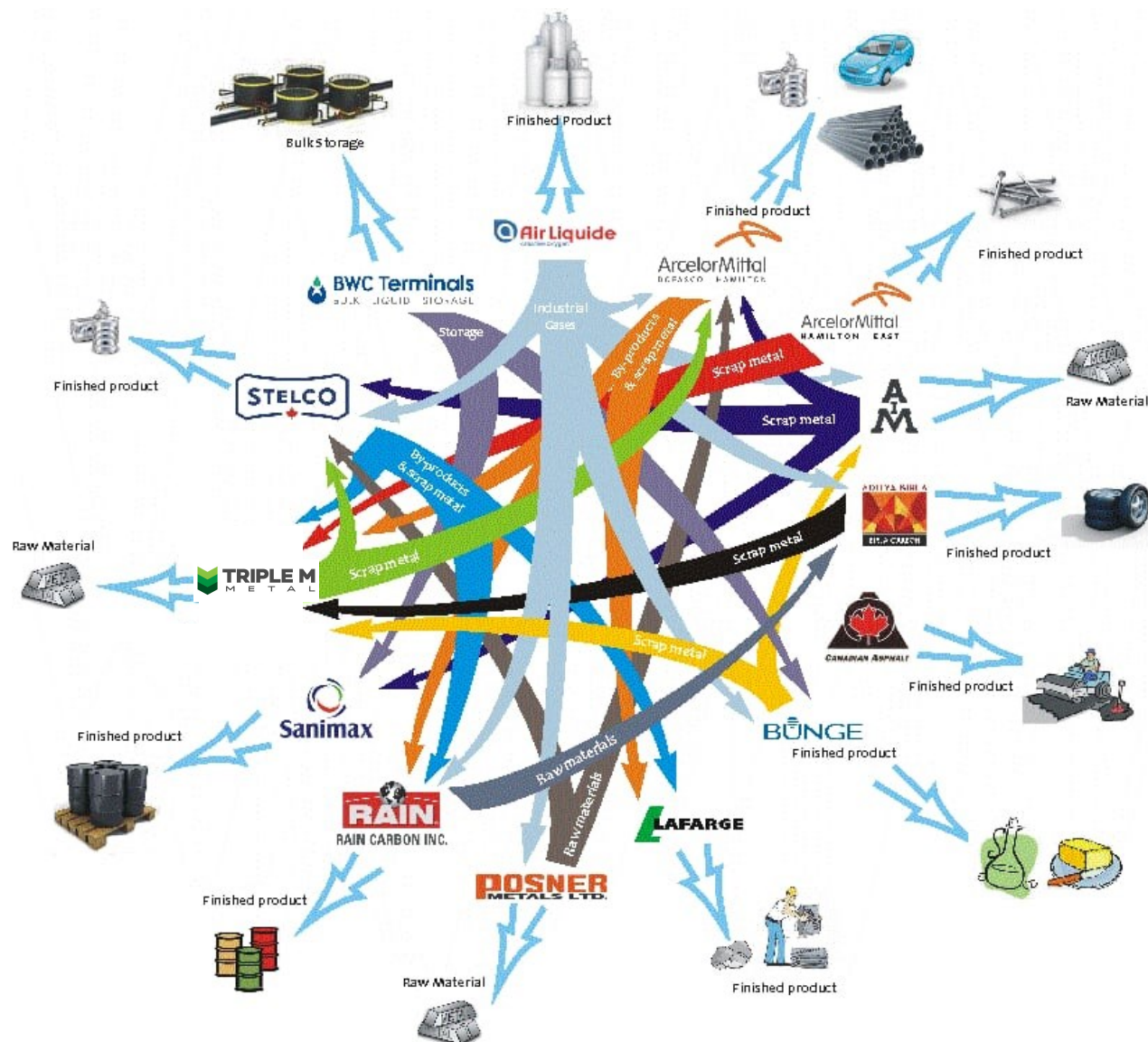
formerly known as Ruetgers. Rain Carbon then processes this into a product that is pumped via underground pipeline to Aditya Birla to be used as feedstock in their production of carbon black. Carbon black is used in the manufacturing of numerous products including tires and toner cartridges.

Synergies such as these have a tremendous positive ecological impact, from reduced greenhouse gas emissions and dust emissions, to improved traffic congestion and road safety. They also prevent the 'leakage' of materials that leave the system as waste products. The close distances between HIEA's members has facilitated improved communications, technology symbiosis, increased productivity and innovation, linked supply chains and encourages partnerships within the cluster. It's hard to imagine to what degree Hamilton's business and natural sectors would be different if the industrial ecosystem did not exist and each company operated independent of one another.

HIEA's 'Industrial Ecosystem' model was first introduced in the 2013 Annual Report and has been expanded on in subsequent Reports. The 2018 report describes the thorough history behind this evolution, dating back to when Hamilton was tree-covered and sparsely populated in the early 1800s and explains how the city's population growth has paralleled its economic cycles. Prior to the 1800s, the land had been occupied for hundreds of years by first the Huron Attiwandaronk (meaning "those who speak a language slightly different from others"), later to be referred to as the 'Neutrals' due to their neutrality in the Huron – Iroquois wars. In 1650, the Iroquois claimed victory over the Hurons and then

moved on to target the Neutrals. French explorers began to arrive and settle in the early 1600s but their influence ended in 1759 following Britain's victory over the French. Over the next century the Mississaugas moved into the Neutrals' territory and Lake Ontario was established as a sphere of the French fur trade. Mass migration from the United Kingdom began and in 1815 George Hamilton settled and recognized the colony's special needs and possibilities and created the town. His vision thus paved the road to Hamilton becoming the dynamic, bustling, and vibrant city as we know it today.

Heidi Levitzky, *Public Relations Coordinator*



HIEA Commitment to Ongoing Improvement

HIEA member companies are invested in the stewardship of our shared environment through minimizing the impacts of our manufacturing activities. Safeguarding the land, air and water is a priority and we are committed to building a prosperous, safe and sustainable industry for the future. We encourage working together and working with the community towards the protection and preservation of our natural resources and ecological improvement in the Hamilton community.

The following charts are based on the compiled data from member companies using 1997 as a base year to evaluate environmental trends. Data from new members is only included in the survey from the date they joined.

Hamilton Air Quality Improvements

Undoubtedly, Hamilton has seen significant improvements in air quality since the 1990s. The Hamilton Air Monitoring Network (HAMN), an independent organization supported by numerous HIEA companies, reports every year on air quality in the industrial area. Many of the observed parameters continue to show a declining trend. In fact, the data indicates most parameters comply with standards and guidelines about 99.5% of the time. However, particulate matter has shown a flat trend since 2010 even though HIEA emissions reveal a declining trend in the same time period.

An Air Shed Study was commissioned by Golder Associates to analyse the sources of air pollution in Hamilton. The study was supported by both the City of Hamilton and HIEA and concluded in 2018. Surprisingly, the results determined that less than 20% of the air contaminants originate from industrial activity for most pollutants in the study. The study found the largest source of air pollution affecting Hamilton is blown in from the USA, followed by transportation. HIEA is dedicated to working with government

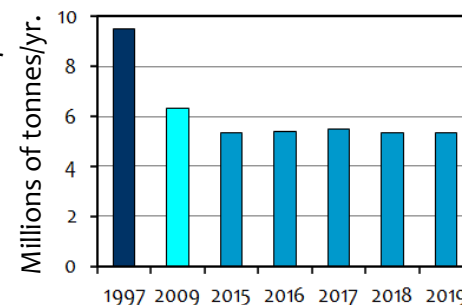
and stakeholders to improve the air quality in Hamilton as well as helping our city reach its target of a 50% reduction in greenhouse gases by the year 2030.

Greenhouse Gases - 44% reduction since 1997

Greenhouse gas (GHG) emissions include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride. Carbon dioxide is the most significant greenhouse gas reported by HIEA member companies.

Total Greenhouse Gas emissions in 2019 are 44% below the 1997 levels and the five-year trend is fairly level, fluctuating at roughly a 1% difference in 2019 compared to 2015.

GHG emission reductions are the result of energy conservation, increased waste energy recovery, increased process yields, and efficiencies and operational changes.

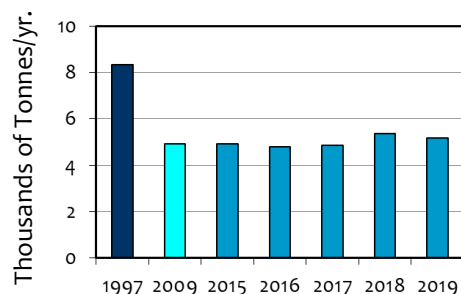


Nitrogen Oxides (NO_x) - 38% lower than 1997 emissions

Nitrogen oxides (NO_x) are precursors to ground level ozone. The main source of NO_x is the combustion of fuels.

HIEA member companies have reduced their NO_x emissions by over 38% since 1997 however the five-year trend shows a slight increase, with 2019 emissions 5% higher than those in 2015.

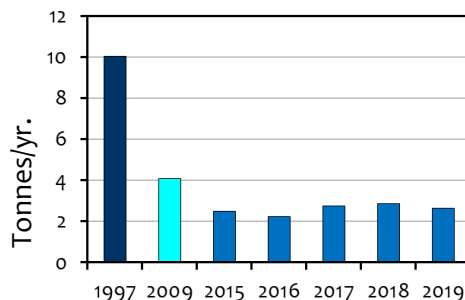
Improvements have primarily been achieved by the installation of advanced combustion technology (low NO_x burners) and the discontinuation of obsolete equipment.



Total Particulate Matter (TPM) - 73% below 1997 levels

Total Particulate Matter (TPM) emissions are over 73% below reported levels in 1997, and are 4% higher than those in 2015. Although there are improved testing methods and better information for PM₁₀ and PM_{2.5}, resulting in higher reported numbers of those parameters in 2009 versus 1997, TPM emissions continue to show a reducing trend. Much of this can be attributed to a number of initiatives implemented in the last few years.

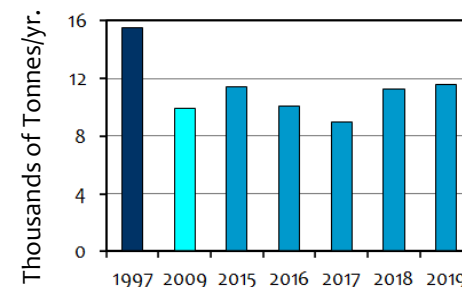
TPM includes particles smaller than 44 microns - the size limit of particles that can be suspended in air.



Sulphur Dioxides (SO₂) - 25% reduction since 1997

Sulphur dioxides (SO₂) are a precursor to acid rain. Although SO₂ emissions have fluctuated over the past five years they are relatively similar to those reported in 2015 while the total emissions remain 25% lower than 1997 levels. The five-year trend shows a slight increase.

The fluctuation is often a result of increases or decreases in production that may require different fuel sources may result in higher or lower SO₂.

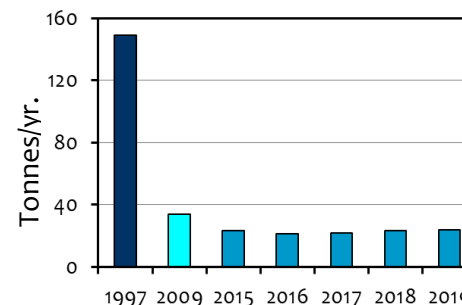


Switching to lower sulphur fuels or feedstock and upgrading equipment can be options used to reduce emissions.

Polycyclic Aromatic Hydrocarbon (PAH) - 84% reduction in emissions since 1997 levels

PAHs are a group of over 100 chemicals, including benzo-[a]-pyrene, that are formed during incomplete burning of coal, oil and gas and are usually found as a mixture containing two or more of these compounds. PAH

emissions have been reduced by 84% since 1997 and although there have been fluctuations in the past 5 years, the trend is now quite flat. These reductions have been achieved primarily by improving coke oven operations.



HIEA Commitment to Ongoing Improvement *continued*



A number of HIEA members operate their own waste water treatment facilities on site that remove contaminants. At Stelco, waste water receives biological treatment in bioreactors that use bacteria to break down some of the contaminants. Then chemical treatment is introduced in the clarifiers where chemicals are added and solids separate. Finally, the water moves to the filtration stage where the solids are removed. The treated water is safely returned to either the municipal sanitary sewer or the Hamilton Harbour.

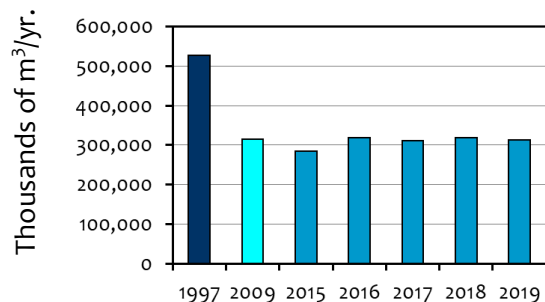
The facilities are maintained and updated as required to ensure compliance with the City of Hamilton's Sanitary Sewer Use By-Laws, provincial regulations, and company permits.

Hamilton Harbour Water Use - 40% lower than in 1997

Hamilton Harbour water taking has decreased by over 40% compared to 1997 and shows a slight increasing trend over the past five years.

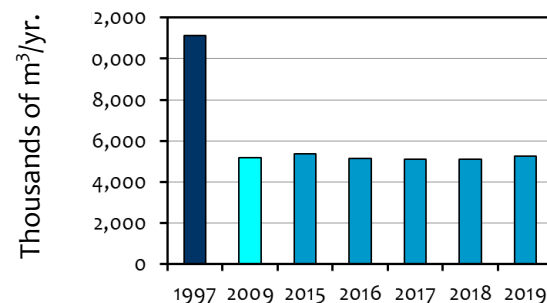
A large portion of this water is used for non-contact cooling and circulates within equipment without contacting any processes and therefore does not pick up

contaminants. Hamilton Harbour water is also used for dust control.



City Water Use - 52.5 % below 1997 consumption levels

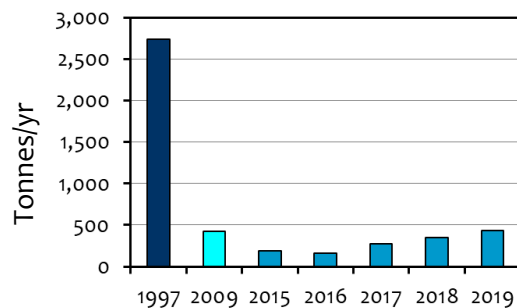
HIEA companies have reduced their city water use by more than half compared to 1997. City water use has shown a slight declining trend since 2015 and continues to remain at these lower levels.



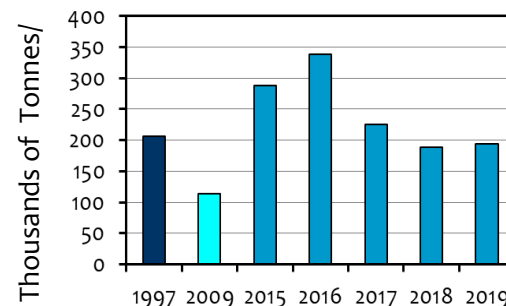
Total Suspended Solids (TSS) - 84% lower than in 1997

Overall Total Suspended Solids discharges have been reduced by over 84% since 1997, with almost 24% of these reduced discharges going to a city wastewater treatment plant for further treatment.

Over the past five years discharges continue to remain stable through the implementation of improved water recycle systems and shutdown of obsolete facilities. New water treatment capabilities added in 2011 and commissioned in 2012 by HIEA member companies continue to reduce these discharges significantly.



Hamilton is an established recycling centre and HIEA companies are major participants. In 2009 waste was defined as materials going to landfill (paid to have taken away) while recycled materials and by-products are things that would be sold for a profit. The definition was reviewed in 2018 and it was determined that materials sent to landfills for a beneficial purpose, such as daily cover, should no longer be reported as waste.



Total off-site disposal levels fluctuate as a result of changes in year to year production, changes in membership, waste management practices and changes in reporting. The waste disposal trend has however been declining since 2015.

Waste Management and Total Offsite Disposal

HIEA members believe that by operating sustainably, the more resilient and successful their business will be. A number of the members have an established Environmental Management System (EMS) which is maintained and continually improved in accordance with the requirements of ISO 14001:2015.

The standard provides best practice methodology to minimize any negative impacts on the environment, while complying with applicable environmental laws and regulations, and continually improving in these areas.

The framework in the ISO 14001 standard can be used within a plan-do-check-act (PDCA) approach to continuous improvement. The PDCA methodology addresses and manages a business's impact on the environment.

ISO 14001 is the most widely recognized environmental management system standard in the world. There are more than 300,000 ISO 14001 certifications in 171 countries around the globe.



HIEA's Scholarship Programs

Preparing today's students for tomorrow's world...

HIEA members believe that it is today's students that will shape the future and address the urgent nature of climate change, resource preservation, air pollution, and biodiversity loss for the generations still to come. To ensure Hamilton students reach their goals HIEA members had chosen to support hands on, educational programming for elementary age students. Our members realized however that the need for support does not end after elementary school, it increases. After some very thoughtful discussions our members determined that establishing an endowed fund would provide the best way to ensure continued support for our local students.

In 2006 HIEA established their bursary fund at Mohawk College with matching funds from the Ontario Trust for Student Support (OTSS) program. In 2009 HIEA provided additional money and doubled the fund. These funds provide financial support for up to 3 students enrolled in various environmental programs at Mohawk College.

In 2014 HIEA supported the establishment of [The Brian McCarry](#)

[Graduate Chemistry Scholarship](#) with friends, family, colleagues, and industry partners in memory of Dr. McCarry, the founder and initial chairperson of Clean Air Hamilton.

This scholarship is to be awarded by the School of Graduate Studies to a graduate student currently enrolled in the Chemistry graduate program. Preference will be given to students pursuing industry-related research.

Each year the interest earned within these funds are distributed to students who meet the criteria set out by Mohawk College and McMaster University.

For information and/or to apply for the bursaries at Mohawk College please check their website at: www.mohawkcollege.ca or contact: Mohawk Student Awards at The Square - Student Services Room C102 or by calling 905-575-2066.

For information about the McMaster University award please check the Student Financial Aid and Scholarships Office through the website <https://sfas.mcmaster.ca>.

Please check our website www.hiea.org to learn about some of our past award winners.

Congratulations to the 2020/21 student Recipients



Samantha Triska

2nd Year Environmental Technician Program

Christa Jackson

2nd Year Environmental Technician Program



Congratulations to

Cody Brian Gale

from the School of Graduate Studies in
the Chemistry program

We are HIEA...

... a non-profit association of local industries working with the community to fulfill HIEA's mandate:

“to improve the local environment – air, land and water – through joint and individual activities, and by partnering with the community to enhance future understanding of environmental issues and help establish priorities for action.”

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270 Sherman Ave. N.
Hamilton, ON. L8L 6N4
www.hiea.org





2020 Report to the Community

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