

2020 Annual Report on Commodity Price Hedging  
The Office of Energy Initiatives

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**Introduction**

The City of Hamilton’s 2020 Annual Report on Commodity Price Hedging deals exclusively with the City’s energy commodity price hedging agreements and utility rate transactions for natural gas, electricity and fuel.

As defined in the Corporate Energy and Sustainability Policy, “Energy Commodities” means electricity, green power, natural gas, methane and all other petroleum based fuel products such as, diesel, bio-diesel, gasoline, fuel oil, propane and any other bulk commodity primarily used by the City for the purpose of heating and cooling of buildings and other structures, electricity generation, cogeneration demand response programs, smart grid programs and the fuelling of City fleets, as determined by the Manager of Energy Initiatives.

**Utility Rates and Commodity Strategies Results**

The utility rates and commodity strategies results include Global Adjustment (GA) rate changes and natural gas hedging programs. For the 2020 calendar year, there was a \$8.02M cost benefit; \$7.40M as a result of Class A and \$0.62M savings from hedging of natural gas.

Figure 1: 2020 Utility Rates and Commodity Strategies Results

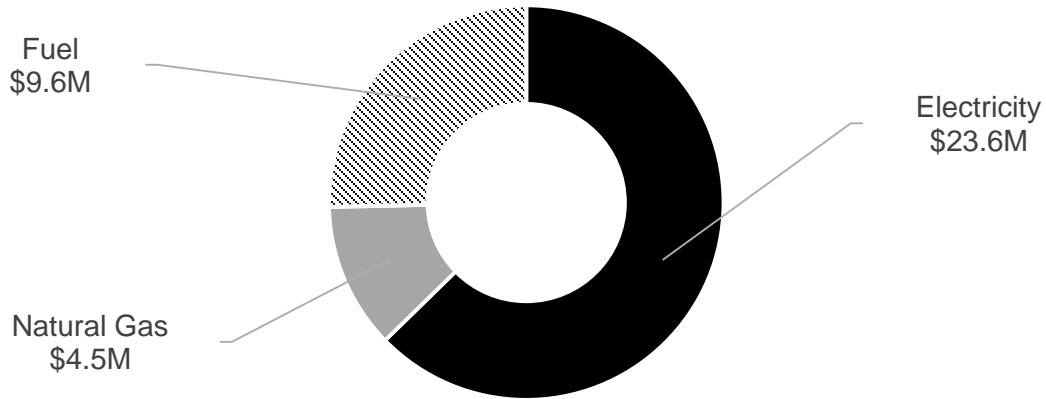
2020 Results	\$M	% Levy	% Rate
Global Adjustment	\$ 7.40	23%	77%
Natural Gas Hedging	\$ 0.62	78%	22%
Total	\$ 8.02	27%	73%

Further breakdown of these results can be found in the Global Adjustment and Natural Gas Risk Management sections in the report.

**Overall Costs**

In the City’s 2020 Annual Energy Report on Commodity Price Hedging (Report PW21049), the total actual energy costs for electricity, natural gas and fuels were reported at \$37.7M. Overall, this is a 7.2% decrease from 2019 energy costs. As outlined in the Annual Energy Report, the results in 2020 are considered atypical due to the varying impacts of COVID-19 on consumption and resulting costs from building closures and changes to operational and staffing activities throughout the year. The breakdown is shown in Figure 2.

Figure 2: 2020 Total Energy Costs (Electricity, Natural Gas & Fuel) in Millions (M)



The electricity and natural gas costs, including those from district heating and cooling are incurred by City-owned buildings / facilities, Hamilton Water, Public Works Operations and Street and Traffic lighting. It excludes CityHousing Hamilton. Utilities include Alectra Utilities, Hydro One and Enbridge Gas Inc. Sites with only partial data may be excluded.

Fuel includes diesel, unleaded gasoline and compressed natural gas (CNG) for all Fleet, Operations and Transit vehicles but does not include Hamilton Police Services or Darts.

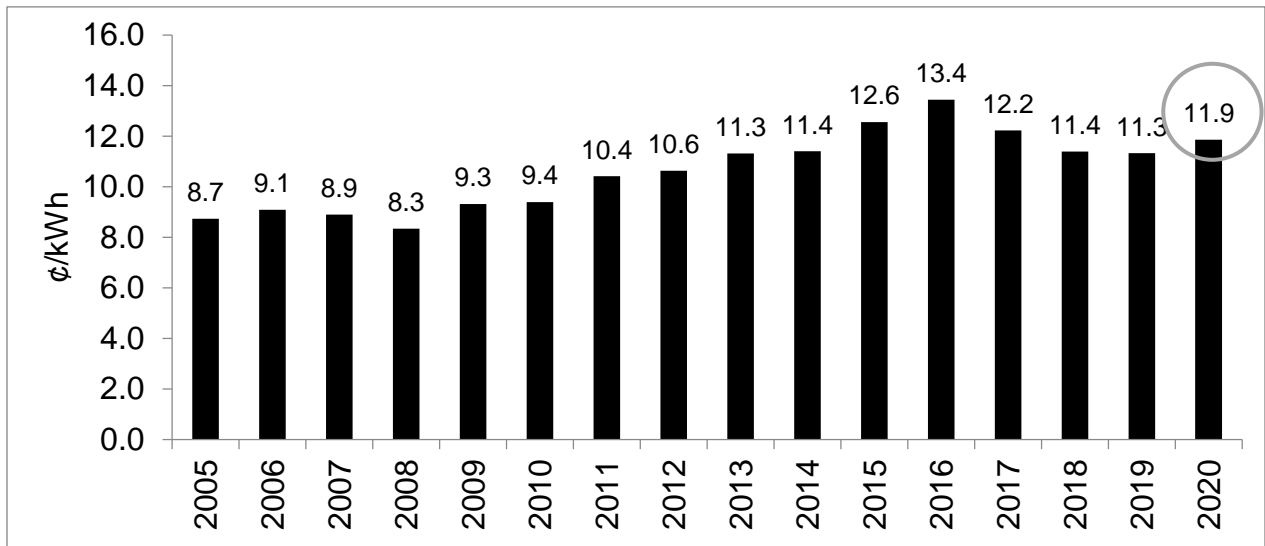
### Electricity

The electricity price comprises commodity, as well as, costs for distribution, transmission, regulatory and delivery. Hamilton is served by two local distribution companies (Alectra Utilities and Hydro One). Both Alectra Utilities and Hydro One are regulated by the Ontario Energy Board (OEB) and must get approval for any rate changes.

In 2020, the City’s overall expenditure for electricity was \$23.6 M. Overall, electricity costs in 2020 decreased by 4% compared to 2019. There was a decrease of 8.2% in overall consumption when compared to 2019. The City’s overall average price of electricity per kilowatt-hour (kWh) increased by 5% from 11.3 cents per kWh (¢/kWh) in 2019 to 11.9 ¢/kWh in 2020.

The average price for electricity, year over year, from 2005 to 2020 is outlined in Figure 3.

Figure 3: City of Hamilton Annual Average Electricity Price (¢/kWh)



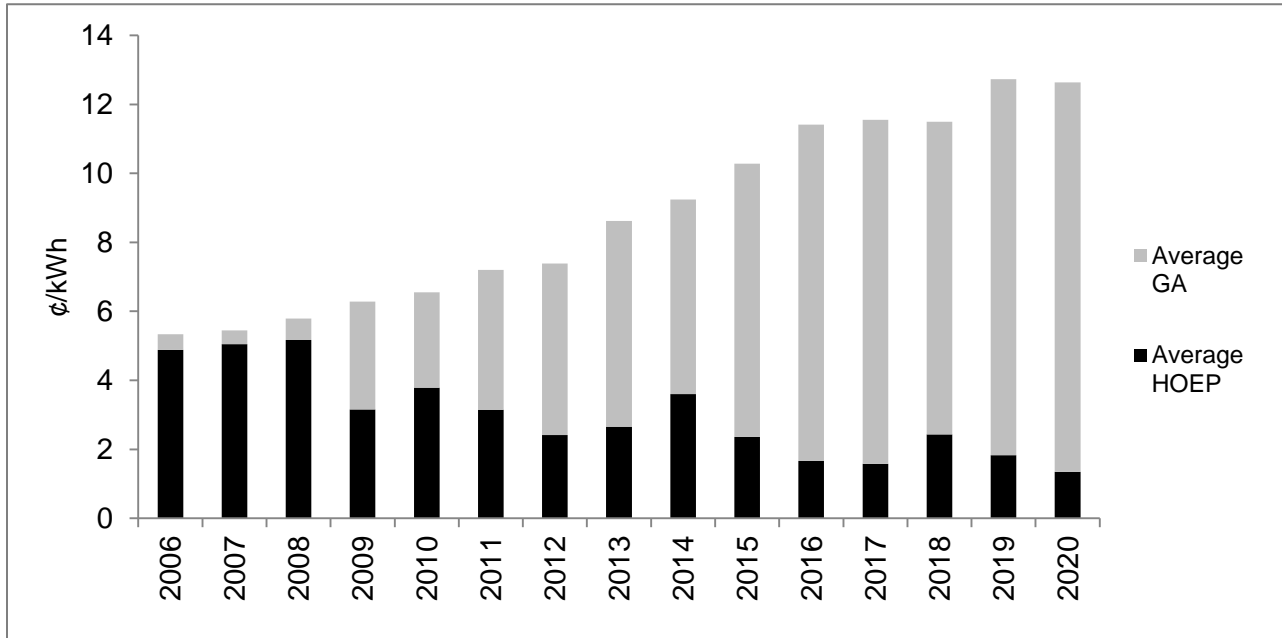
There are a variety of factors that impact electricity cost, some of which are consumption, process changes, regulatory changes, market activity and weather. In 2020, consumption was lower than 2019, due largely to impacts of COVID-19 resulting in operational changes and shuttering of facilities at various periods throughout the year. However, temperatures during the summer months of 2020 were also higher than the previous year. Warmer temperatures will typically increase cooling demand. With limited capacity in most facilities, the impacts from weather would be lower, though cannot be dismissed completely. The cooling degree days in Hamilton were 43% higher in 2020 versus 2019 and 12% higher than the five-year average.

Costs were 4% less in 2020 than in 2019 due mainly from lower consumption although the average per unit price was slightly higher. There were provincial rate relief programs related to COVID-19 response, which temporarily halted regulatory increases in an effort to reduce the impacts on residential and commercial customers. In addition, Global Adjustment (GA) price caps for the April – June 2020 period were intended to limit the upside of those costs despite market activity that could have increased the GA portion of the commodity price.

The electricity market in Ontario itself is complex and volatile. Ontario’s electricity commodity includes the Hourly Ontario Electricity Price (HOEP) and the Global Adjustment (GA). When the HOEP is low, the GA increases to cover the costs of generation. The monthly costs vary depending on consumer demand, the generation mix, weather conditions and how often each type of generation is offered into the market.

It is possible to fix the price on forward terms for the HOEP. However, doing so does little to protect against the greater fluctuations of the GA, which makes up the larger portion of commodity costs. Staff recommendations have been to not hedge against the HOEP due to unfavourable market conditions. While the HOEP has declined over recent years, this has been offset by significant increases to the price of the Global Adjustment, as illustrated in Figure 4.

Figure 4: Electricity - Annual Average Price of HOEP and Global Adjustment



The commodity portion of the electricity price includes HOEP and GA. The annual average HOEP in 2020 was 1.4 ¢/kWh, which was a 36% decrease from 2019. The average GA price component in 2020 was 11.3 ¢/kWh. This represents a 3% increase over 2019. The overall combined commodity price for electricity (12.6 ¢/kWh) was a 1% decrease from 2019.

### Global Adjustment

The Global Adjustment (GA) is a market mechanism to account for differences between the market price and the rates paid to regulated and contracted generators and for conservation and demand management programs. Most of the GA costs arise from contracts that the Independent Electricity System Operator (IESO) has with generators, many of which are fixed price or guaranteed revenue agreements. There is no market mechanism to hedge specifically against the GA rate.

When spot prices (HOEP) are lower, the generator does not earn enough revenue from power sales to meet its revenue guarantees. In that case, the IESO pays the generator to make up this difference and the costs are recovered from consumers through the GA. Therefore, in a month when the market price of electricity is low, the GA will be higher and conversely when market prices are high, the GA will be lower.

For billing of the GA costs, most commercial consumers are on a Class B rate. Class B consumers pay a regulated GA rate set monthly and posted by the IESO. Eligible, high electrical demand customers can opt for a Class A rate. Class A rate customers pay the GA costs based on their percentage contribution to the total monthly provincial GA costs, calculated on the top five peaks during a peak setting period. This is called the peak demand factor (PDF). Class A customers can impact their GA costs by reducing demand during peak periods, resulting in lower costs. As part of the pandemic response, the IESO initiated a peak hiatus for Class A customers to allow large customers to focus on economic recovery from the impacts of COVID-19. For the latter part of 2020, Class A customers did not need to anticipate and reduce demand during peak events and instead would keep the existing PDF into the 2021-2022 period if other eligibility requirements were met.

Class A sites within the City include 900 Woodward Avenue, 850 Greenhill Avenue, 78 Kenilworth North, CUP Operations and Tim Hortons Field. Changes in 2020 included, 1579 Burlington Street East which was re-added and FirstOntario Centre was removed as of July 1, 2020. The results for 2020 was a cost benefit of \$7.4 M as shown in Figure 5.

Figure 5: Annual Global Adjustment Class A Results 2011-2020

Year	Global Adjustment Cost Benefit
2011	\$ 1,061,230
2012	\$ 1,511,939
2013	\$ 2,598,221
2014	\$ 2,348,577
2015	\$ 3,911,299
2016	\$ 4,682,209
2017	\$ 5,976,102
2018	\$ 6,404,572
2019	\$ 7,248,037
2020	\$ 7,397,100
CUMULATIVE	\$ 43,139,287

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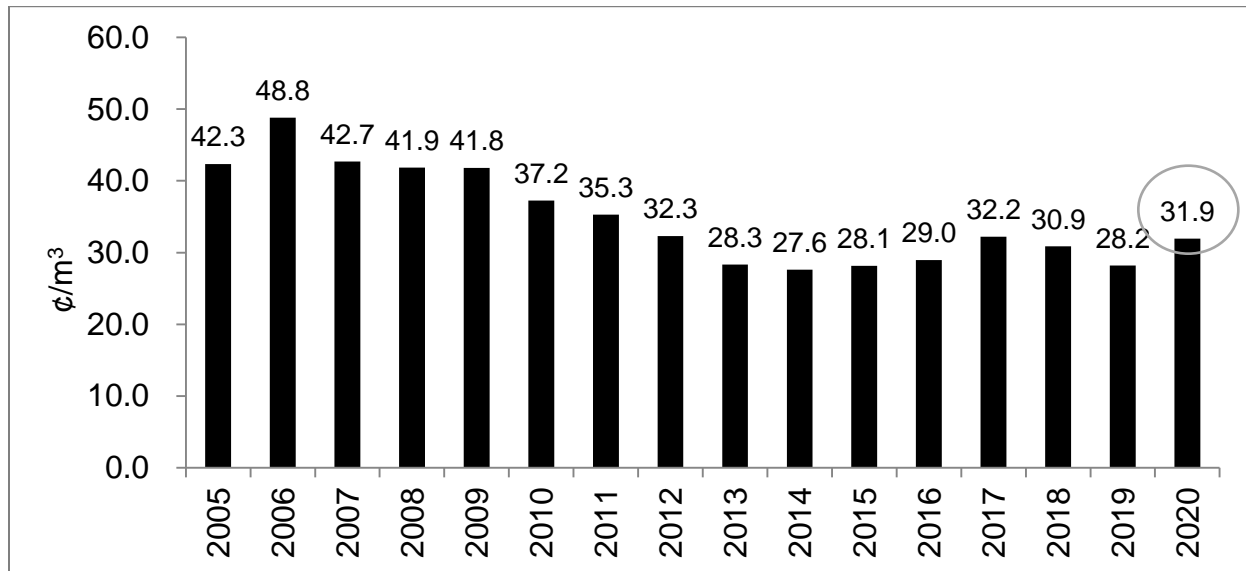
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## Natural Gas

The natural gas price includes commodity, transportation, regulatory and delivery. Hamilton is served by one local distribution company, Enbridge Gas Inc.

The City’s overall expenditure for 2020 natural gas, including the commodity costs and utility charges for delivery, transportation and storage was \$4.5 M. This is an increase of 19% over 2019 costs. There was an increase of 5% in natural gas consumption compared to 2019 totals. The overall average unit price was 31.9 cents per cubic metre ( $\text{¢}/\text{m}^3$ ), which was a 13% increase compared to 2019’s price of 28.2  $\text{¢}/\text{m}^3$ . The average price for natural gas, year over year, from 2005 to 2020 is outlined in Figure 6.

Figure 6: City of Hamilton Annual Average Natural Gas Cost ( $\text{¢}/\text{m}^3$ )



The higher consumption in 2020 is primarily a result of the additional volume required for the biosolids production activity with Hamilton Water. While, the majority of facilities natural gas consumption was lower in 2020 due to pandemic response, the biosolids was a steady user of natural gas starting in May 2020 leading to the overall increase. Weather was of less of an impact to costs and consumption in 2020. The bulk of the heating season was over by the time the first lockdowns began in March 2020, and heating degree days overall were 7% less in 2020 than the 5-year average. Commodity costs themselves remained relatively stable. Ongoing hedging activity, described below in the Natural Gas Risk Management section, helped to mitigate market fluctuations due to uncertainty over COVID-19 and its global economic impacts.

Another impact to costs was the annual increase to the Federal Carbon Charge (FCC). The FCC, mandatory for provinces without a designated carbon reduction plan, was approved for April 2019 and implemented in Ontario starting August 2019. The FCC is charged per cubic meter of consumption on Enbridge Gas bills. The FCC is set to increase annually every April and does increase costs as a result. The charge for the January to March 2020 period was 3.91 cents per cubic meter and increased to 5.87 cents per cubic meter as of April 2020.

### **Natural Gas Risk Management**

Natural gas can be a volatile commodity. There are many factors that can influence prices in natural gas markets including weather, supply, demand, geo-political events and changes to refining and extraction technologies. To maintain control of costs and minimize the degree of price volatility, the City has purchased its natural gas directly from the wholesale market (since June 2006). The City has supply agreements with multiple parties to allow for competitive purchasing.

Overall, the procurement strategy is dynamic as staff, in conjunction with industry experts and the retained consultancy firm, make purchasing decisions based on market conditions. A portion of natural gas supply may be purchased as much as two to three years in advance to protect against market volatility while other portions are purchased just a month or two in advance. Fixing the price on a portion of the City’s natural gas volumes results in better budget predictability and protection against spot market fluctuations, particularly during extreme weather conditions or unforeseen market events.

The City purchases natural gas for City-owned facilities (excluding CityHousing Hamilton) and for compressed natural gas (CNG) for the Transit natural gas bus fleet. The average 2020 price for the natural gas (commodity only) was \$3.14 per gigajoule (GJ) (\$0.124/m<sup>3</sup>) including a blend of hedged and unhedged volumes. This does not include any Enbridge Gas charges such as delivery, storage or federal carbon charge which make up the total price.

For the majority of 2020, an average of 80-85% of natural gas supply was fully hedged. This was based on 2020 volume requirements. At the end of 2020, volumes were hedged for the periods starting November 1, 2020, November 1, 2021, November 1, 2022 and a small volume for period starting November 1, 2023. Figure 7 provides a profile of the completed hedges of the end of December 2020. Staff monitors the market and continues to develop strategies for purchasing into the forward terms to further capture agreeable market opportunities.

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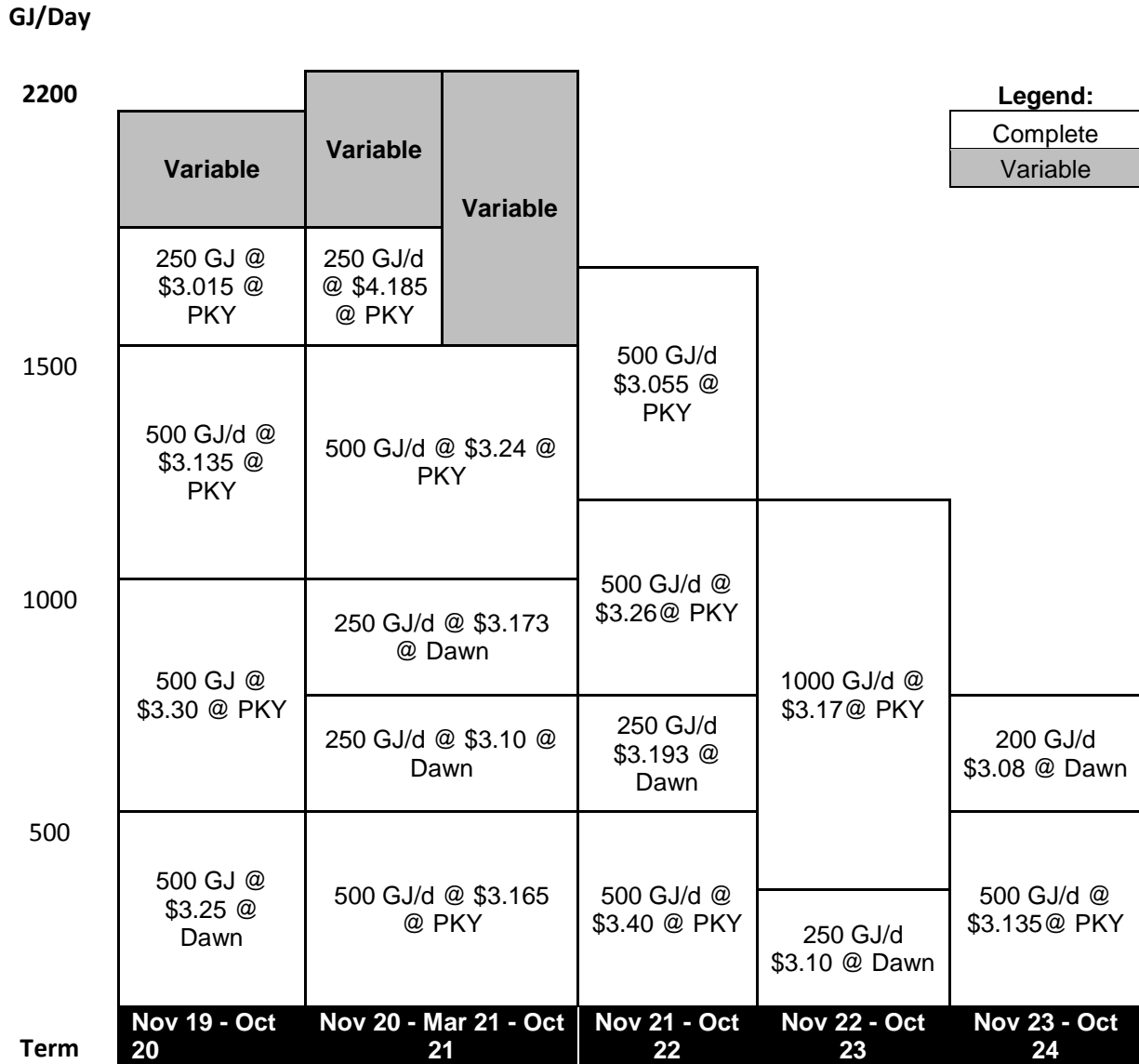
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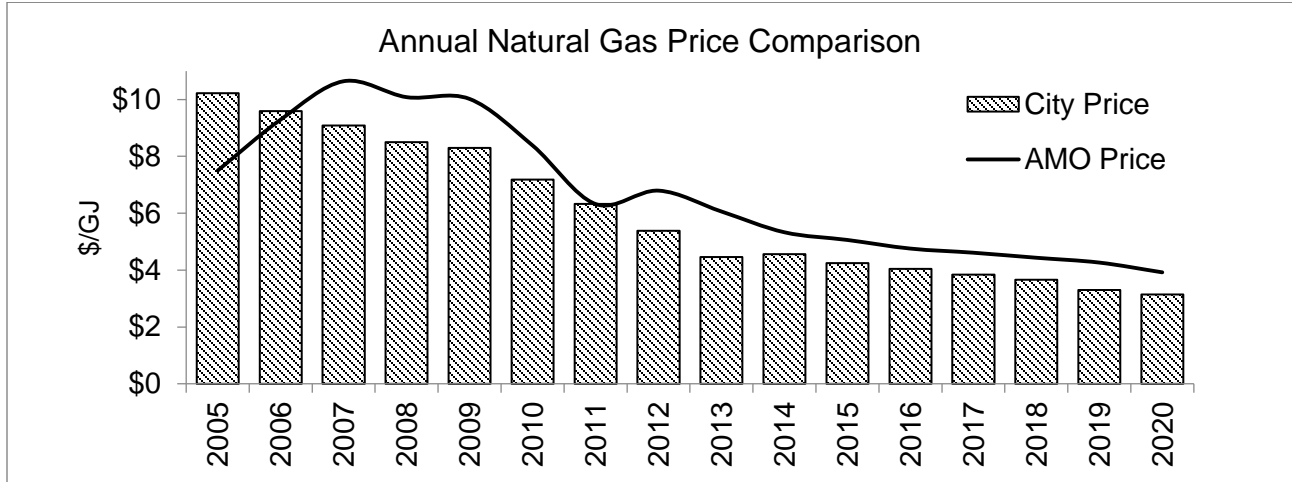
Figure 7: Natural Gas Hedge Profile (as of December 2020)



Notes on Figure 7:

- GJ/Day = Gigajoule per day
- PKY = Parkway Ontario delivery point
- Dawn = Union Dawn Ontario delivery point

To evaluate the performance of the hedging program, the City benchmarks its natural gas hedging activities against the procurement program offered by the Association of Municipalities of Ontario / Local Authority Services (AMO / LAS). Although the City has enough volume to allow for wholesale purchase from market suppliers, smaller municipalities may not have the volume or expertise to manage their own programs and may benefit from and highly valued AMO / LAS purchasing program. The City and AMO / LAS program comparison is shown in Figure 8 with overall results shown in Figure 9. Figure 8: Average Price Comparison of City to AMO/LAS Natural Gas Program\*



\*As posted on LAS program website. <https://www.las.on.ca/>

Figure 9: Performance of Natural Gas Hedging Activity Compared to AMO/LAS Program

Natural Gas Hedging Performance Results	2020 Results	Cumulative Results*
Levy (Tax) Supported Budget	\$ 489,742	\$ 7,674,624
Rate Supported Budget	\$ 134,580	\$ 1,342,831
<b>Total Cost Benefits:</b>	<b>\$ 624,322</b>	<b>\$ 9,017,455</b>

\*Performance relative to AMO/LAS Natural Gas Hedging Program since 2007

Although hedging activities do serve to effectively manage the commodity portion of natural gas prices, controlling consumption plays a role in managing the overall costs of natural gas. Consumption reduction helps to mitigate the potential for increased costs of natural gas due to changes in utility or regulated rates (i.e. delivery, carbon programs), while further reducing the footprint of the City’s facilities by reducing carbon emissions.

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## Natural Gas Agreements for Supply, Transportation, Storage and Delivery

In 2020, the City had master agreements for natural gas supply in place with Shell Energy North America (Canada) Inc., Tidal Energy Marketing Inc., Royal Bank of Canada and EDF Trading North America, LLC. In July 2020, EDF Trading North America sold its Canadian natural gas portfolio and existing forward hedges to Twin Eagle Resource Management Canada LLC. All current supply counterparties have credit ratings that are compliant with the Corporate Energy Policy.

In addition, the City has contracts in place with Enbridge Gas that are required to facilitate the transportation, delivery and storage of the City’s natural gas supply. The utility agreements include a direct purchase agreement for City sites, two T1 rate storage contracts for managing Transit CNG and Hamilton Water biosolids and an M13 rate production contract for renewable natural gas.

### Direct Purchase Agreements (DPA) with Enbridge Gas

DPAs outline the terms of service for delivery of natural gas, including designated delivery points, contract volumes and storage. The parameters are shown below in gigajoules (GJ) which is the unit in which gas is purchased to meet the requirements. Prices and consumption data on Enbridge Gas bills are reported in cubic metres (1 GJ = ~26 cubic metres). In 2020, the agreements and parameters on contract renewal were:

- SA7020 for 1,333 GJ/day – 250 miscellaneous City natural gas accounts which run from November 1 to October 31 each year.
- T1 for 651 GJ/day (increased from 598 GJ/day as of September 2019) - For Transit’s CNG bus fleet and transit site. The contract runs September 1 to August 31 each year.
- T1 for 437 GJ/d (as of May 1, 2020) – For Hamilton Water biosolids production operation. The contract runs from May 1 to April 30 each year.

Each DPA has its own specific delivery requirements, at different points along the variety of pipelines within North America and are reviewed and renewed annually. DPAs may also be amended throughout the year or adjusted to meet specific parameters. Specifically, for the T1 contracts, volumes are reviewed regularly to accommodate more frequent changes to requirements, such as changes to fleet size, weather impacts or operational adjustments. Incremental volumes over DCQ or lower volumes (less than DCQ) are commonly delivered to accommodate for these changes.

### Compressed Natural Gas (CNG)

Natural gas is also purchased for Transit’s fleet of natural gas buses. The CNG station at the Mountain Transit Centre services the fleet of existing and growing number of natural gas buses for the City.

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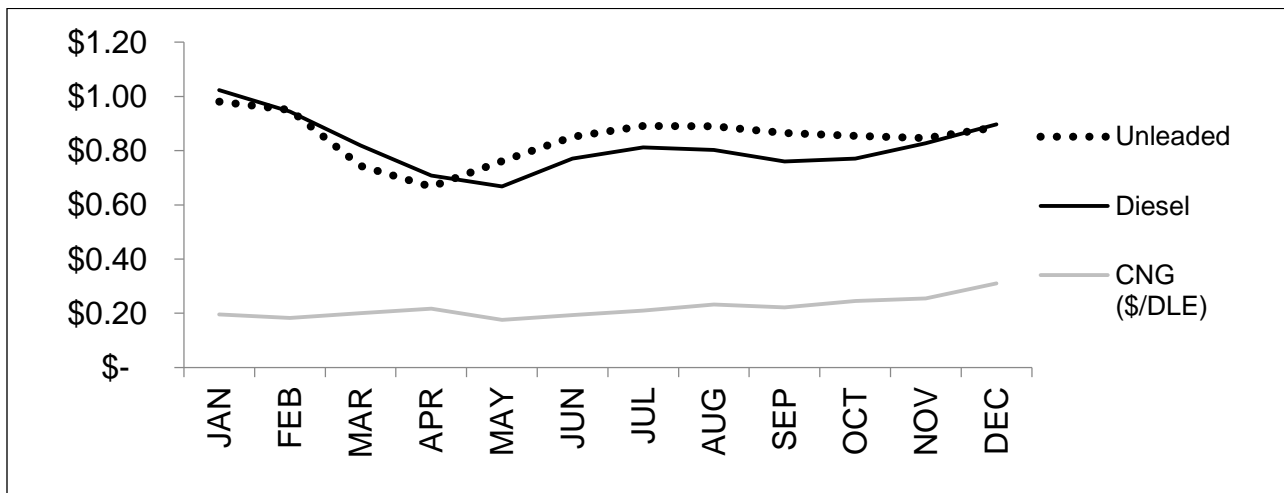
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The CNG station operates under a natural gas storage contract (T1). The T1 contract is a daily-balanced contract with storage availability. The amount of storage volume is contracted annually and for the 2019-2020 contract term (September 2019 to August 2020), the T1 was allotted 15,318 GJs of storage. The difference between the daily volumes purchased and consumed are injected or withdrawn from the storage account. The contract allows for greater flexibility in managing the supply but must be reviewed daily to adhere to specific storage parameters.

The Transit fleet of natural gas buses totalled around 140 by the end of 2020 and is expected to increase in the coming years. Natural Gas has a lower cost compared to diesel, however, it does operate at approximately 75% efficiency per diesel litre equivalent when compared to diesel bus usage. Despite its lower efficiency, the lower cost and lower GHG emissions is of benefit to the City. In 2020, the total cost of natural gas for the buses was \$1.26 M. Figure 10 shows the City’s monthly fuel prices with CNG price converted to diesel equivalent (DLE).

Figure 10: 2020 Monthly Average Fuel Prices for Diesel, Unleaded Gasoline and CNG



\*Prices include Fleet charge of 3.5 cents per litre for diesel and gasoline.

When converted to diesel equivalent dollars and adjusting for efficiency, Transit spent \$2.3 M less in fuel costs using CNG buses than they would have using only diesel buses.

Figure 11: 2020 Cost Benefit of CNG as Compared to Diesel

Diesel Litre Equivalent (L)	5,776,818
Number of DLE Litres of Diesel Required*	4,274,845
DSL cost at \$0.83/L (Average Fuel Price)	\$ 3,548,121.58
2020 CNG Cost	\$ 1,260,549.04
Avoided fuel cost by using CNG	\$ 2,287,572.54

\* Average of CNG buses run at ~75% of DLE compared to average DSL bus.

### **Traditional Fuel Supply**

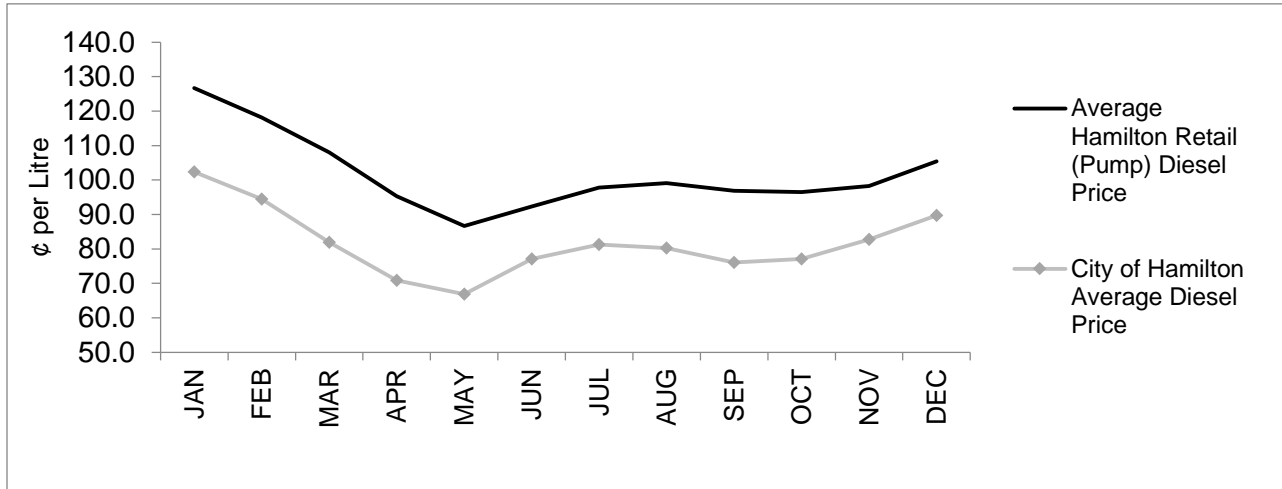
The City of Hamilton purchases diesel and gasoline fuel for its fleet of vehicles including buses, waste collection vehicles, snow removal trucks, street sweepers, forestry and parks vehicles, as well as, Fire and Emergency Services vehicles. In addition, the City purchases fuel for Hamilton Police Services.

In 2020, the City’s fuel procurement strategy involved utilizing a contractual bulk supply agreement with Suncor Energy Products Partnership. Fuel contracts are reviewed annually and based on pricing, deliverability and fuel types, the strategy can be adjusted accordingly.

The pricing arrangement for 2020 was based on the daily “rack” price of each required fuel type (diesel and gasoline) from a designated source terminal with negotiated discounts, delivery charges and taxes. Paying daily rack pricing for fuel assures customers are getting the lowest available price on the market for that day. Suncor Energy Products Partnership has a credit rating that is compliant with the Corporate Energy Policy.

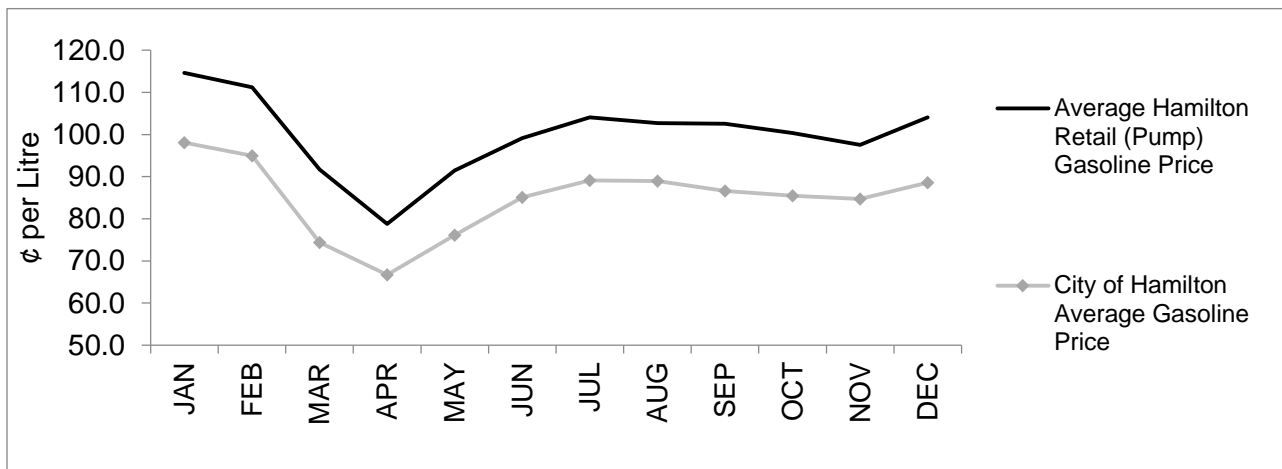
Wholesale purchase of diesel and gasoline offer lower prices than those at public fuel stations across the City. With data collected from reliable industry sources on average fuel pump prices in Hamilton, Figures 12 and 13 show the comparison between the average prices paid for diesel and gasoline purchased under City wholesale contracts versus the average retail prices paid at the pump (“Pump”) by the public at fuel stations throughout Hamilton.

Figure 12: 2020 Monthly Average Price of Diesel Paid by City versus at the Pump\*



\*Average Canadian Diesel retail pump prices for Hamilton from data available by Kent Group Ltd (weekly)

Figure 13: 2020 Monthly Average Price of Gasoline Paid by City versus at the Pump\*



\*Average Canadian gasoline retail pump prices for Hamilton from data available by Kent Group Ltd (weekly)

Fuel purchases for diesel and gasoline, as reported in the 2020 Annual Energy Report on Commodity Price Hedging (Report PW21049) excludes Hamilton Police Services. City departments used approximately 7.6 million litres of diesel, a 12% decrease from 2019. City departments used approximately 2.3 million litres of gasoline, a 3% decrease from 2019. Overall usage in diesel and gasoline was lower in 2020 due to interruptions or changes in services as a result of COVID-19.

The 2020 budget prices for diesel and gasoline were set at \$1.04 per litre and \$1.10 per litre, respectively. For 2020, the average diesel and gasoline unit prices were under budget, with overall costs at 28% below budget. Prices for diesel and gasoline overall dipped dramatically during the early stages of the pandemic but did recover near the mid to end of 2020 to more expected levels as provincial and global demand for fuels increased. With both lower consumption and lower prices, the variance of actual to budget was \$3.2 M. Figure 14 shows the 2020 results as compared to budget.

Figure 14: 2020 Actual Fuel Consumption and Costs Compared to Budget

Fuel Type	2020 Budget	2020 Actual	2020 Variance (Actual - Budget)
Diesel Consumption (L)	8,697,083	7,599,384	- 1,097,700
Diesel Cost (\$)	\$ 9,044,960	\$ 6,313,428	-\$ 2,731,532
Diesel Unit Price (\$)	\$ 1.04	\$ 0.83	-\$ 0.21
Gasoline Consumption (L)	2,267,659	2,292,783	25,124
Gasoline Cost (\$)	\$ 2,494,420	\$ 1,977,370	-\$ 517,050
Gasoline Unit Price (\$)	\$ 1.10	\$ 0.86	-\$ 0.24
Total Consumption (L)	10,964,743	9,892,167	- 1,072,576
Total Costs (\$)	\$ 11,539,380	\$ 8,290,798	-\$ 3,248,582

Purchasing wholesale fuel does help insulate the City from some of the costs associated with pump prices, largely the marketing fees. However, City prices do include Fleet’s fee of 3.5 cents per litre.

### Fuel Risk Management

Like other commodities, diesel and gasoline markets are volatile and are impacted by many localized and global geopolitical factors. One method to manage volatility is to hedge volumes for a forward term at a set price. This is typically achieved by utilizing a financial hedge to manage fluctuations in the market. Although the City has hedged in the past and staff continues to monitor related markets for favorable opportunities, no volumes were hedged in 2020 or are currently hedged.

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## **Contract Agents**

Managing the annual energy cost of over \$37 M requires continuous attention within an ever-changing energy industry. To maximize available expertise, the City uses outside consultants (Contract Agents) to assist staff in negotiating the unstable and complex energy commodity markets and associated regulatory frameworks. The use of these Contract Agents has proven valuable in that they are immersed daily in the energy commodity markets and have specialized expertise with respect to monitoring and responding to market changes. In 2020, the City had a professional services agreement with Jupiter Energy Advisors Inc. to assist with the day-to-day management of the City’s natural gas portfolio.

Additionally, the City reviews several market-based publications and engages with outside parties to further gather information on factors influencing pricing both domestically and globally.

## **Consistency with City Energy Commodity Hedging Policy and Goals**

The agreements executed during the reporting period are consistent with the City’s Commodity Price Hedging Policy and Goals:

- The agreements have provided for a price of natural gas that was more stable and therefore, less risky than it would have been omitting the agreements;
- The actions taken through the authority of the Energy Commodity Policy have reduced uncertainty about energy costs, which have a direct impact on the City’s financial position. It has also enabled staff to respond to favourable market conditions;
- Credit ratings for the City’s primary commodity suppliers remain above the minimum threshold outlined in the policy;
- Commodity hedging provides municipalities with added flexibility to potentially mitigate or manage potential price fluctuations.