



SUBJECT: Annual Energy and Carbon Report for Burlington

TO: Committee of the Whole

FROM: Capital Works

Report Number: CW-25-17

Wards Affected: Not applicable

File Numbers: 210-09

Date to Committee: May 29, 2017

Date to Council: June 12, 2017

Recommendation:

Submit the relevant content/energy data contained in Appendices B and C of report CW-25-17 to the Ontario Ministry of Energy to meet the reporting requirements under Ontario Regulation 397/11.

Purpose:

The purpose of this report is to report on energy consumption and the resulting greenhouse gas (carbon) emissions from city operations and community wide and provide a progress update on the implementation of the Corporate Energy Management Plan and the Community Energy Plan. The report also meets the provincial legislative requirements to report on energy consumption from city operations.

Energy consumption relates to community building and transportation. A more efficient community with a secure and sustainable supply of energy supports economic development and the environment by reducing greenhouse gas emissions. There are a number of links between this report and the Strategic Plan, specifically under:

A Healthy and Greener City - Environmental and Energy Leadership

- The city's operations are net carbon neutral
- The city will work with community stakeholders to implement the Community Energy Plan and achieve the goals and objectives related to energy conservation, generation and availability.
- The city recognizes that climate change is a significant issue and is working with the community and all levels of government towards the goal of the Burlington community being net carbon neutral.

Background and Discussion:

The Corporate Energy Management Plan was endorsed by council in 2013, providing direction on improving the energy efficiency of city operations and reducing greenhouse gas emissions.

The Community Energy Plan was endorsed by council in 2014 with a vision to achieve a community that is efficient and economically viable in how it uses energy to reduce its reliance on the use of energy, reduce its carbon footprint, and improve local energy security.

This is the first year that reporting on energy consumption and greenhouse gas emissions from city operations as well as community wide has been combined into one overall report (Appendix A).

The following provides some highlights from the report:

Corporate Energy Management Plan (City Operations):

- Electricity consumption was down by 2.1% between 2015 and 2016
- Natural gas consumption reduced by 7.8% year over year, primarily due to warmer temperatures in the cooling season.
- When energy data is normalized for weather, overall energy consumption decreased by 3.8% (normalized equivalent kilowatt hours per degree day¹) from 2015 to 2016.
- Water consumption increased during the same time period by approximately 18.6%, due to an increase in irrigation systems as well as the installation of splash pads.
- Greenhouse gas emissions from city operations also decreased from 2015 to 2016.
- A number of measures are being implemented within city operations to reduce energy consumption and resulting greenhouse gas emissions, including:

¹ Degree days are used to normalize energy data and take weather out of the equation. This is done by using the number of days above and below 18 degrees Celsius and dividing total energy by degree days to come up with equivalent kilowatt hours per degree day.

- Expansion of the arena De-Ox systems, an energy efficient means of making ice.
 - The ongoing project to replace lighting with LED fixtures and improve controls.
 - Recommissioning of buildings to ensure systems are functioning as designed.
- **Upcoming actions to support the Corporate Energy Management Plan include:**
 - Real time circuit level energy metering to improve energy information for operations staff.
 - Investigation of power factor correction² at large city facilities.
 - HVAC upgrades (heating ventilation and cooling system) at city facilities, including Tansley Woods Community Centre, Roads and Parks Civic Operations Centre, Transit Headquarters and the Burlington Seniors Centre.
 - Review and update of the city Green Fleet Transition Strategy.
 - Upgrade the city's streetlights to LED fixtures.

Community Energy Plan:

- Community energy consumption has been reduced by 10.9 gigajoules on a per capita basis from 2014. The target for 2016 was 6.4 gigajoules.
- Greenhouse gas emissions on a per capita basis continues to show a downward trend to meet the target of 5 tonnes/person by 2030 as set in the Community Energy Plan
- The transportation sector represents 30% of the energy consumption in the community but just over 42% of the community's greenhouse gas emissions.
- Greenhouse gas emissions within the building sector declined between 2015 and 2016 but there was a slight increase in the transportation sector.

² Power Factor is a measure of how effectively power is being used in a facility. A high power factor signals efficient utilization of electrical power while a low power factor indicates poor utilization of electrical power. Because of the cost of wasted energy, electrical utilities usually charge a higher cost to industrial or commercial customers where there is a low power factor.

- Highlights of actions taking place in the community to reduce energy consumption and greenhouse gas emissions included:
 - Promotion of electric vehicles in the community through events such as Burlington Hydro's open house and the 'Electric Alley' at the summer car show in downtown Burlington.
 - The Sustainable Development Committee hosted a library session on home energy alternatives such as heat pumps and solar.
 - Schools in Burlington continue to be engaged through the EcoSchool program with two schools on track to become Platinum certified.
 - Once again, the city supported the installation of roof top solar projects through a council resolution under the IESO FIT (Feed-in Tariff) program.
 - The Home Energy Rebate program administered by Union Gas provides a rebate of up to \$5,000, increased from \$2,500 under the previous program.
 - The city completed phase two of the district energy study.

- **Upcoming actions to support the Community Energy Plan include:**
 - The provincial Cap & Trade program has begun and is expected to provide funding to municipalities to implement measures to mitigate climate change.
 - The province has shown interest in working with municipalities to support a program using Local Improvement Charges, providing low interest financing to homeowners and small business owners to implement energy efficient measures.
 - The province has adopted legislation requiring large building owners and property managers to report on energy consumption, similar to what municipalities are required to do.
 - Staff are investigating options to develop a business entity and sources of financing to implement and operate a district energy system in Burlington.
 - The city has released the new draft Official Plan, Grow Bold, which is an excellent example of an integrated approach to land use and transportation planning, supporting a community that is transitioning from a suburban community to one that is more urban in character.
 - The Transportation Policy Directions previously presented by staff to council are ambitious and support sustainable transportation options, including cycling, walking, and transit.
 - Planning for the mobility hubs is well under way and represents significant opportunity for sustainable urban development and transportation systems with the potential to implement community energy systems.

In addition to the actions listed above, staff are coordinating efforts to update both the Corporate Energy Management Plan and the Community Energy Plan with stakeholders, particularly in light of the targets in the city's Strategic Plan, as noted above in this report. Reports on the updated plans will be submitted to council in 2018.

There will be challenges to meeting these targets, including:

- The refurbishment of the provincial nuclear generating stations over the next few years will require offsetting of energy generation through the natural gas fired peaking plants, causing greenhouse gas emissions to increase.
- Natural gas is the traditional method of providing thermal energy to buildings. Switching to cleaner options may be more costly.
- The city's Green Fleet Strategy is under review. A cost benefit analysis is required to determine the best available options to reduce emissions from the city's fleet.

Strategy/process

The Sr. Sustainability Coordinator and Energy Coordinator worked together to collect the data and information to prepare the attached report. Updates on actions are also collected from relevant staff and community stakeholders.

Corporate energy consumption is tracked in house using an energy tracking software system. Community energy data is collected from Burlington Hydro and Union Gas. Transportation consumption is based on fuel purchased within Burlington and is purchased from Kent Marketing. Greenhouse gas emissions are calculated through an online tool for the Partners for Climate Protection Program provided by ICLEI and the Federation of Canadian Municipalities.

Financial Matters:

The annual cost of purchasing transportation fuel data for Burlington from Kent Marketing is just under \$200.

Total Financial Impact

Not applicable

Source of Funding

The cost of the fuel data is covered under the capital budget for the Community Energy Plan.

Other Resource Impacts

Not applicable

Connections:

As noted in this report, there are strong linkages between the energy plans and the Strategic Plan, the Official Plan (Grow Bold) and the Transportation Plan (Go Bold).

Public Engagement Matters:

This report will be posted on city's website at www.burlington.ca/environment. Information on both the Corporate Energy Management Plan and Community Energy Plan can be found here.

Conclusion:

This report shows that Burlington is in a leadership position to continue its work to become an energy efficient and secure community and to meet its legislative requirements for energy reporting.

Respectfully submitted,

Lynn Robichaud
Sr. Sustainability Coordinator
905-335-7600 x7931

Tom Pedlar
Energy Coordinator
905-335-7600 7354

Appendices:

- a. City of Burlington Energy and Greenhouse Gas Emissions 2016 Progress Report for Community & City Operations

Report Approval:

All reports are reviewed and/or approved by Department Director, Director of Finance and Director of Legal. Final approval is by the City Manager.