Report to Council



Date:	6/18/2018
File:	[RIM Classification Number]
То:	City Manager
From:	Energy Program Manager, Building Services
Subject:	Summary of the 2018 Corporate Energy and GHG Emissions Plan

Recommendation:

THAT Council receives for information, the report from the Energy Program Manager dated June 18, 2018, with respect to the 2018 Corporate Energy and GHG Emissions Plan.

AND THAT Council receives for information the 2018 Corporate Energy and GHG Emissions Plan as attached to the report of the Energy Program Manager, dated June 18, 2018.

AND THAT Council set a target to reduce Corporate GHG emissions by 12% below 2007 levels by 2022.

AND THAT Council adopt the requirement of Energy Modelling & Airtightness testing for the construction of all new civic facilities.

Purpose:

To update Council on the current state of corporate energy use for the City of Kelowna, including a review of some of the major energy conservation measures implemented in recent years, as well as a look to the future of energy use and energy costs for the City.

Background:

On September 21, 2007 the City of Kelowna signed the BC Climate Action Charter (CAC). By doing so, signatory Local Governments agreed to voluntarily develop strategies and take actions to achieve the following goals:

1. to become carbon neutral with respect to their corporate operations by 2012. The province has since approved 'making progress towards' as part of the common approach to carbon neutrality under the CAC. The City has taken this approach for meeting CAC commitments;

- 2. measure and report on their GHG emission profile; and
- 3. create complete, compact and more energy efficient communities.

In 2010, the City hired a consultant to complete a Corporate Energy and GHG emissions inventory and reduction strategy. The 2011 Corporate Energy and GHG emissions plan was adopted by Council, and included a corporate energy reduction target of 22% below 2007 levels by 2017. In 2014, the City created an Energy Committee, to participate in identifying, exploring, and proposing future energy saving opportunities to areas within the control of the City of Kelowna.

In 2015 the City hired a Term Energy Specialist to focus on overseeing corporate energy reduction initiatives and to provide an update to the 2011 Corporate Energy and GHG Emissions Plan. In 2017 this became a permanent position, responsible for overseeing the Corporate Energy Program.

2018 Corporate Energy Plan

The 2018 Corporate Energy Plan highlights that corporate emissions have been reduced from 2007 levels by 7%, despite significant growth to the City's energy consuming assets. This falls short, however, of the ambitious 22% target.

In 2016, the City of Kelowna had total corporate energy use of 316,000 GJ, resulting in a cost of \$8.65 million. Compared to 2007 where energy use was 307,000 GJ at a cost of \$6.2 million, the City has experienced:

- 1. a 7% reduction in GHG emissions,
- 2. a 3% increase in energy use, and
- 3. a 40% increase in energy costs.



Total Utility Costs (2007-2016)

Over that same period, the City's population has grown by 17%, and the City has grown its asset base with the addition of facilities such as H2O and Parkinson Activity Center, as well as a 40% increase to the city fleet (this includes the total number of pieces of equipment, including trailers and attachments, and expanded service areas such as the Commonage composting facility and sidewalk plowing).



The dotted line on the Corporate GHG Emissions chart shows the projected increase in emissions if the City had not undertaken any carbon reduction initiatives. It is estimated that if the City had not implemented these initiatives, annual emissions would be 9,000 tonnes CO₂e, 17% higher than they are today, and costs would be \$9.6 million per year, 11% higher than they are today.



Corporate GHG Emissions (2007-2016)

Since the City began focusing on energy conservation measures (ECM's) in 2011, a number of significant projects have been completed, including:

- **City Fleet** The addition of 20% bio-fuel, 19 hybrid vehicles and 1 electric vehicle, as well as the implementation of route optimization and an anti-idling program.
- **Wastewater Treatment Facility** Underwent a process optimization program reducing electricity use by 660,000 kWh/yr.
- Kelowna Police Services Building Through energy efficient design, is estimated to use the same amount of energy as the old building, but has a floor area 2.5 times larger.
- Rutland Arena Heat Recovery Project Reducing annual natural gas costs by \$30,000 (23%).
- **LED Street Light Replacement Project** Projected to reduce annual electricity costs by \$900,000 per year. Full implementation of this project started in January, 2018.
- Outdoor Lighting LED Upgrades Airport and Water Treatment Facility.
- **Cedar Creek Pump Replacement** Sizing and replacement of a large pump that was short cycling, causing unnecessary wear and high operating costs.

The table below highlights how in the last three years in particular, a number of successful projects have resulted in ongoing savings of \$135,000 per year, and rebates achieved totaling \$348,000. Once the LED Street Light Project is complete, the annual savings will be over \$1.0M per year, with rebates achieved of \$900,000.

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	Annual Energy Savings		Rebates			
Completed Projects (2015-2017)	(GJ)		(\$)		Achieved (\$)	
Rutland Arena	2700	\$	25,000	\$	100,000	
YLW Outdoor Lighting LED Upgrade	500	\$	10,000	\$	21,000	
WTF Outdoor Lighting LED Upgrade	250	\$	5,000	\$	11,000	
WTF Air Compressor Upgrade	650	\$	13,000	\$	28,000	
WTF Cedar Creek Pump Replacement		\$	12,000			
City Yards Boiler Upgrade	900	\$	9,000	\$	21,500	
Memorial Parkade	400	\$	8,000	\$	16,300	
Kelowna Police Services	4,800	\$	53,000	\$	134,000	
Energy Studies				\$	16,200	
Sub-total	10,200	\$	135,000	\$	348,000	
Upcoming Projects (2018)						
LED Street Light Upgrade	17,500	\$	900,000	\$	673,000	
Total	27,700	\$1,035,000		\$1,021,000		

Projects completed from 2015 to 2017

In addition to the projects list above, the level of awareness regarding energy use has increased across the corporation, and has become a more significant component in day to day discussions, with some examples including:

- Working with development engineering to encourage new developments to include LED street lighting instead of high pressure sodium lighting, as well as working on a bylaw amendment to require LED,
- Investigating natural gas purchasing options from independent marketers,
- Working with the fleet department on a business case evaluation of converting diesel waste collection vehicles to compressed natural gas, looking for opportunities to reduce emissions as well as costs to residents,
- Partnering with the Capital News Center to provide assistance with the business case development and evaluation of a facility wide LED replacement project,
- Working with the Policy and Planning Department to provide recommendations on community energy reduction initiatives,
- Working with infrastructure delivery to obtain approval for FortisBC rebate applications, followed by the review and submittal of capital cost and equipment specification information, to ensure the full rebates are received,

- Partnering with UBCO professors and graduate students to explore energy and sustainability projects and leverage federal funding opportunities,
- Assisting Finance with annual utility budget review and forecasting,
- Annual reporting of energy and GHG emissions reductions to the climate action revenue incentive program, and
- Working with the Airport to calculate its carbon footprint and achieve recognition under the Airport Carbon Accreditation Program.

Looking forward to the future, there are a number of things that will impact the corporation's energy use and greenhouse gas emissions. These include:

- expecting population growth trends to continue,
- planning to complete major infrastructure projects such as an expansion to the water and wastewater treatment facilities,
- looking to construct a major recreation center, to replace Parkinson Recreation Centre, and
- expecting significant growth to the Airport.

Based on historical energy price increases and this expected growth, energy costs are estimated to rise to **\$10.5 million per year by 2022**, if no further action is taken. If, however, the City can maintain the same 1% per year reduction that has been achieved over the last 7 years, costs are estimated to be **\$9.3 million by 2022**, a difference of **\$1.2 million** per year by 2022, and a total of \$4.0 million over 5 years.

Based on the fact that the City of Kelowna is currently spending \$8.65 million on energy annually, and that these costs will continue to rise as the City grows, the ongoing management of utility budgets is becoming increasingly important and requires additional oversight. In order to continue to reduce energy use, GHG emissions, and mitigate energy cost increases, more investigation into cost effective energy reduction opportunities is necessary, including developing a greater and more detailed understanding of the City's energy use.

The Energy Program Manager, with support from the Energy Committee, would like to return to Council with recommendations on:

- Energy use targets for construction of new civic facilities (to align with the upcoming BC energy step code),
- Energy use targets for existing civic facilities,
- A funding strategy to achieving further energy, GHG and cost reduction initiatives,
- A strategy for evaluating long term impacts of energy as part of the capital planning process, and
- Additional policies that outline energy use requirements for each operation sector (buildings, fleet, parks, lighting, water treatment, solid waste).

Internal Circulation:

Deputy City Manager Director, Financial Services Manager, Building Services Communications Advisor, Communications Manager, Parks and Buildings Planning

Financial/Budgetary Considerations:

Additional upgrades will be budgeted through the normal process.

Considerations not applicable to this report:

Legal/Statutory Authority: Legal/Statutory Procedural Requirements: Existing Policy: Personnel Implications: External Agency/Public Comments: Communications Comments: Alternate Recommendation:

Submitted by:

B Tollefson, Energy Program Manager

Approved for inclusion:

I. Wilson, Manager, Infrastructure Operations

cc: