




2018 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 and responsible manner;
- Monitoring our environmental performance;
- Conserving and protecting the natural environment;
- Responding to community enquiries and concerns;
- Working together to promote environmental awareness;
- Communicating to our environmental performance and improvements in a transparent and open manner.

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Message from the Chair



I have been working at ArcelorMittal Dofasco in the Environmental department for the past 18 years and in 2018 took on the position of General Manager / Director of Environment.

After taking on the role of vice chair in the fall of 2016 it was my pleasure to step into the role as chair of the Board of Directors for the Hamilton Industrial Environmental Association (HIEA) in 2018. Throughout this time

on the board I have been able to see the continuing positive impact our HIEA members make on our community.

As a strong, dedicated group of companies, HIEA members continue to work closely with their neighbours, community initiative and not-for-profit environmental sector groups and many local representatives from the City of Hamilton and the Ministry of the Environment, Conservation and Parks.

HIEA member companies are committed to making improvements to their facilities. The many major environmentally focused projects have and will continue to have positive and lasting impacts on the Hamilton community and the local air quality – drastically reducing Total Particulate Matter (TPM), Green House Gas (GHG) and other emissions. These positive impacts are clearly demonstrated in our annual survey where the aggregated environmental performance report results continue to show an overall improving trend for the years 1997 through 2018. As shown later in this report these statistics are a concrete example of the continued success that HIEA member companies are achieving to improve the environment in the Hamilton community.

HIEA's survey results are presented in this publication, at the association's Annual General Meeting and to the Community Advisory Panel. They are also available to the public both in print and on the association's website - www.hiea.org.

Besides being committed to environmental improvements our HIEA member companies continue to participate in, and support, a number of local environmental initiatives including: Bay Area Restoration Council (BARC), Children's Water Festival, Royal Botanical Gardens (RBG) Green Angels Program and the McQuesten Urban Farm. You can learn about these groups here in this report as well as by following up on the contact information in their stories.

2018 was an interesting year for HIEA as it marked a significant change in our organizational structure with the hiring of a second part time staff. HIEA welcomed Ed Cocchiarella to the team in June to take on the role of General Manager. Ed will use his expertise to support our members in their environmental work and will actively make efforts to increase our corporate membership and Community Advisory Panel (CAP) participation, bringing more local industries and community members to the table.

You're invited to Join Us ...

As a local business or a neighbour to industry, your input is integral to HIEA's continued success and we welcome your involvement. For more information about how to get involved as a member, with CAP meetings and other current initiatives, please visit www.hiea.org or contact us at 905-662-2131 or communications@hiea.org.



John Lundrigan
Chair of the Board - Hamilton Industrial Environmental Association

Message from the General Manager



HIEA is embarking on a new exciting chapter as the voice of Hamilton industry on environmental protection and enhancement. I feel fortunate and grateful for the opportunity to take on this newly established role with HIEA.

Some may remember my long involvement with HIEA starting in 1997 when HIEA was founded and through the early years. HIEA has evolved since then and after my

eleven-year absence, the organization still plays a critical role advocating for sound science and effective environmental management. Now nearly 22 years old, HIEA has matured as it addresses a number of critical issues facing Hamilton like climate change, sustainability, and new growth.

There have been many notable successes in the last 22 years, including:

- Significant reductions in emissions and discharges by members.
 - * Our recent air shed model demonstrated that industrial emissions only contribute about 20% to air contaminants in Hamilton.
 - * At the Hamilton Air Summit, HIEA showed how our air emission reductions tracked closely the air quality improvements measured by the Hamilton Air Monitoring Network.
 - * Greenhouse gases have been reduced by 43% since 1997 ahead of a few government set targets.
- The resilience of industry, aided by the efficiencies resulting from our industrial ecosystem and demonstrating leadership

as society moves toward a circular economy. HIEA industries are competing well on a continental and global scale.

- Water quality and diversity of wildlife has improved in and around the Hamilton Harbour and there is now a funded project being implemented to remediate Randle Reef.

There are also new challenges facing the Hamilton community. Foremost is the climate change issue. Industry has reduced greenhouse gas emissions over time but we are also concerned that some new environmental policies while they may target further environmental improvement, may also discourage further greenhouse gas reductions or unfairly stigmatize the Hamilton community as a polluted place to live.

HIEA will continue to advocate for effective policies that address all stakeholders' concerns and not burden the community with restrictive standards with little environmental benefit. Policies that promote greater industrial integration, proximity and efficiency have been proven to yield environmental benefits.

As an organization, we would like to attract new members, which will enhance our environmental programs and strengthen our voice in the community. New members will help strength our industrial ecosystem as we learn from each other's experiences.

The next chapter will be exciting as we tackle these new challenges along side our community and government leaders. Together we can ensure that Hamilton continues to be a clean and healthful place to live and an economic engine for the region and Ontario.

A handwritten signature in dark ink, appearing to read 'Ed Cocchiarella'.

Ed Cocchiarella
General Manager—Hamilton Industrial Environmental Association

2018 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.

ArcelorMittal Dofasco - www.dofasco.ca 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.

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

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 At the Columbian Chemicals Hamilton plant employs approximately 100 people producing carbon black for a variety of industrial uses.

Contanda Canada Inc. - www.contanda.com is a premier provider of bulk liquid storage and related services throughout Canada and the United States.

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.

Ruetgers Canada Inc. 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

Due to its innovative approach in the sourcing and sale of ferrous scrap, Triple M Metal LP employs more than 150 people who are responsible for handling more than 1.5 million tons of material annually.

...Working together for a better Hamilton

Accounting for almost 11 % of Canada's GDP, manufacturing is now a high-skill, high-tech sector. In Hamilton, HIEA members directly provide over 7,000 manufacturing jobs - almost all of them full time and well paying. These jobs support approximately 56,000 more jobs through indirect and induced effects playing a critical role in Hamilton's economy.

HIEA member companies have developed a unique and comprehensive ecosystem - working closely with one another to supply the raw materials needed to manufacture their products. This network allows them to meet customer requirements in a timely and economical manner. This in turn generates employment, fulfills environmental improvements, meets legislation, sustains businesses and, grows the overall local and regional economy. Our members work dependently together in a significant and unique **"circular 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 participated in several committees including: the Air Quality Task Force; the CAH Structure and Planning 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 change 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 over \$742.5 million on environmental capital expenses; paid approximately \$672 million in municipal property taxes; and contributed over \$1 million to community and educational initiatives in the Hamilton community.

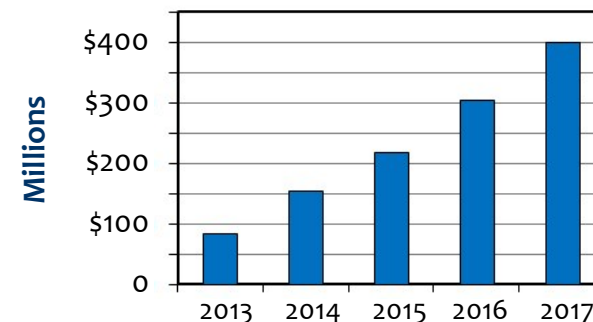
5 Year Cumulative Environmental Capital Spending

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 over \$400 million on

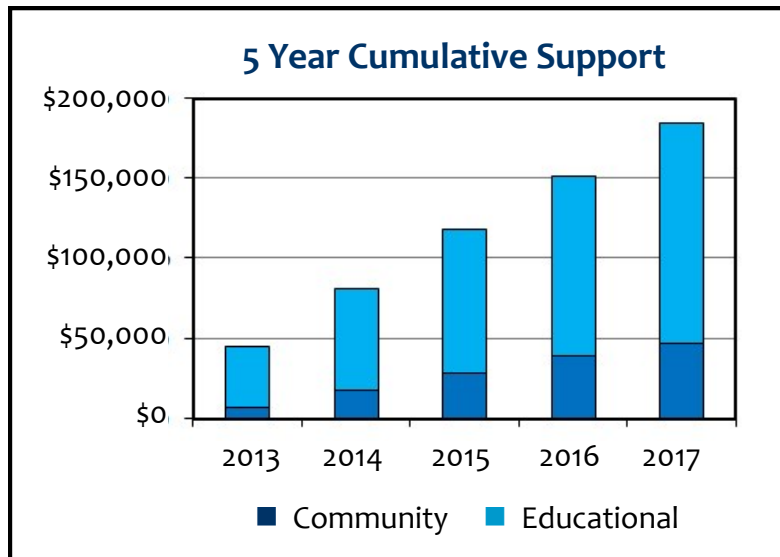
environmental capital improvements in the last 5 years - an average of almost \$80 million per year.

In 2017 HIEA member companies employed over 7,000 people and paid over \$18 million in municipal taxes while occupying almost 740 hectares of land.



HIEA in the Hamilton Community

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



Through direct financial sponsorship and volunteer efforts of its member companies, HIEA continues to provide support to environmental and education programs for youth within the Hamilton community.

Organizations 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, so HIEA members carefully review all submissions.

In 2018 HIEA was pleased to support several local organizations including the **Bay Area Restoration Council (BARC)** to provide for their Yellow Fish Road program (YFR). This valuable project helps to increase youth understanding and appreciation of Hamilton Harbour, its watershed, and the negative impacts of runoff pollution through storm drains.

In 2018 BARC staff delivered 5 Yellow Fish Road events to 113 youth and 29 adult volunteers. After learning about the program these individuals painted a total of 117 storm drains with bright yellow fish.



The students also delivered flyers to 350 nearby mailboxes with the message “Only Rain Down the Drain!” These flyers provide information about the Yellow

Fish Road™ program, ways to properly dispose of hazardous materials, and BARC contact information.

The flyer and other material provides residents with the tools and information they need to make more conscientious decisions. BARC has been using 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

HIEA continued to work together with the **City of Hamilton - Water and Wastewater Division, Public Works,** and the Children's Water Festival. This festival has approximately 30 activities geared to water conservation, water science and technology, water awareness and water protection. This three day event 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 new 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.

Registration filled within minutes; 95% of students surveyed indicated that they learned new things about water and 86% of teachers rated the educational value of the Festival as excellent. For more information about this project visit: www.hamilton.ca/childrenswaterfestival



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

Funding from HIEA allowed the RBG to expand their educational outdoor programming to children and youth that previously could not benefit from a trip to RBG purely due to financial constraints, and in particular focused on a new partnership with Reach for the Rainbow to subsidize summer camp experiences for children with disabilities.

The Green Angels fund provides for children and families in financial need by offering free school programs and bussing, free admission passes and free family memberships. Subsidies are offered to individuals, school boards and local not-for-profit organizations.

continued on page 10...

HIEA in the Hamilton Community

Green Angels Program ... from page 9

The RBG 2018/19 Donor Accountability Report reports that, through the Green Angels program, 484 children and youth visited the RBG through day passes and memberships, 59 school groups, representing 2,480 children participated in educational programming, and 48 children went to camp.

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 McQuesten 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.

The farm will make affordable fresh produce available to neighbourhood residents, enhance an urban greenspace with native trees and plants and provide food and environmental education programming.

In 2018 HIEA's support helped to establish another 75 metres of the native plant walk and enhance another 100 metre section

with additional plantings. In total approximately 1,000 native perennials and shrubs were planted this year. The community also began significant maintenance and replanting of some areas of the plant walk that required greater weed control and restoration. In total over 100 volunteers, residents and youth took part in the events with thousands of volunteer hours given to the project. In total, over 300 native shrubs and 2800 native perennials have been planted to date. We encourage you to check out their website - www.mcquestenurbanfarm.ca to learn more about this project.

Community engagement is also very important for the HIEA members. In addition to our support for Hamilton area youth environmental education, HIEA has developed a **Community Advisory Panel (CAP)** composed of representatives from local neighbourhood associations, community advocacy groups and caring citizens who meet with HIEA members to exchange information, discuss environmental issues and further develop the association by expanding our dialogue between industry and the community.

These informal meetings provide an opportunity to meet other individuals interested in improving the environmental quality of life in Hamilton and provide an update or insight into projects or initiatives that are being developed. Attendees at the meetings are then encouraged to share this information with their neighbours and Neighbourhood Associations.

These meetings are open to everyone. People are welcome to attend as often and whenever they wish without obligation. For information about upcoming meeting topics please check our website at www.hiea.org. If you are interested in attending our meetings please contact us at communications@hiea.org.

HIEA's Scholarship Programs

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

HIEA members believe that it is the students of today that will make a difference in the future. 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 will be 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 our past award winners.

Congratulations to our 2018/19 student winners



David Hutchison

3rd year Chemical Engineering Technology

Dean Kayed

2nd year Chemical Engineering Technology

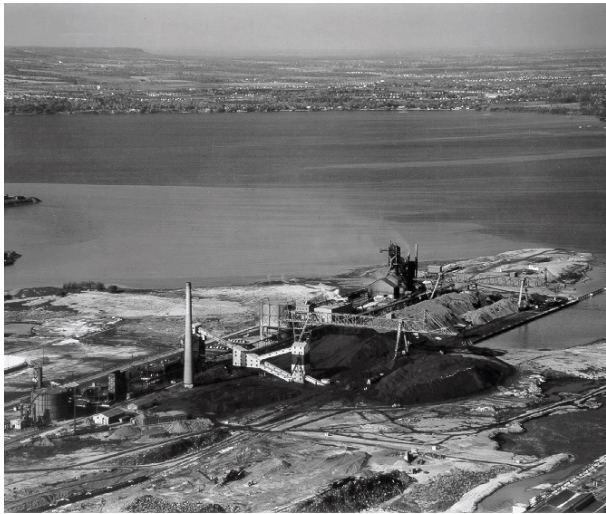


Congratulations to **Majeda Al Hareri** a Masters student who is doing research under the supervision of David J. H. Emslie, Professor Department of Chemistry & Chemical Biology.

Majeda's research is focused on new approaches in element ALD.

The history behind HIEA's "Industrial Ecosystem"

Before 1815 Hamilton, originally known as the Head-of-the-Lake, was covered in forest. A chopping mill was to be the first industry in this area that year and Hamilton was established as a police village. When it became incorporated as the Town of Hamilton in 1833 with approximately 1,000 inhabitants, records list several businesses including 1 tin and sheet iron manufactory.



During the next several years with the establishment of the Great Western Railroad, Hamilton transformed into a major centre, producing the first Canadian-built locomotives in 1856. Following the depression of 1857-1862 the

Great Western Railroad, several associated foundries, machine shops and other wholesalers failed but the manufacturers of farm implements and stoves, which were the mainstays of iron foundries, were able to weather the crisis.

With the underemployment of skilled workers in the machinists trades Hamilton was able to lure a new industry - the manufacture of sewing machines and the clothing industry to the area. During the Confederation era Hamilton lost its commercial and financial edge to Toronto further cementing the shift to an economic strategy of attracting industry to Hamilton.

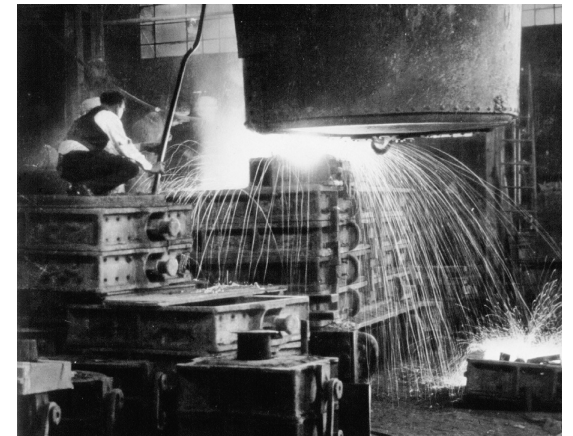
The introduction of hydro electric power in 1896 is credited with helping to increase the population of Hamilton by 75% and in 1906 the city began promoted itself as "The Electric City".

Attracted by cheaper and more efficient power new industries, including the forerunners of Stelco and Westinghouse, settled in Hamilton and the city began to promote itself as "Home of the Manufacturer" with "Unrivalled Shipping Facilities" and the "Cheapest Power in Canada".

By 1938 Hamilton was home to over 500 manufacturing plants and was the centre of Canadian Steel and Electronic activities having the distinction of attracting more American industrial capital than any other city in Canada.

Between 1890 and 1925 Hamilton was successful in luring several major American and Canadian industrial companies to locate here including Canadian Cannery, International Harvester, Otis Elevator Company, Firestone Tire and Rubber, National Steel Car, Hoover Suction Company, Beech-Nut Packing Company, Proctor and Gamble, Westinghouse, The Steel Company of Canada which would later become known as Stelco, and The Dominion Steel Casting Company, now called ArcelorMittal Dofasco.

Although Hamilton has lost many of these



big industrial employers for reasons including the high dollar, high energy prices and overseas competition the city has been able to recover better than most other North American cities. Hamilton still attracts industry to the area because of our close proximity to Toronto, Canada's largest and wealthiest market, our close proximity to the Canada-U.S.A. border and that Hamilton is home to the busiest Canadian port on the Great Lakes.

Even as early as 1916 economists identified the benefits of “spatial clustering” where related firms or industries located in close geographic proximity to take advantage of shared resources including specialized and skilled workers, raw material suppliers, services, transportation, education and the ability to easily exchange business related knowledge. Although it is not easy to determine where an industrial cluster might form, once it starts, its growth can be predicted by the benefits gained and the diversity of the industries it attracts. Clusters have been shown to provide resilience to the economy because of the interdependent efficiencies which only gets stronger as more complementary industries move in - as the cluster grows so will its economic impact and associated benefits grow in the community.

Hamilton is a prime example of a well developed, interdependent cluster or as HIEA calls it an “Industrial Ecosystem” and it was those remaining, early industries like Dofasco and Stelco, that provided the key reason for new businesses to locate in Hamilton.

“Clusters typically include companies in the same industry or technology area that share infrastructure, suppliers, and distribution networks. Supporting firms that provide components, support services, and raw materials come together with like

minded firms in related industries to develop joint solutions and combine resources to take advantage of market opportunities. These are groups of related businesses and organizations - sometimes direct competitors, but more often operating in a complementary manner. They may comprise more than just one industry classification, and a true cluster is more than just a supplier-producer-buyer model.”¹

Clustering in close proximity to related industries helps to improve communications, technology synergies, increased productivity and innovation, linked supply chains and encourages partnerships within the cluster.

Utilizing the close proximity of available raw materials; research and technology; energy and fuel; and market for their finished product a successful ecosystem will also be able to lighten the financial costs and greatly reduce the environmental impacts that are associated with transportation which has been proven to be one of the largest sources of pollution and green house gas emissions for the city of Hamilton.

When asked - “why is community engagement so important to HIEA members?” our members respond “it comes back to sustainability. We need a healthy environment. We need good social programs and we need to achieve balance with our financial performance. We are better served to work together with our community to promote environmental sustainability, and we recognize it's also a critical component to corporate sustainability in the long run.”

Working together HIEA member companies have developed strategic partnerships that will allow the companies to reduce their truck traffic on local road ways. Continued on page 14

¹ <https://www.referenceforbusiness.com/small/Bo-Co/Clusters.html>

HIEA's "Industrial Ecosystem" *continued*

continued from page 13 A good example of this resulted when Lafarge, by working together with ArcelorMittal Dofasco, were able to move their operation location. This change in location resulted in the removal of an estimated 6,250 truck trips per year off local roads resulting in an approximate fuel saving of 26,000 litres/year and almost 70 tonnes GHG emissions reductions. This action has also resulted in significant improvement for the Hamilton community not only for the GHG reductions but also with the lower Total Particulate Matter in the air that results from resuspension of road dust due to traffic. There is also a very real improvement in road safety, reductions in traffic congestion and lower costs to the city for road maintenance by implementing such action.

These emissions, considered fugitive, are not captured as part of each companies reporting to the National Pollution Releases Index (NPRI) so any reductions companies can achieve would represent an additional benefit to the Hamilton community.

The transportation of bulk materials and products emit GHGs through the combustion of fossil fuels in ships, trains and trucks. HIEA members are considering numerous alternative ways that transportation emissions can be reduced by implementing possible policy changes in the procurement and movement of goods processes. Compared to sea-borne foreign cargo the GHG emissions from domestically sourced materials could be much lower. It was determined that replacing all ship-borne foreign steel imports with domestic sources could result in a GHG reduction of 974,000 tonnes.

Newly developed partnerships, an understanding between industry and government, policy and regulatory frameworks

that promote the co-locating or clustering of complementary industries, such as the Hamilton industrial complex, could be implemented and improved thus reducing potentially significant transportation distances and related emissions. Short distances would also favour pipeline and conveyor modes of transportation utilizing Ontario's low-GHG electricity and displace fossil fuels in these areas for the greatest reductions.

HIEA is looking into opportunities that would help inform industry partners and government about these potential savings by determining the policy development and implementation strategies needed and the methodology to achieve results. Significant savings may be achieved when industry considers how their transportation decisions can make an impact. This would also help government develop appropriate policies and regulations to help support industry decisions.

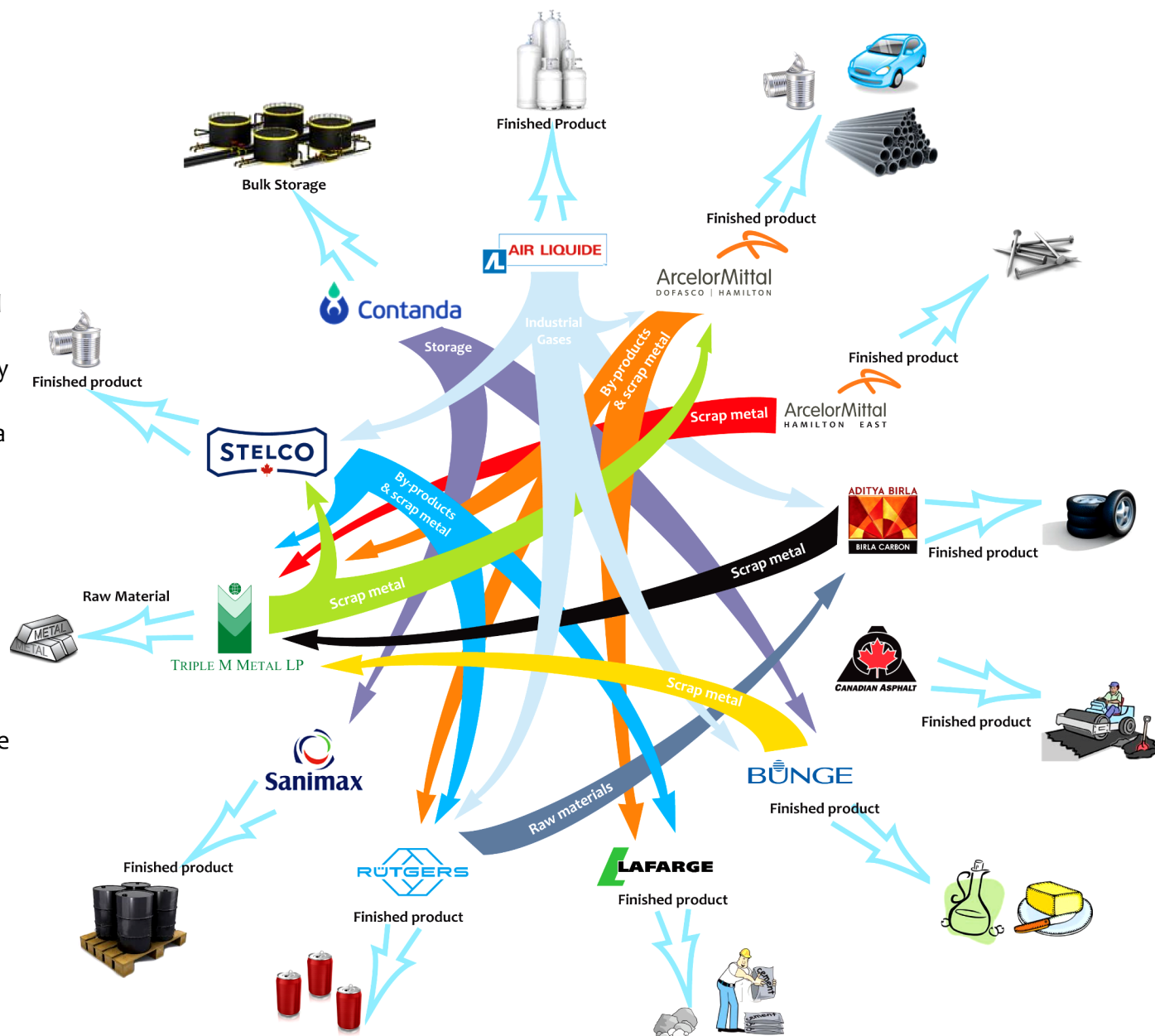
HIEA would also look at potential reductions in GHG's by encouraging consideration of different transportation methods including pipelines and conveyor systems. Relocating the supplier or customer for bulk liquid and solid shipments from 100 km to 5 km would save 95% of GHG emissions, replacing 1 tank truck/day liquid delivery with a local 5 km pipeline would result in an additional reduction of 9.2 tonnes CO₂e or an 99% reduction overall and replacing 600,000 tonnes/yr trucked by-product slag with a 5km conveyor belt system would have a savings of 491 tonnes CO₂e or an additional 97% reduction.

Several HIEA members have already partnered with neighbouring industries to install pipelines enabling them to deliver product more quickly and efficiently and further eliminating the need for trucks to transport supplies and materials. These actions have a

direct, positive effect on the air quality in the city and are an added opportunity for industry to compliment its GHG reduction targets.

HIEA members met with Rod Phillips, Ontario Minister of the Environment, Conservation and Parks and Donna Skelly on Friday October 26 to discuss key issues and priorities for cleaner air for Hamilton area. This was a great example of dedicated industry members, community leaders and governments working together

This diagram only begins to illustrate the interconnectivity of the HIEA members. The complexity of the entire ecosystem and its impact on the Hamilton community would take more space than this publication could provide.



HIEA Commitment to Ongoing Improvement

HIEA Member companies remain dedicated to reducing their environmental footprint and have made a commitment to protect Hamilton's air, water, and land.

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 participates in several committees including: the Air Quality Task Force; the CAH

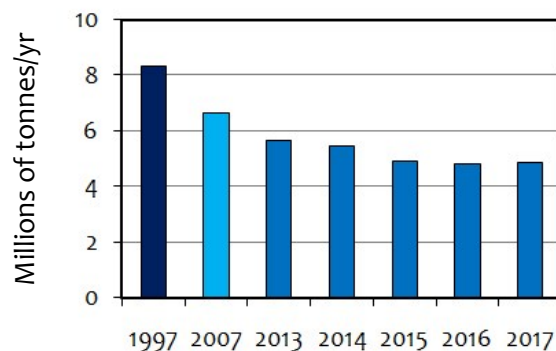
Structure and Planning Committee; the Committee established to review the CAH Annual Report and the Upwind/Downwind organizing committee.

This report was written based on the compiled data and uses 1997 as a base year to evaluate environmental trends. Data from new members is only collected and included in the survey from the date they joined.

Greenhouse Gases - 43% reduction since 1997

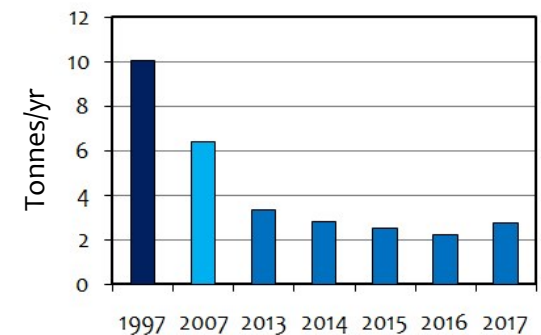
Greenhouse Gas (GHG) emissions from HIEA member companies are primarily carbon dioxide, with small quantities of methane and nitrous oxide. Although there has been an increase in production in the last few years, the total Greenhouse Gas emissions in 2017 are almost 43% below the 1997 levels with almost a 7% decrease since 2013.

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



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

Total Particulate Matter (TPM) emissions are almost 73% below those reported in 1997, and are 17% lower than those in 2013 which represents an increase in emissions over the last two years. Although there are improved testing methods and better information for PM10 and PM2.5 which results in higher reported numbers of those parameters TPM emissions continue to show a reducing trend. Much of this drop can be attributed to a number of initiatives implemented in the last few years. Total Particulate Matter includes particles smaller than 44 microns-the size limit of particles that can be suspended in air.

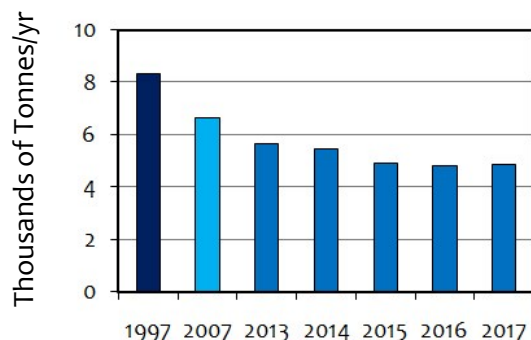


Nitrogen Oxides (NOx) - 42% lower than 1997 emissions

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

HIEA member companies have reduced their NOx emissions by almost 42% since 1997 and are 14% lower than those in 2013. Although production levels have generally increased over the last few years these emissions continue to show a reducing trend.

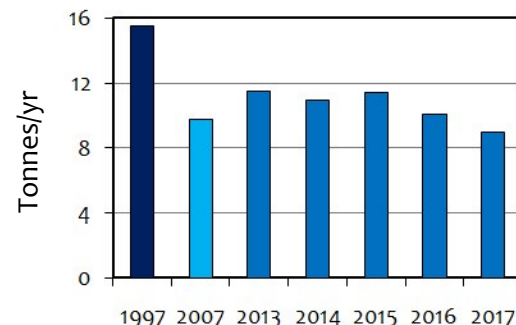
Improvements have primarily been achieved by the installation of advanced combustion technology (low NOx burners) and the shut down of obsolete equipment.



Sulphur Dioxides (SO2) - 42% reduction since 1997

Sulphur dioxides are a precursor to acid rain. Although SO2 emissions have fluctuated over the past five years they are over 22% lower than those reported in 2013 while the total emissions remain 42% lower than 1997 levels.

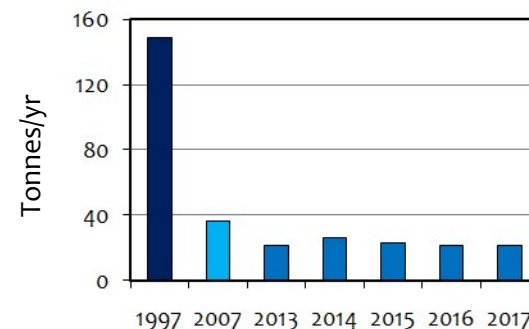
The fluctuation in SO2 emissions is often a result of increases or decreases in production. Changes or slowdowns in production that required different fuel sources may result in higher or lower sulphur dioxide emissions.



Several options are being implemented to reduce these emissions including switching to lower sulphur fuels and feedstock and shutting down obsolete equipment.

Polycyclic Aromatic Hydrocarbon (PAH) - 86% 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 almost 86% since 1997 and although there have been fluctuations in the past 5 years, they have remained consistently low. These reductions have been achieved primarily by improving coke oven operations. The increase shown in 2014 is a result of updated source testing that was conducted this year.



HIEA Commitment to Ongoing Improvement *continued*



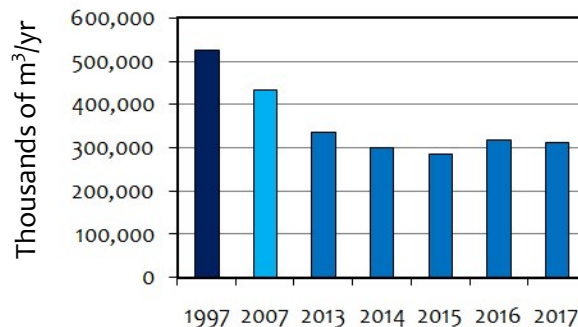
Many HIEA members operate their own waste water treatment facilities. Ongoing improvements and updates to these treatment facilities ensure that their discharges are in compliance with the current requirements of the City of Hamilton's Sanitary Sewer By-Laws and provincial regulations and permits.

Some HIEA members discharge treated water to the municipal sanitary sewer system while others discharge treated water to Hamilton Harbour. Some sites also discharge untreated rain water into the system. Water entering the sewer system is directed to a Hamilton Wastewater Treatment Plant where it undergoes further treatment before being discharged to the Harbour.

Hamilton Harbour Water Use - 45% lower than in 1997

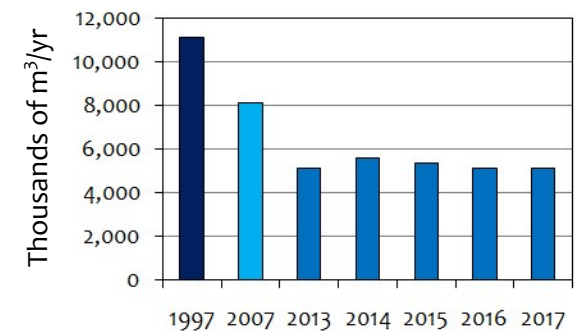
Hamilton Harbour water use has decreased by 45% since 1997 and although levels fluctuate there is a declining trend over the past five years.

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 - 54% below 1997 consumption levels

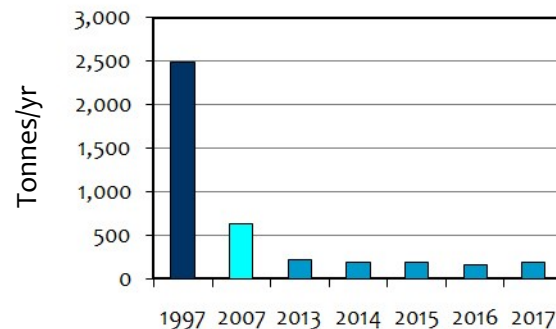
HIEA member companies have reduced their consumption of city water by almost 54% since 1997. Although the use of city water has fluctuated over the past 5 years it continues to remain at these lower levels.



Total Suspended Solids (TSS) - 87% lower than in 1997

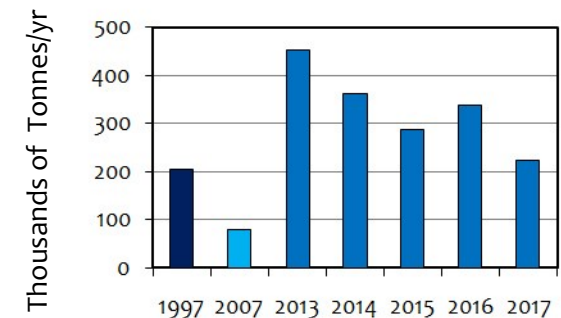
Overall Total Suspended Solids discharges have been reduced by almost 87% since 1997, with almost 50% of these reduced discharges going to a city wastewater treatment plant for further treatment.

Over the past five years discharges continue to show an overall reducing trend 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.



Waste Management and Total Offsite Disposal

Hamilton is an important recycling centre and HIEA companies are major participants. In 2009 waste was defined as something 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. The report has been adjusted to reflect this change.



Total off-site disposal levels fluctuate as a result of changes in year to year production. Although there is a 3% increase over 1997 reported numbers in waste disposal there has been a declining trend overall. The increase in numbers is due in part to changes in membership, waste management practices and changes in reporting by HIEA members.

HIEA member companies are committed to improving their environmental performance and the maintenance of their facilities. Many member companies are ISO 14001 certified and all members follow a prepared environmental management improvement program. These programs have been developed to assist organizations to minimize how their operations (processes etc.) affect the environment; to comply with applicable laws, regulations, and other environmentally oriented requirements, and to improve continually.

These management programs pertain to the process of how a product is produced, rather than to the product itself. Companies regularly perform audits using third-party organizations to ensure they are meeting the requirements set out in their improvement programs. HIEA members work closely with provincial and city regulators to ensure all reasonable steps are taken to both improve their processes and to remain in compliance.

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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