Exhibition Place

Allstream Centre

Energy Performance Report

2012 - 2014

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INTRODUCTION

Exhibition Place, as part of our 2014 – 2016 Strategic Plan has set a goal to reduce the impact of our operations and our business on all aspects of the environment. To meet this goal, we recognize the critical importance of improving the efficiency of existing buildings and reducing our energy consumption.

Two of the main steps towards reducing energy consumption are as follows:

- Firstly, ensure we have systems in place to improve efficiency of our energy use.
- Secondly, to effectively track energy use to understand existing conditions and trends in order to forecast future directions.

This report covers the energy use for the Allstream Centre for calendar years 2012, 2013 and 2014.

Allstream Centre was the former Automotive Building constructed in 1929 and designated a heritage structure under the Ontario Heritage Act. In 2009, the Automotive Building underwent $39.0M of renovations and reopened as the first conference centre in Canada certified as LEED Silver. Allstream Centre consists of 20 meeting rooms and a 43,900 sq. ft. ballroom with full kitchen amenities.

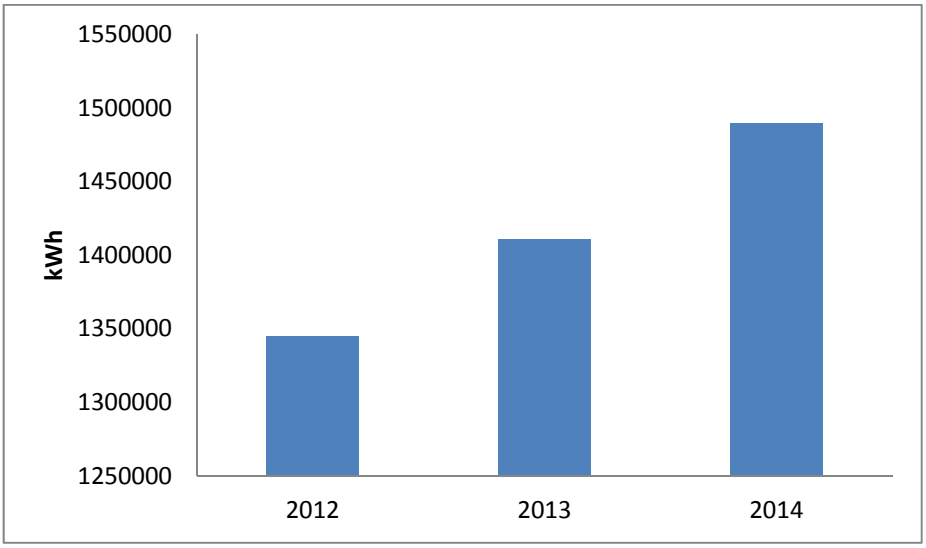
ELECTRICAL CONSUMPTION

Figure 1 below compares the total yearly electricity consumption and the total monthly electricity consumption (Figure 2) for the Allstream Centre over the reporting period 2012, 2013 and 2014.

The electrical consumption includes the following:

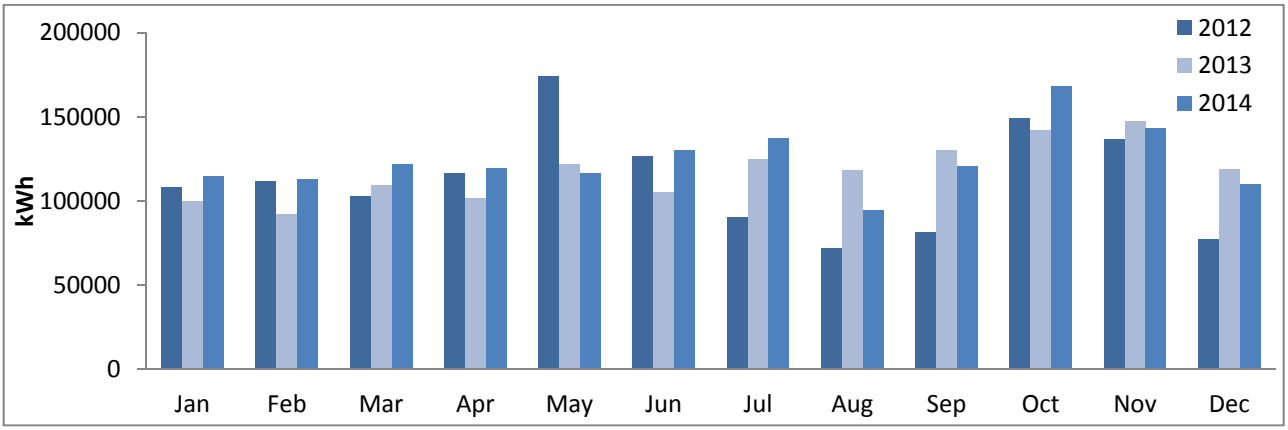
- Kitchen
- Building Power and Systems
- Heat Pumps
- Roof Top Units

Figure 1 – Yearly electricity consumption comparison



Years	% Increase
2014 vs. 2012	11%
2014 vs. 2013	6%
2013 vs. 2012	5%

Figure 2 – Monthly electricity consumption comparison

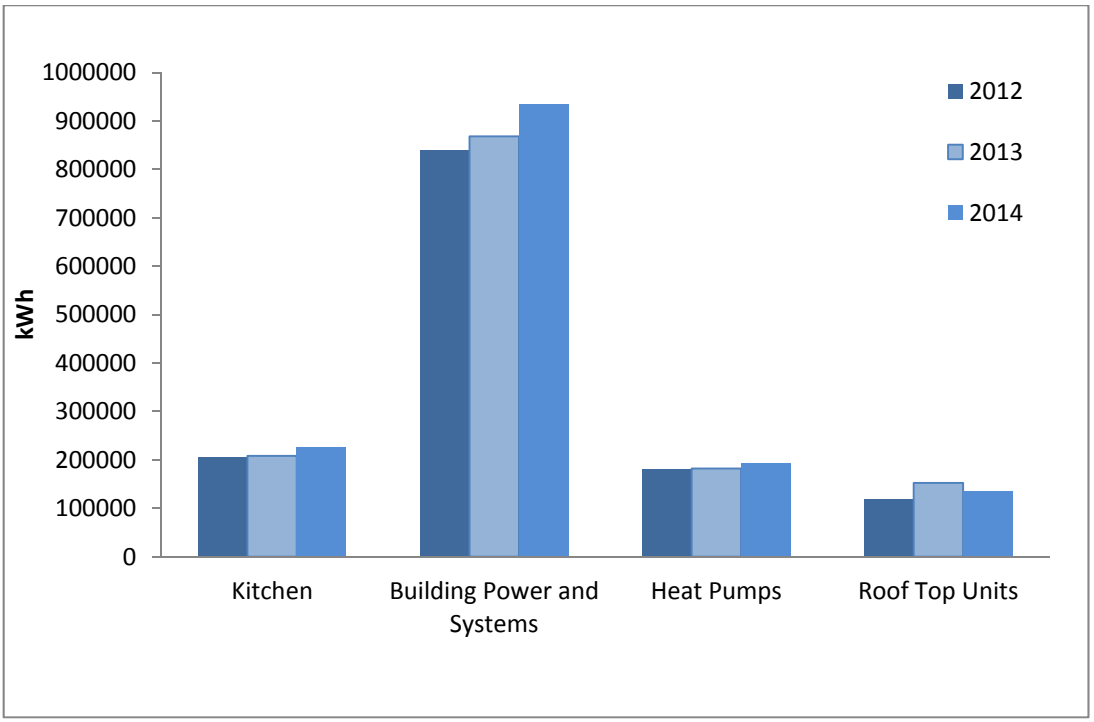


ELECTRICAL ENERGY DISTRIBUTION

Figure 3 illustrates the total electricity consumption distribution of the Allstream Centre over the reporting period.

Total consumption of Allstream Centre is calculated by combining the electrical loads measured by the sub-meters at Kitchen, Building Power and Systems, Heat Pumps and Roof Top Units.

Figure 3 – Electricity Consumption Distribution



BUILDING POWER AND SYSTEMS

Figure 4 shows the monthly breakdown of the Building Power and Systems monthly electricity consumption which is the highest category of consumption in the Centre. Show power and plug loads, elevators and escalators are included in this category.

The consumption in this category is dependent on the occupancy of the building and hours of operation. Building Power and Systems consume almost 60% of total building electricity usage. Generally, the more events / visitors that are in the Allstream Centre on any given day, the higher the electrical load will be. This is expected because as the number of people increases, the fans and pumps consumption need to increase accordingly to service the extra load along with room lighting and plug use.

The baseline consumption of the building corresponds to unoccupied weekend days or no show days at about 1200 kWh/day for Building Power and Systems shown in Figure 4.

Figure 4: Comparison of building power and systems electric consumption (kWh)

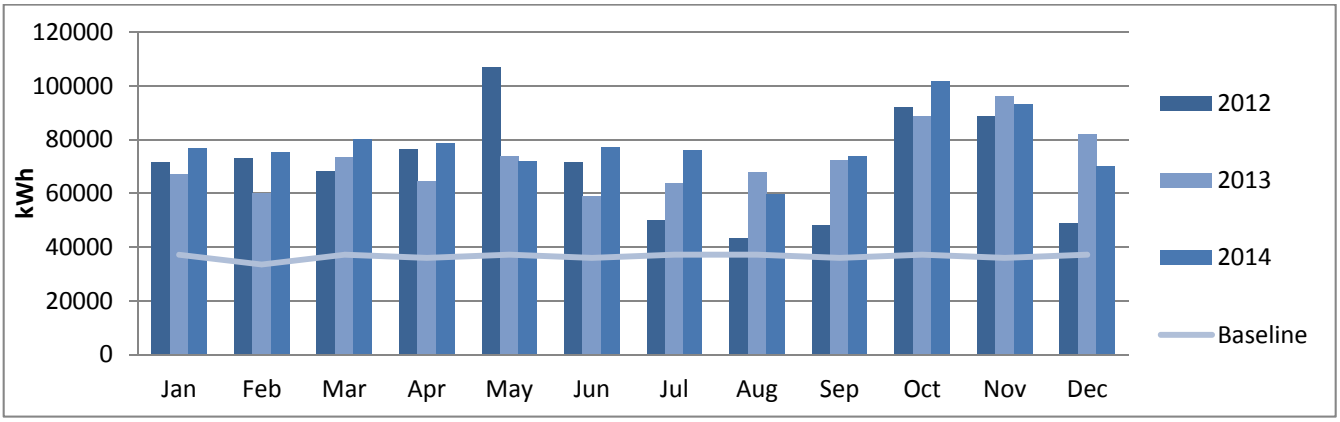


Figure 5 below compares the number of the show days in a month over the reporting period.

As mentioned above, the consumption is dependent on the occupancy of the building and hours of operation. Each event is unique and not necessarily comparable. An event may be held over several days, occupy more space and as a result use more Building Power and Systems compared to the other shows that may have the same duration but occupy less space.

Figure 5: Comparison of show days in a month

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	8	7	14	16	21	12	4	0	7	17	19	4
2013	3	5	10	11	15	12	5	6	13	17	18	8
2014	4	7	16	14	14	16	10	20	16	20	22	8

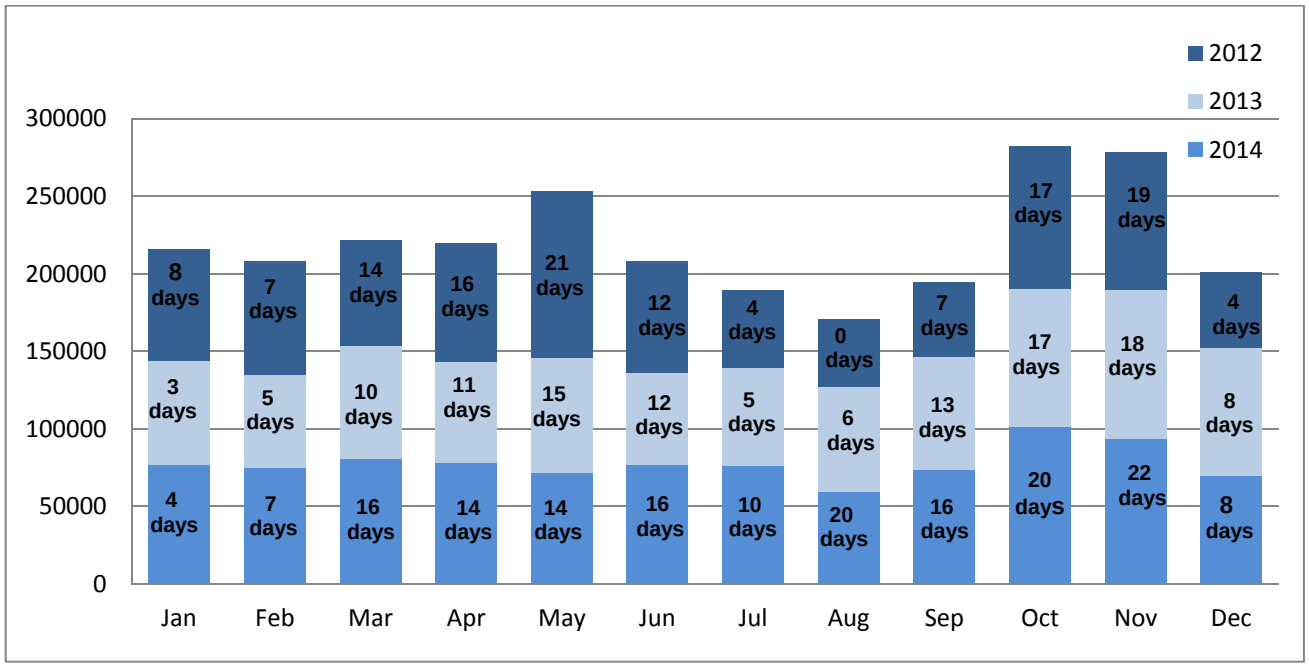
Figure 6 shows the percentage of Building Power and Systems consumption increase and decrease over the reporting period.

Figure 6: Building Power and System Loads

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
2014 vs 2013 (% increase)	14 %	25%	9%	21 %	-2%	31%	19%	-12%	2%	15%	-3%	-14%
2013 vs 2012 (% increase)	-7%	- 18%	8%	- 15 %	- 31%	- 18%	27%	57%	50%	-4%	8%	67%

The electrical consumption of the Building Power and Systems increased from 2014 over 2013 by 8% and the number of show days increased by 36% from 2014 over 2013. Figure 7 shows the effect of Building Power and System loads against number of show days in a month.

Figure 7: Building Power Loads vs. Show days



FACTORS CONTRIBUTING TO INCREASES (ELECTRICAL)

- As shown in Figure 3 the highest consumption in the Allstream Centre is Building Power and Systems. Weather temperature has a direct effect on the performance of these systems. When there is a high temperature difference between inside and outside in winter, it takes more work for the heat pumps to move the same amount of heat to indoors than on a milder day and as a result the heat pumps consumption increases. Heat pumps consume almost 12% of total electricity use of the building. Heat pumps consumption in 2014 increased by 6% and 7%, respectively compared to 2013 and 2012.

- Weather temperature in the winter months of 2014 (January, February, March) was colder by 4C and 7C respectively compared to 2013 and 2012 as shown in Figure 8 below.

Figure 8: Comparison of average temperature (°C)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
2012	-1	1	7	8	17	21	25	22	17	11	5	2
2013	-1	-3	1	7	16	19	23	21	17	12	3	-3
2014	-6	-6	-3	7	15	20	21	21	17	12	3	1

NATURAL GAS CONSUMPTION

Figures 9 and 10 compare the total and monthly natural gas consumption over the reporting period. Natural gas is used in the Allstream Centre in the Kitchen for food preparation and also by the Boilers for heat. In addition, natural gas is used to power the District Energy System as explained later in this report.The natural gas consumption is heavily dependent on weather and events that require the use of natural gas.

The weather temperature in the winter months of 2014 (January, February, March) was colder by 4C and 7C respectively compared to 2013 and 2012 as shown in Figure 8 above and would suggest an increase in Boiler use and natural gas consumption. However, conservation measures were undertaken in 2014 to decrease the building temperature set point which resulted in a decrease in natural gas use by the Boilers by 17% although during the same time, Kitchen gas consumption increased by 20% due to event activity.

Figure 9: Comparison of total gas consumption by year

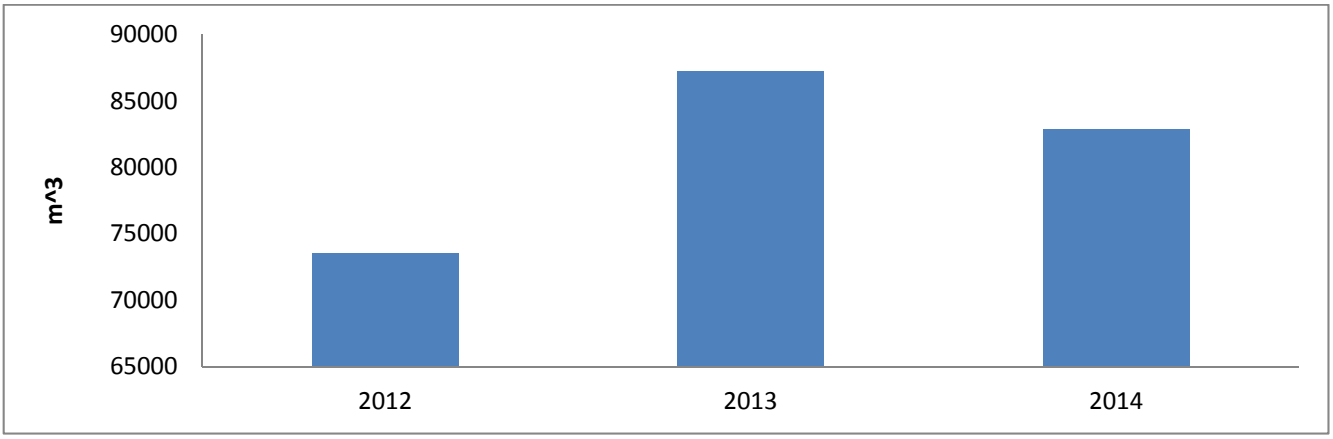


Figure 10 – Comparison of Gas Consumption (m^3) by months for 2012 - 2014

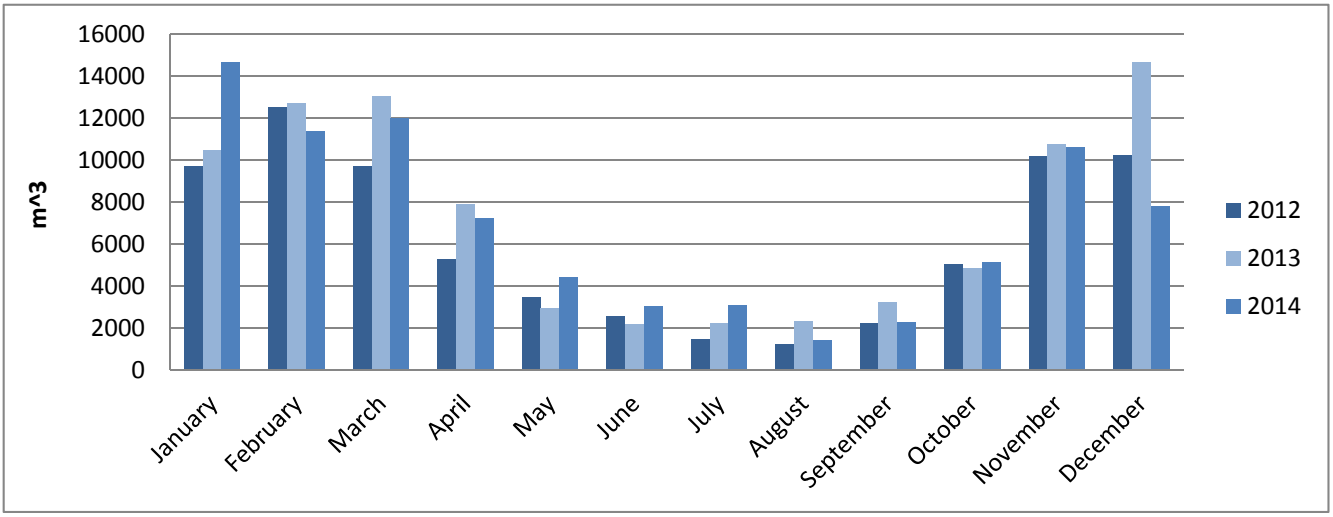


Figure 11 compares the monthly boiler gas consumption of Allstream Centre over the reporting period 2012 – 2014 by Heating Degree Day (HDD).

A heating degree day (HDD) is a way to measure how cold it has been over a 24 hour period. It is determined by calculating the mean daily temperature for the day and subtracting it from a base temperature. Degree days are a good way to keep track of how much demand there has been for energy needed to heat buildings. The colder it is outside, the more degree days (HDD) and the more energy required to heat buildings.

Figure 11 – Monthly boiler gas consumption and heating degree day

Month	Boiler 2012 (m^3)	2012 HDD	boiler 2013 (m^3)	2013 HDD	boiler 2014 (m^3)	2014 HDD
Jan	6399	640	9200	589	12384	649
Feb	6669	559	11571	588	8261	677
Mar	4595	365	9713	515	9267	619
Apr	2115	337	5586	334	3811	312
May	664	91	1284	97	2089	117
Jun	528	26	669	26	1060	7
Jul	585	0	915	0	832	2
Aug	556	4	1229	1	762	4
Sep	1005	94	1490	71	820	56
Oct	1997	253	1531	167	1482	203
Nov	5754	446	3763	408	2818	440
Dec	7115	561	10947	637	4235	514
Total	37981	3376	57897	3432	47822	3600

DISTRICT ENERGY SYSTEM – HEATING & COOLING

The District Energy System (DES) is a thermal energy distribution system for multiple buildings and consists of a heating and cooling central plant within the Enercare Centre and a thermal network of pipes connecting groups of buildings.

Through the Air Handling Units in the Enercare Centre, the DES provides cooling by supplying chilled water to Allstream, Ricoh Coliseum and Hotel X. In 2014, 730 Ton-Hour of chilled water was provided by the DES to Allstream Centre. There is no data recorded for the years 2012 or 2013. The Air Handling Units use electrical power and the electricity consumed to make the chilled water and transport it to Allstream Centre is part of Enercare electricity consumption data.

In addition, the heating for Allstream Centre ballroom and the building make up air is supplied by the central heating plant of the DES. There is no data recorded for the years 2012, 2013 or 2014 for the consumption during these years, however, the baseline consumption is averaged at 111,200 m^3. The DES gas consumption is part of Enercare gas consumption.

GREENHOUSE GASES

The City of Toronto has established aggressive targets to reduce Greenhouse Gas (GHG) emissions as set out in Figure 12 below. The primary greenhouse gases are carbon dioxide (CO2), sulphur oxides (SOx), nitrous oxide (NOx), water vapor, methane and ozone. As an agency of the City of Toronto, Exhibition Place both tracks its GHG emissions and aims to reduce them to help meet the City target

Figure 12 – The City of Toronto's Emission Reduction Targets

	Air Quality Contaminants (2004 Baseline)	Greenhouse Gases (1990 Baseline)
2012	20%	6%
2020	--	30%
2050	--	80%

The City of Toronto has developed a greenhouse gas and air quality inventory program that has the primary purpose of tracking the progress of the City Community and the City Government (the latter as a subset of the City Community) towards achieving its adopted greenhouse gas and air quality emission reduction targets outlined above.

The targets set by the City are absolute targets rather than relative targets, meaning they are independent of population growth or decline, economic growth or decline, or weather variability (e.g., hot summers that lead to more electricity consumption for air conditioning, and cold winters that lead to more natural gas consumption for space heating). The targets apply equally to the City Community and the City Government alike, but progress toward achieving the targets is cumulative. If a sector within the City Community overachieves it may be offset by a sector that underachieves, and vice versa. Equally, if a Division or agency of City Government overachieves it will offset those that do not.

Greenhouse gas emissions in CO2, NOx and SOx from electricity and gas use in the Allstream Centre are shown in Figure 13 and the total greenhouse gas emissions are shown in Figure 14.

Figure 13 - Green House Gas Emissions

Year	Electricity			Gas		
	Co2	NOx	SOx	Co2	NOx	SOx
	kg	kg	kg	kg	kg	kg
2012	328,105	468	85	147,581	118	0.735
2013	344,273	491	89	175,059	140	0.872
2014	363,384	518	94	166,344	133	0.829

Figure 14 - Total Green House Gas Emissions

	Co2	NOx	SOx
Year	kg	kg	kg
2012	475,686	586	86
2013	519,332	631	90
2014	529,728	651	95

HYDRO EXPENSES

The total hydro costs of Allstream Centre is shown in Figure 15 and consists of the electrical loads of the Kitchen, Building Power and Systems, Heat Pumps and Roof Top Units but does not attribute any hydro costs from the DES supply.

Figure 15- Hydro cost

Year	Total Consumption [kWh]	LCD#130510 Average Rate per Kwh $	Hydro Consumption $	Pure Green Purchase $	Total Hydro Expense $
2014	1,489,277	0.1106	164,714	17,600	182,314
2013	1,410,954	0.1096	154,641	16,800	171,441
2012	1,344,692	0.1067	143,479	16,000	159,479

GAS EXPENSES

The total gas consumption cost is shown in Figure 16 and consists of the boiler and the kitchen located in the Allstream Centre but does not attribute any gas costs associated with the DES supply.

Figure 16 - Gas cost

Year	$	M3	Average Rate/M3
2014	22,627	82,882	0.273
2013	20,323	87,224	0.233
2012	15,442	73,533	0.210

FUTURE DIRECTIONS

Increasing the efficiency of existing electrical systems and energy consumption are key steps towards Exhibition Place's energy reduction goal. The following projects are targeted for 2015 to help us meet this goal.

- Shutting down the building during non-use period when there are no events scheduled for 2 weeks or more.
- Continue to optimize set point temperatures during non-occupied periods
- Decrease lighting levels, escalator use and other energy consuming systems, during non-priority periods.
- Upgrade building lighting to more efficient LED technology.
- More accurately calculate and allocate to Allstream Centre the consumption of the DES related directly to Allstream to understand total consumption.